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Trio of human, old and new copilots: Collaborative accountability of human, manuals/standards, and artificial intelligence (AI)

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ABSTRACT

Humans have developed and employed manuals to systematically organize, standardize, and transfer knowledge for decision-making in organizations. These manuals and standards have served as a "conventional copilot" for humans' intellectual activities, taking the form of collected references or operational procedures. Recently, artificial intelligence (AI) has emerged as a "novel copilot" that aids humans in organizations. Given the two non-human supports, this article aims to redefine the relational dynamics among the trio (human, manuals/standards, and AI). It analyzes and suggests that, rather than the new copilot (AI) making the old one (manuals/standards) obsolete, the trio needs to collaborate and complement one another to sustain accountabilities in terms of contingency, competence, and stewardship.

Introduction

Humans are distinguished not only by physical activities but also by intellectual ones, necessitating various forms of intellectual support. Thus, within and outside organizations, we often seek support from our peers. Beyond human assistance, we also depend on non-human aids. Traditionally, we have relied on manuals to systematically organize, standardize, and transfer knowledge for decision-making. These manuals and standards typically come in the form of collected references (e.g., toolkits, handbooks), operational procedures (e.g., algorithms, standard operating procedure: SOP), or combination of references and procedures (e.g., checklists). Recently, artificial intelligence (AI) has emerged as a new form of non-human support. The types of AI range from AI-assisted replication or fabrication of images and sounds, and AI-recommended web browsers to generative AI and AI-based robotics. In any case, AI becomes an intellectual partner to humans, surpassing the conventional role of machines as mere physical assistants.

The advent of AI represents a significant shift in the relationship between human and non-human support, expanding from a duo (human and manuals/standards) to a trio (human, manuals/standards, and AI). This shift leads to new relational dynamics. To better understand these dynamics, we can refer to scenes from the movies "Sully" (2016) and "Interstellar" (2014), where humans rely on non-human support in crises (see Table 1). In "Sully," Captain Sullenberger (played by Tom Hanks) deals with a malfunctioning aircraft after a bird strike. While human copilot Skiles (played by Aaron Eckhart) assists, the manual serves as the primary reference for emergency procedures. In "Interstellar," pilot Cooper (played by Matthew McConaughey) attempts to save a malfunctioning spacecraft with the help of the AI robot CASE.

In both films, the non-human supports—the manual in "Sully" and AI's judgment in "Interstellar"—proved inadequate. In "Sully," the manual could not adapt to atypical circumstances, illustrating a problem known as the "standardization trap." In "Interstellar," CASE sent Cooper an erroneous warning that conflicted with his efforts to stabilize the spacecraft, highlighting the need for human autonomy and oversight of AI. Consequently, the experienced human pilots in both movies intervened and corrected the mistakes made by the non-human copilots.

Given the advantages and disadvantages of non-human support for human intellectual activities as depicted in the movies, a key question emerges: "If AI acts as a copilot aiding the human pilot to utilize the manual, how should the trio—human, manual, and AI—collaborate?" In other words, while manuals and standards have traditionally been used as tools to assist human intellectual activities, AI now serves as a new instrument. Then, how should the three—human, manuals/standards, and AI—work together effectively?

To answer this question, the following sections will review and revisit human reliance on non-human supports and the challenges associated with each. Based on this examination, we will analyze why

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Table 1
Human reliance on non-human supports in crises: Movie scenes.

	Sully (2016)	Interstellar (2014)
Common crisis	Human pilot handling malfunctioning aircraft and spacecraft	
Non-human support	Human pilot utilizing **AI manual** as copilot	Human pilot utilizing **AI** as copilot
Common result of non-human support	The non-human supports—the manual (in Sully) and AI's judgment (in Interstellar)—were inadequate, where the experienced human pilots intervened and corrected the errors.	
Remaining challenge	Standardization trap of manual	Human autonomy and oversight of AI
Common question	If AI acts as a copilot aiding the human pilot to utilize the manual, how should the trio—human, manual, and AI—collaborate?	

