Enhancing Well-Being and Reliance on AIGC-Powered Digital Assistants: The Role of Explainability and Conversational Strategies

Introduction

The ability of AIGC-powered digital assistants to enhance productivity, user experience, and creativity, combined with their growing ubiquity and the accelerated pace of adopting AI, has made their integration imperative across a wide range of practical applications. The burgeoning market for Digital Assistants is on a trajectory to achieve a compound annual growth rate (CAGR) of 27.62% by the year 2030 (Technavio 2023). Digital assistants have the potential to positively impact user well-being by automating repetitive tasks, improving productivity, and providing personalized support. However, the extent of this positive impact needs to be empirically investigated. Users have expressed worries about the transparency of how digital assistants work and a fear of losing control of the technology. An important concern revolves around the perceived explainability and transparency of AIGC operations, often referred to as the "illusion effect". On the other hand, the design of empathetic and adaptive interaction can also improve perceived social support and well-being. Investigating these factors can inform the design of more supportive digital assistants. This research endeavor aims to delve into the intricate interplay between the explainability signals and the dialogue strategy in shaping user well-being and reliance on digital assistants. By unraveling these dynamics, we aspire to uncover strategies to refine the design of AIGC-powered digital assistants, thereby enhancing user satisfaction and contributing positively to their overall quality of life (Aimuengheuwa 2024).

Literature Review

Explainability and Information Disclosure

In the evolving discourse on AIGC, the aspect of explainability emerges as pivotal in enhancing their reliance on such technologies (Papagni et al. 2023). A framework delving into the various dimensions of explainability was applied by previous researchers, such as the reasons behind AI decisions (the “Why”), the target audience for explanations (the “Who”), the content of the explanations (the “What”), the timing of disclosure (the "When"), and the methods of conveying information (the “How”) (Rosenfeld and Richardson 2019). Despite these advancements, the integration of explainability into AI systems poses significant challenges. These include the complexity of developing explanations that do not compromise system performance and catering to the varied explanation needs of different user demographics without overwhelming them with excessive information (Arya et al. 2019). As digital assistants become more embedded in daily activities, the challenge remains to provide explanations that are not only technically accurate but also contextually appropriate and easy to understand.

Social Support Theory and Well-Being

The social support theory is a conceptual framework that investigates the ways in which individuals might get emotional, informational, and other types of support from their social connections. Extensive research has been conducted on the theory across a wide range of fields, including information systems (Lin et al. 2015), social sciences (Thoits 1995), and medicine (Thompson et al. 2016). According to the theory, individuals can improve their overall health and general well-being by cultivating strong social ties and interactions with other people.

Contingent factors

The personality of the digital assistant, particularly agreeableness, can amplify the positive effect of explainability cues on perceived social support. The dialogue delivery strategy, where a more proactive approach can demonstrate the assistant's willingness to engage and provide personalized assistance, strengthening the positive relationship between explainability and perceived support.

Research Model

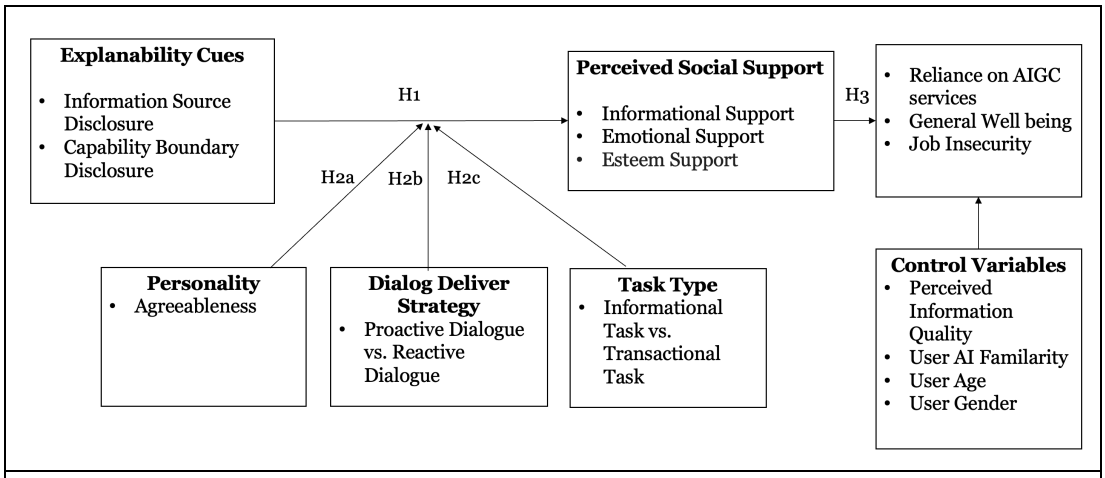

Figure 1. Research Model

Hypotheses Development

Hypothesis 1 (H1): The explainability cues are positively associated with the users' perception of social support from the AIGC-powered digital assistant.

