The Effects of AI-Human-Interaction to Value Creation in Multi-actor Systems: How AI Shapes Digital B2B Sales

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ABSTRACT

Artificial intelligence (AI) has been recognized to be the most disruptive technology in the next ten years. The disruptive potential of AI is based on enhanced data processing capabilities which enable broader task automation but also allows AI to change its behavior based on user input. Simultaneously with AI development new platform-based business structures have gained traction and disrupted traditional pipeline business models. Platform business models rely on digital infrastructures to connect the supply and demand. AI has great potential to enable efficient resource allocation in these kinds of systems and in that way enhance the potential of value creation. Despite this complementary condition between AI and platform-based business, no academic understanding concerning the intertwinement of AI technologies and platform structures has yet been published. This position paper introduces five research areas which help us to understand AI enhanced value creation in B2B sales platforms through technology interaction.

CCS CONCEPTS

• **Applied computing** → **Marketing** • Human-centered computing → Interaction techniques • Human-centered computing → Interactive systems and tools • Human-centered computing → Empirical studies in HCI

KEYWORDS

Artificial intelligence, ecosystems, multi-actor business processes, platform economy, value creation, sales, selling

1 INTRODUCTION

Advances in big data analysis and artificial intelligence (AI) give companies the opportunity to offer more scalable and personalized services with higher quality than never before [22, 127]. AI technologies have been on the top of the Gartner's hype cycle since the year 2016 [10; 11; 12] and AI has been forecasted to be the most disruptive technology in the next ten years, generating over 5 trillion USD of business value in 2025 [24]. According to Deloitte's report [8], the potential of AI is related to new cognitive insights based on revolutionary data processing which implementation possibilities are cross-cutting to all business processes from product development to sales.

Simultaneously with AI development new platform-based business structures have gained traction both in practice and in academic research (e.g. circular economy, crowdsourcing, sharing economy). Because of the increasing interest [15;7;3] and the multi-actor nature of these new forms of business, it can be argued that platform type structures will be a remarkable domain for the implementation of AI solutions. Efficiently operating systems consisting of multiple independent actors rely heavily on high-performance data solutions capable to allocate information and recourses between platform actors [9]. Despite this complementary condition between AI and platform-based business, no academic understanding concerning the intertwinement of AI technologies and platform structures has yet been published. The purpose of this position paper is to create a framework for sketching possible research areas studying the interaction between AI and human actors in multi-actor systems from the perspective of B2B sales.

B2B marketing and sales literature have recognized the importance of machine learning (ML) and AI tools. Areas for AI examination include but are not limited to predicting customer purchasing behavior [5], production decision making [6], supply chain management [17], e-commerce [19] and global marketing [20]. Syam & Sharma [23] describe "Sales Renaissance" where AI and ML will transition the focus of sales to new inter-organizational functions. Tough this inter-organizational nature of AI development has been recognized, extant research [5; 6; 17; 19; 20] have focused more on the effects of AI to intraorganizational processes. This position paper examines this research gap by focusing on multi-actor systems and highlight the active role of the customer and the technology in value creation.

2 VALUE CREATION

This position paper focuses on B2B value creation and examines how digitalization and AI tools can enhance value creation in sales processes taken place in systems consisting of multiple actors. An underlining change in marketing and business literature towards a more customer-centric value conception can be identified. Vargo and Lusch [25; 26] recognize the customer as an active participant in the value creation process. They emphasize that value is created in use and determined by the customer. Lusch et. al. [21] continue that the role of the firm is to support the customer's value creation processes. Because value is created in customer-product or customer-service-interaction, companies can thus only create value propositions, not value itself [21]. Value is created when the customer interacts with value proposition presented by the company.

This co-creational value conception has been widely accepted [14]. Lariviére et al. [17, 241] mention withdrawing money from ATM and use this as an example of value co-creation. The customer creates value by interacting with ATM and thus works as an enabler in this service encounter helping technology to fulfill its role [17, 241].

This position paper adopts the co-creational value conception described above, where value is created by the customer, through customer-product or customer-service interaction. Like Lariviére et al. [17, 241] pointed out, technology can play an important role in these interactions. The focus of this paper further emphasizes the technology's importance. In multi-actor systems, interactions mostly take place in digital platform consisting of multiple technologies and tools to enable and effect to communication.

