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AI as "Another I": Journey map of working with artificial intelligence from AI-phobia to AI-preparedness

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AI-implementability;
AI-preparedness

Abstract
Artificial intelligence (AI) is becoming an indispensable part of both individual and organizational affairs, in terms of both rhetoric and practices. However, many people who want to (and need to) work with AI may find the advent of this technology overwhelming, as they are not well prepared to do so. This paper aims to address organizational preparedness in the era of AI by introducing two major agendas of AI. Firstly, as a diagnosis of AI-related sentiments that inhibit working with AI, four types of "AI-phobia" are presented: AI-literacy, AI-substitutability, AI-accountability, and AI-implementability. Secondly, the paper outlines methods to address and overcome AI-phobia and effectively work with AI, by presenting a journey map that offers a systematic checklist for AI-related communication and decision-making in organizations.

Introduction

Over the past decade, artificial intelligence (AI) has been integrated into our daily lives and organizational affairs. Unconsciously, we have adopted its capabilities through various online services that are embedded in our routine activities. For example, we rely on algorithmic recommendations from platforms like YouTube, Netflix, and Spotify to dictate our entertainment choices. Similarly, we trust Google Photos to categorize our images and our semi-autonomous vehicles to control speed and direction based on their algorithms. Although these AI-driven experiences have left us in awe, our concerns have primarily revolved around privacy rather than feeling threatened by the technology's intelligence.

However, recent advancements in AI, particularly in generative models, seem to have a more significant impact in terms of breadth and depth, evoking more than just mere surprise. In contrast to conventional AI models designed for specific tasks such as content or friend recommendations, state-of-the-art large language models (LLMs) like ChatGPT and Bard demonstrate the potential of artificial general intelligence (AGI). Consequently, these intelligent agents are prompting a reevaluation of the relationship between humans and AI in organizations, shifting from mere utilization to collaboration in a principal-agent dynamic, where humans act as principals and machines as agents. In summary, we are entering a new era where AI truly represents "Another I."

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Although the concept of a principal-agent relationship between humans and AI is not new, its recent resurgence carries two potentially significant implications. On the one hand, the prospect of AI agents promises a more convenient and intelligent lifestyle, fostering a sense of hope and anticipation. On the other hand, many organizational employees may feel apprehensive about the rapid rise of AI, as they lack the necessary understanding and skills to effectively harness these new intelligent agents in their workplaces. Compounding this anxiety is the mounting pressure to implement AI within their work and services, often without fully grasping the underlying mechanisms and consequences.

Considering the ambivalent feelings people have in their organizational affairs towards AI—excitement and reservation—this study aims to systematically review two things: (1) how to understand "AI-phobia," and (2) how to enhance "AI-preparedness" by addressing AI-related issues and concerns in organizations. In doing so, this article presents a set of frameworks which can be used as a practical checklist through which organizational capabilities of utilizing AI can be better evaluated and prepared. The next section introduces the major challenges of working with AI in organizations, which will form the basis of the following discussions on how to systematically handle them.

AI-phobia: challenges of working with AI

The challenges that AI poses to humans working in organizations can be categorized into four areas: AI-literacy, AI-substitutability, AI-accountability, and AI-implementability. This section will present the meanings of these four AI-phobia and their impacts on organizational preparedness for working with AI, as summarized in Table 1.

AI-literacy

The primary fear people have regarding AI is likely the sentiment of "I don't know how AI works or how to use it." The anxiety stems from ignorance and information asymmetry concerning AI mechanisms and impacts. AI literacy subjects may vary based on organizational stakeholders: for instance, designing AI for AI designers and developers, operating AI for AI application suppliers, and using AI for AI end-users. In any case, a common concern is the lack of understanding of AI's workings because of the black box of AI resulting from its multilayered stochastic procedure. Even AI designers cannot fully explain why and how AI generates certain products since AI works through a series of stages where data is combined in more stochastic than predetermined ways.

This cognitive veil surrounding AI technology begets several organizational and social impacts. Firstly, the social impact of AI-literacy is "AI-divide." The conventional concept of the "digital divide" represents the gap between digital literate and illiterate individuals. However, while AI is part of digital transformation, people perceive it as something new due to its technological complexity. Therefore, the gap between those with a good understanding of AI and those without it may lead to a new discrepancy and inequality in terms of knowledge capability and utilization of AI.

Secondly, the technical or economic impact of AI-literacy is "AI-fabrication." AI-literate individuals have better capabilities to understand and design AI, even without having to disclose it to the AI-illiterate. Information asymmetry between AI-literate and illiterate individuals may provide more chances for AI-literate individuals to be tempted to design and influence AI algorithms to favor certain interests. What is worse in the process of AI-fabrication is the fact that common people do not know whether and how fabrication has occurred and how to correct it.

Table 1 AI-phobia and AI-preparedness: Challenges of working with AI.