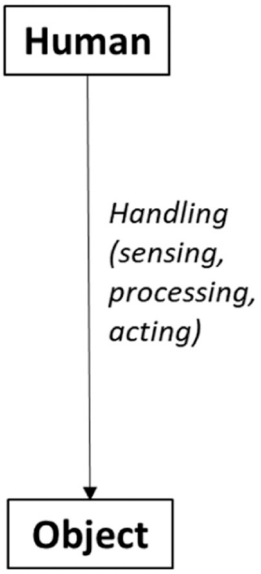

Fig. 1. Basic human activities.

the coexistence and collaboration of the trio (human, manuals/standards, and AI) are necessary, and propose how this collaboration can be designed and implemented.

Human activities and accountabilities

Basic human activities

Before analyzing how non-human supports can assist humans, we need to examine the nature of human activities. To survive and sustain, humans interact with objects in nature and society. These activities typically consist of three phases: sensing, processing, and acting, as illustrated in Fig. 1. During the 'sensing' stage, we use sensors (both physical and mental instruments) to perceive and collect data from our surroundings. In the 'processing' stage, we reorganize and transform this collected data into meaningful information, which can take two forms: reality vs. reference. Information about reality reconstructs our perception of the past (as-was), the present (as-is), and the future (to-be), while information about reference sets standards for decision-making (ought-to-be). Decisions are made based on the comparison (or gap) between reality and reference. The underlying logic and mechanism of this decision-making process are also referred to as an algorithm. At the 'acting' stage, we carry out actions based on these decisions to influence the objects around us.

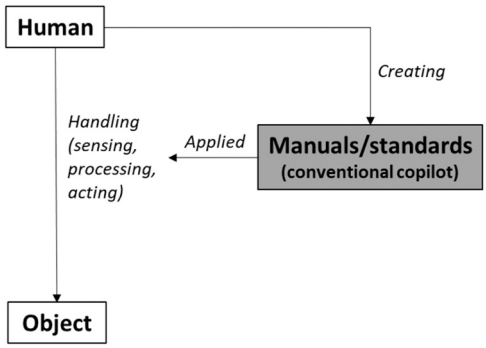

Fig. 2. Reliance on manual and standards.

Challenge of human: Accountabilities for contingency, competence, and stewardship

Actions carry responsibilities. When humans perform tasks in organizations, especially with the aid of non-human supports, it is crucial to monitor and evaluate whether the processes and outcomes meet three intertwined criteria of accountability: contingency, competence, and stewardship. First, 'contingency' refers to the accountability that requires work to be technically feasible. Regardless of the non-human instrument employed, there is always a possibility of unexpected events, and such contingencies should be anticipated in advance. Even if a machine is designed to operate on behalf of humans, preparations must be made for potential technical failures or malfunctions.

Second, 'competence' relates to the accountability that demands humans be capable of performing the work. A significant risk in utilizing non-human supports is the potential "human capability loss", a phenomenon where excessive reliance on automation or AI might ultimately erode human skills, which is also referred to as "Hollow Intelligence." This capability includes not only the ability to design and execute tasks but also creativity (thinking outside the box). Therefore, even when relying on artificial aids, it is essential for humans to maintain the competence to perform tasks effectively.

Third, 'stewardship' involves the accountability that humans should take responsibility for the work processed and completed. It encompasses the human dignity of initiating, recognizing, and owning the entire process and outcome of the work. Even highly advanced AI, superior to human capabilities, cannot be held accountable for work performances. Ultimately, all responsibilities rest with humans. In summary, although non-human supports can enhance every human activity (sensing, processing, acting), the human responsibilities of contingency, competence, and stewardship must still be upheld.

Conventional copilot: Manual with standards

Reliance on manuals/standards

Humans have limited capabilities in terms of memorization and organization of knowledge and work, which is why we often keep records like memos and diaries to bridge these gaps. A more sophisticated form of these records is manuals. Manuals serve as artificial standards, providing a reference to help systematically organize, standardize, and transfer knowledge for decision-making in organizations. As depicted in Fig. 2, manuals and standards support and facilitate human activities. Manuals can take various forms, ranging from a collection of references such as toolkits or handbooks (e.g., boundaries and thresholds of product/service quality), to operating procedures like algorithms or standard operating procedures (SOPs) and combination of references and procedures such as checklists.

