Institutionalizing Digital Transformation through Cryptocurrency Use

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INSTITUTIONALIZING DIGITAL TRANSFORMATION THROUGH CRYPTOCURRENCY USE

Research Paper

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Abstract

Understanding transformative digital phenomena is an ongoing research challenge for the Information Systems discipline. Digital transformation research to date investigated the phenomenon primarily from a firm-centric perspective, but did not explore how individual micro-level practices drive digital transformation more broadly. Our ethnographic study aims to address this gap by exploring how the social practices within which customers use cryptocurrencies drive digital transformation in society more broadly. We offer a theoretical contribution through a novel and inductively derived model exploring how digital transformation in a cryptocurrency context is institutionalized through use. Specifically, our model identifies 10 micro-level practices of cryptocurrency use, and demonstrates how these legitimize the digital transformation of financial services. Finally, our work provides an important empirical contribution and normative guidelines by offering much needed insights related to the emerging context of cryptocurrencies.

Keywords: Bitcoin, cryptocurrency, digital transformation, fintech, social emergence

1 Introduction

“How much for your coffee? 1 euro, a dollar, 10 yuan [...] What if someone walked into the same coffee shop and paid using a stablecoin, or [...] in digital tokens backed by gold or other safe and liquid assets like U.S. Treasury bills? Would we feel like the visitor from another century?” (Adrian and Griffoli, 2019 p. 2).

Digital technologies are transforming our life, in this case, how we can pay for goods and services. Bitcoin, arguably the most prominent digital currency available today, has a global market capitalization exceeding 300 billion dollars (CoinMarketCap, 2020), and is a prime example for how emerging technologies drive digital transformation in the financial service sector (Breidbach and Tana, 2021). Indeed, the Information Systems (IS) discipline has a long history of investigating transformative digital phenomena (Nambisan et al., 2017), with extant research typically exploring how firms actively engage in digital transformation processes (Sia et al., 2016), and how such processes are enabled by firm leadership (Singh and Hess, 2017). Following a similar trajectory, extant cryptocurrency research positioned around digital transformation more broadly also adopted firm-centric perspectives, investigating issues like organizational structures (Harlev et al., 2018), or competition (Janze and Grozdevskiy, 2017). Importantly, the common denominator between digital transformation and cryptocurrency research is the implicit assumption that customers and other non-firm stakeholders affected by digital transformative processes remain passive recipients of digital technologies (Abramova and Böhme, 2016). Consequently, both research streams lack insights about how individual micro-level practices, e.g., customer behavior associated with emerging technologies like Bitcoin, enable digital transformation more broadly. This is a crucial gap in knowledge for IS research and practice, since understanding individual-level implications associated with cryptocurrencies (Beck et al., 2017) and its transformative practices within society (Risius and Spohrer, 2017), represent key IS research priorities. Our present work aims to address these gaps by
asking “how do the social practices with which individual actors (e.g., customers) use and experience emerging technologies like cryptocurrencies drive digital transformation?”.

Our present work makes three meaningful contributions. First, we offer a theoretical contribution through a novel and inductively derived theoretical model exploring how digital transformation in a cryptocurrency context is institutionalized through use. The model identifies 10 individual micro-level practices and demonstrates how these shape the emergence of institutions associated with cryptocurrency use.

Second, we offer an empirical contribution through an in-depth ethnographic study that shows how individual users of cryptocurrencies instigate digital transformation practices, thus highlighting their previously unexplored role in institutionalizing and legitimizing the use of emerging technology in detail. By empirically investigating digital transformation as institutionalization, we provide new insights into the institutionalization process, and open this ‘black box’ that previously remained unaccessible (Lyytinen, Newman, and Al-Muharfi, 2009), including prior work in the cryptocurrency area by Tana et al. (2019).

Third, our work provides important normative guidelines related to the emerging use of cryptocurrencies and its increasingly important role as digital money in the financial service industry and beyond (Adrian and Griffoli, 2019). Our work can help firms refocus their digital transformation strategies and efforts away from an inherently intrinsic, to an extrinsic, customer-oriented lens, considering customers as an active partner in a firm’s digital transformation strategy.

