

AI as a Leader – What Individual Factors Influence the Acceptance of AI Applications that Take on Leadership Tasks?

Deborah Petrat¹, Lucas Polanski-Schröder¹, Ilker Yenice¹,
Lucas Bier², and Ilka Subtil¹

¹Technical University of Darmstadt, Institut of Human Factors and Ergonomics,
Darmstadt, D-64287, Germany

²Lumics GmbH & Co. KG, Frankfurt, D-60549, Germany

ABSTRACT

In times of digital transformation and the rise of Artificial Intelligence (AI), there is a constant power struggle between technology and humans. Some companies are already discussing whether AI could take over management tasks or even replace managers as such. This study in form as an online survey with $N = 74$ managers and employees makes an initial contribution to this discussion by examining the acceptance and expectations of the potential user base on the adoption of AI technology in organizational leadership roles. It is found that technology affinity as well as commitment has an impact on the acceptance of AI managers. Most respondents were convinced that AI-powered leadership will change organizations in terms of new job profiles and new skills, however, they did not believe in a radical transformation any time soon. The obligatory requirements are to work as transparently as possible.

Keywords: Artificial Intelligence, Leadership, Leadership roles, Future of work, Expectations, Acceptance, Cognitive assistants, Transformation, Transparency

INTRODUCTION

Due to the advancing development of digitalization, Artificial Intelligence (AI) is no longer a future version. Through various methods, such as machine learning, it is now already possible to work with a large amount of data. The goal of AI development is to support people in the best possible way in both professional and private contexts (Buxmann and Schmidt, 2018). It is already capable of relieving managers in a company, for example, by allowing routine, steering and/or deployment tasks to be taken over by AI applications, so that managers have more time for their employees and can focus on the strategic development of their own area of responsibility (Manyika et al., 2017; Offensive Mittelstand, 2018). In the case of an AI manager, his or her successful integration will ultimately depend on whether employees and even other human managers will accept an algorithm's instructions (Sahota and Ashley, 2019). It will be critical to the subsequent successful implementation

of AI as a manager to determine what application-specific concerns exist and what specific expectations are placed on the design. This paper makes an initial contribution to this by examining the acceptance and expectations of the potential user base for the use of AI technology in organizational leadership roles.

Background

First, the term Artificial Intelligence is defined before it is set in the context of leadership. The chapter concludes with the research question and the hypotheses derived from the literature for this study.

Definition of AI

Since there is no generally applicable definition for human intelligence, there is also no such definition for AI technology (Buxmann and Schmidt, 2018; Mainzer, 2016). In research, a distinction is often made between weak and strong AI. Weak AI refers to targeted algorithms for specific, delimited problems, such as data analysis. Strong AI, in turn, refers to all approaches that attempt to map and mimic humans or the processes in the brain (Penachin and Goertzel, 2007; Searle, 1980). The last one is difficult for the current research as there are no strong AI technologies established yet which is why such a development is to be waited for according to some experts (Buxmann & Schmidt, 2018). As for this work, the focus will remain on the pragmatical weak AI within the (narrowly) defined context of leadership tasks.

AI and Leadership

The advanced state of the technology lets faster-growing companies want to use AI more for various tasks, including management-related tasks (Kiehne, 2019). The time saved is to be invested in motivating and inspiring their employees, identifying new market opportunities, and setting the right goals. In addition, forecasts show that most teams will be self-managed by 2027, making many traditional managerial positions obsolete (Allen, Root and Schwedel, 2017). In a Bitkom study in 2019, 40% of employees (N = 515 participants) said they would like AI to support their supervisors, and 30% even trust AI to replace them. When it comes to replacing employees, however, only 17% want AI colleagues. AI applications are already being used for management tasks, e.g. Klick, a company based in Canada, has automated most of its management and administrative processes to the point where it no longer relies on a human resources department (Moulds, 2018).

It is important to note that the focus is usually on the function of AI, with little or no mention of the impact on the workforce or the path to implementation. Instead, performance improvements and efficiencies are usually communicated. Therefore, it will be crucial to understand how acceptance is formed in the workforce and in management and what expectations exist in this regard.