We utilize manuals and standards for various purposes, specifically to enable (1) simplification (of information and knowledge); (2)

categorization (for measurement, comparison, and referencing); (3) routinization (for reliability and predictability through automation); (4) compatibility (for communication, interoperability and transferability); and (5) knowledge creation.

Despite the diversity of processes and forms of manuals and standards, they typically involve a process known as BMFB (benchmarking, modeling, forecasting, and backcasting). Benchmarking systematically collects practices and references, while modeling identifies generalizable patterns and causal relationships among the collected information. Forecasting predicts future scenarios based on the results of benchmarking and modeling, whereas backcasting involves creating action plans to achieve a desired or desirable future based on the forecasts. In essence, creating manuals and standards involves the written routinization of practices through scenario planning.

Challenge of manuals/standards: Standardization trap

Although manuals and standards are utilized to ensure the reliability of work, they present several challenges that warrant our concerns, collectively known as the 'standardization trap': rigidity, confusion, oblivion, and alienation. First, the 'rigidity' issue arises from the limited flexibility and creativity of manuals and standards. Being inherently standardized and fixed, manuals often struggle to address unprecedented incidents, locking users into a rigid set of rules that may inhibit flexibility. Such ambivalent features of standardization can be epitomized as "Taylorism vs. Tailorism." While setting standards aims to enhance efficiency, which is represented by Taylorism, these standards may inadvertently overshadow the need for a tailored way of working. An interesting consideration regarding the rigidity of standards is found in classical music. While many people lament that great musicians like Beethoven and Mozart did not leave recordings of their masterpieces, this lack of a "standard" performance might actually benefit numerous musicians by allowing them to experiment with creative variations of the original scores.

Second, the 'confusion' challenge stems from the competition or contradiction between multiple standards. As establishing a set of reference manuals or standards often implies gaining more power and influence, there tends to be a power game among potential standard-setters. This competition results in the presence of multiple and competing standards and manuals, which can overwhelm and confuse users.

Third, the 'oblivion' problem highlights how an emphasis on what to remember, as dictated by manuals, inadvertently strengthens ignorance about why remembering is necessary. Since manuals typically present simplified rules without explaining the backgrounds or rationales behind them, people tend to focus more on the WHAT (rituals and tasks) and less on the WHY (spirit and philosophy). This tendency towards oblivion is often exacerbated in organizations with a long history, where manuals and standards are frequently dismissed as red tape or unnecessary regulations.

Fourth, 'alienation' occurs when manuals are not internalized by their users. Creating a manual is one thing; integrating it into daily operations is another. The existence of a well-designed manual does not ensure a well-managed organization unless its contents are deeply entrenched and internalized in the users' minds and behaviors. Unfortunately, manual creators can become complacent and wrongly satisfied with the creation, neglecting the importance of application and implementation. Therefore, the creation of manuals and standards should be accompanied by subsequent activities such as communication, education, training, and drills.

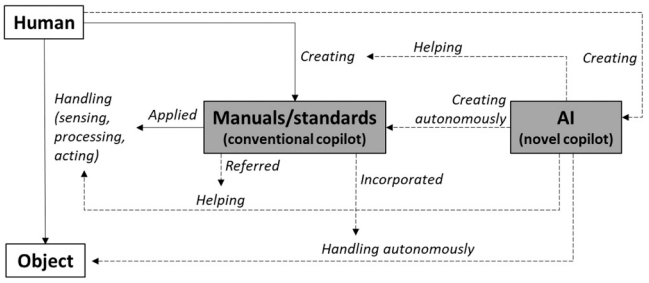

Fig. 3. Reliance on manuals/standards and artificial intelligence (AI). Notes: Solid arrows represent the conventional methods that humans utilize manuals/standards. Dashed arrows represent the novel methods that humans utilize artificial intelligence (AI).

Novel copilot: Artificial intelligence (AI)

Reliance on AI

Besides manuals and standards as conventional support, artificial intelligence (AI) represents a new form of non-human support. The activities supported by AI can be divided into two categories: Working BY AI and Working WITH AI. First, 'Working BY AI' refers to the mechanisms, work procedures, and technologies employed by AI. AI's capabilities align with basic human activities (sensing, processing, acting), as it can be equipped with sensors, algorithms (for machine/deep-learning and decision-making), and actuators. These AI functions are applied in various fields such as image and sound production, paperwork, programming, human interaction, and robotics.

