

Towards Closing the Affordances Gap of Artificial Intelligence in Financial Service Organizations

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Abstract. Artificial Intelligence (AI) is considered being a disruptive force for existing companies and a promising avenue towards competitive advantage. A myriad of companies started investing in AI initiatives. However, a significant number of AI projects is not successfully deployed. Taking a closer look at financial service organizations, we aim at contributing to closing the gap between understanding the potential of AI and proactively leveraging the latter. We draw on affordance theory and socio-technical systems (STS) theory to identify the required socio-technical changes to actualize affordances of AI in financial service organizations. We present preliminary findings from a multiple case study approach with five financial service organizations based on rigorous interview coding that yields first insights into AI affordances. Building up on this, we will prioritize and structure future in-depth case studies to investigate how to orchestrate AI-induced changes in STS for actualizing AI affordances.

Keywords: Artificial Intelligence, Affordance, Socio-Technical Systems, Organizational Development

1 Introduction

Disruptive digital developments being rooted in advancements in Information (IT), data and analytics, or new business models such as digital platforms lead to a volatile, uncertain, complex, and ambiguous business environment [1]. Against this backdrop, also financial service organizations (banks and insurance companies) face challenges in remaining relevant actors in their service value networks. The advent of AI technologies, which are different to generic IT as they learn and adapt evolutionarily, is considered as one of the most disruptive and challenging forces for existing companies [2]. In this paper we refer to AI as systems that "[...] perform activities that we associate with human thought, activities such as decision making, problem solving, learning [...]" [3]. AI is considered being a promising avenue for increasing and maintaining competitive advantage given saturated levels of servitization and the omnipresent commodity trap, which is especially relevant for service-intense companies such as organizations in the financial service industry. Empirical work on investigating how financial service companies can be enabled to successfully leverage AI for competitive advantage is still nascent. Thus, we aim at contributing to closing

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the gap between understanding the potential of AI and proactively leveraging the latter towards successful deployment in financial service organizations. Intending to tackle this challenge, we draw on affordance theory and socio-technical systems (STS) theory to discover and structure the required socio-technical changes to actualize affordances of AI. To frame our research endeavor, we pose the following research questions (RQ):

RQ1: *Which affordances are associated with AI in financial service organizations?*

RQ2: *Which changes need to be induced in financial service organizations to actualize affordances of tasks conducted with AI?*

RQ3: *How do AI-induced changes need to be orchestrated in financial service organizations for actualizing the affordances of AI in different contexts?*

2 Conceptual Background: AI in STS and Affordance Theory

In line with [4], we combine socio-technical systems (STS) and affordance theory to one unified research lens that we use to develop a research design to study AI affordances and the required AI-induced socio-technical changes in financial service organizations. STS theory offers a comprehensive framework that distinguishes two subsystems (social and technical), which comprise four interrelated system components – task, technology, actors, and structure. These components allow to identify and describe the different dimensions and relationships for studying IS design and change in organizational work systems [5–7]. Regarding the social system, the successful application of AI requires firms to develop the right skills and capabilities at the right place in the workforce (**actors**) – e.g. developing technical AI solutions vs. developing business cases to leverage AI [8]. The integration of data scientists within the different business units of an organization is often proposed to quickly and effectively identify and test new AI application scenarios [9, 10]. Regarding organizational **structures**, the establishment of cross-functional collaboration is a major prerequisite of successful AI implementation [11, 12]. Especially the collaboration between business and IT is discussed in academic literature, as organizations have to combine technological and domain knowledge to leverage the potential of AI [8, 13]. Additionally, the company’s culture should be designed in a way that it facilitates a common understanding of the role of AI for the future success of the organization [14]. In the technical system, the implementation of the AI-specific technological infrastructure (**technology**) has to be considered. This comprises new capabilities to collect and analyze huge amounts of data [15]. On this technological basis, AI **tasks** such as recognition [16], reasoning [17], and prediction [18] become possible. By solving these tasks, AI ultimately increases organizational performance in terms of better decision making [17, 18], process efficiency [19], and new products and services [20]. The term “**affordance**” is rooted in Gibson’s work on perceptual psychology [21]. Gibson pointed out early the concept of “value in use” which postulates that an actor seeks interaction with an object for the reason of its specific value in a specific use context rather than the properties of the object [21].

Thus, affordances are context-sensitive and to be viewed as relational constructs [22, 23]. In IS research, affordance theory is a well-recognized research lens for studying the use of distinct IT artifacts in certain organizational contexts intending to investigate the interrelatedness of socio-technical systems [24–28]. Accordingly, we refer to affordances as opportunities for action which stem from the relationship between an actor and an object offering these opportunities to the actor [23, 29, 30]. We intend to investigate required organizational changes in actors, structures, and technology in financial service organizations, which are induced by the affordances of tasks offered as action opportunities by AI as our unit of analysis. Thus, we draw on affordance theory in combination with STS theory by integrating AI affordances into the STS theory as affordances of tasks in the technical subsystem.

