3 Human-AI Collaboration Competency as a New Dimension of Employee Employability

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Abstract

The study intends to conceptualize Human-AI Collaboration Competency (HAICC) as a new competency model by transcending the existing framework of employability competencies and developing a theoretical framework explaining the relationship of HAICC with employee employability as well as organizational outcomes within an AI-based workplace setting. The present study follows a qualitative conceptual research approach through the systematic review and thematic analysis of scholarly literature pertaining to HRM, AI, Organizational Behavior, and employability literature. The theoretical framework for this study is based on theories such as Human Capital Theory, Socio-technical Systems Theory, Resource-Based View and Dynamic Capabilities Theory. The research identify that HAICC is a multi-facet construct consisting of knowledge of artificial intelligence (AI), Human-AI communication, critical thinking of the AI products, adaptive learning, ethical AI decision-making, and collaborative decision intelligence. These competencies seem complementary to the employability skills instead of being alternatives to the latter and necessary for the development of employee adaptability, constant learning, innovation, and organizational performance in the environment supported by AI. In order to illustrate the connection between HAICC, employability of employees, and organizational performance, the researcher develops the framework of HAICC Capability Development. The proposed framework provide insights for organizations, HR practitioners, institutions, and policymakers on how to design their AI-driven talent development, workforce re-skilling, and employability strategies so as to achieve effective human-AI collaboration. Also, this study suggests HAICC as a new employability competency and also develops a conceptual framework that will contribute to the existing literature on Human-AI collaboration.

Keywords: Human-AI Collaboration Competency, Employee Employability, Artificial Intelligence, Human Resource Management, Dynamic Capabilities, AI-Enabled Workplace.

Introduction

The field of Artificial Intelligence (AI) has emerged as an innovation that has been transforming organizational structures, processes and roles of employees in organizations through the adoption of advancements in fields like machine learning, natural language processing, generative AI and intelligent automation in order to improve efficiency, make better decisions, and innovate (Brynjolfsson & McAfee, 2014; Davenport & Ronanki, 2018). While earlier automation waves were mainly associated with replacing manual processes in routine activities, the current wave of technology is becoming more focused on enabling employees to perform their cognitive tasks with the help of automation. This means that employees need to collaborate with intelligent systems, making Human-AI interaction important in today's working environment (Jarrahi, 2018).

The employability of an employee has been traditionally explained as the ability of an individual to get, keep, and advance in his or her job by means of possessing such things as knowledge, skills, competencies, and adaptability (Fugate et al., 2004). The well-known models of employability point out the importance of occupational knowledge, communication, teamwork, problem solving, continuous learning, and career hardiness as key competencies necessary for successful career development (Van der Heijde & Van der Heijden, 2006). Employees need to cooperate with AI technologies, make sense of AI recommendations, check the output of algorithms and integrate machine thinking with human reasoning.

Recent literature distinguishes AI literacy from Human–AI Collaboration Competency (HAICC). According to the latest research, AI literacy is considered separately from the concept of Human-AI Collaboration Competency (HAICC). In turn, Human-AI Collaboration Competency implies much more than technological skills, including the ability to communicate with AI, assess information generated by AI, make decisions with AI support, use AI ethically, and be adaptive to technological changes (Long & Magerko, 2020; Yoo et al., 2023).

AI is great source of information, complicated patterns and giving predictive insights, but it is unable to fully imitate human creativity, emotions, context, ethics and strategy (Wilson & Daugherty, 2018). Consequently, more value can be generated when employees combine AI insights with uniquely human skills. It corresponds with the ideas of Human Capital Theory, which considers competencies of employees as strategic organizational resources (Becker, 1964), and the Socio-Technical Systems Theory, which highlights the interconnection between technology systems and human skills (Trist & Bamforth, 1951).

