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Organizational Capabilities in Emerging Blockchain-Enabled Platform Ecosystems: A Single Case Study of an Asset Tokenization Trading Platform Ecosystem

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Organizational Capabilities in Emerging Blockchain-Enabled Platform Ecosystems: Insights of a Single Case Study

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Abstract

Ecosystems are emerging in almost all sectors. In the banking sector, they enable the disruption of traditional value chains and the emergence of entirely new types of value creation settings. Actors who engage in such constructs need specific organizational capabilities. This is especially true when particular technologies, in the presented case blockchain technology, are used to enable collaborative value creation between actors. We extend organizational capabilities as previously described in the context of platform ecosystems. For this purpose, we conducted a longitudinal case study of the Swiss blockchain-enabled platform ecosystem in the financial services sector. We analyzed the data using the theoretical perspective of organizational capabilities. Initial results confirm the organizational capabilities but indicate a different distribution reflecting the development stages of the ecosystem. Furthermore, the first new organizational capabilities could already be identified.

Keywords

Blockchain-Enabled Platform-Ecosystems, Organizational Capabilities, Asset Tokenization

Introduction

Nearly all sectors are touched by the emergence of ecosystems. From manufacturers, software vendors, and banks, value chains have become broken up and more oriented towards customer needs requiring a new form of efficient coordination to create products jointly with additional actors (Schreieck et al., 2021). Hence, the transformation from traditional value-creation settings, where one organization was the sole provider, is evident. To handle complexity, these actors often leverage new technologies to operationalize IT platforms more efficiently. One innovative enabler is blockchain technology (BT). It relies on a network of separate computing devices, so-called nodes that interact without the mediation of a central party. The distributed logic of blockchain (cf. smart contracts) not only provides the ability to share data between entities but also enables shared process models to facilitate collaboration (e.g. Risius & Spohrer, 2017).

For actors engaging in these new value-creation settings, stated as ecosystems and to be elaborated in the following, we assume that new capabilities are necessary. Using BT to enable efficient joint value creation, for example, can create not only technical but also organizational challenges in the ecosystem (Spohrer & Risius, 2022). Creating services on a joint basis might require a common vision of the people while operationalizing value delivery is dependent on effective processes and the right provision of resources (Valkokari, 2015) Financial services may need specialized capabilities in contrast to other industries. Markets – in our case, the Swiss financial market - are highly regulated, and new services require proactive engagement with regulators early in the process (Gomber et al., 2017).

Ecosystems are a well-known area in management and IS research that focuses on the study of distinct elements and their interconnections (Adner & Kapoor, 2010; Jacobides et al., 2018; Schreieck et al., 2021). Various concepts have emerged (e.g., business ecosystems, platform ecosystems) that describe the relationships between companies for accomplishing overarching business objectives collaboratively (e.g. Adner, 2017; Moore, 1993). Existing research on organizational capabilities in ecosystems typically applies an inter-organizational perspective on value creation between companies (Autio & Thomas, 2018; Schreieck et al., 2021). But the study of technology use and the specific capabilities involved are often neglected. As the central subject of study, we want to provide this integrative perspective on capabilities using blockchain in ecosystems.

We extend the initial understanding of organizational capabilities proposed by Schreieck et al. (2021), considering specific technology. By defining ecosystems as value-creating systems using an IT platform specified by BT with two or more entities, value is generated through IT-supported processes (Zavolokina et al., 2020). To understand the necessary capabilities of value co-creation and capturing in such networks, we address the following RQ: *What capabilities do companies need to enable and balance value co-creation and value capture in emergent blockchain-enabled platform ecosystems (BEPE)?*

To answer the research question, a case study research method was chosen, and a single-case design was applied (Yin, 2009). By presenting first insights as preliminary results, we support practitioners from innovation and strategy to anticipate transformation and overcome internal resistance in enabling value creation and value capturing throughout the lifecycle of blockchain ecosystems. This study contributes to research by expanding the scientific knowledge base with an integrative view of emerging capabilities and providing a foundation for future capability development and distribution across the different stages of the platform ecosystem.

Theoretical Background

Organizational Capabilities

Intangible resources, such as capabilities, skills, and knowledge, gained importance in recent years, which also reflects in IS research. Knowledge-based views of the firm have emerged, limiting the resource-based view (Dosi et al., 2001). Research on the knowledge-based view sees that organizational capabilities lead to competitive advantage (Teece & Pisano, 1994). These capabilities are generally defined in the literature as the ability of an organization to design, implement, and use its resources (Amit & Schoemaker, 1993), or the ability to achieve an intended outcome (Dosi et al., 2001).

