INSTITUTO
UNIVERSITÁRIO
DE LISBOA

EXPLORING THE IMPACT OF EMERGING TECHNOLOGIES ON LEADERSHIP DEVELOPMENT: AN AI CASE STUDY

Huang MingQuan

MSc in Business Administration

Supervisor
PhD Alexandra Azevedo Fernandes O'Neill
Invited Lecturer at ISCTE Executive Education
Invited Lecturer at ISG Business & Economics School

April 2024

BUSINESS
SCHOOL

Department of Strategy, Marketing, Operations and General Management

EXPLORING THE IMPACT OF EMERGING TECHNOLOGIES ON LEADERSHIP DEVELOPMENT: AN AI CASE STUDY

Huang MingQuan

MSc in Business Administration

Supervisor
PhD Alexandra Azevedo Fernandes O'Neill
Invited Lecturer at ISCTE Executive Education
Invited Lecturer at ISG Business & Economics School

April 2024

Dedication and acknowledgements

Heartfelt gratefulness to my supervisor Professor Alexandra Azevedo Fernandes O'Neill for accompanying and guiding me through the completion of this master's thesis. In my academic career, Professor O'Neill taught me profound knowledge, comprehensive science, and rigorous academic methods, she never lacks selfless dedication and patience.

Simultaneously, I also wish to extend my sincere appreciation for the diligent guidance and assistance provided by Professor Renato Lopes da Costa and Professor Ana Amaro. I am sincerely very thankful for the great teachings and unwavering encouragement during the process of writing my thesis.

I have gained a wealth of knowledge and guidance from my professors, my university, valuable mentors, and other talented researchers, as well as my colleagues, and I express my sincere gratitude to them.

Resumo

O principal objetivo desta investigação é examinar a influência da inteligência artificial (IA) no domínio do desenvolvimento de liderança. À medida que a IA continua a permear vários aspectos das operações empresariais, discernir o seu impacto nas dinâmicas de liderança torna-se cada vez mais imperativo. Este estudo procura elucidar os mecanismos pelos quais a IA pode aumentar a eficácia da liderança e reforçar o desempenho organizacional.

Utilizando métodos quantitativos, o estudo analisa dados provenientes de questionários e entrevistas com líderes da indústria chinesa. A análise quantitativa emprega estatísticas descritivas, correlação e regressão, complementada por pesquisa qualitativa para verificar a fiabilidade dos dados.

Os resultados mostram que a IA aumenta significativamente a liderança em tomadas de decisões, eficiência e inovação. Os líderes assistidos por IA excelem na tomada de decisões informadas, gestão de recursos, comunicação e inovação. A IA também melhora o desempenho dos funcionários, levando a uma maior produtividade e satisfação.

A integração da IA na liderança é benéfica, promovendo inovação e eficiência. Futuras investigações devem investigar os efeitos de liderança a longo prazo da IA em diferentes culturas e organizações. Este estudo fornece uma base teórica e insights práticos para aproveitar a IA para melhorar a liderança.

Palavras-chave: Inteligência Artificial; Liderança; Tomada de decisão; Comunicação; Inovação, Desempenho de colaboradores

Classificação JEL: M15, O32

Abstract

The primary objective of this research is to examine the influence of artificial intelligence (AI) on the domain of leadership development. As AI continues to permeate various facets of business operations, discerning its impact on leadership dynamics is becoming increasingly imperative. This study endeavors to elucidate the mechanisms by which AI can augment the efficacy of leadership and bolster organizational performance.

Utilizing quantitative methods, the study analyzes data from questionnaires and interviews with Chinese industry leaders. Quantitative analysis employs descriptive statistics, correlation, and regression, complemented by qualitative research to verify data reliability.

Results show AI significantly bolsters leadership in decision-making, efficiency, and innovation. AI-assisted leaders excel in informed decision-making, resource management, communication, and innovation. AI also enhances employee performance, leading to increased productivity and satisfaction.

AI integration into leadership is beneficial, promoting innovation and efficiency. Future research should investigate AI's long-term leadership effects across different cultures and organizations. This study provides a theoretical foundation and practical insights for leveraging AI to enhance leadership.

Keywords: Artificial Inteligence; Leadership; Decision making; Communication; Innovation, Employee performance

JEL Codes: M15, O32

General Index

Resumo ..... **i**

Abstract ..... **ii**

General Index ..... **iii**

Index of Tables ..... **iv**

Index of Figures ..... **v**

1.Introduction **1**

2.Literature Review **11**

2.1 Multi-dimensional characteristics of leadership 11

2.2 AI and Leadership development 13

3.Methodology **25**

4.Obtained results, findings and discussion **33**

4.1 Descriptive analysis 33

4.2 Correlation analysis 35

4.3 Results of model construction with multiple linear regression analysis 37

4.4 Proposed Findings and Discussion 49

5. Conclusions and Recommendations **54**

References **57**

Annexes **64**

Index of Tables

Table 3.2- Overview of data collection techniques *30*

Table 3.3- Raw data sheet | type, frequency of use, and application field *31*

Table 4.1- Descriptive statistics for detailed results *34*

Table 4.2- Correlation Analysis between AI Technology Application and Leadership Development *35*

Table 4.3- Results of the multiple linear regression analysis for decision-making ability *38*

Table 4.4- Results of the ridge regression analysis for decision-making ability *40*

Table 4.5- Results of the multiple linear regression analysis of organizational capacity *41*

Table 4.6- Results of the ridge regression analysis of organizational capacity *42*

Table 4.7- Results of the multiple linear regression analysis for communication skills ... *43*

Table 4.8- Results of the ridge regression analysis of Communication skills *44*

Table 4.9- Results of multiple linear regression analysis of innovation capacity *45*

Table 4.10- Results of the ridge regression analysis of Innovation capability *46*

Table 4.11- Results of the multiple linear regression analysis of employee performance *47*

Table 4.12- Results of the ridge regression analysis of Employee Performance *48*

Index of Figures

Figure4.1- Descriptive Analysis - Average Comparison Radar Chart *33*

Figure4.2- Decision-making ability Ridge plot *39*

Figure4.3- Organizational capabilities Ridge plot *41*

Figure4.4- Communication skills Ridge plot *43*

Figure4.5- Innovation capability Ridge plot *45*

Figure4.6- Employee performance Ridge plot *47*

1.Introduction

In the chapter, we will introduce the background and definition of the research question, and explain its importance and relevance.The article also provides assumptions about the results and research objectives, as well as an explanation of the objectives and a description of the structure.

This study seeks to investigate how artificial intelligence (AI) impacts organizations from a leadership standpoint, such as decision-making, organizational, communication, innovation, and employee performance. At present, AI technology has widely penetrated all levels of the organization and is closely related to leadership and organizational management. (Wijayati *et al.,* 2022) research on artificial intelligence (AI) and employee achievement and work involvement state reveals that change leadership plays a crucial role in mitigating its effect on these indicators of employee well-being. Therefore, this study focuses on the far-reaching impact of AI on leadership and expected to provide a valuable theoretical basis for future organizational development and leadership promotion.

AI technology has had an enormous impact on organizational decision-making processes. Quaquebeke and Gerpott (2023) noted that AI will change the leadership process, new trends and future of digital leadership. This change challenges traditional leadership models and prompts organizations to rethink decision-making mechanisms and leadership strategies. Innovation ability is another investigation point of this study, and the introduction of AI may enable leaders to show higher capacity in promoting organizational innovation. Smith and Green (2018) emphasized the relevance of AI to leadership roles and suggest that leadership needs to adapt in the era of AI.

Organizational skills and communication skills are also affected by the AI. Leaders need to consider the application of AI technology when organizing manpower and tasks, and rationally design the organizational structure and workflow. Effective communication becomes the key to the success of leaders, who must clearly and timely convey information

related to AI. Peifer *et al.* (2022) discussed the impact of AI on leadership and focused on how AI changes corporate communication and organizational structures.

As an important indicator to measure organizational productivity, employee performance is also closely related to the application of AI technology. This study will explore how AI technology affects the efficiency and effectiveness of employees in completing their work under leadership guidance. Hunt *et al.* (2022) explored the effectual influence of AI on work at the organizational degree by investigating UK business leaders, which provides a framework of reference for this study.

Despite the opportunities of AI technology, there are some challenges and problems. How to balance the collaboration between people and machines, and how to cultivate and improve leadership in the era of AI, has become a problem that organizations and individuals must face and solve. Wenchuan *et al.* (2019) discussed the relationship between AI and management skills and studied the government decision process mechanism based on complex big data, which provided useful inspiration for the conduct of this study.

Through quantitative research methods, this study explores the relationship between AI technology application levels and all aspects of leadership, hoping to provide new insights and theoretical support for the practice and academic circles. The present study proposes that with the continuous development and popularization of AI, its role in organizational leadership will be more prominent and will have a profound impact on the shaping and development of leadership. This study will combine empirical analysis to reveal the internal connection between AI application and each element of leadership and provide guidance and suggestions for leadership practice in the AI era.

Artificial Intelligence technology and various aspects of leadership interact intricately. How to quantify these interactions and reveal their mechanism is the core challenge explored in this study. Through our research, we aim to understand whether changes in artificial intelligence applications will affect decision-making processes, organization, communication, innovation, and employee performance. In fact, as discussed by Peifer *et al.* (2022) and

Quaquebeke and Gerpott (2023) the use of artificial intelligence in organizations presents new challenges and requirements for leadership and leadership skills within enterprises.

This study's intent is to gain a comprehension of the impact artificial intelligence applications can have on leadership processes. This requires both understanding how artificial intelligence technology works and quantifying its level of implementation. For example, this study will refer to the methods of Anghel (2023) and Wijayati *et al.* (2022) Delve deeply into analysis and exploration on number of AI tools, frequencies, and applications of artificial intelligence.

This study examined how the use of artificial intelligence affects various aspects of leadership. In terms of decision-making, we will investigate whether the application of artificial intelligence has improved the accuracy, efficiency, and effectiveness of executives.

In terms of organizational capability, we examined whether artificial intelligence technology can improve leadership efficiency in organizing manpower and tasks. Communication and innovation skills are also key points that must be understood, as proposed by Tang *et al.* (2023). In this sense, we also aim to explore how AI technology improves communication between leaders and team members and drives innovation of organizations.

Employee performance, as an important dependent variable, needs to be carefully studied. In this aspect, the present study will explore whether the work efficiency and effectiveness of employees have been improved with the support of AI technology. The study by Wijayati *et al.* (2022) provides a preliminary discussion of this issue, and the present study proposes a deeper study of the internal link between AI technology and employee performance.

We seek to examine if there is a correlation between AI technology application and leadership and other variables, such as organizational culture and leadership style. Wenjing (2022) and Smith and Green (2018) proposed multiple relationships and dynamics that may exist between AI and leadership, respectively.

Overall, the present study aims the understanding of how the application of AI technology

influences leadership at multiple levels. This study will combine empirical data and theoretical analysis, trying to reveal the interaction mechanism between AI technology and leadership, to provide practical guiding insights for organizational leadership. In this process, this study will refer to and draw on previous research results, but also add its own views and findings, to bring new perspectives and in-depth understanding of the research field of AI and leadership.

The primary aim of the study is to investigate and analyze the reciprocal relationship between the application of AI technology and leadership, and how they influence each other. This study aims not only to examine in detail how AI changes aspects of leadership, but also to understand how these changes further affects employee performance. This study seeks to investigate whether factors like organizational culture and leadership style will impede or promote the correlation between AI technology and leadership.

This study has the potential to deepen our understanding of the interrelation between AI technology and leadership. As AI technology becomes widely used in organizations, it becomes increasingly important to understand how it affects leadership. As shown in Peifer *et al.* (2022) the application of AI technology brings new leadership opportunities for leadership, but also challenges. By exploring these opportunities and challenges in depth, this study aims to provide practical insights and suggestions for enterprises and organizations to help them better integrate AI technologies, exert leadership, and improve organizational performance.

This study also has theoretical implications. Many existing studies have explored one aspect of AI technology and leadership but lack a comprehensive framework for an integrated understanding of the relationships between them. Quaquebeke and Gerpott (2023) and others have studied some interactions between AI technology and leadership but have not formed a unified theoretical framework. This study will strive to fill this theoretical gap and propose a comprehensive and coordinated perspective on the multifaceted relationship between AI technology and leadership.

Another objective of the study was to investigate how the application of AI technology in

an organization affects employee performance. Although the study by Wijayati *et al.* (2022) explored some links between AI and employee performance, this study will explore the nature and intrinsic mechanisms of these associations in more depth. This research direction can not only contribute to this study to understand how AI technology affects the performance of individuals and teams, but also provide strategic guidance for organizations to help them use AI technology more effectively to improve employee performance.

This study also aims to answer the question of the universality and particularity of the correlation or connection between the implementation of AI technology and leadership. We also seek to understand whether the relationship between AI technology and leadership varies between different organizational cultures and leadership styles. Smith and Green (2018) suggests that organizational culture and leadership style may influence the dynamics between AI and leadership. This study will further research in this area, exploring the diversity of relationships between AI technology and leadership under different conditions.

This study seeks to deepen the comprehension of the interaction between AI advanced technology and leadership at both the theoretical and practical levels. We aim that this will not only contribute to academic research, provide theoretical basis, and research direction for subsequent research, but also provide practical insights and strategies for practical organizational management, promoting the continuous success of organizations in the AI era.

To study the relationship, comprehensively and deeply, between AI technology and leadership and its impact on employee performance, this study adopts multiple research methods, combining quantitative and qualitative research methods. Such an approach aims to comprehensively explore and understand the research proposals, providing richer and more hierarchical data and insights.

