

INPOS 2024

**3RD INTERNATIONAL POSTGRADUATE
RESEARCH SYMPOSIUM 2024
(INPOS2024)**

**Data-Driven Management:
Transforming Research and Shaping the Future**

27-28 November 2024

AC Hotel by Marriott Penang

PROCEEDING BOOK

**3rd International Postgraduate Research
Symposium (INPOS) 2024**

***Data Driven Management:
Transforming Research and Shaping Future***

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**3rd International Postgraduate Research Symposium (INPOS) 2024
Data Driven Management: Transforming Research and Shaping Future**

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MESSAGE FROM THE DEAN



Assalamualaikum Warahmatullahi Wabarakatuh, greetings of peace and welcome to Penang, Malaysia. It is a great pleasure to welcome all participants to the 3rd International Postgraduate Symposium 2024 (INPOS 2024), scheduled to take place from 27th to 28th November 2024. INPOS 2024@USM stands out as a premier symposium, gathering leading experts in research methodology. This year, INPOS serves as a premier platform featuring highly cited and esteemed experts in research methodology. I hope this event provides participants with an opportunity to exchange ideas, uncover new possibilities, reconnect with colleagues, forge new friendships, and expand their knowledge.

The theme for INPOS 2024, "Data-Driven Management: Transforming Research, Shaping the Future," highlights the crucial role of data in advancing innovative research methods and shaping the evolution of future management practices. This year, we gather under this theme as a testament to the revolutionary role data plays in redefining research and decision-making in organizations. By harnessing the power of advanced data analytics, this approach paves the way for informed, strategic management practices that drive innovation and operational excellence. The transformation enabled by data-driven methods not only enhances efficiency but also empowers institutions to anticipate future trends with greater accuracy. This paradigm shift ensures that decision-making is agile, real-time, and responsive to the demands of a rapidly changing global environment.

As we delve into this exciting theme, I invite you to embrace the opportunities to explore, exchange ideas, and uncover new perspectives that will inspire your journey toward shaping the future of research and management. I would like to take this opportunity to congratulate Postgraduate Student Society (PGSS) and all administrative staff for organizing this symposium. To all participants, I hope this event provides a wonderful opportunity to reconnect, share experiences, and forge new collaborations. There's much to catch up on, and I look forward to the engaging discussions ahead.

Thank you.

Professor Dr. Noor Hazlina Ahmad,
Dean,
School of Management

ABOUT THE SYMPOSIUM

INPOS @USM is a one-of-a-kind symposium. A platform where we bring top-tier, highly referenced, and known research methodology specialists. An avenue for all scholars and researchers to immerse themselves in understanding the real meaning of research. School of Management proudly presents the 3rd International Postgraduate Symposium 2024 (INPOS2024) that will be held from 26th – 27th October 2023. Postgraduate students, researchers, and academics are invited to exchange ideas and experiences dealing with the rigor and relevance of research and management issues globally. Importantly, INPOS 2023 provides chances for postgraduate students and researchers to comprehend the significance of the research, as well as features of scientific rigour, real-world relevance, and impact. The objective is to improve the shared comprehension among researchers who possess distinct values and methodologies, while maintaining the significance and meticulousness of promoting research and its influence.

Specifically, the objectives are:

1. To explore the impact of data-driven strategies on modern management practices, providing a foundation for making informed, evidence-based decisions.
2. To understand how data analytics can transform research processes, driving innovation and shaping future business trends and operations.
3. To equip participants with practical tools and techniques to apply data-driven approaches in solving organizational challenges, improving efficiency, and fostering growth.

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Table of Contents

MESSAGE FROM THE DEAN.....	i
ABOUT THE SYMPOSIUM	ii
ORGANIZING COMMITTEE.....	iii
Table of Contents.....	iv
Research on The Competency Model of Vice Operation President of Operations Based on 212 Corporate Executives Survey Data	14
A Case Study on the Adoption AI-Integrated Accounting Information Systems in Medium- Sized Clothing Retailers	29
Digital Transformation in Archives Management Poses Leadership Challenges	38
Literature Review of Inter-organizational Knowledge Management	50
Addressing Job Satisfaction Factors in Middle Eastern Schools: Integrating Maslow’s Hierarchy with Self-Determination Theory	68
CEO Age & Firm Risk-Taking: The Moderating Role of Uncertainty in the Middle East Countries	78
A Multi-Level Analytical Framework of Talent Attraction: Integrating Organizational Characteristics, Employee Attitudes, and Justice Perceptions.....	85
The Moderating Effects of Organizational Culture on The Relationship between Employee Satisfaction and Employee Performance in Jordanian Banks.....	98
The Relationship between Workforce Ability and Organizational Productivity: Human Capital Theory Perspective	108
Improving Employee Skills in Amanah Ikhtiar Malaysia: Strategies for Organisational Growth and Development	115
Is GenAI Going to Revolutionise The Work Practices of Chartered Accountants in Malaysia?	125
Bibliometric and Visualization Analysis of the Relationship between Employee Well-being and Turnover Intention	134
Literature Review of Inter-organizational Knowledge Management	149
Developing Effective Talent Management Policies: An Analysis of Talent Introduction and loss in Chinese Public Hospitals with a Case Study of Hospital C	167
Institutional Mechanisms and Stakeholders’ Cognition of Shari’ah Auditing in the Nigerian Islamic Bank Industry: A Conceptual Framework	180
The Influence of Knowledge Heterogeneity and Exploratory Learning on Business Performance with Innovation Work Behavior as Mediating	200
Assessment and Mechanism Analysis of Low Carbon Efficiency in Cold Chain Logistics in the Guangdong-Hong Kong-Macao Greater Bay Area	210
The Strategic Human Resource Management, Firm Resource, Employee Relation Climate in Foreign-Invested Enterprises in Guangzhou Special Economic Zone	226

3rd International Postgraduate Research Symposium (INPOS) 2024
Data Driven Management: Transforming Research and Shaping Future

Factor Influencing Intention to Leave among International Talents in Shared Services Industry in Malaysia	234
The Role of Fintech on Digital lending in the Sustainable Growth of Data-Driven Micro, Small, And Medium Enterprises.....	250

The Impact of Communication on Union Effectiveness: Mediating Role of Digital Transformation and Moderating Effect of Innovative Behavior

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Abstract

This conceptual paper explores the complex relationship between digital transformation and the effectiveness of electronic unions in the northern region of Malaysia. Anchored on the Resource-Based View (RBV) theory, this study examines the mediating role of digital transformation and moderating role of innovative behaviour on the effectiveness of the unions. Building on the RBV theory, which highlights the strategic importance of unique and valuable resources, quantitative research utilizing a survey method to collect data from unions' officers via email questionnaire has been designed. Using the RBV framework to highlight the pivotal role of digital transformation within the union as a strategic resource that fosters effectiveness within the unions thereby enhancing their internal, external communications and organizing efforts. This study's conceptual framework enhances the understanding of one of the factors that influences the unions' effectiveness in Northern Malaysia, emphasizing the critical role of digital transformation within the unions in fostering its growth. The insights derived from this research provide significant implications for the unions, the employers and the state, aiming to understand that failure to embrace technological advancement is one of the reasons behind the stagnating and declining growth of unions.

Keywords: communication, effectiveness, electronic union.

Introduction

According to Hodder and Edwards (2015), trade unions are independent organizations that consist of employees who strive towards shared goals like improved employment perks and separate laws from employers. The key responsibility is to uphold and enhance working conditions, surroundings, and rights to meet the requirements and goals of employees (Majid et al., 2021). Members of a trade union must participate in its activities because of the important role that trade unions play. In the negotiations with management, the union will have significant bargaining leverage if member participation is substantial. Employee control will be easier for management if member participation is low (Toubøl & Jensen, 2014).

Trade Unions in Malaysia Context

Trade Unions in Malaysia have been in existence since many decades ago and many researchers have authored articles on its struggles and uphill battles to seek recognition. Union's history backdated to 1940s where they were not only involved with employers-employee's relationships, but their political motivated struggles for independence also gave

them a strong foothold and by late 1940s there were 298 unions in existence with a total membership of some 200,000 at that time. Its significant role in political, social, and cultural of Malaya during the British colonial days (Charles Hector 2017) resulted in their movement and activities being suppressed by British during those days and later by the state many decades after Malaya had gained its independence.

The Essential Regulations were passed in 1965, giving the Minister of Labor the authority to prohibit any industrial action and to refer any issue to binding arbitration. The Industrial Relations Act of 1967 codified the principal provisions of the Essential Regulations (with amendments in 1971, 1976 and 1980). This Act, with Trade Union Act 1959 (amended in 1980) provided the legal framework for industrial relations in Malaysia. The Minister of Labor has the authority to suspend a union for activities that are "prejudicial to" or "incompatible with" the interest of "the security of" or "public order in" Malaysia, according to the Trade Union Act (Section 18). The Registrar of the Trade Union was given the discretionary power over registration or de-registration of the unions. Strikes for political or humanitarian reasons are prohibited. Strikes were not permitted in conjunction with the recognition conflict; the fear of de-registration was always high, therefore strike activity was minimal.

Workers' unions were not allowed in industries granted "pioneer" status under Section 15 of the Industrial Relations Act before 2007, although this was later repealed after an amendment. This was one of the "suppression" laws enacted by the state to safeguard the interests of multinational corporations (mostly from the electronics industry).

Electronic Industry Employees Union in Peninsula Malaysia (EIEU)

After much lobbying, the state finally approved the formation of regional industrial trade unions in 2009 whereby the four regional unions (Western, Eastern, Northern and Southern, Peninsula Malaysia) were subsequently registered. EIEU Northern Region, though had a huge influx of foreign workers in the industrialized trade zone, none of the companies were unionized at the start. Strong resistance with union busting tactics by the management, the legislative restriction which requires the recognition from the management and strict rules and regulations imposed by the state hampered the growth of trade union.

Despite all the challenges, finally EIEU Northern Region made a breakthrough where they succeeded in seeking recognition in WD Media (M) Sdn in 2012 with a membership of 1200 workers. Three years later, 2015, they succeeded in organizing 1350 workers (all locals) at Infineon Technology Sdn Bhd, located in Kulim, Kedah. Another recognition happened in 2017. Elna PCB was unionized with 450 members (inclusive of migrant workers). It was the first time the union had negotiated a collective bargaining agreement that includes migrant workers (interview with Mohd Radzi – President of EIEU Northern Region). In 2018, the fourth company, Panasonic Automotive System was organized, with a membership of 1100 (mixed of locals and migrants). EIEU Northern region of Peninsula Malaysia (which makes up of Perlis, Kedah and Penang) has only 3697 union members in the electronics manufacturing industry. Its membership remains even a year later, in 2024 (interview with AK David, Secretary General of EIEU Northern Region, 2024).

Challenges Faced by Electronic Unions

During the COVID-19 Pandemic, March 18, 2020, is a historical date for Malaysia when the Movement Control Order (MCO) began throughout the country in line with the announcement made by the YAB Prime Minister, Tan Sri Dato' Seri Haji Muhyiddin bin Haji Md Yassin. The MCO was in 2020, Malaysia went through three phases of MCO: the initial stage MCO, Conditional MCO (CMCO) and the Rehabilitation MCO (RMCO). Since 1st June 2021 however, full lockdown under MCP 3.0 was implemented and this has had a profound

impact on all parties. This pandemic demands extraordinary action in matters pertaining to the service sector and it is indeed a huge challenge to trade unions. Some of the challenges faced by trade unions in enhancing the rights and welfare of employees are as follows:

Economic Recession

Throughout the crisis, the Labor Movement has maintained a high degree of industrial harmony. It has convinced employees to sacrifice to enjoy better employment benefits in the future. Without the collective spirit and determination of fighting COVID-19 and playing the individual roles, it would be unlikely to overcome the worst economic recession since independence easily.

Maintaining the members welfare and rights

The pandemic has accelerated trends such as digitalization, automation, and sustainability in all sectors. To seize these opportunities, the urgent need to transform the economy to be ready for a different post-COVID-19 world is even more apparent. Therefore, trade unions must not only face the current challenges of stagnated density but also be ready for future changes, how to protect and maintain their members’ welfare and rights, leveraging on technological advancement.

Below table showed the electronic union membership in West Malaysia.

Table 1. Membership of Electronic Trade Unions by State – 2023

Maklumat Kesatuan Sekerja				
No	Nama	Alamat	Negeri	Bilangan Anggota
1	Kesatuan sekerja Industri Elektronik Wilayah Selatan Semenanjung Malaysia	Bilik 1, Tingkat 3, 4P Susur 3, Jalan Tun Abdul Razak, 80200, Johor Bahru	Johor	2986
2	Kesatuan Staf Eksekutif Industri Elektronik Wilayah Selatan	D/A No SU 59 Jalan Indah 8, Taman Indah Sungai Udang, 26300 Sungai Udang	Melaka	162
3	Kesatuan Sekerja Industri Elektronik Wilayah Timur Sem. Malaysia	Blok 20 No2, Bandar Indera Mahkota, 25200 Kuantan	Pahang	1330
4	Kesatuan Sekerja Industri Elektronik Wilayah Utara SEM Malaysia (KSIEWUSM)	36 Halaman Mahsuri, Bayan Baru, 11950 Bayan Lepas	P.Pinang	3697

Source: Department of Trade Union Affairs (JHEKS)

The above table presents the density of electronic union in Peninsula Malaysia since their registration in 2009. Their growth is insignificant compared to the growth in the number of employees in the electrical and electronic industry (year to year growth) from January 2023 to January 2024 of 26.1% & 25.8% (2.34 million & 2.37 million workers).

The Electronic Industry

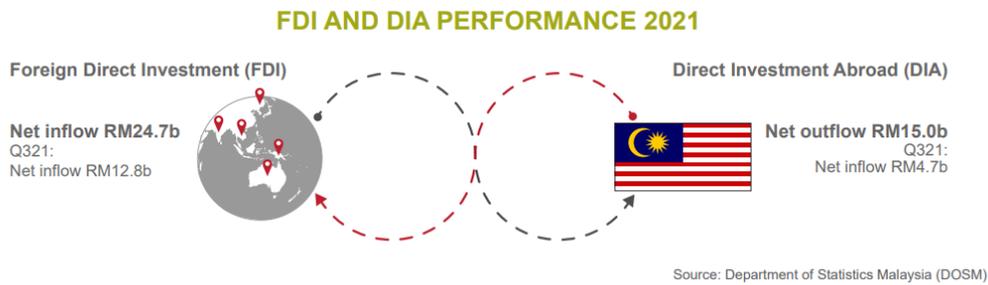
The electronic industry had been a significant driver of Malaysian economic growth during the 1970s. The country's transition from an agricultural to an industrial society was largely facilitated by it (Gallagher and Zarsky 2007). The establishment of tax-free Export Processing Zones was the primary tool utilized by the state to attract foreign investors such as Intel, Hitachi and AMD and it is still the most significant place for the electronics sector (Hürtgen et al. 2009, Rasiah 2009). With this approach of industrialization, Malaysia became the top exporter of microchips in the world during the 1980s and 1990s.

The state launched a variety of initiatives to promote technical advancement in the 1990s. While various innovations and the creation of more complicated, capital-intensive production were the result of this, it had caused an elevated demand for cheap labor, which

was addressed through the recruitment of foreign migrants. During this period, Malaysia's manufacturing sector was led by the electronics industry, which accounted roughly one third of the nation's total manufacturing production (29.3 percent) and more than half of its exports (55.9 percent) (MIDA 2010). In the northern region, Penang alone had approximately 100,000 workers in the electronics sector, and about 200,000 were working in the southern region, cities such as Petaling Jaya, Shah Alam and areas surrounding Kuala Lumpur. Foreign investments made up 88 percent of total investments between January and August 2010; domestic investments made up only 12 percent (MIDA 2010). Hence, low-cost, labor-intensive production was necessary for Malaysia's electronics industry to be integrated into global production networks (Phillips and Henderson 2009).

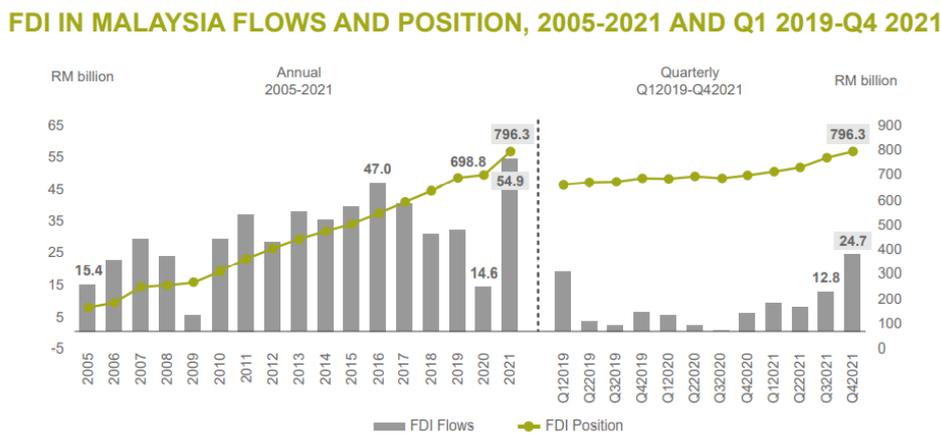
A decade later, foreign investment continued to lead the economic growth of Malaysia, the total stock of FDI in the country expanded by RM26.7 billion to RM796.3 billion, with the manufacturing sector being the highest recipient of FDI at RM312.3 billion or 39.2 percent of the total FDI position (MIDA 2021).

Figure 1. FDI and DIA Performance 2021



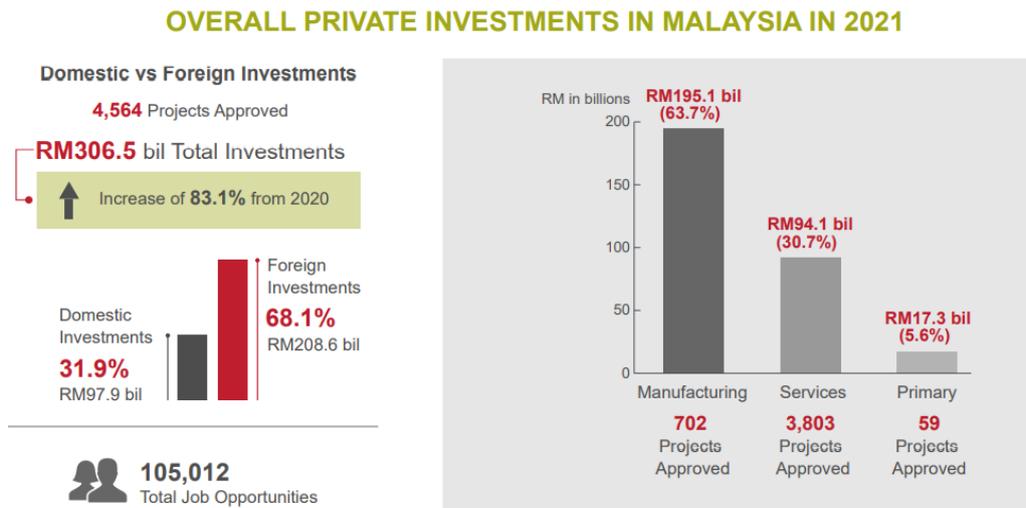
Source: Department of Statistic Malaysia (DOSM) 2023

Figure 2. FDI in Malaysia Flows and Position



Source: Department of Statistic Malaysia (DOSM) 2023

Figure 3. Overall Private Investments in Malaysia 2021



Source: Department of Statistic Malaysia (DOSM) 2023

Table 2. Manufacturing Growth of Sales Value and No of Employees in Manufacturing & EE Sector

Year	Sales Value (billion)	Electrical and Electronic Contribution (year on year growth)	No of employees in mfg sector (million)	No of employees in Electrical and Electronic industry (%)	No of employees increase marginally
February 2017	59.4	13.8%	1.04	NA	1.40%
January 2018	67.8	14.3%	1.07	NA	2.50%
January 2019	72.5	6.3%	1.1	NA	2%
December 2020	124.6	NA	2.2	NA	-2%
January 2021	122.9	NA	2.23	NA	-2.4%
December 2022	156.3	32.1%	NA	26.4	3.40%
January 2023	148	30.4%	2.34	26.1	3%
January 2024	152.7	30.3%	2.37	25.8	NA

Source: Department of Statistic Malaysia (DOSM) 2024

The state recognized the importance of electronic sector from the early start, thus forbade the Electrical Industry Workers' Union (EIWU) from organizing workers in the developing electronics industry all these years (not until 2009). A clear distinction was defined between an "electrical sector" and an "electronics sector," which is unmatched globally, served as the foundation for this. The electronics industry consists of unfinished products, such as printed circuit boards (PCBs) and motherboards, as opposed to the electrical sector, which includes finished products like televisions and radios.

The Resource-Based View (RBV) theory offers a framework for understanding how organizations achieve and maintain a competitive advantage through their distinctive and valuable resources (Lockett et al., 2009; Paradza & Daramola, 2021). This study adopts RBV as a foundation to examine the interplay between communication and union effectiveness, with digital transformation as a mediator while innovative behaviour as a moderator that moderates digital transformation and union effectiveness. Although prior research has highlighted the significance of digital transformation and union effectiveness, there remains a limited understanding of the underlying mechanisms that facilitate successful innovative

behaviour in digital transformation and union effectiveness. Thus, this paper suggests the following research questions.

- H1: Does Communication relate positively to Union Effectiveness in the unions in Northern Peninsula Malaysia?
- H2: Does Digital Transformation provide a positive effect on Union Effectiveness?
- H3: Does Digital Transformation mediate the relationship between Communication and Union Effectiveness?
- H4: Does Innovative Behaviour moderate the relationship between Digital Transformation and Union Effectiveness?

This study seeks to comprehensively explore the factors that influence union effectiveness by analysing the mediating role of digital transformation and the moderating role of innovative behaviour. As a conceptual paper, it aims to enhance the existing knowledge on how technological advancements in communication impact union effectiveness, while providing a foundation for future empirical research. The findings are intended to raise awareness among unions, the state and the employers on integrate emerging digital technologies to support the digitalized communication within the organizations to support growth

Literature Review

The effectiveness of trade unions (in general) has long been a subject of research and interest. Numerous studies have been carried out by academics and researchers to comprehend the influence and efficacy of trade unions in diverse circumstances. The effectiveness of electronic unions and one of its significant factors affecting its effectiveness is reviewed in the discussion that follows, based on some research that had been done previously. The ability of the trade union to effectively represent its members by meeting their wants and interests is a key indicator of its efficacy, according to Bryson and Gomez (2005). According to another study conducted among bank workers, members' loyalty and commitment to their unions are based on the unions' efficacy in organizing, politics, negotiating, and member solidarity (Majid et al., 2021). To gauge trade union effectiveness, Loganathan et al. (2022) concentrated on the status of industrial relations and the traits of trade unions. On the other hand, Bryson (2005) claimed that organizational effectiveness, which involves holding members accountable, and bargaining effectiveness, which involves providing better employment and working conditions, were both components of trade union effectiveness. According to Wood, (2020), there is a growing emphasis on the role of Internet and social media in adding trade union revitalization. Understanding how unions engage online is vital, given the increasing role of social media within unions and the evolution of communication technologies with the rise of the Internet. As Simms et al. (2019) note, "digital technology offers the potential to significantly scale up organizing campaigns." The objective of this paper is to examine and analyses the current communication strategies of the electronic unions and to explore how communication impacts the union's effectiveness, particularly in organizing activities. This study is anchored on robust theoretical underpinnings to provide a comprehensive understanding of the complex relationships between communication, digital transformation and electronic union effectiveness in northern Peninsula Malaysia. Two theories have been selected for consideration: the Resource-Based View (RBV) and its extension, the dynamic capabilities theory.

Theoretical Underpinnings

Digital technologies present new opportunities for both technological organizations, such as IT related organizations and non-technological organizations, such as banks, manufacturing companies, and unions. However, achieving digital innovation requires a significant commitment to adopting emerging technologies. According to Gatignon and Xuereb (1997), a firm aiming to develop an innovation that outperforms its competitors must possess a strong technological orientation. Gatignon and Xuereb (1997) define technological orientation as a firm's commitment to adopting new technologies and its responsiveness to technological advancements. In the context of emerging digital technologies, firms should focus on embracing these innovations and leveraging them to develop transformative digital solutions. In addition to the importance of adopting a digital technology orientation, a firm must also possess the capability to effectively manage and utilize digital technologies in the innovation process. Such capability accelerates the innovation process by integrating and leveraging both human and technological strengths and resources. Building on dynamic capability theory, digital capability can be viewed as a form of dynamic capability, defined as an organization's ability to develop new products and processes while adapting to evolving market conditions (Teece & Pisano, 1994).

Effectiveness

Effectiveness refers to the ability to achieve a desired result or produce the intended outcome. When something is considered effective, it means it has successfully met expectations or goals. In recent decades, there has been considerable research on the effectiveness of unions, particularly as union membership has declined despite a growing workforce. Clark (2009) describes union efficacy as a highly complex and dynamic process, encompassing factors such as "the ability to organize new members," "collective bargaining outcomes," and "impact on society." He also notes that "the degree of democracy within a union" is often seen as an additional measure of union effectiveness. Various forms of measuring were used in many studies to assess union instrumentality or effectiveness. Economic consulting, working environment, member protection, involvement, and communication with others are offered as measures of efficacy, according to Carillon and Sutton (1982).

Communication

Communication is defined as the exchange of information between individuals or between individuals and groups through symbols such as signals, behaviors, and actions. In the workplace, communication can occur in various forms, including verbal (when we speak to others), written, and visual. Nonverbal communication refers to messages conveyed without words, such as through gestures, vocal cues, and body language or spatial indicators. Recently, social media has emerged as an increasingly popular form of communication. The Internet has been revolutionized by social media as a form of communication. Easy accessibility and least expensive, it opens to new approaches to direct connection and communication to the community.

Everyday millions of users publish their articles, photos and videos with the help of services such as YouTube, Flickr, WordPress and share them with others. The phenomenon of user-generated content got into the center stage approximately in 2005 with the arrival of so-called waves of Web 2.0. Many experts led by Tim O'Reilly (the founder of O'Reilly Media (formerly O'Reilly & Associates). pointed to the rising trend of involving the user directly in the creation of the site. Thus, formed web has become more targeted and more useful. As best seen on sites that are now symbols of social media: Facebook (* 2004), YouTube (* 2005) and Twitter (* 2006). Probably with the best definition came Andreas Kaplan and Michael

Haenlein (Professors of ESCP Business School in Germany) who identified social media as "a group of Internet applications built on the ideological and technological foundations of Web 2.0 that allow the creation and exchange of user-generated content.

Social media allows people to exchange ideas and opinions, discuss together the content of pages and make contacts online. Social media is different from traditional mainstream media in that their content can create everybody as well contribute into it or comment on it. They may have a text format, maybe audio, video or photographs and other visual forms that bring together communities and assist people who want to associate together. Social media includes blogs, wikis, video or photo sharing sites and more other things. Creating social networks falls under the category of social media, which is a word that refers to any method of human connection, such as using Facebook, LinkedIn, Myspace and so on. Thus, social networks allow the employees to communicate and present the opportunity for organizing discreetly as most employers suppress interaction of union activists with the employees. Creating profiles and interacting with employees through this method would be more effective than through the conventional methods of face to face meet up with individually.

An increasing collection of research describes and demonstrates how union activists and members view and use social media as part of their union activity (Panagiotopoulos, 2012; Thornwaite et al., 2018). These studies are complemented by qualitative case studies (Taylor & Moore, 2019), which look at how much the Internet and social media can do to "overcome negative dispositions towards unions" and are helpful in establishing the extent to which trade unionists are currently engaging with social media (Wood, 2015). There have been also several studies on how unions interact with other Twitter users, and whether these studies were done at a macro- or micro-level, the conclusions are often the same. Each study indicated that unions preferred to communicate in a static, one-way manner, highlighting how little social media's interactive features are being used by unions. Carneiro and Costa (2020) looked at how union federations in Brazil, Canada, Portugal, and the UK utilized Facebook in a recent study. They noted that the union confederations continued to utilize "an antiquated "one-way" style of communication, preventing possibilities to contact and engage with both union and non-union actors". This study was among the first to comprehensively analyze Facebook posts by union.

Relationship between communication and union effectiveness

There is a significant relationship between communication and the effectiveness of the union. Technology enables information to be accessible quickly in a way that would have previously needed major financial and human resources. One of the fundamental demands of the labor movement has been for more knowledge and greater openness within capitalist society, and it is suggested that as information becomes more easily available, communication via internet may assist to increase the role of workers and trade unions. While physical and tangible barriers to work reorganization still exist, potentially limiting the Internet's influence, its use can reshape the boundaries of work, challenging traditional methods of labor control and organization (Ramos Torres, 2002). Renewal of membership and organizing with the intention of increasing the union membership is critical for the survival of the union. Organizing through an effective platform would bring about intensified response. How do unions organize, what methodology or form of communication to connect with the employees? Union activists' communication to publicize the propaganda of union to the employees discreetly (without the knowledge of the employers) were normally through meet up gatherings past decades ago, however modern technology has enabled each "meet up" with dozens of employees if not hundreds within a single platform instead of individually.

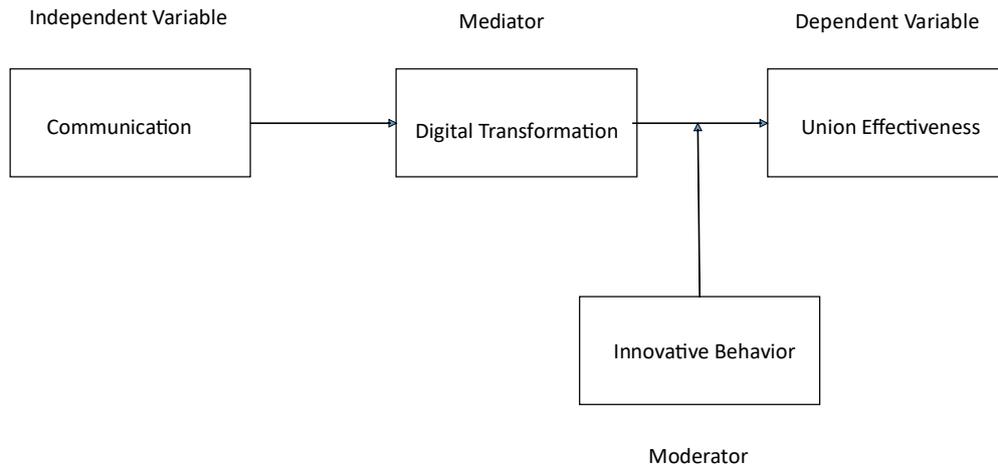
New and more direct methods of obtaining and classifying information have been made possible by advancements in information technology and telecommunications. Such

advancements have helped to further separate time and space (Giddens, 1991). The implications of this for the development of commercial connections are significant since they ostensibly permit a greater diversity in the interchange of institutional and personal information. Although global capital is using these technologies to undermine regulatory systems, the internet can enhance new virtual communities and spaces, enabling the flow of information in ways that are not always hierarchical or controlled by bureaucratic structures (Castells, 2001). The trade union movement would revitalize itself and fill important communication gaps in its national and international networks, fostering a deeper and more meaningful conversation both within and outside of the labor movement. In essence, no one having access to this tool of the new economy could claim with justifications for ignoring labor- and material-related difficulties. The Diamond and Freeman (2002), according to Lee (1996), have fed this optimism. They highlighted how the internet could help organized labor with its issues with operating in an increasingly hostile and unregulated environment. The trade union movement has created a variety of information portals and circuits through the usage of the internet. More particular, the creation of pertinent and targeted websites can provide new points of reference and communication in the most aggressive non-union enterprises. As a result, a variety of services might be made readily available to members, increasing their participation in trade union decision-making. Regarding labor's global participation, the internet makes it simpler to access global campaigns and information. In fact, thanks to websites and information networks, even parties to disputes now have access to independent media. Without paying close attention to the internet, according to Diamond and Freeman, unions risk being marginalized by other players who might use it to establish less independent "representative" entities and even virtual unions. It is undeniable the importance of communication to the union and its effectiveness. By developing and evaluating a conceptual framework, this topic referencing resource-based view theory and its extension, dynamic capacities theory. According to a study by the International Data Corporation (IDC) in Malaysia, 78% of the companies polled cite a lack of commitment and inadequate capabilities as obstacles to their digital transformation process, Ramu and Chu, (2018). Digital innovation cannot be accomplished without a significant commitment to emerging technologies, even while they present new opportunities for both technological and non-technological organizations. An organization that wants to create an innovation that outperforms the competition needs to have a strong technological orientation, according to Gatignon and Xuereb (1997). Technological orientation is defined as a company's dedication to implementing new technologies and adapting to developments in the field. Organizations should be focused on embracing digital technologies considering their emergence to turn them into creative digital solutions. In addition to focusing on the adoption of digital technology, an organization must be able to manage and utilize digital technology in the innovation process to its fullest potential. This is because capabilities that integrate and mobilize technological and human resources and strengths speed up the innovation process.

Conceptual Framework

Building on the discussion above regarding communication (IDV), digital transformation (mediator), innovative behaviour (moderator) and electronic unions effectiveness, this paper presents a conceptual framework illustrated in Figure 4. The relationships among these variables are explored in detail in the subsequent section.

Figure 4. Conceptual Framework (Self-Developed)



Hypothesis Developments

The debate surrounding the internet brings to light the issue of union communication and, by extension, democracy. While the decline of unions is often attributed to structural and organizational changes beyond their control, the challenge of union renewal hinges on how unions ideologically position and represent themselves within the context of a rapidly evolving society. The internet has emerged as a central topic in various political and academic debates. Some view it as the modern equivalent of the "steam engine," symbolizing the driving force behind the new economy and what Castells (1996) refers to as the "informational economy." The intricate relationship among the variables (communication, digital transformation, innovative behaviour and union effectiveness) is grounded in the RBV theory (Bosnjak et al., 2020; Mohammad et al., 2022), as previously outlined in this paper. The subsequent section focuses on the development of hypotheses.

H1. There is a positive relationship between communication and union effectiveness.

While the literature predominantly supports a positive correlation between communication and union effectiveness, the interplay between digital transformation and innovative behaviour will be included. The mediating effect of digital transformation on communication and union effectiveness, the moderating role of innovative behaviour on digital transformation and union effectiveness. Innovative behavior acts as a catalyst for generating fresh ideas and nurturing a culture of innovation within organizations (Ain et al., 2019; Lim et al., 2013; Mohsin et al., 2015). Through activities such as Idea Generation, Idea Championing, and Idea Implementation, entrepreneurs and employees contribute to a robust pool of innovative concepts that fuel organizational growth and success.

H2. Digital transformation mediates the relationship between communication and unions' effectiveness in northern Peninsula Malaysia.

H3. Innovative behavior moderates the relationship between digital transformation and unions' effectiveness in northern Peninsula Malaysia.

Methodology

The methodology used for this paper consists of interviews with the Secretary General and President of the Electronic Union, short survey questionnaire and searches on the portals of electronic unions. There is limited (or even none) previous literature review on the

electronic unions effectiveness, hence, not much analyzed data is available. The state’s official portals such as MIDA, MITI and DOSM combine electrical and electronics data as one sector, making it near impossible to segregate into two different identities. Below, the survey questionnaire response from the President of Electronic Union, Northern Region in Peninsula Malaysia.

Table 3. Survey Questionnaire

Survey Questionnaire				
No	Questions			
1	How does union communicate with the committee members?	Instagram -No	WhatsApp -Yes	Phone call -Yes
2	How does the union communicate with the other members of the union?	Instagram -No	WhatsApp- Yes	Phone call -Yes
3	Does the union use Tik Tok in their organizing activities?		Seldom	
4	How often do the committee access internet via mobile or from home?	Frequent		
5	Which of the following Web2.0 tools and internet applications does union use on regular basis for union activities?			
a	Social Networking e.g. Facebook, Twitter		Seldom	
b	Social media e.g. You Tube or Flickr		Seldom	
c	Instant messaging or chat room	Frequent		
d	virtual meeting e.g. zooms	Frequent		

Source: Survey with Mohd Radzi, President of Electronic Union (Northern Region)

Table 3 indicates that the union committee frequently communicated with their members using methods of instant messaging through mobile applications and virtual meetings, however usage of web tools such as facebook, twitter, you tube or flickr is minimal. This could have led to their stagnated growth in density.

Theoretical Contributions

This paper combines the Resource-Based View (RBV) theory with the concepts of communication and union effectiveness, offering a fresh perspective on how unions can harness their unique resources—such as innovative behavior and data-driven decision-making—to achieve a competitive edge. This theoretical integration provides a more comprehensive understanding of the factors that underpin union growth and success.

Finding & Conclusion

Despite the wide usage of digital communication by unions at other parts of the world, electronic unions in Peninsula Malaysia has a long way to go in terms of fundamentally changing the methods of communication internally with the members or externally with others. Technological advancement where organizations leverage on the AI (artificial intelligence) to run the businesses, the union has not adopted the new approach. This paper has suggested that digital transformation mediates the communication (independent variable) with union’s effectiveness (dependent variable), the innovative behaviour of the union officials moderates digital transformation with union effectiveness, thus, the unions must embrace the change in their current communication methods to increase the density as well as the union members’ participation and commitment.

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- a) Interview: Mohd Radzi (2023), Electronic Industry Employees Union (EIEU), Bayan Lepas, Penang
- b) Interview: AK Divid (2024), Electronic Industry Employees Union (EIEU), Bayan Lepas, Penang

Research on The Competency Model of Vice Operation President of Operations Based on 212 Corporate Executives Survey Data

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Abstract

Consulting experts found that most corporations couldn't find a suitable vice operation president, who is responsible for overall operation management except finance and business, causing corporation's leader and chairman spend too time within the corporation to time for integrating external resources. Therefore, it is extremely important to cultivate qualified vice operation president, which will help the chairman and general manager to concentrate on obtaining external resources. Based on the embeddedness theory, this paper uses SPSS statistical software to analyze 212 valid survey data of corporate executives and finds that loyalty and trust, strategic performance management, HR management of each functional department under the corporate HR rules and the ability to convert corporate financial indicators into management indicators for each functional, technology and management skills, learning comprehension ability, and social communication ability, are the six competency characteristics that affect the stability of the position of vice operation president.

Keywords: competency, embeddedness theory, hexagonal competency model, vice operation president.

Introduction

Usually, the vice operation president of corporation operations management is a position in charge of overall operations management within the corporation (hereinafter referred to as vice operation president). In large and medium-sized corporations, in addition to finance and marketing, vice operation presidents are generally set up to comprehensively manage planning, process technology, procurement, production, quality, warehousing and logistics, research and development and other departments. Whether the vice operation president is competent for the job is directly related to the corporation's operating efficiency.

A summary of the five industries of corporation operation management consultants in the Pearl River Delta, Yangtze River Delta, and central and western China over the past six years found that only 26 of the 418 corporations consulted by consultants had qualified vice

operation presidents, and 93.8% of the corporations were unable to obtain a suitable vice operation president of operations. Only 24.4% of the corporations that hired consultants had 102 vice operation presidents of operations, and only 25.5% of these 102 vice operation presidents were qualified. Three-quarters of the consulting corporations did not have vice operation presidents, and three-quarters of those that did were unqualified. The qualified vice operation presidents of all consulting corporations were 6.2%, which was a serious problem.

Table 1. Statistics of vice operation presidents of consulting corporations

Serial number	Industry	Number of Consultants	Total number of vice operation presidents when starting consultant	Total number of qualified vice operation presidents	Total number of vice operation presidents who failed the assessment	The total number of qualified vice operation presidents after training	Recommended headhunting recruitment	Remark
1	Apparel	126	27	5	22	105	6	
2	Food	54	14	4	10	38	4	
3	Electronic Hardware	112	23	5	18	94	3	
4	Mechanical and electrical automation	108	29	11	18	96	10	
5	Stone	18	9	1	8	15	0	This industry is called the factory director
	Subtotal	418	102	26	76	348	23	
	Percentage %		24.40%	25.50%	74.50%	83.30%		

The reality is that many corporations do not have a loyal and competent vice operation president, or the titular vice operation president does not have the ability to smoothly operate and manage various functions, causing the corporate leaders, the chairman and the general manager, to be "anxious on both ends."

Corporate leaders are in a hurry to meet with key customers or suppliers, and are also in a hurry to go back to the corporation to tell the heads of each functional department what to do, spending most of their time and energy on internal operations management. However, the main time and energy of corporate leaders should be spent on finding and integrating resources for the corporation. Internal operations management is mainly based on convergent thinking, while the external resource integration work of corporate leaders is mainly based on divergent thinking. Corporate leaders are "in a hurry on both ends", and neither end is satisfactory, which restricts the development of the corporation. In many small and medium-sized corporations, the chairman or executive director is the same person as the general manager, and this situation is even more obvious.

For this reason, some corporations set up rotating CEOs. It seems fashionable, with various so-called personal advantages taking turns to show, but it may just be a game. Lacking a talent who understands strategic performance, is proficient in the use of technology and management skills, human resource management of each functional department under the corporate HR rules and ability to convert corporate financial indicators into management indicators for each functional, can quickly learn and understand other functions, and has social communication ability to ensure that each function operates at a high level of cutting-edge technology, they are forced to rotate. Many corporations' rotating CEOs are only at the level of department managers, causing corporation leaders to still be "anxious on both ends". Some corporate leaders may need to travel for a long time or frequently, so they have to appoint their confidants as vice operation presidents, but in fact they are special assistants for supervision or information communication. Many corporations have replaced too many vice

operation presidents, but they lack competence and are unstable. Some of them even abuse their power, causing them to no longer be trusted. Corporate leaders have to do it themselves and continue to be "anxious on both ends". Because they are replaced one by one, two or three aspects of good performance, once they exceed the scope of experience, they cannot perform at the level required by the corporation. When they lack ability, they have power and want to maintain the face of the high position. The evil of human nature may appear. The instability of various vice operation president positions is due to the lack of long-term trustworthy talents to serve as vice operation presidents. Therefore, many corporations are in urgent need of senior talents with vice operation president competence. The stability of vice operation president positions can greatly reduce internal transaction costs of corporations, expand corporate boundaries, and make corporations more profitable, larger in scale and more competitive.

This paper first reviews the relevant research on senior managers' competence, analyzes the six competencies of the vice operation president position based on the embeddedness theory, and uses SPSS statistical software to analyze the competence of the vice operation president based on 212 corporate executive survey data, confirms the six competency characteristics that affect the stability of the vice operation president position in operations management, and constructs a hexagonal competency model for the vice operation president. Finally, summarizes the paper and puts forward relevant suggestions.

Literature Review

The concept of senior managers was first proposed by management guru Peter Drucker in 1956, referring to people who own and use symbols, apply theoretical knowledge and information to work (Peter Drucker, 2003). Robbins believes that managers can be divided into senior managers, middle managers and grassroots managers according to their different levels in the organization. Senior managers mainly establish corporate strategic goals, initiate major changes in the direction of corporate development, monitor corporate results and uniformly allocate funds and resources, contact important external stakeholders, determine the organizational structure of corporate management, and determine the corporate mission, vision and values (Stephen, 2001) . This article studies the vice operation president of operations management among senior managers . The vice operation president is mainly responsible for operations management work other than corporate finance and marketing. He is a senior talent who is fully responsible for operations management within the corporation.

To keep the position of vice operation president stable, one needs to have strong competence. After Harvard University professor McClelland proposed the concept of competence in 1973 (McClelland DC, 1973), a wave of research on competence characteristics was set off from the theoretical to the industrial circles. After half a century of development, there have been many research results on competence, and the most widely used are the iceberg model and the onion model. The iceberg model divides competence characteristics into two parts: the surface and the bottom. The surface part is observable explicit qualities, including knowledge and skills, and the bottom part is implicit qualities that need to be measured through certain methods and tools, including social roles or values, self-concept, personal traits and motivation (McClelland DC, 1973) . The onion model points out that the relationship between competence elements is wrapped in layers, from the outside to the inside, they are skills, knowledge, attitudes, social roles, self-image, and motivation (Boyatzis, 1982) . There is still a lack of research on the competence of vice operation presidents. Existing research only covers a broad concept of senior managers, including senior managers such as the chairman of the board, directors, supervisors, independent directors, CEOs or general managers, vice presidents, presidents, chief accountants or financial directors (Chen Xiaohong et al., 2006) . Spencer proposed that entrepreneurial competence includes six

aspects, such as achievement, influence, and consideration for others (Spencer, 1993). Kaplan et al. constructed five dimensions of executive competence, such as leadership and motivation (KAPLAN SN et al., 2008). Wang Jianmin et al. proposed a preliminary model and scale of competence of Chinese corporations' international executive teams, including ideas, knowledge and experience, and action ability (Wang Jianmin et al., 2015). Jia Jianfeng et al. believed that the competence characteristics of executives are composed of four dimensions, namely insight, strategic awareness, quality and organizational construction ability (Jia Jianfeng et al., 2015). Qi Dawei and Wang Ruoyue studied the core competencies of senior executives in the Internet finance industry and believed that they include management knowledge, financial knowledge, control and implementation of corporate strategy, corporate culture construction and market channel construction, attention to user needs, and grasp of risk control processes and product marketing processes (Qi Dawei et al., 2016). Min Siqi believes that the competency model of private corporate executives consists of 15 indicators in three dimensions: interpersonal management ability, self-management ability, and comprehensive professional skills (Min Siqi, 2021). Hu Pinping et al. believe that the cognitive ability of senior teams has a significant positive impact on efficiency-oriented business models (Hu Pinping et al., 2022). Although the above research on senior competencies has achieved certain results, these are only abstract summaries of the research on senior managers' competencies, and there are still deficiencies in practical application.

The management capabilities of corporate top managers will have a direct impact on corporate economic efficiency, which will not only increase corporate profits but also increase market share. And the competence of corporate executives is significantly positively correlated with corporate performance (Man , 2001), and is the main factor affecting corporate performance (Ou Xueyin, 2010). From the relevant research results of scholars, we can see that the level of corporate executive competency has an important impact on corporate performance, and some of the indicators have a significant role in promoting corporate performance and corporate development (He Xiaogang, 2006). Therefore, only by continuously improving their abilities to adapt to new changes can senior managers be qualified for high-level positions, thereby improving corporate performance, continuing to gain trust, and achieving a stable and rooted position in the corporation.

The embeddedness theory is based on economic sociology and refers to the relatively strong embeddedness between the development of an industry and the social relations in the region, including the relationship between the economy, social system and politics (Polany IK, 1968). Research on corporate embeddedness can generally cover five aspects: relationship, structure, cognition, culture and politics. The political environment and corporate structure are generally stable except for the period of mutation (Su Yunxia et al., 2013). In the study of cultural embeddedness, there is also an overlap between culture and cognitive mechanism (Meyer JW et al., 1987). Assuming that the political environment and corporate structure of the corporation remain stable during the period of senior management selection and training , the embeddedness studied in this paper refers to the strong embeddedness between the job competence of the vice operation president and the corporation. The job competence and embeddedness of the vice operation president are analyzed from the three dimensions of culture, relationship and cognition of the embeddedness theory.

Cultural embeddedness refers to the role that thought systems, rule systems, etc. play in shaping strategies and goals (Zukins, 1990). The cultural embeddedness in this article mainly refers to the loyalty and trust and strategic performance management capabilities of the vice operation president in his job . The corporate culture determined by the corporate leaders is the internal soul of the corporation and the inexhaustible driving force for the corporation's sustainable development (Xia Liangjun, 2022). It is the code of conduct and action guide for all employees. Its core is values, which are stable and unchanged over a certain period of

time. The vice operation president is at the hub of information exchange inside and outside the corporation, and has access to important data from many departments. He should be loyal to the corporate mission, vision and values, and play the role of an advocate and practitioner of corporate culture. He should follow the corporate governance mechanism, be loyal to and trust the cultural thought system and rule system determined by the corporate leaders, implement them in a solid manner, and gain trust with outstanding performance. To achieve outstanding performance, strategic performance management is an important ability of the vice operation president. Strategic performance management should not only focus on business performance, but also pay more attention to the important role of human capital, corporate culture, etc. on the strategic performance of corporations (Hou Pingping, 2022). The vice operation president must unswervingly implement the corporate culture. Under the guidance of corporate culture, thoroughly understand the ideas and will of corporate leaders, and know how to convert and decompose the corporate strategic goals into annual, quarterly and monthly performance target indicators for each function. Through decomposition, talents from different functional departments and different levels of the corporation can effectively communicate and exchange under the norms of corporate culture, fully understand and implement corporate strategy(Wang Qunfeng, 2007). Only in this way can we achieve outstanding performance without deviating from corporate strategy and culture. Loyalty to the strategic performance of corporate culture can gain trust and achieve cultural rooting.

Relationship embeddedness is understood as the influence of direct interaction between subjects, reflecting the strength of the relationship (Granovette M et al., 2001). The relationship embeddedness in this article is reflected in the learning comprehension ability and social communication ability of the vice operation president . The vice operation president of a large or medium-sized corporation is in charge of more than a dozen or even more than thirty functional departments, and the scope of responsibility far exceeds the knowledge, skills and experience possessed by previous work experience. For functional departments beyond the scope of previous experience, it is necessary to provide appropriate management services and bring them to a higher level in order to have or maintain industry competitiveness, highlighting the importance of learning comprehension ability. It is necessary to quickly learn and judge the characteristics of each function and the key points of the technical process. The vice operation president should not only help subordinates understand and judge the key points of technical management, but also guide them to the forefront of the industry. The vice operation president should have strong analytical and judgment skills and the ability to make decisions on ambiguous issues encountered by middle and senior managers. These abilities must come from strong learning comprehension ability. In the process of fulfilling the multi-functional management service responsibilities, the technical management knowledge, insights and cutting-edge information of each function are extremely important. When facing subordinates with different functional technologies and groups with different technical subcultures, it is necessary to learn and understand the corresponding knowledge and technical communication methods to make subordinates understand smoothly. Quickly understand the changes in the external political, economic, cultural, and technological environment of the corporation, grasp the industry trends, learn and understand advanced technology and management skills, and do a good job in the management services of each functional department,so that the learning comprehension ability and social communication relationship ability of the vice operation president are rooted in the hearts of corporate leaders, shareholders and other middle and senior management. In order to obtain more advanced and cutting-edge information, it is necessary to have the help of the multi-functional workplace elite circle of friends. Therefore, the functional elite interpersonal communication ability with certain social relationship connections is an important channel for obtaining new ideas, information and resources. Improving social communication ability will help improve

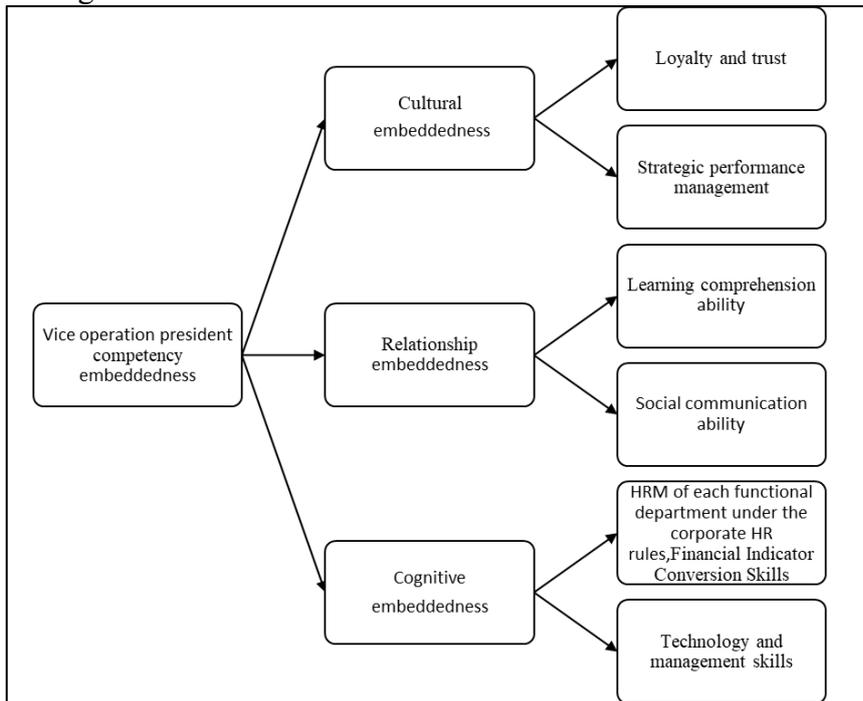
learning comprehension ability, and the two promote each other. If the vice operation president can establish a multi-functional elite interpersonal circle and enhance social communication ability, the regular exchange of ideas and collisions between multi-functional elites will definitely help improve learning comprehension ability and achieve relationship rooting. The vice operation presidents of many corporations need to deal with relationships with the government, associations, etc., which is also inseparable from social communication ability.

Cognitive embeddedness is the way individuals define problems and choose to deal with them (Simsek Z et al., 2003), and is the process of establishing a shared mental map of the union (Kennedy MT, 2008). The cognitive embeddedness in this article is reflected in the belief, values and methods of dealing with problems using the competencies of technology and management skills, human resource management of each functional department under the corporate HR rules and the ability to convert corporate financial indicators into management indicators for each functional. Technology skills is the ability to judge the technical level or development trend of each function. The corporation has only one human resource management department, and the vice operation president has to manage many other functional departments. The vice operation president must not only understand the professional management skills of human resources, but also must understand human resource management of each functional department under the corporate HR rules. Through the corporation's systems and policies issued by the human resources management department, quality assurance management procedures and processes are promoted, and human resource management of each functional department under the corporate HR rules are mastered to form a shared mental framework for each department, so that each functional department can implement corporate culture under the framework of common values, and have the ability to convert corporate financial indicators into management indicators for each functional, to decompose and implement strategic performance, so that each functional department can fully complete its work tasks. The financial department is usually not under the management of the vice operation president, but each functional focus managed by the vice operation president must aim at the financial indicators of the corporation's operations, so the vice operation president must have the ability to convert corporate financial indicators into management indicators for each functional and convert the corporation's annual operating indicators into quarterly and monthly evaluation indicators for talents in each functional echelon. Performance evaluation is not just about completing tasks, but mainly about cultivating echelon talents in the process. The vice operation president should lead the echelon talents to participate in systematic quality and management skills training, strengthen the execution and cooperation capabilities of each functional team in a targeted manner, and enhance the core competitiveness of operation management. Through exchanges in the multi-functional elite network circle, understand or strengthen the ability to judge the technical level of each function and choose the technical route. In this way, human resource management of each functional department under the corporate HR rules and the ability to convert corporate financial indicators into management indicators for each functional, technology and management skills are used to ensure smooth production operations and continuously improve the product quality and output efficiency of the corporation. On the basis of being proficient in the use of human resource management of each functional department under the corporate HR rules and ability to convert corporate financial indicators into management indicators for each functional, technology and management skills, they discover systemic problems in implementing corporate culture and achieving strategic performance, approve corrective actions to solve current problems, and lead the team to explore the root causes of the problems, propose targeted preventive measures, and gradually and systematically improve the execution of various functions under their jurisdiction. In this process, they form a common

belief, values and methodology for dealing with problems in corporate operations management, and achieve cognitive rooting.

The implementation of the value of cognitive root value will gain more trust and enhance cultural rooting. The improvement of social communication ability is conducive to learning comprehension and promotes the cognitive rooting of human resource management of each functional department under the corporate HR rules and the ability to convert corporate financial indicators into management indicators for each functional, technology and management skills. Based on the embeddedness theory, the research framework of this article is constructed , as shown in Figure 1:

Figure 1. Competency Embedded Framework for vice operation president of Operations Management



Methods

The data for this study comes from a questionnaire survey, and the subjects are senior managers of corporations, mainly in the manufacturing and service industries. The frequency analysis method in the statistical software SPSS is used to count the ability characteristics of various vice operation president. The geographical scope of this survey mainly includes the Pearl River Delta, Hunan province, the Yangtze River Delta, and some questionnaires from other provinces in China. These cities are the most developed economic regions in China. The social relationship network is used to distribute to senior managers of corporations . The sample data is spread in different regions and industries, and the data is valid. A total of 212 valid questionnaires were collected in this questionnaire survey. 77.4% of men are significantly higher than 22.6% of women. Most of them are over 40 years old, accounting for 60.4%, and 30-40 years old account for 30.2%. Most of the corporations have a scale of less than 100 people and more than 500 people, accounting for 37.7% and 33% respectively, and 101-200 people account for 13.2%. The details are shown in the following table.

Table 2. Demographics

Demographic variables	Category	Frequency	Percentage%
Gender	male	164	77.4
	female	48	22.6
Area	Pearl River Delta	76	35.8
	Hunan province	75	35.4
	Yangtze River Delta	13	6.1
	other	48	22.7
Industry	manufacturing	100	47.2
	Services	105	49.5
	other	7	3.3
Age	Under 30 years old	20	9.4
	30-40 years old	64	30.2
	Over 40 years old	128	60.4
Corporate scale	Less than 100 people	80	37.7
	101-200 people	28	13.3
	201-300 people	17	8
	301-500 people	17	8
	More than 500 people	70	33
Total		212	100

Results and Discussion

This questionnaire surveys the competency characteristics that a corporate vice operation president should have to maintain his position, using the frequency analysis method in SPSS statistical software. The frequency analysis of the six competency characteristics of loyalty and trust, strategic performance management, human resource management of each functional department under the corporate HR rules and ability to convert corporate financial indicators into management indicators for each functional, technology and management skills, social communication ability, and learning comprehension ability are shown in Tables 3 to 9 below.

Table 3. Frequency analysis of loyalty and trust

	Frequency	Percentage	Effective percentage	Cumulative percentage
Loyalty to corporate goals and corporate leaders can gain trust	152	71.7%	71.7%	71.7%
Only when you gain trust can you be loyal to the corporation	28	13.2%	13.2%	84.9%
No need to worry about loyalty and trust, just complete the work tasks	12	5.7%	5.7%	90.6%
Loyalty is not linked to trust	11	5.2%	5.2%	95.8%
Other	9	4.2%	4.2%	100%
Total	212	100%	100%	

Regarding loyalty and trust, the largest proportion of respondents, 71.7%, believed that loyalty to corporate goals and corporate leaders was the key to gaining trust. This means that the vice operation president should follow the corporate governance mechanism, Loyalty to the system of cultural ideas and rules determined by corporate leader, implement them in a down-to-earth manner, and gain trust through outstanding performance.

Table 4. Frequency analysis of strategic performance management and the ability to convert corporate financial indicators into management indicators for each functional

The proportion of vice operation presidents who convert the corporate annual operating goals into performance target indicators for each function	Frequency	Percentage	Effective percentage	Cumulative percentage
80%	71	33.5%	33.5%	33.5%
50%	51	24.1%	24.1%	57.5%
70%	39	18.4%	18.4%	75.9%
30%	27	12.7%	12.7%	88.7%
100%	16	7.5%	7.5%	96.2%
10%	8	3.8%	3.8%	100%
Total	212	100%	100%	

Regarding strategic performance management and the ability to convert corporate financial indicators into management indicators for each functional, 33.5% of respondents believe that 80% of vice operation presidents have the ability to convert the corporation's annual operating goals indicators into performance target indicators for each function. 24.1% believe that 50% of vice operation presidents are capable, and only 7.5% believe that 100% of vice operation presidents are capable. According to the survey data, vice operation presidents are not good enough at strategic performance management and ability to convert corporate financial indicators into management indicators for each functional, and they need to work hard to train themselves to be able to convert the corporation's annual operating goals into quarterly and monthly assessment indicators for talents in each functional echelon, and to cultivate echelon talents during the implementation process.

Table 5. Frequency analysis of human resource management of each functional department under the corporate HR rules

	Frequency	Percentage	Effective percentage	Cumulative percentage
Not only must you understand the professional skills of human resource management, but you must also understand human resource management of each functional department under the corporate HR rules.	172	81.1%	81.1%	81.1%
Understand professional skills in human resource management	22	10.4%	10.4%	91.5%
Human resource management is the job of the human resources department and has nothing to do with the vice operation president.	9	4.2%	4.2%	95.8%
Other	9	4.2%	4.2%	100%
Total	212	100%	100%	

Regarding human resource management of each functional department under the corporate HR rules, the highest proportion of respondents, 81.1%, believe that it is necessary

not only to understand professional human resource management skills, but also to understand human resource management of each functional department under the corporate HR rules. The vice operation president needs to be proficient in using and mastering the human resource management of each functional department under the corporate HR rules so that each department can form a shared mind framework, so that each functional department can implement corporate culture under the framework of common values and complete corporate work tasks.

Table 6. Frequency analysis of social communication ability

	Frequency	Percentage	Effective percentage	Cumulative percentage
Need to build a multi-functional elite network to understand the forefront of technology management	184	86.8%	86.8%	86.8%
The vice operation president only needs to take care of the internal affairs and handle the relationships at all levels of the corporation.	22	10.4%	10.4%	97.2%
Go to your favorite circle of friends to get together and learn about the forefront of technology management	5	2.4%	2.4%	99.5%
Other	1	0.5%	0.5%	100%
Total	212	100%	100%	

Regarding social communication ability, the highest proportion of 86.8% believed that it was necessary to establish a multi-functional elite network to understand the forefront of technology management. The vice operation president needs to understand the changes in the external political, economic, cultural, and technological environment of the corporation and grasp the industry trends. To obtain more advanced and cutting-edge information, social communication ability is extremely important. The functional elites with certain social connections are good at acquiring new ideas, information, and resources.

Table 7. Frequency analysis of technical judgment ability

	Frequency	Percentage	Effective percentage	Cumulative percentage
Need to be able to judge the various functions under its jurisdiction	203	95.8%	95.8%	95.8%
Just judge the functions you have performed.	5	2.4%	2.4%	98.1%
No need to judge the functions	3	1.4%	1.4%	99.5%
Other	1	0.5%	0.5%	100%
Total	212	100%	100%	

Regarding technical judgment ability, the highest proportion of 95.8% believed that it is necessary to be able to judge the technical level and technical route of each functional department under their jurisdiction. The vice operation president needs to judge the level of

the technical level of each functional department under his jurisdiction, as well as the key points of technical management, and needs to have strong judgment and analysis capabilities.

Table 8. Frequency analysis of management skills

	Frequency	Percentage	Effective percentage	Cumulative percentage
Strategic management leadership and middle management skills required	198	93.4%	93.4%	93.4%
Just keep the heads of the functional departments in charge.	12	5.7%	5.7%	99.1%
No need to pay attention, each functional department learns what they need	1	0.5%	0.5%	99.5%
Other	1	0.5%	0.5%	100%
Total	212	100%	100%	

Regarding management skills, 93.4% of respondents believe that they need strategic management leadership and middle-level management skills. The vice operation president should lead the echelon talents to participate in quality and management skills training in a targeted and systematic manner, enhance the execution and cooperation capabilities of each functional team, and improve the core competitiveness of operations management.

Table 9. Frequency analysis of learning comprehension ability

	Frequency	Percentage	Effective percentage	Cumulative percentage
Must have strong learning comprehension ability and be able to judge the technical management frontiers of all functions under his jurisdiction	194	91.5%	91.5%	91.5%
Just learn and follow the cutting-edge technology management of the department you have worked in.	14	6.6%	6.6%	98.1%
You can't learn so much, just listen to the technical management reports of various departments	2	0.9%	0.9%	99.1%
Other	2	0.9%	0.9%	100%
Total	212	100%	100%	

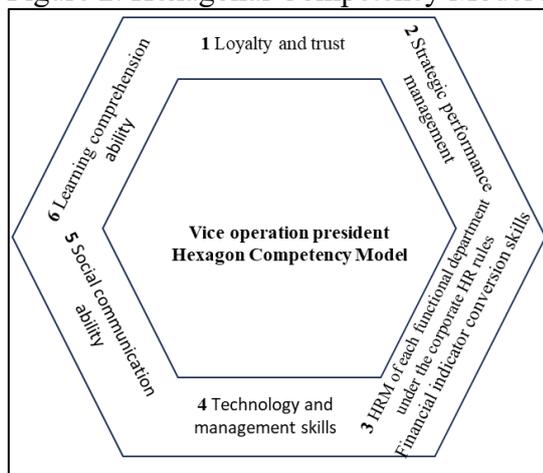
Regarding learning comprehension ability, the highest percentage of 91.5% believes that it is necessary to have strong learning comprehension ability and be able to judge the technical management frontiers of all functions under their jurisdiction. The vice operation president is in charge of many professional functional departments, and the scope of responsibility far exceeds the knowledge, skills and experience possessed by previous work experience. Strong learning comprehension ability is very important, and it is necessary to quickly learn and judge the characteristics of each function and the key points of the technical process.

The above survey data analysis results are consistent with the actual application of industrial and commercial corporations. Corporate consulting management experts have

conducted research, observation and repeated exchanges with more than 200 vice operation presidents of 52 sub-industry corporations in 5 industries, and exchanged and discussed with senior management consulting professionals in the Pearl River Delta, Yangtze River Delta, and capital cities in the central and western regions. It is found that vice operation presidents of large-scale corporations need to deal with various matters of high-level, middle-level and even grassroots management, including any daily emergencies. If not handled properly, they may become major obstacles to the corporate operations. Comparing the behavior of vice operation presidents in handling affairs at work, it is found that vice operation presidents who lack competence and have unstable positions are lacking in six competencies: loyalty and trust, strategic performance management ability, human resource management of each functional department under the corporate HR rules and ability to convert corporate financial indicators into management indicators for each functional, technology and management skills, social communication ability, and learning comprehension ability.

A stable honeycomb is a hexagonal structure, which is widely found in nature and human creation. The regular hexagon has the dual advantages of "complete filling" and "most efficient", and is the most efficient and stable of all shapes. In the large-section hexagonal approach mining method, the hexagonal approach can improve construction efficiency, reduce costs, withstand upper loads, and make the overall stability better (Cao Xin et al., 2021). The hexagonal stability feature is also used in the study of factors affecting the initial career stability of graduates, and a hexagonal stability model for the initial career of graduates is constructed (Zhou Huaming et al., 2023). The above-mentioned embeddedness theory is used to analyze the six competency characteristics of loyalty and trust, strategic performance management ability, human resource management of each functional department under the corporate HR rules and ability to convert corporate financial indicators into management indicators for each functional, technology and management skills, social communication ability, and learning comprehension ability. It is found that the six competency characteristics promote and support each other. If the vice operation president possesses these six competencies, he can stabilize the position of vice operation president and continue to improve. Based on the hexagonal stability principle, combined with the embeddedness theory and analysis of questionnaire survey data, we can obtain the hexagonal competency model for the vice operation president as shown in Figure 2.

Figure 2. Hexagonal Competency Model for vice operation president



Loyalty and trust of cultural rootedness, a thorough understanding of the ideas and will of corporate leaders, and loyalty to corporate culture are the most important characteristics of the vice operation president's position stability. In the real environment of industry and

commerce, it also reflects the moral high ground, so it is at the top of the model as characteristic 1. To achieve the purpose of corporate operations, the vice operation president's work goal is to achieve annual strategic performance, so strategic performance management is arranged clockwise as characteristic 2, both of which are culturally rootedness. Then, the cognitive embeddedness, which are technology and management skills, human resource management of each functional department under the corporate HR rules and the ability to convert corporate financial indicators into management indicators for each functional, proficiently using these basic skills, cultivate echelon talents to achieve goals, so they are characteristics 3 and 4. The vice operation president must lead all functions under his jurisdiction to achieve monthly and quarterly goals at all levels in order to achieve annual strategic performance. He needs social communication ability to establish a multi-functional elite network of contacts, so that he can always maintain multi-functional access to cutting-edge technology information, use learning comprehension ability to digest, and continuously promote the achievement of work goals by various functional departments. Therefore, the relationship-rooted social communication ability and learning comprehension ability are characteristics 5 and 6 respectively. social communication ability and learning comprehension ability ensure the achievement of strategic performance goals and are a manifestation of the vice operation president's job loyalty and trust, forming a hexagonal closed-loop structure.

Conclusion and Recommendations

This paper constructs a hexagonal competency model for vice operation presidents in corporate operations management. Through questionnaire surveys, senior managers of corporations in multiple industries are surveyed. The survey data are analyzed using frequency analysis methods to analyze the six competency characteristics of vice operation presidents' position stability. The research results show that the six competency characteristics that affect the stability of vice operation presidents' positions are loyalty and trust, strategic performance management ability, human resource management of each functional department under the corporate HR rules, ability to convert corporate financial indicators into management indicators for each functional, technology and management skills, social communication ability, and learning comprehension ability. Based on the hexagonal stability principle, a hexagonal competency model for vice operation presidents is constructed.

The vice operation president is a senior talent in corporate operation and management. Having a qualified vice operation president is conducive to improving the economic benefits of the corporation and enhancing its competitiveness. Reducing the internal transaction costs of the corporation may also expand the boundaries of the corporation. Based on the above research conclusions, it is recommended that relevant government departments and institutions should pay attention to the vice operation president of the corporation and introduce relevant policies to promote the cultivation and development of the vice operation president. Corporations can refer to the hexagonal competency model of the vice operation president to carry out relevant training to improve the vice operation president's corporate operation and management level. The vice operation president or professionals who hope to be the vice operation president can refer to the content of the model to train each item to a proficient level, improve their job competency, and seize the opportunity to be promoted to the position of vice operation president and be able to do it steadily. This can also liberate corporate leaders from being "anxious on both ends", which is conducive to improving corporate competitiveness, reducing internal transaction costs and expanding corporate boundaries.