Second, 'Working WITH AI' describes how, when, and where AI can support humans or operate autonomously. As Fig. 3 illustrates, integrating AI into the existing duo relationship (human and manuals/standards) creates more complex interactions among the trio. Specifically, AI contributes in four ways: AI assists humans in creating manuals and standards; AI helps humans handle objects by referring to manuals and standards; AI autonomously creates manuals and standards; and AI autonomously handles objects by incorporating manuals and standards.

Challenge of AI: AI-phobia on human autonomy from autonomous AI

Ironically, the remarkable capabilities of AI also introduce new concerns, which can be described as AI-phobia. These concerns fall into several categories. First, despite AI's superior work capabilities, its procedures and products are not infallible. Frequent reports of biases and errors in AI highlight the need for human oversight due to its limited validity. Second, AI's intellectual prowess can lead to human job losses, as AI not only complements but also substitutes human workers, sparking realistic fears of unemployment. Third, just as critical as job loss, there is the issue of human capability loss. As aforementioned, the more humans rely on AI to perform tasks on their behalf, the more their own work skills may diminish. At the dawn of the AI age, there are mixed arguments about whether AI's assistance may improve or diminish human work engagement, performance, and quality. However, it is evident that the intensity of human attention to tasks will be alleviated thanks to AI assistance, which increases the possibility of losing human capabilities, similar to how we lose muscle strength when it is not used. These three types of AI-phobia present a significant and existential challenge to human autonomy in the face of autonomous AI. Consequently, this underscores the necessity for human autonomy and oversight of AI, which will be further discussed in the next section.

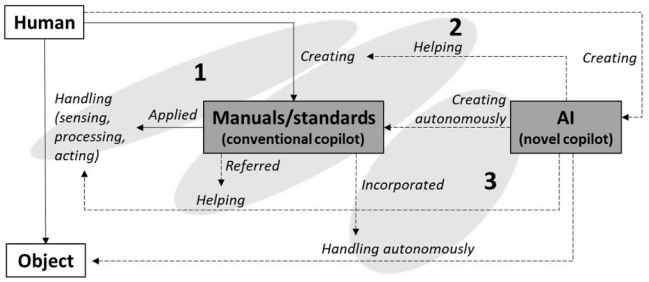

Fig. 4. Collaboration of human, manuals/standards, and AI. Notes: Solid arrows represent the conventional method that humans utilize manuals/standards. Dashed arrows represent the novel method that humans utilize artificial intelligence (AI). Oval areas with numbers represent the trio's collaboration types: (1) autonomous human utilizing manuals/standards; (2) AI-assisted human utilizing manuals/standards; and (3) autonomous AI utilizing manuals/standards.

Table 2
Collaborative accountability of human, manuals/standards, and AI.

Collaboration of trio (human, manuals/standards, and AI)	Sustaining accountabilities (contingency, competence, and stewardship)
1. **Autonomous human utilizing manuals/standards**: Human handling objects by utilizing manuals/standards	Human utilizing manuals/standards, but intentionally excluding or delaying AI utilization
2. **AI-assisted human utilizing manuals/standards**: AI helping human create, revise and align manuals/standards; AI helping human handle objects by referencing and facilitating the use of manuals/standards	AI helping human overcome standardization trap (rigidity, confusion, oblivion, and alienation)
3. **Autonomous AI utilizing manuals/standards**: AI creating manuals/standards autonomously; AI handling objects autonomously by incorporating manuals/standards	Human addressing AI-phobia by overseeing manuals/standards created by and incorporated into AI

Collaboration of human, manuals/standards, and AI

As discussed in the previous section, utilizing non-human supports for human intellectual activities has both advantages and disadvantages. However, the presence of challenges associated with the reliance on manuals/standards and AI does not imply that we should abandon non-human supports altogether. Instead, we should consider how to maximize the benefits and minimize the drawbacks of working with these conventional and novel copilots to ensure and sustain accountabilities for contingency, competence, and stewardship. With this approach in mind, the typical ways of collaborating with non-human supports need to be carefully analyzed and addressed. Fig. 4 highlights three different ways in which humans utilize manuals/standards and AI: (1) autonomous human using manuals/standards; (2) AI-assisted human using manuals/standards; and (3) autonomous AI using manuals/standards. In this section, we will analyze these three types of collaboration and explore how the associated challenges can be effectively addressed to sustain accountabilities, as summarized in Table 2.