Problem Statement

Although the numerous studies of employability within Human Resource Management, current models predominantly pay attention to digital literacy,

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communication skills, flexibility and lifelong learning but neglect competencies that enable efficient cooperation with AI technologies. At the same time, research dedicated to Human-AI Collaboration concentrates on the use of AI, ethics, decision making and implementation aspects rather than the impact of Human–AI Collaboration on employee's employability. Also, currently there is no common theoretical framework in which the concept of Human-AI Collaboration Competency would be represented as one more aspect of employability including AI knowledge, task regulation, ethics, AI communication and continuous learning.

Research Objectives

- To conceptualize Human-AI Collaboration Competency (HAICC) as a new dimension of employee employability and identify its key components in AI-enabled Workplace.
- To develop a theoretical and conceptual framework explaining the relationship between Human-AI collaboration competency, employee employability and organizational performance by integrating relevant organizational and HRM Theories.
- To examine the practical implication of Human-AI collaboration competency for organization, higher education institutions and policymakers in preparing a future-ready workforce.

Research Questions

- What are the key dimensions of Human-AI Collaboration Competency (HAICC) and how can it be conceptualize as a new dimension of employee employability in AI-enabled Workplace?
- How does Human-AI collaboration competency influence employee employability and organizational performance and how can this relationship be explained through relevant organizational and HRM Theories?
- What are the practical implications of Human-AI collaboration competency for organization, higher education institutions and policymakers in developing a future-ready & AI-enabled workforce?

Literature Review

- **Employee Employability: From Traditional Competencies to Future-Ready Skills**

Employee employability has long been regarded as an individual's capacity to obtain, maintain and be able to move from one job opportunity to another using their knowledge, skills, attitudes, and personal qualities effectively. The first models of employability focused on technical skills, education, communication skills, collaboration, and problem-solving capabilities as the key factors for successful careers (Fugate et al., 2004; Yorke, 2006). With the

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dynamics of the labor market growing, the meaning of employability transformed from being a static notion of educational achievement to a more complex notion of adaptability and lifelong learning. One of the best-known models of employability was created by (Van der Heijde & Van der Heijden, 2006). These researchers proposed a framework comprising five interrelated aspects of employability: occupational proficiency, anticipation/optimization, personal flexibility, corporate insight, and balancing. According to their model, employability presupposes both having job-related skills and the ability to predict future environmental changes and learn new things.

- **Artificial Intelligence and the Transformation of Work**

One of the major drivers of organizational change is Artificial Intelligence. In contrast to previous automation technologies that were deployed to automate repetitive manual activities in organizations, AI is increasingly being deployed to assist cognitive functions such as strategizing, forecasting, recruiting, customer service, knowledge management, diagnosis in health care, finance and decision making. (Brynjolfsson & McAfee, 2014) believed that artificial intelligence was a complement to human labor that enhances productivity of people compared to being a substitute of human labor. In the same way, (Davenport & Ronanki, 2018) have found that firms benefit more from the complementary role of AI with human beings than substitution. This is due to the fact that AI performs a supportive function by analyzing vast amounts of data while human beings contribute their contextual insights, ethics, creativity and social intelligence.

- **Human–AI Collaboration: An Emerging Organizational Capability**

The area of Human–AI collaboration has become a new research field in which the relationship between human and artificial intelligence is recognized to be complimentary. Instead of considering the application of AI as a substitute for human labor, the focus is placed on the ability of AI technology to collaborate with human beings and enhance their abilities to make decisions (Jarrahi, 2018; Wilson & Daugherty, 2018). Recent systematic reviews point out that the success of Human–AI collaboration can be attained through the complementary fit between the skills of human beings and the skills of machines (Dellermann et al., 2019; Seeber et al., 2020; Glikson & Woolley, 2020). While machines have computational efficiency, prediction capability, and speed in data processing, human beings possess empathy, contextual awareness, creativity, and ethics (Wilson & Daugherty, 2018).