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A Case Study on the Adoption AI-Integrated Accounting Information Systems in Medium-Sized Clothing Retailers

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Abstract

In the context of accounting information systems, many medium-sized clothing retailers in Guangdong, China, have yet to adopt AI-Integrated Accounting Information Systems (AI-AIS). Managers recognize the potential of AI-AIS to enhance efficiency and accuracy, yet significant barriers hinder implementation. This study aims to explore managers' attitudes, subjective norms, and perceived behavioral control regarding AI-AIS adoption. Utilizing a qualitative case study design, interviews were conducted with five managers from medium-sized clothing retail companies in Guangdong. Data were analyzed through content analysis to identify key themes related to the Theory of Planned Behavior (TPB). Findings indicate generally positive attitudes towards AI-AIS, influenced by government initiatives and competitive pressures. However, perceived behavioral control is significantly impeded by financial constraints, lack of technical expertise, and inadequate infrastructure. These insights highlight critical factors that must be addressed to foster wider AI-AIS adoption in this sector.

Keywords: AI-integrated accounting information systems, attitudes, medium-sized retailers, perceived behavioral, theory of planned behavior, subjective norms.

Introduction

In recent years, Accounting Information Systems (AIS) in China have experienced significant advancements, driven by rapid technological progress and economic growth. As of 2023, approximately 65% of Chinese enterprises have integrated AIS into their operations, leveraging digital tools to improve financial management and decision-making (Li & Zhang, 2022; Wang et al., 2021). These systems enhance accounting efficiency, reduce errors, and provide real-time financial insights, particularly when augmented by AI technologies, which introduce predictive analytics and automation (Chen et al., 2020). AI-Integrated AIS can generate strategic advantages, including real-time reporting and improved decision-making (Zhang & Liu, 2019).

However, adoption within the medium-sized clothing retail sector remains limited. While larger enterprises report a 78% AIS adoption rate, medium-sized retailers lag at 58% (Guo & Sun, 2023). For AI-Integrated AIS, the disparity is even greater, with only 12% of medium-sized clothing retailers employing such systems in 2023 (Li & Wu, 2023). This gap undermines the competitiveness and operational efficiency of these firms. Despite the Chinese government's initiatives, such as "Made in China 2025," which emphasize digital transformation and technological integration in industries (Ministry of Industry and Information Technology, 2021), barriers persist. Financial constraints, technical expertise deficits, and inadequate

infrastructure remain significant challenges for these businesses (Chen & Zhao, 2021; Zhou & Huang, 2023).

The adoption of AI-Integrated AIS among medium-sized clothing retailers in Guangdong, China, is in its early stages, with most firms still relying on traditional systems lacking advanced analytical capabilities. While some managers recognize the potential of AI-Integrated AIS to improve efficiency, skepticism regarding return on investment and system reliability persists, creating a gap between perceived benefits and actual adoption (Zhou & Huang, 2023; Li & Wu, 2023). Adoption is strongly influenced by industry trends, competitor actions, and stakeholder expectations, with subjective norms playing a critical role (Wang et al., 2021). Pressure to align with industry standards and emulate competitors can drive adoption when norms are strong (Guo & Sun, 2023; Xu et al., 2021). However, in environments where resistance to change prevails, adoption rates remain low despite evident advantages (Tang & Gao, 2022). Key barriers for medium-sized retailers include financial constraints, insufficient technical expertise, and inadequate infrastructure, which significantly reduce perceived behavioral control (Chen & Zhao, 2021; Zhou & Huang, 2023). Even with positive attitudes and supportive norms, these limitations often prevent the implementation of AI-Integrated AIS (Li & Wu, 2023; Xu et al., 2021). Addressing these challenges is essential to fostering wider adoption within this sector.

This case study contributes to understanding the factors hindering the adoption of AI-Integrated Accounting Information Systems among medium-sized clothing retailers in Guangdong, China. By exploring the perspectives of managers through the lens of the Theory of Planned Behavior, this research provides valuable insights into the interplay of attitudes, subjective norms, and perceived behavioral control in shaping adoption decisions. The findings have practical implications for business leaders, policymakers, and technology providers seeking to overcome barriers and promote digital transformation in the retail sector.

Research Objective

To explore attitude, subjective norms, and perceived behavioral control of Adoption AI-Integrated Accounting Information Systems in Medium-Sized Clothing Retailers.

Research Questions

- i. How far do managers of medium-sized clothing retailers hold positive attitudes towards the adoption of AI-Integrated Accounting Information Systems (AI-AIS)?
- ii. How far do subjective norms influence managers of medium-sized clothing retailers in adopting AI-Integrated Accounting Information Systems (AI-AIS)?
- iii. How far do managers of medium-sized clothing retailers perceive behavioral control over adopting AI-Integrated Accounting Information Systems (AI-AIS)?

Literature Review

In recent years, the integration of artificial intelligence (AI) into business operations has been significantly influenced by governmental policies aimed at fostering technological innovation and digital transformation. In China, the government has implemented several initiatives to promote the adoption of AI technologies across various industries, including the retail sector. The "New Generation Artificial Intelligence Development Plan" (State Council, 2017) outlines strategic objectives to position China as a global leader in AI by 2030, emphasizing the importance of AI integration in enhancing operational efficiencies and competitive advantages (Li et al., 2020). These policies provide a supportive framework for medium-sized clothing retailers to adopt AI-integrated Accounting Information Systems (AI-AIS), yet the adoption rate remains suboptimal.

Globally, the adoption of AI-integrated Accounting Information Systems has been gaining momentum, driven by advancements in machine learning, data analytics, and automation technologies. Studies indicate that AI-AIS can significantly improve accuracy, reduce manual errors, and enhance decision-making processes in accounting (Wang & Zhang, 2018; Kim et al., 2021). In developed economies such as the United States and European Union member states, the integration of AI into accounting systems is viewed as a critical component for maintaining competitive advantage and operational efficiency (Smith & Johnson, 2019; Müller & Becker, 2020). Conversely, in emerging markets, including China, while there is a growing recognition of the benefits of AI-AIS, the adoption is hindered by factors such as high implementation costs, lack of skilled personnel, and concerns over data security (Chen & Lee, 2021; Zhao et al., 2023).

AI-Integrated Accounting Information Systems (AI-AIS) refer to accounting systems enhanced with artificial intelligence technologies to automate complex accounting tasks, provide predictive analytics, and facilitate real-time financial reporting (Lu & Wang, 2020). In China, the adoption of AI-AIS is gradually increasing, driven by the government's emphasis on digital transformation and the need for businesses to enhance their competitive edge in the global market (Li et al., 2020). However, the adoption rate among medium-sized enterprises, particularly in the clothing retail sector, remains relatively low. According to a survey by the China Information Technology Industry Development Research Institute (2022), only approximately 35% of medium-sized clothing retailers in Guangdong have implemented AI-AIS, highlighting a significant gap between policy aspirations and on-the-ground realities. Factors contributing to this slow adoption include high initial investment costs, lack of technical expertise, and resistance to change within organizational cultures (Zhao et al., 2023).

The limited adoption of AI-AIS in medium-sized clothing retailers in Guangdong leads to several operational inefficiencies and strategic disadvantages. Without AI-AIS, retailers are more prone to human errors in accounting, slower financial reporting processes, and less effective data analysis, which can hinder informed decision-making (Garcia et al., 2019). Additionally, the lack of real-time financial insights can impede the ability to respond swiftly to market changes, thereby reducing competitiveness (Singh & Gupta, 2021). Empirical data indicates that companies utilizing AI-AIS experience a 20% increase in operational efficiency and a 15% improvement in decision-making speed compared to those using traditional systems (Smith & Johnson, 2019). Therefore, the failure to adopt AI-AIS can result in reduced profitability, increased operational costs, and diminished market position (Brown & Davis, 2022).

The theoretical framework underpinning this study is the Theory of Planned Behavior (TPB), which posits that an individual's behavioral intentions are influenced by their attitude towards the behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). TPB has been widely used to predict and understand various behavioral intentions, including technology adoption in organizational settings (Taylor & Todd, 1995; Venkatesh et al., 2003). In the context of AI-AIS adoption, TPB provides a comprehensive lens to examine the psychological and social factors that influence managers' decisions to implement advanced accounting systems.

The choice of TPB as the theoretical framework for this study is driven by its robustness in explaining technology adoption behaviors in organizational contexts. TPB allows for the examination of how managers' attitudes towards AI-AIS, the perceived social pressures (subjective norms), and their confidence in their ability to implement AI-AIS (perceived behavioral control) collectively influence their intention to adopt these systems (Ajzen, 1991). Given the complex interplay of individual and organizational factors in technology adoption, TPB offers a structured approach to dissect the underlying motivations and barriers faced by medium-sized clothing retailers in Guangdong. Previous studies have successfully applied TPB

to understand IT and IS adoption, providing a validated basis for its application in this research (Zhang & Lee, 2019; Liu et al., 2021).

Attitude towards behavior refers to the degree to which a manager has a favorable or unfavorable evaluation of adopting AI-AIS. Positive attitudes, driven by the perceived benefits such as increased efficiency and accuracy, are likely to enhance the intention to adopt (Wang & Zhang, 2018). Subjective norms involve the perceived social pressure from stakeholders, including peers, industry leaders, and suppliers, to adopt AI-AIS. In the context of Guangdong's medium-sized clothing retailers, strong subjective norms can act as a significant motivator for adoption, especially if key industry players are perceived to be moving towards AI integration (Kim et al., 2021). Perceived behavioral control refers to the manager's perception of their ability to successfully implement AI-AIS, encompassing factors such as available resources, technical expertise, and organizational support (Chen & Lee, 2021). High perceived behavioral control can mitigate the perceived risks and barriers associated with AI-AIS adoption, thereby fostering a greater likelihood of adoption (Zhao et al., 2023).

Currently, the attitudes towards AI-AIS among managers in Guangdong's medium-sized clothing retailers are mixed, with some recognizing the potential benefits while others remain skeptical due to the high costs and complexity involved (Liu et al., 2021). Subjective norms are gradually shifting as more industry leaders and competitors adopt AI technologies, creating a conducive environment for AI-AIS adoption (Singh & Gupta, 2021). However, perceived behavioral control remains a significant barrier, as many managers lack the necessary technical skills and resources to implement AI-AIS effectively (Zhang & Lee, 2019). Strengthening subjective norms involves fostering a supportive industry environment through collaborative networks and peer influence, where successful adopters can mentor and guide others (Brown & Davis, 2022). Improving perceived behavioral control requires providing managers with the necessary training, resources, and technical support to build their confidence and capabilities in implementing AI-AIS (Garcia et al., 2019). Literature suggests that interventions targeting these constructs can significantly enhance the likelihood of technology adoption in similar contexts; Venkatesh et al., 2003).

Methods

This research adopts a case study design, which is appropriate for exploring complex phenomena within their real-life context. The research focuses on managers from five medium-sized clothing retail companies based in Guangdong, China.

The purposive sampling method was employed to select participants who are knowledgeable about their organizations' decision-making processes related to technology adoption. Managers were chosen because they are the key decision-makers in the adoption of accounting systems and have direct insight into the barriers and facilitators of AI-AIS implementation. The selection of medium-sized enterprises is strategic, as these companies face unique challenges compared to large enterprises.

Data collection for this study will involve semi-structured interviews with managers of the selected companies, which are ideal for case study research as they offer flexibility for participants to express their views while maintaining a structured approach. The qualitative data obtained will be analyzed through content analysis, a common method for identifying and reporting patterns or themes within qualitative data (Braun & Clarke, 2006).

The data analysis process will involve several stages. First, the interview transcripts will be read and re-read to familiarize the researcher with the data. Then, the data will be coded to identify key themes related to attitudes, subjective norms, and perceived behavioral control.

Results and Discussion

Below is a table summarizing the responses from the managers (Respondents A to E) of the five medium-sized clothing retail companies in Guangdong, China, organized according to the three core constructs of the Theory of Planned Behavior (TPB): Attitude, Subjective Norms, and Perceived Behavioral Control.

Table 1. Attitude toward the adoption AI-Integrated Accounting Information Systems

Respondents	Interview Summary
A	Positive about AI-AIS reducing manual tasks and errors. Concerned about current IT infrastructure limitations.
B	Believes AI-AIS enables real-time financial reporting and enhances competitive edge. Worried about team adaptability to new technology.
C	Recognizes potential benefits of AI-AIS. Uncertain about return on investment due to high initial costs and financial constraints.
D	Concerned about the reliability of AI systems. Skeptical that AI-AIS may produce inaccurate data, impacting financial management.
E	Sees efficiency gains from AI-AIS but remains cautious due to cost concerns. Believes benefits may not currently outweigh the expenses involved.

The respondents generally exhibit a positive attitude towards the adoption of AI-AIS, acknowledging its potential to enhance efficiency, accuracy, and competitive advantage. However, this optimism is tempered by significant concerns regarding high initial costs, return on investment, and the reliability of AI systems. These mixed attitudes indicate that while there is recognition of the benefits, apprehensions about financial and operational risks play a crucial role in shaping managers' intentions to adopt AI-AIS.

Medium-sized clothing retail companies' Subjective Norms the adoption AI-Integrated Accounting Information Systems

The content of the interview analysis clearly expresses the Subjective Norms Influencing AI-AIS Adoption. The overall results of the interview analysis are shown in Table 2.

Table 2. Subjective Norms Influencing AI-AIS Adoption

Respondents	Interview Summary
A	Influenced by government initiatives like "Made in China 2025" promoting digital transformation.
B	Feels pressure from competitors successfully adopting AI-AIS, creating urgency to follow suit.
C	Faces expectations from investors and stakeholders to leverage modern technologies for efficiency and transparency.
D	Experiences moderate pressure from industry trends. Less influenced by competitors' actions compared to other factors.
E	Feels significant pressure to adopt AI technologies as competitors are doing so to avoid falling behind in the market.

Subjective norms play a pivotal role in influencing managers' decisions to adopt AI-AIS. External pressures from government policies, such as the "Made in China 2025" initiative, and competitive actions significantly impact adoption intentions. Managers perceive a strong need to align with industry standards and stakeholder expectations, which heightens the urgency to adopt AI-AIS. However, the degree of this influence varies among respondents, with some experiencing more intense pressure from competitors and stakeholders than others.

Medium-sized clothing retail companies' Perceived Behavioral Control Over AI-AIS Implementation

The content of the interview analysis clearly expresses the Perceived Behavioral Control Over AI-AIS Implementation. The overall results of the interview analysis are shown in Table 3.

Table 3. Perceived Behavioral Control Over AI-AIS Implementation

Respondents	Interview Summary
A	Current IT infrastructure is inadequate for AI-AIS.
	Upgrading requires significant investment and time.
B	Lack of adequate training and technical support hampers effective utilization of AI-AIS.
	Concerns about underperformance without proper support.
C	Lacks in-house technical expertise required for AI-AIS.
	Hiring specialized staff would strain financial resources.
D	Financial constraints make allocating funds for AI-AIS challenging.
	Current IT infrastructure, including internet connectivity and hardware, is insufficient.
E	Difficulty in securing the necessary budget within the current financial framework.
	Recognizes the need for training and support to implement AI-AIS effectively.

Perceived behavioral control emerges as a significant barrier to AI-AIS adoption among medium-sized clothing retailers. Managers highlight financial constraints, insufficient technical expertise, and inadequate technological infrastructure as major obstacles. These factors diminish their confidence in the ability to successfully implement AI-AIS. The lack of resources and support systems further exacerbates these challenges, making it difficult for managers to envision a feasible path towards adoption without substantial external assistance.

Medium-sized clothing retail companies' Strategies to Enhance Perceived Behavioral Control

The content of the interview analysis clearly expresses the Perceived Behavioral Control Over AI-AIS Implementation. The overall results of the interview analysis are shown in Table 4.

Table 4. Strategies to Enhance Perceived Behavioral Control

Respondents	Interview Summary
A	Current IT infrastructure is inadequate for AI-AIS.
	Upgrading requires significant investment and time.
B	Lack of adequate training and technical support hampers effective utilization of AI-AIS.
	Concerns about underperformance without proper support.
C	Lacks in-house technical expertise required for AI-AIS.
	Hiring specialized staff would strain financial resources.
D	Financial constraints make allocating funds for AI-AIS challenging.
	Current IT infrastructure, including internet connectivity and hardware, is insufficient.
E	Difficulty in securing the necessary budget within the current financial framework.
	Recognizes the need for training and support to implement AI-AIS effectively.

To overcome the barriers associated with perceived behavioral control, respondents propose a variety of strategic approaches. These include seeking financial support through government subsidies, reallocating budgets, and forming partnerships with technology providers to access technical expertise. Additionally, implementing AI-AIS in manageable phases and promoting industry collaboration are suggested to mitigate financial and operational challenges. These strategies aim to enhance managers' confidence and capabilities, making the adoption of AI-AIS more attainable despite existing constraints.

Conclusion

This study has elucidated the multifaceted factors influencing the adoption of AI-Integrated Accounting Information Systems (AI-AIS) among medium-sized clothing retailers in Guangdong, China, through the lens of the Theory of Planned Behavior (TPB). The findings indicate that while managers generally harbor positive attitudes towards AI-AIS, recognizing its potential to enhance efficiency, accuracy, and competitive advantage, significant reservations persist regarding the high initial costs, uncertain return on investment, and the reliability of AI systems. These sentiments align with the findings of Li and Wu (2023), who noted that financial constraints and skepticism about ROI are primary deterrents in the adoption of advanced accounting technologies. Additionally, the study underscores the pivotal role of subjective norms, where external pressures from government initiatives like "Made in China 2025" and competitive dynamics significantly shape managers' intentions to adopt AI-AIS. This corroborates the assertions of Wang et al. (2021) and Guo and Sun (2023), who emphasized that alignment with industry standards and stakeholder expectations is crucial for technology adoption. However, the variation in the degree of influence among respondents, as observed in this study, reflects the nuanced nature of subjective norms, echoing the findings of Xu et al. (2021) that highlight the differential impact of peer and industry influences across organizations. Furthermore, perceived behavioral control emerged as a substantial barrier, with financial constraints, lack of technical expertise, and inadequate IT infrastructure being predominant challenges. This is consistent with Chen and Zhao (2021) and Zhou and Huang (2023), who identified resource limitations and technical deficits as critical impediments to AI-AIS implementation. The convergence of these findings with existing literature reinforces the robustness of TPB in explicating technology adoption behaviors within organizational contexts, as also demonstrated by Venkatesh et al. (2003) and Zhang and Lee (2019).

Moreover, the study highlights strategic approaches proposed by managers to mitigate the barriers associated with perceived behavioral control, such as seeking government subsidies, reallocating budgets, and forming partnerships with technology providers. These strategies resonate with the recommendations of Taylor and Todd (1995) and Garcia et al. (2019), who advocate for financial support and collaborative networks to enhance technological adoption. Implementing AI-AIS in phased manners and fostering industry collaboration are practical measures that can alleviate financial and operational challenges, thereby enhancing managers' confidence and capabilities. This aligns with the perspectives of Brown and Davis (2022), who suggest that incremental implementation and industry mentorship can facilitate smoother transitions to advanced systems. Additionally, the study's emphasis on the necessity of training and technical support echoes the conclusions of Liu et al. (2021) and Singh and Gupta (2021), who identified skill development and comprehensive support systems as essential for successful technology integration. By addressing these constructs—attitude, subjective norms, and perceived behavioral control—this research provides a comprehensive understanding of the adoption dynamics of AI-AIS in medium-sized clothing retailers. It underscores the importance of a supportive external environment and adequate internal resources in overcoming adoption barriers, thereby offering valuable insights for business leaders, policymakers, and technology providers aiming to foster digital transformation within the retail sector. Future research could expand on these findings by exploring longitudinal changes in adoption behaviors and the impact of evolving technological advancements on medium-sized enterprises.

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Digital Transformation in Archives Management Poses Leadership Challenges

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Abstract

Under the trend of digitisation, records management is actively changing. This study investigated the challenges posed to management level and leadership in the process of digital transformation of records management in the context of digital transformation. The research for this project used on-site interviews and online questionnaire research involving 32 personnel in archive management and one technical leader of digital transformation in a local industry. This study aims to explore the measures that address the changes in archive digital management brought to managers and leadership. The project collected primary data through interviews and online research and then analysed it. The results show that the digital change process clearly suffers from inadequate management of leaders and the quality of practitioners to keep up with the demands of change. This study will provide a reference for organisations in the same type of change and for improving the adaptive capacity of their teams.

Keywords: digital change, leadership, management level.

Introduction

International Data Corporation (IDC) recently released the 2024 V2 version of its Global Digital Transformation Spending Guide. IDC's latest data shows that global investment in digital transformation exceeds \$2.1 trillion in 2023 and is expected to reach \$4.4 trillion in 2028, with a five-year compound annual growth rate (CAGR) of 15.4 per cent from 2023-2028. This indicates that the digital transformation of global enterprises has entered a stage of continuous development, and enterprises continue to increase their investment in digital transformation.

With the rapid growth of the Chinese market, the Chinese government is actively promoting the development of the digital economy and has introduced a series of policies to encourage enterprises to carry out digital transformation. IDC expects China's digital transformation spending to reach \$733 billion by 2028, accounting for about 16.7% of the world's share, with a five-year compound growth rate of about 15.6%, a rate higher than the overall global growth rate. Due to the global trend of digitisation and the Chinese government's active promotion of the digitisation process, a larger number of Chinese enterprises are also actively engaged in digital transformation. With the support of relevant government policies, state-owned enterprises are also actively changing, but in the process of digital transformation inevitably encountered more problems.

The power industry belongs to China's more traditional industry, the internal structure is stable, the form of management has been solidified, and the work of the personnel is even more stable. Under the characteristics of state-owned enterprises, there are few enterprises competing with China's power companies, so there is also relative stability in management.

From the management point of view, more managers are still stuck in the past management style and management level; but from the professional practitioners, the digital transformation has introduced new technology does bring a series of trouble to the staff in the actual operation process, therefore, it is easier to find the management needs from the professional practitioners' point of view, but the manager's point of view should not be ignored.

Although, there has always been a mentality of stability within the power industry system, but with the application of digitalisation, the advantages of digitalisation are also clearly highlighted, and the power system has to make changes as soon as possible. Electricity data is very large, only through the digital management can be faster to achieve intelligent control and application. In addition, under the influence of digitisation, in addition to the digitisation of power data related systems, in the management also began to gradually digitise. Among them, file management also belongs to the digitalisation process.

Power systems are all in the process of digital transformation, and their archive management is also included in the process of digitalisation. Driven by digitisation, changing the archive management mode and making full use of digital technology to realise the management of archives can greatly save manpower and material resources. Leaders have also considered the application of data after computerisation in the long run, and therefore proposed a future plan to fully exploit the information assets in archives. The digital transformation of archive management can effectively bring into play the value brought by archives. However, in the process of digital transformation, the original tendency to stabilise the management style, management system, the original form of management is no longer adapted to the latest management needs, so a series of management problems.

This study aims to identify and propose measures to address the management and leadership challenges in the digitisation of records management. The study will make judgements on management challenges and leadership challenges from the perspective of managers and professional practitioners. This study lays the foundation for a number of studies in which companies are exploring internal organisational change and leadership in the context of digital transformation. The analysis of data collection through interviews and questionnaires, and in-depth discussion of individual profiles in the discussion and conclusion sections, provide some reference to the article on digital transformation in management.

Problem Statements

When the original paper-based records management is gradually transformed into digital records management and managed using digital tools, both leaders and practitioners, as well as management systems, are severely challenged. In the digital transformation process of archive management, the main problem is that leadership and human resources cannot keep up with the needs of the digital change process. Digital change as an inevitable trend of enterprise management, many enterprises currently do not have a certain reference for transformation. At the same time, the impact of this digital transformation, many current studies are not clear how the digital archive change process will affect their management and how it affects leadership, this issue has obviously not been adequately addressed. Therefore, this project aims to address the management and leadership problems encountered in the process of digital transformation of archive management, and provides valuable recommendations for the same type of enterprises.

Research Objectives

The main purpose of this research is to help companies solve the problems faced by records management in the process of digital transformation from a management perspective, therefore, this research focuses on leaders and management. In terms of setting the objectives

of the study, the project set the research objectives of the project from both leaders and management, and its main objectives of this study are as follows.

RO1: To analyse the planning and objectives of digitalisation in the context of the transformation of the company's archive management, and to explore the type of leadership and management that will be required in the future management of the business.

RO2: To assess the adaptation gaps of leaders and practitioners in the digital management transformation of archives, in particular the leadership level and the quality of staff in the context of the need for change.

RO3: Explore effective strategies to improve the adaptability of archive management teams in the context of archive digital transformation, and provide a reference for the management of similar businesses.

Based on the findings of these research objectives, it can indirectly help the same type of enterprises or parts of archives management how to prepare and adapt in facing the process of digital transformation of archives, and thus to prepare for management and leadership changes in advance.

Research Questions

The following research questions were developed to guide the investigation

RQ1: In the context of digital transformation of archives, what are the new requirements for leadership in archives management based on the company's archives management plans and objectives?

RQ2: How can managers address the adaptation gap between the quality of practitioners in their teams and the demands of change during the digital transformation of archives management?

RQ3: What leadership strategies will help improve the overall adaptability of the records management team during the records digital transformation process?

Literature Review

Leadership Theory

Leadership is defined as the influence on individuals' behaviors and attitudes, encompassing interactions within and between teams regarding the achievement of goals and visions. Leaders are regarded as individuals who can motivate, achieve maximum task accomplishments, manage conflicts, and attain team member satisfaction. Successful leaders establish personal relationships with their team members, fostering trust and cohesion (Davidaviciene, V., & Al Majzoub, K. 2022).

Leadership has been described as the ability to influence, motivate and enable others to contribute to the effectiveness and success of an organisation. Whereas transformational leadership promotes organisational change and innovation by building a shared vision, motivating and inspiring employees. In the process of organisational change, there is a greater need for organisational leaders to make changes in their leadership style.

Knowledge Management Maturity Model

Klimko proposed a comprehensive KMMM model in 2001, which covers five key stages: initiation, knowledge exploration, knowledge generation, knowledge integration, and knowledge updating. Serna, E. (2015), Haraguchi et al. (2024), and Overeem et al. (2022) argued that the Knowledge Management Maturity Model is a framework for assessing an organisation's stage of development and capability in KM practices, which is designed to help organisations understand where they are in KM and develop plans for improvement. In terms of practical application, it can be applied firstly to archive digitisation management to assess the organisation's maturity in the application of digitisation systems and make

recommendations for improvement. The second is the construction of knowledge sharing mechanism: to promote the effective circulation of archive information within the organisation. Finally, it is the period planning and risk management. Through the maturity model, the archive management department can formulate a more forward-looking strategy to optimise the allocation of resources.

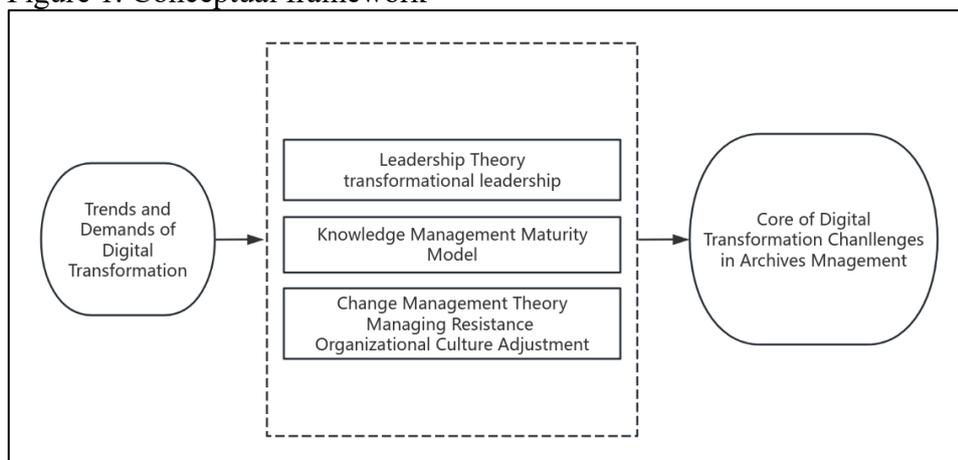
Change Management Theory

Change is defined as a behavioural shift in an organisation from one state to another. Change management is the process of continuously updating the organisational direction, structure and capabilities to meet internal and external customer needs. Digital transformation introduces new technologies and the organisational structure, processes and technology are gradually adapted. Business processes are redesigned and optimised to adapt to the changes brought about by digital technologies, increasing efficiency and responsiveness (AlManei et al., 2018).

Change management theory is a theoretical framework for examining how organisations respond to changes in their internal and external environments and achieve change effectively. In the context of digital transformation, change management places particular emphasis on how organisations adapt to and manage changes in technology, processes and culture. In related literature, Deterrence Theory proposes that organisations' responses to external pressures depend on the perceived consequences of violations, particularly the certainty, swiftness and severity of punishment (Appiah, 2024).

In addition, network strategy theory states that digital transformation requires organisations to adapt their strategies in a changing network environment and redefine their relationships with partners to foster innovation and value creation (Freytag et al., 2016). Finally, the Lean implementation framework suggests that successful change is not only dependent on technological upgrades, but also requires a focus on simultaneous changes in organisational structure, processes and employee behaviour (AlManei et al., 2018). These theories provide systematic guidance for digital transformation, emphasising the impact of external pressures, the need for adaptive adjustments, and the key role of culture and human factors.

Figure 1. Conceptual framework



Concept and Background of Digital Transformation

Digital transformation, as a key strategy for enterprise modernisation, covers changes in technology, processes and culture, with the aim of improving efficiency, optimising decision-making and enhancing competitiveness through the application of information

technology. With the rapid development of digital technology, enterprises are facing increasing external pressure and need to adapt and adjust quickly in the fierce market competition. In this context, change management, as a crucial theoretical framework, provides theoretical support and practical guidance for enterprises in the process of digital transformation (Jones, 1985). Digital transformation is not just about updating technology, but also involves a fundamental shift in organisational structure, processes and culture, which requires effective leadership and organisational adjustments by managers during the strategy and implementation process.

In the field of records management, the impact of digital transformation has been particularly significant. While traditional archive management methods usually rely on manual operation and physical storage, digital transformation enhances the management efficiency and ease of access to archives through electronic archive management systems, cloud storage, and automated processes (Freitag et al., 2016). Through digital means, archive management not only saves storage space, but also improves data security and backup capabilities, reduces human error, and increases the speed and accuracy of document retrieval. However, this transformation also brings new challenges, especially in terms of employee behaviour, technology acceptance and process adaptation, and these barriers need to be overcome through effective change management (AlManei et al., 2018).

Specifically, the impact of digital transformation on records management is twofold: on the one hand, it improves the efficiency of information storage and retrieval through the introduction of new technological tools such as electronic records management systems; on the other hand, it requires changes in corporate culture and employee behaviour, which necessitates a re-examination of managerial leadership (Appiah, 2024). Leaders need to guide their teams to adapt to the new technology and ensure that all employees receive the necessary training and support during the transformation process. In addition, change management requires organisations to develop a clear strategy and plan when implementing digital transformation and ensure that the various technological changes are effectively integrated into existing management processes (AlManei et al., 2018).

The Role of Leadership in Digital Transformation and Challenges for Leadership

Leadership plays a crucial role in driving digital transformation, ensuring a smooth transition by aligning organisational goals with evolving technological capabilities. Müller et al. (2024) state that leaders need to have specific competencies for digital challenges, which will vary depending on the drivers and goals of the transformation. They classify leaders into four typical types: challengers, skilful craftsmen, organisers and competitors, and these competencies enable leaders to cope with the complexity of digital change, thus making leadership a core factor in driving digital transformation in organisations.

However, digital transformation poses many challenges for leadership, especially in terms of required skills and adaptability. Alakaş (2024) states that digital transformation leadership, supported by a strong digital culture and strategy, significantly affects organisational agility and the ability to adapt to digital change. Leaders need to be equipped not only with technical skills but also with the ability to flexibly adapt their strategies to the changing digital environment. As mentioned by Buonocore et al. (2024), leaders must also balance innovation with responsible practices, continuous learning and engagement with stakeholders in the face of rapid technological change.

The complexity of digital transformation further challenges traditional models of leadership. Schiuma et al. (2024) emphasise that transformational leaders must have the ability to integrate digital knowledge and manage change, which are essential to drive digital transformation in organisations. Leaders must ensure that digital transformation is aligned with the company's long-term goals and promote organisational resilience, ensuring that teams

are able to cope with uncertainty in the digital environment. As Rialti and Filieri (2024) emphasise, leaders also need to empower teams in a changing environment to help them meet the challenges of digital transformation.

Application of Change Management and Leadership Theory

The application of change management in archive management, especially in the context of digital transformation, has important theoretical significance and practical value. In the process of promoting the digital transformation of archive management, the role of leadership cannot be ignored. Research has shown that change management theories, such as Kotter's eight-step change model (Freytag et al., 2016), can provide effective guidance for digital transformation in archive management. Leaders in this process must focus not only on the introduction of technological tools, but also on how to manage mindset changes and team culture adjustments to ensure that the digital transformation can go smoothly (AlManei et al., 2018). Leadership theories also help us to understand how different leadership styles can affect the advancement of change, especially in the face of strong external pressures and uncertainty, and how leaders can motivate their employees and overcome the challenges of digital implementation through effective change management approaches.

In concrete practice, external pressures and stakeholder influence also have a profound impact on change management. For example, external pressures in environmental management can be explained by deterrence theory, where leaders' drive for digital transformation needs to focus not only on internal process optimisation, but also take into account the pressures of external regulatory and policy changes (Appiah, 2024). By combining change management with Technology Acceptance Theory (TAM), leaders can more effectively manage the process of technology introduction in archival digital transformation to ensure the acceptance and application of new technologies, thereby improving the efficiency and security of archival management.

Methods

The research adopted a mixed research approach, combining a quantitative questionnaire (360-degree leadership evaluation) and a qualitative interview method to systematically assess and explore in depth the challenges posed to leadership in the process of digital transformation of records management and the difficulties faced by practitioners in this process. The interview method was chosen to explore the topic in depth as there are fewer cases of management in the process of digital transformation of archive management. At the same time, data was supplemented by means of a questionnaire. Due to the large number of branches involved, we chose to go deeper into the head office for data collection and collected ideas and suggestions from branch managers and practitioners through the distribution of online questionnaires.

The research was divided into three steps. In the first step, we conducted interviews with key leaders, with the main goal of understanding the plans and goals of archive management, as well as a future requirement for the leaders. In addition, we communicated with the key leaders several times during the research process. In the selection of leaders, we chose two general managers, the head of the archives management head office and the main technical staff of the digital transformation.

In the second step, we collected online data on the management of records management in the municipal companies; this part of the data collection mainly consisted of self-assessment data from the management of the branch offices.

In the third step, we collected data from records management practitioners; this part of the data collection not only collected practitioners' ideas and suggestions, but also evaluated the company's management.

Participants

Thirty-four practitioners were invited to participate in this study, including one key manager, one digital transformation technical lead, 10 managers and 22 professional practitioners. All of these practitioners play an important role in the digital transformation of records management and were able to provide direct experience and insight.

Research Design

A semi-structured interview method was used in this research to ensure the coherence of the interview topics and the freedom of expression of the participants. In addition to this, in order to enrich the completeness of the questions, this research also used a questionnaire to supplement the relevant questions and the evaluation of the existing management level. The questionnaire was used to collect data from both management and operational levels, and at both levels, the questionnaire was set up with open-ended questions to ensure the freedom of the respondents.

In the design of the interviews, the questions were based on open-ended questions. For the main personnel of archive management, our interviews mainly focused on the objectives of digital transformation of archives, the planning of digital transformation of archives, the current status of digital transformation of archives, the expectations of employees in the digital transformation of archives, and an evaluation of the current level of digital transformation of archives. For the technical staff of the digital transformation of archive management, our interviews mainly focused on the long-term goal of the digital transformation of the entire grid system, the existing functions of the system, the typical problems encountered in the process of transformation, and the problems of some of the systems for archive management.

In the design of the questionnaire, open questions and closed questions are dominated, the main purpose of the open question set is to seek the real ideas of professional practitioners about the existing management level and suggestions from the perspective of professionals; in the closed questionnaire set is mainly based on the evaluation of the existing management level and leadership, therefore, in the assessment of the current state of archive management, we introduced the 'based on the KMMM (Knowledge Management Maturity) model', which combines the process of archive management and Yang Dexuan's (2018) research on engineering archives. After many communications with archive managers, it was decided and combined with the characteristics of the electric power industry, the model was optimised to assess the four dimensions of the archive management guarantee system construction, the quality and transfer of archive documents, the management of the archive after receiving it, and the importance attached to the archive management work by the person responsible for the project.

Table 1. Indicator Design

Level 1 indicators	Level 2 indicators
Construction of the archive management guarantee system	Organisational and institutional safeguards Rules and Regulations Financial security Infrastructure Manpower security
Archival Document Quality and Transfer	Normality of archives Archival Documentation Integrity Accuracy of archival documents Systematicity of archive documents Archiving, transfer
Post-acceptance management of archives	Binding of archives Binding of archives Access to archives Archives storage, classification and statistics Informationisation of archives
Leaders' focus on records management	Organisational Structure of Archives Archives Management Manpower Archives Management Accountability System Archives Training System Archives Management Inspection System

In order to further verify the validity of the assessment model, some open-ended questions were set up in the business level research, and the validity of the Knowledge Maturity Model was verified through the respondents' elaboration of the existing problems in archive management and their needs for improvement of the level of archive management.

Data Collection

The interviews were conducted through an online conferencing platform, and data was preserved by means of field notes and audio recordings. At the same time to ensure the authenticity of the data, a number of different people were invited for corroboration. The questionnaire part of the survey was distributed online, through key leaders in the workflow, where 10 managers were assessed in a multi-faceted 360-degree process.

Data Analysis

Thematic Analysis (TA) was used to categorise the interview data into themes in order to extract leadership challenges and management strategies related to digital transformation. Each theme was extracted based on the original interview text to ensure objectivity in data analysis.

The questionnaire data were analysed using statistical software to calculate the mean and standard deviation of the scores of each dimension to quantify the performance of leaders in different aspects. ANOVA was used to test the differences in scores across roles to understand the consistency or variability of leadership across different groups.

Results and Discussion

The findings of this study are based on the analysis of data collected by management and professional practitioners and the analyses are mainly as follows:

Research Targets

Head Office Managers

There are two head office managers from within the head office, one responsible for planning and leading the overall records management and one responsible for the technical

co-ordination of the digital transformation. The other managers were from each of the 9 prefecture and city branches. This time, the managers from the head office participated in the interviews, and 10 managers from different cities participated in the online questionnaire survey.

Practitioners

Of the 22 people involved in records management in this study, 8 have been in the field for more than 20 years, 9 have been in the field for 10 to 20 years, and 6 have been in the field for 2 to 10 years. Of the researchers, 74 per cent had been in the profession for more than 10 years. In the overall team of archivists, the work experience is relatively rich. However, only two of them have obtained relevant professional certificates, such as internal audit qualification and senior accountant. Although the whole team is more experienced, there is still room for further improvement in terms of professionalism.

Table 2. Basic Information of Survey Respondents

Serial number	Years of practice
1	20
2	15
3	23
4	18
5	24
6	4
7	14
8	10
9	23
10	20
11	4
12	7
13	12
14	10
15	5
16	14
17	4
18	2
19	25
20	15
21	22
22	14

Results of Management Interviews

According to the total interview results, the existing archives are still mainly paper documents, because the whole company is in the process of digital transformation, so part of the archives have been electronic, part of the archives have been operated directly in the digital system.

In terms of archive management, the number of archive management personnel is small and non-specialized. The head office has the following plans for archive management:

Firstly, to study a set of institutional mechanism in line with the digital management of archives, mainly focusing on a series of archive management standards and archive management process such as archive classification, systematic collection and standardized arrangement.

Second, the study of electronic management of archives, the realization of the existing paper archives of electronic management, mainly for query, access, training and field work and other types of applications.

Third, study the transformation of archives into information assets. Study the further construction of archive informationization, turn archive payroll into archive assets, let archive data be applied in more management scenarios, and at the same time, fully explore the value in archive information.

Results of the Management Side Survey

With a score of 5 out of 5, the average score of management's self-assessment of job competence is 4.043, and the vast majority of them still recognize the existing work situation. However, there is still a lack of attention to the management level and file management. Especially in the quality management of the files, such as, the accuracy of the documents, the completeness of the documents, the scientificity of the classification of the documents and whether the flow nodes are clear.

Through the analysis of the results, in general, the managers' evaluation of the management level of this part of archive quality management and transfer is low. In the deeper analysis, we found that the biggest influence on the overall evaluation level of archives is the guarantee situation, and the digital transformation of archive management lacks certain guarantees, such as personnel guarantee, system guarantee, financial guarantee and equipment guarantee.

Findings in terms of practitioners

In the research on practitioners, it can be found that in this digital transformation of records management, there are some main problems as follows:

(1) Management's management level is low, and leadership is still in a laissez-faire type

In the practitioners' evaluation of the management, most of them think that the management pays less attention to this digital transformation of archives. As a result of the lack of attention from upper management, there is also a relative lack of attention from practitioners. The main problems are lagging behind in archive filing; the process information is not organized in a timely manner, resulting in the omission of some files; the system is not perfect and training is not in place; and the implementation of the system is not on the ground, which affects the quality of archive management.

(2) Relatively backward management level

In the management system and process, for the file flow process is mainly the existence of unclear division of responsibilities, training does not pay attention to the timeliness of the system of rewards and punishments system is not implemented and so on; the second is for the management of the file, the file is not complete enough provisions, retrieval tools are less effective. In terms of personnel security support, personnel security is insufficient. As the source of archival materials are very many places, the main person in charge of archives management is a heavy task; and archives management departments need to cooperate with other departments, in the process of digital transformation, part of the process already belongs to the electronic, part of the process is still paper, for the practice of the management of the task is even heavier.

Countermeasures

The four dimensions of the Knowledge Management Maturity Model are used to propose countermeasures to improve the level of records management and to change the leadership style of records management leaders. Therefore, the specific measures proposed based on the existing problems are as follows:

(i) Change leadership style from laissez-faire to transformational

Key leaders need to actively change their leadership style from laissez-faire and inaction to adapt to the challenges of digital change. From the research, both management and

practitioners dimensions can be found that leaders do not attach importance to this digital transformation, which is related to the nature of the grid enterprise and the leadership in a stable and non-competitive environment for a long period of time, the style of more leaders is more inclined to laissez-faire. In this case, it led to the file lag; process information is not timely enough to organize, file omission and other major negligence of file management.

(ii) Establishing basic guarantees for organizational change

Strengthen the basic guarantee needed in the process of organizational change, such as personnel guarantee, system guarantee, environmental guarantee and so on. First, personnel security, in the existing archives management process, optimize the distribution of tasks, sharing the heavy task of the project manager, and at the same time, can be seconded to other parts of the way to expand the archives management staff to support the completion of the management of change. Secondly, in terms of the professionalism of the archive management staff, actively improve the professional level through the implementation of training and guidance. Thirdly

In terms of institutional security, the development of a complete management system, so that rewards and penalties in practice and to enhance the importance of the staff of the change. Fourth, in terms of hardware protection, actively communicate with the digital transformation technology department to improve the hardware protection.

(iii) Optimize the management process and build a flexible workflow

The research shows that there is a little bit of damage in the transfer of archives in normal times. At the same time, the lack of preparation basis in the management of archives, there are errors in the preparation of archives and take a long time. Therefore, in order to further improve the quality of archive management and the efficiency of the archives, one is to strengthen the integrity of the information management in the implementation process of archive management; the second is to improve the electronic handover and standardized classification; the third is to strengthen the archive collection and synchronization of the project, so as to achieve timely filing and quality assurance. Fourth, advance management plan, improve the information system to learn, curing file management retention. At the same time, the audit information will be placed in a special cabinet to save, to ensure that the transfer of the time intact. Finally, more importantly, in the change process of digital transformation, many workflows will change, because building a flexible workflow, the establishment of a new issue post, responsible for the resolution of new issues, can effectively solve the problem of work stagnation in the face of new issues.

Conclusion

Based on the context of digital transformation, this study explores the difficulties and challenges faced by management and leadership in the process of digital transformation of archive management. Combining leadership theory, change management theory, technology acceptance theory and knowledge management maturity theory, and adopting the research method of interviews and questionnaires complementing each other, it summarizes the direction that archive management and leadership need to be transformed under the change. However, this research is limited to the single industry of records management, and future research can be expanded to a wider scope.

Significance of The Research

This study has certain significance both in theory and practical guidance, theoretically supplementing the application of leadership theory, change management theory, knowledge management maturity theory and so on in the digital transformation of archive management, at the same time, exposing the difficulties encountered by enterprises in the midst of change

as well as the improvement measures can provide some reference significance for enterprises in the midst of digital transformation.

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Literature Review of Inter-organizational Knowledge Management

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Abstract

Knowledge management is regarded by many scholars, experts and business people as an effective means to cope with fierce market competition and environmental changes and organizations must make full use of internal and external knowledge to gain competitive advantages in a complex external environment. In addition, the current academic research on knowledge management is mostly focused on the internal organization, and there are problems such as unclear concept definition and unclear types in the research on cross-organizational knowledge management. Therefore, this paper reviews 54 related research papers on the basis of combing the cross-organizational knowledge management literature in multidisciplinary fields such as strategic management, economics, sociology, and information technology, and the article will analyze the obstacles in the influencing factors of cross-organizational knowledge management, the incentive mechanism of cross-organizational knowledge management, the relationship between cross-organizational knowledge management and organizational innovation performance and the shortcomings of existing research, Our research will provide a detailed description of cross-organizational knowledge management and will also provide more suggestions for future research on organizational management.

Keywords: inter-organization; management mechanism; knowledge management.

Introduction

The resource-based view emphasizes the need for enterprises to have unique internal resources and capabilities, including scarce resources, valuable resources, inimitable resources and difficult-to-replace resources and knowledge resources can help enterprises adapt to complex dynamic environmental changes and gain sustainable competitive advantages in the process of management knowledge which is because knowledge is constantly updated and changed, and knowledge management can cope with the impact and influence from the external environment, especially the changes in the global external economic structure after COVID-19 (Bai & Li, 2020). Therefore, for organizations which managing knowledge is as important as managing other resources, and at present which can be said that the academic community has formed a relatively complete research system for internal knowledge management in organizations, but the knowledge management activities of many enterprises have not achieved the expected results and especially the knowledge management resources of small and medium-sized enterprises are relatively scarce (Gomes & Dahab, 2010). In the emerging environment of knowledge economy globalization and

technology globalization, an organization's external relationship network has become the fundamental source of enterprise technological innovation and the main reason for enterprise competitive advantage (Taylor et al., 2013). At the same time, since the competitive advantage of enterprises is increasingly dependent on resource sharing with partners, it is of great practical significance to understand enterprise knowledge management activities from a cross-organizational level (Foss et al., 2010).

Literature Review

The current focus of academic research on knowledge management is on the internal part of the organization. Many scholars are committed to studying how to integrate and utilize the knowledge within the enterprise to effectively respond to changes in the external environment (Yue, 2013). This focus has greatly improved people's understanding of internal processes, but there are still certain limitations in the research on cross-organizational boundaries. For example, scholars have not clearly defined the connotation of cross-organizational knowledge management, resulting in mixed use of concepts, lack of consistency in definitions, and single research contexts. It can be said that the above shortcomings restrict academic exchanges between researchers and also hinder scholars from further understanding of cross-organizational knowledge management (Lendel et al., 2015). In recent years, scholars have reviewed the research on cross-organizational knowledge management, but most of them focus on a narrow topic and are relatively scattered as a whole (Paulo J, 2011). For example, the innovation of supply chain management and complex systems, or the discussion of a certain influencing factor of cross-organizational knowledge management, or the discussion from a certain process of cross-organizational knowledge management, cannot accurately reflect the research progress of cross-organizational knowledge management. Although recent reviews have attempted to address these limitations, they tend to focus on specialized topics and do not provide a holistic perspective on the progress of the field (Fagerström & Olsson, 2002). Moreover, this fragmented approach has limited the development of a cohesive theoretical foundation for inter-organizational knowledge management and the ability of scholars to gain a deeper and more comprehensive understanding of the mechanisms and results of managing knowledge across organizational boundaries (Salisbury, 2008). Therefore, a more systematic examination of inter-organizational knowledge management is needed to develop a unified overall framework and guide future research and practice in this field.

Inter-organizational knowledge management is an important research area because it studies how organizations collaborate across boundaries to manage, share, and leverage knowledge to enhance innovation and competitiveness. Given its importance, this paper fills a research gap by systematically analyzing 54 selected academic papers to assess trends, publication timelines, and evolving research contexts in this field (Yli-Renko et al., 2001). The analysis shows that there is a growing interest in inter-organizational knowledge management as a strategy to improve organizational learning and innovation outcomes. The connotation of inter-organizational knowledge management includes collaborative practices and systems designed to promote knowledge sharing between different entities (e.g., partnerships, alliances, and networks).

Through this study, we identify various types of knowledge management, including explicit and tacit knowledge exchange, technology-driven knowledge systems, and social knowledge networks. Incentive mechanisms that promote effective knowledge sharing, such as trust, contractual agreements, and shared goals, are explored to highlight their role in creating an environment conducive to knowledge management (Gomes & Dahab, 2010). In addition, this study analyzes the impact of knowledge management on innovation performance to show that successful knowledge management can significantly improve an

organization's innovation capabilities by leveraging various sources of knowledge (Fagerström & Olsson, 2002). Based on these insights, we propose future research directions that focus on the integration of digital tools, the role of organizational culture, and the impact of knowledge management on long-term strategic goals, which can provide avenues for theoretical advancement and practical application in this field.

Methods

Data Source

This paper uses the American Web of Science and China National Knowledge Infrastructure as search databases. The specific search methods are as follows. First, this paper sets the search period from January 1986 to April 2024, and the search date is July 6, 2024. Secondly, by reading relevant literature, considering that the concept of knowledge management includes many types such as knowledge creation, knowledge transfer, knowledge sharing, and knowledge exchange, in order to start from the overall concept, this paper is based on existing literature to combine cross-organizational, inter-organizational, and knowledge management respectively, and search in the titles, abstracts, or keywords of electronic databases such as Web of Science and China National Knowledge Infrastructure. Finally, 61 documents were obtained, including 24 Chinese documents and 37 English documents. By analyzing the titles, keywords, and abstracts of the above documents, the documents with low relevance to knowledge management were carefully eliminated after careful consideration, and 54 documents were identified, including 19 Chinese documents and 35 English documents.

Statistical Analysis

We sorted and summarized 54 papers. Before 2000, the number of papers published was 0. This shows that the behavior of early scholars introducing the concept of cross-organization into knowledge management did not attract attention. At that time, people's research on knowledge management has always been committed to the organization, and they are more concerned about the knowledge update and organization within the organization. How to build heterogeneous resources to cope with the changes in the external environment, while ignoring knowledge management from different organizational perspectives, and have never even considered cross-disciplinary and cross-cultural organizational management. We found that from 2000 to 2005, there were 10 related research papers, indicating that the research is still in the initial stage of exploration, and researchers have just begun to pay attention to this field. In 2006 to 2011, the number of related papers has reached 19, indicating that the research has attracted the attention of international scholars, and even many English papers have paid attention to this type of research for the first time; in 2012 to 2017, the number of related papers has reached 35, indicating that the topic of this research has attracted widespread attention from scholars, and the number of studies after 2018 has increased, indicating that more scholars have begun to pay attention to cross-organizational knowledge management, Especially after 2020, people began to focus on the integration of digital tools, the role of organizational culture, and the impact of knowledge management on long-term strategic goals, providing a lot of support and help for theoretical progress and practical application in this field.

Tabel 1. Paper Journal Distribution

Journal name (partial)	Number of literature
Journal of Computer Information Systems	1
Information Development	2
Knowledge Management Research	1

R & D Management	2
Journal of Information Technology	2
Construction Management and Economics	1
Scientific Management Research	3
Science of Science Research	1
Scientific Research Management	1
China Industrial Economics	1
Journal of Management (China)	2

Source: Web of Science and China National Knowledge Infrastructure as search databases

From the perspective of journal sources (as shown in the table), 17 articles (31.5%) were published in important international journals such as CME and JIT, as well as important Chinese journals such as Journal of Management and Science of Science, which shows that cross-organizational knowledge management research has become an academic issue of great concern to the theoretical community. In addition, from the perspective of article content, research on cross-organizational knowledge management is mainly concentrated in the fields of business management (strategic management) and economics, and also involves disciplines such as education, sociology, information science and information technology. This situation also shows that cross-organizational knowledge management is a multidisciplinary and integrated research field.

Research Context

The research context of inter-organizational knowledge management has been explored in a variety of organizational settings, reflecting different approaches and implications. Three main contexts emerged in our analysis of the 54 selected academic papers: supply chain networks, complex system innovation, and collaboration between government and business.

Supply chain networks (6 studies): Research in this area focuses on member organizations in the supply chain, emphasizing the mutual flow of capital, information, and knowledge. It can be said that the trust established between supply chain participants can enable effective knowledge sharing, while the strategic management of knowledge flows between upstream and downstream partners can improve production efficiency and reduce costs. Rather than viewing knowledge management as a function limited to a single enterprise, these studies advocate a broader approach to integrating knowledge management across the entire supply chain (Gupta, 1984). It can be said that this holistic perspective enhances overall competitive advantage by optimizing resource utilization and collaborative processes.

Complex system innovation (7 studies): Member organizations in this context collaborate to form network entities driven by common innovation goals. These networks are usually composed of multiple stakeholders who share common interests and rely on knowledge exchange to guide complex innovation processes, and in this context, effective knowledge management involves matching the right resources and people to specific tasks to promote better decision-making and drive the organization to achieve its goals, with a focus on how collaborative knowledge processes can enhance innovation capabilities within interconnected systems (Karbowski, 2019).

Government-business collaboration (3 studies): In this context, knowledge sharing occurs between government agencies and private enterprises. Governments exchange knowledge to solve complex social problems, strengthen policy making, and improve governance efficiency, while enterprises benefit from these collaborations by gaining implicit and tacit knowledge, which helps them build competitive advantages (Bartezzaghi et al., 1997).

In addition, other studies in the review explored IKM in the fields of education (3 papers), information technology (4 papers), and intelligence systems (3 papers). It can be said that the common denominator in all these contexts is the extensive interconnectedness

between member organizations, including flows of funds, information, risks, logistics, and common goals, and these interdependencies form an important foundation for inter-organizational knowledge management practices and also promote collaborative exchanges necessary for innovation and performance improvement (Oshri & Newell, 2005).

Findings

Connotation of Knowledge Management

Knowledge management has traditionally covered a wide range of interdisciplinary topics, including information science, organizational behavior, and strategic management (Buuren, 2009). However, mainstream research has mainly focused on knowledge management activities within a single organization, often ignoring the dynamics of knowledge management across organizational boundaries. Moreover, current definitions of knowledge management often emphasize internal processes, such as knowledge creation, storage, and utilization within a single entity, which also leads to a lack of consensus on the scope and definition of cross-organizational knowledge management.

To address this gap, this paper revisits the basic concepts by exploring the definitions of "knowledge" and "knowledge management". It builds on these core ideas and integrates insights from existing literature to form a clearer understanding of cross-organizational knowledge management, which refers to the systematic processes and practices of sharing, integrating, and applying knowledge across multiple organizations through collaborative networks, partnerships, or alliances (Williams, 2002). By analyzing various forms of knowledge management, such as supply chain knowledge exchange, collaborative innovation networks, and public-private knowledge sharing, this study enriches the connotation of knowledge management and emphasizes that effective knowledge management requires leveraging inter-organizational relationships, managing shared knowledge flows, and coordinating strategic goals between different entities, ultimately helping to enhance innovation and competitive advantage (Laureano Paiva et al., 2012).

In the modern competitive landscape, knowledge has become a vital intangible resource for enterprises, and its value contribution often exceeds that of traditional assets. However, the concept of "knowledge" has been interpreted in various different academic literature (Salisbury, 2008). From a data perspective, knowledge is usually defined as verified and contextualized information, which is distinguished from raw data by its relevance and applicability, and it can be roughly divided into two categories: explicit knowledge and implicit (tacit) knowledge, each of which has different characteristics and uses within an organization (Laureano Paiva et al., 2012).

Explicit knowledge is structured, codifiable, and easy to communicate. It can be expressed through language, text, symbols, procedures, manuals, and databases, making it accessible and transferable among different stakeholders. Examples include standard operating procedures, documented processes, and written guidelines, which can be effectively shared within and between organizations (Buuren, 2009). This type of knowledge can be further divided into different forms:

Descriptive knowledge (what something is)

Process knowledge (how to accomplish something)

Result knowledge (the results of a process)

Conditional knowledge (under what circumstances something is applicable)

Relational knowledge (the connection between different concepts or entities)

In contrast, tacit knowledge is more subtle and deeply rooted in personal experience, skills, and expertise. It is inherently personal, difficult to express, and not easily acquired or disseminated through traditional methods (Friesl et al., 2011). This includes the insights,

intuitions, and know-how that employees acquire over time, making it a valuable but difficult to manage resource, especially in an inter-organizational environment (Ratna et al., 2020). Bartezzaghi et al. introduced a dynamic perspective that describes knowledge as having a "flow" attribute, meaning that it is able to move and transfer between different parties in a supply and demand network. This view emphasizes the initiative and fluidity of knowledge, especially in a collaborative environment (Salisbury, 2008). However, while explicit knowledge is relatively easy to flow across organizational boundaries, the cross-organizational sharing of tacit knowledge remains a major challenge due to its tacit nature (Ramasamy & Thamaraiselvan, 2011). As knowledge increasingly penetrates into all aspects of business operations, its characteristics also present interdisciplinary and complex characteristics (Lin, 2006). The diversity of organizational culture, the continuous advancement of digital technology and social informatization have made it more complicated to manage and effectively utilize knowledge in today's interconnected and dynamic business environment (Adelstein & Clegg, 2013).

In reviewing the relevant literature, scholars mainly define knowledge management from an organizational perspective, focusing on internal processes (Ratna et al., 2020). In the 1990s, knowledge management was largely viewed as a micro-activity within the enterprise, covering the learning, creation, dissemination and application of knowledge, and the main goal of knowledge management during this period was to promote knowledge exchange and link individual expertise with the internal structure and processes of the organization, which involves systematic practices of acquiring, storing and sharing knowledge to ensure that knowledge can be effectively used for decision-making, innovation and problem solving (Chung & Espinoza, 2023).

By effectively managing knowledge, organizations aim to leverage their knowledge capital to gain long-term benefits and maintain sustainable competitive advantages (Cheng, 1994). For example, knowledge creation and acquisition are driven by identifying key areas where expertise is needed, while knowledge dissemination ensures that valuable insights can be communicated to relevant employees. This has led to a generally accepted definition of knowledge management as the process of combining knowledge sources with organizational needs to achieve strategic goals (Pentland, 1995). However, these early definitions of knowledge management share a common limitation: they focus primarily on the internal dynamics of knowledge management and often overlook the importance of external organizational factors. Moreover, this internal-centric view does not fully address the complexity of knowledge exchange between organizations (Adelstein & Clegg, 2013). Collaboration, trust, and common goals across organizational boundaries play a vital role in improving innovation and competitiveness. However, as enterprises increasingly operate in an interconnected environment, expanding the scope of knowledge management to include cross-organizational perspectives has become key to achieving broader strategic goals.

Connotation of Cross-organizational Knowledge Management

Inter-organizational knowledge management activities have different connotations according to different perspectives.

Transaction cost perspective: From this perspective, inter-organizational knowledge management is a strategic mechanism for improving organizational performance (Holsapple & Joshi, 2002). By streamlining the flow of knowledge between entities, organizations can reduce the transaction costs associated with inter-enterprise exchanges, increase overall efficiency, and maximize return on assets. This approach highlights the economic advantages of minimizing barriers to knowledge transfer between organizations.

Resource-based view: Many organizations face challenges in developing all necessary resources internally, so external collaboration is critical. Cross-organizational knowledge

management enables enterprises to acquire and integrate key external knowledge resources and promote resource complementarity (Wang et al., 2017). By sharing and pooling diverse expertise and information, organizations can build a stronger collective resource base, thereby increasing their competitiveness.

Strategic decision-making perspective: In this context, cross-organizational cooperation is regarded as an important strategy to create value and expand market share (Gupta & Bostrom, 2006). Scholars believe that leveraging external knowledge and integrating it with internal processes can significantly improve an organization's ability to innovate and adapt. Therefore, the absorption and utilization of cross-border knowledge has become the focus of academic research.

Brown et al further elaborated that inter-organizational knowledge management involves facilitating cross-border knowledge exchange and collaboration, a process that requires overcoming barriers related to organizational structure, time and space that separate knowledge sources from practical applications (Borjigen, 2015). Inter-organizational knowledge management is therefore viewed as a strategic tool to enhance organizational learning, innovation and performance in an increasingly interconnected business environment.

Combined with the research scenarios mentioned above, it is found that there must be a wide range of connections between member companies of cross-organizations (Chung & Espinoza, 2023). However, the definition of cross-organizational knowledge management in existing research is relatively scattered, based only on a specific field, and lacks a unified expression. Based on this, this article summarizes cross-organizational knowledge management as: member organizations with certain connections integrate various knowledge resources within the organizational boundaries, realize mutual penetration and mutual influence of knowledge through various forms of cooperation, and thus systematically manage knowledge, thereby enhancing the competitive advantage of enterprises (Ramasamy & Thamaraiselvan, 2011).

Types of Cross-organizational Knowledge Management

Academics have developed various frameworks to classify knowledge management activities to reflect its complexity and multidimensionality (Lin, 2006). One common classification outlines four basic steps: knowledge construction, internalization and integration, dissemination, and application. It can be said that this model emphasizes the sequential process from creating new knowledge to embedding it in the organization, sharing it widely, and applying it to achieve business goals (Cheng, 1994). Tiwana simplified knowledge management into three core activities: knowledge acquisition, knowledge sharing, and knowledge utilization. It can be said that these steps emphasize the basic process of collecting valuable information, disseminating it throughout the organization, and effectively using it to support decision-making and innovation (Tiwana, 2008). Further classifications expand these activities and introduce more refined distinctions, such as knowledge selection, internalization, updating, and externalization. These detailed approaches provide a comprehensive view of the various stages of knowledge management, from the initial identification of valuable knowledge to its continuous improvement and use (Serenko et al., 2010). This article adopts Pentland's classification, which is particularly applicable to cross-organizational knowledge management. His method is widely recognized in academic circles and emphasizes the importance of inter-organizational dynamics (Friesl et al., 2011). Accordingly, this paper classifies knowledge management into three key processes: knowledge acquisition, knowledge application and integration, and knowledge transfer and sharing. It can be said that this classification reflects the basic activities required for effective collaboration across organizational boundaries and promotes knowledge flows to enhance

joint innovation, strategic coordination, and competitive advantages in collaborative networks (Bai & Li, 2020).

Knowledge acquisition is often considered the first step in the innovation and knowledge management process within an organization. It involves identifying, acquiring, and integrating new information, ideas, and insights from the external environment (Chung & Espinoza, 2023). An organization's ability to effectively acquire knowledge depends largely on its ability to interact with its surroundings, including customers, suppliers, competitors, and other external stakeholders (Wang & Noe, 2010). It can be said that this external communication is essential for absorbing new information that can drive innovation, improve existing processes, and develop new products or services.

Professor Nonaka, a well-known scholar in the field of knowledge management, emphasizes that social interaction is the main channel for acquiring new knowledge. He believes that the interaction between employees and external parties promotes the exchange of ideas and information (Nonaka, 2023). Employees are the main players in this process and play a vital role in collecting and internalizing new knowledge, which can then be disseminated throughout the organization. This concept is consistent with the socialization-externalization-integration-internalization (SECI) model proposed by Professor Nonaka and Professor Takeuchi, which illustrates how organizations create, share, and utilize knowledge through continuous interaction between tacit and explicit knowledge (Nonaka, 2023).

At the organizational level, the acquisition of external knowledge can be achieved through a variety of mechanisms. First, organizations can invest in internal development projects that focus on improving the skills and knowledge of employees. This approach leverages internal resources to generate new insights (Lee & Choi, 2003). Second, organizations can seek external assistance by working with consultants, experts, or academic institutions to bring new perspectives that can stimulate innovation. Third, companies can engage in external procurement to acquire specific technologies, patents, or intellectual property to supplement their existing knowledge base (Gupta & Bostrom, 2006). Fourth, inter-enterprise cooperation through partnerships, alliances, and joint ventures can achieve shared knowledge flows and resource pools, promote mutual learning and innovation (Bennett & Gabriel, 1999). Finally, mergers and acquisitions provide a direct means of acquiring a whole set of external knowledge assets, enabling companies to rapidly enhance their capabilities (Adamides & Karacapilidis, 2005).

The knowledge acquisition process is deeply influenced by the organizational environment, and establishing a favorable environment is key to effective knowledge exchange (Nonaka, 2023). Nonaka proposed the concept of "field", which refers to a shared space or platform where knowledge creation can take place. "Field" can be physical (conference room), virtual (online collaboration platform), or spiritual (shared thinking mode), and is a common place for participants to interact, exchange ideas, and co-create knowledge (Nonaka, 2023). In this shared space, individuals can freely express their ideas, challenge existing ideas, and collaborate to generate new insights. It can be said that by creating an environment of trust and open communication, organizations can enhance their ability to acquire valuable knowledge from external sources.

Knowledge management is not a static process, but a dynamic and continuous process that involves the constant acquisition, improvement, and application of knowledge. When organizations acquire new knowledge, they must also effectively integrate it into their existing knowledge base (He & Peng, 1999). Without integration, newly acquired knowledge will remain isolated and underutilized, limiting its potential to drive innovation and competitive advantage. Knowledge integration is therefore a key aspect of the knowledge management process that seeks to combine new insights with the existing knowledge base to facilitate seamless retrieval and application across the organization (Bhatt, 2002).

The integration process involves several steps. First, organizations need to effectively store the acquired knowledge for future use. This typically requires the establishment of a knowledge base or database to categorize, index, and maintain information (Diirr & Cappelli, 2018). With advances in information technology, organizations now have access to sophisticated knowledge management systems (KMS) that facilitate rapid knowledge storage and retrieval, improving the speed and accuracy of decision making. These systems provide a platform for capturing both explicit knowledge (recorded information) and tacit knowledge (experiential insights), enabling organizations to fully leverage their entire knowledge capital (Sargis Roussel & Deltour, 2012). Once new knowledge has been acquired and integrated, the next critical step is to apply it. Effective application of knowledge can transform it into a valuable asset that improves organizational performance (Friesl et al., 2011). Senior managers play a key role in this phase as they are responsible for identifying opportunities where new knowledge can be applied to solve problems, optimize processes, or innovate products. By embedding new knowledge into the organization's strategic and operational processes, managers can drive organizational change and improve overall competitiveness.

Knowledge application can come in various forms, such as process improvement, which is the adoption of new methods or technologies to improve efficiency; product innovation, which is the use of insights from market trends or customer feedback to develop new products; and strategic decision-making, which is the use of external knowledge about industry developments to guide long-term planning (Dunlap et al., 2013). The integration and application of new knowledge enables organizations to adapt to changing market conditions, meet customer needs, and stay ahead of competitors. For example, a company in the technology industry may gain knowledge about new software development tools by working with external companies (Zhao et al., 2013). By combining this new knowledge with existing expertise, the company can streamline its software development process, reduce time to market, and improve product quality (Al-Busaidi & Olfman, 2017). In another case, a manufacturing company may apply new knowledge gained from customer feedback to redesign its products, improve customer satisfaction, and increase market share (Boughzala & Briggs, 2012).

The concept of organizational learning is central to the knowledge application process. As new knowledge is applied and integrated into daily activities, it becomes part of organizational routines and practices, helping to form a continuous learning and improvement cycle (Zhao et al., 2013). This ongoing process not only helps organizations address immediate challenges, but also lays the foundation for long-term innovation and sustainable competitive advantage.

Organizations that achieve free flow of knowledge can usually provide products faster with lower manpower and time costs. The sharing and transfer of knowledge between organizations is the main source of innovation for organizations (Ramasamy & Thamaraiselvan, 2011). Through a series of forms of cooperation, knowledge penetration and influence can be achieved, thereby directly transferring explicit knowledge between organizations (Bhatt, 2002). Similarly, organizations can also transfer implicit knowledge through observation, dialogue and communication. Or implicit knowledge can be made explicit and integrated with the explicit knowledge of other organizations to form internal organizational knowledge, and finally the integrated organizational knowledge can be internalized into the implicit knowledge of the organization itself (Wang et al., 2017). In order to achieve knowledge interaction, member organizations can provide services for knowledge search and matching by building a virtual place - knowledge management system. Knowledge transfer is the basis of knowledge sharing, and knowledge sharing is the external manifestation of knowledge transfer (Dunlap et al., 2013). Although the transfer and sharing of knowledge is conducive to organizations gaining competitive advantages, there are still many obstacles

in real life, such as technical barriers and institutional barriers, and it is closely related to the trust mechanism between organizations.