2 Rethinking Digital Transformation through Cryptocurrencies

Digital transformation is a phenomenon describing the “changes digital technologies can bring about in a company’s business model” (Hess et al., 2016 p. 124), and pursues the goal “to radically improve performance of […] enterprises” (Westerman et al., 2014 p. 1). Prior studies of digital transformation adopted firm-centric lenses, and typically focused on six interconnected pillars. First, studies exploring the role of technology or the IT artefact in digital transformation typically view technology as the enabler or supporter needed to achieve competitive advantages (Hess et al., 2016). Second, digital transformation is also studied as a new way to create value, either by changing a firm’s offerings or revenue model (Chanias et al., 2019; Matt et al., 2015), or by addressing new customer needs (Bilgeri et al., 2017). Third, digital transformation requires process and structural changes (Hansen et al., 2011). Extant work therefore focuses on issues pertaining to leadership and the orchestration of transformation journeys (Kohli and Johnson, 2011), or the means with which this can be supported by structure, operational process, know-how skills and culture (Day-Yang et al., 2011). Forth, financial considerations are equally important to digital transformation research (Hess et al., 2016), with digital transformation initiatives impacting a firm’s ability to decrease cost or increase profit (Ghosh et al., 2018). Fifth, another stream of research investigating collaborations between firms, its partners and competitors (Andal-Ancion et al., 2003), and the means with which a firm reaches the market (Duerr et al., 2018). Sixth, alignment with regulation views regulation as a means to enforce technology standards (e.g., environmental or sustainability issues), thus becoming the driver of digital transformation (Liere-Netheler, Packmohr and Vogelsang, 2018).

Cryptocurrencies are one example for many emerging digital technologies that have a broad transformative impact on individuals, firms, as well as society and markets in general (Breidbach et al., 2020). First, for individuals, cryptocurrencies increase information transparency (Nofer et al., 2017) and support immutability, which enables decentralized financial transactions and data sovereignty (Nakamoto, 2008). Second, cryptocurrencies transform firm’s value propositions. Current payment systems and networks depend on trusted intermediaries (i.e., banks) to ensure account balances and details of transactions are kept up to date (Cuccuru, 2017). In contrast, Bitcoin (and other cryptocurrencies) offer flexible payments, and the potential to serve as a general-purpose payment mechanism (Böhme et al., 2015). This could enable firms to develop new value proposition and alternative business models (Sebastian et al., 2017), or provide an opportunity for process improvement and efficient global operations (Liere-Netheler, Packmohr and Vogelsang, 2018). Third,
cryptocurrencies can also transform society and markets more broadly. One example are the consensus mechanisms embedded in blockchain and cryptocurrency, which drive self-organizing governance (Andersen and Ingram Bogusz, 2017). In combination with smart contracts, this can enable decentralized autonomous organizations to shape the future of autonomous algorithmic contracts, including cross-border transactions that can be uniquely identified and are inherently secure.

Importantly, current research on digital transformation as well as cryptocurrencies implicitly assumes that customers, other non-firm stakeholders, and society more broadly affected by digital transformative processes, are passive actors, using and consuming digital technologies (Breidbach and Tana, 2021). Consequently, both research streams lack insights into the individual micro-level practices with which beneficiaries (i.e., customers) of emerging technologies like Bitcoin drive digital transformation. This is a problem because the ubiquity and pervasiveness of digital technologies affect not only firms, but also our daily life, including that of customers who use digital technologies, and eventually, society in general. It is therefore important to explore cryptocurrencies from an individual micro-level perspective to provide insights into perceived benefits and risks of cryptocurrencies like Bitcoin (Abramova and Böhme, 2016). Addressing this crucial gap in knowledge for IS research and practice require empirical research to understand individual-level implications associated with cryptocurrencies (Beck et al., 2017), its transformative practices (Risius and Spohrer, 2017), and the emerging Fintech context in general (Breidbach et al., 2020).

In what follows, we describe an ethnographic study that we conducted in Crypto Town, Australia, a location where individuals are able to purchase goods and services using cryptocurrencies. As such, it enabled us to empirically study individual-level implications associated with cryptocurrencies, its transformative practices in a real-world scenario, and an emerging Fintech context.

3 Research Method

3.1 Overview

The main research question guiding our present work is: “How do the social practices within which individual actors (e.g., customers) use and experience emerging technologies like cryptocurrencies drive digital transformation?” Because individual-level cryptocurrency use is an area with limited contributions available to date, we relied on an exploratory in-depth ethnographic study, and conducted fieldwork in ‘Crypto Town’ (pseudonym), located in Queensland, Australia. Starting in 2018, Crypto Town had established itself as Australia’s first tourist destination to accept cryptocurrencies (e.g., Bitcoin, Ethereum, Bitcoin Cash, Litecoin) as payment for a wide range of goods and services. The business ecosystem in Crypto Town consists of more than 30 participating businesses who offer cryptocurrencies payments to international and interstate travelers at their point of sale using a proprietary payment platform. As such, Crypto Town represented a unique setting to pursue our work.