For data collection, several representative tissues were selected for empirical studies. This study collects a large amount of data on the application instance of AI advanced technology, leadership performance, and employee efficiency through questionnaires, interviews, and observations.

The data originates from organizations of different types, sizes, and industries, thus representing a wide range of organizational environments and backgrounds.

We studied numbers and facts using computational methods such as multiple regression and structural equation modeling. These technologies discover the relationships between things and identify their causes and impacts. The initial numerical operations demonstrated the connection between artificial intelligence technology, leadership, and employee performance. This gave us some preliminary ideas and knowledge.

The study employed qualitative scientific means, such as interviews and case analysis. These approaches have deepened the research on how artificial intelligence technology collaborates with corporate leadership, as well as how it affects company culture, leadership style, and employee efficiency. Through in-depth dialogue, we can understand the views and experiences of company members and gain a lot of detailed information. Case analysis enable us to delve deeper into certain companies and situations and understand the precise steps and results of how artificial intelligence technology interacts with leadership.

This study also actively draws on the research results of predecessors. Specifically, this study is grounded in the research framework of Peifer *et al.* (2022), and further development and expansion have been carried out according to our research needs. This method aims to make our research practice more solid and scientific. By studying and integrating past surveys, it can help us more effectively express and evaluate the connection between artificial intelligence and leadership.

The methodological overview of this study aims to establish a clear and comprehensive research framework to help readers better understand the research progress. This framework not only helps to explore the relationship between artificial intelligence and leadership, but also provides rich multi-level data and in-depth insights, enabling us to evaluate the interaction more comprehensively and accurately between artificial intelligence and leaders.

This study aims analyze the complex relationship between artificial intelligence technology and leadership using various research methods, and further explore the impact of

this relationship on employee efficiency. The structure of this article seeks to explore and understand the basic issues and main findings of the research. The first part, Introduction, proposes the research, explains the research relevance, and briefly introduces how the research is conducted. The present introduction chapter aims to enable readers to understand the key points and structure of the conducted study. It also includes the reference to similar research. Our next section includes the analysis of literature and theories, delving into the connection between artificial intelligence technology and leadership. This aims to enable a solid theoretical foundation and provide guidance for the research path. The literature review also provides a theoretical framework to support the developed primary data research. The third part is methodology. It provides detailed information about the research methods used in the study. We will discuss how we collected, analyzed, and verified data and its relation to the research question. We will delve into design details and statistical data, such as multiple regression and structural equation modeling. The fourth part describes the results, and findings of this study and provides the analysis of its comparison with current research. In this section, we focus on presenting the quantitative and qualitative results obtained in the study and provide analysis and explanation of the results. At the same time, we conducted detailed examination on the close interaction between artificial intelligence technology and leadership and elaborated on the potential impact of research results on employee performance. This analysis involved comparing our research findings with existing theoretical and empirical studies in the literature to elucidate the specific contributions of this study in both theoretical and practical applications. The final chapter "Conclusion and Suggestions" comprehensively summarizes the main findings and contributions of this study. The exploration of the conducted research not only includes the main achievements of the research, but also provides an analysis of the constraints of the research and proposes the development path of future exploration. In addition, this section also proposes a series of practical and feasible suggestions based on the research results, with the overall goal of encouraging organizations to achieve seamless integration in artificial intelligence technology and leadership to

maximize employee performance. The purpose of the final section is to give readers a grasp of the past and future directions of research as well as provide concrete, usable advice to organizations.

The structural design of this study seeks to promote a clear and logical understanding of the entire research process, to acquire a deeper and more detailed understanding of the interaction between artificial intelligence and leadership. This includes research on the multifaceted effectiveness of this interaction on employee performance. Through the development of this study, our goal is to provide valuable theoretical and empirical information in the field of artificial intelligence and leadership research, thereby promoting progress in related research areas. This design not only seeks a clear understanding of the overall framework of the research, but also the exploration of the complexity of the relationship between artificial intelligence and leadership, aiming to provide understanding and guidance in academic and practical fields.

As for the methodological framework and hypothesis, this study used descriptive statistics, correlation analysis, and multiple linear regression models to validate the research theoretical framework starting from establishing hypotheses through sampling surveys. Descriptive statistics, correlation analysis, and multiple linear regression models objectively and accurately describe the influence of artificial intelligence technology on different dimensions of leadership skills cultivation, while multiple linear regression modeling verifies the possible correlations between variables and provides more objective results, but rather a precise insight into their relationship with leadership development.

Based on existing literature and theoretical foundation, this research investigates possible correlations between AI technology application and various leadership variables and staff performance metrics, constructs a series of research hypotheses to test whether the application degree of AI technology will affect the decision-making, organizational, communication, innovation and employee performance of leaders. In this study, an array of research hypotheses were proposed in order to investigate the link between AI technology applications

and all facets of leadership.

In this sense, the following are the hypotheses for this research:

To explore the correlation or connection between the application degree of AI technology and the decision-making ability of leaders.

Research proposes that AI technology can improve the accuracy, efficiency and effectiveness of decision making, thus introducing hypothesis: H1: the application degree of AI technology is positively correlated with the decision-making ability of leaders.

The association between AI technology application and organizational capacity was investigated. Literature proposes that AI technology has a positive influence on the rationality of organizational structure and the smoothness of workflow. Therefore, H2 is assumed that the application degree of AI technology is positively correlated with the organizational ability of leadership.

To explore the correlation of AI technology application and communication skills. Literature highlights the value of AI technology in increasing information clarity and communication timeliness, thus supporting H3: the application degree of AI technology is positively correlated with leadership communication ability.

Explore the relationship between AI technology usage and innovation ability of leaders. It has been noted that AI contributes to product creation and adoption of innovative technologies, hence, this formative hypothesis H4: the amount of AI tech use is positively correlated with innovation ability of leaders.

Examine the correlation between the utilization of artificial intelligence technology and employee performance. According to literature, artificial intelligence is helpful for employees in terms of time, quality, and efficiency in completing work, thereby improving employee performance; Therefore, this formative hypothesis H5: states that the use of artificial intelligence technology is positively correlated with employee performance.

These research hypotheses took the degree of AI technology application as the independent variable, and took decision-making ability, organizational ability, communication

ability, innovation ability and employee performance as the dependent variables. Testing these hypotheses will use quantitative research methods, including questionnaires and data analysis, to validate these relationships. By testing hypotheses with quantitative research methods such as questionnaires and data analysis, this study seeks to deepen understanding between AI technology applications and leadership and employee performance aspects, providing key insights into leadership development and organizational management practices as well as better appreciating AI technologies in current organizations.

Empirical studies serve to validate and test the relevance of our study hypothesis, helping to achieve an understanding of how AI technology applications relate to leadership as well as providing more specific directions for future research. These hypotheses will be at the heart of this study and help this study to get deeper into and explore the impact and contribution of AI technology application to leadership and employee performance.

The present study aims to comprehensively understand how artificial intelligence technology reshapes organizational leadership. Intended to inspire the academic community and practitioners to understand the profound significance of artificial intelligence technology and provide support and guidance for the leadership skills cultivation and application of future artificial intelligence technology. The overall goal of this study is to discover and propose novel leadership models and strategies through in-depth research on artificial intelligence technology, ultimately promoting the improvement of organizational performance.

Following the introduction to the conducted research, in the next section, a literature review will be conducted to provide the background and definition of the research question, as well as an explanation of its importance and relevance. In addition, the theoretical framework of the research conducted will also be introduced.

2.Literature Review

This study's literature review seeks to lighten the intersection between artificial intelligence technology and leadership, including relevant theories or models proposed in existing research. These theories and models provide a theoretical basis and research direction. In this section, we also briefly introduce some of our research hypotheses and the expected results.

2.1 Multi-dimensional characteristics of leadership

This study focuses on various aspects of leadership, and delves into its relationship with artificial intelligence technology. The use of secondary research data, in this case literature, aims to enable the understanding of leadership in modern organizations, as artificial intelligence technology progresses.

In this sense, the work of DeSimone and Roberts (2023) points out the importance of leadership in non-profit organizations. The authors state that leaders not only need to be skilled in management, but also need emotional intelligence and social awareness. This viewpoint provides us with a perspective on the future role of artificial intelligence, and how it may enable leaders to resolve complex interpersonal and organizational challenges, as this is the leadership objective concept laid down by Svika (2023) that suggests that leaders should no longer be under this narrow conception of management. The author proposes this would allow leaders to focus on long-term planning rather than daily operations, and let artificial intelligence do their routine work, enabling AI to play an instrumental role in unlocking leadership potential.

In a study by Lutz *et al.* (2023) it is pointed out how health-oriented leadership can make intelligence an important component of improving employee satisfaction. Managers using this tool can better understand and meet the needs of employees in distributed work environments, thereby promoting collaborative work between managers and teams. This ultimately helps to

create a work experience for all relevant personnel.

Gutu *et al.* (2023) also emphasized the importance of leadership and digitization in promoting sustainability through leadership development, resource management, and decision-making processes. The research indicates the role of artificial intelligence in leadership structure design, integrating digitalization and artificial intelligence into leadership practices, proposing that it does not improve work efficiency. The study also supports the sustainability of the organization. The authors explored the relationship between technology and leadership practices and revealed how digitalization shapes leadership structures.

Hartel *et al.* (2023) investigated how traits affect leadership in social groups using AI in their research. According to the authors, leaders recognize the value of artificial intelligence in better understanding leadership skills. The study proposes that, in the end, they will adopt different styles to improve the efficiency and effectiveness of the team. Hartel's research emphasizes this aspect, recognizing its impact, and proposes methods to further cultivate these leadership styles.

Sutton *et al.* (2023) conducted an in-depth study on leadership training in plastic surgery practice and its effectiveness in practice. The study proposes that with the improvement of training programs through simulation and performance monitoring, it is possible to use artificial intelligence in this field.

Williams *et al.* (2022) conducted an in-depth survey to examine the impact of typicality on leadership acquisition and perception, emphasizing diversity and inclusivity in leadership training programs. The study proposes that artificial intelligence may enable to consider diversity more fully during training or testing, resulting in more coherent models that can better meet different environments.

Harrington (2022) disrupted care using a quantum led approach. The author proposes when leadership occurs in complex and ever-changing environments, often characterized by rapid changes in conditions, it is necessary to create space for adaptive creativity. It also provides a new structure to address the issue of integrating artificial intelligence (AI) into

advanced training. This quantum leadership model not only provides these intelligent adaptive tools for nursing staff at all levels, but also helps us understand the mutations and upward push brought about by artificial intelligence. All these factors contribute to striking vitality and energy for use in leadership training--making it more suitable for the demanding medical environment of today.

In sum, there are several takes on leadership development in these studies--from research about emotional intelligence at charitable organizations to quantum leadership innovation. The analyzed studies point to how important leadership is in our rapidly changing modern society which uses artificial intelligence ubiquitously-not only data-driven decision making, but also training leaders and personal relationships. All these studies are aiming at how to get a deeper understanding of it, to be able more fully apply its strengths in leadership training.

2.2 AI and Leadership development

The history and development of AI have long begun to influence the evolution and realization of leadership. Combined with the understanding of this development, this study focuses on how AI shapes and drives a new paradigm of leadership. Since the emergence of AI, it has become a key technology, attracting international organizations and countries to invest in and research in it. An example of this development need and international preoccupation, is that the British Embassy hosted the 'UK AI Week' in Bangkok, demonstrating the UK's leadership in AI (2023).

In the context of current leadership research, Quaquebeke *et al.* (2023) clearly expressed the importance of digital leadership and emphasized how AI can change the understanding of leadership. The authors explored how AI is combined with leadership and noted that this will lead to a new evolution in leadership. AI provides organizations with a deep insight that can enhance decision-making, which allows leaders to gain a deeper understanding of how their organizations run.

The integration of leadership and artificial intelligence demonstrates multiple aspects of innovation. Anghel (2023) introduced an innovative perspective on leadership in artificial intelligence and electronic recruitment systems, emphasizing its increasingly diverse uses in leadership applications.

British business leader Hunter argues that artificial intelligence changes leadership opportunities and strategies, while participating in a survey about the influence of AI on organizational operations. The aim is to illustrate how profoundly it can be positively charged by organizations (Hunter *et al.,* 2022). This survey also helps to prove that the influence of AI on leadership models and management systems throughout organizations shouldn't be underestimated. Leaderships from all levels will ultimately feel its transformative power invading their work life, extending even more deeply into diverse parts within your organization at different spatial distributions and scales. The study points out that artificial intelligence (AI) has not only created a platform for leadership, it is also responsible, via the role of organization structures and processes, for this transformation in these practices. Leaders will have to adapt and organize their enterprises in line with this change, employing artificial intelligence tactically within the enterprise structure. They must furthermore foresee challenges or opportunities that may confront them down the road. An understanding and application of AI technologies are now seen as foundational skills for the cultivation and practice of leadership.

How artificial intelligence (AI) affects leadership is a question of fundamental importance that should lead leaders to re-examine both themselves and their methods. Smith and Green (2018) undertook an in-depth study of the impact that artificial intelligence has had on leadership practices and concepts. Literature proposes to define influence as something that enables leaders make to better decisions and also raises the quality of cognition and management. With artificial intelligence, leaders may utilize detailed data analysis to gain an even clearer understanding of the current situation inside and outside their organizations. How can leaders apply new algorithms and models to predict differences in trends, opportunities,

barriers or catches to achieve success? This technology can not only enhance leadership decision-making capabilities but also enlarge their horizons in formulating and implementing company plans. In addition, increasing general awareness will allow leaders to re-allocation of roles and methods accordingly, this in turn should make the transition process easier for all concerned.