In summary, the three types of cross-organizational knowledge management are independent of each other but closely related, complementing each other to form a cycle (Hurmelinna-Laukkanen, 2011). However, in existing research, the division between different types of inter-organizational knowledge management is still relatively vague, and there is no accurate and clear explanation of the differences and internal connections between them. At the same time, there are still many gaps in the measurement of inter-organizational knowledge management (Sargis Roussel & Deltour, 2012). Therefore, this article hopes that there will be more further research on the types and relationships of inter-organizational knowledge management in the future, and to establish an effective measurement method for this system.

Discussion

Looking at the existing literature, there are many factors affecting cross-organizational knowledge management. At present, scholars mainly focus on obstacles (Kasper et al., 2008). Compared with knowledge management activities within an organization, cross-organizational knowledge management presents complex and diverse characteristics. If an organization wants to manage knowledge inside and outside the organization more effectively, it must overcome the organizational, temporal and spatial obstacles caused by the separation of knowledge sources and knowledge applications (Laureano Paiva et al., 2012). Lack of trust, lack of responsibility, excessive obsession with organizational boundaries, complexity of cooperative projects and cultural differences are the most common obstacles to successfully building a cross-organizational connection network. Bennett et al. believe that there are five obstacles to cross-organizational knowledge management: culture, organizational structure, organizational scale, environment and knowledge management methods (Ramasamy & Thamaraiselvan, 2011). Lee et al. also proposed that in the organizational environment of cross-organizational knowledge management, organizational culture, organizational system and personnel changes are important obstacles (Lee & Choi, 2003). Based on Bennett, Liu Xiaomei et al. found through empirical research that culture and protection of knowledge and technology are the most important obstacles to the implementation of cross-organizational knowledge management (Adelstein & Clegg, 2013).

Creating a cultural atmosphere that encourages knowledge sharing is the basis for effective cross-organizational knowledge management (Kasper et al., 2008). Language communication barriers and differences between different cultures hinder the flow and sharing of knowledge. Member organizations may become competitors, so people within the organization may have doubts about whether information and knowledge are shared due to xenophobia and other artificial barriers (Dunlap et al., 2013). In general, organizations tend to implement strict confidentiality measures for organizational knowledge and are unwilling to share important information among member organizations. They generally only provide the little information they must know (Boughzala & Briggs, 2012).

Some scholars analyze the obstacles from the perspective of cost-benefit and believe that there are many obstacles to the transfer and exchange of knowledge through cross-organizational knowledge management activities, and cost is the most important factor hindering such behavior (Dong & Chen, 2007). When the market mechanism lacks efficiency, transaction costs will increase significantly. Especially when it comes to the organization's own technology and capabilities, the organization that provides information is often unwilling to share its truly valuable knowledge. The greater the cost of participating in cross-organizational knowledge management activities, the lower the organization's enthusiasm will be. Only when the expected benefits are greater than the costs will the organization be willing to participate.

Incentive Mechanism for Cross-organizational Knowledge Management

To form a stable and lasting inter-organizational relationship, it is necessary to overcome the above obstacles and establish an effective incentive mechanism to promote knowledge sharing and transfer between member organizations. The behavior of inter-organizational knowledge management is essentially a "double-edged sword". While it brings economic benefits to the organization, it may also bring serious consequences to the organization. When conducting inter-organizational knowledge management activities, member organizations may face consequences such as the loss of intellectual property rights and the leakage of trade secrets. Therefore, some scholars have proposed that establishing a complete knowledge protection mechanism is a prerequisite for inter-organizational knowledge management. Through legal channels, confidentiality clauses signed by both parties and other knowledge protection activities, the knowledge between organizations is protected, and a complete protection mechanism is established to encourage organizations to truly share and transfer valuable knowledge.

Most scholars discuss the establishment of incentive mechanisms from within the organization. Zhou Min et al. proposed that satisfying the internal needs of employees within the organization is the core of successful inter-organizational knowledge sharing and transfer, and the driving force behind employees' cross-organizational knowledge sharing behavior comes from the exploration of their own potential and the sense of achievement of self-satisfaction (Zhou & Li, 2007). Therefore, the key to establishing an incentive mechanism for cross-organizational knowledge management is to meet the higher-level needs of employees within the organization as much as possible (Maas et al., 2016). Liu Xiaomei et al., starting from the external incentive means for organizational employees, conducted empirical analysis from the perspective of economics and game theory, and found that establishing an incentive mechanism based on fair compensation is an indispensable factor for the successful realization of cross-organizational knowledge sharing (Liu, 2008). On this basis, Liu Bingfeng et al. summarized the above factors as inducing factors for cross-organizational knowledge sharing, that is, employees can take actions that meet the expectations of the organization under cross-organizational knowledge sharing behavior (Liu et al., 2008).

In other words, employees participate in cross-organizational sharing because this behavior can provide employees with various rewards, including economic rewards and non-economic rewards, and these rewards become the inducement factors for this behavior. Organizational culture, as a value formed within an organization for a long time, has penetrated into all aspects of organizational activities, thereby subtly influencing the behavior of organizational members (Sammorra & Biggiero, 2008). When the cross-organizational knowledge management activities carried out by an organization match the culture within the organization, it will have an incentive effect on employees (Kersiene & Savaneviciene, 2006). Senior executives are very important in the cultivation of organizational culture. For this reason, senior executives need to establish corresponding institutional measures and implement them at all levels of the organization.

Relationship between Inter-organizational Knowledge Management and Organizational Innovation Performance

Innovation is a process of generating new knowledge and obtaining benefits, including different levels of knowledge management activities (Zhang & Zhu, 2009). Innovation performance is an evaluation index for the efficiency and effectiveness of innovation activities. Scholars have explored the relationship between cross-organizational knowledge management activities and innovation performance from different dimensions. Some scholars have conducted research on the relationship between knowledge acquisition and organizational innovation performance (Chung & Espinoza, 2023). Through empirical research, Yli-Renko

et al. found that acquiring knowledge from cooperative enterprises can increase the depth and breadth of the company's own knowledge, and affect the development of new products in terms of accelerating the launch process and reducing product costs, and further affects the tangible performance of new products (Yang, 2005). Simonin et al. believe that the knowledge gained from cooperative enterprises is related to the the tangible performance and intangible performance of the industry are closely related. Smith's research found that knowledge acquisition improves the innovation capabilities of enterprises and affects the efficiency of enterprises in launching new products (Claver-Cortés et al., 2007). Tidd pointed out that knowledge acquisition reduces the cost and risk of technology and market development, and technology is the driving force for enterprises to conduct research and innovation (Samarra & Biggiero, 2008). Knowledge acquisition can significantly promote the improvement of enterprise innovation performance. From the perspective of knowledge application integration, Yang believes that knowledge application plays an important role in the process of organizational innovation (Al-Busaidi & Olfman, 2017). Cheng Zhong is an indispensable character and if the new knowledge acquired by the organization cannot be integrated with the original knowledge, the value of the knowledge cannot be exerted, resulting in a waste of knowledge. Starting from the process of new product development (Dong & Chen, 2007), Lynn et al. pointed out through empirical research that knowledge application integration has an important impact on the sales volume, market share and profits of new products (Lynn et al., 2000).

Conclusion

Existing scholars' research on knowledge management has gradually shifted from within organizations to between organizations, but there are still many gaps in the research on cross-organizational knowledge management. Therefore, this paper analyzes the shortcomings of existing research fields to clarify the development direction of future research.

The first is a clear definition of concepts and dimensions. Although the concept of cross-organizational knowledge management has been widely used in the field of strategic management, as of now, the theoretical community has not reached a consensus on the definition of cross-organizational knowledge management, and a definition of cross-organizational knowledge management that can be generally recognized by the academic community has not yet appeared (Yang, 2005). Generally speaking, to clearly and accurately define the concept, it is usually necessary to conduct empirical research based on big data samples, but at present, most domestic scholars define the connotation of cross-organizational knowledge management from the perspective of logical deduction, while foreign scholars use big data empirical methods more rigorously to define its connotation and dimensions (Lynn et al., 2000). The unclear definition of concepts and dimensions by different scholars also leads to differences in related research results. Therefore, in the future, we should use methods such as logical deduction and big data empirical research to make the concept and dimension of cross-organizational knowledge management clearer and more accurate (Ramasamy & Thamaraiselvan, 2011).

The second is to explore the role of boundaries. Cross-organizational knowledge management includes the transfer and sharing of knowledge between member organizations (Claver-Cortés et al., 2007). The boundary between the two parties often plays an important role because it can be an obstacle or a facilitator in the process of knowledge transfer. The concept of organizational boundaries occupies an important position in the early management literature, but the research on inter-organizational knowledge management rarely explicitly considers the nature of the boundaries (Kersiene & Savaneviciene, 2006). Boundaries can be divided into organizational boundaries, national boundaries and industrial cluster boundaries. Although scholars generally encourage knowledge sharing between organizational units to

enhance the innovation capabilities of enterprises, when an organization conducts joint activities with other organizations, it is more worried about its own weakening capabilities and protects its own knowledge (Samarra & Biggiero, 2008). Therefore, compared with the boundaries between organizations, the boundaries between units within an organization are more permeable to the sharing and transfer of knowledge (White & Lutters, 2007). When knowledge management activities involve the joint participation of enterprises in multiple countries, its mechanism may be more complicated because it involves different cultures that affect how people process, interpret and use knowledge.

In addition, cultural misunderstandings affect the acquisition of knowledge by local cooperative organizations, and geographical distance can also affect knowledge management activities between organizations (Shang et al., 2023). Within the borders of a country, enterprises may operate near other interconnected enterprises, which together form an industrial cluster (Maas et al., 2016). The social network developed in the cluster promotes the dissemination of knowledge (Liu et al., 2008). Some scholars have found that geographical proximity within industrial clusters provides opportunities for enterprises to communicate and create complex forms of knowledge (Kersiene & Savaneviciene, 2006). The learning process that occurs in industrial clusters produces local expertise that exceeds the boundaries of the enterprise but remains within the spatial boundaries of the cluster. In this regard, Simonin et al. boldly assumed that the knowledge transfer model is different in industrial clusters. In other words, the boundaries of the cluster mark the division of different modes of knowledge transfer between organizations which means that researchers may need to determine the location of the boundaries and be cautious when generalizing the research results beyond the boundaries (Samarra & Biggiero, 2008). Therefore, the focus of future research needs to pay clear attention to the location of different boundaries and focus on how to manage knowledge through boundaries, rather than simply using boundaries as dividing lines between existing units (Maas et al., 2016).

Third, integrate different related factors and currently most academics are studying the obstacles to cross-organizational knowledge management (Zhang & Zhu, 2009). However, in fact, the power relations, trust and risks, structural mechanisms within the organization, as well as the complex environment and social connections outside the organization will have different degrees of impact on cross-organizational knowledge management, and most scholars' research is limited to a specific factor (Serdynskiy, 2020). In reality, although integrating different factors increases the complexity of research design and the difficulty of practice, it can provide insights into the interactive effects of various factors on cross-organizational knowledge management from different levels, providing a new focus for future academic research (Tang & Huang, 2004).

Fourth, broaden the application scenarios of incentive mechanisms in cross-organizational knowledge management. Existing studies mainly focus on for-profit enterprises, and naturally ignore non-profit organizations and third-party organizations in social and economic organizations (Xu et al., 2016). These two types of organizations have different goals, strategies, and requirements for knowledge management, and their organizational culture, organizational environment, and organizational characteristics will also be quite different (Al-Busaidi & Olfman, 2017). Therefore, when generalizing the conclusions to different types of organizations, its suitability and universality need to be considered. In future research, it is necessary to further refine organizational classification and conduct research in different categories to reveal the relationship between the unique cross-organizational knowledge management laws and incentive mechanisms in different application scenarios (Lynn et al., 2000).

Fifth, combining the different characteristics of innovation, we will explore the relationship between cross-organizational knowledge management and innovation

performance (Serdynskiy, 2020). Cross-organizational knowledge is a diverse, complex and extensive concept (Shang et al., 2023). Similarly, innovation, as an important topic that has been deeply explored by scholars from all walks of life, is extremely complex and dynamic, involving all aspects of organizational activities (Diirr & Cappelli, 2018). To thoroughly clarify the relationship between cross-organizational knowledge management and innovation performance, it is far from enough to only start from different dimensions of knowledge, and the conclusions drawn may be one-sided and arbitrary (Liu et al., 2008). Different knowledge management activities act on organizations and reflect innovation performance through products, processes, management and other aspects. Starting from different dimensions of cross-organizational knowledge management, combined with the inherent characteristics of innovation, we will explore the relationship with innovation performance, and the research conclusions obtained will be more convincing and practical (Simonin, 2004).

Finally, the relationship between cross-organizational and intra-organizational knowledge management (van Wijk et al., 2008). More and more studies have shown that the knowledge management mechanisms of cross-organizational and intra-organizational knowledge management are different, and cross-organizational knowledge management is more difficult than intra-organizational knowledge management (van Wijk et al., 2008). As pointed out by Van Wijk et al., national cultural differences have a more obvious impact on the internal organization; while the power issue of cross-organizational knowledge management is more prominent (van Wijk et al., 2008). However, there are differences between the two, but there are also potential connections. Most organizations have horizontal and different levels of internal boundaries (Diirr & Cappelli, 2018). The information flow within the organization is mainly vertical, while the information flow between organizations is mainly horizontal (Lu & Jin, 2008). If the knowledge obtained from the outside cannot reach the appropriate internal decision-making group, it is impossible to obtain the corresponding competitive advantage through this knowledge (Ni & Zhang, 2015). Therefore, in order to have a more comprehensive understanding of knowledge management, in the future, we can consider studying the knowledge information flow inside and outside the enterprise from the perspective of the enterprise hierarchy structure, and on this basis explore the connection and difference between the two, so as to open the black box between knowledge management and organizational performance.

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Addressing Job Satisfaction Factors in Middle Eastern Schools: Integrating Maslow's Hierarchy with Self-Determination Theory

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Abstract

This paper will aim to examine how the integration of Maslow's Hierarchy of Needs and Self-Determination Theory (SDT) could impact job satisfaction among educators in Middle Eastern public schools. The study will explore how addressing both extrinsic needs (e.g., working environment, employee recognition, performance-contingent pay) and intrinsic needs (e.g., autonomy, competence, relatedness) might enhance overall job satisfaction. A conceptual framework will be proposed, drawing on survey data from public school teachers to assess the combined effects of Maslow's and SDT dimensions on job satisfaction. Through quantitative analysis, the study will investigate how extrinsic and intrinsic motivators influence teacher satisfaction in this regional context. Insights from this study will be beneficial for education sector leaders, offering strategies to target both foundational and psychological needs, thereby enhancing job satisfaction. This paper will provide a unique contribution by integrating Maslow's and SDT frameworks in a Middle Eastern educational setting, enabling a more comprehensive approach to understanding job satisfaction. By incorporating both extrinsic and intrinsic factors, the study will address a gap in literature on teacher motivation and retention in public schools.

Keywords: Maslow's hierarchy of needs, Middle Eastern education, PLS-SEM, public schools, teachers' job satisfaction.

Introduction

In recent years, quality education has increasingly become a focal point for scholars, policymakers, and practitioners (Guzmán-Valenzuela et al., 2021). Key environmental challenges related to Sustainable Development Goal 4 (SDG 4), which prioritizes quality education, include ensuring equitable access to educational resources, fostering inclusive learning environments, and addressing gaps in infrastructure and technology, particularly in under-resourced and rural areas (Agbedahin, 2019; Mbithi et al., 2021). To achieve these goals, organizations need diverse resources, including natural, financial, scientific, technological, and human resources. Of these, human resources are the most vital, as they activate and sustain the use of other organizational resources (Olubiyi, 2023). Within organizational development, retaining high-quality human resources with credibility is crucial for optimal performance. When employees demonstrate strong performance, they tend to feel satisfied, which, in turn, promotes loyalty to their organization (Novianti et al., 2024). This principle is also highly applicable in the educational sector, where job satisfaction is essential to both individual and organizational success. Specifically, in Jordan's Ministry of Education, teacher satisfaction requires focused attention to support educational outcomes (Dababneh et

al., 2022). The Ministry of Education in Jordan faces several challenges affecting teacher satisfaction, including low pay, heavy workloads, limited autonomy, and insufficient professional development opportunities (Alnaimat et al., 2022; jo24, 2024; Queen Rania Foundation, 2021). These factors not only reduce job satisfaction but also hinder sustainable educational development (Queen Rania Foundation, 2021). Additional concerns include financial instability, job insecurity, and unmet higher-level needs—such as esteem and self-actualization—often exacerbated by inconsistent teacher training (Alkhlaifat, 2020; Queen Rania Foundation, 2021). Addressing these issues could be supported by integrating Maslow's Hierarchy of Needs and Self-Determination Theory (SDT) into Ministry policies to enhance teacher satisfaction. Studies have indicated that job satisfaction improvements often stem from addressing organizational factors like compensation, workload, working conditions, work organization, supervision, and leadership (Abdulahi, 2020; Jackson, 2018; Suryo Wibowo et al., 2024; Yang et al., 2024). Meanwhile, Aras & Gümüşsoy (2024) observed that many individuals have grown concerned about job security and have considered leaving their positions. Thus, focusing on the root causes of job dissatisfaction in schools may help reduce turnover and strengthen employee engagement (Battaglio et al., 2022; Queen Rania Foundation, 2021; Rojas et al., 2023).

This section introduces the research question, emphasizing the critical need for studies on job satisfaction within Jordan's Ministry of Education schools. Limited literature addresses job satisfaction within the Middle Eastern education sector, highlighting a gap in understanding factors that drive job satisfaction, including elements from Maslow's Hierarchy of Needs and Self-Determination Theory. This study aims to fill these gaps by examining the drivers of job satisfaction in Jordanian schools. Through its research question, the study seeks to provide a thorough understanding of job satisfaction dynamics specific to the context of Jordan's Ministry of Education schools. The research question of this study is: What are drivers influencing job satisfaction in Jordanian public schools?

The structure of this paper is organized as follows: Section 2 offers a comprehensive review of past literature and outlines the development of the study's hypotheses. Section 3 discusses the contributions of this research and presents the conclusions derived from the findings.

Literature Review

Job Satisfaction

Job satisfaction has been understood and defined in various ways, capturing its complex and multi-dimensional characteristics. Vroom (1964) describes job satisfaction as an emotional orientation toward one's work role, highlighting the importance of the emotional connection that employees form with their tasks. Hoppock & Spiegler (1938) define it as a blend of psychological, physiological, and environmental conditions that contribute to an employee's sense of satisfaction with their job. Locke (1976) further describes job satisfaction as a positive emotional state related to one's position. Expanding on this, Leap and Crino (1993) emphasize employees' feelings about their job, the rewards they receive, and the social, organizational, and physical aspects of their work environment. Thus, job satisfaction is influenced by both individual expectations and external factors, making it essential for organizations to cultivate a satisfied workforce to minimize turnover and support high performance.

Underpinning Theories

Maslow's hierarchy of needs is structured as a ladder-like progression, encompassing five levels: physiological, safety, social, esteem, and self-actualization (Ihensekien & Joel, 2023; Rojas et al., 2023). This theory remains widely used by researchers and organizations

alike to analyze human behavior, particularly within educational contexts (Quinteros-Durand et al., 2023; Wood, 2022). In this study, Maslow's hierarchy is further broken down into three key subcomponents based on employees' needs: physiological, safety, and social needs, which include factors such as working environment, employee recognition, performance-contingent pay and intrinsic needs which are reflected in job satisfaction.

Self-Determination Theory (SDT) is a theory of human motivation (Cassia & Magno, 2024; Deci & Ryan, 1985). SDT provides a compelling explanation of how fulfilling the core psychological needs for competence, autonomy, and relatedness leads to thriving and meaningful engagement in work. According to SDT, these needs are foundational for intrinsic motivation, well-being, and purpose; when work environments support these needs, employees experience heightened motivation and satisfaction (Ryan & Deci, 2017; Rigby & Ryan, 2018). Unlike Person-Environment Fit theory, which focuses on alignment between personal traits and job demands, SDT offers mechanisms for how supportive contexts actively enhance well-being and meaning (Greguras et al., 2015; Nikolova & Cnossen, 2020). Research further shows that employees who feel competent, autonomous, and connected to others find greater meaning and are more engaged, productive, and likely to remain in their roles, benefiting both individuals and organizations (Allan et al., 2016; Deci et al., 2017).

Justification for Integrating Maslow's Hierarchy of Needs and Self-Determination Theory

The integration of Maslow's Hierarchy of Needs with Self-Determination Theory (SDT) is well-founded, as both theories complement each other in exploring human motivation and well-being, especially within organizational settings. These frameworks underscore the importance of meeting individual needs to enhance job satisfaction, motivation, and performance.

Maslow's Hierarchy of Needs presents a sequential model where individuals must fulfill lower-level needs, such as physiological, safety, and social before they can address higher-order needs like esteem and self-actualization. In contrast, SDT highlights three fundamental psychological needs: competence, autonomy, and relatedness that are essential for fostering intrinsic motivation and well-being (Deci et al., 2017a; Deci & Ryan, 1985). Both theories agree that satisfying fundamental needs is essential to achieving higher engagement and fulfillment. For instance, Maslow's esteem needs, which include recognition and respect, align with SDT's emphasis on competence, while self-actualization aligns with SDT's focus on autonomy and competence, as individuals seek personal growth and meaningful work (Leroy et al., 2015).

Maslow's theory suggests that human needs are satisfied in a sequential order, beginning with basic survival needs and progressing to higher levels of motivation. In contrast, Self-Determination Theory (SDT) offers a holistic perspective, proposing that the needs for autonomy, competence, and relatedness can be nurtured simultaneously, with the satisfaction of basic needs forming a foundation for deeper psychological fulfillment (Rigby & Ryan, 2018). Combining these theories suggests that when employees' fundamental needs, such as safety and job security, are met, they are better positioned to fulfill their psychological needs, leading to increased job satisfaction and motivation. This approach supports the notion that organizations can address basic needs while simultaneously fostering intrinsic motivation through a supportive work environment (Ryan & Deci, 2017).

The integration of Maslow's Hierarchy and SDT is particularly valuable in organizational contexts, where employee motivation and satisfaction are essential to performance. Maslow's framework offers a structured approach to prioritizing needs, ensuring that organizations initially address essential aspects such as fair compensation, safety, and job security. Once these needs are met, SDT provides guidance for creating a work environment

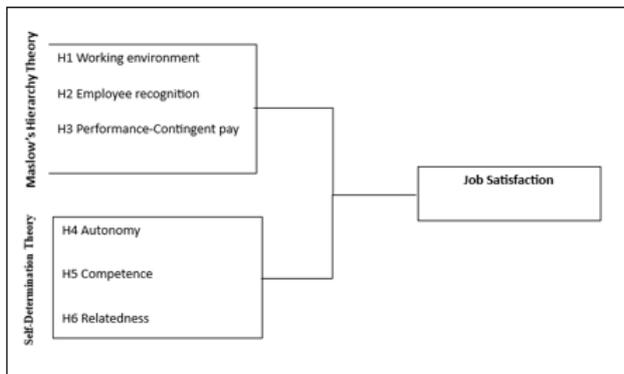
that supports competence, autonomy, and relatedness, which are essential for intrinsic motivation and sustained engagement (Deci et al., 2017). This integrated approach allows organizations to cultivate environments where both foundational and psychological needs are satisfied, resulting in higher job satisfaction, engagement, and productivity.

Research affirms the effectiveness of integrating these theories for understanding employee motivation and satisfaction. Studies have shown that satisfying core psychological needs—competence, autonomy, and relatedness—leads to enhanced intrinsic motivation and job satisfaction (Allan et al., 2016; Deci et al., 2017). Furthermore, combining Maslow’s hierarchy with SDT underscores the importance of addressing both basic and psychological needs to support long-term employee well-being and organizational success (Nikolova & Cnossen, 2020). This integrated perspective provides a robust framework for fostering a motivated and satisfied workforce.

Hypotheses Development

The development of hypotheses on job satisfaction is informed by Maslow’s Hierarchy of Needs and Self-Determination Theory. A supportive working environment (H1) is proposed to enhance job satisfaction by addressing employees’ fundamental need for security and social connection, thus increasing their job satisfaction. Further, employee recognition (H2) and performance-contingent pay (H3) are expected to foster a sense of esteem and fairness, leading to greater satisfaction and commitment. According to SDT, autonomy (H4), competence (H5), and relatedness (H6) are central to intrinsic motivation; when employees feel empowered, skilled, and connected, they experience higher satisfaction.

Figure 1. Research Framework



Working Environment

The working environment includes various factors such as physical conditions, hygiene standards, amenities, and open communication channels that a company provides to enhance job satisfaction (Pang et al., 2023). Wood (2022) defines the work environment as comprising work systems, job design, working conditions, and the treatment employees receive from managers and colleagues. According to Jumady & Lilla (2021), the work environment is everything around the employee, directly or indirectly affecting its implementation. Empirically, according to several earlier studies, the working environment has a positive and significant impact on job satisfaction (Fathurahman, 2022; Raziq & Maulabakhsh, 2015; Zanardi & Zhau, 2020). We followed hypotheses as follows:

H1: Working environment has a positive impact on job satisfaction.

Employee Recognition

Employee recognition is the acknowledgment of employees' performance and contributions, which enhances job satisfaction and motivates them to perform better (Kumar & Vasudevan, 2024). According to Kumar & Vasudevan (2024), management should consider factors like recognition to improve employee motivation and job satisfaction, ultimately leading to improved performance within the company. The past study's findings stated that employee recognition has a positive and significant impact on job satisfaction (Celestin et al., 2024; Kerketta & Shika Chauhan, 2023). In conclusion, we followed hypotheses as follows:

H2: Employee recognition has a positive impact on job satisfaction.

Performance-Contingent Pay

Performance-contingent pay refers to a compensation system in which employees' earnings are directly tied to their performance, with financial rewards reflecting their achievements (Tu et al., 2024). This type of pay structure allows employees to experience a sense of self-efficacy in task performance, leading to increased job satisfaction (Pazy, 2011). In the literature, employers' use of performance pay schemes has indeed proven to create greater feelings of belonging, esteem, and satisfaction (Tu, 2022). Empirical studies have shown that performance-contingent pay has a positive and significant effect on job satisfaction (Balkin et al., 2015; Valaei & Rezaei, 2016). Based on these findings, we propose the following hypotheses:

H3: Performance-Contingent pay has a positive impact on job satisfaction.

Autonomy

Autonomy refers to the degree of control employees have over their work tasks, pace, and decision-making within their roles (Demircioglu, 2018). Providing employees with greater autonomy enhances organizational performance, efficiency, and effectiveness while also boosting employee job satisfaction (Saragih, 2011). Previous research has shown that autonomy positively impacts both individuals and organizations, contributing to increased job satisfaction among employees (Chung-Yan, 2010; Rizwan et al., 2014; Saragih, 2011). Based on these findings, we propose the following hypotheses:

H4: Autonomy has a positive impact on job satisfaction.

Competence

Competence refers to the ability to apply and develop skills, knowledge, and abilities while feeling valued and having opportunities for growth within the workplace (Demircioglu, 2018). When an organization provides employees with the autonomy to make decisions and fosters respect and appreciation, employees' sense of competence can strengthen their self-efficacy (Mustafa et al., 2019). These interconnected factors contribute to increased motivation and satisfaction (Fradkin-Hayslip, 2021). Previous research has shown that competence has a positive and significant impact on job satisfaction (Hajiali et al., 2022; Olafsen et al., 2024). Based on these findings, we propose the following hypotheses:

H5: Competence has a positive impact on job satisfaction.

Relatedness

Relatedness refers to the sense of connection and support that employees feel from colleagues, especially during challenging work situations (Demircioglu, 2018). In a school setting, for example, relatedness encompasses the relationships between teachers and administrators as well as between teachers and students. These interconnected relationships contribute to higher levels of motivation and satisfaction (Fradkin-Hayslip, 2021). Previous research has demonstrated that relatedness positively impacts both individuals and

organizations, including enhanced job satisfaction among employees (Gillet et al., 2013; Slemp & Vella-Brodrick, 2014). In conclusion, we followed hypotheses as follows:

H6: Relatedness has a positive impact on job satisfaction.

Methods

In this study, data will be gathered through a structured quantitative survey conducted within Jordanian public schools. Using a purposive sampling approach, we will identify respondents who are most relevant to the research objectives, specifically focusing on individuals with insights into the educational environment. This method will allow for targeted, in-depth responses, enhancing the study's ability to capture and analyze the factors affecting educational dynamics within this context.

Contributions

Theoretical Integration: This paper will offer a novel contribution by combining Maslow's Hierarchy of Needs with Self-Determination Theory (SDT) to build a more comprehensive framework for understanding job satisfaction. By integrating these theories, it aims to address both extrinsic factors, such as basic needs like financial security and workplace safety, and intrinsic factors, including autonomy, competence, and relatedness. This integrated perspective will provide a dual approach to employee motivation, particularly relevant in the public school sector.

Contextual Relevance: The research will focus on job satisfaction specifically within the context of Middle Eastern public schools, which are often overlooked in motivational studies. By concentrating on this setting, the study will aim to reveal insights into the unique cultural and economic factors that impact job satisfaction among educators in this region, thereby addressing an important gap in the literature.

Policy and Practice Implications: The paper will propose practical insights that policymakers, school administrators, and educational leaders can use to improve retention and job satisfaction in public schools. By highlighting the dual influence of extrinsic and intrinsic motivators, it will suggest balanced approaches that schools could incorporate into policies, fostering a supportive and motivating work environment.

Improving Retention: The study will emphasize how meeting educators' comprehensive needs can help reduce turnover rates in public schools. By addressing the connections between extrinsic and intrinsic needs and job satisfaction, the study will highlight pathways to greater job engagement, offering actionable insights to improve retention across the sector.

Conclusion

Dual Motivational Focus: This paper will argue that job satisfaction among educators can be enhanced through a balanced approach that includes both foundational needs and intrinsic motivators. By meeting these needs, public schools could foster higher job satisfaction levels and lower turnover rates, creating more stability within educational institutions.

Recommendations for Retention: It will conclude that addressing both types of needs could serve as a key strategy for reducing teachers' intention to leave. Establishing a secure environment to fulfill basic needs, coupled with intrinsic motivators that promote autonomy and professional growth, will be shown to enhance employee engagement and retention.

Implications for School Policy: The study will propose that school policies address both extrinsic incentives (such as working environment, employee recognition, performance-contingent pay) and intrinsic needs (including autonomy and development opportunities). Tailoring such policies within the unique Middle Eastern context, this study will suggest, may help schools optimize job satisfaction and retention.

Cultural and Systemic Considerations: Recognizing that the Middle Eastern public school environment may differ culturally from other regions, this paper will highlight the importance of adapting motivational strategies to fit this specific context.

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CEO Age & Firm Risk-Taking: The Moderating Role of Uncertainty in the Middle East Countries

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Abstract

This paper will aim to examine the non-linear relationship between CEO age and managerial risk-taking, with a particular focus on how uncertainty moderates this relationship. Drawing on Upper Echelons Theory, this research aims to investigate how different stages of a CEO's career shaped by their age and experience impact their willingness to take risks, especially in the face of uncertainty. A conceptual framework will be proposed a quantitative research approach, utilizing Panel data from 2013 to 2022, focusing on the banking sectors of Middle Eastern countries. The Dynamic Panel Generalized Method of Moments (GMM) will be employed to examine the non-linear relationship between CEO age, managerial risk-taking, and the moderating effect of uncertainty, accounting for potential endogeneity and unobserved heterogeneity in the data. This study is limited by its focus on the banking sectors of Middle Eastern countries, which may affect generalizability. Panel data also limits capturing short-term changes in CEO behavior or market conditions. This study provides new insights into the non-linear relationship between CEO age and risk-taking, moderated by uncertainty, in Middle Eastern banks. It contributes by applying Upper Echelons Theory and dynamic panel data analysis.

Keywords: CEO's age, firm risk-taking, Middle East countries, uncertainty, upper echelons theory perspective.

Introduction

Firm risk-management plays an important role in improving the efficiency of using assets and the profit opportunities, returns, and firm growth that result (Almustafa et al., 2023). The integrity of a company's directors determines how effectively it is managed and stakeholders' perceptions of its probability of success. Global attention on risk management failures surged after the financial crisis, which led to historic bank insolvencies and a 45% decline in global wealth (Al-Tayan, R. 2022; Pirson & Turnbull, 2011). Middle Eastern economies were heavily impacted as oil demand fell, causing GDP growth in the MENA region to plummet from 5.4% in 2022 to around 2.7-2.9% in 2023 (IMF, 2024). These conditions underscore the need for stronger, adaptive risk management and regulatory frameworks, with failures attributed to both weak risk controls and deficiencies in corporate governance.

However, empirical evidence on managerial risk taking impact on firm value is mixed, partly due to limited understanding of factors critical for effective risk taking implementation. Most existing research relies on data from financial firms in developed countries, particularly the U.S. and Europe, where regulatory frameworks like Solvency II differ significantly from those in other regions (Gatzert & Schmeiser, 2008) and Asia countries China (He et al., 2023) and Malaysia (Yeoh & Hooy 2024). This limits the generalizability of findings to the Middle

East, where risk taking is relatively new and still under-researched, with less than half of firms having adopted risk taking programs. Additionally, regional factors such as reliance on oil exports, unique political and economic contexts, and regional conflicts present challenges to risk taking adoption and development (Dabrowski & Domínguez-Jiménez, 2022).

Current studies demonstrates that directors' actions can have a catastrophic effect on stakeholders and threaten firms' survival (Bhuiyan et al., 2024). Corporate risk-taking is vital for enhancing asset utilization, profit opportunities, and firm growth (Serfling, 2014; Wu et al., 2024). There has been increasing scholarly interest in understanding the determinants of corporate risk-taking through (Guo et al., 2024; Jiang and Chen, 2021) and firm characteristics (AL-Shboul et al., 2024). Additionally, existing literature highlights the influence of managerial experiences and traits, such as gender (Guo et al., 2024), age (Siew-Boey & Hooy, 2021), duality (Li & Tang, 2010), early-life disasters (Bernile et al., 2017), military experience (Benmelech & Frydman, 2015), and pilot credentials (Cain & McKeon, 2016), on corporate risk-taking. Furthermore, drawing on educational research, recent findings suggest that the relative age differences among CEOs due to the timing of formal schooling may impact CEO overconfidence and decision-making related to corporate risk-taking (Yeoh & Hooy, 2021).

The influence of CEO age on risk-taking remains debated, with older CEOs typically avoiding high-risk strategies in favor of financial stability and legacy preservation as they near retirement (Boey, Y. S., & Wooi, 2021). Younger CEOs, on the other hand, are more likely to take on risks like R&D and acquisitions to advance their careers (Yeoh & Hooy, 2020; 2022). However, younger CEOs may avoid risks if they fear career setbacks from failure (Gibbons & Murphy, 1992). Some studies find no significant relationship between CEO age and risk-taking (Chen H.I 2013; Yeoh, S. B., & Hooy, 2020). Additionally, CEO age may interact with other factors, such as uncertainty, moderating the effect of age on risk-taking decisions.

This study seeks to explore the relationship between the adoption of risk taking and firm value, identify the key factors driving risk taking, and assess the effect of CEO age on the risk taking in the banking sector of the Middle East. Additionally, it will examine the moderating role of uncertainty between CEO age and risk taking adoption. The specific objectives are as follows:

- i. Investigate the influence of CEO age on MRT implementation in Middle Eastern countries.
- ii. The positive effect of CEO age on MRT is stronger when uncertainty weaker.

The paper is structured as follows: it begins with the conceptual framework, then examines the link between CEO age and corporate risk-taking, followed by an analysis of how CEO age impacts risk taking quality. The paper also explores theoretical reasons behind the influence of CEO age on risk tolerance and concludes with key insights.

Literature Review

Upper Echelons Theory Perspective of Managerial Risk Taking

CEOs, accountable to the Board of Directors, bear significant risk-taking responsibilities that influence firm success (Chen, 2013). While financial instability and complex products contributed to governance failures, CEOs are often blamed for excessive risk-taking (Gontarek & Belghitar, 2021). The Upper Echelons Theory (UET) by Hambrick & Mason (1984) suggests that executives' personal attributes shape their decision-making, which affects organizational outcomes, with cognitive biases narrowing their perspective. While cognitive traits are hard to measure, demographic characteristics are used as proxies (You et al., 2020), with studies confirming strong links between executive traits and organizational outcomes (Alharbi et al., 2021). UET also posits that executives' psychological properties and experiences form their orientations, which influence strategic choices, including risk-taking, making it the ideal theory to predict how CEO age impacts firm risk-taking behavior.

Firm Managerial Risk Taking

Managerial risk-taking involves committing significant resources to activities with a high chance of failure, such as incurring heavy debt or making large investments in hopes of high returns (Alharbi et al., 2021). It plays a crucial role in strategic management, as top management takes risks to outperform competitors and improve competitive advantage, impacting a firm's economic performance, growth, and survival (Bromiley, 1991). Risk-taking is defined as engaging in behaviors associated with a probability of undesirable outcomes (Yeoh & Hooy, 2021). The willingness to interpret and manage risky situations is considered a key skill (Bhuiyan et al., 2024). Managerial risk-taking is reflected in strategic decisions such as R&D, acquisitions, and corporate activities, and is influenced by organizational, environmental, and managerial factors (García-Lopera et al., 2022). CEO characteristics, such as personality traits, play a significant role in shaping attitudes toward risk-taking (Hoskisson et al., 2017), while organizational culture and control systems, as well as environmental factors like problem framing and familiarity, also impact decision-making (Rashidi, 2020). Managers' risk aversion or willingness to take risks affects corporate behavior, and organizational performance can be influenced by whether managers reject or pursue risky, high-return opportunities (Wu et al., 2024).

CEO's Age

Age is a significant factor influencing a CEO's approach to risk-taking, impacting both their inherent risk preferences and decision-making style. Younger CEOs typically exhibit higher energy levels, greater adaptability, and a willingness to embrace change, often adopting new ideas and strategies to drive innovation (Loukil & Yousfi 2016). Conversely, older CEOs, with a focus on maintaining stability, may be less inclined to challenge established norms or pursue radical changes within the organization (Hambrick & Mason, 1984). While older CEOs possess valuable experience that enhances their ability to evaluate and manage risks effectively (Hsu et al. 2020), they may face cognitive and physical declines that limit their capacity to process new information and adopt higher-risk strategies (Yao et al., 2011). This suggests that older CEOs, despite their experience, might adopt a more conservative decision-making approach due to a preference for stability and a lower willingness to take risks. Therefore, CEO age influences the level of risk they are willing to take and the strategic decisions they make, with a balance between accumulated experience and the natural aging process shaping their risk preferences (Arulanandam et al., 2023; Abouzeenni, A. 2023).

Control Variables

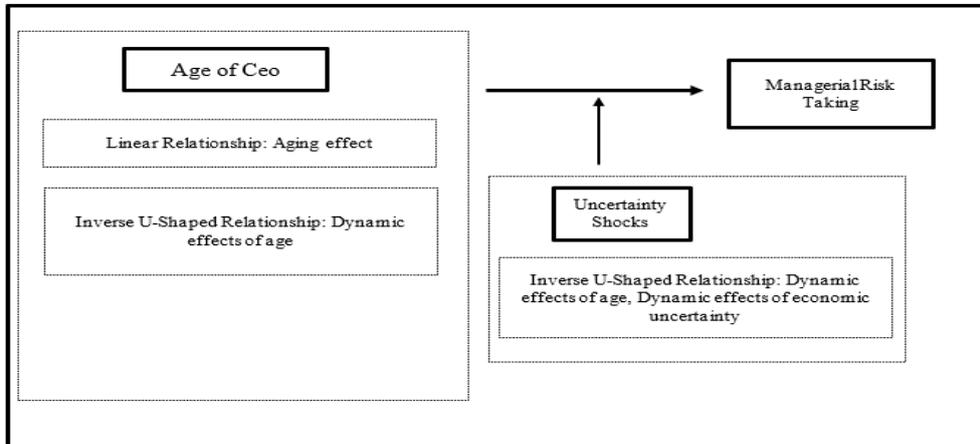
This study includes control variables because previous research has emphasized their importance in understanding risk-taking behavior and firm policies (Bhuiyan et al., 2024; Guo et al., 2024; Wu et al., 2024; Yeoh & Hooy, 2021). Factors such as firm size, leverage, profitability, and GDP growth are commonly used as control variables in risk-taking studies, as they can influence corporate risk decisions. By incorporating these variables, this study aligns with past studies that have highlighted their relevance in explaining the relationship between CEO characteristics and risk-taking behavior, ensuring a more accurate and comprehensive analysis.

Hypothesis Development

This research, using the Upper Echelons Theory, examines how CEO age and uncertainty influence managerial risk-taking. It hypothesizes that age generally negatively affects risk-taking, with younger CEOs more willing to take risks than older ones. However, uncertainty is expected to moderate this relationship, encouraging older CEOs to take more risks in uncertain environments, while younger CEOs may become more risk averse. The model integrates age

and uncertainty to better understand the dynamic nature of CEO decision-making and risk preferences.

Figure 1. Research Framework



Based on the relationship between CEO age and risk-taking behavior, the study proposes the following hypothesis: CEO age is negatively associated with organizational risk-taking, such that older CEOs are more likely to adopt conservative risk strategies due to declining physical and cognitive abilities, while younger CEOs, with higher energy and greater willingness to embrace change, are more inclined to take on higher risks in strategic decision-making. This hypothesis is grounded in the notion that while older CEOs bring valuable experience, their preference for stability and less willingness to embrace high-risk, high-reward opportunities may limit their engagement in more dynamic risk-taking activities (Hambrick & Mason, 1984; Serfling, 2014; Yao et al., 2011).

H1 : There is a negative linear relationship between CEO age and managerial risk taking.

H2 : There is a non-linear relationship between CEO age and managerial risk taking.

Uncertainty as A Moderator

In this study, we also explore the non-linear relationship between CEO age and managerial risk-taking, considering how uncertainty and career horizons influence risk behavior throughout a CEO's career. We propose that the relationship between age and risk-taking is not purely linear but may follow a U-shaped or inverted U-shaped pattern. Specifically, younger CEOs may exhibit high levels of risk-taking as they establish themselves in the role, while mid-career CEOs may reduce their risk-taking as they focus on stabilizing the company. However, as CEOs approach the later stages of their careers, they may again embrace higher risks in pursuit of a lasting legacy, a phenomenon often referred to as "late-career risk-taking." This non-linear perspective aligns with prospect theory, which suggests that an individual's risk behavior shifts depending on their current situation relative to their goals. Empirical evidence supports this, showing that risk-taking behavior peaks early in a CEO's career, diminishes during middle age, and may rise again as they near retirement. Thus, the relationship between CEO age and risk-taking is dynamic, with periods of both increased and decreased risk tolerance depending on the CEO's career stage. Therefore, we hypothesize that the relationship between CEO age and risk-taking is non-linear, characterized by a decline in risk-taking during middle age, followed by a potential resurgence of risk-taking in the later stages of the CEO's career.

H3: There is a negative linear relationship between CEO age and managerial risk-taking in Middle Eastern countries, with economic uncertainty moderating this relationship.

H4 There is a non-linear relationship between CEO age and managerial risk-taking in Middle Eastern countries, with economic uncertainty moderating this relationship.

Methods

This study will employ a quantitative research approach, utilizing Panel data from 2013 to 2022 collected from the banking sectors of Middle Eastern countries. The analysis will focus on exploring the non-linear relationship between CEO age and managerial risk-taking, with uncertainty acting as a moderating factor. To examine these relationships, the study will utilize Dynamic Panel Generalized Method of Moments (GMM), a robust econometric technique well-suited for handling panel data with potential endogeneity and unobserved heterogeneity. The GMM method will allow for the estimation of dynamic relationships between CEO age, risk-taking behavior, and other control variables such as firm size, profitability, and leverage, while accounting for time-dependent effects. Regression analysis and moderation models will also be applied to further assess the impact of uncertainty on the CEO's risk-taking decisions. By using this method, the study aims to obtain reliable estimates and provide a more nuanced understanding of how CEO characteristics and external factors influence managerial risk preferences in the banking sector.

Contributions

Theoretical Contribution

This study aims to enhance the understanding of how CEO age influences managerial risk-taking by incorporating a non-linear relationship, with uncertainty serving as a moderating factor. Through the application of Upper Echelons Theory, the study will provide a fresh perspective on how the age and experience of top executives shape their approach to risk, especially when facing uncertain environments. By investigating how uncertainty affects the decision-making process at different stages of a CEO's career, this research will contribute to expanding existing theoretical models and addressing gaps in the literature concerning risk behavior in top executives.

Practical Contribution

Practically, the study will offer useful insights for organizations in managing their leadership dynamics and strategic decision-making processes. Understanding how uncertainty influences risk-taking in relation to a CEO's age will help companies adjust their strategies to fit the evolving risk profiles of their leaders. This knowledge will aid in preparing organizations for the challenges posed by uncertainty, ensuring that leadership transitions and decision-making processes are aligned with both the career stage and risk preferences of their CEOs.

Conclusion

In conclusion, this research will highlight the intricate relationship between CEO age and risk-taking behavior, emphasizing the role of uncertainty as a moderating factor. The study will challenge conventional assumptions about CEO decision-making, revealing how risk preferences may shift throughout a CEO's career. By providing both theoretical insights and practical implications, this study will contribute to a deeper understanding of executive decision-making in uncertain environments and offer valuable guidance for Bank seeking to optimize leadership strategies.

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A Multi-Level Analytical Framework of Talent Attraction: Integrating Organizational Characteristics, Employee Attitudes, and Justice Perceptions

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Abstract

In the digital economy era, attracting and retaining talent has become a critical challenge for organizations. This article seeks to develop a multi-level conceptual model of “organizational characteristics–employee attitudes–talent attraction” by systematically analyzing the mechanisms through which organizational innovation climate, organizational support, employee job satisfaction, and organizational identity influence talent attraction. Drawing on social exchange theory, social identity theory, and resource-based theory, the framework integrates both organizational- and individual-level perspectives. The study provides a comprehensive analytical framework by delineating the roles of organizational characteristics, such as innovation climate and organizational support, and employee attitudes, such as job satisfaction and organizational identity, in shaping talent attraction. The framework incorporates organizational justice as a critical contextual factor, analyzing its moderating role in the relationships between organizational characteristics and employee attitudes. Additionally, it explores the feedback effects of talent attraction on organizational dynamics. This perspective seeks to enhance understanding of the mechanisms underlying talent attraction, offering valuable theoretical insights for organizations striving to optimize their talent management practices.

Keywords: innovation climate, job satisfaction, organizational identification, organizational justice, organizational support, talent attraction.

Introduction

Competition for talent is the core resource and a main driving force for sustainable development of organizations in the globalized knowledge economy. In the age of digitization, attracting and retaining talented people has emerged as one of the key challenges for most organizations in this modern time when enterprises depend more and more on innovation-driven competitive advantages and internal digital transformation, which requires a strong need for innovative, high-quality talent. Therefore, in this context, it is very important that an in-depth investigation should be conducted into the main factors affecting talent attraction and their organizational management practice mechanism in improving talent competitiveness.

Though the concept of talent attraction has been widely discussed in previous literature, most of the studies have either focused on organizational-level factors, such as leadership styles by Ewerlin & Süß (2016) and employer reputation by Kaur & Pingle (2018), or on individual-level responses, such as job-seeking motivation by Peiffer et al. (2020) and perceptions of organizational attractiveness by Ronda et al. (2020). As talent mobility increases and organizational boundaries become more fluid, static approaches are not so effective in studying

talent attraction or reflecting organizational realities. This has created an urgent need to adopt a dynamic systems perspective. Recent research trends have embraced integrated theoretical perspectives coupled with dynamic process analyses.

Though the concept of talent attraction has been widely discussed, most studies have focused on either organizational-level factors or individual-level responses. Recent comprehensive reviews by King and Vaiman (2019) highlight how talent management research has traditionally been fragmented between macro (organizational) and micro (individual) perspectives. As talent mobility increases and organizational boundaries become more fluid, static approaches are increasingly ineffective in studying talent attraction or reflecting organizational realities (Crowley-Henry et al., 2019).

Recent research trends have embraced more integrated theoretical perspectives. For instance, De Boeck et al. (2018) provided empirical evidence on how employees interpret and react to talent management practices across organizational levels. Building on this, Makarius and Srinivasan (2023) explored how digital transformation is reshaping talent attraction and retention mechanisms, emphasizing the need for dynamic, system-level approaches. These findings point toward the interaction of micro- and macro-level perspectives in understanding talent attraction.

Despite these advances, significant gaps remain in extending theoretical frameworks and capturing dynamic processes in talent attraction research. While systematic frameworks have been proposed (King & Vaiman, 2019), few studies explore relationships between organizational attributes and employee reactions from an integrated perspective. As De Boeck et al. (2018) demonstrate, research needs to better address how employees' perceptions and reactions shape talent management effectiveness. Similarly, while scholars call for more dynamic approaches (Makarius & Srinivasan, 2023), empirical studies examining process dynamics and feedback mechanisms remain scarce. These findings point toward the interaction of micro- and macrolevel perspectives and provide new knowledge about multi-level mechanisms driving talent attraction.

Notwithstanding these isolated advances, there are still significant gaps in extending theoretical frameworks, unraveling mediating mechanisms, and capturing dynamic processes in talent attraction research. Although systematic frameworks have been suggested, such as Amankwaa & Sarpong (2020), very few studies have explored the relationships between organizational attributes, employee reactions, and talent attraction from the perspective of perceived organizational support and innovation climate. Most of the extant research overemphasizes mediating mechanisms at the recruitment stage alone, therefore leaving the mediation role of employee attitudes in talent attraction largely unaddressed. Similarly, scholars called for dynamic approaches to talent attraction, but very few studies examine dynamic processes and feedback mechanisms empirically.

Despite these limitations, the current study aimed to propose a multi-level analytical framework of talent attraction by referring to organizational support and innovation climate. By surveying the process through which organizational characteristics have an influence on talent attraction via employee satisfaction and organizational identity, and how talent attraction then feeds back into organizational dynamics, this study tries to draw out the interactive cycle between organization and employee. The current study further develops the moderating approach of organizational justice to present new visions on the contextual analysis of practices related to talent attraction.

Literature Review

On the basis of previous studies, this paper reviews the concepts and theories related to organisational innovation climate, organisational support, job satisfaction, organisational

identity, talent attraction and organisational fairness, in order to consolidate the theoretical perspectives of this study.

Organisational Innovation Climate

Organisational innovation climate refers to the overall environment and atmosphere created by organisations in terms of encouraging innovation, supporting innovation and rewarding innovation (Shanker et al., 2017). It has been shown that organisational innovation climate promotes employee innovation behaviors (Do et al., 2019) and improves organisational innovation performance (Ali & Park, 2016). An empirical study by Bos-Nehles and Veenendaal (2019) found that organisational innovation climate positively influences employees' innovative work behaviors, and that human resource management practices (e.g., employee participation, performance appraisal) play a partially mediating role.

The innovation climate is shaped by the strategic orientation and top-level support of the organisation. The CEO's transformational leadership style creates an innovative climate in the organisation (Prasad & Junni, 2016), and this innovation orientation further enhances the perceived organisational support of the employees and stimulates intrinsic work motivation (Mahmood et al., 2019). A study on Pakistan's telecommunication industry suggests that an innovation climate supported by executives can influence employee behaviors through mediating mechanisms such as psychological empowerment (Nazir et al., 2018). For R&D teams, the relationship between team innovation climate and individual innovation performance is moderated by individual innovation self-efficacy (Chen et al., 2019).

From the perspective of job characteristics theory, innovative organisations tend to provide employees with more job autonomy and development opportunities, which can satisfy the growth needs of talents and enhance job satisfaction (Audenaert et al., 2019). In addition, an innovative atmosphere also helps to shape a supportive and inclusive organisational culture, allowing employees to feel a sense of belonging that is valued by the organisation, and thus to engage in work with a more positive attitude (Binyamin & Brender-Ilan, 2018). Taking the above logic into account, this study hypothesizes that an organisational innovation climate may enhance the attractiveness of an organisation in the internal and external talent market by increasing employee satisfaction, identification, etc. This inference needs to be tested by empirical data, but it certainly provides new ideas for the study of the relationship between innovation climate and talent attraction.

Organizational Support

Organizational support (OS) is a key factor influencing employee attitudes, behaviors, and ultimately, talent retention and attraction. Recent findings as Hur et al. (2019) found: OS increased job satisfaction and reduced burnout among airline staff. Alcover et al. (2020) showed OS boosted organizational citizenship behaviors through heightened affective commitment in a large worker sample. Shi & Gordon (2020) demonstrated that OS enhanced engagement and innovation via psychological empowerment in hospitality. Meta-analytically, OS has strong positive links with satisfaction, commitment, and performance (Kurtessis et al., 2017).

These findings suggest OS shapes crucial employee attitudes like satisfaction and commitment, leading to reduced burnout, increased citizenship and innovation, and better performance. OS likely enables talent retention by increasing employees' desire to stay. Satisfied, committed employees may also attract new talent by recommending the organization to others.

However, the potential for successful talent management to reciprocally enhance OS perceptions remains understudied. Retaining talent could send positive signals about OS to remaining employees. Future research should examine this feedback loop.

In sum, OS is vital for promoting positive employee attitudes, productive behaviors, talent retention, and potentially talent attraction. Organizations should prioritize providing support to optimize human capital.

Job Satisfaction

Job satisfaction refers to the positive emotional response of employees to their work or work experience (Locke, 1976). As an important indicator reflecting employees' work attitudes, job satisfaction is affected by many factors, such as job characteristics (autonomy, diversity, etc.), organizational characteristics (culture, support, etc.), and individual characteristics (personality, values, etc.) (Judge et al., 2017).

Frederickson's (2017) extended-construct theory provides a new perspective to explain job satisfaction. The theory suggests that positive emotions broaden an individual's attention and way of thinking and construct an individual's enduring resources. Positive emotional experiences at work (e.g., a sense of job accomplishment) can enhance job satisfaction and lead to more positive behaviors (e.g., organizational citizenship behaviors).

Job satisfaction is positively related to employee engagement and organizational commitment, and Rayton and Yalabik (2014) found that job satisfaction positively affects employee engagement, which is mediated by a sense of distributive justice. Employees with high satisfaction have stronger emotional attachment to the organization and are more inclined to reward the organization with altruistic behaviors (Ocampo et al., 2018).

From the perspective of attitude-behavior theory, an individual's positive evaluation of a specific object (e.g., an organization) will stimulate his or her altruistic motivation, which in turn will lead to actions in favor of that object (Lee et al., 2019). Accordingly, highly satisfied employees are more likely to proactively communicate the organization's strengths to the external market and play the role of "organizational spokesperson" to enhance the reputation of the organization's employer brand. In contrast, dissatisfied employees are likely to spread negative information and damage the organization's reputation. It is clear that employee satisfaction is crucial in shaping an organization's talent attractiveness. In this study, job satisfaction is used as a mediating variable to examine the key role it plays in the process of organizational characteristics affecting internal and external talent attraction. This not only deepens the understanding of the antecedents and consequences of job satisfaction, but also provides a practical path for organizations to enhance talent competitiveness.

Organizational Identity

Organizational identity reflects the extent to which employees perceive the organization as an extension of their self-concept, and represents the process of integration between employees and the organization in terms of goals, interests, and emotions (Ashforth et al., 2008). When employees view the organization as an extension of their self-concept, they think more from an organizational perspective and exhibit more pro-organizational behaviors (Lee et al., 2015).

Social identity theory provides an important theoretical foundation for organizational identity. Individuals derive positive self-worth from group identity by categorizing themselves as members of a specific social group (e.g., organization) (Tajfel, 1972). The formation of organizational identity is influenced by factors such as organizational prestige (Podnar et al., 2018), leadership behavior (Marstand et al., 2018).

Organizational identity enhances employees' job performance and organizational citizenship behaviors. Loi et al.'s (2014) study found that organizational identity positively predicts employees' task performance, helping behaviors, and constructive behaviors. In addition, organizational identity reduces employees' tendency to leave (Kumar & Singh, 2018), which is important for talent retention.

In recent years, scholars have begun to focus on the role of organizational identity in the social exchange process. For example, He et al. (2014) found that the sense of organizational support enhances employees' organizational citizenship behavior through the mediating role of organizational identity. This reveals that organizational identity may be a key link between employee attitudes and behaviors. The study intends to explore the mediating role of organizational identity in the process of internal and external talent attraction influenced by employee satisfaction, in order to reveal the important value of employee attitudes in the construction of talent competitiveness of organizations.

Talent Attraction

Talent attraction refers to the ability of an organization to attract excellent talents, including the recruitment attraction of external candidates and the retention of internal talents (Tlaiss et al., 2017). As the strategic position of talent in organizational competitiveness becomes more and more prominent, talent attraction has become a core issue in human resource management (Thunnissen & Gallardo-Gallardo, 2017).

The resource-based view provides an important theoretical perspective for talent attraction. Excellent talents, as a scarce resource, are the root of an organization's sustainable competitive advantage (Delery & Roumpi, 2017). Through unique talent attraction mechanisms, organizations are able to acquire external high-quality human capital and retain internal core talent, thus enhancing resource endowment (Sparrow & Makram, 2015).

Employer branding is an important means of enhancing organizational attractiveness. Employer branding represents the value proposition of the organization as an employer and influences job seekers' employment decisions (Theurer et al., 2018). Maurya and Agarwal's (2018) study found that employer brand image positively affects job seekers' perceived organizational attractiveness, with job search motivation and organizational reputation playing a mediating role.

Organizational reputation plays a key role in candidates' employment choices. Cable and Turban (2003) showed that perceived organizational reputation affects job seekers' evaluation of job attributes (e.g., salary, development opportunities), which in turn affects their job search intentions. A good organizational reputation can make candidates have positive expectations of the organization and enhance organizational attractiveness (Lievens & Slaughter, 2016).

In the context of talent competition, talent acquisition is as important as talent retention. Organizational commitment is a key factor influencing internal talent retention (Arasanmi & Krishna, 2019). A study by Bibi et al. (2018) found that employee-perceived human resource practices (e.g., training, compensation, and job security) negatively affect turnover intentions through the mediating role of organizational commitment. Perceived procedural fairness and perceived distributive fairness then play a moderating role.

In short, attracting external talent and retaining internal talent are the two core tasks of organizational talent management. The influencing factors of talent attraction include both organizational factors (e.g., employer brand, reputation) and individual factors (e.g., job search motivation, organizational commitment). Existing studies have focused more on single-level influencing mechanisms, but lack an integrated model of talent attraction from a multi-level perspective. Given the role of employee attitudes and behaviors in linking organizational management practices and talent attraction (Maurya & Agarwal, 2018), this study intends to construct a multi-level analytical framework of "organizational characteristics-employee responses-talent attraction" to deepen the understanding of talent attraction mechanisms.

Organizational Justice

Organizational justice consists of three dimensions: distributive fairness, procedural fairness and interactive fairness, which refer to employees' perceptions of the organization's

justice in resource allocation results, rule-making processes and daily interactions (Colquitt et al., 2013). Organizational justice has long been regarded as an important situational factor influencing employees' attitudes and behaviors, and a meta-analysis by Rupp et al. (2017) showed that distributive fairness, procedural fairness, and interactional fairness were significantly and positively related to employees' job satisfaction, organizational commitment, and task performance.

This shows that employees' perceptions of organizational justice may moderate the relationship between organizational characteristics (e.g., innovation climate, organizational support) and employee attitudes. When the perception of organizational justice is high, positive signals such as innovation atmosphere and organizational support are more easily accepted by employees, and employees are more inclined to respond to the organization with satisfaction and recognition, thus enhancing the talent attraction effect. In contrast, low perceptions of justice may weaken the positive effects of organizational characteristics. In conclusion, the introduction of the organizational justice perspective helps to reveal the boundaries of the effectiveness of talent attraction practices, and injects new connotations into the creation of a "fair atmosphere" and the optimization of talent ecology in organizations.

Based on the classical concepts of organizational innovation atmosphere, organizational support, job satisfaction, organizational identity and organizational justice, this study attempts to construct an analytical framework of talent attraction with theoretical explanatory power and practical relevance. Through a systematic review of the relevant literature, this study has gained a better understanding of the connotation, mechanism and interaction boundaries of the above variables in the context of talent attraction, which lays a solid foundation for the logical derivation of the propositions of the subsequent study. Based on the above theoretical analysis, the next section will put forward the core propositions of this study and argue them.

Theoretical Framework and Propositions

The proposed conceptual model of "organizational characteristics-employee attitudes-talent attraction" provides a multi-level framework integrating dimensions that shape talent attraction in organizations.

The study constructed a multi-level conceptual model of talent attraction (shown in Figure 1). The core components of the model are as follows.

Organizational-Level Independent Variables: The model considers organizational innovation climate and organizational support as significant independent variables. These constitute organizational antecedents to individual attitudes and behaviors and the talent attraction consequences.

Individual-Level Mediator Variables: At the individual level, job satisfaction and organizational identification act as mediators. These are attitudinal reactions of employees towards their organization and work atmosphere, which are significant intermediary processes between organizational attributes and talent attraction.

Outcome Variables: The model sets internal talent retention and external talent attraction as the outcome variables. These outcomes gauge the competitiveness in attracting and retaining talent in internal and external labor markets of the organization, respectively.

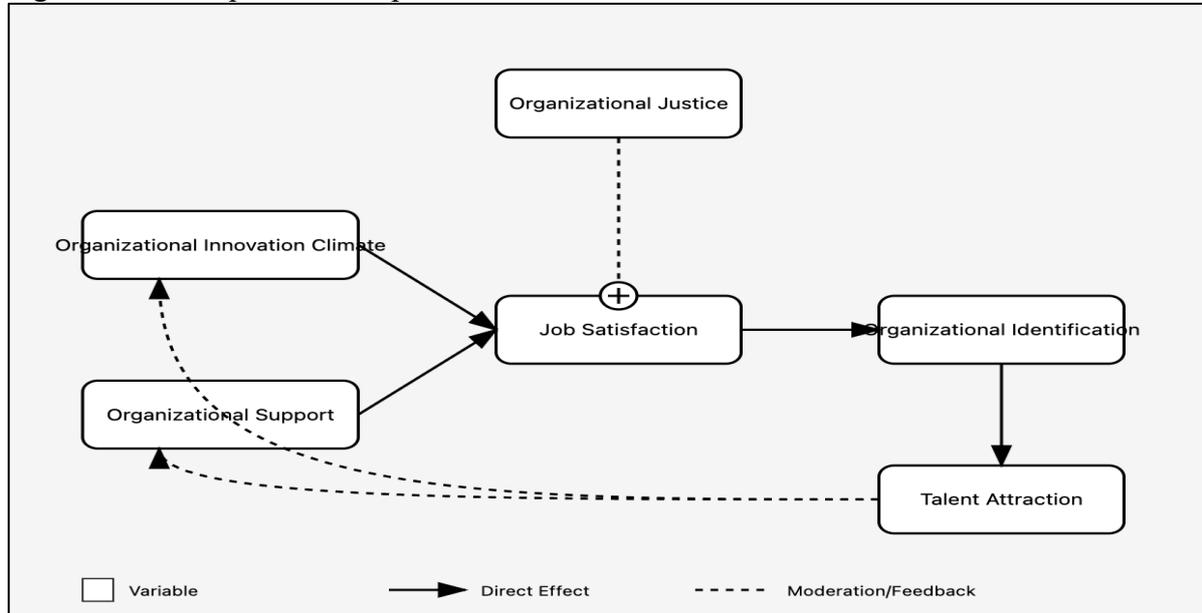
Contextual Moderator Variables: Organizational justice, comprising distributive, procedural, and interactive justice, has been brought in as a contextual moderator. It will be incorporated into the model because it moderates the relationship between organizational characteristics and employee attitudes and, in turn, influences talent attraction in general.

Conceptual Model

The proposed model outlines a multi-level pathway where organizational characteristics, such as innovation climate and organizational support, influence talent attraction—both internal

retention and external recruitment—through their impact on employee attitudes, including job satisfaction and organizational identification. Organizational justice is introduced as a key contextual factor that moderates the relationships between organizational characteristics and employee attitudes. Furthermore, the feedback effects of talent attraction on organizational factors underscore the dynamic and iterative nature of talent management practices.

Figure 1. The Proposed Conceptual Framework



Theoretical Propositions

Organizational Characteristics and Job Satisfaction

Proposition 1a: Organizational innovation climate positively affects employee job satisfaction.

Organizations that foster an innovation climate by promoting flexibility, autonomy, and growth opportunities satisfy employees' developmental and achievement needs, thereby improving job satisfaction (Newman et al., 2018). Additionally, a failure-tolerant culture signals organizational care and support, encouraging employees to reciprocate with positive emotional attitudes (Binyamin & Brender-Ilan, 2018).

Proposition 1b: Organizational support positively affects employee job satisfaction.

Organizational support theory posits that perceived support meets employees' socio-emotional needs for respect and recognition, thereby enhancing satisfaction (Eisenberger et al., 1986). Empirical evidence supports the significant positive relationship between organizational support and job satisfaction (Kurtessis et al., 2017), reinforcing the link between organizational characteristics and employee attitudes.

Job Satisfaction and Organizational Identification

Proposition 2: Job satisfaction positively affects organizational identification.

Job satisfaction reflects employees' favorable evaluations of their work environment. Self-concept theory suggests that positive attitudes toward a group, such as an organization, enhance the perception of that group as part of one's self-concept (Shamir, 1991). Satisfying work experiences align employees' values with organizational goals, strengthening their identification with the organization (Riketta, 2005).

Organizational Identification and Talent Attraction

Proposition 3a: Organizational identification positively affects internal talent retention.

Employees with strong organizational identification develop emotional attachment to the organization and are more likely to establish long-term relationships. Research indicates that organizational identification is a key determinant of retention intentions, as employees align their interests with the organization's objectives (Lee et al., 2015).

Proposition 3b: Organizational identification positively influences external talent attraction.

Employees with high organizational identification often act as "organizational ambassadors," promoting the organization's values and strengths to external talent. Their advocacy enhances the employer brand, significantly influencing job seekers' employment intentions (Van Hove et al., 2016). Additionally, these employees contribute to employer branding initiatives, such as recruitment events, thereby amplifying the organization's attractiveness (Theurer et al., 2018).

Feedback Effect of Talent Attraction

Proposition 4a: External talent attraction positively affects organizational innovation climate.

Recruiting external talent introduces diverse knowledge, skills, and experiences, fostering creative interactions with existing employees and enhancing the organization's innovative capacity (Lee, 2019; Swailes, 2020).

Proposition 4b: Internal talent retention positively affects perceptions of organizational support.

A stable workforce signals a favorable talent environment, boosting employees' confidence in organizational growth and their sense of being valued. Retained senior employees preserve institutional knowledge and foster mentorship, helping new hires perceive organizational care (Huang & Su, 2016).

Multi-level Moderating Role of Organizational justice

Proposition 5a: Distributive fairness moderates the relationship between organizational innovation climate and job satisfaction.

When employees perceive fairness in reward allocation, they are more likely to embrace the values of innovation promoted by the organization, enhancing satisfaction. Conversely, perceived inequities in rewards may diminish the positive impact of the innovation climate (Bobocel & Mu, 2016).

Proposition 5b: Procedural and interactional fairness moderate the relationship between organizational support and job satisfaction.

Procedural fairness, characterized by transparent decision-making and open communication channels, and interactional fairness, defined by respectful managerial interactions, amplify the positive effects of organizational support on job satisfaction. Conversely, perceptions of superficial or insincere support initiatives can weaken this relationship (Zipay et al., 2020).

This study develops a multi-level, dynamic model of talent attraction based on organizational innovation climate and support. The model elucidates the mechanisms linking organizational characteristics, employee attitudes, and talent attraction while incorporating fairness as a critical contextual factor. It also highlights the feedback effects of talent attraction on organizational factors. The theoretical propositions offer a foundation for empirical testing, refining the model's explanatory power, and contributing to the development of talent management practices.

Discussion

Based on the perspective of organizational support and innovation climate, this study constructed a multi-level and dynamic conceptual model of talent attraction. The theoretical contributions of the model are mainly reflected in the following aspects :

The model integrates both organizational and individual perspectives, revealing the multi-level mechanism by which organizational characteristics influence talent attraction through shaping employee attitudes. Previous studies have either focused on the influence of organizational factors on talent attraction or on the match between individual characteristics and organizational attractiveness (Swider et al., 2015), but few studies have systematically examined how organizational factors affect talent attraction across levels. The conceptual model in this study tries to make up for it, and exploring the theoretical path of “organizational characteristics → employee attitudes → talent attraction”, which enriches the theoretical interpretation of the generation mechanism of talent attraction.

Secondly, the model focuses on the mediating role of organizational identity which highlights the core status of social identity process in the formation of talent attraction. Existing studies have focused on the relationship between general work attitudes such as satisfaction and talent attraction, while the employee-organization identity process implied by organizational identity has been relatively neglected. The present model emphasizes the catalyst function of organizational identity, which is the “psychological sense of belonging” of employees, in the transformation of employee attitudes to talent attraction performance, expanding the research on the organizational identity mechanism of talent attraction.