1. Autonomous human utilizing manuals/standards

The first type of trio collaboration is 'human handling objects by utilizing manuals/standards', where humans create and apply manuals and standards to compensate for their intellectual inconsistency and unreliability. In this process, humans sometimes intentionally exclude or delay AI utilization to maintain accountabilities of contingency, competence, and stewardship. This approach of deliberately reducing and discouraging AI intervention can be characterized as 'Working DOWN AI'. It involves maintaining human work, even if inferior to AI, for security reasons; and further excluding AI to preserve human creativity and autonomy.

Several practices demonstrate the preference for traditional manuals and standards over reliance on artificial intelligence: Firstly, for security reasons, entities like airports and government buildings employ comprehensive manuals, known as incident response playbooks, to navigate through procedures necessary to tackle security breaches and other critical issues. These playbooks require security staff to adhere to specific protocols that prioritize human decision-making in controlling access, monitoring, and handling emergencies. In environments demanding high security, such as nuclear facilities, stringent manual processes are mandatory, like the dual key operation by authorized personnel to ensure human oversight in vital operations, including missile launches.

Secondly, concerning contingency measures, pilots and flight attendants use printed emergency manuals to handle critical situations like engine failures or cabin decompression. Similarly, IT professionals conduct manual backup and restoration tasks to secure critical data, preserving its integrity and availability following system failures or cyberattacks. Also, manual overrides are incorporated in autonomous systems, such as self-driving cars, allowing human operators to take over in unforeseen circumstances to ensure safety.

Thirdly, regarding human creativity, artists and craftsmen create unique works manually, leveraging their distinct artistic insights and materials, which AI cannot duplicate. In educational contexts, although AI may aid in producing intellectual outputs such as charts or diagrams, teachers and HRD managers often encourage students and trainees to manually create these items without AI help to foster and maintain their creative skills.

2. AI-assisted human utilizing manuals/standards

The second type of trio collaboration is 'AI-assisted human utilizing manuals/standards,' which includes two sub-categories: 'AI helping human create, revise, and align manuals/standards' and 'AI helping human handle objects by referencing and facilitating the use of manuals/standards.' In this collaboration model, it is crucial for AI to help humans overcome the 'standardization trap' associated with using manuals/standards. As previously mentioned, the standardization trap encompasses four main challenges: rigidity, due to the limited flexibility and creativity of standards; confusion, resulting from competition and contradiction among multiple standards; oblivion, which follows from prioritizing standardized tasks over understanding their rationale; and alienation, stemming from the lack of manuals/standards internalization.

AI can address these issues in several ways. Firstly, regarding rigidity, AI can continually explore new information, providing humans with emerging options beyond outdated and fixed documents. In doing so, AI offers not only accurate and relevant content of manuals and standards but also room for innovation and creativity. Secondly, to tackle confusion, AI can aid in the standardization of standards. It can examine alternative manuals and standards and help align multiple contradictory standards consistently. Thirdly, in handling oblivion, AI can serve as a retriever and reminder by recapitulating the history and rationale of the manuals. Fourthly, for the alienation challenge, AI can help humans by customizing and internalizing manual contents through interactive communication and facilitating training and drills for better acclimation to the manual.

To illustrate the comprehensive benefits of AI in humans' utilization of manuals and standards, consider an organizational dashboard for managing various situations. Most organizations track multiple types of information for decision-making, such as financial management data (cash flow tables, balance sheets showing revenue, expenditure, and

investment) and value chain management data (procurement, manufacturing, inventory, logistics, and sales).

Traditional tools for managing such information include: first, analytic indicators, such as Return on Investment (ROI), Return on Equity (ROE), inventory turnover, and Customer Acquisition Cost (CAC); and second, checklists or manuals/standards for comprehensively assessing information from multiple indicators to make holistic decisions. An organizational dashboard, similar to an operations board in a war room, is often used for this purpose.