- **Human-AI Collaboration and Organizational Performance**

Performance in an organization now depends largely on the ability of the employees to incorporate intelligence through the use of AI technologies into decision-making. Literature shows that organizations that deploy AI technologies without proper preparation of their employees often suffer from low trust, technology

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resistance, adoption problems, and underutilization of the AI potential. On the other hand, organizations that have invested both in AI infrastructure and developing their employees' capability achieve more innovation, better decision-making, increased productivity, and organizational agility. Human-AI Collaboration helps organizations to leverage the efficiencies of machines and human qualities like ethics, creativity, empathy, negotiations, and judgment.

Research Methodology

- **Methodology**

This study uses a qualitative conceptual research design, which is a systematic review and synthesis of existing academic literature to introduce Human-AI Collaboration Competency (HAICC) as a new dimension of employability of the employees. Instead of conducting an empirical analysis, the study synthesizes theoretical and empirical knowledge from the fields of Human Resource Management, Artificial Intelligence, Organizational Behaviour, Information Systems, and Employability Studies. The study applies systematic literature review (SLR). The academic literature was selected through the review of peer-reviewed articles in internationally respected scientific journals and scientific databases, namely Scopus, Web of Science and Google Scholar. Only journal articles in English language, review articles and conceptually strong studies that focus on Artificial Intelligence, Human-AI Collaboration, AI literacy, employability, digital competencies, organizational capability and future skills were taken into account.

The literature search was conducted using combinations of keywords such as "Human–AI Collaboration," "Human-AI Collaboration Competency," "Artificial Intelligence," "AI Literacy," "Employee Employability," "Future Skills," "Digital Competencies," "Human Capital," "Socio-Technical Systems," and "AI-enabled Workplace." Boolean operators (AND, OR) were employed to refine the search and improve retrieval accuracy.

After the selection of studies relevant to the topic, the thematic synthesis method was employed for analysis. Themes related to the identified concepts, dimensions, theoretical viewpoints, and organizational implications of Human-AI Collaboration were identified from the selected studies. Related concepts were combined into broader themes which facilitated the identification of major themes of HAICC that include AI understanding, collaboration with intelligent systems, critical assessment of AI outcomes, ethical use of AI technology, adaptiveness and human-centered decision-making.

In order to build on the theoretical background of the proposed model, the current research employs theories such as Human Capital Theory (Becker, 1964), Socio-technical System Theory (Trist & Bamforth, 1951), Resource Based View (RBV) (Barney, 1991), and Dynamic Capabilities Theory (Teece et al., 1997).

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- **Proposed Human-AI Collaboration Capability Development Framework**