There are different views in the IS literature about the role of IT in organizational capabilities. (Ravichandran & Lertwongsatien, 2005). For instance, IT is regarded as a resource, while human and relational resources are essential for leveraging IT (El Sawy et al., 2010). Recent studies have also explored organizational capabilities within digital platform ecosystems and co-value creation (Schreieck et al., 2021). Figure 1 offers an overview of organizational capabilities in IS research.

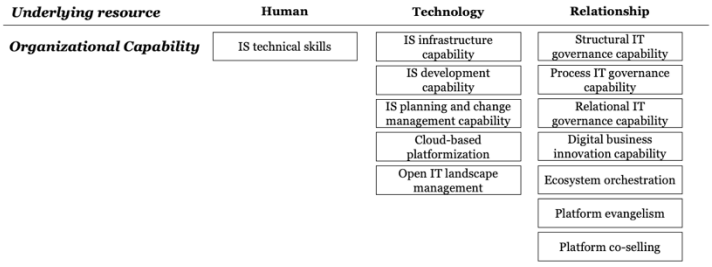

Figure 1: Overview of the Organizational Capabilities in IS Research following Schreieck et al. (2021, p. 369).

The organizational capabilities with humans as resources are seen as the ability to use existing IT (Ravichandran & Lertwongsatien, 2005). Regarding technology as an underlying resource, various capabilities are seen, such as the capabilities relating to the development of IT systems, the IT infrastructure, or IS planning and change management (Bharadwaj, 2000). Further, capabilities are seen that have a relationship as an underlying resource. These capabilities relate to relationships within an organization or

with external partners. The capabilities relate to the structure and process governance and the coordination of the relationship. In the context of digital platform ecosystems, the ability to jointly drive business innovation, the orchestration of an ecosystem, the joint co-selling, and the ability to create a shared vision are also seen (Schreieck et al., 2021).

As we will argue, BEPEs, build on connecting different actors that align to co-create value. For enabling value creation in such settings based on BT, specific organizational capabilities are considered necessary.

Ecosystems and Blockchain

The concept of organizations that work together to enable joint value creation in building customer facing solutions is known as **ecosystems** (Moore, 1993). Organizations in ecosystems jointly create value without a formal contractual base (Adner, 2017). We consider an ecosystem with regard to a central element – a digital platform – and the actors that align around it which is then considered as **digital platform-ecosystem** (Hein et al., 2020). A digital platform is the "extensible codebase of a software-based system" (Tiwana et al., 2010, p. 676). We propose to consider a further extension of this by specifying the technology that does enable the ecosystem considering **blockchain technology**.

The definition of **blockchain** is an often controversial and subjective debate in research (Butijn et al., 2019). Core of all blockchain definitions, nevertheless, is the same: a blockchain serves as a transaction-based, chronological, immutable, and synchronized distributed database or public ledger shared by participants in a peer-to-peer network without relying on an intermediary or central authority (e.g. Risius & Spohrer, 2017).

We follow authors like Riasanow et al. (2018) by combining the idea of ecosystems with the technological perspective of blockchain. But we specify the idea of an ecosystem as platform-ecosystem build on BT and propose to name it here a **blockchain-enabled platform-ecosystem (BEPE)**. In addition to the digital platform, actors and their connection form the BEPE. In the research on hand, we turn to analyze the capabilities of organizations which are necessary for engagement in BEPEs.

Research Design

To answer the research questions, a case study research method was chosen, and a single-case design was applied (Yin, 2009). This study uses a case-based approach because it aims to understand and explain a particular phenomenon and build theories about it (Myers, 2013). The case study method is particularly suitable for examining a current event that cannot be easily studied apart from its surroundings (Yin, 2009). An in-depth analysis of a blockchain ecosystem helps to understand the processes, how an ecosystem evolves, and which capabilities are needed.

Case Context

Bank A and *TokenVenture* developed a blockchain-based platform in cooperation with additional partners. It enables the tokenization of securities from Swiss SMEs for new process improvements (e.g., instant-settlement, automated management of shareholder register) and novel market opportunities across issuance, transfer, and storage of digital assets. It is considered the core of the BEPE. *Bank A* is one of the largest banks in Switzerland, with more than 1,200 employees, and has existed for more than 150 years. Besides its banking offerings, it operates a trading platform as a market leader in unlisted securities. *TokenVenture* was founded in 2018 and currently employs more than ten people. The digital venture operates a tokenization platform on its own and provides services to digitize shares of Swiss SMEs, where processes (e.g., capital increases) are facilitated and conducted more efficiently.