However, using systematic checklists and manuals does not guarantee sound organizational management due to several challenges. First, the volume and complexity of financial information and value chain problems can be overwhelming. Second, managers may become overwhelmed because even the checklists and manuals are too lengthy and complicated to reference promptly. Third, managers have limited spatial and temporal attention, leading to failures in seeing the big picture, timely utilizing manuals, and effectively assessing and handling situations.

AI assistantship can alleviate these typical challenges of using manuals for organizational management. First, AI can continuously monitor the situation using financial and operational indicators. When the situation worsens beyond the thresholds of each indicator (e.g., declining ROI and inventory turnover), AI can provide managers with warning signs according to predetermined manuals/standards and explain the rationale behind the indicators and thresholds.

Second, beyond warning signs, AI can offer recommendations for actions. These AI-recommended options may include changes to investment portfolios and inventory adjustments. The recommendations should also include options outside existing manuals, along with the rationale, to encourage out-of-the-box thinking. AI can also recommend updates and revisions to manuals/standards to align with the ever-changing organizational environment.

Third, AI should help familiarize humans with the utilization of manuals/standards. This can be achieved through interactive manuals such as clickable sections, tooltips, and guided walkthroughs, enhancing comprehension and usability of manuals. AI can also facilitate the learning of operating procedures through virtual drills that replicate extreme situations (e.g., significant changes in ROE and CAC), providing real-time feedback to ensure quick and accurate responses, similar to flight crews training with AI simulators and augmented reality (AR) glasses.

In doing so, AI can help humans overcome the four traps of manuals/standards in organizational management: clearly understanding (overcoming confusion and oblivion), becoming familiarized with (against alienation), and avoiding being locked into existing manuals and standards (overcoming rigidity).

3. Autonomous AI utilizing manuals/standards

The third type of trio collaboration is 'autonomous AI utilizing manuals/standards,' which includes two sub-categories: 'AI autonomously creating manuals/standards' and 'AI autonomously handling objects by incorporating manuals/standards.' In these models, it is crucial for humans to ensure and sustain accountability by addressing AI-phobia and overseeing the manuals/standards created and used by AI. Firstly, humans must define the 'WHAT' of AI activities by setting the breadth (scope, range, and scale) and depth (level) of the manuals/standards that guide AI operations. Secondly, we need to oversee the 'HOW and WHY' of AI activities by monitoring the rationale, sources, process, content, and mechanisms (algorithms, parameters) behind AI's use of these manuals/standards. Thirdly, we should complement digital transformation with 'analog transformation,' adapting AI interfaces to fit human and organizational needs and perceptions.

Many examples show how organizations, instead of allowing humans to fall into social loafing due to AI assistance, diligently work to maintain accountability by supervising the manuals or standard operating procedures created and used within AI's operational processes and products. In the HR sector, for instance, tools for tasks such as resume parsing and interview scheduling are common. Although these tools boost efficiency, HR professionals must rigorously monitor them to ensure they operate ethically, avoid biases, and maintain accuracy. In sectors heavily reliant on technology, specific metrics are employed to monitor AI operations, with a focus on the accuracy and reliability of AI models, data privacy and security, and the transparency and understandability of AI decisions.

Additionally, it is becoming more prevalent for organizations to use natural language processing (NLP) to analyze text, organize information, and integrate it with datasets for efficient monitoring and evaluation (M&E) of their activities. In the realm of smart manufacturing, AI algorithms continuously monitor production processes, detecting errors, foreseeing failures, and modifying settings to enhance efficiency under human oversight, thus meeting production objectives. Customer relations is another organizational domain that quickly assimilates AI to facilitate operations. AI monitors, collects, and learns from the voice of the customer (VOC) data, automatically creating frequently asked questions (FAQs) for customers and a customer service manual for staff. Sometimes, AI uses these self-created algorithms and manuals to directly respond to customer questions or demands (e.g., chatbots and virtual assistants). In short, human oversight is required to ensure that AI-created manuals adhere to human norms and principles. By doing so, humans can remain the accountable principals of work by rigorously taking on a new role as overseers of AI assistance.