Focus of challenge	Locus of challenge	
	Human to AI	AI to human
Human capability	***AI-literacy*** "I don't know about how AI works and how to use it." • **AI-divide**: AI-literate vs. AI-illiterate • **AI-fabrication**: AI-literate individuals' biased design of AI algorithm that favors certain interests	***AI-substitutability*** "I am afraid that AI will make me obsolete and replace me." • **Human employment loss**: AI's replacement of human employees • **Human capability loss**: "Hollow Intelligence"
AI applicability	***AI-implementability*** "I have to adopt AI just because I have to do so." • **AI-fever**: Psychological, cultural, managerial, political, or social pressure to adopt AI without proper preparation • **Accountability (dis)equilibrium**: (Im)balance among various AI-related accountabilities	***AI-accountability*** "When something goes right or wrong, who or what is responsible: me or AI?" • **False attribution to AI**: Attributing human credit or fallacy to AI • **False attribution to human**: Attributing AI credit or fallacy to humans

AI-substitutability

The second form of AI-phobia can be represented by the words: "I am afraid that AI will make me obsolete and replace me." With AI's unquestionable accuracy, speed, breadth, and depth surpassing humans in many intellectual activities, it is natural for human resources to question their competitiveness in the labor market. It is highly likely that AI will replace human labor, ranging from manual to intellectual tasks, potentially leading to a loss of human employment. The subsequent impact of such employment loss can be phrased as "Hollow Intelligence." This phenomenon is similar to the "Hollow State" that emerged during the era of new public management (NPM), where governments outsourced public services to private contractors for efficiency and effectiveness. As a result of public services outsourcing, governments lacked the capacity to provide necessary public services and maintain governmental authority. Similarly, if an organization relies too heavily on AI for its operations, it may lead to a situation where human resources lack the ability to solve problems, resulting in a scenario of "Hollow Intelligence."

AI-accountability

The third type of AI-phobia is about the question: "When something goes right or wrong, who or what is responsible: me or AI?" This question raises anxiety about the unclear accountability for decisions and performance supported or conducted by AI. If AI-provided information is incorrect, who is responsible: the programmer, user, or AI? Similarly, if a human decision based on AI-provided information is incorrect, who is accountable: the programmer, user, or AI? Answering these questions is difficult without determining the accountability boundaries of various stakeholders involved in AI-related organizational tasks, such as the designer, programmer, supplier, and user of AI. The ambiguous responsibility of AI and humans may lead to two types of fallacies. The first is the "false attribution to AI," which attributes human credit or error to AI. The second is the "false attribution to human," which attributes AI credit or error to humans. In either case, if we rely on AI's capability in organizational works, we may be tempted to pass human responsibility to AI (treating AI as an intellectual creature) or attribute AI credits to humans (treating AI as an inanimate object).

AI-implementability

The aforementioned challenges can give rise to the fourth comprehensive manifestation of AI-phobia, referred to as "AI-fever," which hinders AI-implementability. AI-fever encompasses the psychological, cultural, managerial, political, and social impacts negatively associated with the preparedness for AI adoption. The nature of AI-fever can be succinctly expressed as: "I have to adopt AI just because I have to do so." In specific, organizations are often swept by unnecessary changes when organizational reform is conducted not out of an actual need for change but out of a simple desire for change, which can be phrased as "reform fever." Similarly, when higher management in an organization is entrapped by a naïve desire for AI, AI adoption will be more of a fad than a fashion and more rhetoric or symbolic action than actual functionality. The result of such feverish pressure to employ AI without proper preparation will leave managers or frontline staff burdened with the less developed AI operation and the unknown consequence of using AI. Thus, premature utilization of AI might saddle the organization with an "accountability (dis)equilibrium" challenge, where various AI-related accountabilities (e.g., professional, legal, hierarchical, political, and social) do not harmoniously align.

Journey map of working with AI

The first step towards overcoming any fear may be to analyze it deeply and broadly to gain a better understanding of the factors behind it. An in-depth analysis of the environment surrounding the phobia can provide us with the courage and wisdom to handle the fear. With this strategy in mind, it is necessary to examine the organizational contexts