3 TECHNOLOGY INTERACTION AND AI

Technology interactions and AI plays an ever-increasing role in B2B business operations and value creation. Like in the Lariviére's et al. [17, 241] ATM example value creation between the customer and the provider can happen through technology interaction. Technologies can be considered as a tool to enable and enhance customer-provider-interaction in different circumstances. In this

view, technologies are seen rather as a tool than active participants in interactions. In case of non-AI-technologies, this perspective is well justified because the interaction only influences the actions of human participants. The fundamental way of how technology works maintains nonchanged regardless of the content of the interaction.

When AI technologies are taken into consideration the presumption of the nonchanging nature of the technology isn't in all cases any longer valid. One practical example of this is Microsoft's Twitter chatbot, Tay. Tay was designed to engage in interactions with Twitter users. The purpose of Tay was to experiment conversational understanding and create technology which would get smarter while engaging conversations with other users [28]. Every interaction Tay participated in, changed the way the bot acted in subsequent interactions. This led Tay to tweet controversial and improper tweets and Microsoft shut down the bot after less than 24 hours from its launch [28].

4 ECOSYSTEMS

Ecosystem approach offers ideal background for examining systems consisting of multiple actors and technological interfaces. Ecosystem approach has lately gained a lot of traction in business literature [2]. The approach emphasizes the systemic nature of business and underlines that the creation of value and value propositions take place in processes consisting of multiple actors and resources [16]. Ecosystem approach considers technologies and corporations to be part of a wider entity consisting of multiple stakeholders and institutions [1]. The approach shares multiple conceptual similarities with platform literature. Platforms are for example described as enablers of value co-creation and exchange among multiple actors [4; 13].

Extant literature doesn't share one established definition for the ecosystem and multiple different ecosystem streams can be identified [2]. In this position paper ecosystem approach has been raised to examination because of its emphasis on systemic and multi-actor nature of business [16] and embedded way of seeing technology [1]. In this paper ecosystem approach is used as a lens through which the structure, consisting of multiple actors is seen. The position paper sees platforms similar to Basole and Karla [4], as a digital infrastructure which enables value co-creation and exchange among multiple actors.

5 VALUE CREATION IN AI ENHANCED BUSINESS PLATFORMS

Interaction between different platform participants usually takes place in some form of digital infrastructure. Thus, platform participants do not usually interact with each other, but through different platform technologies. This is also the case in B2B sales ecosystems. This means that in AI enhanced platforms both the creation of value proposition and the creation of value are partly formed through the interaction between the platform actor, AI

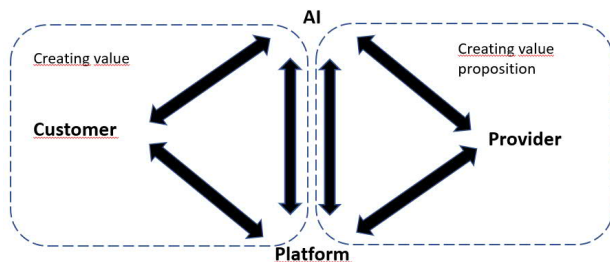and the platform infrastructure. This has been presented in figure 1.

Figure 1: AI and the creation of value and value propositions in B2B sales ecosystems

Figure 1 adapts Vargo's and Lusch's [25;26] concept of value co-creation and has been divided into two sections, the left of which describes customer's interactions required for value creation, and the right provider's interactions for value proposition creation. AI has been separated from other platform technologies because of its possibility to change its behavior after engaging in interactions. This separation is partly problematic because different AI tools vary greatly in terms of their properties and intended use. Others can more clearly be seen as separated entities from other platform technologies, like Microsoft's Twitter chatbot Tay, where others are more embedded by nature, like recommendation algorithms or search functionalities. Regardless of the intended use of AI, this paper sees the ability to learn from and alter behavior based on previous input as a separating factor between AI and other platform technologies but recognizes that this separation should be more thoroughly examined in future research.

6   RESEARCH AREAS

From the extant literature about value creation and ecosystems and the AI's possibility to change its behavior based on interactions it has participated in, we can point out five research areas, understanding of which are crucial when our aim is to describe the value creation in digital, AI-enhanced systems consisting of multiple independent actors. Framework presenting these five research areas is provided in paragraph five, where value creation is described through five different interactions taking place in B2B sales ecosystem. Research areas presented in paragraphs 6.1 – 6.5 focus these specific interactions more closely. Research questions provided for each area are meant to demonstrate the possible content of the area, and should thus be regarded more as examples, not limitations.