Literature proposes that when leaders make use of artificial intelligence (AI) and integrate it into leadership, they can further adapt to changes in the external environment. Nicolai *et al.* (2018) developed studies using higher education leaders and found that the technologies which got attention today were those associated with artificial intelligence, this included the understanding of how AI can be developed to act as a driver for innovation, permitting organizations to rapidly adapt their structure when facing changing circumstances--these are precisely what is needed most for leading organizations.

Literature suggests that Leadership has been greatly influenced by AI. Starting from the relations between leaders and led, Smith and Green (2018) used AI to interact with leadership on every level, examining how its evolution would affect roles of decision-makers and innovators in their organizations, while Gerpott *et al.* (2023) sought insight into what influence digital leadership will have over time--transforming traditional forms found.

It is also suggested by authors that the introduction of AI into organizations is changing the way they assess their leaders and staff. Wijayati *et al.* (2022) propose, based on conducted research into the influence of change leadership for employees performance and work motivation, that AI tech usage also regulates their behavior. The authors also demonstrate significant changes in organizational communications skills due to applications by organizations using this new technology tool.

Wenchuan *et al.* (2019) further argued that AI is essential for the government decision-making system implemented by big data, especially fundamental to such systems involving extremely and informatively complex sets of indirectly quantified responses from large numbers of people using AI as leadership figures. The authors propose how AI technology

enables it possible for the governments to make decisions more accurately, quickly and efficiently at various levels of authority.

Research by Nicolae *et al.* (2018) shows that through using these altered perception planes, leading strategic people in higher education today can truly show the abilities of artificial intelligence applications to drive innovation organizationally and respond creatively taking advantage when they see opportunities and standing up for themselves against problems. It turns out that their study demonstrates how applications of artificial intelligence can become drivers of a given company or organization's core innovation. They assist leaders in innovatively creating new products, for example, they aid them as communities adopt powerful technologies to communicate with one another and create machine-assisted self-awareness.

From organizational operations to the execution of decision-making processes, artificial intelligence, and leadership are proposed to be intertwined at many levels. Artificial intelligence is proposed not only to affect organizational processes, but also to influence the decisions made by managers themselves. Therefore, it is proposed to affect both business processes and decision-making processes. With Artificial Intelligence's continued effect on leadership development over time, learning cycles will need to continue for leaders and organizations to remain effective within an ever-evolving environment (Nicolae *et al.,* 2018).

Literature also proposes that leadership development has garnered worldwide interest and many researchers have investigated various methodologies, strategies, and theories surrounding its study. Investigating various international backgrounds reveals a wide variety of theories and methods utilized in leadership development programs.

In this sence, Prichett *et al.* (2023) emphasized the importance of leadership development for healthcare professionals, especially dermatologists, due to its low representativeness. This author said. That the development of leaders not only enhances individual skills, it actually enhances the overall diversity of groups and organizations.

According to Volsko (2023) respiratory care leaders should be trained for those who not

only lead the industry but also want to actively participate at all levels. The author pointed out the universal importance of leadership development in certain health fields.

Literature also proposes that leadership is most needed during times of crisis. With this in mind, Harrison (2023) pointed out that effective crisis management is impossible without leadership development. Without leaders with the skills and ability to guide an organization in complex, rapidly changing environments, this organizational stability will disappear quickly into thin air.

According to Suwanmanee *et al.* (2023) there has been great potential in education as far as Thai school management is concerned, such that transformational leadership development which Capitalizes on students' abilities within science, maths and technology. Education development is not just limited to the fields of economics or medicine, but also encompasses education that offers more thoroughgoing courses for students.

According to a study by General Electric (2013) companies have different views on the strategies and theories for developing corporate governance, even in one field. This illustrates how different organizations have different leadership development methods in different organizational situations within an industry sector.

As shown in a study by Eddy *et al.* (2023), the pharmaceutical industry is interested in creating leadership places. The subject of the authors research was the opinions about leadership opportunities, and what can be done to speed up training in pharmaceutical schools for future pharmacists. Similar research was also done by Kezar, A. (2023) in higher education, who suggested that a part of general reforms should invest and change leadership development plans, moreover, the authors ideas have been extended to include various fields or aspects of the society as well.

Ryan and Guthier (2023) conducted research to develop an adaptable leadership development model specifically tailored for disability leadership bodies in Australia that could accommodate culturally and societally varied situations. Meawhile, Tan *et al.* (2023) examined the impact of mindfulness training on leadership behavior and effectiveness,

offering another means of creating great leaders by increasing self-awareness and compassion.

Overall, leadership development has emerged as an indispensable field of study across various contexts and fields worldwide. Theories and methods developed specifically for leadership development provide invaluable resources and inspirations that fuel further efforts at expanding one's own leadership abilities.

In the process of aiming to comprehend how AI technology influences leadership, it is necessary to gain an understanding of its fundamental knowledge and types. Artificial Intelligence mimics and extends human intelligence; hence it holds great promise (Smith and Green, 2018). The main goal is to achieve the ability to simulate human learning, reasoning, perception, natural language understanding, and mechanical movement.

Artificial intelligence innovations like machine learning, deep learning, natural language processing and computer vision offer various applications for their users. These technologies help improve the efficiency of organizations in processing large amounts of data, discovering new patterns and trends, and enhancing their understanding and resolution of complex problems. Dan (2023) conducted profound study on the new dimensions of artificial intelligence in the context of leadership electronic recruitment and investigated its application in human resource management and leadership recruitment.

In fact, the application of AI technology can profoundly influence the decision-making ability of leaders, improve the accuracy, efficiency, and effectiveness of organizational decision-making (Quaquebeke and Gerpott, 2023). Artificial Intelligence technology holds great promise to transform all aspects of leadership, foster innovation, and produce lasting changes to current models (Ronald, 2019). Artificial intelligence tools could assist leaders with optimizing manpower allocation and task organization to enhance organizational structure rationality as well as workflow flow (Ronald, 2019). For instance, artificial intelligence tech may help leaders optimize manpower allocation to optimize work productivity.

As Wenchuan *et al.* (2019) have indicated, artificial intelligence technology's

effectiveness extends well beyond improving organizational efficiency and decision-making processes. Artificial intelligence has quickly been proven to be an asset for government decision-making in complex environments, with big data environments such as machine learning and deep learning, enabling leaders to better explain social, economic, and political changes before formulating appropriate strategies and strategies.

Artificial intelligence technology plays a crucial role in improving their communication skills with the team. Executives using artificial intelligence applications such as natural language processing can better provide more accurate information while improving team collaboration and maintaining consistency among teams. Artificial intelligence enables executives to evaluate employee performance and use data analysis techniques to measure efficiency and effectiveness (Tang *et al.,* 2023) more accurately. Artificial intelligence also enables better decision-making, organizational efficiency, communication efficiency, and innovation to promote more efficient achievement of organizational goals. Therefore, studying its impact on leadership is important as it opens new perspectives to better understand it and create innovative patterns for it.

After developing an understanding of artificial intelligence technology and its various uses, we will investigate its influence on leadership. Artificial intelligence's effect is felt across many dimensions; organizations and leaders increasingly recognizing its role (Dan, 2023).

Artificial Intelligence technology has an enormously significant effect on leadership decision-making. (Liu, 2019) stated that using this technology, leaders can process and scrutinize significant quantities of data more accurately and quickly in order to better comprehend problems and make decisions more quickly based on data-driven methods. Furthermore, deep learning and machine learning allow leaders to anticipate future trends and challenges more proactively while remaining more responsive when responding to changes.

Artificial intelligence technologies also play a powerful role in communication and collaboration within organizations. (Oliver *et al.,* 2023) noted that leaders may use natural

language processing and artificial intelligence tools such as machine translation for more efficient team communication efficiency as well as improving responsiveness and agility within an entire organization. By increasing accuracy and timeliness of information transmission leaders can ensure consistent team goals are being met while effectively executing organizational strategies.

Artificial Intelligence technology plays an essential part in increasing leaders' innovation abilities. Kaushal *et al.* (2020) reports that AI enables leaders to quickly grasp market changes and consumer needs that prompt innovation within organizations. Leaders could utilize these tools as early-warning systems before formulating effective innovation strategies or development directions to respond accordingly.

AI technology can assist leaders with better analyzing and managing human resources (Quaquebeke and Gerpott, 2023). Their research indicates that using AI tools for employee performance evaluation helps leaders evaluate employee performances more objectively while creating more suitable rewards and incentive mechanisms.

Artificial Intelligence technologies hold great promise to further leadership development. Artificial intelligence will force fundamental shifts in leadership paradigms and concepts (Ronald, 2019), forcing future leaders to adapt more openly, flexiblely and adaptability when dealing with changes caused by emerging technologies. They should possess keen insight, use artificial intelligence for organizational innovation purposes as well as increasing efficiency levels within organizations while encouraging more transparent working cultures within organizations - only through this kind of adaptation can leaders successfully address future challenges while realizing sustainable organizational growth.

Literature indicates that AI technology has had a profound effect on every facet of leadership, from decision-making and organizational communication to innovation promotion and human resource management. Leaders who use artificial intelligence can better adapt to the constantly evolving environment and achieve the company's strategic goals by adapting and learning new technologies. Managers must also continuously adopt leadership concepts

that meet the future requirements of the organization.

Studies have also revealed that the use of artificial intelligence technology in leadership development has exerted a deep influence on all areas related to business and leadership building. Of special concern to this study is how the use of artificial intelligence will, in leader development terms such as decision-making ability, organization structure and process, communications capabilities or innovation performance and individual employee behavior.

According to Quaquebeke and Gerpott (2023) this type of artificial intelligence can help leaders make better decisions in decision-making situations, even when faced with high uncertainty. Thus, it is proposed that leading companies can use artificial intelligence technology to extract pertinent information from big data and rely on machine learning and predictive analysis for rapid decision-making.

On the other hand, Smith and Green (2018) shows usefulness in enabling executives to apprehend, enhance and increase organizational efficiency. In addition, also supports departmental collaboration and helps with resource allocation, proposing that leaders must have a good grasp of organizational structure and workflow, and that this can be simplified through artificial intelligence technology.

Studies also propose that artificial intelligence can bring executives and ordinary employees together in various ways, such as using chatbots to identify issues in social media posts. Anulita *et al.* (2018) argue that leaders using artificial intelligence tools can provide more accurate and timely data, improve interaction quality, and increase overall engagement.

Even when it comes to the innovative capabilities of artificial intelligence, artificial intelligence technology has great prospects, as indicated by Yannick *et al.* (2022) that demonstrated how artificial intelligence can drive organizational innovation by helping executives develop and introduce new products or technologies, cultivate creative thinking skills to maintain competitiveness in a competitive environment, and thus demonstrate this potential by supporting the formulation and implementation of organizational strategies and improving organizational flexibility through artificial intelligence.

Wijayati *et al.* (2022) demonstrated how artificial intelligence technology regulates employee performance and engagement. With these insights, leaders can more accurately measure employee efficiency and effectiveness, thereby gaining a better understanding of team progress and individual contributions. Furthermore, Ronald (2020) explains how artificial intelligence technology and leadership go hand in hand, and points out how automation, robotics, and artificial intelligence will fundamentally change future leadership roles and responsibilities. In their study Wenchuan *et al.* (2019) showcased the potential of combining AI technology and effective leadership to establish a government decision making mechanism that harnesses the power of intelligence and complex analysis of data. They highlighted the significance of big data for government decision-making purposes and believed AI technologies could assist with more objective analyses of government policies' effects.

Research in AI technology and leadership is still in its infancy, however, Jones (2018) provided some key points and questions surrounding AI's role, authority, ethics and future research directions in terms of making leadership decisions using decision making AI systems. Quaquebeke and Gerpott (2023) focused on artificial intelligence and explored the current, emerging, and future aspects of digital management, arguing that artificial intelligence will ultimately obscure and alter leadership practices. The aurhors research emphasizes its impact on leadership dimensions, such as decision-making accuracy and organizational development, by encouraging leaders to pay more attention to the innovation and clarity of information, we promote the innovation and clarity of information.

Tang *et al.* (2023) further explored the neurosurgical leadership practices in the era of artificial intelligence (AI), such as the neurosurgical leadership of AI, by studying the profound impact of neurosurgical leadership practices on leadership practices. The authors emphasized the profound impact of artificial intelligence sciences and technology on leadership practices and the need to reassess and reconstruct leadership models when introducing AI technology into leadership models and management practices.

Proposing that scholars and researchers alike are currently exploring how artificial intelligence technology impacts and strengthens organizational capabilities, Anghel (2023) provides an innovative perspective on the impact of artificial intelligence on leadership recruitment practices by emphasizing his role in improving organizational structure and promoting workflows. Research has shown that artificial intelligence tools and technologies can optimize the allocation of human resources and tasks by improving the accuracy and efficiency of information management systems within organizations.

Also, Smith and Green (2018) conducted a thorough investigation on the impact of artificial intelligence on executive communication skills, with a particular emphasis on improving the efficiency and effectiveness of team members and executives. Artificial intelligence technology can support this goal by quickly disseminating a large amount of data, helping managers understand the needs of team members more quickly and making it easier to explain expectations to team members.

Research often evaluates employee performance as an important variable, Vijayati *et al.* (2022) conducted an investigation-oriented study how the combination of artificial intelligence technology and transformational leadership affects employee performance and job engagement. This research proposes that artificial intelligence significantly improves performance by improving efficiency and effectiveness, while effective leadership further enhances performance.