Bank A's platform is based on a public permissionless blockchain, whereby Bank B and its trading platform, together with a software provider, ensure the custody of the corresponding cryptographic keys. Further, all modules are technically integrated via an open architecture and comply with existing regulatory standards. The platform was initiated and developed by *Bank A's* subsidiary *InnovationVenture*. The first proof-of-concept was developed by *InnovationVenture,* and the platform was subsequently handed over to *Bank A*.

The technical platform of *TokenVenture* is based on a public permissionless blockchain to fulfill data protection and confidentiality requirements. The legal framework for tokenizing the shares was developed

in cooperation with various legal experts. It is assumed that the usage of blockchain will bring significant efficiency gains and the potential to automate post-processing further.

Data Collection and Analysis

Data collection. We collected data with *Banks A & B*, *InnovationVenture,* and the *TokenVenture* from April 2021 to October 2022, drawing on multiple sources, such as interviews, workshops, and internal and external materials to triangulate our data sources (Yin, 2009). We conducted a total of 18 semi-structured interviews using a guide to capture the participants' experiences. To identify suitable interview partners, we first spoke with our three contacts (project manager *Bank A*, CEO *TokenVenture,* and CEO *InnovationVenture*) to gain access to the essential players in the ecosystem. Subsequently, we followed a snowball strategy to have a broader range of interviewees. Before each interview, we gathered articles and publicly available material related to that firm, and the interviews were subsequently transcribed. In addition, we collected additional internal and public archival data, such as documentation, press material, and blog posts.

Data analysis. In analyzing the data, we took an iterative approach, coding the data with increasing degrees of abstraction and reflection in light of theoretical assumptions (Klein & Myers, 1999). From the beginning, we were interested in how the blockchain ecosystem emerged and what capabilities were needed. Therefore, we built on the relevant literature on organizational capabilities to code the capabilities. We concluded our analysis by interpreting the results based on our theoretical understanding and existing knowledge of organizational capabilities. In particular, we considered the contribution of Schreieck et al. (2021), who studied capabilities in an ecosystem. In the following section, we present the preliminary results.

Preliminary Results

The preliminary results suggest that organizational skills were an important factor in the emergence of the digital asset ecosystem. On the one hand, IS technical skills were of particular importance in conceptualizing the platform based on BT. The skills to develop the technological solution seemed to be partially relevant. The basic technological components were available, such as Bank A's basic trading system, and it was possible to draw on established partnerships for development. But specific components related to BT had to be fundamentally redeveloped. In the relationships, the ability to develop new business innovations and to introduce these into the existing governance structures and processes seemed to be particularly important. In particular, the novelty of the technology and the new regulatory framework created areas of tension. In the initial analysis, we found that different organizational capabilities were needed at different points in time during the development of the ecosystem. We would like to examine this temporal aspect in more detail in further research.

Furthermore, the preliminary results show that the ability to share knowledge in an ecosystem and to build it together played an essential role in its success. The actors have knowledge in different areas (regulatory, technical, and financial industries). The ecosystem actors invest much effort in sharing knowledge, creating a common knowledge foundation, and a consistent understanding. The preliminary data illustrate the importance of a shared vision. In previous IS research, the vision was seen as a concept defined by the platform owner. In the case of the digital asset ecosystem, the vision was collectively shaped and molded by the various stakeholders. This collective shaping of the vision was deliberately chosen to strengthen the commitment of the different organizations to the joint endeavor. Finally, the ability to orchestrate the ecosystem was an essential factor. The governance of the ecosystem was not centrally steered by one actor, as is the case in other platform ecosystems (Schreieck et al., 2021), but by several actors together (*Bank A & B* and *TokenVenture*). The ability to institutionalize this structure was a crucial factor in the emergence of the ecosystem.

Conclusion and Further Research

Our study presents initial findings from an ongoing research project. Using longitudinal data from the BEPE, we have gained initial insights into organizational capabilities. Our results suggest that previous findings on organizational capabilities in digital ecosystems (Schreieck et al., 2021) are also relevant to the BEPE, with different capabilities required at different stages. The preliminary data suggest that ecosystem characteristics influence the required capabilities and their manifestations. For example, while ecosystem orchestration is essential, lacking a central actor leads to different characteristics and expressions of this capability. We will continue to explore the evolution of the BEPE, focusing on capabilities, and report the extended results in future publications.

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