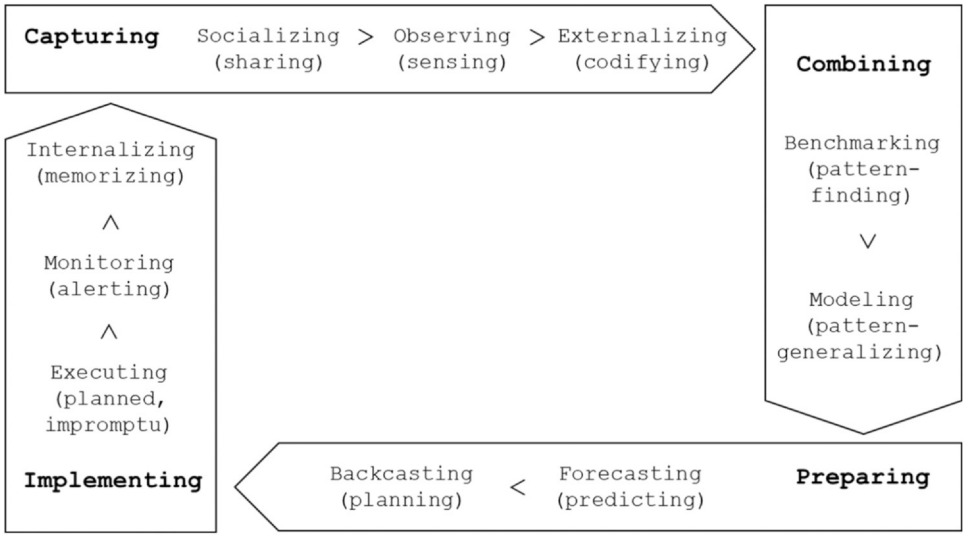

Figure 1. Organizational value chain comprising the four cyclical stages.

and dynamics in which we struggle to work with AI. To that end, this section will review the overall value chain of organizational affairs. Then, it will outline how humans and AI can (and should) coexist and work together by sharing collaborative roles.

Organizational value chain

Every organization, in order to survive and thrive, shares a similar process of communication and decision-making. This process can be characterized as a value chain or value network because completing a task at a certain stage of decision-making adds more value to the product than in previous stages. This study adopts and combines two existing concepts to describe the organizational value chain: (1) SECI (socializing, externalizing, combining, internalizing) of knowledge management; and (2) BMFB (benchmarking, modeling, forecasting, backcasting) of organizational capabilities. According to the concepts, as presented in Figure 1, organizational activities are implemented and add value through four cyclical stages: capturing, combining, preparing, and implementing.

The first stage of the organizational value chain is "capturing," where we gather information useful for communication and decision-making. We capture information through three sub-stages: socializing (sharing information among stakeholders), observing (monitoring and sensing the shared information), and externalizing (transforming tacit information into explicit knowledge by categorizing and codifying it).

The second stage is "combining," where we integrate fragmented information into new knowledge. The combining task can be done through two sub-stages. First, benchmarking is an effort to revisit past practices and find certain patterns such as critical success factors (CSFs) and critical failure factors (CFFs). Although benchmarking provides references and guidance, it can also lead us astray (the "benchmarking trap") because the knowledge drawn from benchmarking can be inapplicable to other cases. That's why the next sub-stage (modeling) is necessary because modeling is a systematic effort to find generalizable evidence out of anecdotal symptoms. Through modeling, the causal relationships among various factors become clear, and the resulting models are ready to be used in the next stage.

The third stage is "preparing," where we apply the retrospective insights gained in the previous stage to inform our prospective foresight. Preparing consists of two sub-stages: forecasting and backcasting. Forecasting is to predict the future based on the models developed in the previous stage. Following forecasting, backcasting involves going back from the future to the present in order to plan actions to achieve a desired future.

The final stage is "implementing," where the plan developed in the previous stage is transformed into actions. The process of implementing comprises three sub-stages: (1) executing planned and impromptu actions; (2) monitoring the execution process and providing alerts; and (3) internalizing what happens during implementation and memorizing it for the next cycle of communication and decision-making.

Role allocation between humans and AI across the organizational value chain

The organizational value chain provides the context where humans and AI work together, which can evoke both excitement and anxiety among human resources. As shown in Figure 2, the collaboration between the two players (humans and AI) takes place at every stage of the value chain, with their corresponding roles characterized by a syntax: "Working + ***PREPOSITION*** + AI." The different prepositions represent and conceptualize the attributes of role allocation between humans and AI.

There are two main areas at the center of Figure 2: "Working ***BY*** AI" (AI working as a substitute for humans) and "Working ***WITH*** AI" (AI working as a complement to humans),