Innovation is a frequently discussed topic in the fields of artificial intelligence and leadership, in this sense, Nicolai *et al.* (2018) recently studied how current university leaders address the worrisome aspects of artificial intelligence, with a focus on their core position as cultural innovators, refocusing organizations to address this new challenge. The authors believe that the appropriate application of artificial intelligence can accelerate product design and adoption. It can also enhance the company's ability to creatively solve problems.

Considering the exposed references, we propose that implementing artificial intelligence is a gradual process that includes various functions and levels of the organization and that

applying artificial intelligence to leadership not only benefits decision-making and organizational skills, but also improves communication and innovation skills, as well as the efficiency of employees and the entire organization. Analyzing the literature input, we propose that as artificial intelligence becomes ubiquitous in organizations around the world, leadership patterns and methods may need to adapt accordingly.

This study relies on relevant literature, including Quaquebeke and Gerpott (2023) study on how artificial intelligence alters leadership, Tang *et al.* (2023) thesis about urgency of leadership during AI era and Wijayati *et al.* (2022) impact study on AI impacting employee performance and work engagement as theoretical bases and quantitative methods to illustrate relationships between AI and leadership.

Following the presented theoretical framework for the conducted research, the applied Methodology of the conducted research will be presented in the next section. Details the specific methods and procedures used, including data gathering, data analysis and validation are represented, as well as details of the design of empirical studies and the application of statistical methods such as multiple regression and structural equation model.

3.Methodology

To demonstrate the scientific nature, rigor, and validity of the conducted study, the applied Methodology of the conducted research will be presented in the section.

Descriptive statistics conduct preliminary surveys on artificial intelligence technology and leadership by collecting and analyzing data. Inspired by Quaquebeke and Gerpott (2023) research on digital leadership, this study collected relevant information from several organizations on how artificial intelligence plays a role in decision-making processes, organizational capacity development, communication efforts, and innovation capabilities.

Through relevant analysis, we investigated the relationship between artificial intelligence and various leadership characteristics. Wijayati *et al.* (2022) mainly focused on the mathematical correlation between artificial intelligence and employee performance. This research project investigated several axes of how artificial intelligence affects leadership, such as how it affects the decision-making process, affects execution decisions, or how team members interact with leaders.

This mutual influence analysis is a way to study the correlation between artificial intelligence and various aspects of leadership (Wijayati et al., 2022). Compared to most researchers who focus on the direct correlation between artificial intelligence and employee performance, in this research project, the author considered the different dimensions of how artificial intelligence affects leadership behavior and its application, including management decision-making ability.

This theory is supported by many hypotheses proposed in this study to guide future empirical research. These hypotheses included possible positive and negative correlations between artificial intelligence technology and various dimensions of leadership as well as any possible impacts. Based on these assumptions, this research collected and analyzed actual data, examined relationships between AI technology and leadership, as well as trying to detect patterns and trends within them.

The application of descriptive statistics, correlation analysis and multivariate linear regression model makes the research with the ability of quantitative analysis and can more accurately and objectively reveal the complex relationship between AI technology and leadership. Through an in-depth exploration of the various dimensions, this study also expects to provide more comprehensive and in-depth insights for theoretical research and practical applications.

In this study, the careful selection and definition of both the independent variables and the dependent variables are crucial, because they constitute the basic framework of the study. The application of the independent variable —— artificial intelligence sciences and technologies is accurately quantified, which describes and quantifies the application degree of AI technology in organizations, such as number of AI tools, the frequency of use, and the number of application fields. The purpose of this variable is to study the impact on the dependent variable, the aspects of leadership, by observing the extent of application of changing AI technology. Specifically, this study focused on five dependent variables: decision-making, organizational, communication, innovation, and employee performance.

Regarding decision-making ability, we consider it to be the ability of leaders to make decisions. This study quantifies the accuracy, efficiency, and effectiveness of decision-making. Organizational ability evaluates the effectiveness of leaders in organizing manpower and tasks, mainly focusing on the rationality of the organizational structure and the smoothness of the workflow. As for communication ability the study aims to quantify leadership effectiveness in communicating with teams, mainly considering clarity of information and timeliness of communication. We also propose that innovation capabilities refer to leaders' abilities to lead organizational innovation efforts, such as creating new products or adopting innovative technologies and that employee performance measures how efficiently employees carry out work under their leaders' supervision.

Our aim is to gain a better understanding of artificial intelligence's application and impact in organizational leadership by quantifying and characterizing relevant variables more fully.

By manipulating the application of artificial intelligence, this study was able to observe changes in performance and leadership variables. Further, correlation analysis and multiple linear regression are employed to form correlations or patterns of their application in leadership situations. This comprehensive study laid the groundwork for subsequent research projects.

In addition to examining how artificial intelligence impacts various leadership structures and functions, this study also offers suggestions for organizations that are considering implementing AI as an assistive tool. Besides analyzing the theoretical connection between artificial intelligence and leadership, this study also offers concrete practical models for how to introduce ana them into effective use within organizations.

Besides this, there was also another part of the research that focused on how artificial intelligence technology influences employee performance. In line with quantitative analysis theory, the positive correlation of results from our research suggests that as organizations increase their use of artificial intelligence, they will see employees become increasingly efficient and powerful. This can help enterprises understand how to apply artificial intelligence most effectively to overall improve their operations.

It offers a theoretical foundation by defining and analyzing the dependent variables of such AI applications in an organizational leadership context. The results may assist organizations in determining how best they may employ artificial intelligence technology which will raise problems for leadership and organizational efficiency.

In this study, the independent variable is the usage of artificial intelligence sciences and technology, covering multiple aspects such as the type, frequency of use, and application field of artificial intelligence tools. Dependent variables of employee performance include decision-making ability, organizational capability, communication ability, innovation capability and employee performance. Below is a table detailing these dependent variables' definition, measurement methods and literature support:

Table 3.1- Relevant literature support for each research variable

Variable name	Variable description	Measure
Application of the AI technology	Describe and quantify the application of AI technology in tissues	The number of AI tools , frequency of use and number of application fields
Decision-making ability	Quantifies the ability of leaders in making decisions	The accuracy, efficiency and effect of decision-making
Organizing ability	Assess the effectiveness of leadership in organizing manpower and tasks	The rationality of the organizational structure, the smoothness of the work process, etc
Communication skills	Quantifies the effectiveness of leadership when communicating with teams	The clarity of information, communication timeliness, etc
Innovation ability	Assess the ability of leaders in driving organizational innovation	Development of new products, the adoption of new technologies, etc
Employee performance	Quantify the efficiency and effect of employees' work under the guidance of leaders	Time, quality and efficiency of work completion, etc

This table offers an outline of various independent and dependent variables supported by literature, with measurements to take place through rigorous quantitative and qualitative research methods to ascertain any impact from applying artificial intelligence technology on aspects of leadership.

This research seeks to gain a better understanding of how artificial intelligence technology is implemented within organizations and its unique impacts on various areas of leadership. We will assess whether artificial intelligence technology impacts decision making, organizational structure, communication channels or innovation abilities of employees within an organization and therefore enable better utilization and ultimately improved overall performance of artificial intelligence technology solutions within businesses.

Specifically, this study will use empirical analysis methods to examine the correlation between the application level of artificial intelligence sciences and technology and various dimensions of leadership. In addition, it will investigate how these relationships are influenced by organizational culture, structure, and employee attitudes. This study strives to consider differences in organizational size, type, and industry to ensure the accuracy and applicability of research results.

This study collected leadership samples from many enterprises in China, with an initial sample size of 30 people. These 30 leaders from different industries represent businesses from

diverse fields; each boasting unique qualities and experiences that add diversity to our research sample. In the process of data collection and processing, some samples had problems such as data insufficiency and inconsistency, and the final effective sample size was reduced to 22 people.

To guarantee the accuracy and validity of data, this study conducted a detailed and rigorous screening of each questionnaire, finally ensuring that all 22 valid answers were accurate, consistent and without omission. Each leader in the sample possesses certain decision-making, organizational communication and innovation abilities.

Although the final sample size is limited, this study aims to explore the potential correlation between the implementation of artificial intelligence technology and various aspects of leadership. The research results will be analyzed using SPSS software and statistical analytical methodologies, encompassing descriptive analysis, correlation analysis, and regression analysis, to verify and understand the relationships between these variables.

The data required in the study stems primarily from questionnaires, interviews, and field observations. The types of data collected include quantitative and qualitative data that help to quantify the application of AI technology and various aspects of leadership, while qualitative data can provide a deeper understanding of the interactions and effects between these variables.

For the independent variable "application of AI technology", data collection involves the number of AI tools , frequency of use and number of application fields . For dependent variables, namely decision-making, organizational, communication, innovation, and employee performance, we primarily relied on self-assessment ratings provided by the respondents. We supplemented this data by conducting interviews and observations with sampled individuals to validate the findings. The data source is mainly from the samples from various enterprises in China, and the effective sample is 22.

On the basis of ensuring data quality and accuracy, the data are used to study how the

application degree of AI technology affects all aspects of leadership, and also to explore whether there are differences in different types of enterprises.

Data gathering is mainly carried out through online questionnaire surveys, telephone interviews, and semi-structured interviews. The questionnaire design contains questions about the application of AI technology and various aspects of leadership according to the research objectives. The question design of the questionnaire underwent several rounds of review, ensuring its reliability and validity. The semi-structured interviews were more focused on collecting qualitative data, understanding how leaders use AI technology in practical work, and exploring their impact on organizational and employee performance.

Table 3.2- Overview of data collection techniques

Source	Data type	Applicable variables	Method description
Questionnaire survey	Quantitative	All variables	Quantitative data on the application and leadership were collected for AI by designing a structured questionnaire
Semi-structured interview	Qualitative	All variables	Qualitative data on how leaders applied the AI and its impact were collected through interviews
Observation	Qualitative	Mainly the organizational ability and communication skills	Behavior data on leaders in organization and communication were collected through field observations

By comprehensive application of the above indicated methods, this study aims to build a detailed, accurate and comprehensive understanding of exploring how the application of AI technology affects various aspects of leadership and whether different business types differ in this process.

To better satisfy the requirements and accuracy of the statistical analysis, the data table generated below contains the independent and dependent variables mentioned above. To simplify, each variable is quantified, which is used to measure the numerical values.

Table 3.3- Raw data sheet | type, frequency of use, and application field

Catalogue number	Number of AI tools (s)	Frequency of use (times / week)	Number of application fields (a)	Decision-making ability (1-10)	Organizational capacity (1-10)	Communication skills (1-10)	Innovation capability (1-10)	Employee Performance (1-10)
1	3	10	2	7	6	8	6	7
2	2	5	1	6	5	6	5	6
3	4	12	3	8	7	7	7	8
4	1	3	1	5	5	5	4	5
5	5	15	4	9	8	8	8	9
6	3	7	2	6	6	7	6	6
7	2	4	1	5	5	5	5	5
8	4	11	3	8	7	7	7	8
9	3	9	2	7	7	6	6	7
10	1	2	1	4	4	4	4	4
11	4	13	3	8	7	7	7	8
12	3	8	2	6	6	6	6	6
13	2	6	1	5	5	5	5	5
14	5	14	4	9	8	8	8	9
15	3	10	2	7	6	7	6	7
16	2	5	1	5	5	5	5	5
17	4	12	3	8	7	7	7	8
18	1	4	1	4	4	4	4	4
19	3	8	2	6	6	6	6	6
20	4	10	3	7	7	7	7	7
21	5	15	4	9	8	8	8	9
22	2	7	1	6	5	5	5	6

In this table, the number of AI tools, frequency of use and number of application fields are all measured for the application of AI technology, that is, different levels of independent variables. Decision-making, organizational, communication, innovation, and employee performance are the dependent variables used to measure all aspects of leadership.

This research uses correlation analysis and linear regression analysis as data analysis methods to measure the relationship between artificial intelligence technology and various aspects of leadership. Using SPSS software, this study conducted a correlation analysis to investigate the correlation between the application of artificial intelligence technology and leadership development. Linear regression analysis can demonstrate how artificial intelligence technology affects various aspects of leadership. This method aims to evaluate the impact of

artificial intelligence technology applications objectively and accurately of leadership through statistical data. After data analysis, the results will be presented in the form of charts and explanatory texts, providing in-depth and comprehensive answers to research questions.

In terms of research ethics, this study respects and protects the rights and privacy of all research participants. We strictly adhere to the principle of obtaining informed consent, ensuring that participants fully understand the nature, objectives, procedures, and potential risks of the study before participating. Participants have the right to voluntarily withdraw from the study at any time. All collected data will be kept confidential and used only for this study. All participant information has been anonymized to prevent personal information leakage.

In this section, we introduced the scientificity, rigor, and effectiveness of this study, and we will present the results, findings, and discussion in the following section.

4.Obtained results, findings and discussion

This chapter introduces the research findings, contributions to existing theories, and inspirations for practice. This chapter will analyze and study the data and explore the relationship between artificial intelligence technology and leadership based on the research results. We will also compare and analyze the findings of this study with the theoretical and empirical research in existing literature to reveal their contributions to theory and practice.

4.1 Descriptive analysis

This study provided a basic understanding of each scale data through descriptive analysis of 22 enterprises, and used indicators to express the overall attitude towards the scale data. Careful analysis of the data reflects various aspects of artificial intelligence technology and leadership force table data, providing guidance for subsequent research and analysis.

