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Short Paper

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Abstract

Recently Artificial Intelligence (AI)-enabled conversational agents or chatbots (ICA hereafter) have been widely introduced in online customer service, and are expected to transform the frontline workforce. However, most studies from employees' perspectives have been qualitative in nature. Moreover, extant empirical studies perceive ICA as a tool rather than considering ICA as an AI-enabled digital workforce. Besides, rare papers moved further to explore the rooted psychological drivers (such as identity) underlying the employees' actions. To address these gaps, our paper integrates the identity theory and cooperation perspectives to examine the impact of ICA's human-like capability on employees' job identity through the enhancement in work experience. Our study is expected to provide an innovative perspective viewing ICA as a human-like agent rather than a tool in behavior studies. This study also enriches the identity theory and cooperation-competition theory and promotes their applications in IS literature.

Keywords: Artificial intelligence, chatbot, digital workforce, job identity, identity enhancement, cooperation

Introduction

Recently Artificial Intelligence (AI)-enabled conversational agents or chatbots (ICA hereafter) have been widely introduced in online customer service (Suthar, 2020). It is predicted that, by 2025, 95% of consumer online service interactions will be chatbot-powered (Clark, 2020). As such, ICA is expected to transform the frontline workforce in a wide range of businesses. Particularly, we focus on ICA in customer service which can screen incoming inquiries, deal with relatively simple requests, and pass relatively complex requests to human employees.

Prior literature documented that working with ICA can enhance employees' working experience (e.g., Asatiani et al, 2021; Ambati et al., 2020). Specifically, a couple of significant impacts of ICA on employees are documented: reduction of repetitive tasks (Asatiani et al., 2021), increase in work productivity through informational support (Lu et al., 2020, Ugale, 2020), and enhancement in employees' psychological states such as the work meaningfulness and job satisfaction (Ugale, 2020).

Despite the importance of such findings, most studies that have explored the impact of ICA on employees have been qualitative in nature. Moreover, extant empirical studies perceive ICA as a tool rather than considering ICA as an AI-enabled digital workforce; as such, they still use the Technology Adoption Model

(TAM) (Davis, 1989) to examine the use of ICA based on ease of use, usefulness and other features. Besides, despite a growing emphasis on employees' psychological factors in the initiation of new technologies in organizations (Bala and Venkatesh, 2013), rare papers moved further to explore the rooted psychological drivers (such as identity) underlying the employees' actions. Particularly, the changes in work experience and the employees' job identity enhancement caused by ICA as a digital colleague have not been widely discussed in the IS literature. Accordingly, there is a call for more extensive research to capture the perspectives of the employees (Bhargava et al., 2021).

In order to address the gaps identified above, this study tries to address the following research questions: **RQ1:** What is employees' perception of ICA's human-like capabilities (i.e., levels of autonomy, learning capability, and natural language dialogue capability) as a new digital worker? **RQ2:** Whether and how these ICA's human-like capabilities may facilitate cooperation and enhance employees' job identity through their perceived enhancement in skill variety, job significance, and job control? To answer these two research questions, we integrated the identity theory (Carter et al., 2015; Stryker and Burke, 2000) and cooperation perspectives (Deutsch 1949) to pursue the following objectives: (1) To identify the employees' perception on ICA's human-like **intelligent capabilities** (i.e., autonomy, learning capability, and natural language dialogue capability) that enable ICA to serve a role as a digital worker, (2) To develop and empirically validate a model to explain how ICA with its intelligence capabilities, can serve as an assistant to enhance employees' job identity through perceived enhancement in job significance, skill variety, and job control. To our best knowledge, the above endeavors are novel aspects not previously considered in the IS literature.

To validate the proposed conceptual model, we will collect individual-level data from frontline employees who have experience working with ICA in North American firms that have already adopted ICA in frontline customer service.