Acceptance and Expectations of AI Leaders

There seems to be a gap between recognizing the potential of AI and implementing it (Fountain et al., 2019; Kolbjørnsrud et al., 2016). Lack of trust in the algorithm is often cited as a reason for this (McAfee and Brynjolfs-son, 2012). Therefore, the aim of this study is to investigate the expectations and acceptance towards AI as a leader. Applied to the context of this study, adoption refers to the intention of employees and managers to use AI in leadership positions. Thus, the research question to be investigated is: *What individual factors of human leaders and their employees influence the acceptance of AI as a leader?*

No matter how good a technology may be, the ultimate use and degree of success is always up to the user. One potential individual factor that affects the acceptance of such applications is technology affinity (Franke, Attig and Wessel, 2019). Therefore, the first hypothesis is that people with an affinity for technology have higher acceptance values with regard to AI as a leader compared to people with little affinity for technology.

In addition to a user's affinity, conviction about one's own abilities in dealing with technology could also play a role in AI acceptance. Neyer, Felger and Gebhardt (2016) call this factor technology commitment, i.e. the successful use of technology. Thus, commitment may contribute to the fact that future users are more likely to see the benefits of the new technology and are therefore more open to it. The second hypothesis derived from this is that people with a high level of technology commitment have higher acceptance values with regard to AI as a manager compared with people with a lower level of commitment.

Some researchers note that while older people are open to new technologies, existing barriers prevent them from acquiring the necessary skills (Melenhorst, Rogers and Caylor, 2001) because they encounter greater difficulties (e.g., overloaded user interfaces) (Kelley and Charness, 1995). Not only could age per se be critical to AI acceptance, but also the attitudes toward technology that result from age. This suggests that affinity for technology, which captures attitude, could mediate the effect between age and acceptance. Thereby, hypotheses 3: Older people have low acceptance values toward AI as a manager compared to younger people and 4: Age moderates the effect of technology affinity on the acceptance of AI managers can be derived from this.

The last individual variable relates to the position of the potential AI user in the organization. It would be informative to know whether there is a difference between the two user groups, i.e., employees (without management tasks) and managers. As described earlier in a Bitkom survey (2019) with $N = 515$ participants, 40% of employees would like support for their superiors in the form of an AI application. This implies a higher acceptance among employees without a leadership role. Thus, the 5th and final hypothesis is: Employees have higher acceptance values in relation to AI managers compared to human managers.

The expectations of future users were evaluated descriptively due to their subjective nature.

Method

The hypotheses are operationalized in a questionnaire that collects data on participants' acceptance and expectations of AI as a manager. The questionnaire is created in German language on the website of 'SoSciSurvey' and is based on literature-based findings and already established instruments. To survey the acceptance of the subjects, the technology acceptance model (TAM) proposed by Davis (1985) is followed by asking the perceived usefulness (PU) and the perceived ease of use (PEU). In the absence of concrete AI applications that embody the identity of an executive, three use cases from the corporate landscape are used as templates for the following scenarios. In formulating the texts, particular care was taken to use objective rather than advertising language in order not to produce bias.

1. Digital cognitive assistance in staff recruitment (inspired by Klick): AI is a special software in human resources to make objective decisions about staff recruitment. Besides, the AI can process all personal data obtained from the internet aggregated along with the application documents.
2. Digital cognitive assistance in supervision (inspired by B12): AI is a smart screen that supports the manager in recording and evaluating employee performance parameters to provide individual and true performance-based feedback.
3. A Physical autonomous system in strategy (inspired by VITAL): AI in the form of a robot that supports the manager in strategic activities and delegates tasks accordingly. It also has voting rights and participates in strategic meetings.

Sample

The sample was $N = 74$, including 34 women, 39 men and one participant who indicated a diverse gender. The mean age of the participants was 37.96 years ($sd = 12.65$). The majority of the participants were employed (72.97 %) whereas others were either civil servants (9.46 %), working students (8.11 %), or not working (6.76 %). 62.16% of all respondents had academic degrees and 21.62% were holding the German general qualification for higher education (A-level). The most represented industry was the finance and insurance industry, accounting together for 29.73 %, followed by the IT industry with 17.56 %, and the educational sector with 12.16 %.