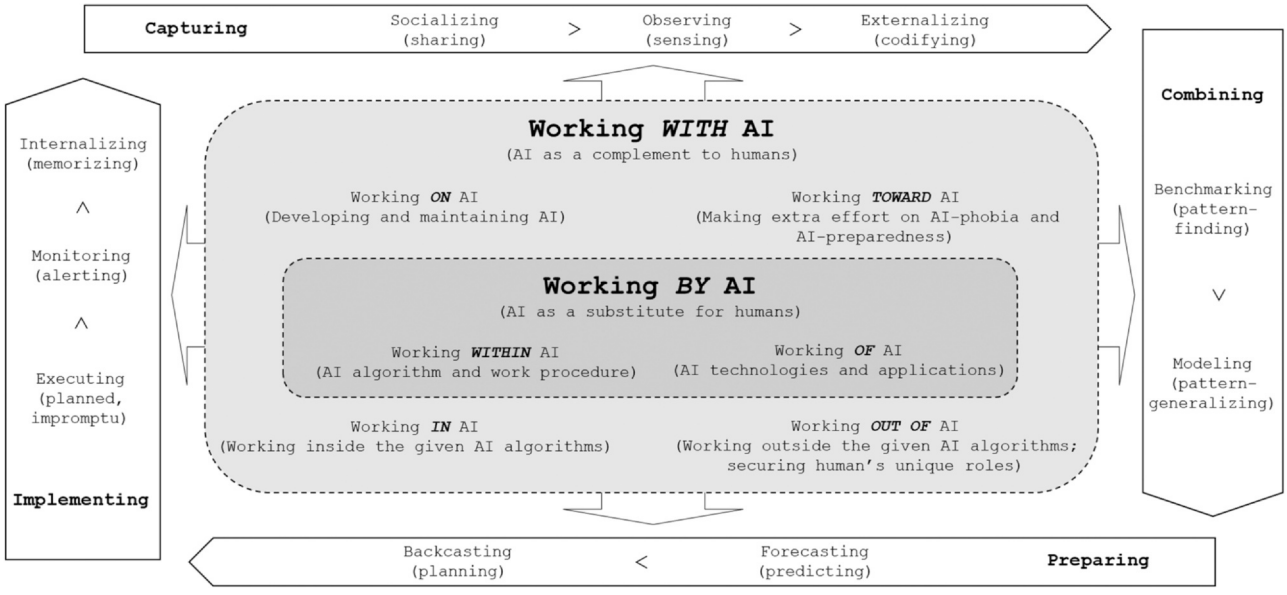

Figure 2. Journey map of working with AI: "Working + ***PREPOSITION*** + AI".

Table 2 Working ***BY*** AI: AI as a substitute for humans.

Working ***WITHIN*** AI: AI mechanism and work procedure	
	Sensor: Input of information into the AI system
	Machine/deep-learning algorithm: Modeling done by human
	Decision-making algorithm: Modeling done by machine
	Actuator: Executing predetermined or prompted commands from humans on information or activities
Working ***OF*** AI: AI technologies and applications	
	AI for images and sounds: Replication or fabrication of images and sounds
	AI for paperwork: Document summarization, multilingual translation, and format transformation
	AI for programming: Democratization and decentralization of programming
	AI for interaction: Interacting with human in service industry
	AI for robotics: Recognizing the situation and react properly by providing appropriate instruction to robots

where the latter includes the former because (1) humans should bear the ultimate responsibility for organizational work (including AI's role) and (2) it is up to humans to handle and overcome their concerns about AI so that human-AI collaboration can be positive and productive. With this big picture in mind, the next section specifies Working ***BY*** AI and Working ***WITH*** AI, which will help coming up with a checklist for humans-AI coexistence and collaboration.

AI's role in organizational value chain: working *BY* AI

This section presents what AI can do in the organizational value chain. The term "Working ***BY*** AI" represents that AI works as an agent of and even a substitute for humans. As summarized in Table 2, Working ***BY*** AI consists of two subcategories: Working ***WITHIN*** AI that means AI mechanism and work procedure; and Working ***OF*** AI that indicates AI technologies and applications.

Working *WITHIN* AI: AI mechanism and work procedure

Almost all AIs share a common mechanism and work procedure, consisting of four stages of functionality. The first stage of AI function is done by the "sensor." An intelligent machine needs to acquire information about the environment or the tasks required to be performed. At this stage, information is input into the AI system by humans or autonomously according to the predetermined procedure. From the perspective of the organizational value chain, "capturing" is done at this stage by using sensors and data codification system. The second stage is administered based on the "machine/deep-learning algorithm," which closely corresponds to "combining" in the organizational value chain. Humans may generate and input a series of commands by which machines can autonomously learn about and from the information obtained at the previous stage.

The third stage is conducted based on the "decision-making algorithm," which is similar to "preparing" in the organizational value chain. While the "machine/deep-learning algorithm" is a modeling done by humans (e.g., designing the training process, deciding on the desired format of its output, and setting up parameters), the "decision-making algorithm" is a model autonomously generated by the machine based on its training results. For example, in autonomous vehicles, the "machine/deep-learning algorithm" involves human developers training the vehicle to recognize traffic signs, navigate intersections, and respond to pedestrians. On the other hand, the "decision-making algorithm" stage comes into play when the vehicle is on the road and independently decides its course of action based on its training. As a result, it may autonomously choose to slow down upon recognizing a stop sign or make a slight swerve to avoid a detected pothole, applying its learned knowledge in real-time situations. At this stage, AI generates its own structure for collecting and processing information to make decisions in compliance with the human commands and previous records that are used as its training set.

The last stage is done by the "actuator," where AI performs the "implementing" job in the organizational value chain. Here, machines will execute predetermined or prompted commands from humans, which can vary from providing information to performing physical activities of robots.