Ethnographic research designs are widely utilized in the IS discipline to date, for example to study the technology usage from onlookers’ perspective (Sergeeva et al., 2017) or development of system design (Orlikowski, 1991). The ethnographic research design allowed us to understand the phenomenon under inquiry from the perspective of the participants in its specific institutional and social context (Myers, 1997), and to gather insights as perceived by the respective individuals (Gobo, 2008), without altering the context of their reality (Baskerville and Myers, 2015). Following best practices for ethnographic research (Baskerville and Myers, 2015), we adopted the role of an active participant, and immersed ourselves full-time in the context of Crypto Town from 1 January 2019 until 19 February 2019.
3.2 Data Collection

We collected data from a variety of sources to allow for triangulation (Benbasat, Goldstein and Mead, 1987), thus strengthening construct validity (Yin, 2018), reducing control bias (Mathison, 1988) and increasing the validity and reliability of our research (Healy and Perry, 2000).

First, we conducted 63 semi-structured interviews, using open-ended questions to gain a deeper understanding of the phenomenon (Rabionet, 2009), and to allow participants to express details from their own perspective (Tellis, 1997). The interview protocol was guided by existing literature, using plain language (Rubin and Rubin, 1995). Guided by our research question, which helped identify potential directions to pursue during the study and avoid personal biases (Schensul, Schensul, and LeCompte, 1999), we identified and selected a variety of participants, including customers using cryptocurrencies, business owners offering cryptocurrency payment solutions, local government officials orchestrating the activities in Crypto Town, and representatives of the vendor firm providing the proprietary point of sales software solution.

Second, we complemented interviews with on-site observations. Yin (2018) explains that observation complements interviews by adding “new dimensions for understanding the actual uses of a new technology…” (p. 122). Overall, we conducted 484 observation hours in Crypto Town, which resulted in 300 photos and 50 pages of field notes for further analysis (Van Maanen, 1995).

Finally, we collected secondary data in the form of documentation provided by participants, including technical or organizational documents, instruction manuals, and government regulations, as well as white papers, website data, and data from travel forums. Table 1 provides an overview.

<table>
<thead>
<tr>
<th>Data Types</th>
<th>Participants</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semi-structured</td>
<td>Local Government Agency: CEO</td>
<td>5</td>
</tr>
<tr>
<td>Interviews</td>
<td>Tourism and Commerce Agency (TCA): President, VP, Executive Managers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Community Initiator in Crypto Town: Community Lead</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cryptocurrencies Payment Platform Service: CEO</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Local Businesses: Business Owners and Managers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Customers and Potential Customers: Travelers</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Cryptocurrencies Payment Platform Service: Analysts and Developers</td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td>63</td>
</tr>
<tr>
<td>Observations</td>
<td>484 observation hours, 300 photos, and 50 pages of field notes</td>
<td></td>
</tr>
<tr>
<td>Documents</td>
<td>25 pages, e.g., payment platform working instruction, digital wallet functionality, tax, community newspaper, Social media documents, news outlet.</td>
<td></td>
</tr>
<tr>
<td>Digital sources</td>
<td>300 pages, e.g., payment platform website, TCA website, social media: Crypto Town digital group facebook and community facebook, crypto telegram groups, media/press release, tax website, related Youtube, and white papers.</td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Ethnographic Data Collection of Crypto Town

3.3 Data Analysis

Data analysis followed an inductive strategy. One author acted as the main coder and, in each step, iteratively discussed emerging codes and insights with the second author to achieve the final model. Supported by NVivo11 (Yin, 2018), we followed processes outlined by Corley and Gioia (2004) and Gioia et al. (2013) and, first, created open codes (Corbin and Strauss, 1990). We specifically adopted the terminology used by participants, to create codes as closely aligned with the data as possible. For example, customers we highlighted practices to institutionalize digital transformation in Crypto Town by actively using terms and terminology like “day-to-day”, “everyday using”, “normal life”, “keep doing it”, “use it here”, “wherever I can”, or “normal currency”. In a subsequent step, we identified relationships between first order codes using axial or second-order coding. Finally, we summarized the axial codes using aggregate dimensions or third order coding. Finally, our theoretical model, displayed in Figure 1, represents the unique theoretical contribution of our work.
4 Findings