6.1   Area 1: Customer-AI-Interaction

This research area focuses to understand human-AI-interaction in value creation. The topic can be divided into two narrower areas: 1) how does the use of AI and automation effect on customer behavior and 2) how does the customer input effect on AI on its subsequent interactions.

6.2   Area 2: Customer-Platform-Interaction

This area examines the customer interaction with non-AI components of platform infrastructure. The area takes a broader perspective to customer behavior and focuses on questions like 1) which technologies customer prefers when interacting with the platform, 2) with which value propositions of the platform customer interacts the most or 3) what the key touchpoints in customers value creation process in the platform are.

6.3   Area 3: Provider-AI-Interaction

Third research area concentrates to provider-AI-interaction. It shares similarities with area 1 but focuses to examine the creation of value propositions rather than the creation of value. Relevant research questions might for example include 1) how does the automation of one part of the value proposition creation process effect on the process in general and 2) how does the input of the provider effect on the behavior of AI.

6.4   Area 4: Provider-Platform-Interaction

Area 4 focuses on the provider's actions in the platform. Just like area 2 on the side of value creation, area 4 takes a broader perspective by examining the provider-platform-interactions. Research questions might include following: 1) which technologies individuals in provider's organization use when interacting with the platform, 2) which resources of the platform are most commonly interacted with and 3) which the key touchpoints in providers value proposition creation process in the platform are.

6.5   Area 5: AI-Platform-Interaction

The last research area focuses on understanding the interaction of AI and non-AI components of the platform. The area focuses on finding optimal ecosystem structure and examines the intertwinement of the value creation and the value proposition creation. It could for example study questions like 1) how to organize data and the teaching of AI in the platform or 2) How to balance between conflicting needs of actors.

7   RESEARCH DESIGN

Research questions sketched in five research areas above are mostly qualitative by nature. The focus of the questions is to understand *how* AI will affect to the value creation and value proposition creation processes in multi-actor systems and *describe* the logic of value and value proposition creation in multi-actor systems. Though the focus of these questions is mainly qualitative, quantitative data shouldn't be disregarded. Quantitative data can reveal qualitative patterns and should thus be treated with equal importance. Data gathered for research areas presented in chapter 6 should consist but not limit to following entities: 1) data describing customer behavior in platforms 2) data describing provider behavior in platforms and 3) data describing actor input and AI output in different stages of the value creation or the value proposition creation processes.

Entities one and two should consist of the data describing the subjective experience but also the objective description of the interaction. Data from subjective experience could be gathered with interviews and questionnaires performed to platform participants whereas objective view could be extracted using digital tools mapping customers and providers actions on the platform. The data for the third entity would mostly consist of the data gathered with digital tools but could also be widened by AI experiments or documenting AI related R&D work.

8 INTENDED CONTRIBUTIONS OF RESEARCH AREAS

"Without a thorough understanding of the interaction concept, the locus as well as nature and content of value co-creation cannot be identified. Value co-creation easily becomes a concept without substance." [14, 279]

By covering the research topics described in this position paper we can create a thorough understanding of interactions taken place in multi-actor-systems from the perspective of value creation. This will help us to describe value co-creation in a relevant manner but also create new knowledge for AI developers and implementors considering interactions between human and AI. Concrete research results might include but will not be limited to 1) a general model of human-AI-interaction which considers both the aspects of AI learning and possible change in human behavior, 2) a model for customer value creation in multi-actor-systems, 3) a description of the effects of AI to organizing forms of the provider 4) a model for provider value proposition creation and resource use in multi-actor-systems and 5) a model for intertwining of value proposition creation and value creation in multi-actor-systems where AI is used to enhance platform performance.

The extant literature has already identified the customer's active role in the value creation process (e.g. [14; 18; 21; 25; 26]). Research areas introduced in this position paper contribute to the literature stream of value creation by emphasizing technology's and especially AI's active role in the value co-creation and describing value creation process in multi-actor systems. In addition, research areas introduced in this position paper will contribute to the literature stream of B2B sales and marketing by broadening the focus of AI-examination from intraorganizational processes [5; 6; 17; 19; 20] to multi-actor-systems.

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