Working *OF* AI: AI technologies and applications

The aforementioned AI mechanism can be applied to various purposes to work for humans. It would be almost impossible to accurately predict what kinds of AI technologies and applications will be developed in the future. Still, the variety of AI at present time can be categorized into at least five types.

Firstly, generative AI technology, such as Deepfake, has the capacity to replicate or fabricate images and sounds. This innovation, like all AI applications, carries both the potential to augment human creativity and the risk of bolstering deceptive intentions.

Secondly, leveraging generative AI for paperwork automation can greatly enhance white-collar worker efficiency. Functions like document summarization, multilingual translation, and format transformation can be delegated to AI systems like ChatGPT, significantly elevating human capabilities in terms of quality and quantity.

Table 3 Working ***WITH*** AI: AI as a complement to humans.

Working ***ON*** AI: Developing and maintaining AI algorithms/parameters	
	ABOVE: Designing AI algorithms/parameters
	ACROSS: Determining the breadth (scope, range, and scale) of AI algorithm and utilization
	INTO: Determining the depth (level) of AI algorithm and utilization
	OVER: Maintaining and repairing AI
	FOR: Improving AI algorithm and data sources; and handling model dilemma (simplicity vs. reality)
	AGAINST: Correcting inaccurate data sources, algorithm, and AI-provided information/answers
Working ***IN*** AI: Working inside the given AI algorithms/parameters	
	BEFORE: Preparing "good" questions/commands for AI work (i.e., prompt engineering)
	THROUGH: Collaborating with AI
	AMONG: Working with multiple/diversified (purposes) AIs (also for cross-checking AI works)
	BETWEEN: Bridging/relaying/automating multiple AIs at different levels/domains in organizations
	DURING: Doing human's own work while AI does its own work
	AT: Overseeing the AI work process
	BEHIND: Monitoring AI processing and products
	BEYOND: Cross-checking, double-checking, and interpreting AI-provided information/answers
	AFTER: Utilizing AI work products
	UNDER: Following and executing AI-provided information/answers
	SINCE: Making decisions/judgments based on AI-provided information/answers
Working ***OUT OF*** AI: Working outside the given AI algorithms/parameters; securing human roles	
	UP: Encouraging and promoting reliance on AI
	TO: Digital transformation, adapting humans and organizations to AI
	FROM: Analog transformation, adapting AI (interface) to humans and organizations
	DOWN: Discouraging and lessening reliance on AI
	BELOW: Keeping human's own work (even if inferior to AI) for security or other issues
	AROUND: Excluding AI (for HRD on human's creativity and autonomy)
Working ***TOWARD*** AI: Making extra effort on AI-phobia and AI-preparedness	
	ABOUT (for AI-literacy): Studying (how to use) AI; enhancing transparency of AI algorithms
	ALONG (for AI-substitutability): Designing multidimensional co-existence of humans and AI
	Spatial co-existence: Diversifying AI usage across hierarchical levels and functional domains
	Temporal co-existence: Employing incrementalism and experimentalism for transition to AI
	BESIDE (for AI-accountability): Defining the accountabilities of AI-related stakeholders

Thirdly, generative AI's role in programming has democratized and decentralized software development, enabling individuals with limited programming expertise to create algorithms and software. Services such as Github's Copilot have proven invaluable for novice programmers seeking to debug or refine their code. Fourthly, generative AI applied to conversational interfaces, like chatbots, can assume repetitive and simple tasks in service industries, such as managing customer inquiries, among other benefits.

Lastly, integrating AI-based systems with robotics allows manufacturing and service robots to intelligently respond to their environments. The process involves three key stages: (1) employing computer vision algorithms and sensors to recognize and comprehend the current situation, (2) determining an appropriate response, and (3) using generative AI to instruct robots in handling the situation effectively. This technology promises wide-ranging applications in manufacturing processes, such as image-based automatic inspection, analysis, process control, and robot guidance.

Human's role in organizational value chain: working *WITH* AI

As reviewed in the previous section, AI can now work at every stage of the organizational value chain where previously only humans were working. In this era of AI, it is up to humans to learn how to work with AI so that AI can work as an effective and reliable complement to humans. As shown in Figure 2 and Table 3, "Working ***WITH*** AI" can be done through four major domains: Working ***ON*** AI, Working ***IN*** AI, Working ***OUT OF*** AI, and Working ***TOWARD*** AI. This section presents that each of the four domains consists of sub-domains through which humans can (and should) work with AI to proactively deal with AI-phobia.

Working *ON* AI: developing and maintaining AI algorithms/parameters

As AI is an agent serving humans, humans should work as a principal taking the initiative in developing (Working ***ABOVE*** AI) and maintaining (Working ***OVER*** AI) AI algorithms and major parameters.