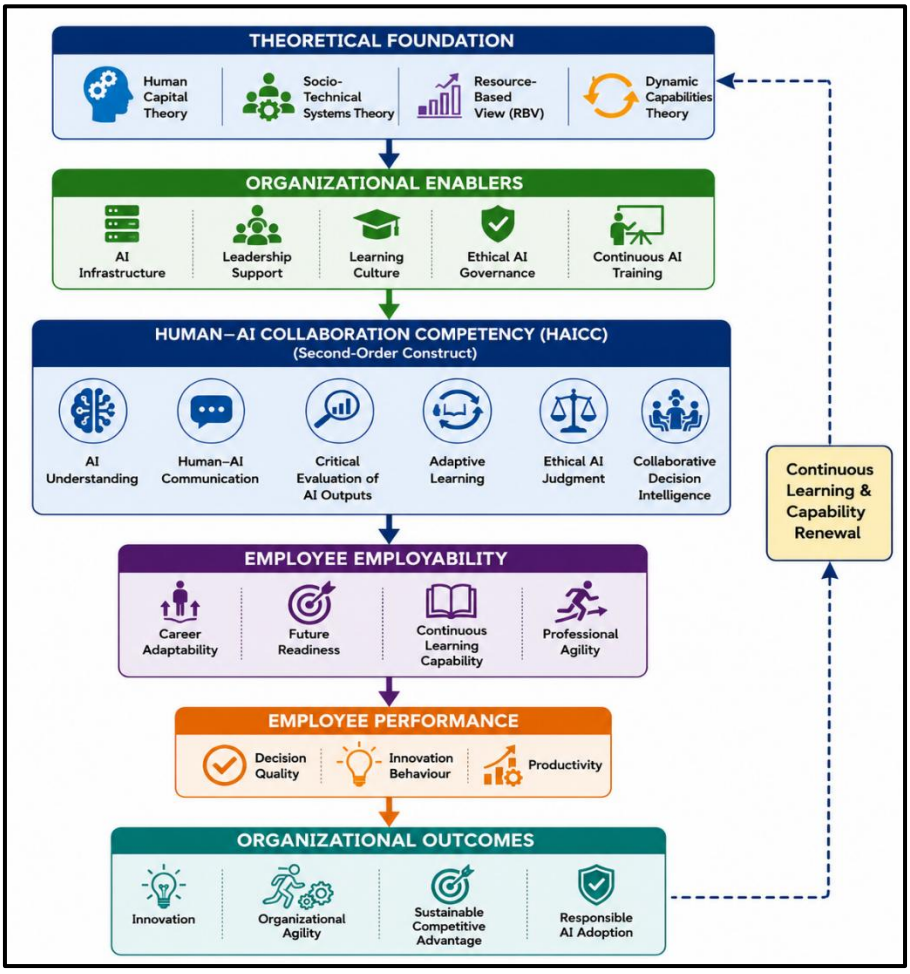


Figure 1: Human–AI Collaboration Capability Framework

- **Theoretical Framework**

The conceptual framework for HAICC capability development suggested in this paper includes a combination of the following four theories: Human Capital Theory, Socio-Technical Systems Theory, Resource-Based View (RBV), and Dynamic Capabilities Theory. Together, these four theories provide a theoretical explanation of the process of HAICC capability development, of the role of HAICC capability in increasing the employability of employees, and the influence of HAICC capability on organizational performance in organizations using AI technologies. The choice of the integrated perspective was made because of the complex nature of human-AI relationship.

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- **Human Capital Theory (Becker, 1964)**

The Human Capital Theory suggests that the knowledge, skills, and competencies of the workers are significant resources of an organization that can be enhanced through educational investments to enhance their productivity and competitive edge. In the context of this research, Human–AI Collaboration Competency can be seen as a new type of human capital. Employability models that have been discussed thus far highlight job-specific expertise, communication, teamwork, and flexibility.

- **Socio-Technical Systems Theory (Trist & Bamforth, 1951)**

The Socio-technical Systems Theory suggests that the optimal performance of an organization results from the optimization of both social systems (human resources) and technical systems (technology). For high organizational performance to occur, there must be complementation of abilities of people and technology instead of their independent functioning. This theory is highly applicable as Human-AI Collaboration Competency relies on the combination of human intelligence and artificial intelligence. While AI brings computational capabilities, predictive modeling, and speed of data processing, employees bring context, ethical considerations, imagination, empathy, and strategic thinking.

- **Resource-Based View (RBV) (Barney, 1991)**

According to the RBV perspective, the sustainability of competitive advantage for organizations comes from VRIN resources. In this context, the suggested framework views Human–AI Collaboration Competency as an organizational resource. While AI technology may become increasingly common, the human skill at collaborating with AI becomes significantly less imitable due to its reliance on learning within an organization.

- **Dynamic Capabilities Theory (Teece et al., 1997)**

Dynamic Capabilities Approach focuses on the capacity of the organization to integrate, develop and recombine its internal capabilities amid environmental dynamics. Artificial intelligence is a constantly evolving technology; hence, the employees have to continuously learn about it. Human-AI Collaboration Capability should, therefore, be considered as a dynamic capability and not a static technical skill. The employees need to constantly learn new applications of AI, adapt to new technology, analyze information from AI, and change their decision-making methods.