Figure4.1- Descriptive Analysis - Average Comparison Radar Chart

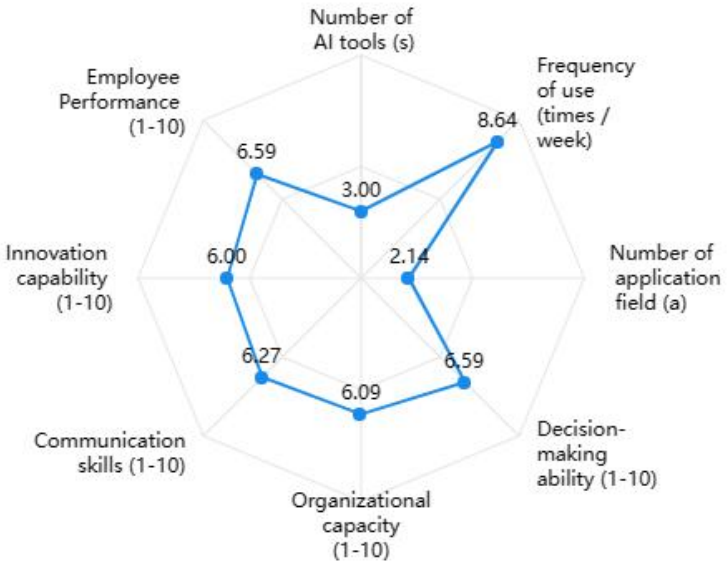


Table 4.1- Descriptive statistics for detailed results

Name	Mean values ± standard deviation	Median	Coefficient of variation (CV)
number of AI tools (s)	3.000±1.272	3.000	42.414%
Frequency of use (times / week)	8.636±3.910	8.500	45.277%
number of application fields (a)	2.136±1.082	2.000	50.653%
Decision-making ability (1-10)	6.591±1.563	6.500	23.718%
Organizational capacity (1-10)	6.091±1.231	6.000	20.209%
Communication skills (1-10)	6.273±1.279	6.500	20.393%
Innovation capability (1-10)	6.000±1.272	6.000	21.207%
Employee Performance (1-10)	6.591±1.563	6.500	23.718%

From the above table, we can observe the relevant differences between the scale data. For example, in terms of the number of artificial intelligence tools, the average value is 3, the standard deviation is 1.272, and the coefficient of variation is 42.414%, indicating a significant difference in the types of artificial intelligence tools used by enterprises. This difference reflects the uniqueness and diversity of enterprises in choosing and applying artificial intelligence tools.

In terms of the frequency of AI technology use, the average was 8.636 times / week, the median was 8.5 times / week, indicating that the frequency of AI technology use in most enterprises is around 8.636 times per week. The coefficient of variation was 45.277%, indicating that there is some fluctuation in the frequency of use, which may be different due to the different business requirements and business volume of different enterprises.

For dependent variables, such as decision-making ability, the mean value is 6.591 and the median is 6.5, which means that most business leaders have better decision-making ability. The coefficient of variation was 23.718%, indicating that there is still some difference

between decision-making ability. This variability may arise due to differences in decision-making style, experience, and knowledge structure between individuals.

Through in-depth descriptive analysis of these variables, this study has gained a clearer understanding of the basic cognitive situation of artificial intelligence technology and leadership force scale data, as well as the overall attitude of the data. These impacts include both positive aspects and areas that require attention and improvement. These analysis results provide a foundation for further research.

4.2 Correlation analysis

In the second part of the data analysis, this study mainly explored the correlation between AI technology application and each indicator of leadership development. Although the involved variables are not continuous, this correlation analysis can help us investigate the possible linear relationship between different variables, and then provide the basis for higher-level regression analysis. Table 4.2 reports the Pearson correlation coefficient, p-value and sample size between each indicator of AI technology application and leadership development.

Table 4.2- Correlation Analysis between AI Technology Application and Leadership Development

		Decision-making ability (1-10)	Organizational capacity (1-10)	Communication skills (1-10)	Innovation capability (1-10)	Employee Performance (1-10)
number of AI tools (s)	Correlation coefficient	0.958**	0.973**	0.907**	1.000**	0.958**
	p price	0.000	0.000	0.000	0.000	0.000
Frequency of use (times / week)	Correlation coefficient	0.972**	0.947**	0.897**	0.967**	0.972**
	p price	0.000	0.000	0.000	0.000	0.000
number of application fields (a)	Correlation coefficient	0.935**	0.955**	0.866**	0.968**	0.935**
	p price	0.000	0.000	0.000	0.000	0.000

*** p<0.05 ** p<0.01**

This simple correlation analysis anticipates an association between each explanatory and dependent variable: artificial intelligence applications seem to have a positive effects in multiple fields such as decision-making, organizational effectiveness, communication innovation, and employee performance.

For example, the correlation of number of AI tools and decision-making ability, the correlation coefficient of 0.958 indicates the existence of a very strong positive correlation, meaning that the diversity of AI tool types may bring higher decision making ability. Similarly, the 0.947 correlation between the frequency of use and organizational capacity also verified that frequent AI technology use significantly improves organizational capacity.

After further investigating the results of correlation analysis, this study sought to validate the previously proposed research hypothesis. Correlation analysis provided substantial support for its initial validation. Specifically, due to the positive correlation of number of AI tools, frequency of use, and various aspects of number of application fields and leadership development, these correlation results support the hypothesis of this research that the application of AI technology can significantly improve leadership development in organizations.

The application of different indicators of AI technology is so highly associated with leadership development, which shows the importance of AI technology in enterprise leadership development. For example, when AI tools are more diverse, more frequently used, and more widely used, decision-making, organizational, communication, innovation, and employee performance are all significantly improved.

Causality cannot be fully confirmed by correlation analysis alone. Despite the strong correlation, this does not mean that the application of AI technology directly leads to leadership. There may also be some unconsidered confounding variables, such as the experience of leadership and the culture of the organization, which can also affect all aspects of leadership. Therefore, future studies should include further exploration of these confounding variables that might alter the correlation between the implementation of AI

technology and the advancement of leadership skills.

This study revealed that, although the correlation between AI technology and leadership development is very strong, caution still needs to be exercised in practical application. The introduction and application of AI technology requires a lot of investment and training, and companies also need to be well prepared to adapt to the changes brought about by AI technology. Moreover, to truly realize the potential of AI technology, more empirical research needs to be explored on how AI technology can be more effectively integrated into the leadership development of the organization.

In general, this study reveals the close relationship between AI technology application and leadership development through in-depth correlation analysis, and preliminarily verifies the research hypothesis. This provides a solid foundation for the subsequent causality analysis and in-depth research, which is important for both theory and practice.

4.3 Results of model construction with multiple linear regression analysis

The multiple linear regression model can be expressed in the following ways:

$$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3*X3 + \varepsilon \qquad (4.1.)$$

here:

Y represents the dependent variable, namely all aspects of leadership (decision-making, organizational, communication, innovation and employee performance).

β 0 is the intercept term of the model.

β 1, β 2, and β 3 are the coefficients for X1, X2, and X3, respectively, indicating the effect of these variables on Y.

X1, X2, and X3 are number of AI tools, frequency of use, and the number of application areas of AI tools, respectively, which are the independent variables of this thesis.

ε Is the error term of the model.

For this study, we will use sample data to estimate the coefficients in this model and test whether these estimated coefficients are significant. This study employs the t-test and P-value tests to analyze each coefficient and see whether any variable has a significant influence on their respective dependent variable. If their P-value falls under 0.05, this variable generally is considered significant by this research study.

Analysis of this model allows this research to gain a clearer understanding of whether AI technology has an overall positive or negative effect on all aspects of leadership and can use this model to predict how all aspects will change when its usage increases or decreases.

In the multiple linear regression analysis of model construction, this study analyzes the five dependent variables of decision-making ability, organizational ability, communication ability, innovation ability and employee performance. The independent variable in this study is the application degree of AI technology, including the number of AI tools (X1), the frequency of use (X2), and the number of application areas (X3). In this study, the sample size was 22.

Perform linear regression analysis on the model with "number of AI tools", "frequency of use", and "number of application areas" as independent variables and "decision-making ability" as the dependent variable, Obtain the following results:

Table 4.3- Results of the multiple linear regression analysis for decision-making ability

N=22	**Non-standardized coefficients**		**Standardization coefficient**	**t**	**p**	**Collinearity diagnostics**	
	B	Standard error	Beta			VIF	Tolerance
Constant	3.145	0.235	-	13.356	0.000**	-	-
number of AI tools	0.330	0.334	0.269	0.988	0.336	26.236	0.038
Frequency of use	0.279	0.084	0.699	3.328	0.004**	15.651	0.064
number of application fields	0.020	0.311	0.014	0.064	0.950	16.478	0.061
R^2	0.949						
Adjust R^2	0.941						

Dependent variable: decision-making ability

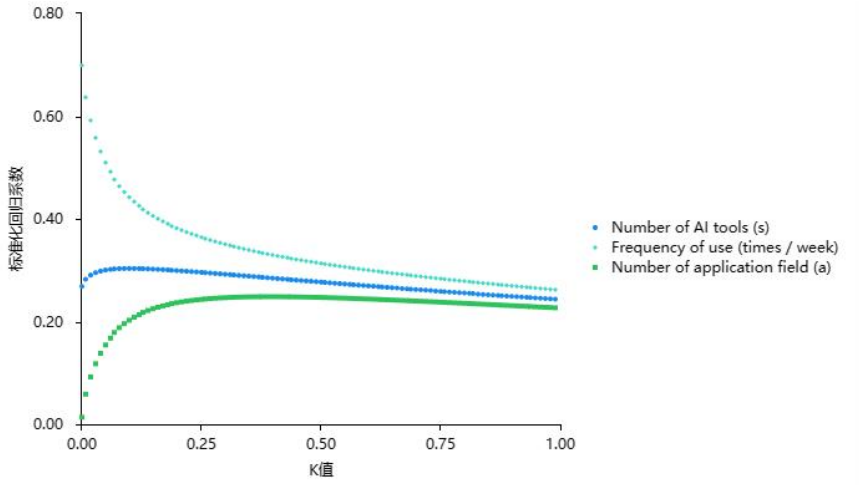
*** p<0.05 ** p<0.01**

From the table above, upon conducting an analysis for multicollinearity on the model, it was found that the Variance Inflation Factor (VIF) values exceed 10 for all variables, indicating the presence of multicollinearity issues.

To address the emergence of multicollinearity, this study explores two potential solutions: stepwise regression analysis and ridge regression analysis. However, due to the tendency of stepwise regression to directly remove collinear independent variables, this may exclude variables that are crucial to our research objectives. Therefore, we choose to use ridge regression analysis as the main method to solve multicollinearity. Ridge regression introduces k units in the regression model, although there is a certain degree of information loss, it is beneficial for reasonable estimation. Therefore, it is important to carefully consider the optimal value of the ridge regression parameter k. We will determine the most suitable k-value that tends towards zero by analyzing the ridge plot, to make the ridge regression analysis as close as possible to ordinary linear regression.

The ridge plot resulting from the Ridge regression analysis reveals that the optimal K value is 0.02, as observed in the graph below. This K value will be utilized to conduct ridge regression analysis on the dependent variable "Decision-making ability".

Figure4.2- *Decision-making ability Ridge plot*



From the table below, it can be observed that the model's R-squared value is 0.948, indicating that "Number of AI tools," "Frequency of use," and "Number of application fields" collectively explain 94.8% of the variance in "Decision-making ability." The regression coefficient value for "Number of AI tools" is 0.357 (t=1.882, p=0.076>0.05), suggesting that "Number of AI tools" does not have a significant impact on "Decision-making ability." The regression coefficient value for "Frequency of use" is 0.237 (t=4.148, p=0.001<0.01), indicating a significant positive relationship between "Frequency of use" and "Decision-making ability." The regression coefficient value for "Number of application fields" is 0.133 (t=0.642, p=0.529>0.05), suggesting that "Number of application fields" does not have a significant impact on "Decision-making ability".

Table 4.4- Results of the ridge regression analysis for decision-making ability

N=22	**Non-standardized coefficients**		**Standardization coefficient**	*t*	*p*	VIF
	B	Standard error	Beta			
Constant	3.193	0.215	-	14.865	0.000**	-
Number of AI tools	0.357	0.190	0.290	1.882	0.076	8.288
Frequency of use	0.237	0.057	0.592	4.148	0.001**	7.084
Number of application fields	0.133	0.207	0.092	0.642	0.529	7.178
R^2			0.948			
Adjust R^2			0.940			

Dependent variable: Decision-making ability

* $p<0.05$ ** $p<0.01$

Perform linear regression analysis on the model with "number of AI tools", "frequency of use", and "number of application areas" as independent variables and "organizational capacity" as the dependent variable, Obtain the following results:

Table 4.5- Results of the multiple linear regression analysis of organizational capacity

N=22	Non-standardized coefficients		Standardization coefficient	t	p	collinearity diagnostics	
	B	Standard error	Beta			VIF	tolerance
Constant	3.351	0.185	-	18.155	0.000**	-	-
number of AI tools	0.686	0.262	0.709	2.621	0.017*	26.236	0.038
Frequency of use	0.022	0.066	0.069	0.330	0.746	15.651	0.064
number of application fields	0.231	0.244	0.203	0.948	0.356	16.478	0.061
R^2	0.950						
Adjust R^2	0.941						

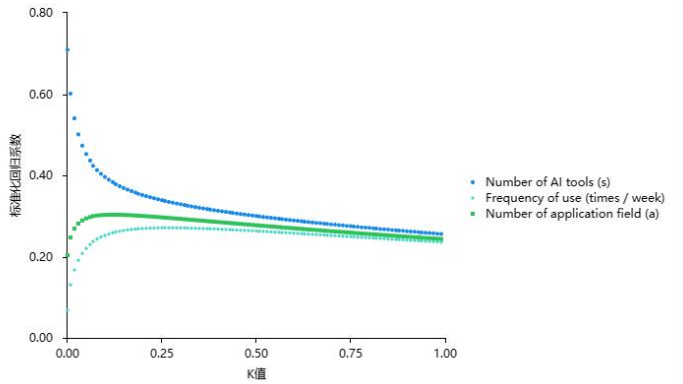
Dependent variable: decision-making ability

*** p<0.05 ** p<0.01**

As shown in the table above, upon conducting tests for multicollinearity on the model, it was found that the Variance Inflation Factor (VIF) values exceed 10 for all variables, indicating the presence of multicollinearity issues. Ridge regression analysis will be employed to address the multicollinearity problem.