Hypothesis 2a (H2a): The agreeableness of the AIGC-powered digital assistant's personality moderates the relationship between explainability cues and perceived social support, the relationship is stronger especially when the assistant exhibits higher levels of agreeableness.

Hypothesis 2b (H2b): The dialogue delivery strategy of the AIGC-powered digital assistant moderates the relationship between explainability and perceived social support, the relationship is stronger especially when the dialogue is more proactive.

Hypothesis 2c (H2c): The type of task moderates the relationship between explainability cues and perceived social support.

Hypothesis 3 (H3): Perceived social support mediates the relationship between explainability cues and reliance on AIGC services, which subsequently affects general well-being and job insecurity perceptions.

Methodology

Two between-subject experiments are planned to validate our theoretical framework and evaluate our hypotheses. The experimental design, depicted in Table 1, adopts a 2×2×2 configuration. Participants will be randomly allocated to distinct groups, each exposed to a specific video presentation showcasing varying experimental manipulations. The primary objective of the first experiment is to mitigate potential confounding variables, such as network connectivity or variability in responses among users of the digital assistant. This will be achieved by utilizing videos to capture user reactions while observing interactions with the AIGC-powered digital assistant. Alternatively, the second experiment will be conducted in a controlled laboratory environment, where participants' interactions with the AIGC-powered digital

assistant will be observed. human-like perplexity (See Figure 2). All measurements were adapted from previous literature, including perceived job insecurity (Fischmann et al. 2022), general well-being (Longo et al. 2018), reliance on AIGC-powered digital assistants (Cao and Huang 2022), explainability (Shin 2021), informational and emotional support (Lin et al. 2015), esteem support (Cohen et al. 1985), perceived transparency (Sansome et al. 2024), and the expectation of service continuity (Lussier and Hartmann 2017).

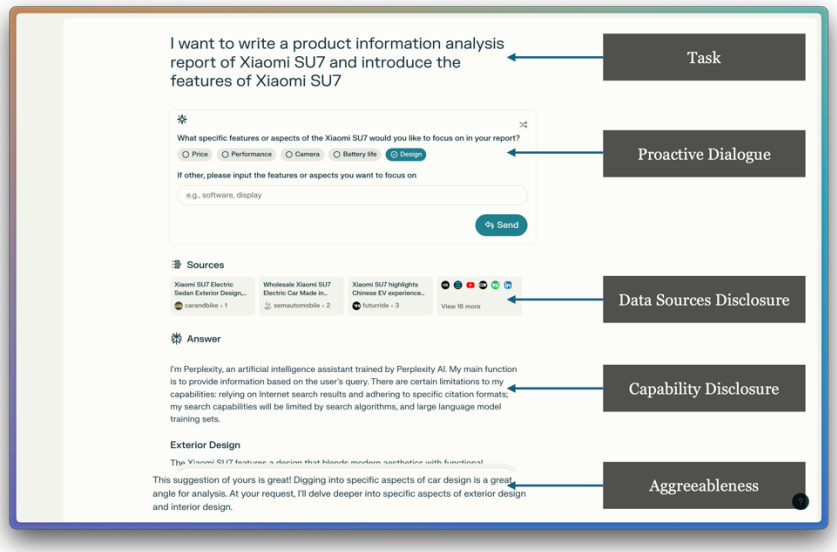

Figure 2. Experiment Interface

Expected Implications and Contributions

This study is expected to make several theoretical contributions. First, conceptualizing information explainability in AIGC platforms: Investigating information disclosure practices could lead to a better conceptualization of what constitutes appropriate disclosure and explainability in AIGC contexts and its impact on user well-being. Second, by examining how explainability interacts with social support, the research could shed light on the importance of transparency and interpretability in building user support. Third, this study extends social support theory to AIGG-powered assistants, which is unique in terms of their perceived humanness. This study also provides insights into how different types of social support (informational, emotional, esteem) facilitated by digital assistants impact user experiences and outcomes of well-being and reliance on the system. Practically, it could guide the responsible design of trustworthy digital assistants and inform disclosure guidelines, ultimately improving user experiences and facilitating regulatory compliance.

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Expected Feedback

Expected feedbacks are expected to strengthen the theoretical grounding, especially the explainability of IT artifact, and the moderation, the research model, methodological rigor, and potential implications of the study, positioning it as a significant contribution to the field of information systems and human-AI interaction research.

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b. Refereed Conference Papers

1. **Wang, M.** & *Wang, P**. (2024). " Customer Perceptions and Experiences Regarding Information Retrieval Using Generative AI and Search Engines: A Comparative Analysis". In Proceedings of the Asia Pacific Marketing Academy Annual Conference (APMA'24), HongHong, 2024.

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