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Antecedents and consequences of individuals' trust formation in artificial intelligence in Korea

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Antecedents and consequences of individuals' trust formation in artificial intelligence in Korea

1. Introduction

Since the mid-2010s, the rapid advancement of artificial intelligence (AI) has increased both people's expectations and their anxieties. Technology-centered optimism is largely widespread, hoping that AI will lead to a blessing of human life and society by maximizing productivity and efficiency. However, serious concerns, such as job substitution, deepening polarization, and human alienation reinforce society's skepticism of AI (Hurlburt, 2017). To achieve a hopeful and sustainable diffusion of AI, building human trust toward the technology becomes a very critical task. Some studies have stressed the role and importance of trust in the successful deployment and diffusion of AI-based applications (Choi and Ji, 2015; Hengstler et al., 2016; Mcknight et al., 2011). However, to the best of our knowledge, little or no attention has been paid to the antecedents and consequences of trust formation in AI. Therefore, against the background of Korean context, we aim to investigate the personal and technical factors influencing that trust formation, which in turn will impact individuals' value-perceptions on AI. We address this problem with three research questions.

- RQ1: What are the perceived technological factors that affect the formation of trust in AI?
- RQ2: What are the personal characteristics that affect the formation of trust in AI?
- RQ3: Does trust in AI affect individuals' value-perceptions?

2. Research model and methodology

We propose a research model to answer the research questions, as shown in Fig. 1. For this end, we first identify the relative importance of trust in AI technology, AI service suppliers, and AI social systems. We then verify how our trust is affected by knowledge

of AI, personal innovation, and openness to technology. We then examine the structural relationships among trust, value attributes consisting of benefits and concerns, and evaluation of AI.

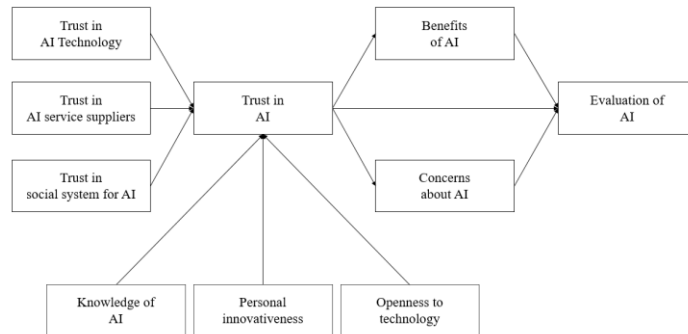


Figure 1. Proposed research model.

We review previous studies as theoretical backgrounds and create hypotheses appropriate for the research model presented in Fig 1. We adopt structural equation modelling as an analytical research method. For this, we construct a questionnaire based on relevant studies and five expert opinions, derived from personnel at universities, corporations, research institutions having AI experience. We collected 876 valid data items from individuals by commissioning a specialized survey company in Korea. Prior to the full survey, we conducted a pretest with 50 persons at universities and firms, and adjusted and revised questions based on those results.

3. Research results

The results of this study are summarized as follows. First, all three sub-elements had positive and significant influences on AI trust. Among those, trust in AI service suppliers was higher than the other two factors. Second, openness to technology only positively affected trust in AI. However, the relationship between knowledge and trust in AI showed an inverted u-shaped curve. The relationship between personal innovation and trust in AI is not statistically significant. In summary, persons with a low open-mindedness toward technology and either very low or very high levels of knowledge of AI had low trust. Finally, the higher the trust in AI, the higher the perceived benefits. There is a negative relationship between trust and perceived concern about AI. Trust, benefits, and concerns

all appear to influence individuals' evaluation of AI.

4. Conclusions

Theoretical and practical implications from our findings are as follows. First, for AI to gain trust in society, companies that provide services should work to build trust. Because AI is inherently a technology provided by service providers, it is difficult to build trust when the providers do not have transparent, fair, and reciprocal relationships with consumers (Lankton et al., 2015). Second, the existence of an inverted u-shaped relationship between the level of AI knowledge and the formation of trust is noteworthy. These results may be verified against the background of various innovative products and services. Therefore, theoretical and practical approaches between knowledge of technology and trust in technology are required to be developed and conducted in the contexts of various innovations including applied AI. Last, the formation of AI trust ultimately leads to consumer value perceptions and evaluation. Therefore, for sustainable adoption and diffusion of AI, the investment and participation of companies, government, and society in building the trust between man and automation are all very important.

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