This study is expected to offer the following potential contributions. First, our study is expected to provide an innovative perspective viewing ICA as a human-like agent rather than a tool in behavior studies. Second, this work strengthens the insights regarding job identity, which is a growing concern in the information systems (IS) research domain and has rarely been examined in the context of ICA. Third, this research will enrich the identity theory and cooperation-competition theory and promote their applications in IS literature. Finally, from a practical perspective, this study can provide a better understanding to firms of assessing conditions for ICA usage and value creation in frontline customer service. Given the increased prevalence of ICA utilization in the work practices, and the challenges facing firms in managing this digital workforce, the proposed research is timely, relevant, and important.

The remainder of the paper is organized as follows: First, we illustrate the theoretical foundation. Then we develop the research model and hypotheses. We introduce the research design to conduct the study, then conclude the paper by discussing contributions, limitations, and future research directions.

Literature Review and Theoretical Foundation

Prior ICA Studies from Employees' Perspectives

Previous studies gave an understanding of employees' attitudes towards AI technology in the workplace. Ambati et al. (2020) employed a semi-structured interview approach to constructing a theory discovering the employees' attitudes toward AI technology. A qualitative study (Ugale, 2020) found that AI devices can reduce repetitive tasks and provide informational support to frontline employees. Extant empirical studies (e.g., Brachten et al., 2021) mainly use UTAUT (Unified theory of acceptance and use of technology) (Venkatesh et al., 2003) and TAM (Technology acceptance model) (Davis et al., 1989) to examine employees' acceptance towards ICA. Accordingly, we notice that most studies that have explored the impact of ICA on employees have been qualitative in nature; and moreover, extant empirical studies perceive ICA as a tool rather than considering human-like ICA as a digital workforce.

ICA Effects on Employee Outcomes

ICA forms through the integration of machine learning and natural language processing, which can simulate human intelligence. Particularly, ICA employs analytical skills and leaves tasks that require empathetic intelligence to human employees (Huang and Rust, 2018). As such, we posit that the human-

like capabilities (i.e., autonomy, learning capability, natural language dialogue capability) of ICA serve as factors that afford changes in the human-AI cooperation relationship and have significant impacts on employees (e.g., Asatiani et al, 2021; Brachten et al., 2021; Ambati et al., 2020) through changes in the employees' work experiences, e.g., reduction of repetitive tasks (Asatiani et al., 2021). Indeed, the enhanced cooperation relationship and work experience obtained from working with ICA can serve to improve employees' psychological status and the employees' attitudes towards ICA, e.g., enhancement in employees' perceived meaningfulness of work and job satisfaction (Ugale, 2020; Ambati et al., 2020). Subsequently, employees' psychological factors (e.g., job identity) lead to various job outcomes, e.g., an increase in work productivity through informational support (Lu et al., 2020; Ugale, 2020). Thus, these conditions confirm the importance of and reliance on ICA for employees' attitudes and firm success.

Identity Theory

Identity is an essential factor for understanding how people behave with respect to IT in embedded social contexts (Carter et al, 2015). Specifically, they developed a concept of IT identity, which perceive IT as part of one's identity. In their paper, they proposed an IT identity framework that suggests that IT characteristics may influence one's IT identity by impacting employees' work experience. We argue that there is a limitation in this "breakthrough" IT identity concept that it still considers IT as a technology, which does not perfectly suit our ICA's context considering ICA's human-like capabilities. Therefore, we extend Carter et al. (2015)'s IT identity framework to the context of job identity, by which we emphasize the role of ICA as a human-like coworker rather than a tool. This effect is rooted in the identity verification perspective (Burke and Reitzes, 1981), which suggests that the enhancement in work experience can enact the verification of identity (Stets and Burke, 2014), then can lead to competence-based self-esteem that forms the job identity (Craig et al., 2019). Notably, identity has attracted an increasing amount of attention in the IS research domain in different contexts, such as health information systems (e.g., Mishra et al., 2012).