Meanwhile, the model introduces the perspective of organizational justice, which provides a contextualized analysis framework for the effectiveness of talent attraction practice. This studies have analysed the boundary conditions of talent attraction which will expand the insufficient discussion about general influencing factors of talent attraction then before. It proposes that organizational justice perception moderates the relationship between organizational characteristics and employee attitudes, which in turn affects talent attraction performance, highlighting the importance of organizational context in talent attraction practice. This perspective extends the application of organizational justice theory in the context of talent management and provides new ideas for subsequent research.

At last, the conceptual model incorporates the feedback path of talent attraction on organizational characteristics, which breaks through the traditional linear causal paradigm and highlights the dynamics of the organizational talent system. Previous studies have regarded talent attraction as an outcome variable of organizational factors and human resource practices, seldomly considered the interactive shaping process of the two. This research model focuses on the feedback effect of talent capital changes on organizational innovation atmosphere and sense of support, which opens up a new direction of research on organizational talent ecology from a dynamic perspective.

Certainly it's not avoidable to have some limitations as a conceptual study, which provide a direction for further expansion of subsequent research.

For one thing, future research needs to test the model with empirical data to examine the explanatory power of each theoretical path. The cross-situational applicability of the model can be compared with different organizational and cultural contexts. Future research can incorporate other moderating variables (e.g., leadership style, personality traits) to further enrich the boundary condition analysis of talent attraction. And also, in view of the continuous interaction between organizations and individual talents, future research should adopt tracking data to portray the dynamic evolution of talent attraction and explore the impact of changes in talent capital structure on organizational performance. Maybe case studies can help to analyze the

logic of talent practices in typical organizations, which can complement for the shortcomings of quantitative research.

Nevertheless, the conceptual framework of this study still has some implications for organizational talent management practices.

Firstly creating a supportive and innovative organizational climate, which is the internal driving force to attract and motivate talents should be paid attention to. The optimization of organizational climate cannot be separated from the attention of senior leaders, and talent development needs to be included in the strategic agenda and put into action. Secondly, the organization should concern more about the satisfaction and recognition of the employees, and incorporate them into the assessment indicators of talent performance. Positive interaction between the organization and employees is the key to cultivate talent capital. Again, the organization should create a fair and just cultural atmosphere, and manifest the concept of fairness in talent policy making and daily management. Employees' perception of fairness is the "lubricant" for the effective operation of talent practice. Finally, the organization should set up a dynamic system view of talent development and pay attention to the virtuous cycle of talent attraction, motivation and cultivation. Talent team building is a systematic project that requires continuous investment and optimization by the organization.

All in all, to face the talent competition in the new era, we need to break through the linear mindset and optimize the talent management concept and practice in a timely manner. This study proposes a multi-level dynamic model of talent attraction from the perspectives of organizational support and innovation atmosphere, hoping to provide theoretical references for the change of organizational talent management, stimulate the wisdom of practice, and promote the construction of talent-strong enterprises. On the basis of this model, future research can combine multi-context, multi-level and dynamic perspectives to further enrich the theoretical connotation and practical effectiveness of talent attraction.

Conclusion

Based on the perspective of organizational support and organizational innovation, this paper proposes a multi-level talent attraction conceptual model of "organizational characteristics-employee attitude-talent attraction". The model reveals the following internal mechanism: the innovative atmosphere and sense of support of an organization positively affect internal and external talent attraction by shaping employees' job satisfaction and organizational identity. Perceived organizational justice plays a contextual role in the relationship between organizational characteristics and employee attitudes. At the same time, talent attraction performance feeds back to organizational innovation climate and sense of support through changes in talent capital, highlighting the dynamic nature of organizational talent system.

It should be noted that there are still some limitations in this study, which provide room for further research. Future research can use empirical data to validate the model in multiple contexts, incorporate more moderating variables to enrich the analysis of boundary conditions, use tracking data to portray the dynamic evolution of talent attraction, and combine with case studies to deepen the logical implications of talent practice. This is not only a deepening of the theory of this study, but also a useful attempt of practical transformation.

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The Moderating Effects of Organizational Culture on The Relationship between Employee Satisfaction and Employee Performance in Jordanian Banks

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Abstract

This study aimed to analyse the effect of employee satisfaction on employee performance, and the moderating role of organizational culture in Jordanian banks. This study was conducted using a self-administered questionnaire distributed among employees from four different Islamic banks in Jordan. A total of 290 responses were collected and analysed using SPSS and partial least square. A significant relationship was found between employee satisfaction and employee performance. There was also a significant effect of the moderating role of organizational culture on the relationship between employee satisfaction and employee performance. One potential reason to support this relationship is that individuals who are satisfied with their performance tend to be happier and need a commitment from the organization to improve their work performance. The finding from correlation analysis shows that implementing the idea of organizational culture illustrates the role that it plays in achieving employee satisfaction while doing their desired work. On the other hand, this suggests that increased organizational commitment in Jordanian Islamic banks increases employee performance significantly, which can enable each bank's management to achieve its targets, missions, and visions. The study is useful for the banking sector, financial institutions and other organizations in any country that seek improvements in employee performance.

Introduction

Sustainability is a new concept that attracts the interest of businesses since it covers vital outputs related to companies' growth and development (Ananzeh et al., 2022c; Forcadell, 2020). Increased interest in employee empowerment in banks in recent years as a result of the great developments that reflected positively on the performance of employees, especially in the work environment. These rapid changes have clearly affected the work environment, which prompted banks to adopt modern management concepts to achieve competitive advantages in order to enhance levels and rates of satisfaction among employees (AbuHazeem & Albloush, 2024). Job satisfaction is an important component of job-related achievements and increases employee efficiency in an organization (Badawy, Srivastava & Magdy, 2018).

The banking sectors especially in Jordan, have witnessed significant changes over the past few years. These changes are supposed to affect their profitability greatly. In addition, banks have become increasingly concerned about controlling and analysing their costs and revenues, as well as measuring the risks taken to produce acceptable returns. In order to do that highly satisfied work force is an absolutely necessity for achieving a high level of performance advancement. Satisfied worker leads to extend more effort to job performance, then works harder and better. Thus every bank tries to create a satisfied work force to operate the well-

being of the bank (Al-Ajlouni, J. A, 2015). However, the total performance depends on efficient and effective performance of individual employees. Therefore, every bank places a considerable reliance on their individual employee performance to gain high productivity. Employee effort is an important factor that determines an individual performance will be. When an employee feels a satisfaction about the job, he/she is motivated to do greater effort to the employee performance. Then it tends to increase the overall performance of the bank. In other words, a satisfied individual employee and his effort and commitment are crucial for the successfulness of the bank.

Many companies realized that employees are organizations best assets that they can compete with internal and external organizations in their sectors (Bailey & Al-Meshal, 2016). In any bank institutions, employees can be considered as inner consumers and must be fulfilled if outside consumers are to be kept up and fulfilled. At the end of the day, fruitful banking institutions can just keep up their preferred position by worker satisfaction and afterward inspiring them (Bhardwaj & Jain, 2021). The employee's performance is considered one of the factors that have an impact and role on the organization's performance, as it directly contributes to the success of the organization through the behaviour of the individual despite the presence of other factors that help in its success (Saleh et al., 2020). Performance assessment is considered the most important human resource activity that is used to assist and develop the current performance of the staff by supervisors (Jabeen, 2011). Armstrong (2006) assessed the role of performance appraisal as a tool to meet new challenges in the organization. Daoanis (2012) discussed the importance of performance evaluation's role in the organization in ensuring that employees perform their assigned work according to the required standards. Employee compensation and incentives are also tied to performance evaluation. Evaluating and assessing employee and staff performance is one of the most common practices in most organizations. (Karimi, Malik and Hussain, 2011).

On the other hand, organizational culture has been a field of interest for many years and this culture represents an influential factor in the KM (Jans and Prasamphanich, 2003) to find out how the employees' attitudes, values, and ways of behaviour influenced the work performance and company success. Numerous definitions have been suggested for the organizational culture and most of them agreed that it is the behaviour related to people that combines internal and external factors together and can be transferred to another generation. Based on Cameron and Quinn (2006), there are four culture types which depend on the relations among employees and how they relate to the effective organization: the hierarchical culture which is controlled by formal rules and policies; the market culture that aims to be highly competitive and which holds the employees and the organization together; the clan culture which refers to friendly working environment and collaboration, since employees are characterized by job and organization commitment and develop friendly relations; and the adhocracy culture, which focuses on innovation and risk taking, assured by highly creative and dynamic working environment (Belias et al., 2015; Chidambaranathan and BS, 2015). Therefore, the type of culture existing in an organization is very significant, because it has a powerful effect on success requirements, including quality, effectiveness, efficiency, product reliability, customer service, and innovation. Hence, it is very important to understand how organizational culture facilitates knowledge processes, as it is the foundation for successful KM (Egbu, 2006).

Job satisfaction is significant because an employee's attitude and beliefs may affect his/her behaviour and his/her dealings with the organization. Job satisfaction can also be seen within the broader context of the range of issues that affect an employee's work experience, or quality of working life (Byremo, 2015). HRMP affects employees' behaviour supported by social exchange theory and signal theory. Social exchange theory states employees are in an exchange

relationship with the organization and payback in kind what they receive from an organization. Maximum organizational support through HRMP will make the employees satisfied with their concerned organization. Job satisfaction is a very important factor among the employees of Public Universities. Job satisfaction is considered an internal principle created by various elements found within a work environment. Due to the influence of various items on job satisfaction, educational organizations should be conscious of implementing the right leadership styles. However, the lack of attention given to this organizational behaviour has led to the rise of abnormal reactions among employees(Khaireddin,2015).

Early research on the relation between organizational culture and job satisfaction suggested that a productive working environment promotes the construction of a specific organizational culture and the experience of employees' job satisfaction (Hellreigel & Slocum, 1974; Schneider & Synder, 1975). Furthermore, they implied that job satisfaction increases as employees progress to higher job levels (Corbin, 1977). Schneider and Reicher's (1983) found a correlation between organizational climate and job satisfaction for employees in certain job positions, as well as a relation between satisfaction and turnover. As they explain, organizational culture is a combination of value system and assumptions which lead an organization to run its business. McCormick and Gilgen (1987) suggested that the measurement of individual dimensions of job satisfaction enables researchers to identify the environmental factors (climate variables) related to certain dimensions of job satisfaction. Robbins (1993) and Hutcheson (1996) suggested that, since the dimensions of job satisfaction are components of an organization, job satisfaction is an evaluation of organizational culture. The latter described job satisfaction as the difference between the outcomes that an employee expects to receive and those that they actually receive. Hence, job satisfaction is related to job characteristics and evaluated according to what employees perceive as being important and meaningful to them. Therefore, it could be said that the evaluation of the different aspects of the job by employees is subjective, and people will reflect different levels of satisfaction around the same factors.

Problem Statement

High Public Debt and Fiscal Deficits: Jordan's high public debt and fiscal deficit put pressure on the financial sector, as it limits the government's ability to stimulate economic growth or provide liquidity support to banks during times of crisis (Makhamreh & Alsaed, 2021). **Regulatory Compliance and Reporting Requirements:** Jordanian banks must comply with a complex and evolving regulatory environment. The Central Bank of Jordan (CBJ) has introduced stringent regulations, including those related to capital adequacy, anti-money laundering (AML), and combating the financing of terrorism (CFT). While these regulations are necessary for stability, they often impose compliance costs and operational challenges on banks (Ismail, 2017).

In the current dynamic global business environment, competition is growing and every organization is exposed to it (Cavusoglu & Knight, 2015). Today, almost all organizations in the world, particularly banks, operate in a risky and uncertain competitive environment. To survive in a competitive environment, an organization's employees are the most important and leading factor for its success (Ali & Ibrahim, 2019). Currently, the banking sector is confronting unstable financial times, related to liquidity, inflation, exchange rate, credit, cash flow, etc. (Al-Ettayem & Zu'bi, 2015). Thus, banks need to build procedures and tools to face these difficulties by enhancing their employee performance (EP) to survive economic hardships (Al-Ettayem & Zu'bi, 2015). The banking sector in Jordan is one of the most important financial sectors that continuously seeks to create a suitable working environment for employees, in light of the intense competition between banks for their distinctive human capabilities and competencies toward the expansion of local banks (Almajali, Al-majali & Bashabsheh, 2016). However, employees in Jordanian banks are deficient in the performance of services rendered

to customers due to lack of experience and inability to meet customer demands efficiently; in addition, the bank management does not have the ability to deal with the problems faced by its employees (Shammout & Haddad, 2014). t, for a bank or any organization to achieve success, employees are the root. Human resources management is one of the most important activities related to the management of an organization and is considered a cornerstone of most organizations (Jiang, Hu, Liu, & Lepak, 2017). It aims to strengthen organizational capabilities by enabling organizations to attract as well as to qualify the skills necessary to keep up with current and future challenges and success (Jiang et al., 2017). Besides, if an organization can manage its employees, their commitment can bring about beneficial results, such as increases in productivity, performance, and effectiveness and decreases in absenteeism and turnover, at both organizational and individual levels (Inanc & Ozdilek, 2015). Proper employee management leads to increased Employee Performance (EP), as it is still a problem that is always faced by the management (Mosisa, 2017). As stated by Armstrong (2009), employees' outstanding performance is achieved when they perform their job-related activities or organizational objectives effectively and efficiently. Most organizations that are aware of this fact have focused on enhancing EP by satisfying their employees (Dinc, 2017). Several previous studies have proved that there was a strong relationship between EP and employee satisfaction (ES) (Huang, Rundle-Thiele, & Chen, 2019; Triwahyuni & Ekowati, 2017; Hira & Waqas, 2012). On the other hand, ES and organizational culture (OC) are also studied together frequently, as some researchers stated that ES influences OC significantly (Aftab, 2012; Abdirahman, 2018; Huang, You, & Tsai, 2012; Fu & Deshpande, 2014), while others studied the relationship between EP and OC (Abdirahman, 2018; Setyaningrum, Setiawan, & Surachman, 2017; Memari, Mahdieh, & Marnani, 2013). However, no previous study has tested OC as a moderator among ES and EP. Thus, this study aimed to analyse the effect of ES on EP and to examine the effect of OC as a moderator in their relationship in Jordanian banks.

Research Questions

On the basis of the above problem statement discussion, this study attempts to answer the following research questions:

- (1) Does job satisfaction has a significant relationship with employee performance in Jordanian banks?
- (2) Does organizational culture has e a significant relationship with employee performance in Jordanian banks?
- (3) Does organizational culture mediate the relationship between job satisfaction and employee performance in Jordanian banks?

Research Objectives

The study's primary objectives are stated as follows;

- (1) To examine the relationship of job satisfaction with employee performance in Jordanian banks.
- (2) To examine the relationship of organizational culture with employee performance in Jordanian banks.
- (3) To examine the mediating effect of organizational culture on the relationship of job satisfaction and employee performance in Jordanian commercial banks .

Significant of Study

As mentioned earlier in the present study, the objective of the study was to explore the influence of job satisfaction on employee performance in Jordanian banks. The findings of the study will contribute to both theoretical and managerial.

In addition, the high competitive advantage is a serious issue, so highlighting issue of low GDP per capita and disposable income, inflation, fierce competition, slowing economic

growth, regulatory changes, liquidity, credit and risk management issues, limited credit information as well as other issues. The solutions will help to overcome this issue not only in Arab context but will also serve as a guideline for other countries as well. The approach and analysis of the study will help to understand the broader picture of the issue within the context of Jordan. The study will serve as a guide for the development of a banking system of Jordan by overcoming the existing issue of fierce competition across banks. It will help policymakers, banking managers, and leaders to reform policies to enhance skills of professional banking staff to improve banking system in Jordan.

Literature Review

Employee Performance

EP is essential as it reveals employees' capacity and capability in completing the tasks allocated to them. So, an organization needs to set clear and measurable criteria as a reference to measure EP (Triwahyuni & Ekowati, 2017). According to Kawiana, Dewi, Martini and Suardana (2018) EP may be defined as "the work quality and quantity achieved by an employee in performing their duties in accordance with the responsibilities given to them". Nassazi (2013) expressed that EP is generally a result of the capacity of employees in finishing their tasks to fulfil organizations targets. Kirimi and Maende (2019) stated in a research paper on EP and advancement that employees are the key component in an organization and its failure or success depends essentially on EP.

Job Satisfaction (JS)

On the other hand, JS is crucial to the development of any organization (Sarker & Ashrafi, 2018). According to Ali (2016), a standout among the most frequently considered concepts in organizational sciences is JS. In addition, JS defined as an effective reaction to a job that results from the comparison of perceived outcomes with those that are desired (Sarker & Ashrafi, 2018). As per Ahamed (2014), JS was otherwise called an employee's feeling of success and achievement that is connected directly to productivity and personal prosperity. Besides, JS explains the way in which an employee's job is satisfactory (Abdirahman, 2018). It is assumed that an employee will feel fulfilled with their work if they are satisfied and enjoy doing their job (Noah & Steve, 2012). Where JS look after there are many material advantages which are reflected on an employee from the work, even the work environment is essential to gain these vital advantages; if the work environment is not effective or satisfactory, it might reduce the spirit of the employee (Adigun, Rotimi, & Hamzat, 2017).

Organizational Culture (OC)

In this study, OC refers to a sense of belonging of the employees toward the company, thus affecting their ability to perform beyond expectations in achieving the company's goals (Ibama, 2016). OC is an important factor to gain more attention from the bank management because the OC has a significant impact on increasing EP and ES. Accordingly, the banks should consider the importance of ES to obtain EP. Bank executives can instil OC toward the employees, by motivating and rewarding those who perform well and have high loyalty to the bank, to reach the desired corporate goals, and create values and culture. Omar (2016) shows in his study that OC could be defined as "an attitude in the form of an attachment that exists between the individual and the organization, and is reflected in the relative strength of an employee's psychological identification and involvement with the organization". As shown in the studies by Abdirahman (2018), Susanty et al. (2013), and Huang et al., (2012), OC has a strong influence on ES as well as On EP.

Hypotheses Development

Relationship between job Satisfaction and Employee Performance

The relationship between JS and EP has drawn the attention of many researchers (Huang et al., 2019; Triwahyuni & Ekowati, 2017; Adigun et al., 2017). JS improves EP and is affected by different factors inside and outside the workplace (Bello, Ogundipe, & Eze, 2017). For example, Huang et al. (2019) concluded that EP is fundamental to ES, which, thus, increases customer satisfaction and loyalty. Also, JS is a significant determinant of JP and may influence organization performance (Chen, Wu, Chang, & Lin, 2015). It is imperative to quantify JS as low levels of JS can expand employees' intent to leave their current employment when opportunities are presented to them (Yao, Qiu, & Wei, 2019). Judge made a study in 2001 has found a moderate positive correlation between job satisfaction and employee performance. It emphasized that while job satisfaction is an important predictor of performance, the strength of this relationship can vary depending on individual characteristics (e.g., core self-evaluations such as self-esteem and emotional stability). The study concluded that employees who are satisfied with their jobs tend to show better performance, especially in roles that require high autonomy and decision-making (Judge, T. A., & Bono, J. E, 2001). However, this study expands on the totalled previously mentioned outcomes to assume the following:

H1: There is a positive relationship between employee satisfaction and employee performance in Jordanian banks.

Organizational Culture, Employee Satisfaction, and Employee Performance

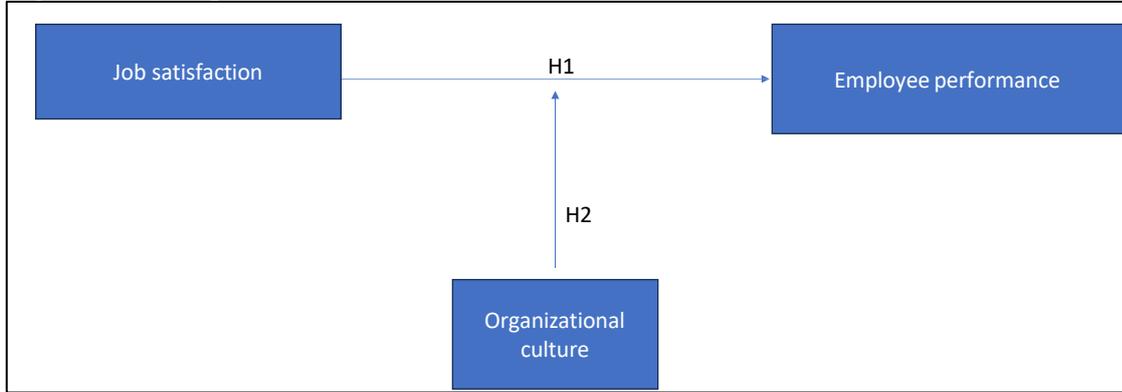
This study aims to examine the effects of JS and EP through OC as a moderator. OC is created by the formal and casual interactions and cooperation among individuals and organizations. In administrative organizations that provide services, contact among employees and the association is occurs mainly through interactive procedures at work (Yao et al., 2019). Abou Hashish (2017) describes OC as the general relative strength of identifying and involving individuals in a specific organization by three factors: first, a strong belief in the goals and values of an organization; second, a desire to exert a determined effort for the organization's benefit; and third, a strong willingness to be one of the members of the organization. Many studies conducted to illustrate the relationships between ES, EP, and OC (Kawiana, 2018; Shibeika, 2016; Triwahyuni & Ekowati, 2017; Dinc, 2017) concluded that JS and EP have a positive and significant influence on OC. For more than three decades, OC and ES have generated a lot of interest among researchers (Ali & Ibrahim, 2019). Besides, if OC is managed properly, employee commitment can promote beneficial results, for example, increased performance and productivity, at both the organizational and individual levels (Inanc & Ozdilek, 2015). Various studies have demonstrated that work-related factors are major determinants of ES and OC among employees. Also, there is a direct relationship between these factors and EP (Ali & Ibrahim, 2019). However, the correlation between all three concepts has been studied rarely; also, no previous studies have examined OC as a moderator among the variables of JS and EP. Unlike previous literature, this paper not only examines the impact of JS on EP and interdependency between them but, also illustrates and tests the effect of OC as a moderator of the relationship between JS and EP as shown in Fig. 1. Hence, this study developed on the totally previously mentioned outcomes to assume the following:

H2: The positive relationship between employee satisfaction and employee performance will be stronger for higher organizational culture in Jordanian banks .

Conceptual Framework

On the basis of the enumerated problem statement, objectives and questions of the research, the study develops a conceptual framework within which three components are contained namely, job satisfaction independent variables, organizational culture (mediating variable), and employee performance (dependent variable).

Figure 1. Conceptual Framework



Methods

Sample and Data Collection

This study was conducted using a quantitative research design method with a probability sampling design by using simple random sampling to select the sample size. The target population of this paper was composed of 3841 employees of Jordanian banks in the Hashemite Kingdom of Jordan which are bank of Jordan , Cairo Arab Bank, ARAB Bank, and Al-Rajhi Bank , capital bank of Jordan , Jordan Ahli bank , housing bank for trade and finance . Besides, according to Sekaran (2003), the sample size was 351 respondents from the target population, selected from all bank employee rank, from the frontline to the managerial level. Therefore, after we distributed questionnaires for this research, we utilized the self-administered process to collect the questionnaire responses from the respondents. For the purposes of scientific research and analysis, 340 questionnaires were distributed to the respondents. Several steps were taken by the researchers to improve the response rate for the current research; first, questionnaires with a cover letter that introduces the purpose of this study were personally delivered; second, respondents were informed that all the information they provided in the questionnaires would be highly confidential. In addition, the researchers relied on a few employees in each bank who were an internal point of contact. These employees took care of gathering the questionnaires from different employees and encouraged them to take an interest in the questionnaires. A total of 290 questionnaires were finally collected and usable for analysis, which represented a valid response rate of 75.7%. Babbie (1992, p. 267) mentions that this is a very good rate; “60% response is good and 70% is very good.” Thus, the data tested the reliability and validity of the instruments by using SPSS software version 25, to conduct a descriptive analysis of the demographic profile of the respondents; the data were also screened and cleaned to remove outliers. The measurement and structural model of the research framework was analysed by using Smart PLS 3.2.9.

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The Relationship between Workforce Ability and Organizational Productivity: Human Capital Theory Perspective

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Abstract

This study explores the intricate relationship between workforce capability and organizational productivity in the manufacturing sector, focusing on the impact of investing in human capital development. While Human Capital Theory emphasizes the importance of improving workers' skills and knowledge as a primary driver of productivity growth, it has faced criticism for neglecting the broader social and organizational factors that also play a critical role. By analyzing existing literature and relevant case studies, this research seeks to provide a nuanced understanding of human capital's role in enhancing productivity. It challenges the traditional perspective of Human Capital Theory by advocating for a more holistic approach that integrates not only skill enhancement but also factors such as workplace culture, team dynamics, and organizational structure. The findings aim to offer valuable insights for industry leaders, policymakers, and scholars, emphasizing the need for comprehensive strategies that align workforce development with broader organizational objectives to achieve sustainable productivity growth.

Keywords: human capital theory, human resource management, organizational productivity, skills, workforce capability.

Introduction

The manufacturing sector, a cornerstone of the global economy, is instrumental in job creation, technological innovation, and economic growth (Rathi et al., 2022). However, it is also under constant pressure to innovate and enhance efficiency in response to evolving market demands, technological disruption, and labour shortages. One of the most effective yet underutilised strategies for tackling these challenges is upskilling, which involves enhancing the workforce's capabilities through training and development programs (Pika & Wynn, 2020). Organisations can significantly increase production productivity by aligning workforce efficiency with industry standards and technological advances.

According to Ajayi and Udeh (2024), skill improvement or upskilling refers to improving employees' knowledge and skills to better adapt to the latest technology and work methods. This means that enhancing skills helps employees perform their tasks more efficiently and affects the products' quality and the more optimal use of resources.

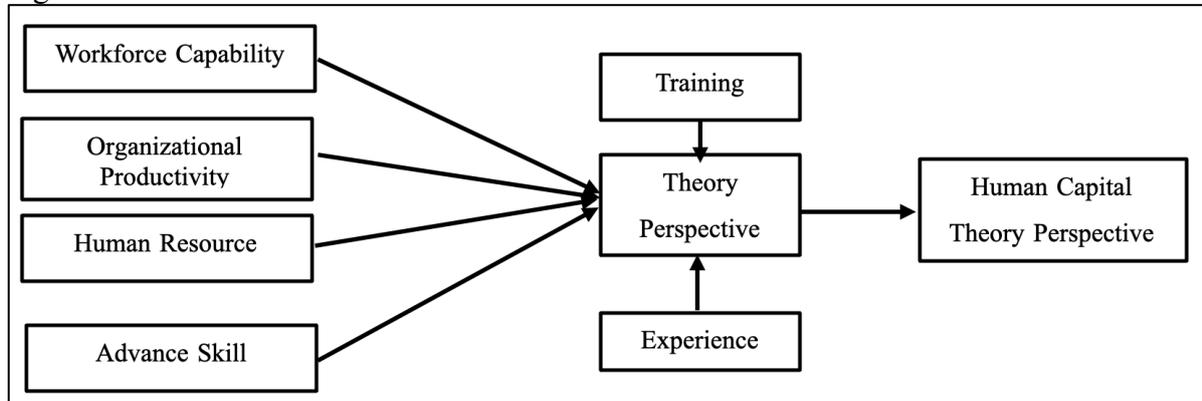
The concept of skill improvement refers to teaching employees new skills or improving existing skills to suit current demands in the workplace (Nair, Kaushik, & Dhoot, 2023). In manufacturing, upskilling can involve training in advanced machinery operation, automation software usage, data analysis interpretation, and course production techniques. Companies can

improve operational efficiency through upskilling and foster a culture of continuous improvement, adaptability and innovation (Li, 2022).

Today, upskilling among workers is increasingly prioritised by many industries, especially in the manufacturing sector. A dynamic work environment, characterised by rapid technological advancements, changing market demands, and increasingly intense competition from domestic and international players, requires workers to adapt to new skills that can support the production process. Reliance on highly skilled labour can increase organisational productivity (Almeida & Cho, 2012). However, many factors influence the actual impact of upskilling on productivity, including the appropriateness of the skills taught to the tasks performed, employee commitment, and organisational support.

This paper explores the effect of skill enhancement on productivity in the manufacturing sector by using the human capital theory approach to understand how workforce skill enhancement impacts effectiveness and efficiency in the work environment. This paper also looks at the criticism of the human capital theory on employee upskilling.

Figure 1. Research Framework



Human Capital Theory in Skill and Productivity Improvement

The relationship between workforce capability and organisational productivity has been widely studied in human resource management and operations management. According to the theory of human capital introduced by Theodore Schultz, investment in education and training increases the productive capacity of workers, resulting in better performance results. Workforce capability refers to the ability of individuals in an organisation to perform their duties effectively and efficiently. This ability is not only limited to technical skills but also includes soft skills such as communication, leadership, and adaptability (Uhrin, Bruque-Cámara, & Moyano-Fuentes, 2017).

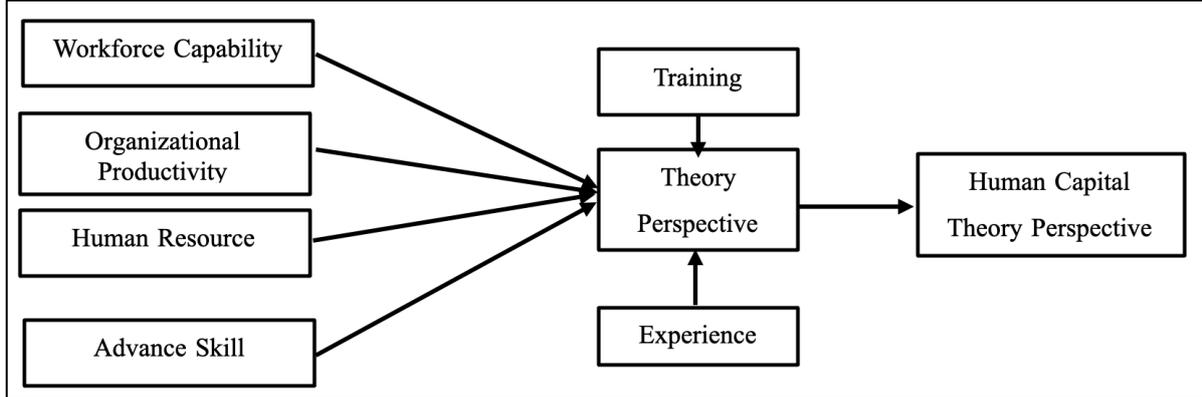
Okoye and Ezejiofor (2013) argue that organisational productivity refers to efficiency in using resources to produce more quality output. In manufacturing, increased skills provide workers with the knowledge and competence needed to optimise the production process, reduce waste and increase output (Anosa, 2021).

This shows that the relationship between workforce capability and organisational productivity is meaningful because a more capable workforce can produce more output using fewer resources or improve the quality and innovation of products and services.

Additionally, increased skills foster newer technologies and methodologies that streamline production workflows. With the rise of Industry 4.0, which emphasises automation, artificial intelligence (AI), the Internet of Things (IoT), and data analytics, skilled workers are better equipped to operate, maintain, and improve the use of advanced technologies. This increase in technical efficiency and reduces the risks associated with using this technology, such as machine downtime, quality defects and inefficiency. (Gofman & Jin, 2019).

Human Capital Theory, introduced by Theodore Schultz and developed by economist Gary Becker, sees the skills and knowledge of employees as an investment that can give returns to the organisation in the form of higher productivity. This theory assumes that employees with a higher level of skills and knowledge can improve product quality, efficiency in the work process, and innovation in the organisation. The diagram below shows the relationship between productivity and workforce ability.

Figure 2. Relationship Between Investment in Human Capital and Improved Productivity

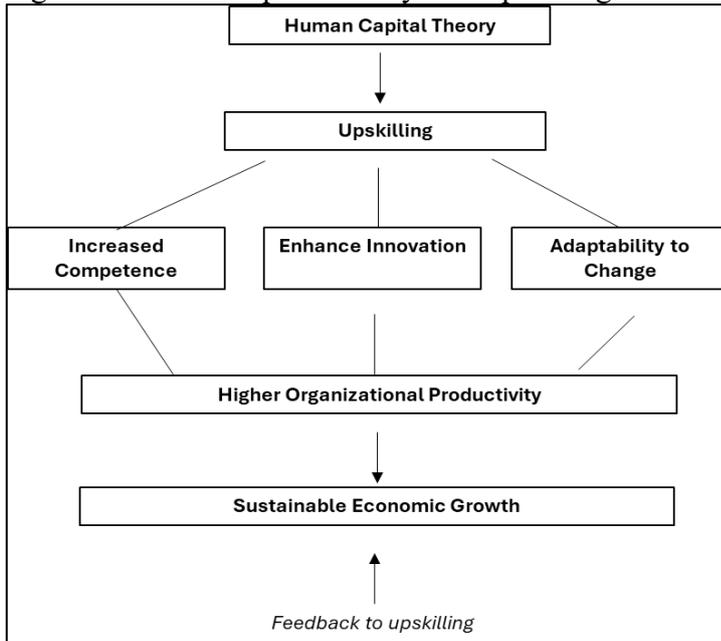


Source: Becker, 1975

Figure 2 explained investing in human capital through education, training, and wellness programs enhances employee skills, health, and motivation, leading to improved efficiency, innovation, and overall productivity.

In the context of upskilling, this theory suggests that when organisations invest in improving employee skills, it improves individual performance and strengthens the organisation as a whole. Through upskilling, employees gain new or deeper skills in certain areas, which enable them to perform tasks better and adapt to the latest technological developments

Figure 2. Human Capital Theory and Upskilling



Source: Becker, 1964

Human Capital Theory diagram above highlights how investing in upskilling, such as education and training, increases employee capabilities, leading to greater productivity and organisational growth.

Mechanism Through Skill Improvement to Increase Productivity According to Human Capital Theory

Human Capital Theory argues that investment in education, training, and improving employee skills is one of the main factors that can increase productivity and organisational performance (Pika & Wynn, 2020). In this context, enhancing employee skills is considered a form of human capital investment that brings positive returns through increased efficiency, innovation, and the ability to face change. Therefore, the mechanism that explains how skill improvement can improve organisational productivity must be analysed in several interrelated dimensions. Skill improvement, directly and indirectly, impacts production productivity, as shown through several critical mechanisms in the Table 1, below.

Table 1. Mechanisms Through Improving Skills to Increase Productivity According to Human Capital Theory

Mechanism	Explanation	Example/Impact
Improvement of Work Efficiency	Workers with higher skills can perform tasks more quickly and accurately, reducing errors and improving output quality.	Training in automation software reduces work time and improves work quality.
Increased Innovation and Creativity	Trained employees can produce new ideas and solve problems more creatively, increasing the organisation's competitiveness.	Employees in R&D produce new, more innovative products after receiving specialised technology training.
Adaptation To Change	Training helps employees adapt to technological or market changes, increasing flexibility in facing new challenges.	Workers trained in artificial intelligence (AI) can adapt to technological changes and improve efficiency.
Increased Motivation and Engagement	Employees who are allowed to improve their skills feel valued and increase their enthusiasm and commitment to the organisation.	Employees who undergo leadership training are more committed and show improvement in team performance.
Knowledge Transfer and Organizational Learning	Skills learned by employees can be shared with colleagues, creating a learning culture and improving overall organisational efficiency.	Employees trained in project management share knowledge with the team, improving overall performance.
Higher Productivity Returns	Investments in upskilling lead to cost reductions and increased employee output, providing higher returns to the organisation.	Training in Lean Management reduces waste and increases efficiency, increasing productivity.

Sources: Becker, 1975; Schultz, 1961; Psacharopoulos & Patrinos, 2004

Criticism of Human Capital Theory in Skill Improvement that Increases Productivity

Although Human Capital Theory provides a robust framework for the relationship between investment in education and training and increased productivity, some criticisms need to be considered in the context of growing skills as a driver of productivity. One of the main criticisms of this theory is the need for more emphasis on formal education and technical training. This theory often assumes that increasing skills through formal training or academic education will result in significant productivity gains (Livingstone, 2012).

However, studies conducted by researchers including Livingstone (2012), Gasteiger, Norina, et al. (2021), and Rafner et al. (2022) show that social, communication, and leadership skills that are not always taught in formal training programs also play an essential role in increasing employee productivity. Therefore, this theory may not emphasise the importance

of "soft skills", which also affect work performance. The following Table 2, contains studies that criticise Human Capital Theory and their explanations and criticisms of the theory.

Table 2. Criticism of Human Capital Theory

Study	Criticism	Explanation/Comment
Mercer, Barker, & Bird (2010)	Too much focus on formal education	They criticise that Human Capital Theory emphasises formal education and technical training as the only way to improve workers' skills. Employees also need social and interpersonal skills, which should be given more attention in this theory.
Akerlof & Kranton (2010)	Lack of Consideration of Social Identity	Akerlof & Kranton (2010) argue that Human Capital Theory focuses too much on economic aspects in measuring the value of human capital without considering the social identity and social role played by employees in the organisation. They suggest a more holistic approach to understanding human capital.
Jiang, Lepak, Hu, & Baer, (2012)	Neglect of Employee Welfare	Jiang et al. (2012) criticised this theory because it does not consider factors of employee well-being, such as mental and physical health, which also affect productivity. Although employees may be well trained, poor well-being factors can affect their productivity.
Liu, Gong, Zhou, & Huang (2017)	Lack of Focus on the Influence of Technology and Globalization	Liu et al. (2017) criticise that this theory needs to be revised to address the rapid influence of technological change and globalisation on workers. Workers trained in skills that may be outdated or irrelevant will only be able to increase productivity if they can adapt to global change.
McGoldrick, Stewart, & Watson (2002)	The Influence of the Organizational Environment Is Not Emphasized	McGoldrick, Stewart, & Watson (2002) criticised this theory for not paying enough attention to the organisational environment that supports the implementation of new skills. They insist that more than improving abilities is needed, with an organisational structure supporting applying those skills.
McAfee & Brynjolfsson (2017)	Misuse of Upskilling in the Automation Era	McAfee & Brynjolfsson (2017) criticise Human Capital Theory because it needs to consider the potential of automation and artificial intelligence replacing human jobs. In the era of Industrial Revolution 4.0, skill improvement in some sectors may no longer be relevant as those jobs can be replaced by technology.

Sources: Bowles & Gintis, 1975; Mercer, Barker, & Bird, 2010; Akerlof & Kranton, 2010; Jiang, Lepak, Hu, & Baer, 2012; Liu, Gong, Zhou, & Huang, 2017; McGoldrick, Stewart, & Watson, 2002; McAfee & Brynjolfsson, 2017

Criticism of Human Capital Theory highlights some significant weaknesses in this theory that need attention. First, this theory is often criticised for emphasising formal education and technical training without considering the importance of social and interpersonal skills, which also affect worker productivity. Second, Human Capital Theory is considered too focused on economic aspects, assuming that increased skills will automatically improve productivity. Still, it ignores crucial employee well-being factors, such as mental health and work-life balance, which also affect long-term work performance.

In addition, human capital theory needs to be revised to deal with the influence of globalisation and rapid technological change, which causes the skills learned by workers to become irrelevant or outdated in some industrial sectors.

Finally, this theory needs to pay more attention to the organisational environment that supports the implementation of new skills. With appropriate structure and support, skill enhancement will have the expected impact on productivity. Therefore, although Human Capital Theory provides an essential perspective on investment in training and education, it needs to be improved by considering more holistic and dynamic factors in the modern work environment.

Conclusion

In an increasingly competitive and technologically advanced manufacturing environment, upskilling is a critical driver of increased productivity. Organisations can improve operational efficiency and product quality by equipping workers with the skills to operate sophisticated machines, adopt new technologies, and improve production processes. Upskilling fosters a culture of continuous improvement, innovation and employee engagement, all critical to long-term productivity gains. As manufacturers face complex challenges, strategic investment in workforce development will be essential to maintaining competitiveness and driving sustainable growth.

Although Human Capital Theory provides an essential perspective on the relationship between investment in human capital and productivity, several criticisms need to be considered. This theory is only partially comprehensive because it ignores factors such as employee well-being, imbalances in the distribution of training benefits, and the broader organisational context. Therefore, in its application, it is necessary to consider additional elements that involve a balance between improving skills and humanitarian aspects and the industry's ever-changing needs.

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Improving Employee Skills in Amanah Ikhtiar Malaysia: Strategies for Organisational Growth and Development

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Abstract

Skills development is crucial for organizations like AIM Kedah, particularly in the fast-evolving microfinance sector. This study highlights significant gaps in digital literacy, leadership, and project management skills—competencies vital for operational success and long-term adaptability. To address these challenges, a structured skills assessment program is recommended to identify specific training needs across the workforce. Building a culture of continuous learning is equally important, encouraging employees to upskill regularly while recognizing their efforts. A blended learning approach, combining traditional methods with digital tools such as e-learning platforms and interactive simulations, can enhance training effectiveness. Leadership development should also be prioritized through tailored programs that focus on strategic thinking, decision-making, and team management, supplemented by mentoring initiatives. Furthermore, fostering inter-departmental collaboration through cross-functional projects and regular dialogue will promote knowledge-sharing and team resilience. Implementing these measures through a phased approach—beginning with needs analysis, followed by training design and rollout, and concluding with robust monitoring and evaluation—will enable AIM Kedah to measure progress and refine strategies as needed. By adopting this plan, AIM Kedah can strengthen its workforce, improve operational efficiency, and build a resilient organizational culture ready to tackle industry challenges. This, in turn, will significantly boost the organization's impact on the local community's economic growth, reinforcing its role as a leader in the microfinance sector.

Keywords: amanah ikhtiar Malaysia, human resource management, skill development, upskilling.

Introduction

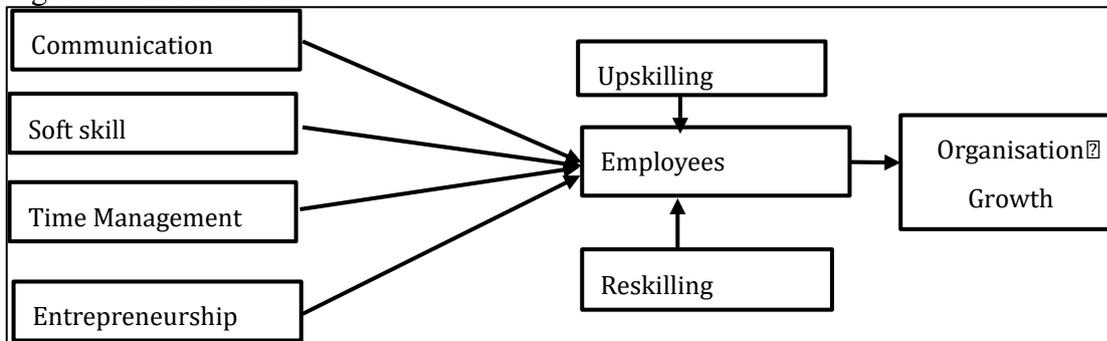
In today's fast-paced environment, organisations are increasingly focused on enhancing the skills and competencies of their workforce. As highlighted by Noe et al. (2017), the growth of employees is crucial for driving effectiveness within organisations, boosting productivity, fostering innovation, and ensuring long-term sustainability. With the rapid pace of technological change, evolving market demands, and shifting industry standards, cultivating a skilled and adaptable workforce is more critical than ever. Continuous improvement in employee skill sets is essential to maintaining organisational flexibility and resilience (Sung & Choi, 2014). Amanah Ikhtiar Malaysia (AIM) is pivotal in Malaysia's economic growth, mainly by supporting rural communities.

In a dynamic landscape, AIM must consistently provide high-quality services while responding to increasing demands. As a key player in local economic development, AIM is dedicated to enhancing rural economies and improving livelihoods. AIM depends significantly on its employees' capacity to uphold operational standards and effectively engage with diverse customer groups to achieve these aims. Therefore, building a skilled and responsive workforce is vital for AIM to realise its mission and make a meaningful contribution to national progress.

This paper centres on AIM, where skills development programmes may not entirely correspond with its employees and the organisation's evolving needs. Identifying these gaps is crucial, as any shortcomings can restrict employees' ability to serve customers effectively, respond to emerging challenges, and enhance overall organisational performance. Garavan et al. (2021) emphasise that understanding skills lacking and identifying areas needing improvement are the first steps towards cultivating a more capable and high-performing workforce. Moreover, Majchrzak, Malhotra, and Zaggl (2021) underscore the significance of targeted skill development initiatives, which can notably enhance employee performance by addressing specific operational and strategic needs.

Thus, a thorough evaluation of AIM's current practices will provide valuable insights into the strengths and weaknesses of its skills development approach. This article examines AIM's current skills development activities at the Kedah Branch, identifies potential gaps, and recommends evidence-based strategies for enhancement. It stresses the importance of creating a culture of continuous learning, where employees are offered tailored training programmes and supported through strategic skill-building efforts. Such an approach is anticipated to boost the adaptability and efficiency of Kedah AIM, aligning it more closely with its long-term objectives, ultimately enhancing organisational performance and promoting sustainable regional development.

Figure 1. Research Framework



Literature Review

The foundation for developing employee skills is based on various concepts, each offering a distinct viewpoint on enhancing workforce capabilities. Human capital theory is at the heart of this, which regards employee skills as vital assets that can drive value for an organisation. Additional frameworks, like continuous improvement models and principles of organisational learning, build on this notion by emphasising the necessity for ongoing development and adaptability in the face of external challenges. This theoretical framework is relevant to AIM Kedah, a microfinance organisation operating in a fluctuating socioeconomic environment.

Human Capital Theory

Human capital theory suggests that investing in workforce skills boosts individual productivity and overall organisational efficiency (Becker, 1964). Research supports this perspective, indicating that organisations with well-trained employees are more equipped to

achieve performance goals and adjust to shifting market conditions (Crook et al., 2011; Coff & Raffiee, 2015). Consequently, skills development is viewed as a strategic investment, with substantial evidence connecting it to increased productivity, improved service quality, and enhanced organisational performance (Wright & McMahan, 2011; Brynjolfsson & McAfee, 2014).

In the case of AIM Kedah, this theory highlights the advantages of focusing on skill development for staff members who engage directly with the community. By enhancing technical and interpersonal skills, AIM Kedah can equip its employees to provide high-quality services that cater to customer needs, ultimately leading to greater operational efficiency and impact. Investing in human capital is especially crucial for development organisations, where customer interactions demand a blend of financial knowledge, cultural sensitivity, and empathy (Aguinis & Kraiger, 2009; Noe et al., 2014). For AIM Kedah, which operates under a specific social mandate, strengthening its human capital can serve as a critical pillar for advancing both organisational aims and broader social goals.

Continuous Improvement Model

Continuous improvement models, especially Total Quality Management (TQM), have long been essential in integrating skill development into strategies for enhancing quality and performance (Petersen, 1999). Initially developed to improve manufacturing standards, TQM emphasises the ongoing development of employees as a vital component in maintaining operational excellence and nurturing a culture of quality (Yusof & Aspinwall, 2000; Oschman, 2017). In service-oriented organisations like microfinance institutions, TQM principles translate into continually improving employee skills, enabling them to adapt to evolving customer expectations while upholding high service standards (Powell, 1995; Li, 2022).

Recent research indicates that organisations that implement TQM practices—such as continuous development for their employees—are more resilient to change and experience higher employee engagement and satisfaction (Wall, 2021; Abukhader & Onbaşıoğlu, 2021). For AIM Kedah, emphasising continuous improvement aligns perfectly with its mission of community empowerment, ensuring that employees remain adept at supporting clients in an ever-changing socioeconomic landscape. By applying TQM principles, AIM Kedah can establish well-structured skills development programmes, allowing them to respond to shifts in customer needs and operational requirements proactively.

Learning Organisation Theory

The concept of a learning organisation, widely known by Senge (1990), stresses the importance of cultivating a culture that prioritises continuous learning and adaptability. Within a learning organisation, employees are encouraged to acquire new skills, share knowledge, and tackle new challenges, fostering an environment ripe for innovation and resilience (Garvin et al., 2008; Marsick & Watkins, 2003). This mindset is particularly pertinent for organisations operating in complex and rapidly changing environments, such as microfinance institutions that serve diverse communities.

Research illustrates that learning organisations are more adept at navigating external changes and achieving long-term success as they weave learning into their daily operations (Ellinger et al., 2002; Ortenblad, 2004). Embracing a learning-oriented culture at AIM Kedah can effectively tackle the skills gap by positioning continuous development as a key organisational value. Given the nature of AIM Kedah's work, this approach will also facilitate the growth of context-specific skills, including cultural competence and community engagement, which are crucial for delivering effective services (Chiva et al., 2007; Goh & Lopez, 2016).

Application of Theory to AIM Kedah

The intersection of human capital theory, continuous improvement models and learning organisation principles provides a robust framework for understanding the skills development needs of AIM Kedah's workforce. For organisations with a development mission, this theory collectively suggests that skill development should be continuous and context-sensitive, aligned with the organisation's strategic goals and community needs (Billett, 2020; Cerasoli et al., 2018).

The human capital theory implies that AIM Kedah can achieve greater operational efficiency and social impact by investing in tailored training programs. Building technical skills (e.g., financial literacy, data analysis) and interpersonal skills (e.g., communication, empathy) will prepare employees to handle customer interactions and respond to socioeconomic challenges more effectively. Second, the continuous improvement model supports a structured approach to skill development that aligns with quality management principles. A regular training and performance evaluation system can help AIM Kedah maintain high service standards and adapt flexibly to customer needs. Finally, the learning organisation framework provides the basis for embedding adaptability into AIM Kedah's culture, fostering an environment where employees are motivated to learn and innovate.

The literature shows that an integrated approach to skills development, combining human capital investment, continuous improvement, and a learning-oriented culture, is essential for organisations aiming to achieve sustainable growth in complex settings. For AIM Kedah, applying this theory can improve employee skills, organisational adaptability, and customer satisfaction and align workforce capabilities with the broader mission of community empowerment.

Methodology

This study uses qualitative research methodology to explore skills development practices in AIM Kedah, focusing on understanding existing gaps and identifying strategies to improve employee performance. Qualitative methods are well suited for this type of research, as they allow in-depth exploration of organisational processes and complex factors that influence employee development (Creswell, 2013; Denzin, 2018).

By analysing secondary data from AIM Kedah's internal documents and conducting a comparative analysis with similar organisations, this methodology provides a comprehensive framework for identifying and adopting practical skills development practices for AIM Kedah.

Data Collection Method

Secondary Data Analysis: This study analyses secondary data sources, including AIM Kedah's internal reports, annual evaluations, and records related to employee development programs. This document provides insight into current training initiatives, skills gaps and organisational goals. Secondary data analysis is beneficial because it offers rich contextual insights and allows researchers to conclude without disrupting organisational routines (Johnston, 2017). Using existing organisational data also ensures that the findings reflect the real-world context of AIM Kedah, increasing the relevance of the proposed recommendations.

Comparative Analysis of Similar Organizations: Comparative analysis focused on similar organisations in the microfinance and development sectors to identify best practices that can be adapted to the Kedah AIM context. Case studies and published reports from organisations known for practical skills development programs, such as BRAC and Grameen Bank, were reviewed. Comparative analysis allows for identifying patterns and practices that have proven effective elsewhere, providing a basis for recommending a tailored approach for AIM Kedah (Bryman, 2016; Flick, 2018).

Data Analysis Techniques

Thematic Analysis: Thematic analysis was used to identify recurring themes in AIM Kedah's internal data and case studies of comparable organisations. Thematic analysis is particularly suitable for qualitative research, as it allows researchers to capture critical patterns and themes from textual data, thereby providing a deeper understanding of underlying issues and potential solutions (Braun & Clarke, 2006). Key themes explored include skills development gaps, employee needs, training effectiveness and organisational impact.

Content Analysis for Comparative Data: Content analysis was conducted on data from similar organisations, coding for critical practices in skill development that have shown positive effects on employee performance and organisational effectiveness. Content analysis helps identify and categorise practical insights that can be adapted to the Kedah AIM context, supporting the development of specific, actionable recommendations (Hsieh & Shannon, 2005; Elo & Kyngäs, 2008).

Validity and Reliability

Ensuring validity and reliability in qualitative research requires a careful approach, especially when interpreting secondary data and comparative case studies. Various data sources were triangulated to strengthen validity, including internal evaluations of AIM Kedah, external reports and case studies of similar organisations. This triangulation helps validate the findings and increase the credibility of the proposed strategy (Patton, 2015). In addition, themes and insights were iteratively reviewed to ensure consistency and to confirm that the interpretations accurately reflected the data.

Ethical Considerations

This research complies with ethical standards by ensuring that all data used is publicly accessible or authorised by AIM Kedah management. Since secondary data are mainly reports and evaluations of organisations, the risk to individuals is minimal. However, confidentiality is maintained when reporting specific internal findings to protect organisational integrity and employee privacy.

Limitations

This study's reliance on secondary data from AIM Kedah and case studies of similar organisations presents certain limitations. Although secondary data provide valuable insights, they may lack detailed information about informal or unrecorded skills development initiatives. Furthermore, the comparative analysis relies on data published from outside organisations, which may not fully capture the context-specific nuances applicable to AIM Kedah. Future research could address this limitation by including primary data from interviews or focus groups with Kedah AIM employees.

This qualitative methodology provides a robust framework to assess Kedah AIM's skills development practices and identify relevant strategies for improvement. This research aims to deliver evidence-based practical recommendations tailored to the unique organisational context of AIM Kedah through secondary data analysis and comparative case studies.

Findings and Analysis

This analysis presents critical findings about skills gaps and development practices in AIM Kedah, which were informed by organisational reports and studies of similar programs in rural microfinance in Malaysia. The vision is focused on identifying the specific skills required by AIM Kedah employees to increase their effectiveness and adapt to emerging challenges, focusing on digital literacy, leadership and soft skills, and project management.

Identifying the Skills Gap in AIM Kedah

The analysis revealed several areas where AIM Kedah staff could benefit from targeted skill development:

Digital Literacy: The report shows that AIM Kedah, like many organisations in rural microfinance, has room to strengthen its digital infrastructure and the competence of its employees in digital tools and platforms, especially as digital transformation progresses across industries (Hamdan & Kassim, 2022). Limited digital competence restricts employees' ability to access and analyse data, communicate through modern channels and manage digital transactions efficiently.

Leadership and Soft Skills: Effective communication, interpersonal skills, and adaptability are essential in a microfinance role, where building trust with clients is essential (Chan, 2013). AIM Kedah staff often engage with clients from various socio-economic backgrounds, requiring leadership and advanced communication skills. These skills will improve customer interactions and enable employees to deal with challenges more resiliently.

Project Management and Strategic Planning: Given the project-oriented work of AIM Kedah, proficiency in project management methodologies such as Agile and strategic planning skills will equip employees to handle projects more effectively. This need aligns with findings from microfinance studies highlighting how structured project management practices improve organisational performance in community-based finance programs (Baharudin et al., 2018).

Summary of Findings

The findings show that although AIM Kedah has initiated valuable training efforts, addressing specific skills gaps in digital literacy, leadership, and project management will significantly improve workforce effectiveness. By implementing customised training, fostering mentoring and peer learning, using online platforms, and encouraging cross-functional collaboration,

AIM Kedah can develop a more adaptive and skilled workforce. A structured performance evaluation and feedback mechanism will continue to support AIM Kedah in aligning training with organisational goals, ultimately enabling the organisation to face the challenges of its dynamic operating environment more effectively.

Recommendation

Best Practices in Skills Development

AIM Kedah can enhance its skills development initiatives by adopting some industry best practices observed in similar organisations:

Customized Training Program: Training tailored to specific skill gaps is essential for roles in AIM Kedah. Such programs should target digital tools training alongside workshops on effective communication and teamwork, improving role-specific skills while ensuring a foundation of basic skills across all employees.

Mentoring and Peer Learning: A mentoring program where senior staff mentor and support junior colleagues fosters valuable knowledge transfer. Peer learning can further encourage staff to collaborate, share insights, and learn from each other's experiences, which has proven beneficial in similar institutions (Mahmood et al., 2015).

Online Learning Platform: Utilizing e-learning resources like the Learning Management System (LMS) enables AIM Kedah employees to continue continuous self-learning. The LMS platform provides flexibility and enables employee progress tracking, helping managers tailor training content based on employee feedback and skill development results.

Cross-functional collaboration and Job Rotation: Allowing employees to rotate across different functions and departments can improve their understanding of the organisation and equip them with broader competencies. This approach has been successfully implemented in

similar microfinance contexts, fostering cross-functional adaptability and expertise (da Silva Cavalcante et al., 2022).

Performance Evaluation and Feedback Mechanism

Organisations should implement structured performance appraisals and feedback mechanisms to ensure adequate skills development efforts to improve AIM Kedah's workforce. The evaluation process can include:

Skill Improvement Metrics: Track the progress of technical and soft skills through periodic performance reviews, ensuring training aligns with skill development goals.

Productivity and Project Outcomes: Evaluating productivity changes and project success rates offers insight into the impact of skill development on operational effectiveness. Studies have shown that trained workers contribute significantly to project efficiency, as they are better prepared to manage the demands of microfinance activities (Tammili et al., 2018).

Employee Satisfaction and Engagement: Surveys that assess job satisfaction and engagement provide valuable feedback on the perceived impact of the training program. High satisfaction levels are often linked to skill development, as employees who feel competent and valued tend to be more engaged and productive.

Conclusion

This study has highlighted the critical need for skills development initiatives in AIM Kedah to ensure long-term organisational growth and resilience. Through a detailed analysis of existing practices and identified skill gaps, it is evident that AIM Kedah can significantly improve its workforce capabilities in areas such as digital literacy, leadership and project management. To address these challenges, this paper has proposed a structured framework for skill development that includes frequent skill assessments, continuous learning opportunities, leadership development programs, and fostering a learning culture through incentives.

The recommendations presented are designed to ensure a sustainable approach to skills development that is aligned with the workforce's needs and AIM Kedah's strategic objectives. AIM Kedah can equip its workforce with the skills to navigate the evolving microfinance landscape by investing in technology tools, encouraging interdepartmental collaboration, and implementing tailored training programs. This initiative will improve individual performance and contribute to the organisation's overall success and resilience in achieving its development goals.

Combining these strategies will enable AIM Kedah to create a skilled and adaptable workforce ready to respond effectively to the dynamic challenges of the microfinance sector, ensuring its role as a leader in community-based financial services. Focusing on continuous learning and employee development is essential to sustain AIM Kedah's impact and advance its mission to foster socio-economic growth in Malaysia's underserved communities.

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Is GenAI Going to Revolutionise The Work Practices of Chartered Accountants in Malaysia?

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Abstract

Artificial Intelligence (“AI”) have been in existence for many years, but the birth of Generative Artificial Intelligence (GenAI) is revolutionising many industries working practices, including that of accounting professionals. Malaysian Institute of Accountants (MIA) has taken a proactive approach to encourage accounting firms to embrace AI in their work practices by holding seminars and conferences. MIA advocates that accounting professionals should embrace technology and maximise the potentials of GenAI by having the right mindset, encourage peers to embrace the innovative technology culture, ensure they have right talent and skills and to explore and find the technology that best suit their organisation. This study proposes research to understand the Chartered Accountants of MIA knowledge and views on GenAI and whether they have or will start embracing AI in their work practices together factors that influenced their behaviour.

Keywords: AI, artificial intelligence, chartered accountants, GenAI, GenAI working practices, generative artificial intelligence.

Introduction

Although Artificial Intelligence (“AI”) may have been in existence for many years now, following the birth of Generative Artificial Intelligence (GenAI), AI has been the “buzz word” in recent times and has re-ignited as a hot topic of discussion for many. At the World Tour Essentials Singapore in May 2024, Laurence Liew of AI Innovation Singapore, was of the view that AI is not likely to replace employees but employees who use AI to perform their tasks are likely to replace those who do not (Siu, 2024). The Malaysian of Accountants (MIA) Sustainability, Digital Economy and Reporting Team reported that GenAI will significantly change the accounting profession landscape in Malaysia (MIA, 2024b). Therefore, many firms will have to review their work practices in light of the influence of AI to keep abreast of the competition if they are already not done so. This would in turn have a knock-on effect for the employees. It is likely that those employees who do not conform to the changes in the work practice could be replaced by those who will.

This research aims to understand the knowledge and perception of GenAI by registered chartered accountants in MIA (CAM) and understand to what extent they have or will incorporate GenAI in their work practices. Chartered accountants registered with MIA are permitted to use the “C.A.(M)” designation.

Rapidly Evolving of AI

AI is here to stay and evolving at a fast pace. Not a day goes by where AI related matters are not making the news. AI-infused innovation is significantly impacting on how we live and work (ACCA, 2024). Many countries, including Malaysia, are investing heavily in AI related innovation and technologies. Malaysia is in the top 50 countries worldwide in the Technology Sector Pillar and was ranked 23rd in the Government AI readiness Index 2023 (Oxfordinsights,

2023). The Malaysian Government's Budget 2024 included a RM20m allocation for University Technology Malaysia to establish the country's first AI faculty (Fam, 2023). In September 2024, the Selangor state government announced the establishment of an Artificial Intelligence centre to assist SMEs embrace AI technology (Priya, 2024). The Malaysian Government seems to be actively involved in promoting AI. It is focusing on both the training aspect and the assistance for business organisations.

The 2024 Work Trend Index Annual Report from Microsoft and LinkedIn indicated that 75% of global knowledge workers are using AI at work and 45% of them only started using it in the six months prior to that research. 90% of the participants had indicated that AI had reduced the time it takes to perform their task, more than 80% indicated that this resulted in them focusing on important tasks, become more creative and made the job they do more enjoyable. In addition, the survey indicated that 60% of the leaders are concerned about the lack of vision and strategy to implement AI in their organisation (Microsoft&LinkedIn, 2024). This means more employees have started embracing AI in the last six months prior to their survey but at the same time leaders may not fully understand how to incorporate AI into their working practices.

AI and GenAI Definition

Many may view Artificial Intelligence as something that machine does that humans normally do. Alan Turing, who is considered as the pioneer for AI vision, quoted "What we want is a machine that can learn from experience possibility of letting the machine alter its own instructions provides the mechanism for this" at a public lecture in 1947 (Copeland, 2024).

AI refers to the use of algorithms (computer languages) to perform cognitive tasks that would otherwise require human intelligence, such as reasoning and decision-making. It denotes a fundamental shift, from humans telling computers how to act to computers learning how to act (Franke, 2019; Scharre et al., 2018).

GenAI refers to the use of algorithms to generate content, software codes and ability to reason. These developments give models more abilities to access data, execute tasks and generate content. GenAI is constantly evolving (Jung & Desikan, 2024).

GenAI and Top Accounting Practices - An Overview

The Big 4 are, as expected, leading the accounting sector in relation to rapidly evolving technology and continued their partnerships with technology leaders. They have, as explained below, made significant investments in AI to offer bespoke platforms for both employees in-house and their clients.

Deloitte announced in December 2022 that they were investing USD1.4B to enhance its professional development experience and deliver training for future applications of technologies (Deloitte, 2022). In September 2024, Deloitte announced that in addition to their USD1B multi-year investment in GenAI globally, they were intending to invest a further USD3B over the next 6 years (Deloitte, 2024). PwC US announced in April 2023 that they were investing USD1B over three years to expand and scale their AI offerings in line with their global strategy (PwC, 2023). EY announced in September 2023 that they invested US1.4B for their new platform "EY.ai" which they believe will benefit both their employees and their clients to maximise their operations with AI (EY, 2023). Finally, KPMG announced in July 2023 that they, in partnership with Microsoft, were investing US2B in AI and cloud services over the following five years (Maurer, 2023).

The top 5th and 6th accounting firms have also made major investments to provide AI offerings for its employees and clients. However, there does not seem to be a coordinated approach by its global practices, as with Big 4. Grant Thornton UK launched in October 2023 its AI platform, GTAssist, that uses Microsoft Azure Open AI to help its employees and clients achieve their goals (Pardo, 2023). BDO UK announced the launch of its GenAI platform,

Personas, an internal platform to assist its employees on a range of tasks and boost productivity (BDO, 2024b). BDO Canada launched AI solution for financial institutions (Consulting.ca, 2024). RSM Australia embraced robotic process automation and AI to create better experiences for its employees and achieved US\$3.03M costs savings since inception and projected US\$3.9M savings for 2024 year (Abbot, 2024).

In Malaysia, MIA has taken a proactive approach to encourage accounting firms to embrace AI in their work practices. MIA Sustainability, Digital Economy and Reporting Team (MIA DTIC) reported in September 2024 that GenAI will significantly change the accounting profession landscape in Malaysia following a panel session on “Navigating Tomorrow: GenAI in The Accountancy Profession”. The panel was of the view that the accounting professionals should embrace technology and maximise the potentials of GenAI by having the right mindset, encourage peers to embrace the new technology culture, ensure they have right talent and skills and to explore and find the technology that best suit their organisation. (MIA, 2024b). The employees will need to keep up with the changes and ensure they are not left behind in the competitive market.

Literature Review

The rapid evolvement of AI had attracted the attention of researchers, industry experts and general public. AI has the ability to produce far-reaching realistic and creative results in many areas. The introduction of applications, like ChatGPT, enabled users access to Large Language Models (LLMs) for content creation such as reports, images, and music (García-Peñalvo & Vázquez-Ingelmo, 2023).

The AI concept started in 1950 with Alan Turing’s Turing Test that focused on whether machine is capable of thinking like human. AI initially focused on symbolic reasoning and problem solving. From the 1990s, computers started to learn from data and improve performance using algorithms and decision trees. This moved to deep learning techniques in 2000 onwards. Deep learning architecture and the significant evolvement of hardware enabled new AI capabilities and the birth of GenAI. The release of ChatGPT in 2022 sparked the global race in GenAI. GenAI is making significant inroads in many industries, including accounting. (BDO, 2024a).

From an accounting and finance perspective, initially, corporate computing information systems were single integrated systems. The enterprise systems replaced these single integrated systems and streamlined the data flows (Davenport TH, 1998). Big data and the advent of analytics enabled firms to analyse massive amounts of data and help them with strategic planning (Cokins, 2009 as cited in Shchyrba et al., 2024). ChatGPT has the potential to automate repetitive tasks, enhance the analysis and reporting tasks, and simplify interactions with clients, thus reshaping the accounting process (Zhao & Wang, 2024).

Shchyrba et al. (2024), using blended mathematical modelling and empirical survey analysis, found that the adoption of technologies like ChatGPT resulted in initial surge in productivity with the expected stabilisation overtime. In addition, the model predicted the requirement of initial investment and training costs, but the efficiencies resulted in cost savings. AI-based accounting system helps reduce the repetitive tasks performed and will thus free up their time to focus on strategic and advisory issues for their clients.

Being aware and having an understanding GenAI capabilities can reshape how accounting professionals acquire their knowledge and skills and use GenAI to aid with their working practices and decision-making process. Equally it is important that the accounting professionals has the appropriate training to develop the competencies on the type of prompts to use to obtain the relevant information, learn how to interpret the information and at the same time beware of the risks involved (Anica-Popa et al., 2024; Wall, 2024). Adopting AI-based system can enhance audit quality as it will be easier to identify unusual transactions. (Adnan et al., 2024).

As with other new technological GenAI has its shortcomings. Trust is one of the serious issues as it is far from faultless. Inconsistency is another issue as GenAI gives different outputs each time a same question is asked. One of potential challenges for accountants who use GenAI is explainability – how could they explain how it works and how the GenAI comes to its conclusions. Therefore, human interface is still important to ensure that the outputs can be relied on (Wall, 2024).

Problem Statement and Aim of The Study

GenAI is revolutionising many industries, including the accounting professions, and is transforming the traditional landscape of the accounting profession. Mr Hoh, partner and EY ASEAN Assurance Digital Leader, Ernst & Young PLT at the MIA DTIC panel discussion in September 2024 stated “While technology tools can handle the bulk of the workload, I believe we will still need the human touch to make the final judgement in interpreting the outcomes generated by GenAI” (MIA, 2024b). This means the accountants roles could change from spending their time on repetitive tasks to focusing more on strategic or advisory roles.

As part of MIA’s initiatives to support its members in digital technology adoption, they held complimentary webinars over a four-week period in April/May 2024, with the theme ‘Digital Empowerment: Innovation for Sustainable Growth and Future Leadership’. The sessions topics included IT audit, sustainable technology, business model innovation in the digital age, cybersecurity, digital transformation success stories, and GenAI in the profession. It concluded on 15 May 2024 with MIA Accounting & Financial Technology Showcase 2024. On 28 June 2024 MIA hosted an event to facilitate digital adoption among small and medium size practitioners. The participants gained insights into challenges, best practices as well practical strategies to advance in their digital transformation journey (MIA, 2024a). These initiatives show that MIA is a great advocate for AI and the lengths they go through to ensure all its members is aware of AI revolution and how it could change the accounting professionals’ working practices.

A review of accounting packages in Malaysia, using Google search engine, seems to indicate that, in contrast to the situation in the UK and the US, many of the software firms have not started to embrace AI in their offerings. A couple of the software firms indicated that they are using AI as part of their offerings. QNE Software offers QNE AI Cloud Accounting package for SMEs. It uses AI to evaluate reports before submission to relevant government authorities¹. aBOT is an audit automation package that uses AI for data validation and assistance during implementation stage². This could be a start of the AI offerings in Malaysia with more accounting software firms making such offerings in future as the demands from the accounting firms surge.