4.1 Precursors of Cryptocurrency Payments

Our findings show that many individuals who travel to Crypto Town strongly believe in cryptocurrencies as “a revolutionary format of peer-to-peer payment” [P3 - Customer]. Most have some sort of cryptocurrency experience, e.g. as trader, Bitcoin enthusiast, or ‘hodler’. In addition, we found that visitors to Crypto Town have already established connections with cryptocurrency advocates through social media (i.e., by following Twitter feeds of crypto-influencers) or actively discuss information about cryptocurrencies with peers or family members. Hence, they demonstrated existing connections with other social actors (connectedness).

All participants in our study were actively seeking to self-educate themselves about cryptocurrencies, or had formal education (knowledge-seeking), e.g., from online-courses. These individuals were also actively seeking cryptocurrency experiences through trading, or through using cryptocurrency for online purchases in their day-to-day lives.

“I decided to know what I was buying and just get quite self-educated, and I’ve just fallen in love with it, really.” [P25 - Customer].

These individuals assess benefits provided to them by cryptocurrency payment services, including how easy cryptocurrency payments are to execute, economical benefits, and speed. Other than that, our participants also highlighted to us their thoughts about the characteristics of cryptocurrencies like security and transparency, and how cryptocurrency can enable control over their funds.

Despite a generally very enthusiastic outlook, participants actively justified limitations underpinning cryptocurrencies, including infrastructure performance, (market) price volatility, and service network availability. Quoted here is one of the participant statement associated with the market price:

“We're not going to let the conversation die just because the market's dead.” [P12 - Community Lead].

Our findings indicate that those actively engaged with cryptocurrencies developed proactive coping mechanisms, highlighting and acknowledging that challenges are always “part and parcel with using new technologies” [P16 - Customer]. All participants nevertheless decided to use and trial cryptocurrency payment services in Crypto Town. Specifically, micro payment services at various Points of Sale (PoS). Micro payment services enable small payments to purchase goods and services (i.e., paying for a cup of coffee with Bitcoin)

“I'm not too fussed by where the price is at, so I'd like to just try and use it and see how it actually goes. And, especially, I would like to see how the [cryptocurrency] network handles small payment [e.g., micro payment]” [P16 - Customer].

Executing a micro payment requires participants to scan QR codes produced by the cryptocurrency PoS platform and thereby to pay with cryptocurrency using their crypto wallet. In doing so, our participants experienced emotional fulfillment.

“A crypto-coffee! Yeah. I was so excited when I got back to my cousin.” [P25 - Customer].

4.2 Cryptocurrency Payments as a Shared Social Practice

Whenever individuals used cryptocurrencies in Crypto Town, they acquired products and services from local businesses, e.g., cafés, hotels, or tourism activities. In doing so, individuals enable the emergence of cryptocurrency payments as a shared social practice, which demonstrates the value of crypto payments to other social actors. Specifically, after using cryptocurrencies in Crypto Town, our participants reportedly shared their experiences with peers, family and friends through social media, thus demonstrating that cryptocurrency payments are functioning. This, in turn, influences others (e.g., not only other individuals, but also including businesses) to adopt and, eventually, legitimizes cryptocurrency payments as a new shared social practice:
“If we're afraid to spend cryptocurrencies, merchants never learn how to use it. Because a lot of the merchants, for quite a few of them is like their first time taking a Bitcoin payment, but if people come in and do it all the time, [they will be like], ‘Oh, I've got to hold on to it.’ And the merchants themselves [...] need to know that people want it [...]” [P24 - Customer].

Our findings indicate that individuals who use cryptocurrencies for everyday payments do this to affect others within their social network. They promote cryptocurrency payments as an alternative to the existing financial system, e.g., payments using cash or credit cards. By doing so, they demonstrate feasibility of transactions in the cryptocurrency blockchain and in Crypto Town. Each payment requires miners to verify transactions, which supports the cryptocurrency community. Most importantly, this will eventually affect society at large, with cryptocurrency payments emerging as a shared social practice.

4.3 Institutionalizing Cryptocurrency Payments as a Shared Social Practice

Cryptocurrency payments emerged as a shared social practice in Crypto Town, thus institutionalizing digital transformation – the outcome we are reporting on here. Specifically, by establishing cryptocurrency payments as a shared social practice, the collective efforts by individuals in Crypto Town created a new social structure for what was essentially a niche market at the time (e.g., a market for everyone to use cryptocurrency). However, doing so further incentivized others to use cryptocurrencies. As the availability of cryptocurrencies increased overall, it institutionalizing digital transformation more broadly.