Cooperation Perspective

A cooperation perspective was proposed by recent literature (e.g., Dang and Liu, 2021; Fraune et al, 2019) to capture the changes in the human-AI cooperation relationship caused by the new technology adoption in organizations, which is rooted in the competition and cooperation theory (Deutsch, 1949). Particularly, human-AI interactions can involve cooperation that evokes job assistance (Dang and Liu, 2021). Cooperation is a process whereby two or more individuals work together toward the attainment of a mutual goal or complementary goals (Deutsch, 1973). Changes in human-AI cooperation relationships are expected to influence employees' psychological factors and can be further used to evaluate how robots affect the outcomes of the work (Dang and Liu, 2021).

In line with this perspective, we use "enhancement in work experience" to capture the changes in the human-AI cooperation relationship caused by the introduction of ICA as a digital workforce. Particularly, employees who directly cooperate with ICA face significant enhancement in their work experience. For example, ICA mainly takes over monotonous tasks and forwards inquiries that require empathetic intelligence to employees (Huang and Rust, 2018). Therefore, employees can observe many critical changes in work practices including reduction of repetitive tasks and enhancement in the complexity of their duties (Ugale, 2020). Adapted from the job characteristics model (JCM) (Hackman and Oldham, 1975) which contains a couple of core job characteristics (e.g., autonomy, task variety, task significance, task identity, and feedback from the job itself), our construct "enhancement in work experience" has three dimensions: (1) enhancement in skill variety, (2) enhancement in job significance, (3) enhancement in job control.

Research Model and Hypotheses Development

Figure 1 depicts our proposed research model, illustrating the hypothesized relationships.

Figure 1. Research Model
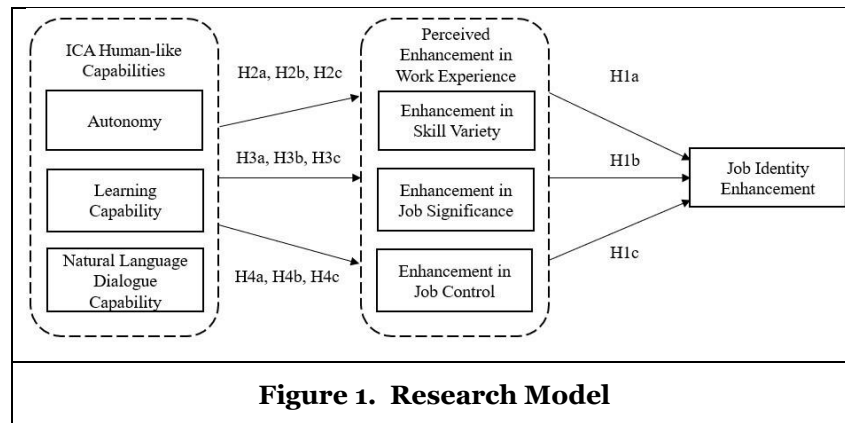
Impact of Enhancement in Work Experience on Enhancement in Job Identity

According to prior literature, the prerequisites for employees' identity change are: (a) the characteristics of IT, and (b) the working experience (Esmaeilzadeh, 2021; Carter et al., 2015). Changes in employees' work experience are likely to associate with employees' self-beliefs, which are likely to manifest in identity change (Mirbabaie et al., 2022). Job identity refers to the part of how people view themselves in their occupational contexts (Stryker and Burke, 2000). Thus, employees may experience enhancement in job identity when ICA is introduced as the assistive workforce. Particularly, IT identity enhancement refers to the desired effects caused by IT on people's self-beliefs (Craig et al., 2019).

In order to illustrate the mechanism for the impact of work experience on job identity, we leverage the view of self-esteem and the identity verification theory (Stets and Burke, 2014; Burke and Reitzes, 1981). The mechanisms of employees' identity being affected are often explained from the self-esteem perspective (Craig et al., 2019). Self-esteem refers to the assessment that people's self-beliefs are "capable, significant, and worthy" (Coopersmith, 1959). From the self-esteem perspective, employees develop an evaluation of what they are in their job; in this process, they develop a collection of self-beliefs in their role-based tasks which contributes to their overall self-esteem (Stets and Burke, 1994).