Working ***ABOVE*** AI. A key role for humans in working with AI is to design AI algorithms or to modify existing AGI models

optimized for their purposes. Although designing and modifying AI models might seem to be a purely scientific and philosophically objective task, in reality, they are far from value-neutral because there is ample opportunity for the designer's intentions to be reflected in the algorithm. Specifically, as an AI's principal, humans should do two things: (1) Working ***ACROSS*** AI, meaning that they should define the breadth (scope, range, and scale) of the AI algorithm; and (2) Working ***INTO*** AI, defining the depth (level) of the AI algorithm and its utilization (e.g., data collection, information reorganization, knowledge creation, value judgment, etc.). The importance of understanding potential and limitation of a given AI system and setting boundaries of its application becomes critical in organizations, which suggests that in the near future, the role of CTO (chief technology officer) may increasingly have a characteristic of CAO (chief artificial intelligence officer) who should work above AI. Based on human judgment regarding the extent of AI implementation within organizations, different directions of AI utilization can be identified, such as working ***UP*** AI and working ***DOWN*** AI which will be discussed in detail in the following section.

Working ***OVER*** AI. Even after a careful and sophisticated design of an AI system, there is still a great need for extra effort to maintain and improve it. Regarding the human role to maintain AI-based systems, there are two specific jobs. Firstly, Working ***FOR*** AI entails continuous refinement of algorithms, data sources (references) and data quality within the learning process, often necessitating human intervention. For example, Large Language Models (LLMs) such as ChatGPT are designed to generate text with the highest probability, utilizing training data sourced from the internet. Consequently, this may result in unnatural responses in typical human communication or the production of toxic and discriminatory content influenced by the darker aspects of the Web. To mitigate these issues, contemporary LLMs frequently incorporate direct human engagement during their training phases, a technique known as reinforcement learning from human feedback (RLHF). In this process, human evaluators assess and score multiple AI-generated responses to ensure alignment with human preferences. Moreover, every (computer) model encounters a dilemma between simplicity of model and accuracy of reality. In other words, reality is often too complex to be fully comprehended without being simplified into a model, whereas if the model is overly simplified, it can deviate from reality. Therefore, humans must assess and judge where to draw the line when determining the level of simplification required in AI modeling.

On the contrary to Working ***FOR*** AI, the second type of job of Working ***OVER*** AI is Working ***AGAINST*** AI, which indicates that we should acknowledge the possibility of AI's fallacies — such as using incorrect data or providing inappropriate information — and keep testing and reporting those undesired and unpredictable outputs. This fallacy of AI may have more negative impacts than fake news from conventional media, because AI-generated information can contain "partial facts" that appear more credible than outright deception. For instance, on social platforms like Twitter or Reddit, users frequently share their experiences with AI tools such as ChatGPT. In some cases, the model may generate "hallucinated" information, presenting fabricated data or events as if they were true. These active discussions play a crucial role in exposing and documenting potential fallacies that can arise from AI systems. Therefore, it is also within the human's role to prevent and correct the inaccuracy or inappropriateness of the data sources (references), algorithm, and AI-provided information.

Working *IN* AI: working inside the given AI algorithms/parameters

The AI algorithms that are designed and maintained by humans will act as collaborators with humans. This is where we need to work inside the AI algorithms. Working ***IN*** AI consists of four sub-domains: Working ***BEFORE***, ***THROUGH***, ***AT***, and ***AFTER*** AI, representing the four types of activities that occur in a temporal sequence within the organizational value chain.

Working ***BEFORE*** AI. Before starting to work with AI, one of the most crucial things humans need to do is to prepare customized instruction for AI. As we experience while using ChatGPT, AI responds to human commands very effectively, but the quality of the product is fluctuated based on how human users instruct and command it. Simply put, the quality of AI's work heavily depends on the quality of human instructions or commands. Therefore, in return for saving more time by using AI, we need to spend more time learning how to efficiently communicate with AI models and developing smarter questions and commands (technically called prompt engineering) so that AI can work more effectively for us. In short, in the era of AI, humans' unique role can be defined as their capability to generate specific, complex, and creative prompts for AI.

Working ***THROUGH*** AI. With the increasing presence of AI in our workplace, it is highly likely that we will be doing almost all of our work through AI. This close collaboration with AI may happen in at least three forms. Firstly, Working ***AMONG*** AI means that we will work with multiple AIs in our offices diversified for various purposes. As reviewed before, there are various types of AI systems specialized for different tasks, such as computer vision for manufacturing process control and chatbot for customer communication. So, it would be literally working among various AIs. Secondly, Working ***BETWEEN*** AI represents the situation where humans work by mediating multiple AI systems. In other words, when different AI systems work independently but they need to work collectively, humans can intervene to bridge, relay, or automate multiple AI systems. For instance, if an officer in charge of customer communication using a chatbot wants to make the chatbot more friendly, she may order another generative AI model for images to create a virtual clerk image, which she can (order the AI model to) transfer to the chatbot machine later. Thirdly, Working ***DURING*** AI implies that there are things humans need to do while AI does its work. It would be similar to using a washing machine at home, where while the machine cleans clothes, we sit next to the machine to monitor it or prepare a drying rack. Likewise, there are many tasks for humans to do, such as monitoring the process or preparing the next commands, while the AI system works.