The ridge plot resulting from the Ridge regression analysis reveals that the optimal K value is 0.02, as observed in the graph below. This K value will be utilized to conduct ridge regression analysis on the dependent variable "Organizational capabilities".

Figure4.3- Organizational capabilities Ridge plot



From the table below, it can be seen that the model's R-squared value is 0.949, indicating that "Number of AI tools," "Frequency of use," and "Number of application fields" collectively explain 94.9% of the variance in "Organizational capacity". The regression coefficient value for "Number of AI tools" is 0.523 (t=3.512, p=0.002<0.01), suggesting a significant positive relationship with "Organizational capacity." The regression coefficient value for "Frequency of use" is 0.053 (t=1.174, p=0.256>0.05), indicating no significant impact on "Organizational capacity." The regression coefficient value for "Number of application fields" is 0.306 (t=1.878, p=0.077>0.05), suggesting no significant impact on "Organizational capacity ".

Table 4.6- Results of the ridge regression analysis of organizational capacity

N=22	**Non-standardized coefficients**		**Standardization coefficient**	***t***	***p***	**VIF**
	B	Standard error	*Beta*			
Constant	3.415	0.169	-	20.259	0.000**	-
Number of AI tools	0.523	0.149	0.540	3.512	0.002**	8.288
Frequency of use	0.053	0.045	0.167	1.174	0.256	7.084
Number of application fields	0.306	0.163	0.269	1.878	0.077	7.178
R^2			0.949			
Adjust R^2			0.940			

Dependent variable: Organizational capacity

* p<0.05 ** p<0.01

Perform linear regression analysis on the model with "number of AI tools", "frequency of use", and "number of application areas" as independent variables and "communication skills" as the dependent variable, Obtain the following results:

Table 4.7- Results of the multiple linear regression analysis for communication skills

N=22	Non-standardized coefficients		Standardization coefficient	t	p	Collinearity diagnostics	
	B	standard error	Beta			VIF	tolerance
Constant	3.470	0.350	-	9.906	0.000**	-	-
number of AI tools	0.821	0.497	0.816	1.651	0.116	26.236	0.038
Frequency of use	0.112	0.125	0.343	0.898	0.381	15.651	0.064
number of application fields	-0.294	0.463	-0.249	-0.634	0.534	16.478	0.061
R 2	0.832						
Adjust R 2	0.804						

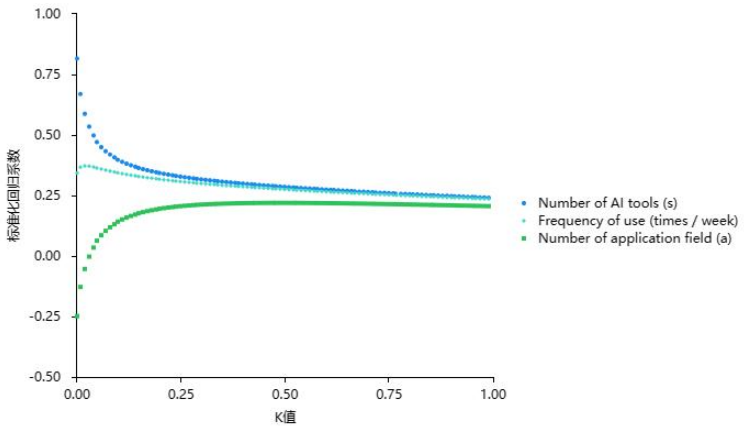
Depactor variable: Communication ability

*** p<0.05 ** p<0.01**

As shown in the table above, during the multicollinearity testing of the communication skills model, it was found that the variance inflation factor (VIF) values for all variables exceeded 10, indicating the presence of multicollinearity issues. Ridge regression analysis will be employed to address the multicollinearity problem.

The ridge plot resulting from the Ridge regression analysis reveals that the optimal K value is 0.02, as observed in the graph below.

Figure4.4- Communication skills Ridge plot



After conducting ridge regression analysis, from the table below, it can be observed that the model's R-squared value is 0.830, indicating that "Number of AI tools," "Frequency of use," and "Number of application fields" collectively explain 83% of the variance in "Communication skills." The regression coefficient value for "Number of AI tools" is 0.591 (t=2.098, p=0.050>0.05), suggesting that "Number of AI tools" does not have a significant impact on "Communication skills" The regression coefficient value for "Frequency of use" is 0.122 (t=1.437, p=0.168>0.05), indicating that "Frequency of use" does not have a significant impact on "Communication skills." The regression coefficient value for "Number of application fields" is -0.063 (t=-0.205, p=0.839>0.05), suggesting that "Number of application fields" does not have a significant impact on "Communication skills".

Table 4.8- Results of the ridge regression analysis of Communication skills

N=22	**Non-standardized coefficients**		**Standardization coefficient**	***t***	***p***	**VIF**
	B	standard error	*Beta*			
Constant	3.585	0.319	-	11.242	0.000**	-
Number of AI tools	0.591	0.282	0.587	2.098	0.050	8.288
Frequency of use	0.122	0.085	0.372	1.437	0.168	7.084
Number of application fields	-0.063	0.308	-0.054	-0.205	0.839	7.178
R^2			0.830			
Adjust R^2			0.801			

Depactor variable: Communication skills

* $p<0.05$ ** $p<0.01$

Linear regression analysis was conducted on the model with "number of artificial intelligence tools", "frequency of use", and "number of application areas" as independent variables and "innovation capacity" as dependent variable. The analysis results are shown in the table below. It was found that the variance inflation factor (VIF) values of all variables in the model exceeded 10, indicating the existence of multicollinearity problems. Ridge regression analysis will be used to solve the multicollinearity problem.

Table 4.9- Results of multiple linear regression analysis of innovation capacity

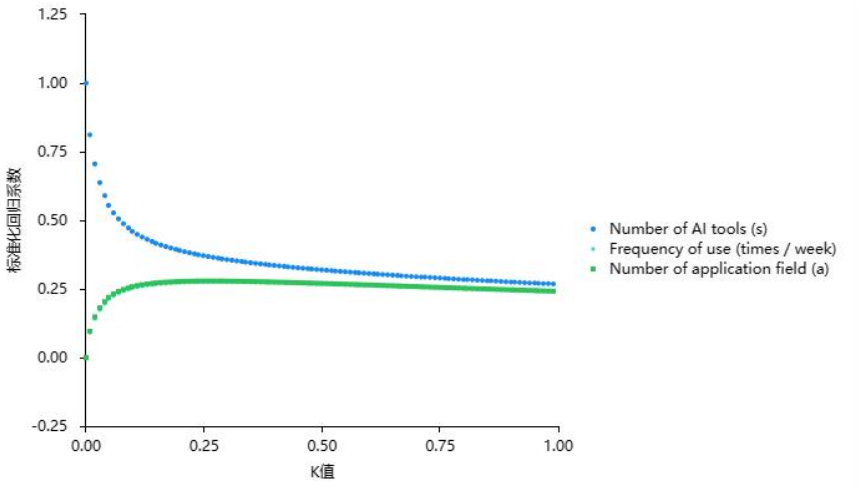
N=22	Non-standardized coefficients		Standardization coefficient	t	p	Collinearity diagnostics	
	B	Standard error	Beta			VIF	tolerance
constant	3.000	0.000	-	79672329600323.813	0.000**	-	-
number of AI tools	1.000	0.000	1.000	18718815577385.664	0.000**	26.236	0.038
Frequency of use	-0.000	0.000	-0.000	-0.661	0.517	15.651	0.064
number of application fields	0.000	0.000	0.000	0.571	0.575	16.478	0.061
R^2	1.000						
Adjust R^2	1.000						

Dependent variable: Innovation ability

*** p<0.05 ** p<0.01**

The ridge plot resulting from the Ridge regression analysis reveals that the optimal K value is 0.02, as observed in the graph below. This K value will be utilized to conduct ridge regression analysis on the dependent variable "Innovation capability".

Figure4.5- Innovation capability Ridge plot



From the table below, it can be observed that the model's R-squared value is 0.997,

indicating that "Number of AI tools," "Frequency of use," and "Number of application fields" collectively explain 99.7% of the variance in "Communication skills." The regression coefficient value for "Number of AI tools" is 0.705 (t=18.057, p=0.000<0.01), indicating a significant positive relationship with "Innovation capability." The regression coefficient value for "Frequency of use" is 0.046 (t=3.918, p=0.001<0.01), suggesting a significant positive relationship with "Innovation capability." The regression coefficient value for "Number of application fields" is 0.174 (t=4.079, p=0.001<0.01), indicating a significant positive relationship with "Innovation capability ".

Table 4.10- Results of the ridge regression analysis of Innovation capability

N=22	**Non-standardized coefficients**		**Standardization coefficient**	***t***	***p***	**VIF**
	B	standard error	*Beta*			
Constant	3.113	0.044	-	70.353	0.000**	-
Number of AI tools	0.705	0.039	0.705	18.057	0.000**	8.288
Frequency of use	0.046	0.012	0.142	3.918	0.001**	7.084
Number of application fields	0.174	0.043	0.148	4.079	0.001**	7.178
R^2			0.997			
Adjust R^2			0.996			

Depactor variable: Communication skills

* $p<0.05$ ** $p<0.01$

Linear regression analysis was conducted on the model with "number of artificial intelligence tools", "frequency of use", and "number of application areas" as independent variables and "employee performance" as dependent variable. The analysis results are shown in the table below. It was found that the variance inflation factor (VIF) values of all variables in the model exceeded 10, indicating the existence of multicollinearity problems. Ridge regression analysis will be used to solve the multicollinearity problem.

Table 4.11- Results of the multiple linear regression analysis of employee performance

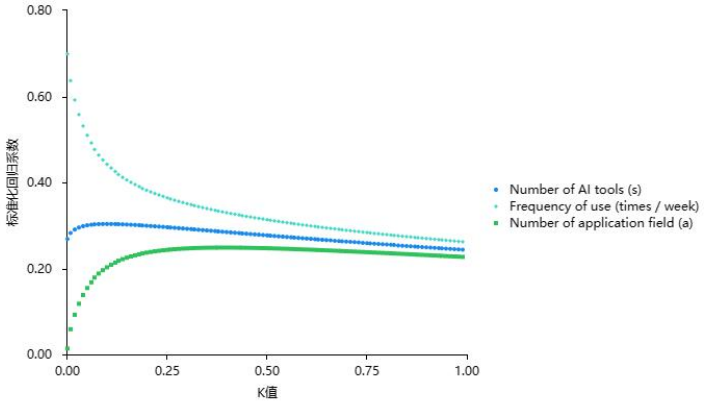
N=22	Non-standardized coefficients		Standardization coefficient	t	p	collinearity diagnostics	
	B	standard error	Beta			VIF	Tolerance
Constant	3.145	0.235	-	13.356	0.000**	-	-
number of AI tools	0.330	0.334	0.269	0.988	0.336	26.236	0.038
Frequency of use	0.279	0.084	0.699	3.328	0.004**	15.651	0.064
number of application fields	0.020	0.311	0.014	0.064	0.950	16.478	0.061
R^2	0.949						
Adjust R^2	0.941						

Factor variable: Employee performance

*** p<0.05 ** p<0.01**

The ridge plot resulting from the Ridge regression analysis reveals that the optimal K value is 0.02, as observed in the graph below. This K value will be utilized to conduct ridge regression analysis on the dependent variable "Employee performance".

Figure4.6- Employee performance Ridge plot



From the table below, it can be seen that the model's R-squared value is 0.948, indicating that "Number of AI tools," "Frequency of use," and "Number of application fields" collectively explain 94.8% of the variance in "Communication skills." The regression coefficient value for "Number of AI tools" is 0.357 (t=1.882, p=0.076>0.05), suggesting that it does not have a significant impact on "Employee Performance." The regression coefficient

value for "Frequency of use" is 0.237 (t=4.148, p=0.001<0.01), indicating a significant positive relationship with "Employee Performance." The regression coefficient value for "Number of application fields" is 0.133 (t=0.642, p=0.529>0.05), suggesting it does not have a significant impact on "Employee Performance".

Table 4.12- Results of the ridge regression analysis of Employee Performance

N=22	**Non-standardized coefficients**		**Standardization coefficient**	***t***	***p***	**VIF**
	B	standard error	*Beta*			
Constant	3.193	0.215	-	14.865	0.000**	-
Number of AI tools	0.357	0.190	0.290	1.882	0.076	8.288
Frequency of use	0.237	0.057	0.592	4.148	0.001**	7.084
Number of application fields	0.133	0.207	0.092	0.642	0.529	7.178
R^2			0.948			
Adjust R^2			0.940			

Factor variable: Employee performance

* $p<0.05$ ** $p<0.01$

Through these models, we can see the extent to which AI technology can impact leadership on all levels, especially in organizational ability and innovation ability. In terms of communication skills, no significant effects were observed that may indicate that the application of artificial intelligence technology requires more research and research in certain aspects.