Indeed, employees' evaluation of self-esteem can be explained via the verification of identity (Stets and Burke, 2014; Burke and Reitzes, 1981). This perspective argues that when the jobs carry the meanings that are consistent with employees' role identity meanings, role identity is confirmed, then employees' perceptions of competence and efficacy increase. Specifically, enhancement in skill variety refers to the extent of employees' perceived enhancement in the variety of skills and talents required to complete the work, compared with working with human colleagues. Enhancement in job significance refers to the extent of employees' perceived enhancement in the meaningfulness and influence of their jobs, compared with working with human colleagues. Enhancement in job control refers to the increase in the degree to which employees can decide how to perform the job in an acceptable manner (Ganster and Fussilier, 1989). According to the principles of job control that spouts from the job design theory (Ganster and Fussilier, 1989), when employees feel strengthened in control of the job resulting from working with ICA, they will be more motivated and subsequently feel an enhancement in their job identity. Such an enhancement in job identity can be explained by the strengthened professional responsibilities caused by ICA's assistive roles (Mirbabaie et al., 2022). For example, Malik et al. (2022) documented that if employees have higher levels of person-organization fit, they will have higher levels of job satisfaction. Stock et al. (2019) pointed out that employees perceived behavioral control has a significant positive effect on their acceptance of ICA in an enterprise context. Users can expect enhancement in their efficacy-based self-esteem in the usage of ICA (Esmaeilzadeh, 2021). Taken together, when employees feel an enhancement in their work experience (i.e., enhancement in skill variety, enhancement in job significance, enhancement in job control), employees may feel an enhancement in self-esteem which may lead to evaluation of what they are in their job (i.e., job identity). Thus, we hypothesize that:

H1a, b, c: *The higher the employees' perceived enhancement in skill variety (H1a), enhancement in job significance (H1b), and enhancement in job control (H1c) caused by working with ICA, the higher the employees' job identity enhancement will be.*

Perceived ICA's Human-like Capability

As suggested by the literature, AI refers to "a growing resource of interactive, autonomous, self-learning agency, which enables computational artifacts to perform tasks that otherwise would require human intelligence to be executed successfully" (Taddeo and Floridi, 2018). Thus, considering the innovative introduction of ICA as a digital workforce, we identify ICA's communication capabilities and workplace-related capabilities as two categories of capabilities. Specifically, we identify two human-like capabilities, autonomy (e.g., Xiao and Kumar, 2021) and learning capability (Chen et al., 2022) that are unique to the digital workforce, and one human-like capability, natural language dialogue capability (Chen et al., 2022) that is unique to human-AI communication. Notably, we perceive ICA as a new coming colleague in the team rather than a tool; indeed, we believe that our focus on ICA's human-like capabilities stands this study out from extant IS literature that uses the TAM (Davis, 1989) to examine its ease of use and usefulness. Taken together, we believe these facets to be salient for employee-related smart work practices. Following Bala and Venkatesh (2013), we propose that employees' perceptions of ICA human-like capabilities will affect their perceptions of work experience.