Findings & Discussion

- **Human–AI Collaboration Competency Emerges as a Distinct Employability Competency**

From the literature synthesis, it can be seen that the quick integration of artificial intelligence in organizational processes has led to a significant change in the

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competencies that are expected from employees. The traditional models of employability have put stress on the importance of occupation-specific skills, communication, teamwork, adaptability and lifelong learning as critical determinants of career success. However, such models were created before the era of intelligent workplaces and hence offer little information about competencies required for collaboration with intelligent technologies.

Moreover, it is shown that AI literacy by itself is not sufficient for employability in current companies. Even though AI literacy mainly involves the comprehension of concepts and applications of artificial intelligence, HAICC includes the broader competence that consists of such competencies as communication with AI systems, analysis of their results, integration of these results into decision-making processes, ethical decision making, and constant adaptation to new technologies. Thus, it can be argued that HAICC is a unique and multidimensional competency and not the extension of digital or AI literacy.

- **Human–AI Collaboration Competency Extends Existing Employability Theory**

Analysis of the existing literature on employability shows that currently developed theories of employability are mostly concerned about competencies related to the abilities of humans without addressing the issue of working collaboratively with artificial intelligence. The classic theory of employability is centered on job competency, anticipation, individual adaptability, business acumen and equilibrium. These competencies still retain their significance; however, they fail to account for the competencies required for effective collaboration with intelligent machines which become more widely used for performing strategic, operational and knowledge-based functions.

Therefore, the current research contributes to the field by adding another dimension to the employability theory: the concept of Human-AI Collaboration Competency. Contrary to the classical theory of employability, HAICC adds value to existing employability competencies by combining technological knowledge and human skills such as contextual thinking, ethical reasoning, creativity and adaptability.

- **Human–AI Collaboration Competency Functions as a Strategic Organizational Capability**

Another significant contribution made by the literature review is the strategic advantage of Human-AI Collaboration Competency in the organization. It has been well documented that an organization would get more value out of AI systems that complement human capacities as opposed to those that replace human capacity. The AI system has advantages such as computational effectiveness, predictive

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abilities, and information processing speed while humans add context, ethics, creative thinking, empathy, and strategic decision-making to the organization.

Based on the above argument, one can view HAICC as a strategic capability within organizations which improves innovation, quality of decision-making, organizational agility, and responsible AI use. Organizations that strategically develop HAICC within employees will benefit more from AI investments compared to organizations whose main focus is technology implementation.

- **The Integrated Theoretical Framework Provides a Comprehensive Explanation**

This theoretical framework clearly shows that there is not enough evidence from any single theory that could account for the relation between Human–AI Collaboration Competency and employee employability. The combination of Human Capital Theory, Socio-Technical Systems Theory, Resource-Based View, and Dynamic Capabilities Theory helps explain the matter better. The reason Human Capital Theory can help us understand why HAICC should be viewed as an investment in employees' capabilities is clear; Socio-Technical Systems Theory helps us see how humans and AI complement each other; HAICC is explained through the Resource-Based View as a strategic resource; Dynamic Capabilities Theory stresses the need for constant learning and change in ever-changing technological environment.

- **Proposed Human–AI Collaboration Capability Development Framework**

On the basis of the thematic synthesis, this research presents the Human-AI Collaboration Competency Development Framework, where HAICC is the crucial mechanism that ties AI-powered work environment with employees' employability and organizational results. According to this framework, there are six interdependent competency dimensions – AI Understanding, Human-AI Communication, Critically Evaluating AI Generated Results, Adapting to Learning from AI Systems, Making Ethical Judgment of AI, and Collaborative Decision Intelligence that help employees work collaboratively with intelligent systems.