According to research, usage frequency correlates positively with employee performance, decision-making ability and innovation, suggesting that the frequency of use of artificial intelligence is an important factor influencing leadership.

Overall, our research model provides insights that help to understand the impact of artificial intelligence on various aspects of leadership development. They showed that while artificial intelligence has great potential and value, the search for more effective ways to use it is still an important topic that requires further research.

4.4 Proposed Findings and Discussion

In this section, we will analyze and explore our proposed research findings and compare them with similar studies in literature. The proposed study explored the intrinsic connections between these variables through data analysis.

According to the analysis results, the relationship between the number of types and application fields of artificial intelligence tools and decision-making ability is not significant, but the frequency of use is significantly positively correlated with decision-making ability ($p=0.001$). This may mean that simply introducing different artificial intelligence tools does not directly improve an individual's decision-making ability, but frequent practical use of these tools may help improve decision-making ability. Therefore, we suggest that businesses and individuals should emphasize the practical application of technology, rather than just the quantity and scope of tools used.

We observed a significant positive correlation between AI tool type and organizational capacity ($p=0.002$), while the relationship between the frequency of use and application field and organizational capacity was not significant. Thus, we propose that adopting multiple types of AI tools may help to improve organizational capacity. AI tools may play a pivotal role in providing various types of support, opening more possibilities and flexibility in organizational management.

Data analysis suggests there was no meaningful relationship between the number of AI tools, frequency of use and number of application fields with communication ability. This may indicate that even though AI technology can aid productivity improvements in certain ways, interpersonal communication skills largely rely on individual social experience rather than on technological solutions.

The number of AI tools ($p=0.000$), frequency of use ($p=0.001$), and number of application fields ($p=0.001$) are significantly positively correlated with innovation ability, indicating that

artificial intelligence can play an extremely beneficial role in helping innovation ability. Frequent use of multiple tools may lead to more diverse solutions, stimulating thinking and creativity, and ultimately resulting in improvement.

According to this analysis, frequency of use demonstrated a strong positive correlation with employee performance (p=0.001), suggesting more frequent usage may have more of an immediate impact than types and applications areas for AI tools in terms of employee work productivity. This finding highlights practical applications' importance, suggesting employees be encouraged to use AI tools more regularly for optimal work performance.

An investigation of the relationship between AI technology and individual ability and performance has unearthed various practical associations. The diverse application of AI tools can not only promote significant improvements in organizational and innovation capabilities, but also directly drive the growth of employee performance through their high-frequency applications. This series of discoveries provides guiding practical concepts for enterprises in practical application, so that enterprises can more clearly understand that the introduction and implementation of AI technology needs reasonable design and deployment, in to better serve the development goals of enterprises.

Based on all the research results above, it can be seen that the hypothesis previously proposed is H1: the application degree of AI technology is positively correlated with the decision making ability of leaders; H2 assumes that the application level of artificial intelligence technology is positively correlated with the organizational ability of leaders; H3: The application degree of AI technology is positively correlated with leadership communication capability; H4: The amount of AI technology use is positively correlated with innovation ability of leaders; H5: States that the use of artificial intelligence technology is positively correlated with employee performance. The research results indicate a positive correlation between the level of artificial intelligence technology utilization and the five leadership abilities,verified hypotheses.

In particular, decision-making capabilities and organizational capabilities are the two

areas most significantly affected by the application of AI technology. Specifically, with the improvement of the application degree of AI technology, the decision-making ability and organizational ability of leaders have been significantly improved. This is consistent with literature results, again confirming the critical role of AI technology in improving decision-making and organizational efficiency.

The positive correlation between the application of artificial intelligence technology and communication ability has also been confirmed in the correlation analysis, but the correlation is relatively low. It should be noted that in more detailed regression analysis, there is no significant correlation between the variables in artificial intelligence technology and communication skills, which may be because communication skills still rely more on interpersonal interaction rather than technological application.

This investigation also suggests that AI technology exerts a substantial positive influence on both innovation capability and employee performance, which is similar to what was proposed by Nicolae *et al.* (2018) and are consistent with the findings of Wijayati *et al.* (2022).

Regarding the relationship between AI technology application and decision-making ability, considering Quaquebeke and Gerpott (2023) we may consider an alignment in proposed results, highlighting the role of AI technology in improving decision accuracy, efficiency and effectiveness. However, this study further points out that the diversity of AI technologies does not directly affect the improvement of decision-making ability, but that the frequency of their use is the key factor. This finding provides a new perspective on the practical application of leadership training and AI tools.

In terms of the relationship between AI technology application and organizational ability, this study differs from the studies of Hunt *et al.* (2022). Although the indicated reference study also demonstrated a positive impact of AI technology on organizational structure and workflow, the present conducted research further proposes that multiple types of AI tools are particularly important to improve organizational capacity. This variable is rarely mentioned in existing research, which provides new ideas for the application of AI technology for

leadership development.

Regarding the relationship of application of AI technology and communication ability, and comparing the results of the conducted research with the research presented by Smith and Green (2018), although the authors highlighted the role of AI technology in improving information clarity and communication timeliness, no significant association between types of AI technology, frequency of use and number of application fields of AI technology and communication skills was proposed. This suggests that interpersonal communication and experience may be more critical than technology application in improving communication skills.

As for the relationship between AI technology application and innovation ability, and considering the research presented by Nicolae *et al.* (2018), the results are aligned, proposing that AI technology contributes to the improvement of innovation ability.

Concerning the correlation between the implementation of AI technology and the performance of employees, the proposed findings are aligned to those of Wijayati *et al.* (2022), indicating that the application of AI technology enables to improve the work efficiency and effectiveness of employees. However, this study further emphasized the direct impact of use frequency on employee performance and also presents specific implementation suggestions.

In conclusion, based on regression analysis, the conducted research not only verifies the important role of AI technology in leadership development, but also proposes specific application of AI technology in the cultivation of different leadership skills. These findings not only enrich the existing theoretical framework, but also provide valuable references for future research and practice. In this way, this research aims to provide a more detailed and comprehensive understanding of leadership development and organizational management, while providing empirical support for the effectiveness of AI technology in practical applications.

Future studies could further explore the impact of the specific types and application domain of AI tools on individual ability and performance, and also look at different

organizational types and industries, as well as different cultural backgrounds, to explore the heterogeneity in the correlation between AI technology applications and individual ability and performance. Considering more control variables, such as individual learning ability and adaptability, would also enable researchers to explore how these factors affect the utilization of AI technology in various applications and individual ability and performance.

5. Conclusions and Recommendations

Through in-depth and comprehensive research and analysis, this study investigates the correlation between the extent of AI technology application and multiple aspects of leadership. The conducted research proposes a positive correlation between the application degree of AI technology and leadership decision-making ability, organizational ability, communication ability, innovation ability and employee performance. Among these variables, we propose AI technology has a particularly significant impact on decision-making ability, organizational ability and Innovation capability, which also confirms the previous research, and confirms that AI technology plays an irreplaceable role in improving decision-making accuracy, organizational rationality, and drive enterprise innovation. The conducted research also proposes a positive correlation of AI technology application with communication ability and employee Performance, although we consider that this proposed correlation requires further empirical research. The proposed contribution for practice and theory is that AI technology has a significant favorable potential to improve employee performance.

The theoretical contribution of the conducted study resides in enhancing the comprehension of the association between AI technology and leadership. Through empirical research methods, the presented study verifies the previous theoretical hypothesis, but also provides practical data support, and suggests the repercussions of integrating AI technology. The research results provide a proposed foundation for future research, and new perspectives for scholars in related fields. At the practical level, the conducted research proposes the specific application value of AI technology in organizations and provides a proposed direction and basis for enterprises to use AI technology to improve their leadership capacity. These findings could enable organizations to use AI technology more judiciously and efficiently in order to meet organizational goals more easily while improving organizational performance.

Based on our findings, we suggest that government should increase investments and support for research and development of AI technology while encouraging its application across diverse sectors.This measure can not only enhance a country's technological

knowledge and competitiveness, but also promote entrepreneurship and innovation, thereby promoting economic expansion. It is also recommended to strengthen artificial intelligence education and training in order to expand the understanding and mastery of artificial intelligence in the public. Society can benefit from promoting a workforce that is competent in artificial intelligence and thus advocates for the accelerated adoption of artificial intelligence. This can enable society to address its unique technological challenges while promoting its sustainable development and use. Government agencies and relevant departments can develop responsible and secure policies and regulations to promote the implementation of artificial intelligence.

Although this study has drawn valuable conclusions, there are also certain limitations. For example, a small sample size and types of artificial intelligence variables may limit the applicability of research results. Future research will expand sample size and diversity to obtain more in-depth research results. In addition, this study concentrates on examining the correlation between artificial intelligence and leadership. We suggest that future research can explore the interaction between artificial intelligence and factors such as culture and organizational structure, which will improve our understanding of the practical application of artificial intelligence. Further studies may also delve into AI's impact on various leadership types and levels, unraveling its connection with leadership diversity.

However, through regression analysis, this study not only validated the important role of artificial intelligence technology in leadership development, but also proposed specific applications of artificial intelligence in cultivating different leadership skills. We can propose that all hypotheses have been validated, and the research results indicate a significant positive correlation between the implementation level of artificial intelligence technology and the five abilities or performance indicators, especially in the two areas where decision-making ability and organizational ability are most significantly affected by the implementation of artificial intelligence technology. Specifically, with the increasing application of artificial intelligence technology, the decision-making and organizational abilities of leaders have significantly

improved. This is consistent with the literature results, once again confirming the crucial role of artificial intelligence technology in improving decision-making and organizational efficiency. At the same time, we also found that the comprehensive use of artificial intelligence has a positive impact on innovation ability, which further confirms the results of the literature. It should be noted that although the application of artificial intelligence technology has shown significant advantages in certain aspects, several specific variables in artificial intelligence technology did not show a significant positive correlation with communication ability in regression analysis. This finding suggests that interpersonal communication, as a core competency, depends more on an individual's social skills and accumulated experience. Therefore, in the widespread application of artificial intelligence technology, this study suggests considering the development and improvement of human abilities, in order to achieve harmonious coexistence between technology and humans.

The presented findings suggest that, despite the great potential and value of AI technologies, how to use these technologies more effectively in practice is still an important issue that needs to be deeply studied and explored.

References

[1]Anghel, D. (2023). New Perspectives for Human and Artificial Intelligence Interactions for Leadership e-Recruitment. *Societies, 13*(3), 55. https://doi.org/10.3390/soc13030055

[2]Attention C-Suite: New GE Study Finds Divergent Views on Leadership Development. (2023, September). *Businesswire*. Retrieved 2024, from https://www.businesswire.com/news/home/20230905776823/en/Attention-C-Suite-New-GE-Study-Finds-Divergent-Views-on-Leadership-Development

[3]Ayers, D. F. (2022). Community College Leadership Discourses in Dissertation Abstracts, 1980 to 2020. *Community College Journal of Research and Practice, 47*(9), 565–581. https://doi.org/10.1080/10668926.2022.2050841

[4]British Embassy Bangkok. (2023, August). *The British Embassy held 'UK AI Week in Bangkok' showcasing the UK leadership and unlocking the potential of AI in Thailand.* GOV.UK. Retrieved 2024, from https://www.gov.uk/government/news/the-british-embassy-held-uk-ai-week-in-bangkok-showcasing-the-uk-leadership-and-unlocking-the-potential-of-ai-in-thailand

[5]Bidgely Utility Artificial Intelligence Leadership Recognized by Navigant Research. (2019, August). *Businesswire*. Retrieved 2024, from https://www.businesswire.com/news/home/20190820005244/en/Bidgely-Utility-Artificial-Intelligence-Leadership-Recognized-by-Navigant-Research

[6]Brame, J. L. (2023). Trends in dental hygiene academic leadership development: Influencers, barriers, and enabling mechanisms. *International Journal of Dental Hygiene, 21*(4), 710–718. https://doi.org/10.1111/idh.12737

[7]DeSimone, J. R., & Roberts, L. A. (2023). Nonprofit leadership dispositions. *SN Business & Economics, 3*(2). https://doi.org/10.1007/s43546-023-00420-9

[8]Eddy, E., Gubbins, P. O., & Cillessen, L. (2023). Future leaders in pharmacy (FLIP): Student perceptions of leadership development within pharmacy school. *Currents in Pharmacy Teaching and Learning, 15*(11), 943–949. https://doi.org/10.1016/j.cptl.2023.09.003

[9]Galinat, B. J., & Navarro, R. A. (2023). *Instructional Course Lectures: Volume 72.* Lippincott Williams & Wilkins. http://books.google.ie/books?id=-AqmEAAAQBAJ&pg=PP72&dq=Sutton+Karen,+Mulcahey+Mary+K,+Provencher+Capt+Matthew+T,+Bedi+Asheesh,+%26+Retzky+Julia.+(2023).+Leadership+in+Orthopaedi

c+Surgery:+Creating+a+Highly+Effective+Leader.+Instructional+course+lectures.&hl=&cd=1&source=gbs_api

[10]GE Study Finds Divergent Views on Leadership Development. (2023). *Manufacturing Close - Up*.