3 Research Design and Preliminary Findings

We follow the case study method [31] to explore the affordances and outcomes associated with AI in financial service organizations and to identify required changes to actualize the latter. To this end, we employ affordance theory for identifying AI-enabled affordances perceived by decision makers in the financial service industry. We use STS theory as a structuring lens to capture outcomes provided by AI Technology and to identify the required changes in actors, structure, and technology. Accordingly, the chosen research design brings attention to the interplay of how actors and new technology might stimulate the actualization of such novel affordances [22, 23]. The case study method is useful for studying phenomena in context-rich environments over which the researcher has little to no control [31], and where only limited theory is available to guide the research [32, 33]. We follow a multiple case selection strategy, and select five financial service organizations to study how affordances can be actualized in different organizational contexts. In a first step, we purposefully select Swiss banking and insurances organizations to enhance potential variation of AI affordances between the cases while maintaining comparability through similar market and regulatory conditions. In this phase, we only include organizations, which have already implemented AI information systems. Our data collection is guided by our theoretical pre-understanding [31]. Firstly, we aim for gaining an overview of perceived AI affordances. To this end, we initially conduct semi-structured interviews following a predefined guideline [31] with Chief Information Officers (CIOs) and managers reporting to the CIO within each organization. The interviewees' broad perspectives on their organization shall be seized to understand the case contexts and to identify entry points for case study deep dives.

The initial case data analysis is based on 69 pages of six rigorously transcribed interviews that are coded by three researchers in selective coding [34]. To justify and motivate our future research we present a first high-level conceptualization of AI affordances and required socio-technical changes here: We structure AI affordances along three dimensions: customer facing front-stage perspective, internal process (back-stage) perspective, and product and services (outcome) perspective. From a

customer facing perspective, AI affords the generation of deep customer insights for tailoring customer channels. Thus, AI affords to enable a higher level of individualization, which is especially important in the financial service industry. On an **internal process-level**, interviewees stated that they expect AI to afford an increasing quality of data analysis, improving internal routing of information, which is essential to financial service companies in order to run efficient business processes, and reducing internal bureaucracy. This implies that in the end employees have more time for priority tasks as support tasks are performed by AI. From an outcome-oriented **product and services perspective**, AI is perceived to afford the enablement of innovation endeavors, which is interlinked with sourcing of new revenue channels as it affords to make data useable as a key resource to a company's business model. We also observed a preliminary set of required socio-technical changes that are induced by AI affordances of task. We structure the latter along the remaining sub components of socio-technical systems: Regarding **actors**, interviewees stated to face the challenges of establishing a mutual and cooperative AI mindset between IT and business units to break up AI silos and establish a company-wide AI culture. Besides changing mindset and culture, also the internal diffusion and build-up of AI skills among employees is a pressing issue, especially in the context of the "war for talents". Thus, companies intend to invest in internal trainings for increasing AI capabilities from the inside of the company. In the subcomponent of **structure**, AI requires the mutual team performance of business and IT units. Thus, the interviewees see the need to design and employ mediation processes between IT and business units to foster communication and mutual goal setting. Furthermore, creating a skill development strategy tailored to AI is structurally required. Finally, processes for identifying AI use cases in a structured manner pose structural difficulties to financial service organizations. This goes along with idea creation and selection processes tailored to AI endeavors. From a **technical** perspective, there need to be adequate mechanisms in place for individual handling of exceptions in AI outputs as especially in the insurance and banking industry customers are sensitive when it comes to unintended flaws in service delivery processes. Additionally, all interviewees face the necessity to induce technical changes for managing the training effort of AI models required to fully leverage the learning capabilities of AI.

4 Conclusion and Outlook

It is our overall research goal to contribute to closing the gap between understanding the potential of AI and proactively leveraging the latter towards successful portfolio integration in financial service organizations. Thus, we seized the opportunity of this short paper to lay out our multiple case study approach as a research design towards achieving this goal, drawing on affordance theory in combination with socio-technical systems (STS) theory. We present first preliminary findings from six semi-structured interviews within five organizations. However, our research is yet in an early stage: Investigating the case-specific relations between single affordances, particularly required socio-technical changes in actors, structure

and technology, and the actualized outcomes are the next steps of our research project. Based on the initial orientation interviews, we will lay out our future in-depth case studies such as extending our set of interviewees to AI project managers responsible for interdisciplinary teams, and extending the set of cases to grasp variation in culture, and variation in success or failure of respective AI initiatives in financial service organizations.

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