It should be mentioned that, according to the framework, developing the aforementioned competencies can increase career adaptability, future readiness, ability to learn continuously, innovation capability and professional agility of employees. From the perspective of organizations, such results as innovation, employee productivity, organizational agility, sustainable competitive advantage, and responsible use of AI can be achieved through improving HAICC. Thus, this framework may serve as a theoretical base for future researches on the topic.

Practical Implications

The proposed framework of Human-AI Collaboration Capability Development is helpful as it serves as a tool to direct organizations in developing such capabilities

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among their employees who can work efficiently with AI. The framework does not only suggest technical knowledge of AI but also proposes that Human-AI Collaboration Competency should be incorporated in the talent management, recruitment, performance management, and employee development programs of organizations. The proposed competency dimensions can be used by HR professionals to fill in capability gaps among their employees.

There are several implications of the framework for higher education institutions and professional training agencies as well. In universities and business schools, it is important to update the content of courses related to management and employability by introducing skills such as AI literacy, evaluating outputs of AI, ethical decision-making in AI, adaptation through learning, and Human-AI interaction. In terms of policy implications, governments and industry associations can apply the framework in the development of national workforce development policies and initiatives of AI readiness. In light of the growing use of artificial intelligence in various functional areas in organizations, the development of appropriate policies is becoming more and more relevant.

Limitations and Future Scope

This study provides a theoretical understanding the concept of Human-AI Collaboration Competency (HAICC) as a novel aspect of employee employability; however, there are several weaknesses in this study. First, this study is grounded on a conceptual research design based on a systematic review and thematic analysis of relevant literature rather than empirical data. Consequently, proposed framework has not been empirically validated & should be regarded as a theoretical proposition requiring farther examination. Furthermore, the analysis of literature has been conducted using peer-reviewed English-language articles available in certain academic databases only.

The HAICC framework aims at offering an interpretation of the concept of Human–AI Collaboration Competency that applies generally to AI-enabled organizations, and does not take into account the differences associated with industry, organizational setting, or culture. Thus, the differences in the level of development of artificial intelligence technologies, technological infrastructure, and workforce may affect the emergence and application of HAICC; thus, the HAICC framework must be considered in light of its conceptual purpose.

Further research could be done in the validation of the proposed framework by creating scales for the empirical analysis of the relationship between HAICC, employee employability, and the organization through a quantitative, qualitative or mixed-method approach. Comparative and longitudinal research in different countries and industries can help gain an understanding of how HAICC creates employability sustainability through time.

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Conclusion

The increasing integration of artificial intelligence within organizations is bringing about changes in the competencies needed for employability. Traditional views of employability, which have focused more on occupational skills, adaptability, communication, and learning throughout one's career, provide little direction on what competencies might be useful for working effectively with intelligent machines. This paper aims to bridge this knowledge gap by introducing the concept of Human-AI Collaboration Competency (HAICC), as a specific employability competency. By systematically reviewing the existing research, the study suggests that skills such as AI comprehension, human-AI communication, critique of AI decisions, adaptive learning, ethical AI judgment, and decision intelligence collaboration have become indispensable for employees in AI-driven organizations.

This research enhances the employability body of knowledge by introducing the framework entitled the Human–AI Collaboration Capability Development Framework that shows the relationship among HAICC, employability of employees, and organizational impacts. In addition, the incorporation of the theories Human Capital Theory, Socio-Technical Systems Theory, Resource-Based View, and Dynamic Capabilities Theory provides an extensive theoretical base regarding how the Human–AI collaboration capability may be used to benefit both the careers of individuals and the organizations they belong to. By defining HAICC as a strategic capability and not only a technological one, this research contributes to the body of knowledge on employability.

From a practical point of view, the framework can provide valuable recommendations for those entities involved in preparing the workforce for working in AI-environments. Developing the Human-AI Collaboration Competency will allow people to continue their professional development, adapt to changing conditions, adopt AI technologies responsibly, and build up organizational resilience. Even though further empirical testing should be done, the study provides a solid theoretical basis for further studies and development of employment strategies in the digital economy.

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