[11]Gilmartin, M. J. (2023). Nurses Improving Care for Health Systems Elders (NICHE): An evidence-based professional practice model for an aging nation. *Geriatric Nursing, 53*, 310 – 312. https://doi.org/10.1016/j.gerinurse.2023.08.002

[12]Gupta, S., Keim, J., Kennedy, G., Opland, B., Sigterman, Y., & Wingate, B. (2023). A Systems View of Career Development for Systems Engineering Leadership. *INCOSE International Symposium, 33*(1), 1468 – 1494. https://doi.org/10.1002/iis2.13093

[13]Gutu, I., Agheorghiesei, D. T., & Tugui, A. (2023). Assessment of a Workforce Sustainability Tool through Leadership and Digitalization. International Journal of Environmental Research and Public Health/*International Journal of Environmental Research and Public Health, 20*(2), 1360. https://doi.org/10.3390/ijerph20021360

[14]Hannah Quinlivan. (2017). SYSTRAN Strengthen global leadership in the field of automatic translation through AI. *Computer and Networks (04)*, 79.

[15]Harrison, C. (2024b). *Leadership During a Crisis.* Taylor & Francis. http://books.google.ie/books?id=xwXsEAAAQBAJ&printsec=frontcover&dq=Christian+Harrison.+(2024).+Leadership+during+a+crisis:+A+focus+on+leadership+development.+ROUTLEDGE.&hl=&cd=1&source=gbs_api

[16]Harrington, A. (2022). Quantum leadership: a new approach for nurse leaders. *Nursing Management, 30*(4), 25 – 31. https://doi.org/10.7748/nm.2022.e2059

[17]Härtel, T. M., Leckelt, M., Grosz, M. P., Küfner, A. C. P., Geukes, K., & Back, M. D. (2021). Pathways From Narcissism to Leadership Emergence in Social Groups. *European Journal of Personality, 37*(1), 72 – 94. https://doi.org/10.1177/08902070211046266

[18]Henry, E., Chandler, C., Laux, J., Noble, C. C., Corbie, G., Fernandez, C. S. P., & Dave, G. (2023). Evaluating Leadership Development Competencies of Clinicians to Build Health Equity in America. *the Journal of Continuing Education in the Health Professions/Journal of Continuing Education in the Health Professions.* https://doi.org/10.1097/ceh.0000000000000526

[19]Hunt, W., Sarkar, S., & Warhurst, C. (2022). Measuring the impact of AI on jobs at the organization level: Lessons from a survey of UK business leaders. *Research Policy, 51*(2), 104425. https://doi.org/10.1016/j.respol.2021.104425

[20]Jones, W. A. (2018). Artificial Intelligence And Leadership: A Few Thoughts, A Few Questions. *Journal of Leadership Studies, 12*(3), 60–62. https://doi.org/10.1002/jls.21597

[21]Kezar, A. (2023). Provocation 6: Higher Education Needs to Invest in and Transform Leadership Development to Foster a Healthy Enterprise. *Change/Change (Washington, D.C. Online), 55*(5), 2–4. https://doi.org/10.1080/00091383.2023.2235240

[22]L7 Defence. (2020, September). *L7 Defense Awarded the 2020 Global Product Leadership Award for Its Fully Autonomous AI-based API Security Solution.* PRnewswire. Retrieved 2024, from https://www.prnewswire.com/il/news-releases/l7-defense-awarded-the-2020-global-product-leadership-award-for-its-fully-autonomous-ai-based-api-security-solution-301141948.html

[23]Lawrason, S. V., Shaw, R. B., Turnnidge, J., & Côté, J. (2023). Characteristics of transformational leadership development programs: A scoping review. *Evaluation and Program Planning, 101*, 102354. https://doi.org/10.1016/j.evalprogplan.2023.102354

[24]Liu Bingli. (2022). *Dean of the University Information Leadership Research* (dissertation). Retrieved from https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CDFDLAST2023&filename=1022031976.nh.

[25]Liu Wenchuan, Tang Jian, & Wu Chao. (2019). AI and Leadership: a research on the government decision-making mechanism supported by complex big data. *Reform and Opening-up (11)*. https://doi.org/doi:10.16653/j.cnki.32-1034/f.2019.011.013

[26]Low, J. (2021). ‘Singapore-West’ hybridization: policy learning in the development of leadership training in the Singapore Public Service. *Journal of Asian Public Policy, 16*(3), 426–441. https://doi.org/10.1080/17516234.2021.2021126

[27]Lutz, R., Jungbäck, N., Wischlitzki, E., & Drexler, H. (2023). Health-oriented leadership, gender-differences and job satisfaction: results from a representative population-based study in Germany. *BMC Public Health, 23*(1). https://doi.org/10.1186/s12889-023-15014-1

[28]Lyubykh, Z., Turner, N., Hershcovis, M. S., & Deng, C. (2022). A meta-analysis of leadership and workplace safety: Examining relative importance, contextual contingencies, and methodological moderators. *Journal of Applied Psychology, 107*(12), 2149–2175. https://doi.org/10.1037/apl0000557

[29]Majumdar, A., Shetty, K., & Subramaniam, K. (2020). 75 Demonstrating leadership in health care: utilising artificial intelligence to improve NCD outcomes. *Abstracts.* https://doi.org/10.1136/leader-2020-fmlm.75

[30]Nauris, S. (2022). *A Leader Doesn’t Have to Be a Boss-How to Earn Respect and Lead a Team*. Independently Published.

[31]Nicolae, M., & Nicolae, E. E. (2018). Leadership in Higher Education – coping with AI and the turbulence of our times. *Proceedings of the . . . International Conference on Business Excellence, 12*(1), 683 – 694. https://doi.org/10.2478/picbe-2018-0061

[32]National Science Foundation. (2023). Notice of Workshop on U.S. Leadership in Software Engineering & Artificial Intelligence Engineering: Critical Needs & Priorities. In The Federal Register.

[33]Olinover, M., Gidron, M., Yarmolovsky, J., Lipschits, O., & Geva, R. (2022). Predicting Leadership Success in Extreme Organizations: A Prospective Study From Pre-Recruitment Through Leading in Real-Life. *Journal of Leadership & Organizational Studies, 30*(1), 71 – 89. https://doi.org/10.1177/15480518221117886

[34]Our school holds the 2021 cambridge AI academic leadership seminar. (2021). *Journal of Jimei University (Education Science Edition) (02)*, p. 80.

[35]Peifer, Y., Jeske, T., & Hille, S. (2022). AI and its impact on leaders and leadership. *Procedia Computer Science*, *20*0,1024–1030. https://doi.org/10.1016/j.procs.2022.01.301

[36]Pritchett, E. N., Cordoro, K. M., Ayers, L. A., & Sokumbi, O. (2023). Commitment to leadership development for underrepresented in medicine (URM) dermatologists. *Journal of the American Academy of Dermatology,90*(2), 346–348. https://doi.org/10.1016/j.jaad.2023.10.002

[37]*Qlik Expands Analytics and Business Intelligence Leadership in AI and Machine Learning.* (2018, May). Qlik. Retrieved 2024, from https://www.qlik.com/us/company/press-room/press-releases/1205-qlik-expands-analytics-and-business-intelligence-leadership-in-ai-and-machine-learning

[38]Quaquebeke, N.V., & Gerpott, F. H. (2023). The Now, New, and Next of Digital Leadership: How Artificial Intelligence (AI) Will Take Over and Change Leadership as We Know It. *Journal of Leadership & Organizational Studies, 30*(3), 265 – 275. https://doi.org/10.1177/15480518231181731

[39]Ronald, S. (2020, October). *The Future of Leadership: Rise of Automation, Robotics, and Artificial Intelligence.* PRISM. Retrieved 2024, from

https://ndupress.ndu.edu/Media/News/News-Article-View/Article/2054294/the-future-of-leadership-rise-of-automation-robotics-and-artificial-intelligence/

[40]Ryan, C., & Guthier, C. (2023). The emergence of specialist disability leadership development—a case study of the disability leadership institute in Australia. *Consulting Psychology Journal, 75*(3), 297 - 314. https://doi.org/10.1037/cpb0000262

[41]Salemo, C., & Fitzpatrick, M. M. (2023). Nurse Leader Development Programs. *Nursing Management, 54*(9), 35 - 46. https://doi.org/10.1097/nmg.0000000000000050

[42]Sanders Ronald.(2019).*"book-review"The Future of Leadership: Rise of Automation, Robotics, and AI.*PRISM(3).

[43]Smith, A. M., & Green, M. (2018). Artificial Intelligence and the Role of Leadership. *Journal of Leadership Studies, 12*(3), 85 - 87. https://doi.org/10.1002/jls.21605

[44]Suwanmanee, S., Wannapairo, S., Chumruksa, C., Kasinant, C., Prasitpong, S., Sae-Tae, K., Benjasri, W., Yaodum, T., Di-Sawat, M., Klaithong, P., Kaeopheng, W., & Pisitphunphorn, J. (2023). Transformational Leadership Development for School Administrators Emphasizing Area Potential with Learners ' Science, Math and Technology Competencies in Education Sandbox, Thailand. *Cogent Social Sciences, 9*(1). https://doi.org/10.1080/23311886.2023.2179740

[45]Tan, N., Peters, E. K., & Reb, J. (2023). Effects of a Mindfulness-Based Leadership Training on Leadership Behaviors and Effectiveness. *Mindfulness, 14*(9), 2181 - 2194. https://doi.org/10.1007/s12671-023-02209-1

[46]Tang, O. Y., Ali, R., Connolly, I. D., Fridley, J. S., Sullivan, P. L. Z., Cielo, D., Oyelese, A. A., Doberstein, C. E., Telfeian, A. E., Gokaslan, Z. L., Shin, J. H., & Asaad, W. F. (2023). Letter: The Urgency of Neurosurgical Leadership in the Era of Artificial Intelligence. *Neurosurgery/Neurosurgery Online, 93*(3), e69 - e70. https://doi.org/10.1227/neu.0000000000002576

[47]*TIBCO Recognised as a Leader in 2020 Gartner Magic Quadrant for Data Science and Machine Learning Platforms; Company Believes its Recognition Validates its Leadership in AI and Augmented Analytics*. M2 Presswire. (2020).

[48]Volsko, T. A. (2023). Leadership Development and Respiratory Care. *Respiratory Care, 68*(10), 1477 - 1478. https://doi.org/10.4187/respcare.11338

[49]Wang Wei. (2019). *Research on the information-based leadership of primary and secondary school principals in the context of "education informatization 2.0" --take Southern Henan for example*. CNKI.

https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202001&filename=1019186372.nh

[50]Wijayati, D. T., Rahman, Z., Fahrullah, A., Rahman, M. F. W., Arifah, I. D. C., & Kautsar, A. (2022). A study of artificial intelligence on employee performance and work engagement: the moderating role of change leadership. *International Journal of Manpower, 43*(2), 486–512. https://doi.org/10.1108/ijm-07-2021-0423

[51]Williams, M. J., Wade, J. B., Nwadei, T., Swaminathan, A., Harrison, C. K., & Bukstein, S. (2022). Looking the Part: Stereotypicality in Appearance Among White Professionals Predicts Leadership Attainment and Perceived Leadership Suitability. *Personality & Social Psychology Bulletin,* 014616722211437. https://doi.org/10.1177/01461672221143756

[52]Wu Jingjing. (2018). *Teaching Leadership Research*. CNKI. https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD201901&filename=1018242318.nh

[53]Xiong Wenjing. (2022). AI and Leadership:New Changes of Leadership Under the Development of AI..(eds.). In *Proceedings of the 2022 7th International Conference on Modern Management and Education Technology (MMET 2022)(pp.)*. Atlantis Press.

[54]Yang Changyong. (2020). *Research on Government Leadership Improvement in Urban Traffic Management under the perspective of Big Data*. Retrieved from https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CDFDLAST2023&filename=1020961569.nh.

Annexes



Survey on the Relationship between AI Technology and Leadership

* 1. Your gender:

- ◯ male
- ◯ female
- ◯ other

* 2. your age:

- ◯ 25~30
- ◯ 31~40
- ◯ 41~50
- ◯ 51 and above

* 3. Education:

- ◯ Undergraduate
- ◯ master
- ◯ PhD
- ◯ other

* 4. Industry

* 5. Using artificial intelligence at work?

- ◯ Yes
- ◯ No

* 6. Number of artificial intelligence tools used

Please enter a specific number of 1-5 (such as machine learning, natural language processing, machine vision, deep learning, etc.)

* 7. Personal AI tool usage frequency

Weekly frequency, such as 10 times/week

* 8. Number of fields using artificial intelligence

Please enter a specific number of 1-5 (such as decision-making, communication, organizational management, innovation research and development, performance management, etc.)

* 9. Evaluation of one's own decision-making ability (1-10 points)

* 10. Evaluation of your own organizational management capabilities (1-10 points)

* 11. Evaluation of your own communication and collaboration skills (1-10 points)

* 12. Evaluation of one's own innovation and R&D capabilities (1-10 points)

* 13. Evaluation of your own performance management capabilities (1-10 points)

Interview Questions
1. Share a specific case where you utilized AI technology for decision-making:
2. In organizational management, how do you address challenges that may arise from using AI technology?
3. When promoting innovation and research & development, how do you integrate AI technology for better outcomes?
4. In day-to-day communication and collaboration, how do you use AI technology to enhance team cooperation?
5. What impact has AI technology had on your leadership style?
6. Regarding employee performance management, do you believe AI technology has brought about noticeable changes?
On-site Observation
1. Observe the leader's actual behaviors in utilizing artificial intelligence technology for organizational capacity.
2. Observe how the leader utilizes artificial intelligence technology to facilitate communication and collaboration in daily work.