Working ***AT*** AI. Regardless of how well AI performs, human oversight of AI work is absolutely essential. This oversight can occur at two stages. First, Working ***BEHIND*** AI involves monitoring AI's learning processes and outputs,

which may require the use of additional intelligent systems to help humans better observe and supervise AI's operations. Second, Working ***BEYOND*** AI means that humans must perform additional work even after AI has completed its tasks. The completion of AI work does not guarantee that the outputs are always valid and error-free. As many AI developers and suppliers publicly acknowledge, AI can produce unreasonable outcomes due to various factors, such as inaccurate information sources or unverified data processing methods. As a result, humans must be prepared to cross-check, double-check, and reinterpret the results of AI processing and production. For double-checking purposes, multiple machines can be utilized, allowing each of them to operate independently and cross-check one another's work.

Working ***AFTER*** AI. After AI completes and provides its work outputs, such as collected information or newly generated images, humans utilize them in at least two ways. First, Working ***UNDER*** AI entails treating AI as the principal, and ourselves as the agent, following and executing what AI recommends. This approach assumes that what AI produces is reliable and manageable within the boundaries of human understanding and management. Second, Working ***SINCE*** AI represents a more prudent and active use of AI systems, where humans make decisions or judgments based on AI-provided information or answers. In this approach, different from the previous one, AI is treated as an assistant that supports human's subsequent decision-making and judgment. Consider a scenario where a physician utilizes an AI system to analyze patient data and receive treatment recommendations. For example, the AI system might examine a patient's symptoms, medical history, and lab results, and propose a specific medication as the most effective treatment option. However, instead of unquestioningly adopting this suggestion, the doctor, leveraging their professional expertize and clinical judgment, critically evaluates the AI's recommendation. The physician takes into account various factors that the AI might not fully grasp, such as the patient's individual preferences or potential side effects, before arriving at a final treatment plan.

Working *OUT OF* AI: working outside the given AI algorithms/parameters

Two facets of AI—its enormous capacity and its potential for mistakes—are the reasons why human intervention is necessary at every stage of the organizational value chain. This intervention means that humans exercise their unique role in leadership, followership, communication, and collaboration outside the given AI systems. Here, human intervention will take two different directions: encouraging reliance on AI (Working ***UP*** AI) or discouraging it (Working ***DOWN*** AI) in organizations.

Working ***UP*** AI. Based on our trust and hope in the value of AI, we may encourage and promote reliance on AI in organizations. Promoting AI utilization can be done in two ways. First, Working ***TO*** AI involves efforts towards "digital transformation," which means adapting organizations to an AI-friendly environment. This involves implementing a series of reforms across five dimensions of organizational design and management—organizational strategy, work processes, organizational structure, human resources, and the rewards (incentive) system—that can facilitate the adoption of AI-based workflow. Second, Working ***FROM*** AI includes the opposite approach of "analog transformation," which is to adapt AI's interfaces to humans. Since humans feel more comfortable with analog-based objects, the interactions between humans and AI can be redesigned to be user-friendly and accommodate human needs for an analog environment.

Working ***DOWN*** AI. There are reasons to be cautious and reduce reliance on AI, such as distrust of AI and the desire to maintain human uniqueness. First, Working ***BELOW*** AI is a conscious or unconscious effort to prioritize human work even if it is inferior to AI. For example, in cases where fraud using AI, such as fake IDs created by deepfake technology, is highly possible, face-to-face contact may be a better method to ensure a person's identification, despite being more inconvenient than digital communication. Second, Working ***AROUND*** AI is the intentional exclusion of AI from organizational work. For those responsible for human resource development (HRD), adopting AI in the organization poses a dilemma. While relying more on AI can expedite and improve work performance, it may also result in a loss of human creativity and autonomy, leading to concerns about "Hollow Intelligence." Therefore, to maintain human creativity and autonomous capability in terms of HRD, sometimes it may be preferable to train human resources without the assistance of AI.

Working *TOWARD* AI: making extra effort on AI-phobia and AI-preparedness

All the aforementioned presentations on Working ***BY*** and ***WITH*** AI across the various domains of organizational management are conducive to a deeper understanding of how AI works, why humans are hesitant to use AI, and how we need to work with AI more systematically. Still, there are several other issues that address what should be done additionally to handle AI-phobia in pursuit of AI-preparedness of organizations.

Working ***ABOUT*** AI. To address concerns about AI-literacy, it is important for us to keep trying to know about how AI works and how to effectively work with it. Ignorance about AI can lead to unfounded fear, but gaining more knowledge about AI can help alleviate fear and increase confidence in working with AI. Additionally, enhancing transparency of AI algorithms can also help lessen anxiety about AI-literacy. By clearly disclosing how AI works and thinks, humans can better understand, design, and utilize AI.