Impact of Perceived ICA Autonomy on Work Experience

Perceived ICA's autonomy refers to the degree to which employees perceive the ICA can complete the intended tasks based on the current state and sensing without human intervention (e.g., Huang et al., 2021). ICA with a higher level of autonomy can fulfill more complicated tasks in a more uncertain environment with less human intervention, which is regarded as more helpful to coworkers, and thus can influence employee acceptance of a robot in customer service (Xiao and Kumar, 2021). As such, the autonomy of ICA allows ICA to complete simple tasks independently and releases employees from the work burdens caused by low-value, monotonous and strenuous tasks (Ambati et al., 2020), which enables employees to focus on tasks that require higher-level intelligence (e.g., interpersonal communication with customers) (Huang and Rust, 2018), and further, lead to higher job significance (Ugale, 2020). Particularly, ICA screen incoming requests, take over mundane inquiries, and forward inquiries that require employees to devise personalized solutions to customers. Thus, facing complex inquires and requests, employees change focus to performing value-adding tasks that require more various skills, and thus, they feel a higher sense of significance in their job roles (Ugale, 2020; Huang and Rust, 2018). This is especially true for frontline employees who need to handle bundles of strenuous incoming inquiries from customers. Moreover, ICA with autonomy to assist employees also enables employees to have more control over their jobs. Particularly, employees' control of the job is manifested by the decreases in decision latitude caused by the advancement of ICA's autonomy (Karasek, 1979). Therefore, we hypothesize that:

H2a, b, c: *Employees with higher perceived ICA autonomy will exhibit a greater perception of enhancement in skill variety (H2a), enhancement in job significance (H2b), and enhancement in job control (H2c).*

Impact of Perceived ICA Learning Capability on Work Experience

Perceived ICA's learning capability refers to the ability of ICA to inductively improve through data and experience in an automatic manner (Berente et al., 2021). With the support of big data analytics, ICA is expected to have the capability to learn and improve by itself. That is, after ICA onboarding with the embedded corporate systems, the company does not need to spend much further time training and improving it manually. This learning capability is a relatively newfound capability that is quite essential in recent fast-changing business environments. ICA's learning capability, which is reflected by the supervised simple inductive learning, requires human intervention in improving (Berente et al., 2021); as such, a higher skill variety and job significance can be expected by employees. Spouting from employability perspectives that empathize with the importance of expertise and skills (Bhargava et al., 2021), ICA's learning capabilities can strengthen employees' perceived job control through the strengthened skills and knowledge that they can provide to augment and assist employees (Hicks, 2014). Specifically, ICA with learning capability is able to acquire expertise and skills that allow ICA to enhance its ability as a digital workforce (Chen et al., 2022). The enhanced ability plays an important role in providing supplementary information to employees in the work practices. As such, ICA augments employees in the decision-making process (Dellermann et al., 2019). Based on the above discussion, we hypothesize that:

H3a, b, c: *Employees with higher perceived ICA learning capability will exhibit a greater perception of enhancement in skill variety (H3a), enhancement in job significance (H3b), and enhancement in job control (H3c).*

Impact of Perceived ICA Natural Language Dialogue Capability on Work Experience

ICA is supposed to be equipped with NLP (i.e., natural language processing) technologies that support the contextual understanding of human dialogues (Li et al., 2021). Perceived ICA's natural language dialogue capability is defined as the ability of ICA to understand the users' requests, and give proper responses with relevant information. Particularly, ICA with this capability can understand human dialogues and provide interactive conversations with users in a relatively accurate manner. ICA with natural language dialogue capability is expected to overtake simple communicative tasks and forward complex tasks that require "soft skills"; as such, employees need to exhibit skills of providing personalized responses under particular situations, which may lead to employees' sense of enhancement in their skill variety, and further, lead to higher job significance (Chen et al., 2022; Ugale, 2020). In addition, perceived natural language dialogue capability is found to facilitate users' interacting experience and further improve users' support for chatbot systems (Nguyen and Sidorova, 2018). Also, Song et al. (2022) posited that the communication capability of frontline chatbots is a major driver of service effectiveness and user attitude. Thus, by working with ICA with natural language dialogue capability, employees can feel a strengthened sense of control and power because ICA with such human-like capabilities can make a contribution to employees' service quality control (Chen et al., 2022). Taken together, we hypothesize that:

H4a, b, c: *Employees with higher perceived ICA natural language dialogue capability will exhibit a greater perception of enhancement in skill variety (H4a), enhancement in job significance (H4b), and enhancement in job control (H4c).*

Methodology

The proposed research model (Figure 1) will be empirically validated using a survey study. With the data from multiple-choice questions, we will be able to verify the causal relationships between the identified predictors and consequences and eliminate alternative explanations.