From a technical support perspective, accounting professionals require access to both the legislation and other related books and journals to perform their work and also keep them technically abreast of recent developments. The accounting firms normally make selected materials, in hard and/or soft copies, for their employees. A review of the main technical support providers, like Wolters Kluwer, LexisNexis and Thompson Reuters indicate that they have joined GenAI revolution. Wolters Kluwer Tax & Accounting (TAA) Asia Pacific (APAC) announced on 31 July 2024 their GenAI enabled tax and legal research platform, CCH iKnowConnect. This enhanced facility will have a ‘Question and Answers’ feature by combining the firms deep domain expertise and the power of GenAI (Wolters Kluwer, 2024).

As noted above in point **Error! Reference source not found.**, Big 4 had made significant investments in GenAI and are starting to reap the benefits from these investments.

¹ see <https://qne.com.my/cloud-accounting-software-malaysia/>

² see <https://www.abot.my/>

The pro-active role taken by MIA meant that most of its members are aware of rapid AI evolution and how this can revolutionise the way they work. The main technical support providers have embraced AI in their offerings to accounting practices. The accounting software firms in Malaysia, albeit at a slower phase, are starting to embrace AI in their offerings.

From the preliminary literature review (see para **Error! Reference source not found.**), it is clear that accountants need to be aware and understand GenAI capabilities. In addition, the accountants need to have the relevant training and also be aware of the shortcomings to enable them to incorporate GenAI effectively as part of their work practices.

This study therefore proposes to study CAMs knowledge and views on GenAI and whether they have or will start embracing AI in their work practices together factors that influenced their behaviour.

Research Questions

The research questions for this study are:

1. Does the level of AI and GenAI understanding influence the implementation AI and GenAI in the work practice?
2. Do the attitudes to AI and GenAI influence the implementation AI and GenAI in the work practice?
3. Does the availability of AI trainings and support influence the implementation AI and GenAI in the work practice?
4. Do the benefits of AI and GenAI influence the implementation AI and GenAI in the work practice?
5. Do the barriers of AI and GenAI hinder the implementation AI and GenAI in the work practice?
6. Does the ethical stance influence the implementation AI and GenAI in the work practice?

Research Objectives

The research objectives for this study are:

1. Understand the level of understanding AI and GenAI.
2. Understand the acceptance or resistance to AI and GenAI
3. Determine the trainings and support available in relation to AI and GenAI modules
4. Determine the benefits and/or perceived benefits of AI and GenAI
5. Determine the barriers and/or perceived barriers of AI and GenAI
6. Understand the ethical views of AI and GenAI

Scope

According to International Federation of Accountants (IFAC) website, MIA and Malaysian Institute of Certified Public Accountants (MICPA) are Malaysian members as January 2024. There is a special pathway for members of MICPA to join MIA. A review of respective websites indicate that MIA has more than 39,500 members and MICPA has more than 3,500 members.

It is proposed limit the scope of this study to CAMs. As the members MIA members are significantly higher than MICPA and members of MICPA may also be member of MIA, it not proposed include them for this study.

Methodology of the Study, Underlying Theories, and Framework

This is a quantitative research study. The population will be CAMs. This study proposes undertake a survey by sending the questionnaire to a sample of CAMs.

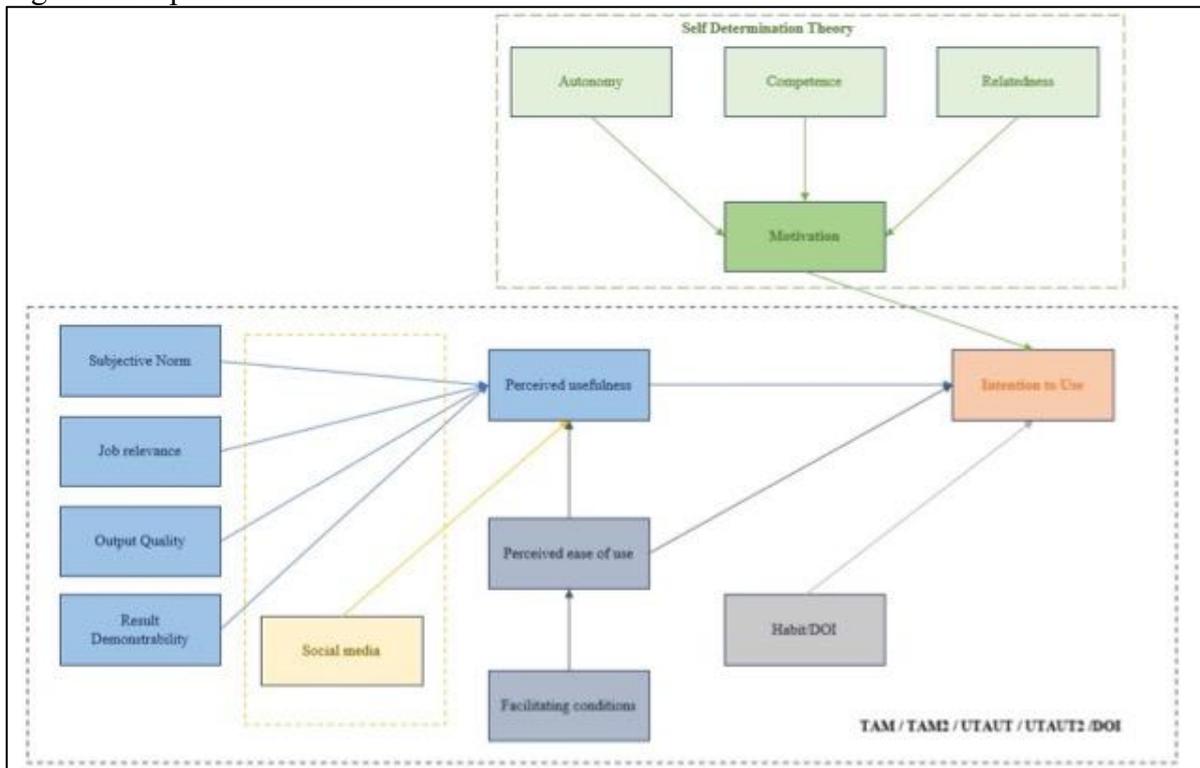
In 1962, Everett M. Rogers published the Diffusion of Innovations Theory (DOI) which categorises the users of new technology into five groups. The Technology Acceptance Model (TAM) was developed by Fred Davis in 1989 which discusses how perceived usefulness and perceived ease of use influences the attitude towards usage and behavioural intention to use, which in turn effects on actual usage. This went through various changes - Extended Technology Model (TAM 2), Unified Theory of Acceptance and Use of Technology (UTAUT) and Extending Unified Theory of Acceptance and Use of Technology (UTAUT2).

Edward L. Deci and Richard Ryan Self Determination Theory discusses how the three basic needs competence, autonomy and relatedness affects an individual's motivation.

This study proposes adapt these models for this study.

The proposed framework for the study is shown in Figure 1.

Figure 1. Proposed Framework



Source: Developed by author for this study

Significance of the Study

This study should provide insight into CAMs attitude towards GenAI and perception whether the GenAI revolution will impact on their accounting practice together with factors that influence their behaviour. It should provide an insight to academic institutions on what, if any, changes are required to ensure the accounting graduates are prepared for the new working practices within the accounting industry. Finally, it should provide insight for MIA DTIC on how it could enhance their training and support for its members.

Conclusion

Accounting profession can, by incorporating AI with big data and data analytics, become the centre of twenty first century business world. Their skills had in the past evolved from pencils and paper to spreadsheets and accounting software (Bose et al., 2022). ChatGPT was the spark of a new revolution in many industries, including accounting (BDO, 2024a).

As explained in 1.3, the Big 4 recognised the potentials of GenAI could offer, invested heavily and are starting to reap the benefits. MIA has also acknowledged the far-reaching potentials and believes that GenAI will significantly change the accounting profession landscape in Malaysia. MIA DTIC has been actively educating on AI and encouraging its members to embrace GenAI. (MIA, 2024a, 2024b).

In September 2024 panel session organised by MIA DTIC, the panel concluded that with the right mindset together with a right culture and training the accounting professions can explore and experiment the various technologies that is available and relevant for their practice (MIA, 2024b).

This research aims to explore further and understand how CAM perceive the GenAI revolution will impact on their working practices.

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Bibliometric and Visualization Analysis of the Relationship between Employee Well-being and Turnover Intention

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Abstract

This study explores the relationship, attention, and research trends between "turnover intention" and "employee well-being" through bibliometric analysis. Using VOSviewer and SCImago software, data from 1999 to 2024 covering 83 relevant articles were analyzed. Key findings include: (1) Turnover intention and employee well-being remain vital topics in human resource management, with research concentrated in management and applied psychology, emphasizing the need for interdisciplinary approaches. (2) The global distribution of publications and affiliations highlights the universality of these themes, underscoring the importance of international collaboration for advancing research. (3) Keyword co-occurrence networks and overlays reveal intricate relationships between these topics, including factors such as mental health, work environment, and leadership behavior. This study offers valuable insights into the development of these themes and emphasizes the importance of continuous research to enhance employee well-being and organizational effectiveness in a dynamic work environment.

Introduction

Given the momentum of economic globalization and technological innovation, the working environment has evolved, consequently altering employees' attitudes and behavioral patterns (Gurtskoy et al., 2022; Sonawane, 2021). Against this backdrop, employee happiness is regarded as a crucial factor influencing employee performance and organizational success (Sikandar & Sikandar, 2023; Alzain et al., 2023). Turnover intention, as a multifaceted psychological phenomenon, has long been a focal point of interest in both business management and psychology research (Kaptanoglu, 2020; Qi & Yu, 2021). Similarly, the relationship between employee happiness and turnover intention has garnered international attention. Institutions such as the International Labour Organization and the World Economic Forum increasingly emphasize employee happiness, recognizing its critical importance to employee quality of life, economic, and social stability (International Labour Organization, 2023).

Given that existing research predominantly focuses on theoretical analysis and case studies when examining the relationship between employee happiness and turnover intention, this study adopts a bibliometric analysis approach to systematically review and integrate relevant literature from the past 25 years. Through collecting, screening, and analyzing literature from major academic databases and employing visualization tools such as VOSviewer and Scimago, this study identifies major trends, core themes, development trajectories, and future research directions. By deeply analyzing historical literature on this topic, the study aims to explain and predict the relationship between employee happiness and turnover intention. Through achieving these objectives, the study provides new perspectives and methods for a

deeper understanding of the relationship between employee happiness and turnover intention, offering insights for future research and practice.

This study unfolds as follows: the second section introduces the research methodology and data sources, the third section presents the results of bibliometric analysis and visualization, the fourth section discusses the findings based on bibliometric analysis results, and the fifth section concludes the study along with its limitations.

Literature Review

The relationship between employee well-being and turnover intention has garnered significant attention in contemporary organizational management research, particularly against the backdrop of intense global economic competition. Managers are increasingly concerned about employees' propensity to leave, while the importance of well-being is gaining prominence in people's perceptions. Consequently, researchers have delved into examining the nexus between employee well-being and turnover intention, aiming to uncover their underlying mechanisms and influencing factors.

From the perspective of human resource management, employee benefits, career development opportunities, and work-life balance are also considered crucial factors influencing employee well-being and turnover intention. Some studies have indicated a positive correlation between employees' dissatisfaction with compensation, benefits, and career development and their intention to leave (Artha & Jahja, 2023; Aguwamba et al., 2019). These findings underscore the significance for organizational managers to focus on designing compensation systems, providing career advancement opportunities, and facilitating work-life balance. Moreover, research in human resource management emphasizes the impact of employee involvement in decision-making and perceived fairness on well-being and turnover intention. Shrestha et al. (2023) noted that organizations with high levels of employee participation in decision-making and perceived fairness tend to enhance employees' well-being while reducing their intention to leave.

From an organizational behavior perspective, the relationship between employee well-being and turnover intention is also influenced by internal organizational factors (Ratna et al., 2022). Organizational culture, leadership styles, and job design are considered crucial factors influencing employee well-being and turnover intention (Biggadike et al., 2023; Sitohang, 2023). Some studies have indicated that a supportive work environment and positive employee relationships provided by organizations can significantly reduce employees' intention to leave (Souza et al., 2023; Yusoff & Yusoff, 2022). These findings underscore the importance for organizational managers to shape a positive work environment and enhance employee well-being. Additionally, research in organizational behavior has highlighted the impact of employee engagement and self-efficacy on well-being and turnover intention. Employees with high levels of engagement and strong self-efficacy tend to exhibit higher levels of well-being and lower turnover intention (Sigursteinsdóttir, 2020; De Oliveira & Da Costa Rocha, 2017).

Moreover, from a psychological perspective, employee well-being is considered a manifestation of their subjective psychological state, reflecting individuals' satisfaction with life and work (Rickardo et al., 2023; Zinovieva et al., 2021). Psychological research has revealed a close association between employee well-being and turnover intention (Charles - Leija et al., 2023; Ahmed et al., 2022; Bellamkonda & Pattusamy, 2022). For instance, some studies have found that positive emotions and emotional well-being in the workplace are negatively correlated with employees' propensity to leave (Bellamkonda & Pattusamy, 2022; Sharma & Tiwari, 2022). These findings suggest that the higher the level of positive emotional experiences and psychological satisfaction employees derive from work, the lower their intention to leave. Additionally, psychology emphasizes the match between individuals and the work environment in influencing well-being and turnover intention. For example, the theory of job satisfaction

suggests that employees' well-being is influenced by factors such as the work environment, task characteristics, and organizational culture, which in turn affect their intention to leave (Ratna et al., 2022; Pahlawan & Wahyuni, 2022).

In summary, the relationship between employee well-being and turnover intention is a complex and multidimensional issue that has garnered extensive attention and research across fields such as psychology, organizational behavior, and human resource management. While past research has made progress in both theoretical and empirical aspects, there still exist unresolved questions and knowledge gaps. Therefore, this paper intends to systematically review and evaluate relevant literature through bibliometric analysis, aiming to explore the current status, hot topics, and future directions of research on the relationship between employee well-being and turnover intention. By quantitatively analyzing indicators such as publication categories, geographical distribution, and keyword patterns, this study seeks to provide theoretical and practical guidance for further research, thereby fostering the advancement of the discipline and accumulation of knowledge.

Methods and Data Source

Methods

This study will employ bibliometric analysis and visualization methods using VOSviewer and Scimago software to analyze the acquired data. Bibliometric and visualization analysis methods involve the quantitative and visual analysis of literature or academic materials, typically utilized for systematically organizing, analyzing, and presenting literature in specific fields or topics (Lazarides et al., 2023). The advantage of this approach lies in its objective and systematic analysis of literature through data-driven means, coupled with the use of visualization tools to present research results, enabling researchers and readers to gain clearer insights into the relationships and trends among literature (Fei & Zhang, 2022).

In academic and research fields, bibliometric and visualization analysis methods are increasingly recognized and adopted as valuable tools, facilitating the discovery of characteristics, hotspots, and future trends in a particular research area (Wang et al., 2023; Nie et al., 2022). More scholars are beginning to apply this method for trend analysis in disciplinary development (He et al., 2023; Qu et al., 2023; Herawati et al., 2022). Particularly in the era of big data, bibliometric and visualization analysis holds advantages, helping researchers to make more extensive use of abundant literature information for data acquisition (Lundberg, 2023; Tchunte & Haddadi, 2023). Bibliometric and visualization analysis methods have thus become pivotal research tools.

In this study, we utilized two software tools, VOSviewer and Scimago, for data analysis. VOSviewer was primarily employed to generate co-occurrence network maps of keywords, revealing interrelations among documents and research hotspots. It also facilitated the understanding of the structural aspects of research fields and collaboration networks among authors, thereby offering a more intuitive comprehension of document associations and research trends. Meanwhile, Scimago was employed to examine the output of different countries in specific research domains, enabling an understanding of the extent of scientific contributions from various nations in those fields. The combined application of these two software tools aids in comprehensively understanding the current status of research fields and international scientific collaboration, providing a more comprehensive and in-depth perspective for research endeavors.

Data Source and Preparation

In this study, the data was sourced from the Web of Science database. The following criteria were used to define the search topics: "Employee happiness" or "Employee well-being" for one topic and "Turnover intention*" or "Intention to leave" for the other. To enhance the

quality of the articles, document types such as "Review Article," "Proceeding Paper," "Book Chapter," and "Meeting Abstract" were excluded. Additionally, only articles written in English were considered. The data retrieval and organization were conducted on November 1, 2024. To ensure accuracy, Excel was utilized for data organization, and no duplicate data was found. All articles meeting the criteria were included, resulting in a total of 83 articles.

Results

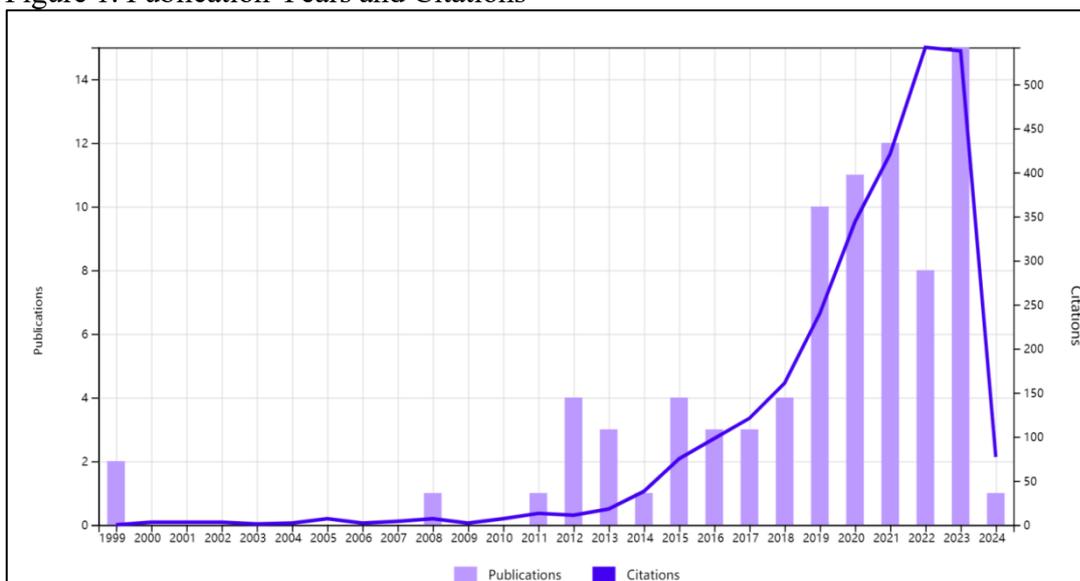
Figure 1 presents statistical data on the publication and citation counts of academic articles related to employee happiness and turnover intention from 1999 to 2024. From the graph, it is evident that both the academic interest and influence in this research area have significantly increased over the past 25 years.

Observing the publication years, the research topics "employee happiness" and "turnover intention" first appeared in 1999. There was a gap of seven years from 2000 to 2007 where no scholars published articles related to these topics. In 2008, only one article was published, and there were no publications for the consecutive years of 2009-2010. During the period from 1999 to 2010, the overall number of publications was low, and citation counts were relatively low as well, reflecting the limited attention paid to the relationship between employee well-being and turnover intention during that time.

From 2011 onwards, there has been a general upward trend in article publications, accompanied by an increase in citation counts, indicating a rising research interest year by year. Particularly since 2018, there has been a significant growth in both publication counts and citation counts, peaking in 2022. This change may be related to the challenges organizations face in the context of globalization, changes in the work environment, and increasing concerns about employee mental health, which have attracted scholars' attention. The sharp increase in citation counts from 2022 to 2024 suggests that the outcomes of early research have been widely acknowledged and continuously referenced in subsequent studies, indicating the increasingly profound impact of theoretical foundations and empirical findings on subsequent research.

It is worth noting that although the publication count slightly decreased in 2023 compared to 2022, citation counts remained high, indicating a potential transition of this field towards a mature stage in both theory and practice.

Figure 1. Publication Years and Citations



Discussion

From the perspective of research categories, Table 1 represents the top five fields in the study of employee happiness and intention to leave, with management occupying the highest proportion at 37.35%. This figure significantly surpasses other categories, indicating the keen research interest and academic engagement of management scholars in exploring employee well-being and its association with turnover intentions. Management focuses on organizational behavior and human resource management, with employee happiness and intention to leave being pivotal factors in this domain (M. Wang et al., 2022). The attention to individual employee needs and behaviors within this field facilitates in-depth research into employee happiness and intention to leave, aiding in the interpretation and prediction of organizational behavior and providing practical guidance for management (Ilies & Aw, 2023). Consequently, the high ranking of management underscores its academic vigor and practical significance in advancing employee well-being within this domain.

Applied psychology ranks second, accounting for 24.1%. This reflects the significance of the psychological perspective in interpreting employee behaviors and attitudes. Research in psychology may emphasize understanding employees' intrinsic motivations, emotional states, and how these psychological variables influence their intention to leave. Additionally, psychological studies may focus on employees' mental health status in the work environment and its association with turnover intentions (Khalid et al., 2022), thus providing organizations with deeper insights and solutions.

The presence of 12 records (14.458%) in business disciplines and 9 records (10.843%) in industrial relations and labor studies indicates that the attention to employee well-being and turnover intention issues has expanded beyond theoretical research to encompass broader business and industrial applications. Lastly, although the category of hospitality, leisure, sports, and tourism studies only accounts for 8 records (9.639%), its inclusion underscores the attention to this issue within industry-specific environments. In such industries, employee well-being directly affects customer service experiences, and high turnover rates may negatively impact business continuity and customer satisfaction.

In summary, the attention from various disciplines to the theme of employee happiness and turnover intention reflects an interdisciplinary research trend, where scholars from different fields are endeavoring to address this prevalent workplace issue. This interdisciplinary research collaboration provides diverse perspectives and methods for understanding and improving employee well-being, enriching both the theory and practice of human resource management and employee retention strategies (Prasanna & Mythili, 2022).

Table 1. Categories of the Study

Web of Science Categories	Record Count	% of 83
Management	31	37.349
Psychology Applied	20	24.096
Business	12	14.458
Industrial Relations Labor	9	10.843
Hospitality Leisure Sport Tourism	8	9.639

Analysis of the affiliations of publishing institutions in Table 2 reveals the involvement of institutions from various countries, including the United States, South Africa, Australia, Norway, Canada, India, and Malaysia, among others. This indicates that research on employee happiness and turnover intention has garnered global attention and research interest. This global attention reflects the significance of employee happiness and intention to leave as crucial domains within organizational behavior, which hold universality and importance across different countries and cultural backgrounds. Additionally, it underscores the importance of

cross-cultural research in exploring employee well-being and organizational behavior, which aids in expanding the scope and enhancing the applicability of research. Consequently, it provides international organizations with more comprehensive and effective management strategies and practical recommendations. Among these research institutions, the University System of Ohio appeared four times, North West University South Africa appeared three times, and the Royal Melbourne Institute of Technology RMIT appeared three times as well. Furthermore, this also indicates the high level of attention these institutions place on issues related to employee happiness and intention to leave, as well as their sustained focus in this field. These institutions may possess specialized research teams and ample resources, allowing them to conduct in-depth research and generate impactful findings. Consequently, the frequency of their appearance reflects their academic standing and influence in this field. These institutions may possess strong research capabilities and influence in this field, warranting further attention.

Table 2. Affiliations of the Study

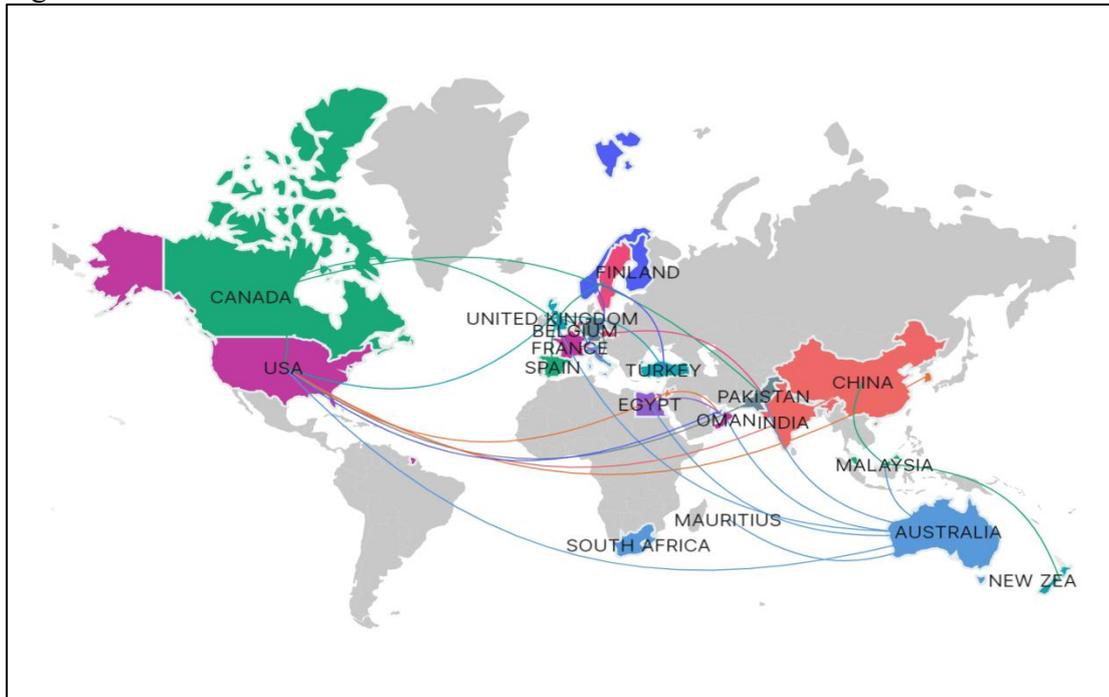
Affiliations	Record Count	% of 83
University System Of Ohio	4	4.819
North-West University South Africa	3	3.614
Royal Melbourne Institute Of Technology Rmit	3	3.614
Australian Catholic University	2	2.41
Bi Norwegian Business School	2	2.41
California State University System	2	2.41
Chandigarh University	2	2.41
Cochin University Science Technology	2	2.41
Concordia University Canada	2	2.41
Indian Institute Of Management Im System	2	2.41
Indian Institute Of Management Kozhikode	2	2.41
National Yang Ming Chiao Tung University	2	2.41
Portland State University	2	2.41
State University System Of Florida	2	2.41
Universiti Kebangsaan Malaysia	2	2.41
University Of Lahore	2	2.41
University Of North Texas Denton	2	2.41
University Of North Texas System	2	2.41
Xlri Xavier School Of Management	2	2.41

From the geographical distribution of publications in Figure 2, it is evident that Asia, the Americas, Europe, Africa, and Oceania are all involved, indicating a high level of internationalization in this research field. The significant presence of the United States and Canada is consistent with their leading positions in global research funding and the number of higher education institutions (Ghani et al., 2022). Furthermore, the significance of European countries such as the United Kingdom, France, and Germany correlates closely with the emphasis and investment of the European Union in research and innovation strategies.

The prominence of China and India indicates that the research capabilities of these emerging economies are rapidly strengthening, aligning with their continued growth in the proportion of international research paper output. This growth may partially stem from extensive investments in education and research and the increased research opportunities brought about by rapid economic development. However, the participation of countries in Africa such as South Africa, Mauritius, and countries in the Middle East like Egypt also demonstrates that even in resource-constrained settings, certain countries can achieve significant achievements on the international stage through specific strategies or focusing on specific research areas. This indicates that research influence is not limited to developed countries but also contributes to developing countries.

The quantity of scientific publications from countries such as the United States, Canada, China, the United Kingdom, India, and Australia stands out, indicating their high research activity in this field. The colored lines in the graph represent collaboration relationships among different countries, revealing the breadth and diversity of international cooperation. The graph shows a rich network of collaboration lines, indicating extensive international collaboration networks exist among multiple countries and regions. Particularly noteworthy are the numerous connection lines between the United States, China, the United Kingdom, India, and Australia, highlighting the active roles of these countries in research collaboration. These connections encompass not only collaboration between developed countries and emerging economies but also interactions across different continents, demonstrating the global and inclusive nature of research collaboration. Additionally, the widespread distribution of research collaboration is significant for promoting international knowledge sharing, technological innovation, and addressing global challenges. Through detailed analysis of these collaboration relationships, this study offers deep insights into global scientific research collaboration patterns, providing empirical evidence for future policy-making and international research projects.

Figure 2. The Publication Countries



In Figure 3, the Keyword Co-Occurrence Network comprises 263 keywords, with 50 keywords selected that appear two or more times. The maximum link established is 49. In the graph, keywords such as "employee happiness," "turnover intention," and "happiness" represent the core themes of the current research area, focusing on the discussion. The thickness of the lines between words reflects the degree of closeness in their relationship. Thick lines between keywords such as "employee happiness," "turnover intention," and "happiness" indicate strong associations between them.

The dense connections among factors related to "employee well-being" (such as "job performance," "work engagement," and "job satisfaction") in Figure 3 suggest that job performance and satisfaction are closely related to employee happiness. The appearance of keywords like "turnover intention" and "job stress" reveals negative factors influencing

level of organizational support for employee well-being and job performance, as well as the role of leadership in the work environment. The purple group involves studies on ethics and morality, such as moral voice, ethical leadership, reflecting the emphasis on internal organizational ethics standards, ethical norms, and the moral behavior and role modeling of leaders. The orange group pertains to aspects related to psychological theories and self-development, such as mindfulness and self-determination theory, understanding psychological theories and self-development theories can help individuals better understand their inner world and behavioral motivations, thereby achieving self-development and growth.

Figure 5. Keyword Cloud Map. Source: SCImago Graphica



Conclusion and Limitations

In this study, "turnover intention" and "employee well-being" were selected as the main themes for bibliometric analysis, aiming to explore the relationship, attention, and research trends between these two topics, and to discover their correlation and influencing factors, as well as future research trends.

Bibliometric analysis and visualization methods using VOSviewer and SCImago software were employed to analyze the data. The literature related to the themes of this study began in 1999 and continued until 2024, covering a research time of 25 years, with a total of 83 relevant articles. This study presented publication counts, citation counts, research categories, affiliations, countries of publication, keyword co-occurrence networks, keyword overlays, and word clouds. Three main conclusions can be drawn from the analysis:

First, turnover intention and employee well-being have sustained research interest in the field of human resource management. From the perspective of research categories, studies related to "employee well-being" and "turnover intention" are mainly concentrated in the fields of management and applied psychology. This reflects the complexity and interdisciplinary nature of these topics, suggesting that future research may benefit from interdisciplinary research methods and theories.

Second, the affiliations of publishing institutions and the distribution of publishing countries demonstrate global attention and research activities regarding turnover intention and employee well-being. This indicates the universality and importance of these two topics in

different countries and regions, suggesting that future research could enhance cooperation and communication globally to promote research progress.

Third, analysis tools such as keyword co-occurrence networks, keyword overlays, and word clouds reveal the correlation and related themes between turnover intention and employee well-being. A complex network of relationships was found between these two topics, including factors such as employee mental health, work environment, and leadership behavior, providing important research directions and insights for future studies.

In summary, this study provides a comprehensive view of the literature related to employee well-being and turnover intention, showcasing the development trends of these themes and offering valuable insights for theory and practice. Continuous research is crucial for improving employee well-being and organizational effectiveness amidst the changing work environment.

However, this study has limitations. It only used the Web of Science as the data source, potentially overlooking literature from other academic databases, which may affect the comprehensive understanding of the research field. Although VOSviewer and SCImago software provide rich visualization analysis functions, their analysis results are still subject to the limitations of the methods themselves, such as difficulties in interpreting complex relationships. Additionally, bibliometric analysis may lag in reflecting the latest research dynamics and may have limitations in analyzing the development trends of certain fields or topics.

In future research, considering the aforementioned limitations, it is advisable to integrate other academic databases such as Scopus, PubMed, etc., to obtain more comprehensive literature information, thereby enhancing the credibility and representativeness of the research. Besides VOSviewer and SCImago, other analysis tools and methods, such as social network analysis, topic modelling, etc., should also be considered to delve deeper into the potential correlations and trends in the literature data. It is essential to update the literature data on time to track and understand the latest trends in the research field, ensuring the timeliness and accuracy of the analysis results.

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Literature Review of Inter-organizational Knowledge Management

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Abstract

Knowledge management is regarded by many scholars, experts and business people as an effective means to cope with fierce market competition and environmental changes and organizations must make full use of internal and external knowledge to gain competitive advantages in a complex external environment. In addition, the current academic research on knowledge management is mostly focused on the internal organization, and there are problems such as unclear concept definition and unclear types in the research on cross-organizational knowledge management. Therefore, this paper reviews 54 related research papers on the basis of combing the cross-organizational knowledge management literature in multidisciplinary fields such as strategic management, economics, sociology, and information technology, and the article will analyze the obstacles in the influencing factors of cross-organizational knowledge management, the incentive mechanism of cross-organizational knowledge management, the relationship between cross-organizational knowledge management and organizational innovation performance and the shortcomings of existing research, Our research will provide a detailed description of cross-organizational knowledge management and will also provide more suggestions for future research on organizational management.

Keywords: inter-organization, knowledge management, management mechanism.

Introduction

The resource-based view emphasizes the need for enterprises to have unique internal resources and capabilities, including scarce resources, valuable resources, inimitable resources and difficult-to-replace resources and knowledge resources can help enterprises adapt to complex dynamic environmental changes and gain sustainable competitive advantages in the process of management knowledge which is because knowledge is constantly updated and changed, and knowledge management can cope with the impact and influence from the external environment, especially the changes in the global external economic structure after COVID-19 (Bai & Li, 2020). Therefore, for organizations which managing knowledge is as important as managing other resources, and at present which can be said that the academic community has formed a relatively complete research system for internal knowledge management in organizations, but the knowledge management activities of many enterprises have not achieved the expected results and especially the knowledge management resources of small and medium-sized enterprises are relatively scarce (Gomes & Dahab , 2010). In the emerging environment of knowledge economy globalization and technology globalization, an organization's external

relationship network has become the fundamental source of enterprise technological innovation and the main reason for enterprise competitive advantage (Taylor et al., 2013). At the same time, since the competitive advantage of enterprises is increasingly dependent on resource sharing with partners, it is of great practical significance to understand enterprise knowledge management activities from a cross-organizational level (Foss et al., 2010).

Literature Review

The current focus of academic research on knowledge management is on the internal part of the organization. Many scholars are committed to studying how to integrate and utilize the knowledge within the enterprise to effectively respond to changes in the external environment (Yue, 2013). This focus has greatly improved people's understanding of internal processes, but there are still certain limitations in the research on cross-organizational boundaries. For example, scholars have not clearly defined the connotation of cross-organizational knowledge management, resulting in mixed use of concepts, lack of consistency in definitions, and single research contexts. It can be said that the above shortcomings restrict academic exchanges between researchers and also hinder scholars from further understanding of cross-organizational knowledge management (Lendel et al., 2015). In recent years, scholars have reviewed the research on cross-organizational knowledge management, but most of them focus on a narrow topic and are relatively scattered as a whole (Paulo J, 2011). For example, the innovation of supply chain management and complex systems, or the discussion of a certain influencing factor of cross-organizational knowledge management, or the discussion from a certain process of cross-organizational knowledge management, cannot accurately reflect the research progress of cross-organizational knowledge management. Although recent reviews have attempted to address these limitations, they tend to focus on specialized topics and do not provide a holistic perspective on the progress of the field (Fagerström & Olsson, 2002). Moreover, this fragmented approach has limited the development of a cohesive theoretical foundation for inter-organizational knowledge management and the ability of scholars to gain a deeper and more comprehensive understanding of the mechanisms and results of managing knowledge across organizational boundaries (Salisbury, 2008). Therefore, a more systematic examination of inter-organizational knowledge management is needed to develop a unified overall framework and guide future research and practice in this field.

Inter-organizational knowledge management is an important research area because it studies how organizations collaborate across boundaries to manage, share, and leverage knowledge to enhance innovation and competitiveness. Given its importance, this paper fills a research gap by systematically analyzing 54 selected academic papers to assess trends, publication timelines, and evolving research contexts in this field (Yli-Renko et al., 2001). The analysis shows that there is a growing interest in inter-organizational knowledge management as a strategy to improve organizational learning and innovation outcomes. The connotation of inter-organizational knowledge management includes collaborative practices and systems designed to promote knowledge sharing between different entities (e.g., partnerships, alliances, and networks).

Through this study, we identify various types of knowledge management, including explicit and tacit knowledge exchange, technology-driven knowledge systems, and social knowledge networks. Incentive mechanisms that promote effective knowledge sharing, such as trust, contractual agreements, and shared goals, are explored to highlight their role in creating an environment conducive to knowledge management (Gomes & Dahab, 2010). In addition, this study analyzes the impact of knowledge management on innovation performance to show that successful knowledge management can significantly improve an organization's innovation capabilities by leveraging various sources of knowledge (Fagerström & Olsson, 2002). Based on these insights, we propose future research directions that focus on the integration of digital

tools, the role of organizational culture, and the impact of knowledge management on long-term strategic goals, which can provide avenues for theoretical advancement and practical application in this field.

Methods

Data Source

This paper uses the American Web of Science and China National Knowledge Infrastructure as search databases. The specific search methods are as follows. First, this paper sets the search period from January 1986 to April 2024, and the search date is July 6, 2024. Secondly, by reading relevant literature, considering that the concept of knowledge management includes many types such as knowledge creation, knowledge transfer, knowledge sharing, and knowledge exchange, in order to start from the overall concept, this paper is based on existing literature to combine cross-organizational, inter-organizational, and knowledge management respectively, and search in the titles, abstracts, or keywords of electronic databases such as Web of Science and China National Knowledge Infrastructure. Finally, 61 documents were obtained, including 24 Chinese documents and 37 English documents. By analyzing the titles, keywords, and abstracts of the above documents, the documents with low relevance to knowledge management were carefully eliminated after careful consideration, and 54 documents were identified, including 19 Chinese documents and 35 English documents.

Statistical Analysis

We sorted and summarized 54 papers. Before 2000, the number of papers published was 0. This shows that the behavior of early scholars introducing the concept of cross-organization into knowledge management did not attract attention. At that time, people's research on knowledge management has always been committed to the organization, and they are more concerned about the knowledge update and organization within the organization. How to build heterogeneous resources to cope with the changes in the external environment, while ignoring knowledge management from different organizational perspectives, and have never even considered cross-disciplinary and cross-cultural organizational management. We found that from 2000 to 2005, there were 10 related research papers, indicating that the research is still in the initial stage of exploration, and researchers have just begun to pay attention to this field. In 2006 to 2011, the number of related papers has reached 19, indicating that the research has attracted the attention of international scholars, and even many English papers have paid attention to this type of research for the first time; in 2012 to 2017, the number of related papers has reached 35, indicating that the topic of this research has attracted widespread attention from scholars, and the number of studies after 2018 has increased, indicating that more scholars have begun to pay attention to cross-organizational knowledge management, Especially after 2020, people began to focus on the integration of digital tools, the role of organizational culture, and the impact of knowledge management on long-term strategic goals, providing a lot of support and help for theoretical progress and practical application in this field.

Table 1. Paper Journal Distribution Table

Journal name (partial)	Number of literature
Journal of Computer Information Systems	1
Information Development	2
Knowledge Management Research	1
R & D Management	2
Journal of Information Technology	2
Construction Management and Economics	1
Scientific Management Research	3
Science of Science Research	1
Scientific Research Management	1
China Industrial Economics	1
Journal of Management (China)	2

Source: Web of Science and China National Knowledge Infrastructure as search databases

From the perspective of journal sources (as shown in the table), 17 articles (31.5%) were published in important international journals such as CME and JIT, as well as important Chinese journals such as Journal of Management and Science of Science, which shows that cross-organizational knowledge management research has become an academic issue of great concern to the theoretical community. In addition, from the perspective of article content, research on cross-organizational knowledge management is mainly concentrated in the fields of business management (strategic management) and economics, and also involves disciplines such as education, sociology, information science and information technology. This situation also shows that cross-organizational knowledge management is a multidisciplinary and integrated research field.

Research Context

The research context of inter-organizational knowledge management has been explored in a variety of organizational settings, reflecting different approaches and implications. Three main contexts emerged in our analysis of the 54 selected academic papers: supply chain networks, complex system innovation, and collaboration between government and business.

Supply chain networks (6 studies): Research in this area focuses on member organizations in the supply chain, emphasizing the mutual flow of capital, information, and knowledge. It can be said that the trust established between supply chain participants can enable effective knowledge sharing, while the strategic management of knowledge flows between upstream and downstream partners can improve production efficiency and reduce costs. Rather than viewing knowledge management as a function limited to a single enterprise, these studies advocate a broader approach to integrating knowledge management across the entire supply chain (Gupta, 1984). It can be said that this holistic perspective enhances overall competitive advantage by optimizing resource utilization and collaborative processes.

Complex system innovation (7 studies): Member organizations in this context collaborate to form network entities driven by common innovation goals. These networks are usually composed of multiple stakeholders who share common interests and rely on knowledge exchange to guide complex innovation processes, and in this context, effective knowledge management involves matching the right resources and people to specific tasks to promote better decision-making and drive the organization to achieve its goals, with a focus on how collaborative knowledge processes can enhance innovation capabilities within interconnected systems (Karbowski, 2019).

Government-business collaboration (3 studies): In this context, knowledge sharing occurs between government agencies and private enterprises. Governments exchange knowledge to solve complex social problems, strengthen policy making, and improve governance efficiency,

while enterprises benefit from these collaborations by gaining implicit and tacit knowledge, which helps them build competitive advantages (Bartezzaghi et al., 1997).

In addition, other studies in the review explored IKM in the fields of education (3 papers), information technology (4 papers), and intelligence systems (3 papers). It can be said that the common denominator in all these contexts is the extensive interconnectedness between member organizations, including flows of funds, information, risks, logistics, and common goals, and these interdependencies form an important foundation for inter-organizational knowledge management practices and also promote collaborative exchanges necessary for innovation and performance improvement (Oshri & Newell, 2005).

Findings

Connotation of knowledge management

Knowledge management has traditionally covered a wide range of interdisciplinary topics, including information science, organizational behavior, and strategic management (Buuren, 2009). However, mainstream research has mainly focused on knowledge management activities within a single organization, often ignoring the dynamics of knowledge management across organizational boundaries. Moreover, current definitions of knowledge management often emphasize internal processes, such as knowledge creation, storage, and utilization within a single entity, which also leads to a lack of consensus on the scope and definition of cross-organizational knowledge management.

To address this gap, this paper revisits the basic concepts by exploring the definitions of "knowledge" and "knowledge management". It builds on these core ideas and integrates insights from existing literature to form a clearer understanding of cross-organizational knowledge management, which refers to the systematic processes and practices of sharing, integrating, and applying knowledge across multiple organizations through collaborative networks, partnerships, or alliances (Williams, 2002). By analyzing various forms of knowledge management, such as supply chain knowledge exchange, collaborative innovation networks, and public-private knowledge sharing, this study enriches the connotation of knowledge management and emphasizes that effective knowledge management requires leveraging inter-organizational relationships, managing shared knowledge flows, and coordinating strategic goals between different entities, ultimately helping to enhance innovation and competitive advantage (Laureano Paiva et al., 2012).

In the modern competitive landscape, knowledge has become a vital intangible resource for enterprises, and its value contribution often exceeds that of traditional assets. However, the concept of "knowledge" has been interpreted in various different academic literature (Salisbury, 2008). From a data perspective, knowledge is usually defined as verified and contextualized information, which is distinguished from raw data by its relevance and applicability, and it can be roughly divided into two categories: explicit knowledge and implicit (tacit) knowledge, each of which has different characteristics and uses within an organization (Laureano Paiva et al., 2012).

Explicit knowledge is structured, codifiable, and easy to communicate. It can be expressed through language, text, symbols, procedures, manuals, and databases, making it accessible and transferable among different stakeholders. Examples include standard operating procedures, documented processes, and written guidelines, which can be effectively shared within and between organizations (Buuren, 2009). This type of knowledge can be further divided into different forms:

- Descriptive knowledge (what something is)
- Process knowledge (how to accomplish something)
- Result knowledge (the results of a process)
- Conditional knowledge (under what circumstances something is applicable)

Relational knowledge (the connection between different concepts or entities)

In contrast, tacit knowledge is more subtle and deeply rooted in personal experience, skills, and expertise. It is inherently personal, difficult to express, and not easily acquired or disseminated through traditional methods (Friesl et al., 2011). This includes the insights, intuitions, and know-how that employees acquire over time, making it a valuable but difficult to manage resource, especially in an inter-organizational environment (Ratna et al., 2020). Bartezzaghi et al. introduced a dynamic perspective that describes knowledge as having a "flow" attribute, meaning that it is able to move and transfer between different parties in a supply and demand network. This view emphasizes the initiative and fluidity of knowledge, especially in a collaborative environment (Salisbury, 2008). However, while explicit knowledge is relatively easy to flow across organizational boundaries, the cross-organizational sharing of tacit knowledge remains a major challenge due to its tacit nature (Ramasamy & Thamaraiselvan, 2011). As knowledge increasingly penetrates into all aspects of business operations, its characteristics also present interdisciplinary and complex characteristics (Lin, 2006). The diversity of organizational culture, the continuous advancement of digital technology and social informatization have made it more complicated to manage and effectively utilize knowledge in today's interconnected and dynamic business environment (Adelstein & Clegg, 2013).

In reviewing the relevant literature, scholars mainly define knowledge management from an organizational perspective, focusing on internal processes (Ratna et al., 2020). In the 1990s, knowledge management was largely viewed as a micro-activity within the enterprise, covering the learning, creation, dissemination and application of knowledge, and the main goal of knowledge management during this period was to promote knowledge exchange and link individual expertise with the internal structure and processes of the organization, which involves systematic practices of acquiring, storing and sharing knowledge to ensure that knowledge can be effectively used for decision-making, innovation and problem solving (Chung & Espinoza, 2023).

By effectively managing knowledge, organizations aim to leverage their knowledge capital to gain long-term benefits and maintain sustainable competitive advantages (Cheng, 1994). For example, knowledge creation and acquisition are driven by identifying key areas where expertise is needed, while knowledge dissemination ensures that valuable insights can be communicated to relevant employees. This has led to a generally accepted definition of knowledge management as the process of combining knowledge sources with organizational needs to achieve strategic goals (Pentland, 1995). However, these early definitions of knowledge management share a common limitation: they focus primarily on the internal dynamics of knowledge management and often overlook the importance of external organizational factors. Moreover, this internal-centric view does not fully address the complexity of knowledge exchange between organizations (Adelstein & Clegg, 2013). Collaboration, trust, and common goals across organizational boundaries play a vital role in improving innovation and competitiveness. However, as enterprises increasingly operate in an interconnected environment, expanding the scope of knowledge management to include cross-organizational perspectives has become key to achieving broader strategic goals.

Connotation of cross-Organizational Knowledge Management

Inter-organizational knowledge management activities have different connotations according to different perspectives.

Transaction cost perspective: From this perspective, inter-organizational knowledge management is a strategic mechanism for improving organizational performance (Holsapple & Joshi, 2002). By streamlining the flow of knowledge between entities, organizations can reduce the transaction costs associated with inter-enterprise exchanges, increase overall efficiency, and

maximize return on assets. This approach highlights the economic advantages of minimizing barriers to knowledge transfer between organizations.

Resource-based view: Many organizations face challenges in developing all necessary resources internally, so external collaboration is critical. Cross-organizational knowledge management enables enterprises to acquire and integrate key external knowledge resources and promote resource complementarity (Wang et al., 2017). By sharing and pooling diverse expertise and information, organizations can build a stronger collective resource base, thereby increasing their competitiveness.

Strategic decision-making perspective: In this context, cross-organizational cooperation is regarded as an important strategy to create value and expand market share (Gupta & Bostrom, 2006). Scholars believe that leveraging external knowledge and integrating it with internal processes can significantly improve an organization's ability to innovate and adapt. Therefore, the absorption and utilization of cross-border knowledge has become the focus of academic research.

Brown et al further elaborated that inter-organizational knowledge management involves facilitating cross-border knowledge exchange and collaboration, a process that requires overcoming barriers related to organizational structure, time and space that separate knowledge sources from practical applications (Borjigen, 2015). Inter-organizational knowledge management is therefore viewed as a strategic tool to enhance organizational learning, innovation and performance in an increasingly interconnected business environment.

Combined with the research scenarios mentioned above, it is found that there must be a wide range of connections between member companies of cross-organizations (Chung & Espinoza, 2023). However, the definition of cross-organizational knowledge management in existing research is relatively scattered, based only on a specific field, and lacks a unified expression. Based on this, this article summarizes cross-organizational knowledge management as: member organizations with certain connections integrate various knowledge resources within the organizational boundaries, realize mutual penetration and mutual influence of knowledge through various forms of cooperation, and thus systematically manage knowledge, thereby enhancing the competitive advantage of enterprises (Ramasamy & Thamaraiselvan, 2011).

Types of Cross-Organizational Knowledge Management

Academics have developed various frameworks to classify knowledge management activities to reflect its complexity and multidimensionality (Lin, 2006). One common classification outlines four basic steps: knowledge construction, internalization and integration, dissemination, and application. It can be said that this model emphasizes the sequential process from creating new knowledge to embedding it in the organization, sharing it widely, and applying it to achieve business goals (Cheng, 1994). Tiwana simplified knowledge management into three core activities: knowledge acquisition, knowledge sharing, and knowledge utilization. It can be said that these steps emphasize the basic process of collecting valuable information, disseminating it throughout the organization, and effectively using it to support decision-making and innovation (Tiwana, 2008). Further classifications expand these activities and introduce more refined distinctions, such as knowledge selection, internalization, updating, and externalization. These detailed approaches provide a comprehensive view of the various stages of knowledge management, from the initial identification of valuable knowledge to its continuous improvement and use (Serenko et al., 2010). This article adopts Pentland's classification, which is particularly applicable to cross-organizational knowledge management. His method is widely recognized in academic circles and emphasizes the importance of inter-organizational dynamics (Friesl et al., 2011). Accordingly, this paper classifies knowledge management into three key processes: knowledge acquisition, knowledge application and

integration, and knowledge transfer and sharing. It can be said that this classification reflects the basic activities required for effective collaboration across organizational boundaries and promotes knowledge flows to enhance joint innovation, strategic coordination, and competitive advantages in collaborative networks (Bai & Li, 2020).

Knowledge acquisition is often considered the first step in the innovation and knowledge management process within an organization. It involves identifying, acquiring, and integrating new information, ideas, and insights from the external environment (Chung & Espinoza, 2023). An organization's ability to effectively acquire knowledge depends largely on its ability to interact with its surroundings, including customers, suppliers, competitors, and other external stakeholders (Wang & Noe, 2010). It can be said that this external communication is essential for absorbing new information that can drive innovation, improve existing processes, and develop new products or services.

Professor Nonaka, a well-known scholar in the field of knowledge management, emphasizes that social interaction is the main channel for acquiring new knowledge. He believes that the interaction between employees and external parties promotes the exchange of ideas and information (Nonaka, 2023). Employees are the main players in this process and play a vital role in collecting and internalizing new knowledge, which can then be disseminated throughout the organization. This concept is consistent with the socialization-externalization-integration-internalization (SECI) model proposed by Professor Nonaka and Professor Takeuchi, which illustrates how organizations create, share, and utilize knowledge through continuous interaction between tacit and explicit knowledge (Nonaka, 2023).

At the organizational level, the acquisition of external knowledge can be achieved through a variety of mechanisms. First, organizations can invest in internal development projects that focus on improving the skills and knowledge of employees. This approach leverages internal resources to generate new insights (Lee & Choi, 2003). Second, organizations can seek external assistance by working with consultants, experts, or academic institutions to bring new perspectives that can stimulate innovation. Third, companies can engage in external procurement to acquire specific technologies, patents, or intellectual property to supplement their existing knowledge base (Gupta & Bostrom, 2006). Fourth, inter-enterprise cooperation through partnerships, alliances, and joint ventures can achieve shared knowledge flows and resource pools, promote mutual learning and innovation (Bennett & Gabriel, 1999). Finally, mergers and acquisitions provide a direct means of acquiring a whole set of external knowledge assets, enabling companies to rapidly enhance their capabilities (Adamides & Karacapilidis, 2005).

The knowledge acquisition process is deeply influenced by the organizational environment, and establishing a favorable environment is key to effective knowledge exchange (Nonaka, 2023). Nonaka proposed the concept of "field", which refers to a shared space or platform where knowledge creation can take place. "Field" can be physical (conference room), virtual (online collaboration platform), or spiritual (shared thinking mode), and is a common place for participants to interact, exchange ideas, and co-create knowledge (Nonaka, 2023). In this shared space, individuals can freely express their ideas, challenge existing ideas, and collaborate to generate new insights. It can be said that by creating an environment of trust and open communication, organizations can enhance their ability to acquire valuable knowledge from external sources.

Knowledge management is not a static process, but a dynamic and continuous process that involves the constant acquisition, improvement, and application of knowledge. When organizations acquire new knowledge, they must also effectively integrate it into their existing knowledge base (He & Peng, 1999). Without integration, newly acquired knowledge will remain isolated and underutilized, limiting its potential to drive innovation and competitive advantage. Knowledge integration is therefore a key aspect of the knowledge management

process that seeks to combine new insights with the existing knowledge base to facilitate seamless retrieval and application across the organization (Bhatt, 2002).

The integration process involves several steps. First, organizations need to effectively store the acquired knowledge for future use. This typically requires the establishment of a knowledge base or database to categorize, index, and maintain information (Diirr & Cappelli, 2018). With advances in information technology, organizations now have access to sophisticated knowledge management systems (KMS) that facilitate rapid knowledge storage and retrieval, improving the speed and accuracy of decision making. These systems provide a platform for capturing both explicit knowledge (recorded information) and tacit knowledge (experiential insights), enabling organizations to fully leverage their entire knowledge capital (Sargis Roussel & Deltour, 2012). Once new knowledge has been acquired and integrated, the next critical step is to apply it. Effective application of knowledge can transform it into a valuable asset that improves organizational performance (Friesl et al., 2011). Senior managers play a key role in this phase as they are responsible for identifying opportunities where new knowledge can be applied to solve problems, optimize processes, or innovate products. By embedding new knowledge into the organization's strategic and operational processes, managers can drive organizational change and improve overall competitiveness.

Knowledge application can come in various forms, such as process improvement, which is the adoption of new methods or technologies to improve efficiency; product innovation, which is the use of insights from market trends or customer feedback to develop new products; and strategic decision-making, which is the use of external knowledge about industry developments to guide long-term planning (Dunlap et al., 2013). The integration and application of new knowledge enables organizations to adapt to changing market conditions, meet customer needs, and stay ahead of competitors. For example, a company in the technology industry may gain knowledge about new software development tools by working with external companies (Zhao et al., 2013). By combining this new knowledge with existing expertise, the company can streamline its software development process, reduce time to market, and improve product quality (Al-Busaidi & Olfman, 2017). In another case, a manufacturing company may apply new knowledge gained from customer feedback to redesign its products, improve customer satisfaction, and increase market share (Boughzala & Briggs, 2012).

The concept of organizational learning is central to the knowledge application process. As new knowledge is applied and integrated into daily activities, it becomes part of organizational routines and practices, helping to form a continuous learning and improvement cycle (Zhao et al., 2013). This ongoing process not only helps organizations address immediate challenges, but also lays the foundation for long-term innovation and sustainable competitive advantage.

Organizations that achieve free flow of knowledge can usually provide products faster with lower manpower and time costs. The sharing and transfer of knowledge between organizations is the main source of innovation for organizations (Ramasamy & Thamaraiselvan, 2011). Through a series of forms of cooperation, knowledge penetration and influence can be achieved, thereby directly transferring explicit knowledge between organizations (Bhatt, 2002). Similarly, organizations can also transfer implicit knowledge through observation, dialogue and communication. Or implicit knowledge can be made explicit and integrated with the explicit knowledge of other organizations to form internal organizational knowledge, and finally the integrated organizational knowledge can be internalized into the implicit knowledge of the organization itself (Wang et al., 2017). In order to achieve knowledge interaction, member organizations can provide services for knowledge search and matching by building a virtual place - knowledge management system. Knowledge transfer is the basis of knowledge sharing, and knowledge sharing is the external manifestation of knowledge transfer (Dunlap et al., 2013). Although the transfer and sharing of knowledge is conducive to organizations gaining

competitive advantages, there are still many obstacles in real life, such as technical barriers and institutional barriers, and it is closely related to the trust mechanism between organizations.

In summary, the three types of cross-organizational knowledge management are independent of each other but closely related, complementing each other to form a cycle (Hurmelinna - Laukkanen, 2011). However, in existing research, the division between different types of inter-organizational knowledge management is still relatively vague, and there is no accurate and clear explanation of the differences and internal connections between them. At the same time, there are still many gaps in the measurement of inter-organizational knowledge management (Sargis Roussel & Deltour, 2012). Therefore, this article hopes that there will be more further research on the types and relationships of inter-organizational knowledge management in the future, and to establish an effective measurement method for this system.

Discussion

Looking at the existing literature, there are many factors affecting cross-organizational knowledge management. At present, scholars mainly focus on obstacles (Kasper et al., 2008). Compared with knowledge management activities within an organization, cross-organizational knowledge management presents complex and diverse characteristics. If an organization wants to manage knowledge inside and outside the organization more effectively, it must overcome the organizational, temporal and spatial obstacles caused by the separation of knowledge sources and knowledge applications (Laureano Paiva et al., 2012). Lack of trust, lack of responsibility, excessive obsession with organizational boundaries, complexity of cooperative projects and cultural differences are the most common obstacles to successfully building a cross-organizational connection network. Bennett et al. believe that there are five obstacles to cross-organizational knowledge management: culture, organizational structure, organizational scale, environment and knowledge management methods (Ramasamy & Thamaraiselvan, 2011). Lee et al. also proposed that in the organizational environment of cross-organizational knowledge management, organizational culture, organizational system and personnel changes are important obstacles (Lee & Choi, 2003). Based on Bennett, Liu Xiaomei et al. found through empirical research that culture and protection of knowledge and technology are the most important obstacles to the implementation of cross-organizational knowledge management (Adelstein & Clegg, 2013).

Creating a cultural atmosphere that encourages knowledge sharing is the basis for effective cross-organizational knowledge management (Kasper et al., 2008). Language communication barriers and differences between different cultures hinder the flow and sharing of knowledge. Member organizations may become competitors, so people within the organization may have doubts about whether information and knowledge are shared due to xenophobia and other artificial barriers (Dunlap et al., 2013). In general, organizations tend to implement strict confidentiality measures for organizational knowledge and are unwilling to share important information among member organizations. They generally only provide the little information they must know (Boughzala & Briggs, 2012).

Some scholars analyze the obstacles from the perspective of cost-benefit and believe that there are many obstacles to the transfer and exchange of knowledge through cross-organizational knowledge management activities, and cost is the most important factor hindering such behavior (Dong & Chen, 2007). When the market mechanism lacks efficiency, transaction costs will increase significantly. Especially when it comes to the organization's own technology and capabilities, the organization that provides information is often unwilling to share its truly valuable knowledge. The greater the cost of participating in cross-organizational knowledge management activities, the lower the organization's enthusiasm will be. Only when the expected benefits are greater than the costs will the organization be willing to participate.

Incentive Mechanism for Cross-Organizational Knowledge Management

To form a stable and lasting inter-organizational relationship, it is necessary to overcome the above obstacles and establish an effective incentive mechanism to promote knowledge sharing and transfer between member organizations. The behavior of inter-organizational knowledge management is essentially a "double-edged sword". While it brings economic benefits to the organization, it may also bring serious consequences to the organization. When conducting inter-organizational knowledge management activities, member organizations may face consequences such as the loss of intellectual property rights and the leakage of trade secrets. Therefore, some scholars have proposed that establishing a complete knowledge protection mechanism is a prerequisite for inter-organizational knowledge management. Through legal channels, confidentiality clauses signed by both parties and other knowledge protection activities, the knowledge between organizations is protected, and a complete protection mechanism is established to encourage organizations to truly share and transfer valuable knowledge.

Most scholars discuss the establishment of incentive mechanisms from within the organization. Zhou Min et al. proposed that satisfying the internal needs of employees within the organization is the core of successful inter-organizational knowledge sharing and transfer, and the driving force behind employees' cross-organizational knowledge sharing behavior comes from the exploration of their own potential and the sense of achievement of self-satisfaction (Zhou & Li, 2007). Therefore, the key to establishing an incentive mechanism for cross-organizational knowledge management is to meet the higher-level needs of employees within the organization as much as possible (Maas et al., 2016). Liu Xiaomei et al., starting from the external incentive means for organizational employees, conducted empirical analysis from the perspective of economics and game theory, and found that establishing an incentive mechanism based on fair compensation is an indispensable factor for the successful realization of cross-organizational knowledge sharing (Liu, 2008). On this basis, Liu Bingfeng et al. summarized the above factors as inducing factors for cross-organizational knowledge sharing, that is, employees can take actions that meet the expectations of the organization under cross-organizational knowledge sharing behavior (Liu et al., 2008).

In other words, employees participate in cross-organizational sharing because this behavior can provide employees with various rewards, including economic rewards and non-economic rewards, and these rewards become the inducement factors for this behavior. Organizational culture, as a value formed within an organization for a long time, has penetrated into all aspects of organizational activities, thereby subtly influencing the behavior of organizational members (Sammorra & Biggiero, 2008). When the cross-organizational knowledge management activities carried out by an organization match the culture within the organization, it will have an incentive effect on employees (Kersiene & Savaneviciene, 2006). Senior executives are very important in the cultivation of organizational culture. For this reason, senior executives need to establish corresponding institutional measures and implement them at all levels of the organization.

Relationship between Inter-Organizational Knowledge Management and Organizational Innovation Performance

Innovation is a process of generating new knowledge and obtaining benefits, including different levels of knowledge management activities (Zhang & Zhu, 2009). Innovation performance is an evaluation index for the efficiency and effectiveness of innovation activities. Scholars have explored the relationship between cross-organizational knowledge management activities and innovation performance from different dimensions. Some scholars have conducted research on the relationship between knowledge acquisition and organizational innovation performance (Chung & Espinoza, 2023). Through empirical research, Yli-Renko et

al. found that acquiring knowledge from cooperative enterprises can increase the depth and breadth of the company's own knowledge, and affect the development of new products in terms of accelerating the launch process and reducing product costs, and further affects the tangible performance of new products (Yang, 2005). Simonin et al. believe that the knowledge gained from cooperative enterprises is related to the the tangible performance and intangible performance of the industry are closely related. Smith's research found that knowledge acquisition improves the innovation capabilities of enterprises and affects the efficiency of enterprises in launching new products (Claver - Cortés et al., 2007). Tidd pointed out that knowledge acquisition reduces the cost and risk of technology and market development, and technology is the driving force for enterprises to conduct research and innovation (Sammarrá & Biggiro, 2008). Knowledge acquisition can significantly promote the improvement of enterprise innovation performance. From the perspective of knowledge application integration, Yang believes that knowledge application plays an important role in the process of organizational innovation (Al-Busaidi & Olfman, 2017). Cheng Zhong is an indispensable character and if the new knowledge acquired by the organization cannot be integrated with the original knowledge, the value of the knowledge cannot be exerted, resulting in a waste of knowledge. Starting from the process of new product development (Dong & Chen, 2007), Lynn et al. pointed out through empirical research that knowledge application integration has an important impact on the sales volume, market share and profits of new products (Lynn et al., 2000).

Conclusion

Existing scholars' research on knowledge management has gradually shifted from within organizations to between organizations, but there are still many gaps in the research on cross-organizational knowledge management. Therefore, this paper analyzes the shortcomings of existing research fields to clarify the development direction of future research.

The first is a clear definition of concepts and dimensions. Although the concept of cross-organizational knowledge management has been widely used in the field of strategic management, as of now, the theoretical community has not reached a consensus on the definition of cross-organizational knowledge management, and a definition of cross-organizational knowledge management that can be generally recognized by the academic community has not yet appeared (Yang, 2005). Generally speaking, to clearly and accurately define the concept, it is usually necessary to conduct empirical research based on big data samples, but at present, most domestic scholars define the connotation of cross-organizational knowledge management from the perspective of logical deduction, while foreign scholars use big data empirical methods more rigorously to define its connotation and dimensions (Lynn et al., 2000). The unclear definition of concepts and dimensions by different scholars also leads to differences in related research results. Therefore, in the future, we should use methods such as logical deduction and big data empirical research to make the concept and dimension of cross-organizational knowledge management clearer and more accurate (Ramasamy & Thamaraiselvan, 2011).

The second is to explore the role of boundaries. Cross-organizational knowledge management includes the transfer and sharing of knowledge between member organizations (Claver - Cortés et al., 2007). The boundary between the two parties often plays an important role because it can be an obstacle or a facilitator in the process of knowledge transfer. The concept of organizational boundaries occupies an important position in the early management literature, but the research on inter-organizational knowledge management rarely explicitly considers the nature of the boundaries (Kersiene & Savaneviciene, 2006). Boundaries can be divided into organizational boundaries, national boundaries and industrial cluster boundaries. Although scholars generally encourage knowledge sharing between organizational units to

enhance the innovation capabilities of enterprises, when an organization conducts joint activities with other organizations, it is more worried about its own weakening capabilities and protects its own knowledge (Samarra & Biggiero, 2008). Therefore, compared with the boundaries between organizations, the boundaries between units within an organization are more permeable to the sharing and transfer of knowledge (White & Lutters, 2007). When knowledge management activities involve the joint participation of enterprises in multiple countries, its mechanism may be more complicated because it involves different cultures that affect how people process, interpret and use knowledge.

In addition, cultural misunderstandings affect the acquisition of knowledge by local cooperative organizations, and geographical distance can also affect knowledge management activities between organizations (Shang et al., 2023). Within the borders of a country, enterprises may operate near other interconnected enterprises, which together form an industrial cluster (Maas et al., 2016). The social network developed in the cluster promotes the dissemination of knowledge (Liu et al., 2008). Some scholars have found that geographical proximity within industrial clusters provides opportunities for enterprises to communicate and create complex forms of knowledge (Kersiene & Savaneviciene, 2006). The learning process that occurs in industrial clusters produces local expertise that exceeds the boundaries of the enterprise but remains within the spatial boundaries of the cluster. In this regard, Simonin et al. boldly assumed that the knowledge transfer model is different in industrial clusters. In other words, the boundaries of the cluster mark the division of different modes of knowledge transfer between organizations which means that researchers may need to determine the location of the boundaries and be cautious when generalizing the research results beyond the boundaries (Samarra & Biggiero, 2008). Therefore, the focus of future research needs to pay clear attention to the location of different boundaries and focus on how to manage knowledge through boundaries, rather than simply using boundaries as dividing lines between existing units (Maas et al., 2016).

Third, integrate different related factors and currently most academics are studying the obstacles to cross-organizational knowledge management (Zhang & Zhu, 2009). However, in fact, the power relations, trust and risks, structural mechanisms within the organization, as well as the complex environment and social connections outside the organization will have different degrees of impact on cross-organizational knowledge management, and most scholars' research is limited to a specific factor (Serdynskiy, 2020). In reality, although integrating different factors increases the complexity of research design and the difficulty of practice, it can provide insights into the interactive effects of various factors on cross-organizational knowledge management from different levels, providing a new focus for future academic research (Tang & Huang, 2004).

Fourth, broaden the application scenarios of incentive mechanisms in cross-organizational knowledge management. Existing studies mainly focus on for-profit enterprises, and naturally ignore non-profit organizations and third-party organizations in social and economic organizations (Xu et al., 2016). These two types of organizations have different goals, strategies, and requirements for knowledge management, and their organizational culture, organizational environment, and organizational characteristics will also be quite different (Al-Busaidi & Olfman, 2017). Therefore, when generalizing the conclusions to different types of organizations, its suitability and universality need to be considered. In future research, it is necessary to further refine organizational classification and conduct research in different categories to reveal the relationship between the unique cross-organizational knowledge management laws and incentive mechanisms in different application scenarios (Lynn et al., 2000).

Fifth, combining the different characteristics of innovation, we will explore the relationship between cross-organizational knowledge management and innovation performance

(Serdynskiy, 2020). Cross-organizational knowledge is a diverse, complex and extensive concept (Shang et al., 2023). Similarly, innovation, as an important topic that has been deeply explored by scholars from all walks of life, is extremely complex and dynamic, involving all aspects of organizational activities (Diirr & Cappelli, 2018). To thoroughly clarify the relationship between cross-organizational knowledge management and innovation performance, it is far from enough to only start from different dimensions of knowledge, and the conclusions drawn may be one-sided and arbitrary (Liu et al., 2008). Different knowledge management activities act on organizations and reflect innovation performance through products, processes, management and other aspects. Starting from different dimensions of cross-organizational knowledge management, combined with the inherent characteristics of innovation, we will explore the relationship with innovation performance, and the research conclusions obtained will be more convincing and practical (Simonin, 2004).