Conclusion

Humans have long developed and used manuals to systematically organize, standardize, and transfer knowledge for decision-making within organizations. These manuals and standards have acted as "conventional copilots" in supporting human intellectual activities, taking forms such as collected references, operational procedures, or checklists. Recently, artificial intelligence (AI) has emerged as a "novel copilot," aiding humans in various organizational tasks. With these two non-human supports in place, this article aims to redefine the relational dynamics among the trio—human, manuals/standards, and AI. It argues that instead of AI rendering the traditional manuals/standards obsolete, all three should collaborate and complement each other to uphold accountabilities in terms of contingency, competence, and stewardship.

Given the rapid pace of technological change, it is uncertain how AI technology will develop or how it will influence humans and manuals/standards. However, it is certain that, regardless of how AI develops, the trio will continue to interact within ever-changing relational dynamics. Therefore, humans must maintain a pivotal role for a tensional balance within this trio by working both independently (as overseers of the non-human supports) and dependently (as better performers helped by the non-human supports), all in the interest of sustaining the collaborative accountabilities of the trio.

Selected bibliography

For the movies where manuals/standards and AI help humans, see: *Sully: Miracle on the Hudson*. (2016). Warner Bros. Pictures.; and *Interstellar*. (2014). Paramount Pictures.

For manual, standards, and the "standardization trap," see: Busch, L. (2011). *Standards: Recipes for Reality*. Cambridge, MA: The MIT Press.; Hawkins, R., K. Blind, & R. Page. (2017). *Handbook of Innovation and Standards*. Elga.; and Lee, J. (2024). Behind and Beyond the Standard (ization) Trap: Diversifying Power Sources by Differentiating Centralization and Standardization. *International Review of Public Administration,* 29(1): 1–19.

For the BMFB, see: Lee, J. (2023). The Era of Omni-learning: Frameworks and Practices of the Expanded Human Resource Development. *Organizational Dynamics,* 52(1): 100916.

For the "Working + proposition + AI," "AI-phobia," and "Hollow Intelligence," see: Lee, J., & J. Park. (2023). AI as "Another I": Journey map of working with artificial intelligence from AI-phobia to AI-preparedness. *Organizational Dynamics,* 52(3): 100994.

For the security challenges of AI utilization, see: United Nations Development Program (UNDP). (2022). 2022 Special Report on Human Security. New York.

For the impact of AI on human creativity, see: Zhou, E., & D. Lee. (2024). Generative artificial intelligence, human creativity, and art, *PNAS Nexus*, 3(3): 052.

For the impacts of working AI on human work engagement, performance and quality, see: Cymek, D. H., A. Truckenbrodt, & L. Onnasch. (2023). Lean back or lean in? Exploring social loafing in human–robot teams. *Frontiers in Robotics and AI*, 10; Onnasch, L., & T. Panayotidis. (2020). Social loafing with robots–an empirical investigation. *Proc. Hum. Factors Ergonomics Soc. Annu. Meet*, 64 (1): 97–101; and Wijayati, D. T., Z. Rahman, A. Fahrul lah, M. F. W. Rahman, I. D. C. Arifah, & A. Kautsar. (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.

For the importance of human intervention of AI, see: Goldfarb, A., & J. R. Lindsay. (2022). Prediction and Judgment: Why Artificial Intelligence Increases the Importance of Humans in War. *International Security*, 46(3): 7–50.

For the impact of AI on user manuals, see: Rachele, A. (2023). *The Evolution of User Manuals in the AI Era*. Doakio.com.

For the human oversight of AI, see: Wilson, H. J., & P. R. Daugherty. (2018). Collaborative Intelligence: Humans and AI Are Joining Forces. *Harvard Business Review*, July-Auguest; and World Economic Forum. (2021). *Human-Centred Artificial Intelligence for Human Resources: A Toolkit for Human Resources Professionals*. WEF. Geneva.

CRediT authorship contribution statement

Junesoo Lee: Writing – original draft, Visualization, Data curation, Conceptualization. **Duk-Jo Kong:** Writing – review & editing, Data curation, Conceptualization. **Taejun Lee:** Writing – review & editing, Conceptualization.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used ChatGPT4.0 in order to copyedit the manuscript originally written by the authors. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

No data was used for the research described in the article.