With the help of a global online market research firm, we will invite frontline employees in customer service in North America to participate in the survey pilot study (50 samples) and full-scale study (250 samples), based on the 10-times rule raised by Goodhue et al. (2012) that the sample size should be greater than 10 times the maximum number of model links in the model.

Participants need to have adequate experience in working with ICA within their firms. Thus, participants are recruited from customer-focus industries (e.g., telecommunication, banking, and insurance). At the beginning of the survey, we will ask participants their extent of experience and awareness about working with ICA within their firms and only those with sufficient direct work experience with ICA (e.g., frontline employees in customer service) will be allowed to take part in the survey.

To ensure content validity, measurement scales for the constructs in the proposed model will be selected from the previously validated scales. All constructs are measured on a 7-point Likert scale from highly disagree to highly agree. Perceived ICA's autonomy will be measured following Moussawi et al. (2021). Perceived ICA's learning capability and natural language dialogue capability will be measured following Chen et al. (2022). Perceived enhancement in job significance and perceived enhancement in skill variety will be measured based on Kuo et al. (2010). Perceived enhancement in job control will be measured by adapting from Bala and Venkatesh (2013). Perceived enhancement in job identity will be measured following Craig et al. (2019). Additionally, relevant control variables were included: employees' age, educational background, job title, years working in customer service, and when the company introduced ICA service (Raisch and Krakowski, 2021).

Since our analysis aims to test a theoretical framework that includes many constructs from a prediction perspective, and, considering the relatively small sample sizes in our study, we posit that the Smart PLS 3 software is appropriate to run the PLS-SEM analysis (Hair et al., 2019).

Discussion

Contributions

First, the focus on ICA's human-like capabilities stands this study out from extant IS literature that perceives ICA as a tool and uses TAM (Davis et al, 1989) to examine its ease of use and usefulness. Second, previous papers only reveal the surface drivers; indeed, rare papers moved further to explore the rooted psychological drivers underlying the employees' actions (e.g., job identity). Thus, our study is a novel addition to the ICA literature. Third, it reveals the mechanisms for the impact of ICA on employees' job identity. That is, from a cooperation relationship enhancement perspective, ICA performs as a cooperator on employees' job identity through work experience (e.g., enhancement in skill variety, job significance, and job control). Overall, to our best knowledge, this is the first known empirical study to conceptualize, operationalize and validate the concept of changes in work experience caused by ICA's human-like capabilities from a cooperative perspective, and to study its impact on employee job identity.

From a practical perspective, by extending the understating of ICA's positive impacts on employees' job identity, this research can help organizations to better manage the introduction and utilization of ICA as digital workers in online customer service and their work relationships with existing human employees. Firms can develop guidelines and training programs to boost employees' identity enhancement through the collaboration between employees and ICA. Additionally, our study provides a better understanding to firms of assessing conditions for ICA usage and value creation in frontline customer service. Industrial and organizational psychologists could use these findings to coach employees on "how" to make themselves employable, and advise organizations on "how" to fully utilize it in the workplace. Given the increased prevalence of ICA utilization in the workplace, and the opportunities and challenges facing firms in managing this new type of digital workforce, the proposed research is timely, relevant, and important.

Limitations and Future Directions

Several limitations should be acknowledged, and accordingly, future research directions are identified. First, employees' job identity can be affected by factors other than ICA capability and changes in work experience caused by adopting ICA. Therefore, the potential mediating and moderating impacts of other factors on job identity call for future research, such as employees' personality (innovative vs. conservative), knowledge of AI (high vs. low), and current job positions (high vs. low rank). Second, changes in employees' job identity can lead to further outcomes (e.g., organizational commitment, job burnout), which might be an interesting area to be studied furtherly. Third, we should be cautious that future advanced ICA's intelligence might have paradoxical consequences for employees, which deserves future exploration.

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