Finally, the relationship between cross-organizational and intra-organizational knowledge management (van Wijk et al., 2008). More and more studies have shown that the knowledge management mechanisms of cross-organizational and intra-organizational knowledge management are different, and cross-organizational knowledge management is more difficult than intra-organizational knowledge management (van Wijk et al., 2008). As pointed out by Van Wijk et al., national cultural differences have a more obvious impact on the internal organization; while the power issue of cross-organizational knowledge management is more prominent (van Wijk et al., 2008). However, there are differences between the two, but there are also potential connections. Most organizations have horizontal and different levels of internal boundaries (Diirr & Cappelli, 2018). The information flow within the organization is mainly vertical, while the information flow between organizations is mainly horizontal (Lu & Jin, 2008). If the knowledge obtained from the outside cannot reach the appropriate internal decision-making group, it is impossible to obtain the corresponding competitive advantage through this knowledge (Ni & Zhang, 2015). Therefore, in order to have a more comprehensive understanding of knowledge management, in the future, we can consider studying the knowledge information flow inside and outside the enterprise from the perspective of the enterprise hierarchy structure, and on this basis explore the connection and difference between the two, so as to open the black box between knowledge management and organizational performance.

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Developing Effective Talent Management Policies: An Analysis of Talent Introduction and loss in Chinese Public Hospitals with a Case Study of Hospital C

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Abstract

Hospitals are talent-intensive organisations, and talent is the core competitiveness of hospitals because he determines the level of medical care in a hospital. The hospital's talent policy plays an important role in the change of the number of talents, but few hospitals go to evaluate the effectiveness of the hospital's talent policy. This paper takes hospital C as an example, and tries to analyse whether the talent policy of hospital C is effective from three aspects, namely, talent introduction, talent loss and talent target. Analyse the factors affecting the hospital talent policy, and use relevant theories to analyse the deep-seated reasons. Finally, the strategy to develop effective talent policy is given. Although the hospital's talent training has also increased the number of talents in the hospital, but whether they will be lost is also affected by the talent policy, so this paper only focuses on the policy of talent introduction and in-service talent policy.

Keywords: hospital, talent introduction, talent loss.

Introduction

Public hospitals are hospitals directly managed by the government. In recent years, the government pays great attention to the introduction of talents in hospitals and has set the index of the number of talents introduced for the annual assessment of public hospitals, and the results of the assessment affect the approval of the total amount of wages of hospitals in the next year. High-level Talent Introduction Programme' was revised to achieve the talent goal and released to the society to introduce talents to work in Hospital C in order to complete the assessment targets of the higher government departments and promote the development of the hospital at the same time. It is now necessary to analyse whether the existing talent policy is working effectively, in order to revise and improve the talent policy so that it can better meet the requirements of government departments. The issue of talent is the core of public hospital management, people are the most basic, revolutionary and active elements of the productive forces, and the quality of human beings determines the level of advanced productivity[1].

Sustainable Development Goal 3 (SDG 3): Good Health and Well-being focuses on ensuring healthy lives and promoting well-being for all at all ages.SDG 3 has 13 specific targets and 4 means of implementation.End Preventable Deaths of Newborns and Children (3.2):Reduce neonatal mortality to at least as low as 12 per 1,000 live births.Reduce under-five mortality to at least as low as 25 per 1,000 live births[2].Hospital C is the only tertiary specialised children's hospital in the province and is located in an underdeveloped frontier

province, which is in urgent need of medical talents to upgrade the hospital's medical standard, which is also in line with SDG 3 requirements.

Hospital C The largest and best specialised children's hospital in the province and is located in an underdeveloped frontier province, which is in urgent need of medical talents to upgrade the hospital's medical standard, saving more children's lives which is also in line with SDG 3 and meet the government's requirements.

Related Concepts

Introduction of Talent

In this paper, talent introduction is defined as the introduction of personnel with doctoral degree or deputy senior and above title to work in the unit in accordance with the hospital's talent introduction policy, and to give relevant treatment.

Talent Loss

This paper defines the talent loss as the phenomenon of personnel who can work independently in the unit, and who can hold their own in a certain area, with outstanding performance, with a doctoral degree or with a deputy senior and above, leaving the hospital due to their personal wishes.

Managing Talent

Managing talent, for these authors, requires doing what HR has always done but doing it faster (via the internet or outsourcing) or across the enterprise (rather than within a department or function)[3]. In this paper, Managing talent is categorised into talent acquisition and talent retention.

Public Hospital Posts

Professional and Technical Positions

It is obtained through job competition after obtaining the appropriate level of title certificate. In hospitals, they are mainly health care workers. Full senior posts (Level 1, 2, 3, 4), deputy senior posts (Level 5, 6, 7), intermediate posts (Level 8, 9, 10), and Junior positions (Level 11, 12, 13).

Administrative Position Level

Hospital leaders: positions are selected by the higher government departments to assess and select, such as the president, vice president.

Middle-level cadres: obtained by competitive selection within the hospital, such as department director, deputy director, head nurse, deputy head nurse.

Ordinary staff: such as doctors, nurses.

China Hospital Grade

Hospital grade classification standard, is China's hospital qualification assessment indicators based on hospital size, research direction, human resources and technical strength, medical hardware and equipment. It is uniform throughout the country, regardless of the background of the hospital, the nature of ownership, etc. In accordance with the Hospital Classification and Management Standards, hospitals are assessed and determined to be of three levels, each of which is further divided into three classes: A, B and C. Among them, special classes are added to the three levels of hospitals, so that hospitals are divided into three levels and ten classes in total[4]. The Interim Measures for Hospital Accreditation, issued by the National Health and Wellness Commission in 2011, clearly stipulates that the conclusions of

hospital accreditation at all levels are classified as Grade A, Grade B, or unqualified, and that the 'three levels and ten grades' classification standard is no longer applied[5].

Hospital Ownership

Public Hospitals

Public hospitals are hospitals (including government-run hospitals) whose economic type is state-owned and collectively-run [6]. It can also be understood as state-run. There are four levels of hospitals, Level 1 being community hospitals, Level 2 being county (district) hospitals, Level 3 being municipal hospitals, and 4 being provincial hospitals. Public hospitals are the mainstay of China's healthcare delivery system.

Private Hospitals

Private hospitals are hospitals that are not publicly run by the government and are private in nature. Most of the private hospitals are run by socially-funded, for-profit organisations; a few are non-profit organisations that receive government subsidies. Private hospitals are a powerful complement to public hospitals.

Hospital C Overview

Hospital C is the only Level 3A children's specialist public hospital in the province where it is located. The hospital covers all paediatric subspecialties except obstetrics. The hospital covers a total area of 126 acres and has 1,352 beds. The total number of outpatient and A&E visits in 2023 reached approximately 2.3 million. The hospital has a total of 2005 employees, including 17 doctoral students and 354 master's degree students, 80 senior titles and 176 deputy senior titles, and 71 departments, including 39 clinical departments, 8 medical and technical departments, and 24 functional departments.

Research Methods

Literature Research Method

I read the relevant literature and theories on health professional and technical talents, talent introduction, talent loss, etc. through the database of USM library, Google Scholar and CNKI, collected the talent introduction policies used in Hospital C in the past 5 years, and collected the data on the introduction of talents and talent loss in Hospital C from 2020 to 2024.

Interview Method

Interviews are conducted with the existing talents of Hospital C and the outflow talents of the hospital to understand their personal needs, outflow destination, and the positions employed in the new hospital.

Comparison Method

Compare the old and new talent introduction policies of Hospital C, compare the introduction of talent and talent loss, compare the gap between talent retention and the 14th Five-Year Plan, and compare the gap between the number of senior positions and the number of qualified personnel.

Introduction of Talents in Hospital C

Talent Acquisition Programme

The introduction of talent (i.e., recruitment, acquisition, and integration) must be carefully designed and aligned with organizational objectives. This includes identifying key roles, attracting top candidates, and ensuring new hires fit with the company's culture and strategic needs[7].

July 2019 Develop and publicly release the Programme for the Introduction of High-level Talents in Hospital C. The key elements of which are shown in (Table 1).

Table 1. Major Project Costs for the High Level Talent Introduction Programme, 2019

Level	Degree	Title	Academic Committee Appointment	Settlement fee(RMB)	Scientific Research Fund(RMB)
1	Doctor	Senior	Chairman of Provincial Academic Committee	1,000,000	450,000
2	Doctor	Senior	No need.	600,000	450,000
3	Doctor	Associate	No need.	500,000	300,000
4	Doctor	Intermediate	No need.	300,000	150,000
5	Doctor	Junior	No need.	200,000	150,000

Source: Hospital C

April 2024 Develop and publicly release the Implementation Programme for the Introduction of High-level Talents and Teams in Hospital C (Trial). The key elements of which are shown in (Table 2).

Comparing The Two Talent Introduction Programmes

Advantages of the 2019 programme: simple, easy to operate, reduces the examination and assessment of different conditions of the introduction target. Disadvantages: stereotypical, can only introduce doctoral degrees, there is no detailed distinction for talents with different conditions.

Advantages of the 2024 programme: more specific, there is a clear distinction between the various levels of talent, a wider range of settlement fees, research fees, in line with the hospital's development of the new period of high-level talent needs, doctoral degree is no longer a mandatory condition, the introduction of talent is more diversified. Disadvantages: It takes a long time to use the programme to assess all aspects of the target candidates against the various conditions of the target candidates.

The old and new Talent Introduction Programmes are consistent in terms of fees for people with the same job title and the same academic qualifications, and the new programme is an inheritance and improvement of the old one. As the 2024 Talent Acquisition Policy is a revision and improvement of the 2019 Talent Acquisition Policy, the old and new Talent Acquisition Policies have greater consistency in the division of levels and the use of amounts, and are therefore collectively referred to as the Hospital C Talent Acquisition Programme.

Existing Talent Policy of the Hospital C

Hospital C employees who obtain a master's degree are reimbursed 50 per cent of tuition fees, awarded RMB 1,000 and paid a monthly RMB 200 master's allowance. Employees obtaining a doctorate degree are rewarded RMB 2,000, reimbursed 80% of tuition fees, and paid a monthly allowance of RMB 800 for doctorate degree. Employees are adjusted upward in accordance with the hospital's salary policy upon title and position advancement.

In terms of treatment, the policy given to the existing talents of the hospital is significantly lower than the policy given to the imported talents.

Table 2. Schedule of Major Project Costs For The 2014 High-Level Talent Acquisition Programme

Level	Degree	Title	Have one of the following conditions	Settlement fee(RMB)	Scientific Research Fund (RMB)
1	No requirement	Senior	1. Undertaking one or more key projects of the National Natural Science Foundation of China; 2. Chairman of the professional group of the relevant speciality branch of the Chinese Medical Association; 3. Supervisor of Ph;4. Chairperson of relevant speciality of provincial medical association...	2,000,000	1,000,000
2	Doctor	Senior	1. Supervisor of master's degree students; 2. Vice-chairman of relevant specialties of provincial medical association; 3. Ranked 1st in the second prize of provincial science and technology award; 4. Winner of the third prize of provincial professional and technical talents with outstanding contribution...	1,200,000	600,000
3	Doctor	No need.	1. Associate senior title; 2. Provincial 'Xing Dian Ying Cai Talent Support Programme Famous Doctor Special' selected; 3. The first author or corresponding author of one or more academic papers published in the journals...	500,000	300,000
4	Doctor	No need.	The introduction of high-level talents and teams by the hospital leading group identified as the hospital's urgent need, shortage of talent, can independently undertake medical teaching and research work.	300,000	200,000
5	Not have	No need.	The hospital's high-level talent and team introduction work leading group identified as the hospital's urgent need, shortage of high-end talent.	≤300,000	≤200,000

Source:Hospital C

Effectiveness of Implementation Introduction of Talent

According to (Table 3), since 2020 to 2024, a total of talent introduced 7 people, the introduction of the number of people showed a year-on-year reduction in the end of November 2024, the total number of talent reached 17 people, from the C hospital fourteen five talent to reach the target of 34 people difference of 17 people, take the maximum number of talent introduced in the last 5 years 3 people, the end of 2025, the total number of talent can reach 20 people, from the fourteen five target is still Difference of 10 people, talent accounted for the number of all employees than did not continue to improve the hospital staff structure has not been optimised, so the C hospital talent programme did not achieve the effect of achieving the talent development goals, affecting the overall development of the hospital.

Table 3. 2020-2024 Changes in Talents

Year	Number of Talents Introduced	Talent outflow	Number of Talent Changes	Number of talents at the end of the year	Total number of hospital staff	Percentage of talents
	A	B	A-B	D	E	D/E
2020	3	2	1	12	1860	0.65%
2021	2	1	1	17	1915	0.89%
2022	1	2	-1	16	1954	0.82%
2023	1	2	-1	17	1959	0.87%
2024	0	0	0	17	2005	0.85%
total	7	7	0	17	2005	0.85%
2025 (Fourteenth Five-Year Target)	un-	un-	un-	34	2050	1.66%

Note: The number of talents in the following year is not equal to the number of talents in the previous year plus the number of people brought in minus the number of people leaving the hospital because it is affected by the number of retirements and the number of talents trained by the hospital.

Source: Hospital C

Talent Loss Situation

From (Table 4), it can be seen that from 2020 to 2024, the total number of talent outflow is 7, and after tracking survey to form the 'Talent Loss Destination Table', it is divided into 3 categories according to the different transfer units:

The first category, into a higher level of hospitals, 2 people from municipal hospitals into provincial hospitals, 1 person's position did not change, 1 person's position was promoted to department head.

In the second category, entering the same level of municipal hospitals, 4 people entered other municipal hospitals in the province from municipal hospitals, and all 4 people's positions were promoted to department heads.

In the third category, entry into a lower-level hospital, one person entered a county hospital from a municipal hospital, and his position was promoted to hospital director, the highest position among the outflow.

Brain drain cancels out the gains of brain gain: Loss of talent has a counteracting effect on the introduction of talent. Because on the one hand, hospital C spends a lot of money to introduce talents, on the one hand, hospital C spends a lot of money and time to train the talents lost. In the case of the number of hospital talent remains unchanged hospitals pay twice as much as the cost of talent, so it is ineffective introduction of talent.

Table 4. 2020-2014 Brain Drain

No.	name	Degree	Type	Title	Age	Length of stay	Next hospital ownership	Hospital level	Administrative duties	Administrative positions in new units
1	S**	doctoral	doctor	Intermediate title	39	2	public	provincial	none	none
2	W**	master	doctor	Senior Title	42	14	public	municipal	none	department head
3	S*	master	doctor	Associate title	47	12	public	municipal	none	department head
4	W**	doctoral	doctor	Associate title	39	1	public	county (district)	none	hospital director
5	Z*	doctoral	pharmacist	Senior Title	46	11	public	provincial	none	department head
6	C*	master	doctor	Associate title	41	11	public	municipal	none	department head
7	F*	master	doctor	Associate title	48	15	public	municipal	none	department head

Source: Hospital C

Analysis of The Causes of Brain Drain

Analysed Using Maslow's Hierarchy of Needs Theory

Maslow's Hierarchy of Needs is a psychological theory proposed by Abraham Maslow in 1943, which outlines a five-tier model of human needs arranged in a pyramid. The levels represent the stages of human motivation, starting from the most basic needs to higher-level psychological and self-fulfillment needs.

Here's a summary of the five levels:

Physiological Needs: These are the most basic human survival needs, including food, water, warmth, rest, and other vital bodily requirements.

Safety Needs: Once physiological needs are met, individuals seek safety and security. This includes physical safety, financial security, health, and well-being.

Love and Belongingness Needs: After safety needs are satisfied, social needs become important. This level involves emotional relationships, friendships, intimacy, and family connections.

Esteem Needs: Esteem needs include the desire for respect, self-esteem, status, recognition, and a sense of accomplishment. This level can be divided into self-esteem and esteem from others.

Self-Actualization Needs: This is the highest level, where individuals seek personal growth, fulfillment, and realizing their potential. It involves creativity, problem-solving, and pursuing personal goals.

Maslow suggested that individuals must satisfy lower-level needs before they can attend to higher-level needs. Understanding this hierarchy can help in various fields such as psychology, education, and management by highlighting what motivates individuals at different stages[8].

Physiological needs, safety needs and social needs have been satisfied for the high-level talents in Hospital C. They need more respect and self-realisation. The talents in Hospital C's own hospital are the ordinary workers who become talents through learning and medical practice by continuously improving their academic qualifications, titles, and medical levels. As they grow, their low-level needs are constantly being satisfied, and the high-level needs are constantly increasing, and it is when their own high-level needs cannot be satisfied in their own units, it is higher administrative positions and higher-level hospitals that will give them more respect, because new units and positions will give them more resources at their disposal, which will be conducive to the realisation of their self-worth.

Most of the personnel lost in Hospital C have been working in the hospital for more than 11 years, with considerable working clinical experience, higher titles and academic qualifications. What they need is respect and self-fulfilment, not to be an ordinary junior doctor or nurse all the time, but the scarcity of senior professional and technical posts and middle-level administrative posts in the hospital is unable to meet their needs.

There is an imbalance in the professional and technical posts in Hospital C. However, this is set up uniformly and proportionally by the higher government departments, and public hospitals are not allowed to make adjustments on their own. For example, Grade 4, Grade 7, Grade 10, respectively, is the lowest level of the senior, deputy senior, intermediate, the annual competition is very large, often in a saturated state, by (Table 5) can be seen, 48 people were not appointed to the Grade 4 post, 39 people were not appointed to the Grade 7 post, and 57 people were not appointed to the Grade 10 post, of which the Grade 4 and Grade 7 are senior positions. Resulting in a lot of people although the corresponding title but due to the position is very limited and competition is very big and many years can not be appointed to the post corresponding to the title, if there are other hospitals promise to give appointment to the relevant position is very easy to shake, just as the C hospitals talent cited by the introduction of the introduction of the unit will be asked to introduce the level of the certificate of associate title for its appointment to the deputy high position as its introduction conditions. The reason is officially due to its original unit due to the scarcity of jobs it can not be appointed to the original unit to the deputy high position, and choose to other hospitals.

Professional and technical personnel in public hospitals are evaluated and employed separately, and employees need to be appointed to the corresponding positions after obtaining the title certificate in order to be able to count the time of performance, and the time of performance will be used as a condition for the declaration of more senior titles. As a result of the inability to successfully post promotion, and thus affect the title promotion of professional and technical staff of the institution. Continuous development and expansion of the hospital will be based on more branches of the disease or patient needs to develop and set up subdivided departments, thus increasing the demand for departmental cadres. When the growth of young health technicians themselves has reached a certain height, such as with health technology associate senior and above, strong business ability to independently complete diagnosis and treatment and surgery, with considerable talent honour, have to undertake more responsibilities, due to the lack of corresponding positions, prone to brain drain. The government talent introduction in the introduction of personnel can be appointed in accordance with the acquisition of the title level, so the introduction of talent to other hospitals can be directly appointed to the corresponding post level, even if the level of the post has been appointed to the full, can be over-appointed, and the hospital staff can only wait until the post is available in order to compete for the post with other qualified personnel.

Table 5. 2024 Statistics on Appointments to Professional and Technical Positions

Professional and Technical Positions	Level	Number of approvals	Number of appointments	vacant post	eligible persons	Eligible but not appointed
	A	B	C	B-C	E	E-C
Senior Title	Level 1	0	0	0	unavailable	unavailable
	Level 2	0	0	0	unavailable	unavailable
	Level 3	13	12	1	unavailable	unavailable
	Level 4	25	21	4	unavailable	unavailable
	total	38	33	5	81	48
Associate title	Level 5	25	22	3	unavailable	unavailable
	Level 6	50	50	0	unavailable	unavailable
	Level 7	50	48	2	unavailable	unavailable
	total	125	120	5	159	39
Intermediate title	Level 8	88	58	30	unavailable	unavailable
	Level 9	106	84	22	unavailable	unavailable
	Level 10	88	85	3	unavailable	unavailable
	total	283	227	56	281	57
Junior title	Level 11	91	66	unlimited	unlimited	unlimited
	Level 12	91	111	unlimited	unlimited	unlimited
	Level 13	0	20	unlimited	unlimited	unlimited

Note: Only hospital staff are involved, and non staff employees have been appointed to corresponding positions according to their professional title certificates.

Source:Hospital C

Analysed Using Social Comparison Theory

Leon Festinger's Social Comparison Theory (1954) is a psychological framework that explains how and why people evaluate themselves by comparing themselves to others. According to Festinger, individuals have an inherent drive to assess their own abilities, opinions, and social standing, and one of the primary ways to do this is through comparison with others. This process of social comparison is crucial for self-understanding and self-evaluation, and it shapes how people perceive themselves and their place in the world.

Key Components of Festinger's Social Comparison Theory

The Need for Self-Evaluation: Festinger argued that people have an intrinsic need to evaluate their own abilities and opinions. Since there is no objective yardstick for many personal traits (like intelligence, attractiveness, or social competence), individuals rely on others as a reference point to understand where they stand.

Social Comparison: Festinger posited that people do not just evaluate themselves in isolation. They look to others to make judgments about their own attributes. For example, if someone wants to gauge how good they are at a particular skill, they might compare themselves to others who possess the same skill. These comparisons help individuals form a more accurate picture of their own abilities.

Comparison with Similar Others: Festinger suggested that people are more likely to compare themselves to individuals who are similar to them in relevant ways (e.g., similar age, interests, background, or abilities). Comparing with similar others is more informative, because these individuals provide a more accurate gauge for self-evaluation[9].

According to this theory: the degree of satisfaction of employees with their income can influence their motivation to work, and that satisfaction depends on a social comparison process, in which a person cares not only about the amount of his or her absolute income, but also about the amount of his or her relative income. Each person will make social comparisons of his own labour and the remuneration he receives with that of others, and also make historical comparisons of his present labour and the remuneration he receives with that he received in the

past. The individual worker needs to maintain a sense of distributive fairness, and if, when he finds that the proportion of his own income and expenditure is equal to the proportion of others', or that the proportion of his present income and expenditure is equal to that of the If he finds that the proportion of his income and expenditure is equal to that of others, or that the proportion of his present income and expenditure is unequal to that of the past, he will think that it is fair and reasonable, and thus be in a good mood and work hard. If he finds that the proportion of his income and expenditure is unequal to that of others, or that the proportion of his present income and expenditure is unequal to that of the past, he will have a sense of unfairness and internal dissatisfaction, and his work motivation will be lowered accordingly. Overseas, based on the basic viewpoints of equity theory, enterprises take various measures, such as paying bonuses separately and secretly, in an effort to create a subjective sense of fairness among employees, thereby mobilising their motivation[10].

Through the interview with the talent of Hospital C, it is understood that his hospital talent will be compared with their colleagues, classmates and other people with the same conditions in the unified industry on the salary and position. When found under the same conditions of other people to get higher treatment, higher positions will produce a sense of unfairness, which will make him produce to find the fairness of the motivation, when the hospital can not achieve its fairness, other units to carry out the talent has been promised to provide higher treatment, position, there may be the outflow of talent.

Hospital C has not had a department head selection process since 2017 until November 2024, and the Gastroenterology, Outpatient Clinic, and Traditional Chinese Medicine departments have been temporarily replaced by nurse practitioners or senior doctors due to the retirement of their department heads. Those who are already in the post of department head may slacken off due to the lack of competition for a long time and may no longer be a qualified department head, but they can still not be replaced. Clinical department chairs are medical specialists, the same as those with advanced degrees and titles. During the seven years in which there was no department head selection there were constantly employees who grew to become medical professionals but could not be promoted to the position of department head, leading to a strong sense of unfairness. When other hospitals are able to offer the relevant treatment and the post of department head, it is very likely that they will leave the hospital to take up employment in other hospitals. The introduction of talents has a certain extrusion effect on the talents of this unit, when the talents in the hospital see that people with the same conditions as their own through the introduction of talents to obtain higher treatment and positions than their own, it will produce a sense of unfairness, and when encountered with other units that have the opportunity of the introduction of talents and can provide higher treatment or positions may be a loss of talents.

Hospital Talent Work Strategy

Developing More Attractive Talent Introduction Policy

Understand the specific personal needs of the target of the introduction of talent, grasp the level of their needs in Maslow's needs analysis, targeted development of personalised talent needs to meet their needs.

Compare the talent introduction policy of hospitals of the same level in the same region, and formulate a more competitive talent introduction policy in the same level in the region, so as to prevent the risk of talent loss when they find that other hospitals offer higher treatment or positions after joining the hospital, which will create a sense of unfairness when they make comparisons.

Concentrate funds on the introduction of talents that hospitals really need.

Increase the added value of providing housing, children's schooling, family resettlement and so on;

Provide quantifiable development route plans for the imported talents, with specific timeframes and clear, achievable conditions.

Homogenisation of Hospital Talent Management

Hospitals should develop a homogenisation of the management of talent, through the introduction of talent channels into the hospital talent and the hospital with the same conditions of talent to enjoy the basic treatment, so that the hospital personnel will not produce a sense of unfairness.

Our hospital talent is easy to compare with the introduction of talent, under the same conditions and the introduction of talent should be given the same treatment, personal development space. Avoid due to the introduction of talent treatment, job higher than the hospital talent caused by the sense of unfairness and leave the hospital. The same newly introduced talents if found, with the newly introduced talents into the old staff, and after its newly introduced talents than their own high treatment, will also produce the same unfair psychology. Therefore, to save the new and old talent treatment with consistency. Don't let the new talent block the old talent after the promotion, otherwise the old talent will become the new talent of other hospitals, then the introduction of talent will fail.

Standardise the talent selection system in hospitals, establish a sound competition mechanism, encourage staff to take up their posts through legitimate competition, and conduct regular talent assessment in a manner that is open, transparent and subject to staff supervision, so as to prevent people who are not talented or who do not act from occupying important posts for a long time. Selected talents will be assigned to higher and more important positions in accordance with their expertise and needs, so as to enhance their motivation and promote the continuous development of departments and disciplines.

Optimising the setting of professional and technical posts in hospitals, increasing the proportion of senior posts, making full use of the number of professional and technical posts in hospitals, and improving the efficiency of the use of senior posts. In order to make the usage rate of each level position reach more than 90 per cent, graded positions are competitively recruited. First of all, the senior post competition, to reach the appointment of saturation and then the deputy senior post competition, to reach the saturation and then the intermediate post competition, so as to put an end to a certain level of post competition for more people and other posts competition for fewer people lead to the generation of vacant posts.

Building a sustainable talent pipeline. Clinical departments are built into a 3-tier talent team structure to prevent the emergence of talent faults, which may lead to the departure or retirement of a department head affecting the normal operation of the department. Such as hospital C gastroenterology, outpatient clinic, Chinese medicine, due to the lack of a reasonable talent team structure, as the technical core of the department and the core of the management of the department director retired, the department by the head nurse or general practitioner can barely maintain the operation of the department, the department's development has been stagnant, and also hindered the growth of departmental employees into a talent. As the hospital has not carried out the middle-level cadres of the middle-level competition for a long time, the hospital's other talents do not have a way to get the middle-level cadre positions in these departments. 3 levels of the talent team structure is as follows:

The first level for the technical core, industry experts, department management core, with high education, high title personnel, for the department director, deputy director, core staff.

The second level is the technical backbone, able to independently handle most of the work in the department, with higher education, intermediate titles, and experienced employees in the department.

The third tier consists of employees with less seniority, shorter working time, higher education and junior titles who need to complete their work under the guidance of others within the department.

Give and ordinary employees a clear career planning and promotion channel, reachable and achievable. To provide employees with a larger space for development and promotion of the platform, in this position has been a good performance, ability has exceeded the requirements of the position of the employee, but for the time being there is no higher level of job vacancies, it may be supplemented by the staff to the level of the rotational post, with a new position, a new job, a new challenge to stimulate the enthusiasm of the staff to work, at the same time, but also let the staff to learn more knowledge and skills, and effectively improve the overall quality of the staff. Comprehensive quality, for the staff can be competent for higher-level jobs solid foundation to provide employees with enough training opportunities. Give the staff level talent to go out for further training, study plan, give the opportunity to serve as a teacher of the College of Paediatrics, give the opportunity to serve as a master's degree, doctoral tutor, enter the national postdoctoral research workstation work, enhance research capabilities, so that the hospital ordinary staff to become a talented person, the existing talent can also continue to improve their own, to meet the level of their own needs.

Conclusion

Whether it is talent introduction or talent outflow is the hierarchy of needs theory and social comparison theory in play, hospitals should fully understand these two theories, and apply them to the formulation of talent management related policies. Effective talent introduction policy is to use the hierarchy of needs theory and social comparison theory, to attract those in the original unit can not be achieved to meet the respect and self-fulfilment of the talent, these talents through social comparison found that the introduction of talent units can provide higher treatment, positions, better development space, so the introduction of talent will be a success, so the introduction of talent policy to have a competitive advantage, can be higher than the introduced talent Therefore, the talent introduction policy should have a competitive advantage, which can give higher treatment or position than that of the introduced talents. To understand the hospital's existing talent management will become the introduction of other hospitals, in order to reduce the loss of talent, the hospital should also pay attention to the treatment of the unit's talent, and constantly according to the level of demand for changes in the provision of adjustments to the treatment and to provide opportunities for higher positions, to reduce the sense of unfairness arising from its social comparison, which requires hospitals to have a complete career planning, with the growth of the employee Continuously meet the demand for going. For the introduction of talent and less talent outflow are to pay the cost, and the hospital's talent funds are limited, so to conduct a talent assessment, the funds are used in those who can improve the core competitiveness of the hospital's need for talent, for hospitals is the medical talent.

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Institutional Mechanisms and Stakeholders' Cognition of *Shari'ah* Auditing in the Nigerian Islamic Bank Industry: A Conceptual Framework

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Abstract

Shari'ah audit is a systematic process of exploring sufficient, efficient, effective and relevant evidence to form an opinion as to whether the subject matter i.e., the personnel, process, outcome, stocks financial as well as non-financial performance in conformity with *Shari'ah* principles and rules which is universally accepted by the Islamic community and to report to the stakeholders. Hence, ineffective governance practices amongst Islamic financial institutions (IFIs) will lead to the possibility of facing *Shari'ah* non-compliance risks in their operational activities. Therefore, *Shari'ah* audit is a fundamental mechanism that plays a significant role in ensuring *Shari'ah* compliance. However, Islamic finance is an emerging industry in Nigeria. Thus stakeholders of IFIs do not know much about matters related to IFIs such as *Shari'ah* audits due to the weakness of institutional mechanisms. Therefore, this study examines institutional theory's effect on stakeholders' cognition (awareness, understanding, and perception) of *Shari'ah* auditing in Nigerian Islamic banks. Stakeholders of Nigerian Islamic banks are the targeted participants in the study. The Partial Least Squares (PLS) and the Structural Equation Modelling techniques will be used to test the hypotheses of this study.

Keywords: awareness, coercive, mimetic, normative, perception, understanding, *shari'ah* audit

Introduction

Scholars such as Ali et al. (2015) and Askary & Clarke (1997) described the concept of *Shari'ah* audit in Arabic terms as *hesaab* (reckoning/auditing). The term *hesaab* appeared eighty-four times (84) in the Noble Qur'an (Chik, 2011). Further, the verses are often referring to the last hour. For example, Allah (SWT) says:

Verily, those who made wander astray from the path of Allah (shall) have a severe torment, because they forget the Day of Reckoning (auditing) (Q: 38:26).

Moses said: Verily, I seek refuge in my Lord and your Lord from every arrogant who believes not in the Day of Reckoning (auditing) (Q: 40:27). Besides, it is known as the "day of reckoning (auditing)" because Allah (SWT) will hold His slaves accountable on this day so that He can audit and live up to His title as *Al-Haseeb* (the most auditor or the most reckoner/sufficient) (Al-Ashqar, 2003). Moreover, Imam Qurtubi said:

The meaning of *Al-Hesaab* is that Allah will audit the deeds of mankind, good, and bad as well as audit His blessings that He bestowed). Then He will weigh

the elements of good and evil (in each action), and whichever outweighs the other will determine whether that action is recorded as good or evil (Al-Ashqar, 2003).

It is narrated that the Prophet Muhammad (PBUH) said:

There is not one of you but Allah (SWT) will speak to him directly without any mediator (Sahih Al-Bukhari No. 7005 and Sahih Al-Muslim No. 1016).

Therefore, the concept and tradition of *Shari'ah* audit traces back to the revelation of the Noble Qur'an, signifying its enduring legacy (Ahmed et al., 2019). For example, the concept of *Shari'ah* audit can be traced in the Noble Qur'an where Allah narrated how different forms of *heesab* can be carried out. Hence, before the *heesab* (pre-audit) a man who will receive his books of accounts on the right-hand side will run to his family and confess that he will get his audit, though not very sure about the outcome. Similarly, for those who will receive his records on the left-hand side, he will invoke for his destructions and he shall enter a blazing fire, and be made to taste its burning. Allah said:

Then as for him who will be given his record (books of accounts) in his right hand will say: Here! Read my record (books of accounts). Surely I believe I shall meet my account (Q: 69:19 & 20).

But as for him, who will be given his record (books of accounts) in the left hand, he will say: I wish that I had not been given my record and that I had never known how my account is (Q: 69:25 and 26).

Further, those who get their records on the right-hand side will get an easy *heesab* (during the audit) and run to their family after the audit (post-audit). Allah said:

Then as for him who will be given his records in the right hand, he will surely receive an easy reckoning and will return to his family in full joy (Q:84:7, 8 & 9).

However, those who get their records on the left-hand side will invoke his destructions and he shall enter a blazing fire (during the audit) and be made to taste its burning (after the reckoning-post-audit). Allah said:

For those who will receive his records (books of accounts) on the left-hand side, he will invoke for his destructions and he shall enter a blazing fire, and be made to taste its burning (Q: 84:10, 11 & 12).

Also, the concept of self-audit and *Shari'ah* audit evidence can be traced in the Noble Qur'an. Allah said:

And (for) every person We have imposed his fate upon his neck, and We will produce for him on the Day of Resurrection a record which he will encounter spread open. (It will be said), "Read your record. Sufficient is yourself against you this Day as a reckoner this day. Whoever goes right, then goes right only for the benefit of his own self. And whoever goes astray, then he goes astray to his loss. No one laden with burdens can bear another's burden. And We never punish until We have sent a Messenger (to give warning) (Q: 17:13-15).

And the book (books of one's accounts) will be placed and you will see the *Mujrimum* (criminals, polytheists, sinners), fearful of that which is (recorded in this books of accounts) therein. They will say: Woe to us! What sort of book is this that leaves neither a small thing nor a big thing, but has recorded it with numbers and they will find all that they did, placed before them, and your Lord treats no one with injustice (Q: 18:49).

So, whosoever does good equal to the weight of an atom (or a small ant) shall see it. And whosoever does evil equal to the weight of an atom (or a small ant) shall see it (Q: 99:7-8).

And We have created man, and We know what his ownself whispers to him (man) And We are nearer to him than his jugular vein (by Our Knowledge). (Remember) that the two receivers (recording angels) receive (each human being), one sitting on the right and one on the left (to note his or her actions). Not a word does he (or she) utter but there is a watcher by him ready (to record it) (Q: 50:16-18).

Also regarding the concept of *hisbah*, an agency that originates the duties and responsibilities of the *Shari'ah* auditor. Allah says:

Let there arise out of you a group of people inviting to all that is good (Islamic), enjoining *Al-Ma'ruf* (all goodness) and forbidding *Al-Munkar* (all badness). Allah, it is they who are the successful (Q:3:104).

Therefore, the concept of *Shari'ah* audit is as old as the Noble Qur'an (Ahmed et al., 2019). However, in contemporary times, it is one of the most recent terms in the literature of Islamic Accounting due to the recent growth and rapid development of the Islamic finance industry worldwide (Handoko, & Mardian, 2021). Its practice however was limited largely at the individual (ethical audit) level only (Rayyes, 2023). It was never implemented as a matter of priority at organizational levels or systematized formally for administrative application. Also, the dire need for *Shari'ah* audits at the organizational and administrative levels has not been realized or appreciated until recently with the emergence and rapid development of Islamic financial institutions (IFIs) worldwide (Puad et al., 2020). These bring a lot of significant changes in many spheres of business transactions and activities, including accounting, finance, and auditing (Yazkhiruni, et al. 2018), in ensuring conformity with *Shari'ah* rules and principles. Such changes include creation and the development of *Shari'ah* Supervisory Boards (SSB), *Shari'ah* compliance units, internal *Shari'ah* units, and various *Shari'ah* products and packages by IFIs.

However, scholars such as Ullah (2014) identify deficiencies in knowledge, understanding, commitment, and attention to *Shari'ah* audit and research in Bangladesh. Similarly, this is coupled with the notion of Puad et al. (2023) and Abbas & Ali (2019) in Malaysia and Pakistan respectively that, the key factors that hindered *Shari'ah* audit that led to *Shari'ah* compliance are many but not limited to *Shari'ah* knowledge, efforts, seriousness, and awareness of the bank authorities and employees among others. Moreover, Yaso et al., (2014) maintained that the awareness of the importance of the Shariah audit framework is scanty in Malaysia and other countries. Hence, there is very limited awareness, understanding and perception of *Shari'ah* audit across the globe.

Moreover, it has been challenged heavily by scholars and practitioners (Aziz, et al. 2023) across the world; with particular attention being paid to the fact that some of the products and or services offered by Islamic banks increasingly resemble conventional banks' items which are against the *Shari'ah* principles and rules (Abbas & Ali, 2019; Ahmed, 2014).

In the Nigerian context, the guidelines published in 2011 by the CBN require all Islamic banks to abide by the Code of Corporate Governance, BOFIA of 1991, and Company and Allied Matters Act (CAMA) of 2020, as amended for Banks in Nigeria Islamic banks inclusive. However, all these coercive and normative mechanisms in the form of Laws, Acts, and Codes are originally developed for conventional banks. Hence these Acts, regulations, and rules do not adequately lead to cognition of *Shari'ah* audit by Nigerian stakeholders of Islamic banks. This cognition fundamentally includes awareness, understanding and perception of the *Shari'ah* audit. As a result, the *Shari'ah* audit in Nigeria has to be addressed in Islamic banking because of its fundamental significance in shaping the operational and marketing strategies of other IFIs striving to acquire a substantial share of the country's financial market in the country. As the pioneering Islamic sector in Nigeria, it serves as the cornerstone for the development of other IFIs in the country. This is imperative as the absence of stakeholders' awareness, understanding and perception of Nigerian Islamic banks regarding *Shari'ah* audit needs to be addressed from the onset.

Aligned with the points, the current study noted weak institutional mechanisms regarding the coercive, normative and mimetic aspects of *Shari'ah* audit mechanisms towards the enhancement of stakeholders' awareness, understanding and perception of *Shari'ah* audit as observed in Malaysian, Indonesian, and Bangladeshi practices within the Nigerian context. Hence, to solve the problem of the inadequacy of stakeholders' awareness, understanding and perception of *Shari'ah* audit Nigerian Islamic banks and to achieve the highest objectives of *Shari'ah* (Maqasidil-*Shari'ah*), this study intends to conceive isomorphism pressures as institutional mechanisms of *Shari'ah* audit under institutional theory (DiMaggio & Powell (1983) as well as Maqasidil-*Shari'ah* theory to address the issue.

Literature Review

To accurately assess total compliance by critical stakeholders of Islamic banks in Nigeria, a robust *Shari'ah* audit mechanism is essential to validate their adherence to *Shari'ah* rules. Thus, this study will underscore the importance of stakeholders' cognition of *Shari'ah* audit practices. Furthermore, scholars such as Arwani (2018) explore the cognition of practitioners directly or indirectly involved in the *Shari'ah* audit process within IFIs. The study addresses issues concerning standards for *Shari'ah* auditing, the qualifications of auditors, and their independence. It underscores the importance of auditor qualifications and independence, especially considering the lack of mandatory regulated professional codes for *Shari'ah* auditors to keep pace with the rapid growth of IFIs. The findings suggest practical implications for regulators, advocating for the revision of existing standards for *Shari'ah* auditing practices and the establishment of a mandatory professional governance framework for *Shari'ah* auditors.

Additionally, Ahmad (2017) assessed the role and awareness of the *Shari'ah* audit in Pakistan as one of the dimensions of stakeholders' cognition. To point out issues faced by *Shari'ah* audit and how they are resolved. The findings of the study show that most of the individuals working in Islamic banking are fully aware of the *Shari'ah* audit. The State Bank of Pakistan plays a vital role in promoting and boosting *Shari'ah* audits in the country. Also, regarding understanding as one of the dimensions of stakeholders' cognition of *Shari'ah* audit, Alam et al. (2017) established the need for competency criteria, encompassing understanding, to fulfil the growing expectations of the IFIs. The Knowledge, Skills, and Other Abilities (KSOA) of *Shari'ah* auditors are the main emphasis of this study's innovative paradigm. By improving the effectiveness of *Shari'ah* auditors, this framework seeks to advance the Islamic financial system. The study adopts a mixed-method approach to propose a new model for *Shari'ah* auditors in IFIs in Pakistan. Additionally, the study finds that many *Shari'ah* auditors in IFIs lack understanding of *Shari'ah* audit due to inadequate experience

and qualifications in *Shari'ah* audit and Islamic banking. Furthermore, previous studies in Pakistan have not delineated the specific knowledge, skills, and other abilities required for *Shari'ah* auditors. These findings underscore the need for a similar study to be conducted in the Nigerian context, considering the specific challenges and requirements of Islamic finance in Nigeria.

Moreover, by leveraging *Shari'ah* audit mechanisms, regulatory bodies, executives, and employees can gain valuable cognition into the status of *Shari'ah* audit within Islamic financial institutions, identify weaknesses or areas of non-compliance, and take corrective actions to strengthen *Shari'ah* governance frameworks and ensure adherence to Islamic principles. This understanding will enable them to address deficiencies and enhance compliance practices. Additionally, clients are expected to receive guidelines to facilitate the selection and evaluation of Islamic banking products more effectively, thereby making informed decisions regarding their financial engagements. For this reason, one needs to have awareness, understanding, and good perception regarding the *Shari'ah* audit.

Based on the above review, it is observed that the institutional mechanisms of the *Shari'ah* audit process cannot be fully achieved without the adequate stakeholders' cognition of *Shari'ah* audit in IFIs such as regulators at the regulatory level, managers, *Shari'ah* scholars, and internal *Shari'ah* auditors at the industry level respectively. Doing so can warrant maximum *Shari'ah* compliance. Until now literature failed to empirically test the influence of institutional mechanisms of *Shari'ah* audit towards stakeholders cognition among Nigerian Islamic banks. As a result, this study intends to assess the influence of institutional mechanisms (coercive, normative, and memitive) of *Shari'ah* audits towards the stakeholders' cognition (awareness, understanding, and perception) of *Shari'ah* audits among Islamic banks in Nigeria.

Conceptual Framework

Institutional and Maqasidil-*Shari'ah* theories will be employed to underpin this study. The theories will serve as the foundation upon which hypotheses will be developed and tested, guiding the researcher in formulating predictions about how different factors interact. They provide the framework within which these variables will be conceptualised, and their relationships will be explained. The significance of institutional processes is emphasized by this conceptual framework, which offers a thorough understanding of the elements impacting stakeholders' cognition of *Shari'ah* audit in Islamic banking. Thus, stakeholders' cognition of *Shari'ah* audit is an important component of Islamic banking and finance (Supriatna & Kamal, 2022). Therefore, Islamic banks are obligated to conduct their business operations including auditing assignments by all applicable laws, rules, and Islamic principles because these are the key factors that set Islamic banks apart from traditional banks so that their stakeholders can become more aware, understanding and perceptions of its operation based on Islamic precepts, *Shari'ah* audit inclusive.

Regarding the *Shari'ah* audits in IFIs, the Maqasidil *Shari'ah* theory is considered a unique means of revealing the objectives of the *Shari'ah* audit itself. This is because the main aim of the *Shari'ah* audit is to ensure the conformity of *Shari'ah* laws towards maintaining the affairs of the IFIs to achieve the highest objective of *Shari'ah* (Maqasidil *Shari'ah*).

Institutional Theory

Institutional theory indeed occupies a prominent position in accounting and auditing research, particularly concerning the utilization of institutional mechanisms. Institutional theory focuses on understanding how organizations and individuals conform to external norms, values, and rules within their institutional environment (Antoniuk et al., 2021). In the context of auditing, institutional theory helps researchers and practitioners analyze how auditing practices are shaped by institutional pressures, such as regulatory requirements,

professional standards, and societal expectations. It explores how auditing practices evolve in response to changes in the institutional environment, including legal frameworks, cultural norms, and technological advancements. Specifically, Chekavinskaya (2019) suggested that various studies have linked institutional theory with the field of auditing. Previous studies about the significance of institutional procedures have been established in various legal contexts, encompassing public, business-oriented organizations, and other non-profit entities. One of the main concepts in IT is that all institutions become one of the same over time or adopt the same strategies or laws which is called “isomorphism”. It is a term introduced by DiMaggio and Powell (1983) to advance the ideas of Meyer and Rowan (1977) by adding isomorphism at the organizational and social levels of the institution. Thus, becoming the same or adopting the same practices can be attributed to three isomorphic pressures or mechanisms. These mechanisms are the coercive mechanism, mimetic mechanism, and normative mechanism.

The coercive mechanism is utilized when the institution changes its practices or adopts certain rules due to the pressures from dominant stakeholders or actors (for example laws, guidelines, and or tax offices) added to gain more legitimacy. Also, normative under institutional theory means that companies become more professional and follow guidelines specific to an industry (Puad et al., 2023). Finally, mimetic pressures manifest as mechanisms when an institution observes that a competitor's strategies are successful and chooses to adopt the same or similar for their company to excel.

The coercive mechanism is utilized when the institution changes its practices or adopts certain rules due to the pressures from dominant stakeholders or actors (for example laws, guidelines, and or tax offices) added to gain more legitimacy. As the name implies, coercive adoptions of certain laws and guidelines by force by certain stakeholders as an institution have no alternative but to abide by the pressures from such stakeholders. For example, the Central Bank of Nigeria (CBN) under section 12 (2) of the *Shari'ah* governance framework directed all NIFIs in Nigeria to adopt AAOIFI standards for any lacunas of the *Shari'ah* guidelines developed by CBN. Thus, all NIFIs in Nigeria have no option but to follow CBN's directives and conform to AAOIFI's standards.

Also, normative under institutional theory means that companies become more professional and follow guidelines specific to an industry. Moreover, the central idea is that organizational progress is primarily driven by professionalism, and sustainable education is centred on normative isomorphism (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). Additionally, Puad et al. (2023) confirmed that normative pressure arises from the adoption of professional standards and attitudes by professional groups and trade associations, which are then integrated into organizations through employment practices. In a similar vein, the normative process comes into play when groups and norms compel institutions to follow particular actions or procedures that are accepted as normal. Groups with specific training tend to adopt similar practices, and non-conformity or non-adoption may lead to sanctions by the group. For example, internal auditors can influence the IFIs to comply with *Shari'ah* principles in carrying out their audit functions otherwise it will lead to non-conformity reports. Thus, unlike the coercive mechanism which has an element of force in its application, the normative mechanism aims to eradicate uncertainty and increase professionalism respectively without any coercing. Hence, normative isomorphism comes into being from an increase in professionalization within the organization. In the context of *Shari'ah* audits, this certainly increases the professionalism of *Shari'ah* audits across organizations.

Finally, the mimetic mechanism is utilized when an institution observes that a competitor's strategies are successful and decides to adopt them for their own company to excel. In essence, institutions emulate the practices of successful counterparts, potentially gaining access to resources and strategic advantages in the process. Mimetic behaviour

enables organizations to replicate successful strategies and achieve similar outcomes as their competitors. For example, CBN directed the IFIs in Nigeria to adopt the standards of AAOIFI by considering its suitability with sister organizations across the world but without any coercing or force from AAOIFI.

To relate theory to the *Shari'ah* audit, IT confirmed that mimetic isomorphism is a means of change initiated internally by the organization. Mimetic isomorphism can exist when the conventional financial institutions that operate *Shari'ah* windows are convinced that the functions of *Shari'ah* audit (both internal and external) will help them meet their requirements for the overall improvement of the organization. Therefore, IT as claimed by Scott and Meyer (1983) that the organizational setting is peculiarized by certain rules that regulate the institutions whereby the institutions must abide to secure total legitimacy and support is inconsistent with *Shari'ah* audit in IFIs that aimed to have total conformity with *Shari'ah* laws which majorly differentiate it with conventional audit (Abubakar & Sani, 2021; Omar, 2019; Islam et al., 2019).

It should be noted that institutional theory occupies a prominent position in the research of accounting and auditing (Antoniuk et al., 2021). Specifically, Chekavinskaya (2019) opined those various studies associated with institutional theory and the field of auditing. Therefore, Prior studies that utilize the institutional mechanisms in various specializations have been identified across the jurisdictions both in public (Frumkin & Galaskiewicz, 2004), business-oriented organizations (Antoniuk et al., 2021; Chekavinskaya, 2019; Boolaky & Soobaroyen, 2017) and other non-profit-making organizations (Osinubi, 2020; Goddard et al., 2016).

Finally, by applying IT to the study of stakeholders' cognition, researchers can gain insights into how institutional mechanisms, such as regulatory bodies, industry associations, and professional standards, influence the stakeholders' adequate awareness, understanding and perception of *Shari'ah* audits in IFIs. This theoretical perspective allows for a comprehensive awareness, understanding and perception of the factors that shape *Shari'ah* audit practices and their impact on organizational behaviour and performance. Indeed, the institutional theory provides valuable insights into the practice of *Shari'ah* audits within Islamic banks (Puad et al., 2023). By emphasizing the importance of institutional mechanisms, such as regulations issued by relevant authorities like the Institute of Internal Auditors (IIA), BNM), AAOIFI, and IFSB, IT highlights the role of external pressures and regulatory frameworks in shaping stakeholders' cognition of *Shari'ah* audit and entire auditing practices.

Maqasid al-*Shari'ah* Theory

The perspective offered by Dusuki and Abozaid (2007) underscores the comprehensive nature of Islam as a way of life encapsulated within the framework of the Maqasid al-*Shari'ah* theory. According to this view, Islam encompasses not only individual beliefs and practices but also extends to institutions and society, both in the present life and the hereafter. The Maqasid al-*Shari'ah* theory provides a holistic understanding of Islamic principles and objectives, which guide individuals, organizations, and communities towards fulfilling their roles and responsibilities by Islamic teachings. By emphasizing the interconnectedness of various aspects of life, including spiritual, social, economic, and political dimensions, the theory highlights the integrated nature of Islamic ethics and values.

In essence, the Maqasid al-*Shari'ah* theory serves as a conceptual framework for interpreting and applying Islamic principles in diverse contexts, ensuring that individual actions and societal institutions are aligned with the overarching goals of Islam. This perspective reinforces the idea that Islam offers guidance not only for personal conduct but also for the organization of society and the pursuit of collective well-being in both temporal and spiritual realms. Indeed, the Maqasid al-*Shari'ah* theory provides a comprehensive framework for understanding the objectives of *Shari'ah* audits in IFIs. At its core, the purpose

of *Shari'ah* audits is to ensure the adherence of IFIs to *Shari'ah* principles and laws in all aspects of their operations, thereby upholding the objectives of *Shari'ah*.

By aligning the practice of *Shari'ah* audits with the broader objectives outlined in the Maqasid al-*Shari'ah* theory, IFIs aim to fulfil their ethical and religious responsibilities towards their stakeholders, including depositors and shareholders. This involves not only ensuring compliance with specific *Shari'ah* rules and regulations but also promoting the overall well-being and prosperity of individuals and society.

Moreover, the concept of stakeholders' cognition in Islamic banks underscores the importance of conducting financial activities by Islamic principles, such as avoiding *riba* (interest), *gharar* (uncertainty), and *maysir* (gambling), among others. By adhering to these principles, IFIs seek to create an environment that fosters economic justice, fairness, and ethical conduct, thus contributing to the realization of the highest objectives of *Shari'ah*.

In essence, the Maqasid al-*Shari'ah* theory serves as a guiding framework for *Shari'ah* audits in IFIs, emphasizing the broader goals of promoting social welfare, economic prosperity, and ethical integrity within the Islamic finance industry. By integrating the principles of Maqasid al-*Shari'ah* into their audit practices, IFIs can ensure that their operations are not only compliant with *Shari'ah* law but also conducive to the attainment of the ultimate objectives of Islam.

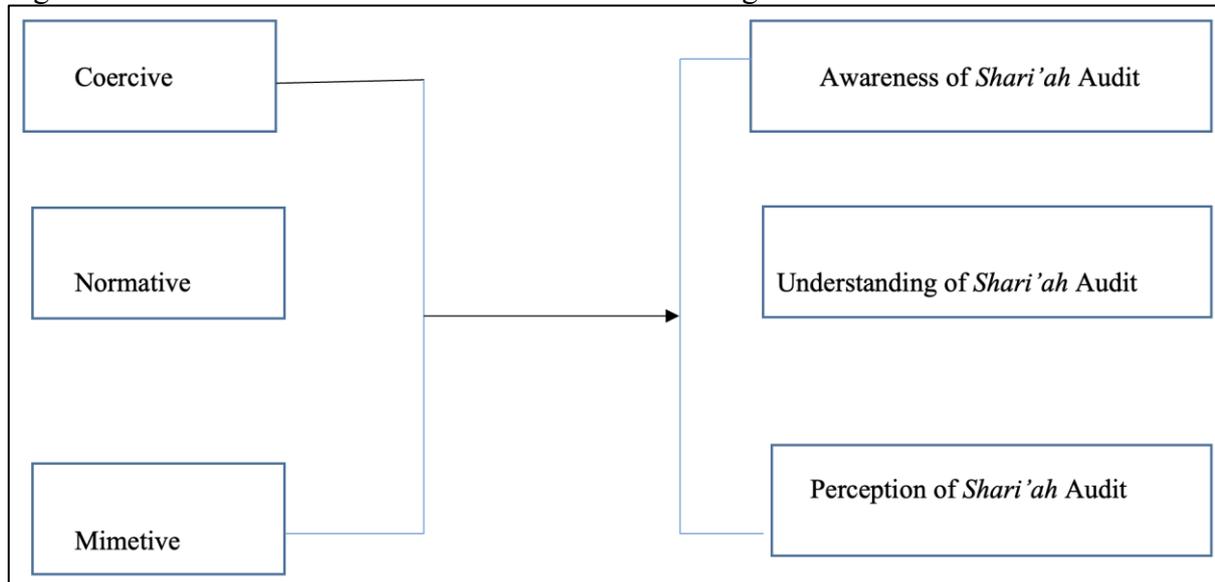
Similarly, from the standpoint of *Shari'ah* auditing absolutely, the principles of *Hifz-al-aql* (preservation of intellect) and *Hifz-al-mal* (preservation of wealth) are integral components of *Shari'ah* auditing in Islamic finance. These principles emphasize the importance of safeguarding depositors' funds and ensuring transparency and accountability in the management of financial assets by Islamic banks. Hence, in the context of *Shari'ah* auditing, *Hifz-al-aql* underscores the need to protect depositors' money from mismanagement and misallocation, which can lead to financial losses and undermine trust in the Islamic banking system. By adhering to this principle, *Shari'ah* auditors play a crucial role in ensuring that Islamic banks operate transparently and provide timely and accurate information to depositors about the management of their funds. Similarly, *Hifz-al-mal* emphasizes the importance of preserving wealth and avoiding any activities that may lead to financial harm or exploitation. *Shari'ah* auditors must carefully evaluate the investment practices and financial transactions of Islamic banks to ensure that they comply with *Shari'ah* principles and do not involve any prohibited activities such as interest (*ribah*) or ambiguous (*gharar*) transactions. Furthermore, *Shari'ah* auditors must go beyond merely assessing compliance with legal criteria and focus on upholding the broader objectives outlined in Maqasid al-*Shari'ah*. This involves evaluating the economic substance of transactions and ensuring that they contribute to the well-being and prosperity of individuals and society as a whole.

Consequently, *Shari'ah* auditors play a critical role in promoting transparency, accountability, and ethical conduct within Islamic banks. By adhering to the principles of *Hifz-al-aql* and *Hifz-al-mal* and upholding the objectives of Maqasid al-*Shari'ah*, *Shari'ah* auditors can ensure that every transaction audited is not only legally compliant but also ethically sound and conducive to the realization of the highest objectives of *Shari'ah*.

Therefore, the current study regarded Maqasidil Shariah theory as an umbrella theory encompassing all relational items in highlighting the need for institutional mechanisms of *Shari'ah* audit for ensuring adequate stakeholders' cognition of *Shari'ah* audit in all the operations of IFIs to achieve the highest objectives of *Shari'ah* in Islamic banking and finance industry in Nigeria. It is also considered in addressing the morals, ethics, values, regulations, and principles of operating the Islamic banking business in the country. The role of institutional mechanisms (coercive, normative and mimetic) as an independent variable shows how far it influences the stakeholders of Nigerian Islamic banks to have adequate

cognition (awareness, understanding, and perception) of *Shari'ah* audit in the country. Figure.1 below illustrates the conceptualized framework for the study.

Figure 1. Institutional Mechanisms and Stakeholders' Cognition of *Shari'ah* audit



Source: (Developed by the Authors).

Hypothesis Development of Institutional Mechanisms and Stakeholders' Cognition of *Shari'ah* Audit

In every research endeavour, hypotheses are formulated by the model of the study employed in the study. (Farouk et al., 2018). Similarly, hypotheses are vividly connected and consistent with prior relevant empirical studies and the theories) that underpin the research model (Flache et al., 2017). Therefore, this study developed hypotheses based on its research model as depicted in Figure 4.1 above.

Coercive Institutional Mechanism and Stakeholders' Awareness of *Shari'ah* Audit

Lessons from past experiences, such as how various corporate scandals and failures were caused by failing to thoroughly review financial audits, corporate governance, and risk management, have led to a growing awareness of the advantages of institutionalizing *Shari'ah* audits over conventional ones in IFIs (Yusuf, 2013). Therefore, many stakeholders such as academics, regulators, BoDs, Managers, etc. across the world such as in Malaysia become more aware of the benefit of *Shari'ah* audit due to the issuance and imposing Policy Document (SGPD, 2019) by the Bank Negara Malaysia that explains more about the *Shari'ah* audit and imposed it to Islamic banks in Malaysia (Abd Rahman et al., 2020) for proper institutionalisation. Therefore, stakeholders become more aware of the *Shari'ah* audit and its relevance because of regulatory actors imposing or coercing *Shari'ah* guidelines. Hence, this study proposes the following hypothesis.

Hypothesis 1: The influence of coercive mechanisms positively influences Stakeholders' awareness of the *Shari'ah* audit amongst Nigerian Islamic banks.

Normative Institutional Mechanism and Stakeholders' Awareness of *Shari'ah* Audit

Studies proved that there is a growing awareness among Islamic banks' stakeholders of the need for *Shari'ah* auditing due to the normative pressures from international Islamic standards setters, Islamic professional bodies, and higher institutions of learning (Tahir, 2018; Yahya, 2016). Also, previous studies have acknowledged the influence of the Stakeholders'

awareness of the *Shari'ah* audit due to the normative pressures for professionalizing the *Shari'ah* audit discipline (Ali et al., 2018). Moreover, stakeholders' awareness about engaging *Shari'ah* auditors that have Islamic accounting and auditing professional certificates like CSAA, and CSA would enhance *Shari'ah* conformity, because they believed that *Shari'ah* auditors would use their professional skills and expertise to detect the *Shari'ah* non-compliant items in the financial and non-financial operations in the Islamic banks while carrying out their *Shari'ah* audit assignments (Omara, 2019). Therefore, this study proposes the following hypothesis:

Hypothesis 2: The influence of normative mechanisms positively influences Stakeholders' awareness of the *Shari'ah* audit amongst Nigerian Islamic banks.

Mimetic Institutional Mechanism and Stakeholders' Awareness of *Shari'ah* Audit

Mimetic pressures conceived as one of the institutional mechanisms of *Shari'ah* audit are primarily caused by an organization's perception of core rivals' performance (Liu et al., 2010). In the same vein, IFIs such as Islamic Banks and Takaful companies are encouraged to adopt certain practices such as the *Shari'ah* audit due to positive results gained by prior adopters (Yasoa et al. 2024; Puad et al., 2023). Also, stakeholders' awareness about *Shari'ah* audits may prevail due to *Shari'ah* auditors' reports of successful Islamic banks. Moreover, the mimetic mechanism comes from successful Islamic banks that already have practised *Shari'ah* audit functions across the world and may influence the stakeholders to become more aware of the relevance of *Shari'ah* audit (Hoq et al., 2010). Therefore, the following hypothesis can be proposed:

Hypothesis 3: The influence of mimetic mechanisms positively influences Stakeholders' awareness of the *Shari'ah* audit amongst Nigerian Islamic banks.

Coercive Institutional Mechanism and Stakeholders' Understanding of *Shari'ah* Audit

Stakeholders' understanding of *Shari'ah* audits involves accepting and agreeing with the need for *Shari'ah* stems from the requirement that the IFIs should comply with *Shari'ah* rules and regulations, especially on matters related to regulatory forces (Hassan & Haridan, 2019). Furthermore, prior studies such as (Arwani, 2018; Ahamad & Abikan, 2017) confirmed that coercive mechanisms from the regulatory actors influence stakeholders' understanding of *Shari'ah* audit. Therefore, from the foregoing, the prior studies proved that coercive mechanisms from the regulatory actors influence Stakeholders to understand *Shari'ah* audits. Therefore, this study posits the following hypothesis:

Hypothesis 4: The influence of coercive mechanisms positively influences Stakeholders' understanding of the *Shari'ah* audit amongst Nigerian Islamic banks.

Normative Institutional Mechanism and Stakeholders' Understanding of *Shari'ah* Audit

Understanding of the *Shari'ah* audit by the Stakeholders because of such awareness by the professionals and standard setters influences the Islamic banks to become cautious about audit *Shari'ah*ness in carrying out their operational activities (Muzammil & Siddiqui, 2020). Similarly, Ali et al. (2018)) opined that understanding *Shari'ah* audit by *Shari'ah* internal auditors and *Shari'ah* scholars necessitates that Malaysian IFIs Islamic banks adopt a framework stipulated by International Standards Professional Practices Framework (IPPF) and Guidelines 10 on Minimum Guideline for internal Auditors (Ali et al., 2018; AICB 2016). Therefore, normative mechanism influences Islamic banks to adopt such professional standards to ensure *Shari'ah* compliance. Similarly, Najeeb & Ibrahim (2014) revealed that *Shari'ah* auditors need not have academic certificates only, but professional certificates are also relevant so that they would get technical and necessary exposure for preventing all possible *Shari'ah* non-compliant risks. Hence, this study proposes the following hypothesis:

Hypothesis 5: The influence of normative mechanisms positively influences Stakeholders' understanding of the *Shari'ah* audit amongst Nigerian Islamic banks.

Mimetic Institutional Mechanism and Stakeholders' Understanding of *Shari'ah* Audit

The mimetic mechanism is one of the principal factors leading to institutionalization (Mizruchi and Fein, 1999). The Mimetic mechanism pushes organizations to emulate the systems or structures of other successful organizations (Elnihewi et al., 2014). Therefore, due to such comprehension, stakeholders such as the Board of Directors (BoDs) of Islamic banks in Nigeria in their efforts to imitate other successful Islamic banks seek the help of competent intellectuals from various nations to act as heads of their respective ACEs. For example, Ja'iz Bank Plc engaged Prof. Monzer Kahf from the USA, and TAJ Bank Plc employed Asst. Prof. Ziyaad Mahomed from Malaysia and Lotus Bank engaged Shaykh Haytham Tamin from the UK and Dr. Marjan Binti Muhammad from Malaysia to lead their *Shari'ah* board (Sapovadia, 2015). Thus, the proper understanding of the relevance of *Shari'ah* audit in ensuring adherence to *Shari'ah* rules and regulations, stakeholders of Islamic banks in Nigeria struggle to mimic successful Islamic banks. Against this backdrop, this study suggests the following hypothesis:

Hypothesis 6: The influence of mimetic mechanisms positively influences Stakeholders' understanding of the *Shari'ah* audit amongst Nigerian Islamic banks.

Coercive Institutional Mechanism and Stakeholders' Perception of *Shari'ah* Audit

Studies confirmed that various stakeholders from different jurisdictions have diverse perceptions of the term "*Shari'ah* audit" in IFIs (Mulyany & Ibrahim, 2019). It was stressed by Rizqiani & Yulianto (2020) that IFIs' requirement for *Shari'ah* audit depends on several regulations guaranteeing audit *Shari'ah*ness which need to be perceived well by the stakeholders. As a result, the *Shari'ah* audit is extremely important for Islamic banks (Butt, 2022). Moreover, the regulations and standards by regulatory organs and standards setters stimulate stakeholders of Islamic banks like internal *Shari'ah* auditors, *Shari'ah* review officers, Managers, BoDs, *Shari'ah* experts, and academics to perceive well about the *Shari'ah* audit (Yahya et al., 2016). Similarly, Hanif et al. (2018) found that the perception of *Shari'ah* audits by the stakeholders of Islamic banks in Malaysia boosts confidence in their minds. Still, in Malaysia, Shafii et al. (2013) found that a proper and unique *Shari'ah* framework from the regulators and standards motivates the stakeholders to understand and perceive the relevance of *Shari'ah* audit in detecting non-*Shari'ah* compliance in operations. Against these findings, this study suggests the following hypothesis:

Hypothesis 7: The influence of coercive mechanisms positively influences Stakeholders' perception of the *Shari'ah* audit amongst Nigerian Islamic banks.

Normative Institutional Mechanism and Stakeholders' Perception of *Shari'ah* Audit

Scholars such as Najeeb and Ibrahim (2014) in their study found that professionalizing the role of *Shari'ah* auditors in Malaysia and making Malaysia the hub for *Shari'ah* audits' professional certification arises due to the perception of the stakeholders in the country on the relevance of *Shari'ah* audit in ensuring compliance to *Shari'ah* rules and regulations by IFIs. Also, *Shari'ah* scholars as stakeholders perceived that curbing low compliance to *Shari'ah* rules and regulations by Islamic banks can only be realized when *Shari'ah* audit assignments are conducted by *Shari'ah* professionals who possess both Islamic and financial certificates (Tahir, 2018). Similarly, Isa (2012) found that educational and professional certifications related to *Shari'ah* audit influence stakeholders such as SSB, Internal *Shari'ah* officers, and *Shari'ah* internal auditors and *Shari'ah* external auditors to gain more proper perception of *Shari'ah* audit and thus enable them to comply with professional standards, especially

AAOIFI *Shari'ah* standards while conducting their assignments. Therefore, this study proposes the following hypothesis:

Hypothesis 8: The influence of normative mechanisms positively influences Stakeholders' perception of the *Shari'ah* audit amongst Nigerian Islamic banks.

Mimetic Institutional Mechanism and Stakeholders' Perception of *Shari'ah* Audit

Studies confirmed that the mimetic mechanism influences stakeholders to perceive the relevancy of *Shari'ah* audit. For example, in Saudi Arabia, Al-Twaijry (2003) found that the Mimetic mechanism influenced the stakeholders of Islamic banks in the country to perceive the functions of the *Shari'ah* internal audit towards the assurance of audit *Shari'ah*ness. Consequently, the author maintained that the mimetic mechanism influences the increasing number of organizations establishing *Shari'ah* internal audit departments in Saudi Arabia. Hence, against this backdrop, this study suggests the following hypothesis:

Hypothesis 9: The influence of mimetic mechanisms positively influences Stakeholders' perception of the *Shari'ah* audit amongst Nigerian Islamic banks.

Methods

Instrument and Measurement Items

This study is a survey in nature, it will utilise questionnaires as a method of collecting data from different stakeholders of Nigerian Islamic banks by using both nominal and Likert-scale measurement scales. The study also considers nine (9) members of the Financial Regulations Advisory Council of Experts (FRACE) from the Central Bank of Nigeria (CBN) to serve as the regulators of Islamic banks. Secondly, eighteen (18) Advisory Council of Experts (ACEs) from each Islamic bank in Nigeria (at the industry level). Thirdly, 116 managers of Nigerian Islamic banks are also considered as targeted respondents. Fourth, the study looks at 15 internal *Shari'ah* auditors of Islamic banks and finally 45 and 7 staff of the supervision department at CBN and NDIC respectively. The study will also draw the sample via the Krijcie and Morgan (1970) table. This study will use the stratified sampling technique while choosing the sample size.

Moreover, SPSS version 25 will be used to diagnose the data to ensure its suitability for the Partial Least Square Structural Equation Modelling (PLS-SEM), The PLS approach constitutes a variance-based structural equation modelling technique. Finally, to operationalize all constructs relating to three institutional pressures (coercive, normative, and mimetic), stakeholders' cognition (awareness, understanding, and perception) of the *Shari'ah* audit as well as demographic and background questions. Finally, five-point Likert scales ranging from "strongly disagree" (1) to "strongly agree" (5) will be used in measuring the items of the constructs.

To operationalize all constructs relating to three institutional pressures (coercive, normative, and mimetic). This study will adapt a scale from prior studies such as Kauppi and Luzzini (2021), Alziady and Enayah (2019), Dubey et al. (2017), Munir and Baird (2016), Jalaludin et al. (2011);, Rautiainen (2009), Zhang and Li (2009), Liang et al. (2007), Guerreiro et al. (2006), Hussain and Hoque (2002). Items are adjusted to suit the context of Islamic banks in Nigeria with an instrument containing 15, 7, and 2 items for the coercive, normative, and mimetic respectively. Table 3.1 lists the elements, dimensions, items, operational descriptions, and sources of the institutional procedures of the *Shari'ah* audit (ISHA).