Working ***ALONG*** AI. As we face the inevitable trend towards AI dominance, it's important to consider how we can coexist with AI. To address concerns about AI substitutability, we can design a coexistence plan for humans and AI based on space and time dimensions. First, spatial coexistence can be achieved by diversifying AI usage across hierarchical levels and functional domains. For example, a CEO might need an AI that can assist with general strategic decisions, while a frontline manager might require an AI that can collect specific operational data. By identifying what humans can do better than AI (and what AI can do better than humans) in different locations within the organization, we can diversify

the better mix of human resources and AI. For instance, when a chatbot encounters a customer who requires more serious attention, it should actively seek intervention from a human counselor. Second, temporal coexistence can be achieved by using incrementalism and experimentalism for transition to AI. Instead of relying on benchmarks set by other organizations, each organization should consider a gradual and experimental adoption of AI to suit its unique organizational environment.

Working ***BESIDE*** AI. What AI can do for us is one thing, namely, and what humans should do for AI-related tasks is another, namely. Two roles of AI and humans should run parallel in the wake of working with AI. In other words, humans should keep standing beside AI. When it comes to issues of AI accountability, the ambiguous and sometimes confused attribution of responsibilities between humans and AI might be an everlasting challenge as long as we work with AI. However, what is certain is that AI is not human but an inanimate creature. Therefore, it is (legally and practically) impossible for AI to take charge of tasks. It is humans who should take responsibility for what happens even through the process of working with AI. Thus, we need to keep trying to define the accountability boundaries of AI-related stakeholders such as customers, designers, developers, and end-users of AI. Especially, the task of setting boundaries for AI's data sources should be entrusted to humans in order to ensure the reliability and confidentiality of work. Plus, AI should be programmed to incorporate and actively seek human intervention and judgment throughout the working process. By doing so, we can reduce and prevent potential instances of human abuse of resources (such as authority, information, networks, etc.) and misuse of AI.

Conclusion

Artificial intelligence is becoming an indispensable part of both individual and organizational affairs, in terms of both rhetoric and practices. However, many people who want to (and need to) work with AI may find the advent of this technology overwhelming, as they are not well prepared to do so. This paper aimed to address organizational preparedness in the era of AI by introducing two major agendas of AI. Firstly, as a diagnosis of AI-related sentiments that inhibit working with AI, four types of AI-phobia were presented: AI-literacy, AI-substitutability, AI-accountability, and AI-implementability. Secondly, the paper outlined methods to address and overcome AI-phobia and effectively work with AI, by presenting a journey map that offers a systematic checklist for AI-related communication and decision-making in organizations.

The future of working with AI is uncertain even to eminent experts in the field due to emerging technologies and the corresponding relationship between humans and AI. However, what is certain is that humans will continue working with AI, and AI will continue to take over human work. Will AI development make human labor completely obsolete? This idea is highly questionable because humans have a spirit and soul that is unique to human nature and irreplaceable by machines. Instead, AI can make humans more human by helping to explore what human spirit can do better than machines, thereby saving humans from work alienation. How can this humane coexistence of humans and AI be possible? It may be up to human efforts, for which this study's frameworks can be helpful as they can be utilized as a checklist of working with AI.

SELECTED BIBLIOGRAPHY

For the four functions of knowledge management (socializing, externalizing, combining, and internalizing: SECI), see: Nonaka, I., and Takeuchi, H. (1995). *The Knowledge-creating Company*. New York: Oxford University Press; and Nonaka, I., Toyama, R., and Konno, N. (2001). SECI, Ba and Leadership: a Unified Model of Dynamic Knowledge Creation. In *Managing Industrial Knowledge: Creation, Transfer and Utilization*, edited by Nonaka, I., and Teece, D. Sage Publications, 13–43.

For the four organizational capabilities (benchmarking, modeling, forecasting, and backcasting: BMFB), see: Lee, J. (2023). The Era of Omni-learning: Frameworks and Practices of the Expanded Human Resource Development. *Organizational Dynamics*, 52(1).

For the five dimensions of organizational design and management, see: Galbraith, J. R. (2014). *Designing Organizations: Strategy, Structure, and Process at the Business Unit and Enterprise Levels* (3rd edition). Jossey-Bass.

For large language models, such as ChatGPT, see: Zhao, W. X. et al. (2023). A survey of large language models. *arXiv preprint arXiv:2303.18223*.

For the impact of GPT on the labor market, see: Eloundou, T., Manning, S., Mishkin, P., & Rock, D. (2023). Gpts are gpts: An early look at the labor market impact potential of large language models. *arXiv preprint arXiv:2303.10130*.

CRediT authorship contribution statement

Junesoo Lee: Conceptualization, Formal analysis, Writing - original draft, Writing - review & editing. **Jaehyuk Park**: Data curation, Formal analysis, Writing-review & editing.

Data availability

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

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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.

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