RESULTS

First, the quantitative results regarding the acceptance of AI managers are presented. This is followed by the expectations of the subjects.

Technological Affinity and Commitment

Using linear regression, the influence of technological affinity, the conviction of technology control, the conviction of technology competence and the technology acceptance on the different acceptance measures was tested for the different scenarios separately. In scenario 1 none of the predictors were found

to predict the different outcomes, indicating that there is very little of a relationship between one's overall attitude towards technology and the acceptance of AI-driven recruiting software. These results differ from scenario 2, where significant predictors for PEU as well as PU were found. Having increased conviction of technology-related competencies predicted slightly higher PEU of AI supervision (t -value = 2.46, p = .016) while higher overall technology acceptance led to increased perception of the usefulness of such AI manager systems (t -value = 2.38, p = .021). The predictors explain 18% (PU) and 29% (PEU) of the outcome variance. In contrast, scenario 3, similar to scenario 1, showed no significance for any of the two TAM beliefs. This means that the acceptance of a physical implementation of AI Managers with strategic functions is not influenced by technology-related attitude and knowledge.

Age

With regard to age as a predictor, no significant relationship was found with any of the three scenarios or response variables. This means that for this sample and the age groups represented in it (the age range was between 21 and 67 years), age alone cannot predict the acceptance of AI as a leadership tool. Consequently, hypothesis 3 is rejected. However, mediation effects showed only a strong tendency for age to influence overall acceptance by TA (standardized indirect effect = -0.10 , p = .056). Consequently, hypothesis 4 is rejected.

Position in the Organization

Lastly, it will be investigated to what extent acceptance is influenced by whether the person has management responsibilities within the company. This is done by applying a two sample t -test, even though the sample size varies between both groups. Regarding PEU, no significant difference in means was found amongst the two groups for any scenario (scenario 1: t -value = -0.38 , p = .703; scenario 2: t -value = -0.04 , p = .965; scenario 3: t -value = 0.37 , p = .716). Same applies for PU (scenario 1: t -value = -0.62 , p = .539; scenario 2: t -value = 0.91 , p = .365; scenario 3: t -value = 0.18 , p = .857). Consistently, there is no significance to be observed if all scenarios were aggregated (PEU: t -value = 0.16 , p = .872; PU: t -value = 0.57 , p = .569). No significant effect was found for general acceptance as a dependent variable either, assuming whether someone has leadership responsibility or not (t -value = 1.46 , p = .149). Therefore, hypothesis 5 is rejected, implying that for the acceptance of AI managers it did not matter whether or not someone carried out management tasks themselves.

Expectations

Information about potential users' expectations for the use of AI managers was analyzed descriptively. When asked to what extent AI will impact leadership tasks in the coming years, the majority of 54.55% of respondents (n = 66) indicated that AI will change current leadership tasks and require new expertise. Less convinced about AI in a leadership context are 39.39% of respondents who indicated that AI will not have a fundamental impact on

current leadership tasks. Only a small share of participants (6.06 %) believed that AI would make current leadership roles obsolete.

CONCLUSIONS

The influence of individual variables on AI manager acceptance differed between the scenarios and the TAM constructs. Technology-related factors predicted higher acceptance for scenario 2 AI managers. In this case, participants who indicated more technological expertise or involvement in AI activities perceived AI managers as easier to use. However, technology affinity was not significant for acceptance of AI managers. As expected, the effect of age on perceived ease of use was mediated by technology affinity (for all scenarios and aggregated), such that older respondents had lower technology affinity and thus lower perceptions of the ease of use of AI managers. In addition, whether the user had managerial responsibilities or not did not matter for acceptance. Overall, most respondents had clear expectations about the impact of AI managers, i.e., that they will drive change (new jobs and skills) in organizations, but in a non-radical way. For most participants, AI managers need to operate as transparently as possible so that decisions can be tracked at all times. Respondents were convinced that AI managers can deliver productivity gains, so they are well suited for data-driven analytics and administrative work. However, they are seen as unsuitable for more interpersonal tasks, with most participants seeing a risk of dehumanization from AI managers. The first step has been taken, which now needs to be confirmed in a broad-based study.

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