Table 1. Variables, Dimensions, Operational Definitions, Items, and Sources of institutional mechanisms of shari'ah audit (ISHA)

Independent Variables	Dimensions	Operational Definitions	Items	Source
Coercive	Shari'ah Principles and Rules	Refers to values, laws, and ethics of Islamic accounting and finance that occur from three main foundations, the Quran, Hadiths, and Ijmah (Ullah et al., 2023).	1. All Shari'ah audit assignments on the business policies require my institution to abide by Shari'ah principles and rules.	Kauppi and Luzzini (2021)
			2. All Shari'ah audit assignments on contractual agreements with my institution, and other party (ies) forced my institutions to abide by Shari'ah principles and rules.	
			3. All Shari'ah audit assignments on financial and non-financial disclosures can be accomplished only when abiding by Shari'ah principles and rules.	
			4. All Shari'ah audit assignments on operations and procedures of my institution are subject to all Shari'ah principles and rules	
			5. Abiding with Shari'ah principles and rules is necessary while writing a Shari'ah audit Report	
	Laws and Regulations	Refers to all recognized provisions of Acts, circulars, standards, etc by the Nigerian government regarding all the operational activities of the Islamic banking industry (Conteh et al., 2022)	1. The Central Bank of Nigeria requires my institution to abide by all rules and regulations while carrying out the Shari'ah audit.	Alziady and Enayah (2019)
			2. My institution maintains a good	

Independent Variables	Dimensions	Operational Definitions	Items	Source
			relationship with the Central Bank of Nigeria.	
			3. Pressure is placed on my institution to abide by standards produced by international Islamic standards setters such as AAOIF and IFBS	
			4. Due to the influence of international Islamic standards setters, we use many financial and non- financial standards while carrying out Shari'ah audit assignments	
			5. There are frequent government inspections or audits in our institution to ensure we comply with laws and regulations while carrying out the Shari'ah audit functions	
			6. Our main stakeholders frequently make requests for us to adopt certain practices or initiatives in carrying out Shari'ah audit assignments	
			7. There are many regulations imposed on my institution while carrying out Shari'ah audits	
			8. The Central Bank of Nigeria requires our institution to use Guidelines for the Regulation and	

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Data Driven Management: Transforming Research and Shaping Future

Independent Variables	Dimensions	Operational Definitions	Items	Source
			Supervision of Institutions Offering Non-Interest Financial Services	
			9. The competitive conditions require our institution to institutionalize the Shari'ah audit system	
			10. There are negative consequences for institutions that fail to comply with the Central Bank of Nigeria's laws and regulations related to the Shari'ah audit.	
Normative	Professional	The extent of the utilization of professional skills and expertise to detect the Shari'ah non-compliant items in the financial and non-financial operations in the Islamic banks while carrying out their Shari'ah audit assignments (Omara, 2019).	1. There must be some regular training sessions about Islamic Banking and Finance for <i>Shari'ah</i> Auditors.	Munir and Baird (2016),
			2. The practices of the Islamic finance industry have been influenced by Islamic professional membership such as CIPA, CSAA, etc.	
			3. The <i>Shari'ah</i> auditor can only be a qualified accountant with some Islamic finance knowledge and training certification.	
	Top Management	The extent of the involvement of top management in ensuring the effectiveness of the practices of shari'ah audit in IFIs (Zakaria et al., 2019)	1. Top management is very much involved in institutionalizing and monitoring Shari'ah audit practices in my Islamic institution.	
			2. Top management	

Independent Variables	Dimensions	Operational Definitions	Items	Source
			is well-informed and supports all attempts to improve the Shari'ah audit practices in my institutions.	
			3. Top management must be fully equipped with <i>Shari'ah</i> knowledge related to Shari'ah audits.	
			4. Top management must take appropriate action against employees who have failed to ensure conformity with the Shari'ah rules and principles concerning all matters related to Shari'ah audit practices	
Mimetic	Modeling successful Organization	Refers to imitating successful organizations that have common features and have scaled from the acceptance, practicing, or institutionalization of specific standards or specialization (El- Gazzar et al., 1999).	1. Shari'ah audit practices of my institution are being influenced by what other financial institutions (Islamic and/or conventional) have done and succeeded	Dubey et al. (2017)
			2. Shari'ah audit practices of my institution are being influenced by what our competitors (Islamic and/or conventional) have done and succeeded in.	

To operationalize the constructs of awareness, understanding, and perception, this study will adapt from the studies of Isa (2012), Isa et al. (2020), Riaz, et al. (2019), Ab Ghani et al. (2015), Ringim & Yussof(2014), Ringim and Yussof(2013), Kasim et al. (2009) and Mulyany and Ibrahim (2009). Items were adjusted to suit the context of Islamic banks in Nigeria with an instrument containing 07 items for each of the stakeholders' awareness, understanding, and perception of the Shari'ah audit. Table 3.2 shows the dependent variables, dimensions, operational definitions, items, and sources from which the items were adapted and adopted.

Table 2. Dependent Variables, Dimensions, Operational Definitions, Items, and Sources of Stakeholders' Awareness, Understanding, and Perception of the Shari'ah Audit

Dependent Variables	Dimensions	Operational Definitions	Items	Source
Awareness of Shari'ah Audit	Degree of awareness of Shari'ah audit by stakeholders	Refers to the degree to which these stakeholders are informed and knowledgeable about the principles and practices of Shari'ah audit (Isa et al., 2020).	1. The level of audit shari'ahness in Nigerian Islamic banks depends on Stakeholders' awareness of the Shari'ah audit	(Isa et al., 2020).
			2. Forums/Conferences are important in creating awareness about Shari'ah audit	
			3. Stakeholders' preferences influence Shari'ah audit.	
			4. There are no hidden costs in a Shari'ah audit compared to a conventional audit	
			5. Shari'ah audits are based on Shari'ah conformity	
			6. Many stakeholders are aware of the fundamental principles of shari'ah audit	
			7. To create awareness about shari'ah audits among stakeholders, Islamic banks should do more enlightenment	
Understanding of Shari'ah audit	Degree of understanding of Shari'ah audit by stakeholders	It is the extent of the deeper level of stakeholders' knowledge, grasp, or comprehension (Beskow & Weinfurt, 2019) of the Shari'ah audit practice by stakeholders	1. The level of audit Shari'ahness by Nigerian Islamic banks depends on Stakeholders' understanding of the Shari'ah audit	(Mulyany et al., 2009)
			2. Forums/Conferences are important in increasing the understanding of the Shari'ah audit	
			3. Stakeholders' preferences influence Shari'ah audit	
			4. There are no hidden costs in ensuring a shari'ah audit compared to a conventional audit	
			5. Shari'ah audits are based on Shari'ah conformity	

Dependent Variables	Dimensions	Operational Definitions	Items	Source
			6. Many stakeholders do understand about fundamental principles of the Shari'ah audit	
			7. To understand more about Shari'ah audit among the stakeholders' Islamic banks should do more enlightenment	
Perception of Shari'ah audit	Degree of perception of Shari'ah audit by stakeholders	It is the conscious reception, selection, processing, and interpretation of the Shari'ah audit stakeholders (Velmans, 1999)	1. The level of audit shari'ahness by Nigerian Islamic banks depends on the Stakeholders' perception of the Shari'ah audit	(Isa, 2012)
			2. Forums/Conferences are important in perceiving the relevance of the Shari'ah audit	
			3. Stakeholders' preferences influence Shari'ah audit	
			4. There are no hidden costs in a Shari'ah audit compared to a conventional audit	
			5. Shari'ah audits are based on Shari'ah conformity	
			6. Many stakeholders have a good perception of the fundamental principles of the Shari'ah audit	
			7. To perceive the relevance of Shari'ah audit among the stakeholders, Islamic banks should do more enlightenment	

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The Influence of Knowledge Heterogeneity and Exploratory Learning on Business Performance with Innovation Work Behavior as Mediating

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Abstract

This study aims to determine the influence of knowledge heterogeneity and exploratory learning on business performance with the mediation of innovation work behavior. This research is quantitative with an exploratory approach with a population of 296 respondents, namely the president director of the Conventional People's Credit Bank or BPR in East Java. Total sampling was selected for use with 41 statement items on a likert scale of 1-5 and tested with SEM PLS both inner and outer with mediation. The results of the study shows that knowledge heterogeneity and explanatory learning has an effect positive and significant to business performance in BPR and stated that knowledge heterogeneity carried out by sharing ideas and various competencies through work behavior innovation, namely the use of work technology, was proven to be able to improve business performance in Conventional BPR in East Java. Exploratory learning carried out by analyzing and using data through innovative work behavior with work technology has been proven to be able to improve business performance in Conventional BPR in East Java.

Keywords: business performance, exploratory learning, innovation work behavior, knowledge heterogeneity.

Introduction

People's Credit Bank as a mediator in the collection of funds and the distribution of public funds. Banks have started to develop innovative products for their customers. Organizational performance can be analyzed from a financial and non-financial perspective through a balanced score card , namely a financial perspective, a customer perspective, an internal business process perspective, and a learning and growth perspective. Based on the phenomenon of banking business competition with the decline in BPR management capabilities, especially in credit quality and categorized as unhealthy BPRs, this has an impact on the decline in BPR's financial performance (Yasin, Wendy, and Giriati 2023). The phenomenon of high NPLs encourages people's credit banks to take corrective actions and improve risk management (Agustin and Hasan 2022). Banks should implement better risk

management practices, including more careful credit assessments, continuous credit monitoring, and recovery efforts against non-performing loans.

Another problem faced is the unpreparedness of human resources, where with a lot of training given to directors and managers of BPR, but the information received cannot be absorbed properly and even difficult to share with employees, declining skills in mastery of technology (fintech) and credit quality management are factors in the failure of BPR management and declining business performance. To address the above problems, the role of the RBV (Resource Based View) theory is needed which states that a company's strategy should be based on the use and utilization of internal resources (Asiva Noor Rachmayani 2015). Resources and strategic capabilities can help companies achieve competitive advantage. RBV is also relevant in a fast-changing business environment, emphasizing the importance of innovation in resources. The implementation of RBV in the banking industry involves identifying, developing, and optimizing unique and hard-to-replicate resources, as well as managing organizational capabilities that support competitive advantage.

KBV (Knowledge Based View) theory which states the existence of a new existence from a company's resource-based view and provides strong theoretical support for intellectual capital. It emphasizes the importance of effective knowledge management, the formation of strategic alliances, and the dissemination of relevant information to create added value at the regional level that can help cooperation to identify and address development challenges holistically, resulting in more innovative and sustainable solutions (Agarwal, Grassl, and Pahl 2012).

The research conducted (Rehman et al., 2015) resulted in the conclusion that knowledge diversity improves organizational business performance, knowledge diversity is an important success factor in achieving organizational competitive advantage. Exploratory learning and knowledge transfer can build business performance strategy alliances (Alegre, Sengupta, and Lapidra 2013). Research by (Adekanmbi & Ukpere, 2022) concluded that organizational learning significantly affects adaptive performance in the banking industry, Exploratory Learning has a positive relationship with organizational performance. Several studies related to business performance and Organizational Learning, especially exploratory learning and innovation, state that a company's learning ability plays an important role in producing innovation which implies the generation of acceptance, implementation of new ideas, product or service processes. (Zhang et al., 2022) states that the utilization of knowledge resources to achieve the development of corporate capabilities must be accompanied by organizational learning.

Organizations that rely on innovative behaviors to adapt to the changing environment to help them continue to build and maintain a competitive advantage and improve business performance (Tsai 2018). Knowledge heterogeneity (KH) is the diversity in the knowledge of individuals or organizations and to explore a wider set of relationships between KH and multidimensional (i.e. dynamics and ambidexterity) innovation (Tao et al., 2020) In the banking industry, Knowledge Heterogeneity can include a variety of knowledge about various fields such as finance, risk, investment, banking regulation, information technology

Novelty in this study is also found in the innovation work behavior indicator by including the technology aspect as one of the indicators. Unlike previous studies that did not consider technology in these indicators, this study recognizes the role of technology in facilitating and encouraging innovation in the workplace. In addition, the scope of knowledge heterogeneity in this study is broader, covering various aspects and more diverse contexts, compared to previous studies that only focused on the dynamics in a particular team.

Literature Review

Knowledge Heterogeneity

Knowledge heterogeneity is defined as a state of collective knowledge that consists of various domains, forms, contextual meanings and methods of representation and exists in an organizing unit (J. Zhao et al., 2021). The heterogeneity of knowledge is divided into general knowledge and specialized knowledge. General knowledge is accessible to everyone and does not depend on specific tasks. Specific knowledge is knowledge that is driven in a general context, can be possessed by several individuals, and is therefore considered general (F. S. Tsai, 2018). Knowledge Heterogeneity is measured using 4 indicators, referring to (Ding et al., 2022b), namely;

1. Individual knowledge learning: the ability to seek out new information derived from personal experience.
2. Growth of individual knowledge: the ability to understand current topics by adding competencies to continue learning.
3. Individual work experience: The work experience brought into BPR contributes to the completion of tasks.
4. Diversity of knowledge: diversity/variety of knowledge is needed in the completion of work

Explanatory Learning

Exploitative Learning refers to efforts to carry out operational efficiency according to the standardization of procedures, consolidation of current knowledge with the abilities possessed, improvement of the quality of knowledge and the ability to carry out activities efficiently, and building capabilities in finding solutions to problems that come from consumers. (Lenart-Gansiniec, 2021) which has been adapted to the object of the research.

The dimensions of this exploration are measured using 5 indicators, referring to (Liu, 2017) and (Lenart-Gansiniec, 2021), namely;

1. Product and service innovation rate: the ability of BPR to create new ideas regarding the best products and services.
2. Market exploration: the ability of BPRs to explore new markets rather than their competitors
3. Organizational flexibility: the ability of BPRs to adjust strategies when market conditions change
4. Use of data analysis: the ability of BPR to use data in decision-making
5. Creativity: BPR's ability to optimize ideas for product improvement

Business Performance

From the financial side, organizational performance can be aimed at providing information related to revenue achievement, financial growth, product value and market value, besides that financial performance value is also created as a responsibility to investors who have invested their capital, capital in an organization (Cui et al., 2019). The overall performance dimension of the organization is measured by four criteria, namely operational excellence, customer proximity, product leadership, and financial achievement (Kordab et al., 2020). The dimensions in business performance are financial perspective, customer perspective, internal business process perspective, learning and growth perspective (Asaasira, 2016). Business Performance in this study is business performance in terms of balance scorecard. BPR performance is measured using 4 dimensions, namely;

1. Financial Perspective
2. Customer Perspective
3. Internal Business Process Perspective

4. Learning and Growth Perspectives

Innovation Work Behavior

Innovation work behaviour is the amount of physical and cognitive work activities carried out by employees in the context of their work, either solitary or in a social environment, to complete a series of tasks necessary to achieve the goals of innovation development. (Basu, 2017). Innovation work behaviour of bank employees is defined as the self-reported level of three different behavioral tasks, namely idea generation (new and useful ideas, critical thinking, searching for new methods and techniques, etc. in the bank), idea promotion (social activities of officers to obtain approval, awareness and support for innovation), and idea realization (the nature of participation and application of innovative ideas by bank officers), to be additive incorporated as a measure of innovative work behavior (Widmann & Mulder, 2018). Indicators in innovative work behavior are measured using 5 indicators, referring to (Dahiya & Raghuvanshi, 2022) namely;

1. Generate new ideas: The ability to generate new ideas at every level of work.
2. Adopting new ideas: The ability to adopt new ideas from other parties.
3. Idea implementation: Ability to implement new ideas in Action at every level of work
4. Improved work processes: the ability to improve efficient work processes for BPRs.
5. Work technology: the ability to master the technology of digital tools used at every level of work to improve work skills.

Methods

This research is quantitative with an exploratory approach with a population of 296 respondents, namely the president director of the Conventional People's Credit Bank in East Java. Total sampling was selected for use with 41 statement items on a linkert scale of 1-5 and tested with SEM PLS both inner and outer with mediation. Knowledge heterogeneity indicators are individual knowledge learning, individual knowledge growth, work experience and diversity of competency capabilities. Exploratory learning indicators are the level of innovation, market exploration, organizational flexibility, data analysis and use, and creativity. Indicators of innovation work behavior are coming up with new ideas, adopting new ideas, implementing new ideas, improving work processes, and work technology. Business performance indicators are strategies for funding speed, customer satisfaction, completeness of services and employee capabilities.

Findings

Respondent Characteristics

A sample of 296 respondents with a questionnaire that was obtained again was 282 respondents and 14 respondents did not return the questionnaire. The response rate is 95.56 %. Most of the respondents were 41-50 years old with a percentage of 34% of the total number of respondents. Meanwhile, in the data on working hours, the majority of respondents have worked for 6-10 years with a total of 101 respondents or 36% of the total 282 respondents.

Validity Test

Tabel 1. Validity Test Result

Variable	Indicator	Indicator Item	Loading Factor Coefficient (Pearson Product Moment)	Sig.	Information
<i>Knowledge Heterogeneity (M)</i>	M1.1	M1.1.1	0.747	0.000	Valid
	M1.2	M1.2.1	0.783	0.000	Valid
	M1.3	M1.3.1	0.782	0.000	Valid
		M1.3.2	0.758	0.000	Valid
	M1.4	M1.4.1	0.793	0.000	Valid
		M1.4.2	0.792	0.000	Valid
		M1.4.3	0.793	0.000	Valid
M1.4.4		0.757	0.000	Valid	
<i>Innovation work Behaviour (Z)</i>	Z1.1	Z1.1.1	0.749	0.000	Valid
	Z1.2	Z1.2.1	0.703	0.000	Valid
		Z1.2.2	0.744	0.000	Valid
	Z1.3	Z1.3.1	0.716	0.000	Valid
	Z1.4	Z1.4.1	0.711	0.000	Valid
	Z1.5	Z1.5.1	0.798	0.000	Valid
<i>Exploratory Learning (X2)</i>	X2.1	X2.1.1	0.711	0.000	Valid
		X2.1.2	0.706	0.000	Valid
	X2.2	X2.2.1	0.738	0.000	Valid
	X2.3	X2.3.1	0.768	0.000	Valid
	X2.4	X2.4.1	0.744	0.000	Valid
		X2.4.2	0.754	0.000	Valid
	X2.5	X2.5.1	0.726	0.000	Valid
		X2.5.2	0.738	0.000	Valid
	X2.6	X2.6.1	0.762	0.000	Valid
		X2.6.2	0.795	0.000	Valid
	X2.7	X2.7.1	0.752	0.000	Valid
		X2.7.2	0.743	0.000	Valid
	X2.8	X2.8.1	0.749	0.000	Valid
	X2.9	X2.9.1	0.754	0.000	Valid
X2.10	X2.10.1	0.718	0.000	Valid	
	X2.10.2	0.724	0.000	Valid	
<i>Business Performance (Y)</i>	Y1.1	Y1.1.1	0.766	0.000	Valid
		Y1.1.2	0.754	0.000	Valid
	Y1.2	Y1.2.1	0.748	0.000	Valid
		Y1.3	Y1.3.1	0.756	0.000
	Y1.3.2		0.736	0.000	Valid
	Y1.4	Y1.4.1	0.739	0.000	Valid
	Y1.5	Y1.5.1	0.722	0.000	Valid
		Y1.5.2	0.759	0.000	Valid
	Y1.6	Y1.6.1	0.761	0.000	Valid
	Y1.7	Y1.7.1	0.778	0.000	Valid
	Y1.8	Y1.8.1	0.754	0.000	Valid
		Y1.9	Y1.9.1	0.775	0.000
	Y1.9.2		0.737	0.000	Valid
	Y1.10	Y1.10.1	0.849	0.000	Valid
Y1.10.2		0.729	0.000	Valid	
Y1.10.3		0.751	0.000	Valid	
Y1.11	Y1.11.1	0.742	0.000	Valid	
Y1.12	Y1.12.1	0.738	0.000	Valid	
Y1.13	Y1.13.1	0.729	0.000	Valid	
Y1.14	Y1.14.1	0.755	0.000	Valid	
	Y1.14.2	0.760	0.000	Valid	

Source: Primary data processed (2024)

Based on the results of the validity test, it was obtained that all indicators were valid and had a relationship with the variables so that they could be continued to the next stage of testing.

Reliability Test

Table 2. Cronbach's Alpha First Order Result

Variable	Cronbach's Alpha	rho A	Information
<i>Innovation work Behaviour (Z)</i>	0.858	0.892	Reliable
<i>Knowledge Heterogeneity (X1)</i>	0.901	0.905	Reliable
<i>Exploratory Learning (X2)</i>	0.878	0.885	Reliable
<i>Business Performance (Y)</i>	0.874	0.883	Reliable

Source: Primary data processed (2024)

Based on the results of the reliability test above, results were obtained that show all indicators used reliably.

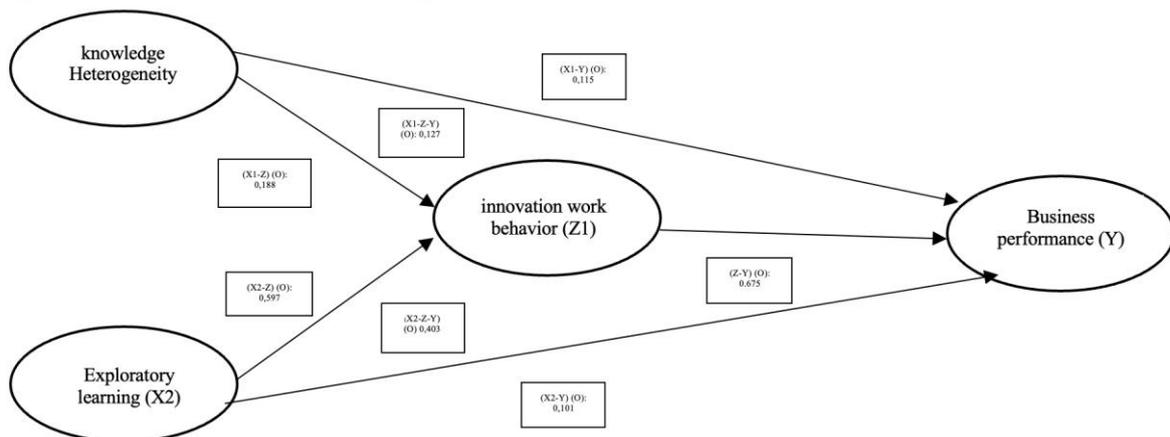
Hypothesis Test Results

Table 3. Corfficient Path Results

	Original Sample (O)	Average Sample (M)	Standart Deviation (STDEV)	T Statistic (O/STDEV)	P Values
IWB → BP	0.675	0.678	0.044	15.169	0.000
KH → BP	0.119	0.120	0.049	2.411	0.008
EL → BP	0.101	0.099	0.048	2.091	0.019
KH → IWB → BP	0.127	0.132	0.036	3.510	0.000
EL → IWB → BP	0.403	0.406	0.039	10.325	0.000

Source: Primary data processed (2024)

Figure 1. Research Model Findings



Source: Primary data processed (2024)

Discussion

Knowledge heterogeneity has a significant effect on business performance

Sharing ideas, managing knowledge and sharing existing knowledge so that it is easily accessible and used effectively, up to date and relevant to the needs of BPR. There are cross-functional training sessions where employees from different departments (credit, marketing

and customer service) share their experiences and strategies, for example the credit team can share how to assess credit risk more effectively and the marketing team can share advice on how to attract new customers. Monthly meetings of ideas on service or operational improvement as well as mentorship programs from senior employees who share advice on how to manage customer relationships or resolve bad loans. The results of this study are in line with and support when *knowledge heterogeneity* is high, which is a positive effect of *knowledge sharing* on *business performance* to be stronger (Tan et al., 2022)

Exploratory learning has a significant effect on business performance

The empirical results of this study in terms of *organizational learning* about more accurate credit risk assessment or the use of data in new management information systems can be pursued with technical training where periodic training programs for credit staff, customer service and risk management such as customer collectibility analysis training. Soft skills development in addition to technical skills, also focuses on the development of soft skills such as communication, negotiation in customer service. Leadership training to prepare employees in managerial roles, focusing on developing team management skills, strategic decision-making and conflict resolution between employees. Organizational learning can be seen as a way to guide managers to improve business performance (Frare, Beuren, and Silva 2022).

Knowledge heterogeneity has a significant effect on business performance through Innovation work behavior

Introduction and implementation of digital technology innovations mobile applications for credit management that allow customers to apply, track and manage loans directly from their smartphones. Developing a chatbot for customer service that aims to share information, advice, knowledge that can help customers with common questions and the credit application process online. This reduces the workload of staff and leaders in improving service responsiveness. The results of this study are in line with the idea that Big data and analytics are increasingly becoming important resources for companies that provide valuable ideas and information for decision-making and update RBV theory in internal resource excellence (Rokhman et al. 2023). The heterogeneity of knowledge, involving differences in thinking, cognition, and ideology within a group, can lead to different approaches to work tasks (Xiang and Jiang 2023).

Exploratory learning has a significant effect on business performance through Innovation work behavior

The empirical results in this study in BPR can be shown in data analytics where data analysis tools to monitor operational and financial performance in real-time help management to make payments faster and more accurately based on accurate data. There are partnerships and collaborations with Fintech, establishing partnerships by developing technology solutions that can improve BPR services such as mobile banking applications or digital payment systems. Cooperation with educational institutions to conduct joint research and gain access to innovative ideas and knowledge resources. Furthermore, this study confirms that innovative work behaviors are an important mechanism that bridges the relationship between organizational learning and business performance (Mai, Do, and Ho Nguyen 2022). This in turn improves business performance as the resulting innovations can improve efficiency, service quality, and customer satisfaction.

Conclusion

The stronger the *knowledge heterogeneity*, the more able it will be able to improve business performance, meaning that sharing ideas can improve employee capabilities through

training. Monthly idea meetings and brainstorming to improve operational services and manage customer relationships and settlement of bad loans. The stronger *Exploratory learning*, the more able it will be able to improve *business performance*, meaning the better the use of data analysis and risk management, able to improve strategies, speed of funding, and increase employee capabilities. With periodic training programs, risk management in customer collegibility analysis training and leadership skills development will create effective and efficient business performance in conventional BPRs in East Java. The use of technology is able to improve the speed of funding strategy The use of information technology such as SID, the internet, and internal online forums to improve operational efficiency and communication in the organization is able to partially mediate.

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Assessment and Mechanism Analysis of Low Carbon Efficiency in Cold Chain Logistics in the Guangdong-Hong Kong-Macao Greater Bay Area

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Abstract

According to Yang et al. (2023), the research objectives are well-defined and center on evaluating the effectiveness of cold chain logistics, investigating the fundamental mechanisms that impact performance, and identifying variables like market conditions, economic development, and government support that moderate efficiency outcomes. The research questions that direct the study are also presented in this chapter, such as: How can cold chain logistics' low-carbon efficiency be quantified? Which are the main determinants of efficiency? In what ways are these interactions moderated by outside factors? This work is important because it advances theoretical knowledge and real-world applications. By combining the three aforementioned theories and using a Three-Stage DEA technique to assess logistics efficiency.

Keywords: cold chain logistics, DEA, efficiency, greater bay area, low-carbon.

Introduction

The significance of cold chain logistics has grown dramatically in recent years, particularly in the Guangdong-Hong Kong-Macao Greater Bay Area (GBA), an economic center that is expanding quickly. A vital part of the supply chain for sectors including chemicals, food, and pharmaceuticals is cold chain logistics, which deals with the movement and storage of goods that are sensitive to temperature. Sustainability is severely hampered by this industry's high energy consumption and the huge rise in carbon emissions from transportation and refrigeration. Accordingly, reaching regional and international environmental targets now depends on increasing the cold chain logistics' low-carbon efficiency (Liu et al., 2023; He et al., 2023).

The objective of this research is to assess and examine the GBA's cold chain logistics' low-carbon efficiency while taking environmental and financial performance into account. In particular, this study examines the variables that affect cold chain logistics companies' efficiency by taking into account both desired and undesirable outcomes, such as carbon emissions and freight volume and economic growth. In order to accomplish this, the study uses a Three-Stage Data Envelopment Analysis (DEA) as its main instrument for assessing cold chain logistics companies' performance. This method enables a thorough evaluation that takes into consideration external influences on efficiency as well as environmental aspects (Ma et al., 2023).

The current inefficiencies in the cold chain logistics industry and their significant contribution to regional carbon emissions are highlighted in the research's problem statement. The particular problem of lowering emissions while preserving economic performance has

not yet been entirely resolved, despite considerable attempts to increase logistical efficiency (Xu et al., 2024). Improving the sustainability of the GBA's logistics operations is essential for local stakeholders as well as the region's global competitiveness, given its strategic location as a key economic center (Zhang et al., 2024).

Three major theories form the theoretical basis of this research: Ecological Modernization Theory (EMT), Stakeholder Theory, and Resource-Based Theory (RBT). RBT offers information on how logistics companies use internal resources, like labor and capital, to cut emissions and increase efficiency (Barney, 1991). Stakeholder theory emphasizes how different stakeholders, such as consumers, governments, and businesspeople, may support low-carbon activities (Freeman, 1984). EMT highlights how regulatory changes and technology developments propel sustainability in logistics (Mol & Spaargaren, 2000). When combined, these ideas offer a thorough understanding of how cold chain logistics might improve low-carbon efficiency while striking a balance between environmental and economic effects.

According to Yang et al. (2023), the research objectives are well-defined and center on evaluating the effectiveness of cold chain logistics, investigating the fundamental mechanisms that impact performance, and identifying variables like market conditions, economic development, and government support that moderate efficiency outcomes. The research questions that direct the study are also presented in this chapter, such as: How can cold chain logistics' low-carbon efficiency be quantified? Which are the main determinants of efficiency? In what ways are these interactions moderated by outside factors?

The Role and Environmental Challenges of Cold Chain Logistics in the Greater Bay Area

The Guangdong-Hong Kong-Macao Greater Bay Area (GBA) encompasses nine mainland cities alongside Hong Kong and Macao. As one of the world's most dynamic urban clusters, its growing demand for fresh food, pharmaceuticals, and other temperature-sensitive goods has made cold chain logistics increasingly vital. However, the energy-intensive nature of cold chain logistics, heavily reliant on refrigeration and transportation infrastructure, poses significant environmental challenges (Zhang et al., 2020).

In 2023, China's cold chain logistics demand reached 350 million tons, with a 6.1% year-on-year growth. Refrigerated trucks exceeded 430,000 units (a 12.8% increase), and refrigerated storage volume reached 228 million cubic meters, with high-standard cold storage accounting for 62% (Guangdong Statistical Yearbook, 2024). While cold chain logistics has spurred economic growth, balancing economic performance with environmental sustainability remains a critical challenge for the GBA (Liu et al., 2023).

Cold chain logistics faces multiple environmental challenges due to its reliance on energy-intensive technologies. Key issues include:

High energy consumption and carbon emissions: refrigeration systems and transportation are major sources of energy use and greenhouse gas (GHG) emissions. Globally, the logistics sector accounts for approximately 24% of total CO₂ emissions, with cold chains contributing around 5% due to their reliance on fossil fuels (IEA, 2023). In the GBA, carbon emissions from refrigeration and transportation equipment have grown at an average annual rate of 3.5% (Guangdong Statistical Yearbook, 2024).

Refrigerant Use: Common refrigerants, such as hydrofluorocarbons (HFCs), have high global warming potential and significantly contribute to climate change if improperly managed (Hu et al., 2022). Studies indicate that HFC emissions from refrigerant leakage account for approximately 15% of total cold chain emissions (Wang et al., 2021).

Waste Generation: Poorly managed cold chains lead to food spoilage, wasting resources, and generating methane, a potent GHG. Additionally, outdated refrigeration equipment contributes to electronic waste (Boschiero et al., 2019).

Transportation Inefficiencies: Inefficient logistics routes and aging refrigerated vehicles increase fuel consumption and emissions. In 2023, transportation energy consumption accounted for nearly 70% of the total energy used in the GBA’s cold chain logistics (Chen et al., 2023).

In the GBA, these challenges are further exacerbated by regional climate factors such as high ambient temperatures, which increase refrigeration energy demands. Addressing these issues requires adopting renewable energy technologies, improving efficiency through technological innovation, and strengthening regulatory frameworks (Yan et al., 2022). As the GBA continues to develop as a global logistics hub, transitioning to sustainable cold chain practices will play a pivotal role in achieving regional economic and environmental goals.

Rising Trends in Global Energy Consumption and CO2 Emissions

With an expected 37.9 billion tons of CO2 emissions in 2024—a 1.3% increase from the year before—global energy-related CO2 emissions are still on the rise (IEA, 2023a). Fossil fuel dependence is still a major element, particularly in developing nations, even though this growth rate is somewhat slower than the 3% world GDP increase (IEA, 2023b).

Fossil fuels continue to be responsible for more than 80% of CO2 emissions, which have increased by 1.9% annually on average between 2000 and 2024 (IEA, 2023b). Significant regional disparities exist: established economies such as the US and the EU have cut emissions by 2.4% and 4.2%, respectively, while Asia—particularly China and India—has witnessed an increase in emissions, with China alone accounting for 35% of global CO2 emissions in 2024 (IEA, 2023c).

Figure 1. Global Energy-Related CO2 Emissions and Annual Changes (2000-2024)

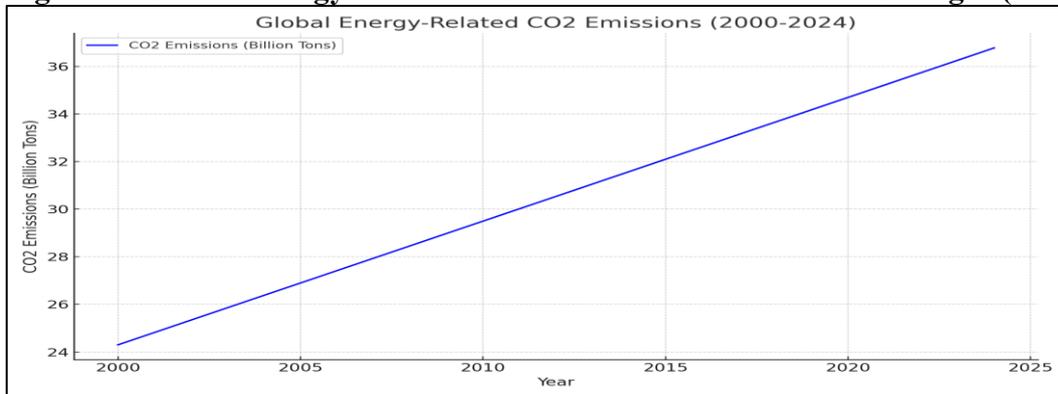


Table 1. CO2 Emissions by Region (2023-2024)

Region	2023 Emissions (Billion Tons)	2024 Emissions (Billion Tons)	Growth Rate (%)
China	12.2	12.6	3.3
India	2.5	2.6	4.0
European Union	2.4	2.3	-4.2
United States	4.2	4.1	-2.4
Rest of World	16.5	16.8	1.8

Table 1 provides a comparative view of CO2 emissions by region, highlighting the dominant contributions from China and India relative to other global regions. Developing

Asia shows notable emission growth compared to reductions in developed economies like the EU and the United States (IEA, 2023a).

Key Contributors to Global CO2 Emissions: Developing Asia

In 2024, developing Asia—represented mostly by China and India—was responsible for almost 52% of the world's CO2 emissions. This significant portion emphasizes how important the area is to the dynamics of the global climate.

With 12.6 billion tons of CO2, China was the biggest emitter, accounting for 35% of world emissions and a 3.3% annual rise (IEA, 2023b). India, the third-largest emitter in the world, increased its emissions to 2.6 billion tons in 2024, a result of steady expansion fueled by energy demand and industrialization (IEA, 2023b).

Table 2. Developing Asia's CO2 Emissions, 2023–2024

Country	2023 Emissions (BillionTons)	2024 Emissions (Billion Tons)
China	12.2	12.6
India	2.5	2.6

Table 2 highlights how China and India account for the majority of CO2 growth. Despite continuous efforts to increase the infrastructure for renewable energy, their reliance on coal and fossil fuels presents hurdles for the global carbon neutrality targets.

The rising emissions from developing Asia underscore the necessity of focused climate policies, global collaboration, and investments in renewable energy to promote sustainable development while reducing environmental stressors.

Proceeding Increase in CO2 Emissions in the Logistics Sector in China

In recent years, China's logistics sector has been progressively expanding its CO2 emissions. According to the National Bureau of Statistics, the CO2 emissions from China's logistics industry were approximately 948 million tons in 2021, accounting for 9.01% of the national total emissions (National Bureau of Statistics, 2022). This number is expected to increase by 2024.

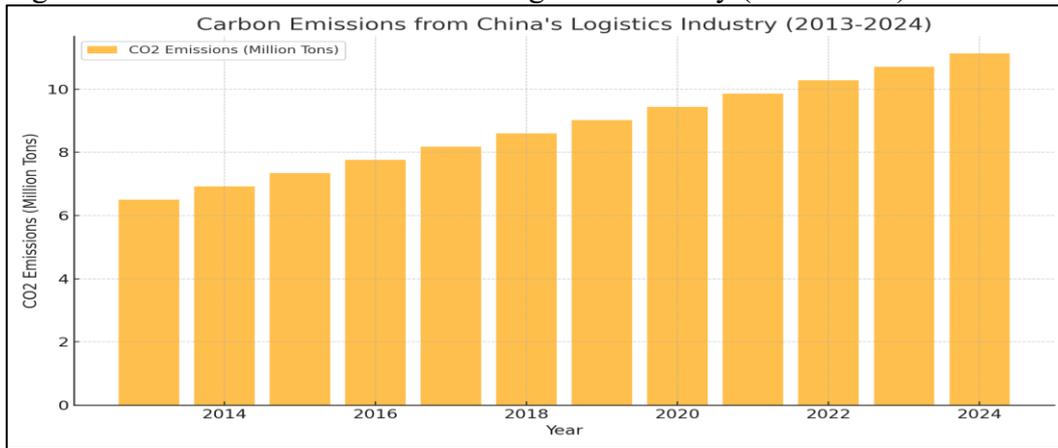
Table 3. Projected CO2 Emissions in China's Logistics Industry (2021-2024)

Year	CO2 Emissions (Million Tons)	Annual Growth Rate (%)
2021	948	-
2022	990	4.4
2023	1.02 billion	3.9
2024	1.07 billion	4.2

Source: (National Bureau of Statistics, 2022).

This data reflects the steady increase in CO2 emissions from China's logistics industry, primarily driven by increased transportation demand and the expansion of logistics scale.

Figure 2. CO2 Emissions in China's Logistics Industry (2013-2024)



Source: National Bureau of Statistics (2022)

Figure 2 shows the trends in CO2 emissions from China's logistics industry from 2013 to 2024. As demonstrated, emissions have been steadily increasing due to the growing demand for logistics services and the expansion of transport and warehouse infrastructure. This upward trend reflects not only the industrialization and urbanization of China but also the continued reliance on fossil fuels for energy, particularly in transportation and cold chain logistics.

In 2021, the logistics sector contributed 948 million tons of CO2 emissions, and it is projected to reach approximately 1.07 billion tons by 2024 (National Bureau of Statistics, 2022). The chart highlights the steady rise in emissions over the years, with significant increases observed between 2015 and 2024, driven by higher freight volumes and transportation requirements across the country.

Literature Review

Importance of LCCCL in GBA

On February 18, 2019, China published the GBA Development Plan Outline. In their examination of the GBA, LIU (2020) sheds light on its background, significance in assimilating HKM into China, relationship to the OBOR project, the MIC2025 plan, and China's overall economic growth. Furthermore, LIU (2020) looks to the GBA's future and highlights the challenges that still need to be addressed. In the realm of blockchain technology, Lai et al. (2020) have built a blockchain-based intelligent logistics platform that might be a useful reference point for the GBA in encouraging the harmonious expansion of city clusters and easing the integration of logistics. Additionally, Liu et al. (2021) provide three crucial suggestions for international energy cooperation within the

Greenhouse Gas Emissions

In order to investigate the levels of CO2 emissions in the GBA and neighboring cities between 2000 and 2019, Luo et al. (2023) suggested a research methodology that combines the usage of system dynamics (SD) and the logarithmic mean divisor index (LMDI). Analyzing the causes of these emissions, forecasting future patterns, and evaluating the policy consequences are the primary goals of this study. The first scenario predicts that regional CO2 emissions will rise further, reaching 1.25 times the 2019 levels by 2030.

The expected changes in the wetlands inside the GBA between 2020 and 2035 are assessed by Peng et al. (2023) in order to bolster the report on Wetland Conservation and Sustainable Development Goals (SDGs).

Greater Bay Area Cold Chain Logistics

A principal component analysis approach was used to evaluate the logistics performance in the GBA from a low-carbon perspective (Xu, 2023). According to the results, Zhongshan had the lowest score and Hong Kong the highest (Chu et al., 2023). The purpose of this study is to offer recommendations for maintaining the quality of rhubarb fish while it is being transported in the cold chain. It is advised to limit temperature changes during the cold chain process and to rapidly freeze the obtained samples in order to guarantee adherence to quality requirements. Given the unpredictability of this process, a well-established and routinely monitored cold chain logistics network is essential. Yuan's (2022) study employed the Ontario region to optimize important variables, such as data analysis and the usage of mathematical models.

Environmental Efficiency Theory

A recent study by Yamasaki et al. (2019) offers important information to Japanese officials about how to assess eco-efficiency in cities. Governments should support business innovation, increase the effectiveness of resource allocation, and progressively lower environmental pollution while maintaining enterprise sustainability, claim Ai et al. (2020). However, evaluating how these environmental regulations affect important economic outcomes like innovation, productivity, competition, energy efficiency, and carbon emissions is difficult due to the lack of trustworthy empirical evidence.

By computing a number of measures to gauge the seriousness of environmental regulations and carrying out an extensive statistical study to compare these indicators, Galeotti and colleagues (2020) significantly contributed to the solution of this problem. They also provided real-world case studies that highlighted energy efficiency and environmental innovation.

Sustainable Development

Since energy efficiency lowers emissions of pollutants and energy consumption, it is crucial for policy development. From 2008 to 2016, researchers examined the energy efficiency of several Chinese provinces. They employed a three-phase approach known as data envelopment analysis, which ignored exterior environmental influences in favor of concentrating on scale efficiency, a critical component of energy efficiency. An integrated evaluation of eco-efficiency that took into account possible emission reductions, energy savings, and resource allocation across Chinese areas was presented in another academic study. In order to determine the main elements influencing eco-efficiency, the study took into account variables including resource disparities and environmental legislation. Furthermore, a quantitative research looked at 20 developed countries' environmental, energy, and carbon dioxide emissions efficiency.

Methods

Rising Market Demand for Cold Chain Logistics and Facility Shortages in the Greater Bay Area

The Greater Bay Area (GBA)'s current facilities cannot keep up with the need for cold chain logistics, which is constantly increasing. The demand for cold chain agricultural goods is predicted to exceed 27.67 million tons by 2025 in all 11 of the GBA's cities. To accommodate this demand, the cold chain's current infrastructure—which includes refrigerated transportation equipment and cold storage—is woefully inadequate.

Despite a rise in investment in cold chain logistics infrastructure, the rate of infrastructure development expansion has not kept pace with the demand, according to the Guangdong Statistical Yearbook (2024). For example, in terms of cold storage, the proportion of high-standard cold storage is still low, with only 62% of the cold chain facilities meeting high.

Table 4. Cold Chain Agricultural Product Demand vs. Existing Facilities (2025)

City	Cold Chain Agricultural Product Demand (10,000 Tons)	Cold Storage Capacity (10,000 Tons)	Gap in Demand (10,000 Tons)
Guangzhou	646.94	450	196.94
Shenzhen	620.67	500	120.67
Zhuhai	89.89	50	39.89
Dongguan	409.05	350	59.05
Zhongshan	142.81	120	22.81
Zhaoqing	151.06	110	41.06
Huizhou	199.28	170	29.28
Foshan	337.56	300	37.56
Jiangmen	170.06	140	30.06
Total	2767.32	2180	587.32

According to Table 4, the GBA's current cold storage capacity will be greatly outstripped by the demand for cold chain agricultural products by 2025, leaving a 5.87 million ton deficit. The cold chain infrastructure in the majority of cities is severely lacking, particularly when it comes to capacity for refrigerated transportation and high-standard cold storage.

Table 5. GBA Cities' Projected Demand for Cold Chain Agricultural Products (2025)

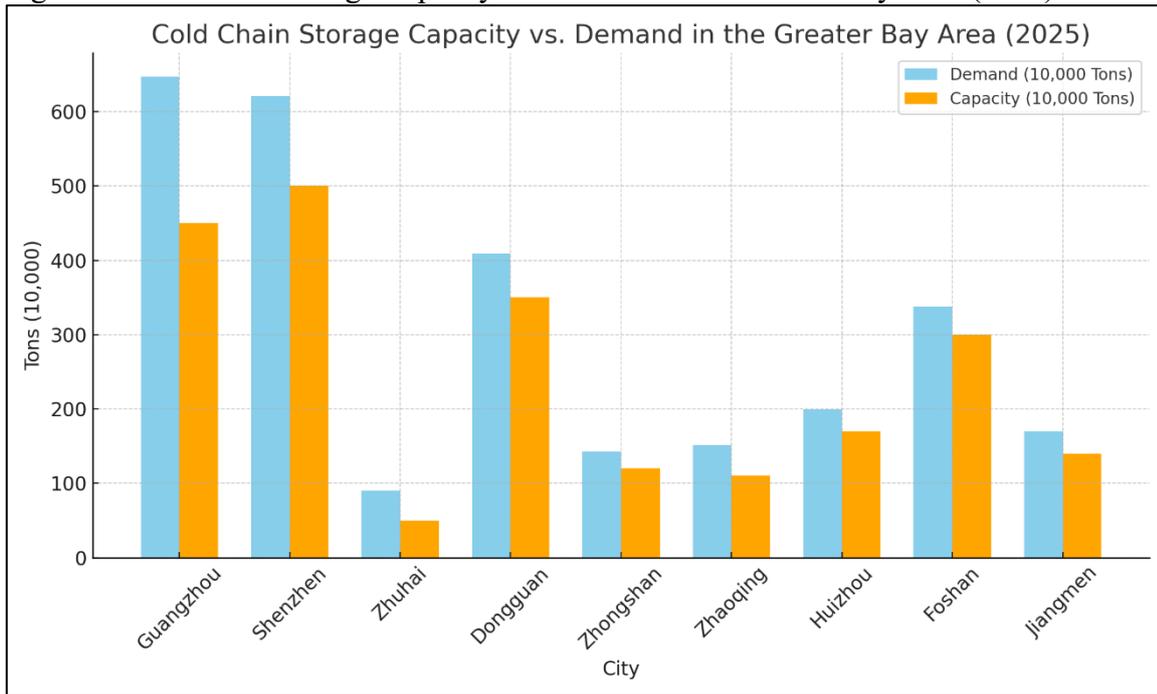
City	Vegetables	Meat	Poultry	Aquatic Products	Eggs	Dairy Products	Fruits	Total
Guangzhou	232.23	79.27	79.60	78.58	20.71	18.75	137.80	646.94
Shenzhen	222.80	76.05	76.37	75.39	19.87	17.99	132.21	620.67
Zhuhai	32.27	11.01	11.06	10.92	2.88	2.61	19.15	89.89
Dongguan	146.84	50.12	50.33	49.69	13.09	11.85	87.13	409.05
Zhongshan	51.27	17.50	17.57	17.35	4.57	4.14	30.42	142.81
Zhaoqing	54.23	18.51	18.59	18.35	4.83	4.38	32.18	151.06
Huizhou	71.53	24.42	24.52	24.21	6.38	5.78	42.45	199.28
Foshan	121.17	41.36	41.53	41.00	10.80	9.78	71.90	337.56
Jiangmen	61.04	20.84	20.92	20.66	5.44	4.93	36.22	170.06
Hong Kong	80.50	26.94	27.00	26.70	7.03	6.37	46.85	221.39
Macau	14.20	4.75	4.80	4.75	1.25	1.13	8.32	39.20

By 2025, the Guangdong-Hong Kong-Macao Greater Bay Area (GBA)'s 11 cities' anticipated demand for cold chain agricultural products—which include fruits, vegetables, meat, poultry, aquatic products, eggs, and dairy products—is shown in Table 5.

Guangzhou has the biggest demand (6.47 million tons), followed by Shenzhen (6.21 million tons), as the GBA keeps expanding. A large portion of the demand for cold chain logistics is driven by these cities because they are important economic centers. Cities like Zhuhai and Macau, on the other hand, have smaller demands—0.89 million tons and 0.39 million tons, respectively. Their lower scale and less demanding logistics requirements are the cause of this.

There are regional differences in the demand for particular agricultural goods. Fruits and vegetables are.

Figure 3. Cold Chain Storage Capacity vs. Demand in the Greater Bay Area (2025)



The Greater Bay Area (GBA) cold chain storage capacity and demand comparison for 2025 is depicted in the chart. The orange bars display the storage capacity (in 10,000 tons) across different cities, whereas the blue bars show the demand (in 10,000 tons). The greatest demand and capacity are found in Guangzhou and Shenzhen, but in many places, including Zhuhai and Dongguan, the demand is more than the capacity, indicating serious deficiencies in the cold chain logistics infrastructure. This disparity highlights the necessity of further cold chain facility development to satisfy the expanding demand in these areas.

Table 6. Policies and Development Goals in GBA Cities

City	Policy Focus	Development Goal
Guangzhou	13th Five-Year Plan on Energy Saving and Carbon Reduction	Three International Strategic Hubs
Shenzhen	12th Five-Year Plan on Low Carbon Development	International Innovation Service Center
Zhuhai	Greenhouse Gas Emission Control Implementation Plan	Expanding Bridgehead and Innovation Plateau
Foshan	Low Carbon City Construction Plan	International Industrial Manufacturing Center
Dongguan	13th Five-Year Plan on Industrial Energy Saving	International Manufacturing Service Center
Zhongshan	Green Development Strategy Plan	State-Level Advanced Manufacturing Base
Huizhou	Low Carbon Ecology Plan	Green City and Eco-Tourism Hub
Jiangmen	Low Carbon Development Strategy Plan	State-Level Advanced Manufacturing Base
Zhaoqing	Low Carbon Development Subject Plan	Traditional Industry Upgrading Zone
Hong Kong	HK Climate Action Plan 2030	Global Financial and Logistics Center
Macau	Macao Environmental Protection Plan	World Tourism and Leisure Center

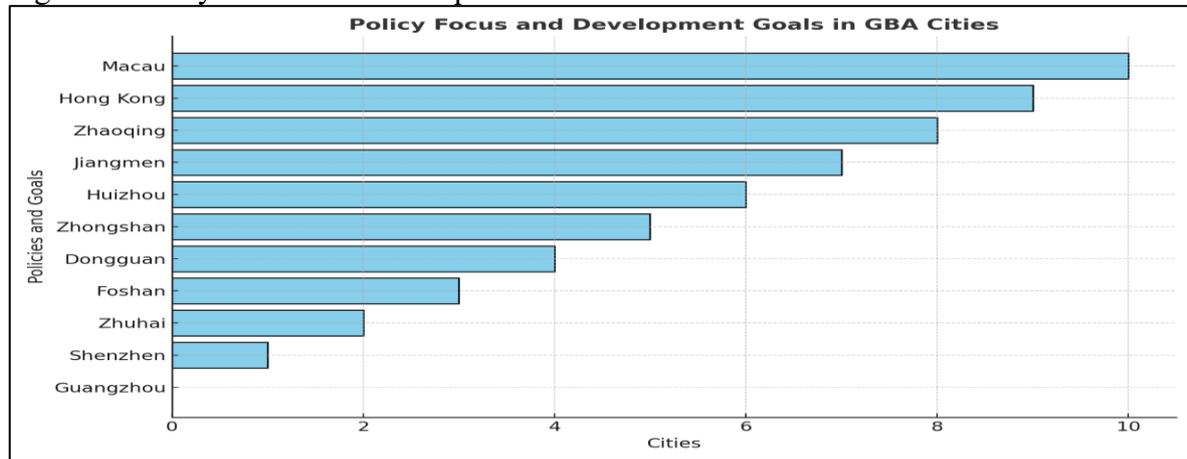
Key Insights from Policy and Development Goals

The policies and development goals in the GBA illustrate diverse regional focuses and strengths. The following table summarizes the key insights drawn from these policies, highlighting the roles and priorities of different city groups.

Table 7. Key Insights from Policy and Development Goals

City Group	Focus	Characteristics
Guangzhou, Shenzhen, Dongguan	Becoming international hubs with strong industrial and innovation infrastructure	Prioritize carbon reduction while focusing on global connectivity and innovation hubs
Foshan, Zhongshan, Jiangmen	Emphasizing manufacturing and industrial development	Integrate green strategies with traditional and advanced manufacturing bases
Zhuhai, Zhaoqing	Balancing industrial upgrades with low-carbon goals	Play supportive roles in industrial and economic upgrading within the GBA
Hong Kong, Macau	Financial, logistics, and tourism sectors	Combine sector-specific economic goals with low-carbon practices for global positioning

Figure 4. Policy Focus and Development Goals in GBA Cities



A chart has been created that summarizes the development objectives and policy focus for each of the Greater Bay Area's (GBA) eleven communities.

The Function of Resource-Based Theory and Technological Innovation

Adopting cutting-edge technologies is essential to improving cold chain logistics' low-carbon efficiency. Businesses with valuable, uncommon, and unique resources—like cutting-edge technologies and highly qualified personnel—can achieve long-term competitive advantages, claims the Resource-Based Theory (RBT) (Barney, 1991). Energy-efficient refrigeration systems, real-time tracking tools, and route optimization algorithms are examples of technological resources that are crucial to lowering carbon emissions and increasing operational effectiveness in the context of cold chain logistics.

Energy-efficient refrigeration systems, for example, drastically reduce energy use in logistical processes, which in turn lowers greenhouse gas emissions. Systems for real-time monitoring do not

Research Gaps and Developing an Integrated Framework

Despite the increasing recognition of the importance of low-carbon cold chain logistics, significant research gaps persist in understanding the mediating role of generalized total factor productivity (GTFP) and the moderating effects of external factors. GTFP, as a measure of the efficiency with which inputs are transformed into outputs, provides valuable insights into how

resources such as labor, capital, and energy are utilized in the logistics sector (Liu et al., 2023). However, existing studies have rarely examined GTFP within the specific context of cold chain logistics, leaving ample room to explore its impact on low carbon efficiency.

Furthermore, while it is widely acknowledged that external factors—such as government policies, economic conditions, and market environments—play a role in shaping low-carbon initiatives, their functions as moderating variables remain underexplored. Research has indicated that regions with stronger government support and more competitive markets are more likely to adopt low-carbon logistics practices (Yan et al., 2022). Nevertheless, there is a lack of systematic analysis on how these external factors interact with internal inputs and mediators such as GTFP, particularly within the GBA's unique socio-economic and environmental context.

To address these gaps, this study aims to develop an integrated framework that combines data envelope analysis (DEA) and structural equation modeling (SEM). The framework will examine the relationships between capital investment, labor input, composite technical investment, and energy input while incorporating the mediating roles of GTFP and energy structure. Furthermore, the framework includes external moderating factors, providing a holistic perspective on the drivers of low carbon efficiency in cold chain logistics. By filling these research gaps, this study seeks to advance theoretical understanding and offer actionable insights for policymakers and industry stakeholders.

The Three-stage DEA Methodology

The Three-Stage Data Envelopment Analysis (DEA) methodology is an advanced technique used in operational research and economics to evaluate the efficiency of decision-making units (DMUs), such as companies, hospitals, or educational institutions. This method extends the traditional DEA approach by incorporating external environmental variables and statistical noise, which might affect the performance measurements. Here's a breakdown of how it works:

Stage 1: Traditional DEA

In the first stage, DMUs are evaluated using the standard DEA model (either input-oriented or output-oriented). This model measures the efficiency of each DMU relative to an efficiency frontier, which represents the best performance observed in the dataset. The efficiency score is calculated based on the ratio of weighted outputs to weighted inputs, and DMUs are classified as efficient or inefficient based on this score.

Stage 2: Adjusting for External Variables

The second stage involves regression analysis to account for the influence of external environmental variables and random noise that could affect the initial efficiency scores calculated in Stage 1. This stage aims to separate the effect of these variables from the performance of the DMUs. By doing so, the efficiency scores are adjusted to reflect the performance of the DMUs more accurately, isolating the effects of factors beyond their control.

Stage 3: Adjusted DEA Model

In the third stage, the DEA model is reapplied using the adjusted efficiency scores from Stage 2. This reapplication provides a new set of efficiency scores that are corrected for statistical noise and external environmental influences. The final scores offer a more precise evaluation of the intrinsic efficiency of each DMU.

Applications and Benefits

The three-stage DEA methodology is particularly useful in environments where external factors significantly impact the performance but are not directly controllable by the DMUs. It

provides a more nuanced understanding of efficiency by: identifying true performance benchmarks; allowing managers and policymakers to recognize areas for improvement that are within their control; supporting fair comparisons among DMUs by considering the impact of external and uncontrollable factors.

Research Framework

Figure 5. Policy Focus and Development Goals in GBA Cities

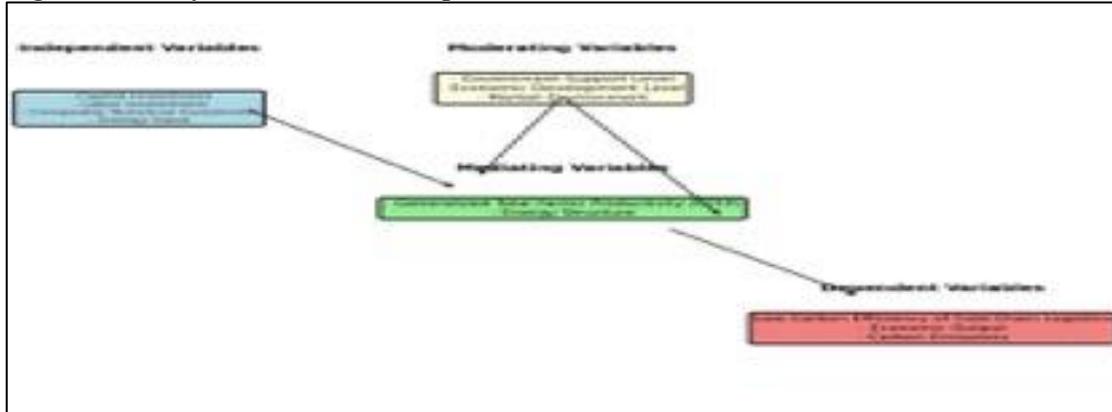


Table 8. Selection of Evaluation Index of Cold Chain Logistics Efficiency

Variable Category	Selected Variable	Indicator Name	Unit	
Input Variables	Capital Investment	Total Fixed Asset Investment in Cold Chain Logistics	100 million CNY	
	Labor Investment	Number of Employees in Cold Chain Logistics	person	
	Composite Technical Investment		Road Mileage	km
			Warehouse Capacity	10,000 tons
			Refrigerated/Insulated Storage Capacity	10,000 tons
		Number of Refrigerated/Insulated Vehicles	units	
	Energy Input	Annual Energy Consumption	10,000 tons of coal equivalent	
Output Variables	Economic Output	Cold Chain Logistics Flow	100 million CNY	
	Scale Output	Turnover Volume of Freight Transport	tons	
Undesirable Output	Environmental Output	Total Carbon Emissions of Cold Chain Logistics	10,000 tons	
Environment Variables	Economic Development Level	Regional GDP	100 million CNY	
	Government Support Level	Government Support Intensity	%	
	Market Environment	Market Openness Level	%	

Findings

The results imply that government regulations and cutting-edge technologies have a critical role in supporting low-carbon behaviors. This study emphasizes how crucial external assistance and effective resource management are to simultaneously accomplishing economic and environmental goals. By combining Resource-Based Theory (RBT), Stakeholder Theory, and Ecological Modernization Theory (EMT) with an emphasis on cold chain logistics, this study adds to the body of existing work.

Discussion

By combining Resource-Based Theory (RBT), Stakeholder Theory, and Ecological Modernization Theory (EMT) with an emphasis on cold chain logistics, this study adds to the body of existing work. Structural equation modeling (SEM) and the three-stage data envelope analysis (DEA) offer a sophisticated knowledge of the ways in which external and internal resources contribute to low-carbon efficiency.

The study emphasizes the importance of investing in cutting-edge refrigeration technologies and streamlining logistics channels to improve energy efficiency for governments and industry stakeholders. It is also clear how important government assistance is in creating and implementing laws that promote the use of green technologies. These understandings can help develop focused interventions meant to lower carbon emissions in the logistics industry. Furthermore, the study indicates that the environmental impact of the cold chain logistics sector can be considerably reduced by expanding the coverage and standardization of superior cold storage facilities.

It is important to recognize the following limitations of this study: Data Availability: The availability and accuracy of data on energy use and carbon emissions unique to cold chain logistics inside the GBA limited the study's scope. Geographic Focus: The study's primary focus is the GBA, which may restrict the findings' applicability to other areas with distinct logistical, environmental, and economic dynamics.

Conclusion

The study offers a thorough examination of low-carbon efficiency in the GBA's cold chain logistics industry. It emphasizes how important government regulations, resource-based skills, and technical innovation are to improving sustainability practices. Despite data and geographic specificity limits, the results make a substantial contribution to theoretical frameworks and real-world applications. In the future, the study highlights the need for strong policy frameworks that balance environmental sustainability objectives with economic development and promotes greater research into the integration of eco-friendly technologies across a wider range of logistic environments.

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1. Research on Cold Chain Logistics Efficiency Measurement and Influence Mechanism in Guangdong, Hong Kong and Macao Greater Bay Area under Low Carbon Perspective (KYYB202328)
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4. Study on the Coupling and Synergy of Digital Economy and Intelligent Cold Chain Logistics for High Quality Development in Guangdong, Hong Kong and Macao Greater Bay Area (2024CSLKT3-420)

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The Strategic Human Resource Management, Firm Resource, Employee Relation Climate in Foreign-Invested Enterprises in Guangzhou Special Economic Zone

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Abstract

Human resource is the core strategic resource of enterprises. More and more scholars start to pay attention to the strategic value of human resources and strategic human resource management. This study takes strategic human resource management and human resource management practice as the main line, takes foreign-invested enterprises in Guangzhou Special Economic Zone as the survey object, and uses the form of questionnaire to explore whether there is a positive correlation between strategic human resource management and enterprise performance and employee atmosphere. At the same time, the paper explores whether the ownership type of a company affects the choice of strategic human resource management and human resource management practice and whether it has a moderating effect on employee management climate.

Introduction

Strategic human resource management (SHRM) is depicted as "the situation of HR associations and exercises which are focused on a relationship to accomplish its targets" (Wright and McMahan, 1992). It has been battled to upgrade the legitimate sufficiency and execution if the HR practice of an association is predictable (for example, interior wellness) and with the principal targets (for example, outside wellness) of the alliance (Huselid, 1995; Wright and McMa-han, 1992). While SHRM is identified with the association's Game Plan, HR rehearses are the fundamental instruments for HR procurement, progress and inspiration. SHRM centers around the "what" an organization does with HR and HR rehearses suggest the "how" assets are overseen. In the West there has been a reasonable and exact relationship between SHRM and firm execution (Huselid et al. 1997). The utilization of fundamental HR rehearses end up being unequivocally related, both monetarily and operationally (Delaney & Huselid, 1996). Also, the affirmation of the synergistic impact of HR practice gatherings on firm outcomes has been positive (Huselid, 1995; MacDuffie, 1995). However, no persuading results were found in the significance of SHRM and posh HR rehearses in Asia and the manner in which they come or go from the West (Bae et al. 2003; Von et al. 2002). A couple of co-ordinated assessments as of late tracked down a positive organization among SHRM and firm execution in China (Bjorkman and Fan, 2002). This survey looks for a theoretical model for HR execution according to the Individuals' Republic of China to grow the examination line referenced previously. It varies from past research on propensities. We assess specifically whether SHRM and HR rehearse identify with different results in an organization like monetary execution, operational execution, and environmental change appointment. The

environment of designated relations is viewed as a basic piece of genuine plentifulness that has been under-researched (Fe, 1982,). Besides, we test the planning effect of organization possession on SHRM and HR relationship with solid outcomes. Organizations of different sorts, including state-attested organizations (SOEs), new commitment endeavors (FIs) and Particular endeavors (POEs) are searching for various foundations in the Chinese passing economy (Ahlstrom and Bruton 2001; Ding et al. 2006). From now into the foreseeable future, the consequences for the execution of SHRM and HR rehearses between these affiliations will most likely change. Thirdly, for their appraisal of the extent of the HR work in their firm we inspected both the President and the other ranking executive. The current synthesis utilizes regularly single-reacting HR practices and firm execution, paying little mind to how tremendous extents of the appraisal bungle might be available in these exercises (Gerhart et al., 2000). In this survey, we gathered data from various respondents and hence held an essential partition from the central vital pattern.

Problem Statement

Foreign direct investment (FDI) in China is the most sensational indication of China's open-Entryway strategy. Along with constant import and fare extension, FDI has progressively uncovered the Chinese economy toward the western world during the previous decade. There are, be that as it may, a few contrasts among FDI and unfamiliar exchange terms of their suggestions for the homegrown economy. Chinese specialists are enthusiastic about reviewing the developing unevenness in local dispersion of FDI. Foreign direct investment, notwithstanding, keeps up that conditions are very troublesome in the western area.

South China's financial center point, Guangzhou, as of late, gave another authority archive underscoring that the public authority will give more impetuses to unfamiliar direct venture (FDI) fascination. The report pushes Guangzhou to have more areas open to FDI, offer more financial help just as administrative accommodation, and develop a better foundation. Guangzhou likewise expects to differentiate the roads for foreign direct investment to increment enrolled capital, keep up income and raise extra capital. Later on, the foreign direct investment will actually want to use particular sorts of capital – including capital assets, undistributed benefits, homegrown organization value, enrolled unfamiliar obligation and hold reserves – to build their enlisted capital for the organizations. It is likewise trusted that organizations can get nearby cash all the more effectively by finishing foreign exchange settlements because of different organization needs, as opposed to installment needs just, and furthermore by being permitted to contribute with their lawful RMB pay abroad.

Additionally, the public authority even designs to prescribe qualified unfamiliar business entities to list at home and abroad, furnishing them with a bigger foundation of capital-raising. Regarding financial execution, operational execution and the specialists' relations climate, SHRM and HR will discover quick and helpful results.

Research Questions

There are several questions that arise when conducting the research. Questions are:

- Do the types of ownership influence SHRM and HR company selection?
- Do SHRM and HR practices positively related to firm performance?
- Do SHRM and HR practices positively related to the employee relations climate?
- Do the ownership types moderate the relationships of SHRM and HR practices with firm performance and employee relations climate?

Research Objectives

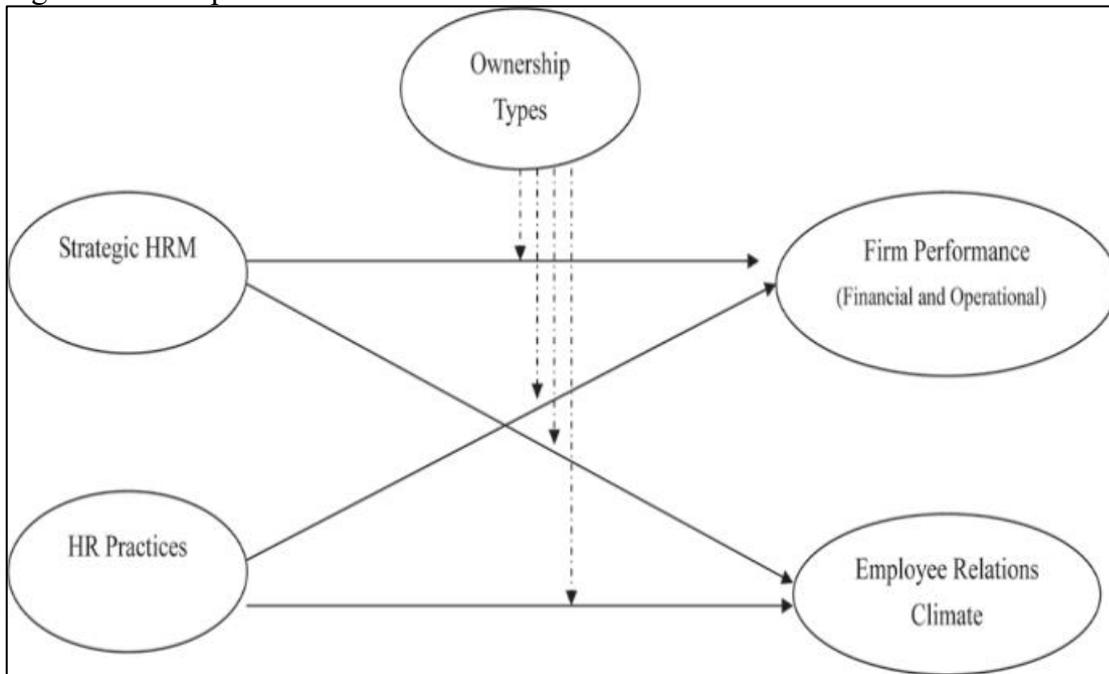
The broad objective of the study will help to find the strategic human resource management, firm resource, and employee relation climate in foreign-invested enterprises in Guangzhou special economic zone.

The specific objective of the research study includes the following:

- To detect ownership types, use of SHRM and HR business practices.
- To find out SHRM and HR practices are positively related to firm performance.
- To find out SHRM and HR practices are positively related to the employee relations climate.
- To find out the ownership types moderate the relationships of SHRM and HR practices with firm performance and employee relations climate.

Conceptual Framework

Figure 1. Conceptual Framework



Significance of Research

This report shows details on the strategic management of human resources, the resource base and the employee relationship atmosphere in the Guangzhou special economic zone for foreign investors.

Furthermore, for the purposes of finding out the ownership types affect the appropriation of SHRM and HR practices of companies, the types of ownership moderate relationships with SHRM and HR practices with firm performance and an employee climate.

Literature Review

SHRM and HR Practices

As per the Resource-Based View (RBV), bizarre, huge, preeminent and no substitute indoor business resources can create wellsprings of useful help (Barney, 1991). Human asset evidence that agrees with these standards is a wellspring of this sort of data (Wright and McMahan, 1992) and overhauls the definitive execution. The RBV assisted with building SHRM or the investigation of HR's work on the side of business philosophy (Wright, Dunford,

and Snell, 2001). SHRM was a basic cycle for the execution of methodology by Devanna, Fombrum, Tichy and Warren (1982). Specifically, a few sorts of deals with HR were considered as essential in the system, comparative as execution assessment, pay and progress emphatically for grams, in the event that they could motivate practices by specialists and include administrators in achieving key long haul objectives (Schuler & Jackson, 2019). Huselid (1995) planned SHRM to underline the adjustment in its HR limits and veritable innovation for each organization. This arrangement (or outer fit) is obviously valuable for the execution of an organization (Bae et al., 2003). The HR practices of an association likewise address a wellspring of benefit as proposed by Lado and Wilson (1994). When all is said in done, "HR rehearses" hint a ton of predictable practices inside organizations that update worker information, limit, restriction and inspiration. As the HR and limit are kept up and created, the assessments of the venture are expanded (Wright et al., 1995). The "standard" (Lepak et al., 2005) or "best" HR rehearses are these practices, for the most part, dominated and utilized by huge organizations in Western nations.

HRM in China

The state-possessed endeavors had driven China's economy before the cash-related change. Standard culture and a Socialist conviction system have unequivocally affected the activity and the SOE pioneers. Notwithstanding appreciation of development, in-group congruity, correspondence and responsibility, Chinese culture was isolated by neighborhood and Confucian areas (Chen, 1995). This culture molded the pre-change HRM structure at SOEs related to close administrative control from people in general, which was exhibited by solid business security, degree and boosts in compensation and wide help programs from the public authority (Warner, 1996; Yu 2005). Regardless, the assumed business framework "iron rice bowl," which underlined populism and the consistent nature of laborers, was reprovved actually of the new money-related climate by SOE. Hence, the working arrangement of the "iron rice bowl" was eliminated. The scorn for these changes, HR choices in various SOEs, especially government-supported retirement change and the potential for massive joblessness, have been really shocked by warm and political contemplations (Wong et al., 2005; Zhu, 2005). In huge organizations, government obstructions are the bosses in SOEs and the reformist laziness is the deterrent to the adjustment in HR structures (Ding and Akhtar, 2001). As Goodall and Warner (1999) illustrate, some basic practices (for example, social government backing and representatives association) exist related to advertising-based practices (for example, business game plans and the board-related remuneration) in these endeavors. Because of the philosophy for open-entryway access, the quantity of new undertakings in China has expanded over the late quite a while generously. Western standard practices in HRM, for example, proper execution assessments, execution-based installments and broad arrangements in these affiliations, have been generally embraced (Ding et al., 2006; Warner, 1997). These affiliations are wiser at masterminding their own HR structures, subject to less authoritative impedance from the focal and region governments.

HRM and Firm Performance In China

Law et al. (2003) tracked down that the fundamental control of HR is vital for the execution of joint endeavors by a tremendous overview completed by HR pioneers across China (JVs). Bjorkman and Fan (2002) focused on JVs and had new colleagues across China and discovered assistance with the useful result of unparalleled HR practices and HRM melding level on organization execution. They likewise saw that HRM technique coordination was a more generous marker of execution than HR strategies. Coincidentally, Mitsuhashi et al. (2000) have detailed that HR bits of worldwide associations' horrid event (MNCs). The HR heads credited the precluded execution to the misdirection of HR divisions in purposeful activity.

Moreover, Zhu and al (2005) discovered HR chiefs of numerous types start to look at central elements; anyway, it stays indistinct how far they can purposely put together HR work. Taking everything into account, Deng et al. (2003) uncovered that numerous HR rehearses impacted macroeconomic execution in their outline of SOEs. Yu and Egri (2005) tracked down that the work fulfillment and eager reformist obligation of the officials working in the JV and SOE are identified with a couple of HR rehearses. Bjorkman and Fan (2002) highlight the solid marker of FIE's corporate execution by HR rehearses, which assess the independent execution and business inspiration. Furthermore, Takeuchi et al. (2003) discovered help with a representation of Japanese specialists for the positive relationship between subsidiary HR practice and money-related execution. Wang et al. (2003) additionally contended that unambiguous business relations are fundamental for corporate executives, with different degrees of initiation and anticipated duties. For business ventures, the execution of the underinvestment approach is by and large goal (for example, low paces and high anticipated obligations), yet for SOEs, the execution of organizations is most significant while utilizing the "partner centered methodology" (i.e., high motions and high anticipated responsibilities). In expansion, Tsui and Wu (2005) proposed that unique practices of HR, for instance, lead to a corporate relationship that increments corporate execution.

Method

There uses a mixed research paradigm as Jhonson (2007) where both qualitative and quantitative research was used in which quantitative research will dominate the research. "For quantitative research, the past writing will be combined to build the idea and connect ideas." Quantitative research will test the relationship and validate the model.

Research Design

Collecting and analyzing data is fundamental to research design. According to Bryman and Bell (2007), research design can further clarify research methods and types, and it can build a framework for solving problems. The research design of this paper is firstly to select research methods, followed by case selection, sampling, questionnaire design and data collection. Finally, the reliability, validity and statistical analysis tools are explained.

Questionnaire Design

For preparing good questionnaire problems like, omit important aspects due to inadequate preparatory work and do not adequately probe particular issues due to poor understanding has been tried to minimize. This questionnaire is organized and worded to encourage respondents to provide accurate, unbiased and complete information. This questionnaire has been designed to make it easy for respondents to give the necessary information and for the interviewer to record the answer.

These three steps are involved in the development of the questionnaire of this report: 1. Multiple choice questions of demographic variables; 2. Likert scale to identify the factors; 3. Open-ended question.

The researcher used the nominal scale in this report for the first part of the questionnaire (Set-A) in which we put a total of nine questions on demographic data concerning the respondent. The nominal dimension is fundamentally the crudest measurement scale, categories in which no order is supposed to be implied by individuals, companies, products, brands and other entities. It is often called a categorical scale. In fact, It is a classification system and does not put the entity in a continuum. The frequency of cases assigned to the different categories is simply counted. (FAO's repository of corporate documents).

The researcher used the nominal scale in this report for the first part of the questionnaire (Set-A) in which we put a total of nine questions on demographic data concerning the

respondent. The second section of this report's questionnaire (set-B) is designed using the Likert scale of 5 points in the HR director or financial director's questionnaire.

A scale of Likert is the summed scale of the instrument. That means the Likert-scale items are added to generate an overall score. A Likert scale is actually a composite of individualized scales. Each item of scale usually has five categories with scale values between -2 and +2, and neutral reactions between 0 and -2.. (FAO Repository of Corporate Documents).

Sampling and Data Collection

On the one hand, in this research, a random sampling process has been used to pick a sample size from the random population. A total of 300 respondents gave their responses to a survey by face-to-face interview. Respondents were categorized as age, gender, occupation, income, etc.

On the other hand, in order to make the study more meaningful and presentable, both secondary and primary sources of data and information are used. The secondary sources of data are from different article and journals, while the primary sources of data are different Enterprises HR director or financial director.

Data Analysis

Collected information has been processed by using three software, SPSS 23 and SPSS Amos 20. Necessary tables have been made on the basis of processing information and various statistical techniques have been applied to get the desired result. We have used a frequency table for nominal data, factor analysis and regression analysis for scaling data. Detailed information about analysis has also been incorporated in this report.

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Factor Influencing Intention to Leave among International Talents in Shared Services Industry in Malaysia

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Abstract

The industry of shared services in Malaysia is highly competitive. Many past studies examined various factors influencing intention to leave of employees, however, not many studies in the past focused on the industry of shared services in Malaysia. This study examined the factors between job stress, available job alternative, autocratic leadership style and intention to leave among international talents in shared services industry in Malaysia. The target respondents were international talents in shared services companies in Klang Valley, Malaysia. Data was collected through 172 sets from 6 companies in Klang Valley, Malaysia. Furthermore, the collected data was analyzed using descriptive analysis, Pearson's correlation, and Linear Regression. The findings revealed that job stress, available job alternative and autocratic leadership style have positive significant relationship with intention to leave among international talents in shared services industry in Malaysia. The study result could be used for shared services companies as well as policy makers and researchers to understand the factors influencing intention to leave among international talents in shared services industry in Malaysia.

Keywords: available job alternative, autocratic leadership, intention to leave, job stress.

Introduction

The issue of employee turnover has been highlighted among business organizations as the serious matter and it has been seriously concerned in an organizational management (Belete, 2018). Accordingly, the increasing number of intentions to leaves among employees is not indicated as a good sign to the company both internally and externally. In fact, internally, it impacts the managing cost in the company as it will reduce its reputation and increase the cost of rehiring new employees, employee's morale that work in the organization, the dissatisfaction of employee and weak performance (Ilmi et al., 2019). However, externally, it will affect the organizational image and the overall performance of the company (Saleh et al., 2022; Arifin & Gunawan., 2020; Sinniah & Kamil, 2017; Al Battat et al., 2014; Shropshire & Kadlec, 2013).

In Malaysia, the turnover issue has been reported to significant increase from 10.1% in 2013 (Wee, 2013) to 27.9% in 2019 (Department of Statistic, 2019). According to the Survey by Jobstreet.com (2012), it stated that salary, relationship between, supervisor/ manager, company policies and benefits are ranked among top five factors affecting the satisfaction of

employees which eventually cause them to leave their company. According to Kumar (2011) and Hassan (2014), turnover is a crucial issue for human resource department in every sector of the economy as it could affect the productivity and service quality. When an employee decides to leave the organization, it would affect the company's cost and result in the loss of the company's competitive advantages (Holtom et al., 2008).

Today, Malaysia hosts many global organizations that set up shared services companies and have chosen to outsource the processes to locally based Business Process Outsourcing. Malaysia as a developing country has become one of the most strategic locations for Multinational companies to establish and expand their operation, regionally and globally in the form of shared service centres. The survey conducted by Michael Page (2018) stated that the top three locations of Shared Services Centers or SSCs in Malaysia are in Kuala Lumpur (43%), Selangor (25%) and Cyberjaya (14%). Besides, the survey also concluded that the top three job functions of employees in SSCs in Malaysia are Finance (27%), IT (19%) and HR (11%).

According to SSON (2015), over 8 consecutive years, Malaysia was ranked the world's third behind India and China in most attractive Shared Services and Outsourcing (SSO) location. Consequently, Malaysia is trying its best to emerge as an Asian Tiger for Global Shared Services and positioned itself as the destination of a high-value service with the full availability of government support, skilled talents, first-world infrastructure, sectoral expertise, and last but not least, the ease of travel (Hartung, 2014).

The Deloitte (2017) reported that SSC has globally experienced 20% of turnover rate which has more than tripled compared to year 2015. Global policies of Multinational Companies and SSC has indicated that by three years from 2017, SSC will attempt to focus more on the use of robotic, which will lead to expansion of the scope of SSC in processing and procedure and, reduce the functions of local entities and transfer those tasks to SSC (Deloitte, 2017).

As of 2018, over 200 companies including major local, and multinationals have established shared services and outsourcing operation in Malaysia (Michael Page, 2018). In Southeast Asia region, Malaysia was ranked among the top two highest voluntary turnover rate by 6% and third-highest voluntary turnover of 9.5% (Ilmi et al., 2019).

Many SSCs in Malaysia are in progress of transforming such operations and changing from the status of Shared Service to Global Service Hub. Thus, the operations and transactions will be more centralized, and functions will be more intensified in operations. Subsequently, many employees who are working under shared services centers are directly impacted and suffering the overload of tasks, higher pressure, and higher expectation in coping all those tasks. According to Employee Satisfaction Report for SSC in Malaysia, conducted by Michael Page (2018), over 45% of employees who attended the survey were dissatisfied with Leadership and 43% with career progression. And most significantly from the survey, reported that 85% of employees in SSCs in Malaysia showed their intention to leave their job given the right opportunity. In this study, it also reported that most of employees in SSCs have commonly experienced of frustration, disappointment, and gratitude.

The previous study by Azlan (2021) indicated that most of the respondents in his research in Malaysia indicated a higher turnover rate, especially at the mid-career level compared to past years, by 57% of the employers' listed their employees were dissatisfied with pay as the main cause for attrition. An employee who works under highly stressful condition will tend to have job stress matter. Job stress has been considered as one of the significant factors that influence individual performance (Alias et al., 2018).

Another factor that was investigated by previous studies is available job alternative. In amid of high competition in the market, the labour market is getting crucially intense. Zakariya and Shuaibu (2021) explained that available job alternative is found as the condition of

external opportunities which employees can accept for the change of their current job and, this condition can cause the relationship between job satisfaction and withdrawal behavior. With the present scenario, the intention of employee to whether leave or stay depends on current job condition and the availability of the job post in the job market.

And the leadership style is another study in examining factor that influence intention to leave of employees. Siew (2017) asserted that the leadership style of manager has a strong relationship with intention to leave. Meaning that the poor leadership of manager will directly influence the intention to leave of employees. Puni et al. (2016) highlighted that the autocratic style of leader will enhance high probability of employees to leave the company especially in the scenario of current transformation of shared services industry when employees are assigned with tremendous works and the complexity of change in an organization. This makes the relationship between manager and subordinate become more fragile, it will eventually cause employees to leave.

Literature Review

Shared Services Industry

In the age of high uncertainty, most giant companies are looking for the most valid way to reduce costs as much as possible while at the same time increasing the quality and professionalism in driving the business is the top priority. Many organizations nowadays face the severe force to eventually decide to downsize, and shared services become the solution as an innovative organization model in which to offer the critical approach to reduce cost and improve efficiency (Forst, 1997; Ulrich and Smallwood, 2004). For a definition of shared services, Ulrich (1995) defined it as a model of organization in which the firm combined significant functions in the business to perform with multiple operating units or entities into a distinct center that provides services to the rest of the firm as it services customers or so-called, business clients.

In an organizational view, a shared services organization is established in between a full hierarchical and market-driven model, which is identified as two extremes (Jansen & Joha, 2008). Hence, it was proposed with the idea of signifying both high-quality services and cost reduction (Ulrich, 1995). With this idea, it was further deliberated on the main objective to decrease or eliminate the costly duplication of manpower functions in organizations by emphasizing subsets of the existing business functions into a small number of new, semi-autonomous business units (Schulman et al, 1999; Bergeron, 2003). Soalheira and Timbrell (2014) explained that shared services are a mechanism for managing resources, workflow, and costs that can be traced back to where the operations are centralized, and the process is streamlined and managed to deliver the economy of scale in order to improve internal service.

Typically, in a shared services center, there are various departments that are split from the company such as Finance and Account, Information Technology, and Human Resources (Klender et al., 2009). According to the study by Rigby and Bilodeau (2009), in the private sector, shared services center is more likely adopted by various sizes of companies, regions, industries, and markets. Thus, with the nature of shared services, there is a high concern for improvement every day in the information and communication capabilities and the flexibility in the organizational structure which enables local and shared services to grow and, as the result, this growth impacts more diverse in the organizational environment, more diverse workgroup which generates bigger complication to manage (Orhan, 2011).

Intention to Leave

Intention to leave is described as employees are having intention to leave an organization. Heneman and Judge (2009) described that Turnover can be divided into two types, it can be voluntary turnover and involuntary turnover. Perez (2008) explained that when

turnover is dealt with variables like job satisfaction, thus, it can be determined that this is voluntary turnover as if an employee will leave the organization, it is based on factors that influence the decision to leave. Mobley (1997) further explained that turnover is the process of withdrawal decision from the consequences of psychological factors such as job dissatisfaction, job evaluation, thinking of quitting the job, utility expectation evaluation of search and cost of quitting, intention to find for job alternatives, search for alternatives, evaluation of alternatives, comparison between alternatives and current job, and intention to stay or quit. On the other hand, turnover can be explained as the situation when an employee or member of the organization leaves the organization, and hence, it negatively impacts the organization, especially on the expenditure and the full ability to perform the services.

With the impact of the intention to leave, the organization will struggle with the huge losses from the impact of turnover. Consequently, if the organization did not make any significant action toward turnover, it then will trigger another wave of additional turnover (Donn & Al-Balushi, 2013). With this impact, turnover will cause another turnover by initiating a decline in attitude and thinking that alternative jobs may be available to grab for (Staw, 1980).

Table 1. Summary of selected studies on factors influencing intention to leave

Authors and Years	Factors influencing intention to leave
Ooi & Teoh (2021)	Work engagement Job Demands Organizational Commitment
Alias et al (2018)	Job Stress Work Engagement Job Satisfaction Organizational Commitment
Al Mamun & Hasan (2017)	Managerial Factors Working Environment Pay Fringe Benefit Career Promotion Job Fit Clear Job Expectation Perceived alternative employment opportunity Influence Co-workers
Harun (2020)	Work Family Conflict Employee Engagement Role Stressors
Kim and Moon (2021)	Organizational commitment Job Satisfaction Job Stress
Ramlawati et al. (2021)	External Alternatives Job Stress Job Satisfaction
Awal et al. (2020)	Job Satisfaction Job Alternatives

Job Stress

Moorhead and Griffen (1998) defined that stress is the unpleasant physical and psychological responses that happen in an individual person in which there is the inability to cope with some demands that are made on him or her. It is a state of tension that is initiated by unusual demands on an individual person (Daniel, 2019). By the overdemand on an individual, Shah (2003) supported that the stress itself starts with the demand and opportunity from an organization that requires the individual's reaction to that demand and opportunity.

Connectively, when stress is associated with a job or an assigned task, it becomes another term, called job stress. Naqvi et al. (2012) described that job stress is an occurrence related to an unpleasant emotional situation that an individual faces when the demands of the job are not met with his or her ability to overcome the situation. In another word, it is a phenomenon that employees and employers experience at the job and they handle it in different ways according to their own. Basically, it is an imbalance between the capabilities of individuals and the demands of the organization (Pediwal, 2011; Jayashree, 2010).

When employees feel stress due to the environment in an organization, it is the feeling of an imbalance of physical and psychological condition, it then consequently affects the process of thought, emotions, and condition of an employees (Novitasi, 2020). These conditions are supported by Robbins and Judge (2013), who identified three indicators of stress which are physical, psychological, and behavioral terms. They further explained that one of the factors causing job stress is the demand for assigned tasks, and this factor was further magnified which included job designs, working conditions, and physical layout of work.

Moreover, Sopiiah and Sangadji (2020) highlighted that job stress is an influent factor of turnover through job satisfaction of employees, as result, dissatisfied employees will have potential intention to leave the company. With this, employees in an organization who are dissatisfied as their needs are not fulfilled will directly have an impact on the turnover. Thus, it was supportively proved that there is a relationship between job stress and intention to leave (Hakim, et al., 2018; Kaffashpoor et al., 2014; Baharom, 2016).

Available Job Alternative

In recent literatures, authors commonly use or call this factor as perceived alternative employment opportunities in which to refer to available job alternative or opportunity which can be defined as the perception of an individual employee on the availability of future opportunities in the talent market which caused them to think of job alternatives (March & Simon, 1958).

Gerheart (1989) described that this perception of employees is dependent on the skill sets and experiences of employees themselves. In a tight talent market like Singapore where is full of job alternatives and opportunities, with this plentiful condition in the economy where jobs are more available relative to job seekers, the organization might intuitively expect the resignation rate to be bigger than the loose talent market where the situation is more to scarcity of jobs where few jobs are open for application and many are laid off (Chew et al., 2016; Ehrenberg & Smith, 1982).

Treuren (2013) explained that dissatisfaction with the current job may be started by several factors such as job characteristics like boredom, lack of autonomy and poor salary, and managerial practices namely abusive supervision, poor communication, and tyrannical decision making. Thus, the condition of dissatisfaction of employees, led employees to identify if job alternatives are available, or they may believe that job alternatives will be available, then it will trigger the intention of employees to leave the organization and start to search for those alternative opportunities as they believed (Blau, 1994).

There were several studies investigating the impact of job satisfaction and available job alternatives on the intention to leave of employees. The majority of research found a negative impact on job satisfaction as the moderating outcome of the intention to leave of employees (Awal et al., 2020; Albalawi et al., 2019; Ramlawati et al., 2021). Mushtaq et al. (2014) highlighted the relationship between available job alternatives and job satisfaction, when there is a high perceived alternative job and opportunities, it will result in decreasing level of job satisfaction toward the organization or vice versa. They affirmed that the intention of employees to stay depends on the perceived alternative job opportunity and job satisfaction.

Zakariya and Shuaibu (2021) explained that perceived available job alternative is found as the concept of external opportunities which is opposed to the current employers and, this concept has been found that there is a relationship between job satisfaction and withdrawal behavior.

Leadership Style (Autocratic Leadership)

Griffin and Moorhead (2014) defined leadership can be both the process and property. As the process, leadership is a non-forcing influence whereas, as the property, it is the set of characters that contribute to people or someone who is perceived to use influence. Northouse (2010) and Yukl (2005) agreed to point out that leadership is more involved in the process of interaction between leader and followers in which the leader has to influence followers to achieve the organizational goal. Essentially, the role of leadership in an organization is a critical key factor that creates a vision and mission to determine and establish the objectives, strategies, policies, and the method to succeed in the organization's goal along with straightforward coordinating the efforts and organizational activities (Xu & Wang, 2008).

There is a discussion on leadership styles which is viewed as a combination of various characteristics, behaviors, and traits that are characterized by leaders in interaction with their followers (Mitonga-Monga & Coetzee, 2012). It is also pointed out that leadership style is the kind of relationship between leader and followers and the manner in which leader chooses to perform towards his or her followers to work together for the common goal and objectives, and at the same time, the way of leadership function that exercises to followers is carried out by followers (Harris et al., 2007; Mullins, 2000; Armstrong, 2012).

Autocratic Leadership

Nwankwo (2001) and Enoch (1990) defined autocratic leadership as the style in which paying the most attention to the production and focusing on the expense of individual consideration, especially when decisions are made solely by the leader. They added that being autocratic of the leader, will believe that people are evil, weak, unwilling to work, have limited reasoning and incapable of self-determination. Therefore, the autocratic leaders always push and force subordinates to do work.

Maqsood et al. (2013) explained that autocratic leader is normally known as a leader who control all decisions and less concern on others' point of views. This is also supported by Ardichvili and Kuchenke (2010) that an autocratic leader will never allow his or her followers to involve in decision, and a leader is usually far from followers. Cherry (2018) further explained that the autocratic leader does not give a space for discussion with team, and any opinion from followers will not be allowed to express, but it is expected them to obey orders and instructions without explanations.

However, the autocratic leadership can be considered as a good practice in some situation, but there are occasions where this style of leadership could be a reason for inactive response from subordinates and this is why leaders who misconduct the use of autocratic style are viewed as dictatorial practice (Northouse, 2015).

Undeniably, the practice of leadership styles will always influence the intention to leave or stay of employees (Puni et al., 2016). This is asserted by Mbah and Ikemefuna (2011), the negative practice of leadership which can be identified as a product of autocratic leadership style or production-oriented leadership flair serves as the main reason for employees' intention to leave. In the same way, the hostile relationship between leaders and their employees can cause the loss of commitment among employees and job satisfaction, those employees who stay in their jobs facing poor leaders have lower job satisfaction, lower job commitment, psychological distress, and consequently high turnover (Morrow et al., 2005; Gwavuya, 2011). Chukwusa (2018) described the autocratic leader that employees in an organization may think

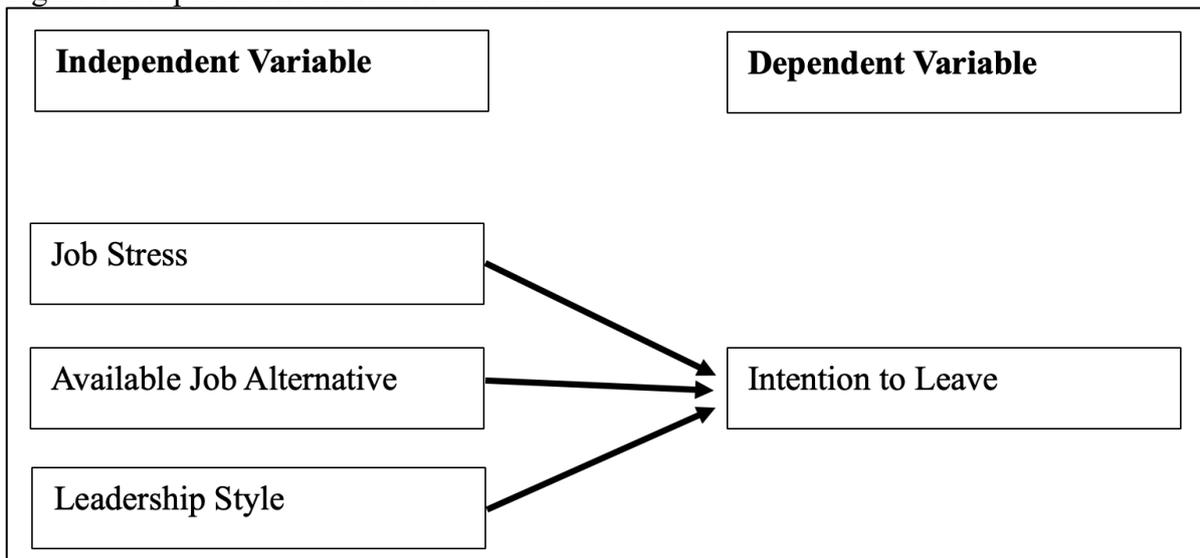
of this style as a sort of command and control, using negative language, leading by abusing influence and threats.

Harr et al. (2016) highlighted and discussed the effect of abusive supervision in a way of autocratic leadership is the subsequent result of leadership style, mentioned “*Abusive supervision was found to reduce perceived organizational support and increase intention to leave even while perceived organization support reduces them. This shows that abusive supervision can play a significant role in employees’ turnover intention*” (p.147-148). Tepper (2007) expanded that focusing on the context of national cultural differences towards abusive supervision. Snell et al. (2013) stated that cross-culture management could create a large power distance, and this renders Asian employees vulnerable to causes leading to autocratic supervision. Hence, it is found that there is a significant relationship between leadership styles in an organization and the intention to leave of employees (Siew, 2017).

Research Methodology and Hypotheses

Based on the above literature review, the dependent variable is intention to leave, whereas job stress, available job alternatives, and autocratic leadership style are independent variables.

Figure 1. Proposed Theoretical Framework



H1: There is a significant positive relationship between job stress and intention to leave among international talents in the shared services industry in Malaysia.

H2: There is a significant positive relationship between available job alternatives and intention to leave among international talents in the shared services industry in Malaysia.

H3: There is a significant positive relationship between autocratic leadership style and intention to leave among international talents in the shared services industry in Malaysia.

Data Collection and Analysis Method

The survey is conducted to collect data and information provided by the focused respondents (DeLecce, 2014) and self-administered questionnaire is constructed using 5-Likert scale adopted to variables. Thus, respondents are requested to rate their opinions according to ranging from 1 to 5, which means 1 refers to “Strongly disagree”, 2 refers to “Disagree”. 3 refers to “Neutral”, 4 refers to “Agree” and 5 refers to “Strongly agree”. All instruments were adapted from several past studies as shown in Table 2 below.

Table 2. Summary of Instruments

Variable	Source
Intention to leave	Roodt (2004).
Job Stress	Parker and Decotiis (1983)
Available Job Alternative	Weng and McElroy (2012) and Lee and Mowday (1987)
Leadership Style	Akor (2014) and Greenhaus et al. (1990)

The collected data from 30 sets of pre-testing questionnaires for pilot test were examined in SPSS.

On collecting data, 200 sets of questionnaires are distributed to the foreign respondents who are involved in shared services Centers or global business services which included those international employees who are currently working in shared services centers or global business services which located in specific areas in Klang Valley namely Kuala Lumpur, Petaling Jaya, Cyber Jaya and Damansara. Questionnaires were distributed to active employees in share services cernters using Google form. However, only 172 questionnaires were responded. Table 3 depicts the demographic profile of the respondents.

Table 3. Gender of Respondents

Gender	Frequency (n)	Percentages (%)
Male	36	20.9
Female	136	79.1
Total	172	100

Results and Discussion

Table 4. Pearson Correlation Analysis for All Variables

	IL	JS	AJA	LS
Intention to Leave	1	.		
Job Stress	.888**	1		
Available Job Alternative	.827**	.785**	1	
Leadership Style	.783**	.836**	.730**	1

** Correlation is significant at the 0.01 level (2-tailed).

Table 4 presents that all three independent variables namely job stress, available job alternative and leadership style positively correlates with dependent variable, intention to leave. Furthermore, it is indicated that among three independent variables, job stress has a large correlation or strong significant relationship with intention to leave with correlation coefficient of 0.888, and it is similar to available job alternative and leadership style with a strong significant relation with intention to leave with correlation coefficient of 0.827 and 0.783 respectively. Thus, it can be determined that all the correlations were statistically significant at $p < 0.01$.

Regression Analysis

In this study, Linear Regression Analysis is used as a statistical tool to predict future outcomes based on past data. the Linear Regression is a versatile and a simple analysis which examine between a one dependent variable and a one independent variable. Thus, this study is performed by Linear Regression for each independent variable and dependent variable. Table 5 below exhibits the summary of the regression model collected using the responses on independent variable, job stress and the dependent variable, intention to leave.

Table 5. Regression Model Summary of Job Stress

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.888 ^a	0.788	0.787	0.44404

a. Predictors: (Constant), Job Stress

Table 6. Regression Model Summary of Available Job Alternative

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.827 ^a	0.684	0.682	0.54280

a. Predictors: (Constant), Available Job Alternative

Table 7. Regression Model Summary of Leadership Style

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.783 ^a	0.614	0.611	0.60008

a. Predictors: (Constant), Leadership Style

To perform the hypotheses testing, the linear regression was run in SPSS for the testing. According to the results exhibited in Table 5, the R Square is 0.788 which signifying 78.8 percent of the variance in intention to leave (Dependent variable) which can be explained by job stress (Independent variable). However, as shown on that significant point, there is the remaining 21.2 percent of the variable in intention to leave which could not be explained by job stress, and this may be able to predict with other factors that are not included in this study. Thus, the model calculated by job stress is acceptable to predict employees' intention to leave. According to the results exhibited in Table 6, the R Square is 0.684 which signifying 68.4 percent of the variance in intention to leave (Dependent variable) which can be explained by available job alternative (Independent variable). However, as shown on that significant point, there is the remaining 31.6 percent of the variable in intention to leave which could not be explained by available job alternative, and this may be able to predict with other factors that are not included in this study. Thus, the model calculated by available job alternative is acceptable to predict employees' intention to leave.

Consecutively, the results exhibited in Table 7, the R Square is 0.614 which signifying 61.4 percent of the variance in intention to leave (Dependent variable) which can be explained by Leadership Style (Independent variable). However, as shown on that significant point, there is the remaining 38.6 percent of the variable in intention to leave which could not be explained by Leadership Style, and this may be able to predict with other factors that are not included in this study. Thus, the model calculated by Leadership Style is acceptable to predict employees' intention to leave.

Table 8. Coefficient of Job Stress, Available Job Alternative and Leadership Style

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Job Stress	0.919	0.037	0.888	25.166	0.000	1.000	1.000
Available Job Alternative	1.072	0.056	0.827	19.173	0.000	1.000	1.000
Leadership Style	1.809	0.049	0.783	16.428	0.000	1.000	1.00

As presented in Table 8, the *p* value of job stress, available job alternative and leadership style are less than 0.05. It proved with sufficient evidence that H1, H2 and H3 are accepted.

The coefficient of job stress, available job alternative and leadership style therefore are statistically different from 0 at alpha of 0.05, and it could be summarized that there are significant positive relationship between job stress and intention to leave, available job alternative and intention to leave, and leadership style and intention to leave among international talents in the shared services industry in Malaysia.

Hence, the summary of hypotheses presents that there are significant relationships between all independent variables and dependent variable. The findings on the hypotheses are summarized below.

Table 9. Summary of Findings

Independent Variables	Hypotheses	Finding
Job Stress	H1: There is significant positive relationship between job stress and intention to leave among international talents in shared services industry in Malaysia.	Supported
Alternative Job Alternative	H2: There is a significant positive relationship between available job alternative and intention to leave among international talents in shared services industry in Malaysia.	Supported
Leadership Style	H3: There is a significant positive relationship between autocratic leadership style and intention to leave among international talents in shared services industry in Malaysia.	Supported

Conclusion and Recommendations

This study is in consistent with previous studies of turnover intention, as well as it supported the theory in which job stress, available job alternative and leadership style have positive significant relationship with intention to leave among international talents in shared service industry in Malaysia. In other words, it has been proven in this study that all three independent variables are influencing factors to cause the intention to leave of international talents in shared services industry.

The relationships between four variables that were analysed were all positive. The study contributed to the literature on the four variables investigated in this study as well as to put recommendations for future study. Further, all findings are in line with past studies. However, the demographic data such as gender, education, working experience and level of position are also important factors to examined. This information help companies create awareness in handling turnover issues as well as to forecast the worst-case scenario for future management.

Significantly, it is proved that the intention to leave of international talents in shared services industry in Malaysia was caused by three main factors as per the results in the study which are Job stress on the job assignments, available job opportunity or external job available in the job market and the autocratic style of manager and supervisor in involving with their subordinates. The findings of this research are expected to enhance and enable the management to identify the factual reasons of foreign employees or intention of decision to leave the companies. From this research, three factors such job stress, available job alternative and leadership style are identified based on data collected and the results of analysis. Furthermore, it can be ensured that the management can use the findings from this study as well as recommendations to manage and monitor the issue of turnover intention of foreign employees with the most suitable approaches. It is believed that this study will raise awareness and concern among managers as well as the management team to tackle the issue by initiating preventive actions to prevent the recurrent issue of turnover. In addition, by understanding the issue of turnover in organizations, it is expected that managers and the management team can be more proactive in dealing with foreign employees to avoid the perception of intention to leave. Thus, employees will be more convenient to express their feeling and think to change

their mind to stay instead of leaving. This study is also expected to service as a reference for future research which related to the issue of turnover intention in shared service industry.

This study calls for the management team and policy makers of the company to consider the following suggestion to handle the issue of intention to leave of foreign employees that can sustain their organization and thus increase their productivity: firstly, the management should ensure the job satisfaction of foreign talents by providing attractive salary and flexibility with other job conditions such as working environment, promotion, bonus and so on; secondly, the management should appraise their job performance fairly; thirdly, the management must ensure a friendly working environment as well as good working relationship.

On recommendation, firstly, the population of the study on intention to leave of foreign employees in related to shared services industry in Malaysia should be broadened the range. As mentioned earlier, the population of this study was focused only in Klang valley area, hence, the focus should be more considered in other parts of Malaysia in order to improve the validity and representatives of the findings to general population of foreign employees in shared services industry. It is believed that the larger sample of population will be shown in a different pattern of finding results.

It is believed that future study in this topic should be carried out considering all the limitations faced by the author in order to avoid inaccuracies of data and the result will be improved and more accurate. Thus, the future researchers should consider in wider aspects especially when dealing with companies, the preparation and coordination must be taken earlier to collaborate with responsible person in charge of companies. This will avoid the issue of time restriction and the restrictions of certain companies.

To further improve the future study on intention to leave of employees among international talents in shared services industry in Malaysia, the scope of the research can be widened as this study was limited to job stress, available job alternative and leadership style. However, in the future research, other factors can be considered to investigate as independent variables such as organizational support, work-life balance, organizational engagement and etc. With this, the new findings from different factors will be able to provide better results in determining intention to leave of employees in order to get a higher percentage of effect size of the research model.

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The Role of Fintech on Digital lending in the Sustainable Growth of Data-Driven Micro, Small, And Medium Enterprises

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Abstract

The substantial influence of fintech on digital financing was reviewed along with its consequences for the long-term expansion of MSMEs. By improving access to financial services and promoting financial inclusion, fintech innovations offer affordable solutions to financial contractual frictions. Research suggests that fintech-enabled entrepreneurship can help solve important economic issues like inequality and unemployment while encouraging creativity and innovation. Moreover, MSMEs can use data-driven insights to improve their operational efficiency and decision-making skills thanks to the digitalization of financial services. Achieving sustainable development goals requires MSMEs to include fintech into their financial operations, as they are critical to economic expansion and employment creation. In order to enable MSMEs to prosper in a competitive environment and eventually support greater economic resilience and sustainability, this study highlights the revolutionary potential of fintech.

Keywords: digital lending, fintech, MSMEs, sustainable growth.

Introduction

There is a paradigm shift in the financial services industry. Combined with ever-changing customer expectations and preferences, emerging technologies such as artificial intelligence (AI), machine learning, the internet of things (IoT), and blockchain are redefining how financial institutions deliver services. It is an enormous task to remain competitive in this ever-changing environment (Murinde et al., 2022). Financial Technology (FinTech) is a synergy of two words Finance and Technology, and is major part of the digital future. Khando et al. (2023) reported that the trend towards digitalization and the use of the internet has brought about major changes in the ways the global economy functions. The emergence of a broad range of financial technology (FinTech) applications enables consumers to move beyond the conventional cash-based payment system. It is commonly cited as one of the most important innovations in the financial industry (Iman, 2020). Digital innovation is enhancing financial services. After the arrival of fintech, the operations of banking are getting easier. Financial technology was adapted by all banks, from startups to well-established banks. In the banking sector, it is a revolution in modern times (Prakash, 2022). The interplay between finance and technology with the use of the internet triggered the emergence of digital payment technologies (Khando et al., 2023). It has been playing an increasingly critical role in driving modern economies, society, technology, and many other areas. Smart FinTech is the new-generation FinTech, largely inspired and empowered by data science and artificial intelligence (DSAI) techniques (Cao et al., 2021). Fintech is any technology that eliminates or reduces the costs of financial intermediation. It refers to various financial technologies used to automate

processes in the financial sector, from routine, manual tasks to non-routine, cognitive decision making (Das, 2019). According to Thakor (2020), one promise of fintech is the unveiling of cheaper ways to overcome financial contracting frictions and lower the cost of financial services to improve consumer welfare. Digital financial transformation supports financial inclusion and financial development (Buckley et al., 2019).

Rabbani (2022) described, Fintech as a phenomenon; a disruption and it provides an opportunity to the Islamic finance to show its full potential and provide a true sustainable, ethical, and alternative financial system to the world. Finance has always relied on and co-evolved with technology. Finance, after all, is a social technology, based on a system of recording assets and liabilities (credits and debits), which has developed through a series of innovations from coins, through to bills of exchange, double-entry book-keeping, insurance and central banking, all the way to financial derivatives and high-frequency algorithmic trading (Knight & Wójcik, 2020). Khando et al. (2023) gave the state-of-the-art classification of digital payment technologies and presents four categories of digital payment technologies as: card payment, e-payment, mobile payment and cryptocurrencies.

The objectives of this study were:

1. To explore how fintech innovations can improve access to financial services for MSMEs
2. To demonstrate how fintech can contribute to the long-term expansion and sustainability of MSMEs.
3. To investigate how fintech-enabled entrepreneurship can help tackle significant economic challenges such as inequality and unemployment.
4. To identify the barriers that MSMEs face in adopting fintech solutions.
5. To illustrate how these technologies can enhance operational effectiveness and decision-making quality
6. To provide insights that can inform policymakers about the importance of integrating fintech into the financial operations of MSMEs

Literature Review

Micro, Small, and Medium Enterprises (MSMEs) and Their Role in The Economy

Micro, small and medium-sized enterprises (MSMEs) have a potential impact on achieving many of the sustainable development goals much greater than their size (Endris & Kassegn, 2022). They are one of the pillars of any economy, comprise the majority of enterprises, while their performance remains modest comparatively with large companies (Ciocoiu et al., 2024; Rosyidiana & Narsa 2024), MSMEs form the backbone of many economies worldwide, contributing significantly to economic growth and employment (Rosyidiana & Narsa, 2024). The dynamic nature of the business landscape, coupled with insufficient resources, increases the vulnerability to risks and threatens the long-term sustainability of MSMEs. The definitions of micro, small, and medium-sized enterprises (MSMEs) are not constant around the world. In fact, the categories themselves differ between countries and regions (Dambiski Gomes de Carvalho et al., 2021). MSMEs are great platforms for entrepreneurship and innovative thinking if they are to thrive and be sustainable. Devine & Kiggundu (2016) and Endris & Kassegn (2022) explained that entrepreneurship can be a cure for problems such as unemployment, inequality, low productivity, disconnect from global value chains, etc. Entrepreneurial innovation refers to creativity and experimentation while presenting new products, services, and carrying out research (Yacob et al., 2021). The General Assembly adopted resolution 71/221 recognizes the important contribution entrepreneurship to sustainable development by creating jobs, driving economic growth and innovation, improving social conditions, and addressing social and environmental challenges (Endris & Kassegn, 2022; UN, 2018). Rosyidiana & Narsa, (2024) reported a positive and significant

relationship between innovation and MSMEs' financial performance, emphasizing the crucial role of innovative practices.

Digitalization is the use of digital technology to transform a business model and provide new revenue and value-generating opportunities. This is a process of moving to digital business. Furthermore, the digitization process cannot occur without digitalization. Digitalization is the use of digital technology and digitized data, to influence work completion, change company-customer interactions, and create new revenue streams (digitally) (Meilariza et al., 2024). Vhikry & Mulyani, (2023). Digitalization is very crucial to contemporary MSMEs in an advent of technological innovations and increase in the frontiers of knowledge by mankind driven by data and artificial intelligence.

How Data Analytics and Insights Support Msmes in Growth and Decision-Making

Innovative technologies such as big data and predictive analytics are facilitating a global revolution in operational management (Vachkova et al., 2023). In today's hyper-competitive business landscape, leveraging data-driven strategies is paramount for sustainable growth and profitability. Predictive analytics harnesses historical data and advanced modeling techniques to forecast future trends, enabling businesses to make informed decisions with precision (Oloruntosin Tolulope Joel & Vincent Ugochukwu Oguanobi, 2024). The dynamic capabilities of big data analytics, digital platforms and networks all help to improve the performance of manufacturing MSMEs by improving innovation performance (Bhatti et al., 2022). By understanding predictive analytics, businesses can effectively identify expansion opportunities by analyzing market trends, segmenting customer bases, and uncovering new markets and niches. Moreover, predictive analytics empowers organizations to enhance profitability through optimized pricing strategies, demand forecasting, and personalized marketing initiatives tailored to customer preferences and behaviors (Oloruntosin Tolulope Joel & Vincent Ugochukwu Oguanobi, 2024). Akhtar et al. (2023) in their study reported that research on digital economy and social media analytics has shifted from the developed world to the developing nations. Now, more and more research is being conducted in the countries like China, Pakistan, Bangladesh, Ukraine and India. Through the density visualization of keywords analysis, it is revealed that keywords like "digitalization", "artificial intelligence", "blockchain", "cryptocurrency", and "bitcoin" are in trends of research. This because according to Awan et al. (2021). Big data analytics capability drives decision-making quality in organizations, and data-driven insights do not mediate this relationship. Business intelligence and analytics is associated with decision-making quality through data-driven insights. These findings offer important insights to managers, as they can act as a reference point for developing data-driven insights with the circular economy paradigm in organizations. In addition to customer and financial perceptions, data analytics also improves operational efficiency, key performance indicators (KPIs) such as production rates, supply chain performance, and employee productivity can be tracked. By taking advantage of real-time data, MSMEs can quickly respond to in consumer behavior, market conditions, or industry trends, ensuring they remain competitive and responsive to customer needs. Data analytics and insights are invaluable tools for MSMEs, enabling them to make smarter decisions, optimize their operations, and drive sustainable growth.

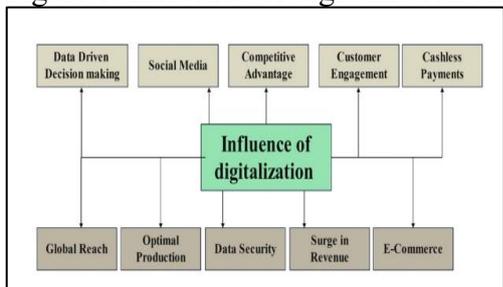
Current Challenges Faced by MSMEs

Worldwide, micro, small, and medium enterprises (MSMEs) are increasingly recognizing the advantages of digital systems, however, the resources needed in terms of time, skills, and finances to create tailored systems for SMEs are often too high. This is largely because the capacity to tailor enterprise systems to the specific demands of SMEs relies on their unique requirements. In Bangladesh, the application of financial technology (FINTECH) in MSMEs is still quite limited. When compared to larger organizations, small and medium-

sized enterprises (SMEs) in developing nations confront far more formidable challenges when trying to secure financing. Due to their size, previous experience, and business profile, these enterprises often have limited access to financing through the traditional banking system (Lasak, 2022). Hossin & Hossin (2023) reviewed literature and summarized that some of the challenges faced in Bangladesh by MSMEs are: Absence of a precise definition for SME, Insufficient funding and exorbitant financing expenses, Exorbitant transportation expenses, Absence of contemporary technology, Unreliable or insufficient power and raw material supplies, The absence of explicit government regulations. Absence of knowledgeable technicians and employees, Lack of facilities for research and development, high employee turnover, Absence of an open legal system, The market's small size and slow development pace, Absence of female involvement, The domestic market's dependence, Bureaucratic red tapes.

Major obstacles include a lack of access to and understanding of technology, concerns about digital security, and growing competition. MSMEs also encounter risks associated with data privacy and uncertain regulatory conditions in a digital landscape. Nonetheless, despite these hurdles, the digital age offers new possibilities for MSMEs, including access to global markets, opportunities for product innovation, and enhanced operational efficiency through technological integration (Abdurohim, 2023). The shift towards digital transformation introduces challenges across all sectors and industries. Moreover, the progress in digital transformation has spurred the rise of fintech initiatives, which are considered vital innovations in the financial sector. These initiatives are growing swiftly, partly fueled by the sharing economy, regulatory factors, and advancements in information technology (Suryono et al., 2020). Large corporations possess superior financial and technical resources compared to micro, small, and medium enterprises (MSMEs), prompting MSMEs to pursue alternative funding avenues beyond conventional banking and capital markets to meet their escalating financial requirements. Furthermore, the small business sector continues to encounter substantial skill gaps, which further hinders their ability to obtain financing. The existing solutions available for SMEs are mostly isolated and lack integration (Telukdarie et al., 2022). The difficulty in accessing funds is widely acknowledged as a significant barrier to the expansion by MSMEs (Gupta et al., 2022). It was opined that FinTech developments may also damage financial well-being by triggering impulsive consumer behavior when interacting with financial technologies and platforms (Panos & Wilson, 2020). Hossin & Hossin (2023) reviewed the literature and summarized that some of the challenges faced in Bangladesh by MSMEs are the absence of a precise definition for SME, Insufficient funding and exorbitant financing expenses, Exorbitant transportation expenses, Absence of contemporary technology, Unreliable or insufficient power and raw material supplies, The absence of explicit government regulations. Absence of knowledgeable technicians and employees, Lack of facilities for research and development, high employee turnover, The absence of an open legal system, The market's small size and slow development pace, the Absence of female involvement, The domestic market's dependence, Bureaucratic red tapes. The factors that affect the digitalization of SMEs are shown in Figure, as described by Pande et al. (2023) in Figure 1.

Figure 1. Influence of digitalization on SMEs



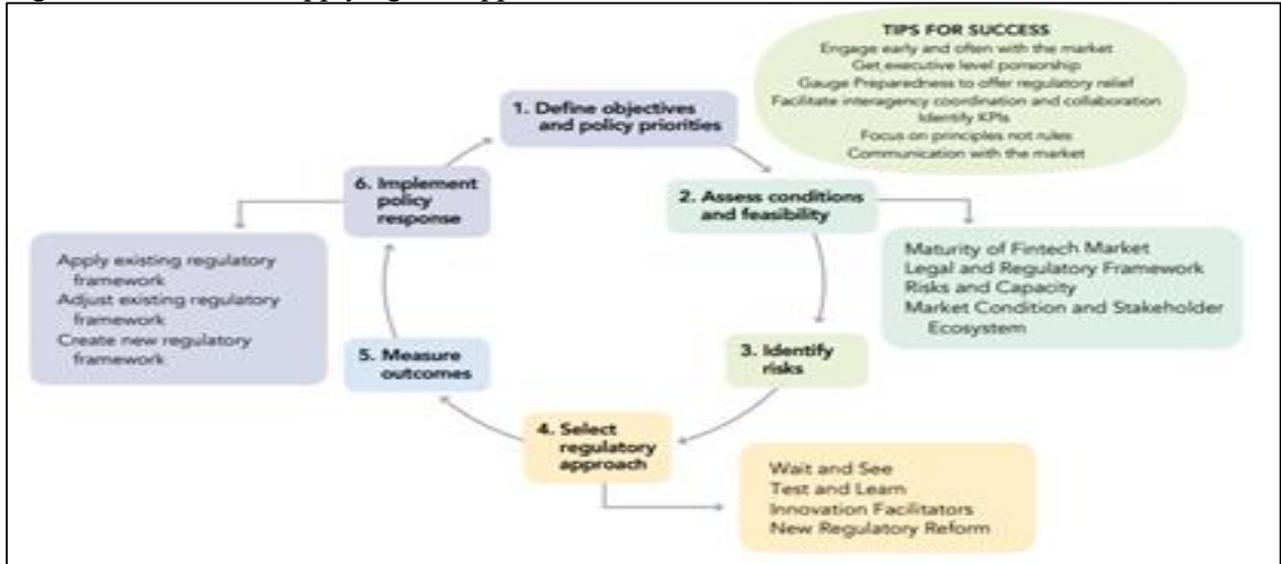
Source: Pande et al. (2023)

Materials and Methods

This study is descriptive and based on secondary data. The secondary data was collected from government documents of related government offices, journals, websites, the SCOPUS database, and Google Scholar. Some financial tools, techniques, and descriptive statistics have been used to analyze the data.

Figure 2, below shows the method recommended by the World Bank as an approach by Fintech to apply digital lending by financial institutions

Figure 2. Process for Applying An Approach towards Fintech



Source: World Bank (2020)

Results

Fintech has significantly enhanced MSME sustainability by addressing traditional barriers to financial access and fostering inclusive growth. One of its primary contributions is:

Enhanced financial inclusion: as digital platforms leverage mobile technology and alternative credit scoring to reach underserved MSMEs, particularly in remote regions (Huang et al., 2020). This enables more businesses to participate in formal financial systems.

Improved loan accessibility: is another hallmark of fintech, characterized by streamlined application processes, automated approvals, and faster disbursements. Platforms like Kabbage and MyBank use real-time data analytics to provide credit to MSMEs, bypassing traditional requirements like collateral (Mhlanga, 2024).

Tailored services: offered by fintech cater to the unique needs of MSMEs, providing customized financial products that align with business cash flows and growth trajectories. **Data-driven decision-making:** fueled by AI and big data, improves credit risk assessments, reduces default rates, and ensures transparency in transactions (Rehman et al., 2023).

Moreover, fintech promotes sustainable practices, such as green financing and ESG-focused credit products, which empower MSMEs to adopt environmentally friendly operations. By enabling access, affordability, and sustainability, fintech not only drives MSME growth but also positions them as contributors to equitable and resilient economies (Zetzsche et al., 2019).

Challenges in Fintech Adoption: While fintech has revolutionized MSME financing, its adoption faces significant challenges, including regulatory hurdles, data privacy issues, and risks of over-indebtedness. Regulatory hurdles arise from the fragmented and evolving nature

of fintech regulations across jurisdictions. Inconsistent rules regarding licensing, compliance, and consumer protection create barriers to entry for fintech companies, particularly in developing economies. Regulatory sandboxes have emerged as a solution, but gaps in harmonized frameworks remain (Zetzsche et al., 2019).

Data privacy and cybersecurity issues pose another critical challenge: Fintech platforms rely heavily on sensitive user data, such as financial and behavioral information, to drive decision-making. This reliance increases the risk of data breaches, unauthorized use of information, and compliance violations under privacy laws like GDPR. Such incidents undermine trust in digital lending systems and deter MSMEs from adopting these solutions (Rehman et al., 2023).

Over-indebtedness is an unintended consequence of easy access to credit: Digital lending platforms often approve loans rapidly with minimal oversight, leading some MSMEs to over-borrow without adequate financial planning. This can result in debt cycles, harming their financial health and long-term sustainability (Mhlanga, 2024). Addressing these challenges is essential to ensure fintech adoption fosters equitable, sustainable growth for MSMEs without exacerbating systemic risks.

Policy and Regulatory Implications: To fully harness the potential of fintech in MSME digital lending, effective policy frameworks and global best practices are essential. Policy recommendations include the creation of regulatory sandboxes to pilot innovative fintech solutions in controlled environments, reducing barriers to entry and enabling iterative improvements (Zetzsche et al., 2019). Governments should also promote open banking standards to enhance transparency, competition, and secure data-sharing between financial entities (Rehman et al., 2023). Global best practices highlight the success of countries like the UK and Singapore, where supportive fintech ecosystems, clear guidelines, and robust licensing frameworks have accelerated fintech adoption. Kenya's M-Pesa is another example, showcasing how mobile-based solutions can foster financial inclusion among underserved MSMEs (Mhlanga, 2024). To address risks, policymakers must enforce robust consumer protection, data privacy laws, and credit monitoring systems to mitigate over-indebtedness. Cross-border collaboration on regulatory standards can further harmonize fintech development and ensure sustainable economic impacts.

Table 1 below shows findings based on a survey of literature as secondary data:

Table 1. The impacts of fintech implementation in Digital Lending for MSMEs based on numerous earlier Studies

Sources	Keywords	Summary of Research Gap	Objectives	Outcome	Contributions	Practical Implications of the study
(Hamzah et al., 2023)	Mobile Payment, QR-Code, e-Wallet, Brand Image, UTAUT2, Technology adoption	In order to gain a better understanding of QR-code e-wallet usage, future studies should consider varied situations, objective measures, comparative analyses, and qualitative insights.	With the goal of better understanding digital service experiences in retail contexts, this study models the interactive impacts of brand image on consumers' intents to use QR-code e-wallets. It focuses on emerging economies like Malaysia.	Improving the user experience and using focused marketing strategies can greatly impact customer acceptance and usage intentions in emerging economies, according to the study, which emphasizes the significance of brand image in the adoption of QR-code e-wallets.	By highlighting the role of brand image in influencing customer behavior in the digital payment landscape, this research adds to our theoretical and practical understanding of QR-Code e-wallet adoption.	To increase consumer adoption of QR-code e-wallets and, eventually, service quality and brand reputation, the study highlights the importance of improving user experience, standardizing QR codes for interoperability, and putting focused marketing strategies into practice.
Santa'Annan & Figueiredo, 2024	Financial inclusion, Fintech, Financial Innovation, Inclusive Innovation, Digital Finance, Mobile Lending	The impact of fintech on financial inclusion, the function of financial capacities, and the efficiency of regulatory frameworks in maintaining stability are among the study gaps that have been found.	These aims to improve understanding of fintech's role in increasing financial inclusion while ensuring the stability of financial systems.	According to the study, fintech has the potential to improve financial stability and inclusion, but it also highlights issues like inequality and the necessity of strict regulation to optimize gains for underserved groups.	The study's contributions all work together to improve our knowledge of how fintech can be used to advance financial inclusion while preserving financial stability, offering a path forward for more investigation and useful applications in the area.	These useful ramifications give stakeholders a road map for maximizing fintech's potential while making sure it advances more general goals of stability and financial inclusion.

3rd International Postgraduate Research Symposium (INPOS) 2024
Data Driven Management: Transforming Research and Shaping Future

Sources	Keywords	Summary of Research Gap	Objectives	Outcome	Contributions	Practical Implications of the study
(Alfarizi et al., 2024)	Big Data; digital adoption; internet of things; MSMEs; sustainable digital business	The study points out knowledge gaps on the use of technology by microbusinesses, the necessity of cross-national comparisons, and the dearth of comprehensive research on the integration of Big Data and IoT. Furthermore, little is known about the obstacles to digitalization and the impact of outside variables on MSMEs.	The collective goal of these goals is to shed light on the economic and technological trends that have an impact on Indonesian MSMEs' ability to perform sustainably in the digital age.	In light of the changing industrial landscape, this study emphasizes how important technology is to improving the competitiveness and sustainability of Indonesian digital MSMEs.	The study identifies barriers to women's empowerment and proposes strategic solutions through a comprehensive framework, emphasizing education and stakeholder collaboration, which can inform policies and enhance women's roles in society	The study emphasizes the need for MSMEs to adopt digital transformation strategies, enhance technology literacy, and foster collaboration among stakeholders. These efforts are crucial for improving operational efficiency and achieving sustainable business performance in the evolving digital landscape.

Sources	Keywords	Summary of Research Gap	Objectives	Outcome	Contributions	Practical Implications of the study
Widiastuti, et al. (2024)	D-ANP, Modified pentahelix model Problem Solution Women empowerment	The research gap highlights significant gender disparities in Indonesia across sectors like education and political representation, with insufficient studies addressing barriers and strategic solutions for women's empowerment, particularly in coordination among stakeholders and public awareness	These objectives collectively aim to improve the quality of women's empowerment in Indonesia and enhance the country's position in the Women's Empowerment Index.	These outcomes collectively aim to create a more supportive framework for women's empowerment in Indonesia, addressing the unique challenges they face and promoting sustainable development.	Through a thorough framework, the study identifies obstacles to women's empowerment and suggests strategic solutions that prioritize stakeholder engagement and education. These solutions can inform policies and strengthen women's roles in society.	The study highlights the importance of training and education as top priority for women's empowerment. Along with removing obstacles and enhancing interagency coordination, cooperation between the public sector, academic institutions, and the community is crucial. Campaigns for public awareness can increase support for gender equality and strengthen the position of women in society.
Madan, 2020	Access to finance, Micro, small and medium enterprises, Digital financial services, Least Developed Countries, Policy recommendations.	This study examined the insufficient awareness of formal MSMEs' access to financing in specific Asia-Pacific Least Developed Countries. The study analyzed the demand-supply disparity, the availability of formal	The study examined micro, small, and medium companies (MSMEs)' access to credit in selected Asia-Pacific Least Developed Countries and how digital financial services (DFS) improve it. The study examined the	This study demonstrates that digital financial services (DFS) can improve MSMEs' financial inclusion. The survey states that while bank accounts have expanded globally, the gender gap remains a	This study greatly enhances MSMEs' financial inclusion. Financial inclusion, formal MSMEs' access to credit, and demand-supply imbalances are examined in selected Asia-	Digital financial services (DFS) can boost MSME finance and financial inclusion. By using DFS, big data, and AI to assess credit risks and payback frequency, financial institutions may better

Sources	Keywords	Summary of Research Gap	Objectives	Outcome	Contributions	Practical Implications of the study
		MSMEs to financing, and the contribution of digital financial services to financial inclusion in addressing this disparity. The report evaluated the legislative and regulatory initiatives of each target country aimed at enhancing loan access for MSMEs, examining advancements in digital finance and providing recommendations for policymakers and financial institutions to bolster the financial inclusion of MSMEs.	target nations' financial inclusion background and MSMEs' financing issues. Another goal was to assess each target country's legislative and regulatory efforts to boost MSMEs' credit flow and digital finance advancements. The study concluded with policy recommendations to improve MSMEs' financial inclusion through DFS.	concern. The survey also highlights that MSMEs still struggle to access finance, and DFS can help close this gap. The paper advises regulatory steps to enable DFS adoption and emphasizes the relevance of big data and AI to help financial institutions identify MSMEs' credit risks. The study sheds light on how governments, financial institutions, and MSMEs might use DFS to improve financial inclusion, and MSMEs can leverage DFS to enhance financial inclusion.	Pacific Least Developed Countries. The paper examines MSMEs' financing difficulties and each country's legislative and regulatory efforts to increase credit flow. It also highlights the importance of digital financial services (DFS) in MSME access to finance and suggests ways governments might enhance financial inclusion through DFS. This report helps policymakers, financial institutions, and MSMEs create strategic financial inclusion policies.	understand MSMEs' cash conversion cycles. DFS may help MSMEs get bigger and better financial products by creating a financial footprint. Legislators must promote DFS expansion and foster acceptance

Sources	Keywords	Summary of Research Gap	Objectives	Outcome	Contributions	Practical Implications of the study
Soni et al., 2022	FinTech, Hesitant fuzzy sets, Industry 4.0, Supply chain finance, Sustainable supply chain finance, Technology, Technology selection model	These gaps (Absence of Guiding Frameworks, Need for Empirical Validation, Generalizability of Findings, Subjectivity in Decision-Making Techniques, Integration of FinTech Solution, Challenges in Technology Adoption) suggest that SMEs need further study to comprehend and use Industry 4.0 technologies and SSCF, which would improve their sustainability and market competitiveness.	This study sought to improve efficiency and performance, develop a decision-making framework, incorporate sustainability, evaluate alternative technologies, and conduct sensitivity analysis to help SMEs implement Industry 4.0 technologies and ensure supply chain sustainability.	The study outlines potential avenues for future research, including the need for empirical studies to validate the criteria for SSCF and the exploration of alternative decision models like data envelopment analysis. This opens up opportunities for further refinement of the technology selection framework.	This study advances the understanding of how Industry 4.0 technologies can be effectively implemented in the context of sustainable supply chain finance, particularly for SMEs facing resource constraints.	These methods are sensitive to judgment and may not be generalizable, the authors warn. The study's paradigm might be used to develop fit-for-purpose suggestions to help managers optimize SSCF results, according to the authors. This study's findings could be validated and refined utilizing data envelopment analysis or graph theory in future research.

Discussion

Micro, small and medium-sized enterprises (MSMEs) have a potential impact on achieving many of the sustainable development goals much greater than their size (Endris & Kassegn, 2022). They are one of the pillars of any economy, comprise the majority of enterprises, while their performance remains modest comparatively with large companies (Ciocoiu et al., 2024; Rosyidiana & Narsa 2024), MSMEs form the backbone of many economies worldwide, contributing significantly to economic growth and employment (Rosyidiana & Narsa, 2024). The dynamic nature of the business landscape, coupled with insufficient resources, increases the vulnerability to risks and threatens the long-term sustainability of MSMEs. The definitions of micro, small, and medium-sized enterprises (MSMEs) are not constant around the world. In fact, the categories themselves differ between countries and regions (Dambiski Gomes de Carvalho et al., 2021). MSMEs are great platforms for entrepreneurship and innovative thinking if they are to thrive and be sustainable. Devine & Kiggundu (2016) and Endris & Kassegn (2022) explained that entrepreneurship can be a cure for problems such as unemployment, inequality, low productivity, disconnect from global value chains, etc. Entrepreneurial innovation refers to creativity and experimentation while presenting new

products, services, and carrying out research (Yacob et al., 2021). The General Assembly adopted resolution 71/221 recognizes the important contribution entrepreneurship to sustainable development by creating jobs, driving economic growth and innovation, improving social conditions, and addressing social and environmental challenges (Endris & Kassegn, 2022; UN, 2018). Rosyidiana & Narsa, (2024) reported a positive and significant relationship between innovation and MSMEs' financial performance, emphasizing the crucial role of innovative practices.

Digitalization is the use of digital technology to transform a business model and provide new revenue and value-generating opportunities. This is a process of moving to digital business. Furthermore, the digitization process cannot occur without digitalization. Digitalization is the use of digital technology and digitized data, to influence work completion, change company-customer interactions, and create new revenue streams (digitally) (Meilariza et al., 2024). (Vhikry & Mulyani, 2023). Digitalization is very crucial to contemporary MSMEs in an advent of technological innovations and increase in the frontiers of knowledge by mankind driven by data and artificial intelligence.

Case Studies on Fintech's Role in Digital Lending for MSMEs: Case studies from emerging markets highlight fintech's transformative role in MSME financing. For instance, Ant Group's My Bank in China utilizes AI and big data to provide loans to MSMEs with minimal paperwork, granting over 20 million MSME loans by 2020 (Huang et al., 2020). In Kenya, M-Pesa's mobile lending solutions have empowered MSMEs by enabling microloans via smartphones, reducing barriers to financial inclusion (Mhlanga, 2024). In the United States, Kabbage, a digital platform, uses real-time data analytics to offer credit lines to small businesses, ensuring quick approvals and tailored solutions (Rehman et al., 2023). These examples illustrate fintech's capacity to bypass traditional credit challenges, promoting MSME growth and sustainable development globally.

Importance of Data-Driven Approaches

Innovative technologies such as big data and predictive analytics are facilitating a global revolution in operational management (Vachkova et al., 2023). In today's hyper-competitive business landscape, leveraging data-driven strategies is paramount for sustainable growth and profitability. Predictive analytics harnesses historical data and advanced modeling techniques to forecast future trends, enabling businesses to make informed decisions with precision (Oloruntosin Tolulope Joel & Vincent Ugochukwu Oguanobi, 2024). The dynamic capabilities of big data analytics, digital platforms and networks all help to improve the performance of manufacturing MSMEs by improving innovation performance (Bhatti et al., 2022). By understanding predictive analytics, businesses can effectively identify expansion opportunities by analyzing market trends, segmenting customer bases, and uncovering new markets and niches. Moreover, predictive analytics empowers organizations to enhance profitability through optimized pricing strategies, demand forecasting, and personalized marketing initiatives tailored to customer preferences and behaviors (Oloruntosin Tolulope Joel & Vincent Ugochukwu Oguanobi, 2024). Akhtar et al. (2023) in their study reported that research on digital economy and social media analytics has shifted from the developed world to the developing nations. Now, more and more research is being conducted in the countries like China, Pakistan, Bangladesh, Ukraine and India. Through the density visualization of keywords analysis, it is revealed that keywords like "digitalization", "artificial intelligence", "blockchain", "cryptocurrency", and "bitcoin" are in trends of research. This because according to Awan et al. (2021). Big data analytics capability drives decision-making quality in organizations, and data-driven insights do not mediate this relationship. Business intelligence and analytics is associated with decision-making quality through data-driven insights. These findings offer important insights to managers, as they can act as a reference point for developing data-driven insights with the circular economy paradigm in

organizations. In addition to customer and financial perceptions, data analytics also improves operational efficiency, key performance indicators (KPIs) such as production rates, supply chain performance, and employee productivity can be tracked. By taking advantage of real-time data, MSMEs can quickly respond to in consumer behavior, market conditions, or industry trends, ensuring they remain competitive and responsive to customer needs. Data analytics and insights are invaluable tools for MSMEs, enabling them to make smarter decisions, optimize their operations, and drive sustainable growth.

Conclusion

Micro, small, and medium-sized businesses (MSMEs) have a transformational chance to attain sustainable growth through the incorporation of fintech into digital lending. Entrepreneurship is crucial in addressing various economic challenges, such as inequality and unemployment, by fostering innovation and creativity within corporate processes. The literature review indicates that fintech solutions enhance access to financial resources, enabling MSMEs to leverage advanced strategies that significantly improve their financial performance.

Furthermore, MSMEs are empowered to make well-informed decisions, streamline operations, and spot new market opportunities thanks to the dynamic capabilities provided by data analytics and digital platforms. Businesses can efficiently meet client wants by forecasting trends and customizing their tactics, especially with predictive analytics (Martínez-Peláez, 2023). For, MSMEs, which frequently deal with resource limitations and increased susceptibility to market swings, this competence is crucial (Pandey,2024). Since MSMEs are the foundation of many economies and are responsible for job creation and economic growth, they have a significant potential to support sustainable development goals (Dasaraju, 2020). Global differences in MSMEs' definitions and classifications, however, may affect their ability to obtain funding and assistance (Esubalew, 2017).

MSMEs are increasingly using using a lot of state of the art chnology such as blockchain, artificial intelligence, and digitalization. These technologies may tremendously improve MSMEs' operational efficiency and decision-making especially real time, leading to robust and sustainable growth in a competitive context. In conclusion, fintech's role in digital finance helps MSMEs to employ data-driven insights and innovative techniques to boost productivity and economic impact, which is crucial to their long-term success.

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