“But when we get to the point where it perhaps circulates more [...] you're receiving it for various methods, maybe rewards, well, that's when we start to see it circulating into more utility, more use, more support.” [P27 - Customer].

Consequently, we stipulate that, over time, shared social practices eventually legitimize cryptocurrencies, which eventually transform social structures. As social structures change, individual practices alter once more, thus further influencing shared social practices in a recursive manner. Figure 1 represents our theoretical model.

![Diagram](image_url)

**Figure 1.** Institutionalizing Digital Transformation

5 Discussion

5.1 Theoretical Implications

This work represents a first in-depth study to empirically explore the roles individual (non-firm) actors play, and their practices of digital transformation in the context of cryptocurrencies. As such, our work addresses gaps in extant IS research pertaining to digital transformation and cryptocurrencies, which...
lacked insights about individual micro-level practices of emerging technologies like Bitcoin, and the means with which they drive digital transformation in society more broadly. We therefore responded to current research priorities in our discipline to provide a better understanding of individual-level implications associated with cryptocurrencies, answered “new questions associated with customer value cocreation” (Tana et al., 2019, p. 8) and its transformative practices (Risius and Spohrer, 2017) more broadly. In what follows, we briefly discuss the resulting implications, as well as our contributions to the digital transformation and cryptocurrency literatures.

Individual practices of technology-use represent micro-level actions underpinning digital transformation. Our work demonstrates that these, in turn, create new social practices and routines by social actors. This process of collaborative emergence of social practices (of which cryptocurrency payments are but one), affects existing formal institutional arrangements, or promote a new conventions and norms. As such, the process of digital transformation itself should be reconceptualized away from the firm-centric and technology-driven perspective dominating current work, to one of institutionalized social practices that emerges through the active role of customers, and their individual actions legitimizing the use and role of the emerging technology in society more broadly. Put differently, digital transformation begins with technology use and acceptance on the micro-level, is rooted in actors’ individual practices, which thereby collectively shape pattern of behaviour that eventually transcend into a ‘new normal’ including legitimacy and, eventually, completed macro-level transformation. As we have shown, individual social actors are not merely passive recipients and users of emerging technologies, but are able to actively challenge institutional stability by creating and defending new practices that allow them to construct new narratives and solutions, which eventually promoting legitimacy of new practices. Importantly, our work diverges from prior technology acceptance work (Davis, 1989), in that we described actual practices of social actors, rather than ‘perceived’ motivating factors. We also extend those studies related to the use of cryptocurrencies that explored individual decisions to use and adopt cryptocurrencies (Chen and Farkas, 2019), but that did not investigate the consequences originating from here. Ultimately, our model represents an original theoretical contribution, and a complementary perspective to prior empirical work focusing on cryptocurrencies and digital transformation.

5.2 Managerial Implications

Our findings have important implications for firms and regulators. Specifically, in the context of cryptocurrencies and digital money, we recommend that firms pay attention to the emergence of social practices initiated by their customers that will likely divert from, or precede, formal regulations related to cryptocurrencies. Understanding micro-level practices can be used to align business practices, and to initiation innovation projects. Such far sight would enable industry incumbents (e.g., banks), to approach challenges and risks related to cryptocurrencies practices and novel offerings more strategically. Second, practitioner should reformulate and rethink their digital transformation strategy to capture and incorporate a more holistic understanding of digital transformation procedures and objectives by integrating perspectives on individuals (e.g., customers), other market-stakeholders and regulatory aspects. Third, we recommend firms view customers as proactive collaborators and seek to co-create future digital value propositions with them directly. Our findings highlighted that customers collectively foster economic transactions and affect other social actors, especially by showing and sharing evidence on technology usage. Through their use of emerging technologies, customers can help to legitimize novel digital value propositions, which will be crucial to grow market reach.

Finally, our findings provide guidance for regulators or policy makers tasked with guiding society through the transformative impact of emerging technologies, including cryptocurrencies or digital money. Regulators should have a holistic strategy in place that favours individual-level practices and needs over those supported by incumbents. We therefore recommend that regulators collaborate closely with individual non-firm stakeholders like grassroots organizations to identify needs and desired outcomes. Such an approach could lead to the development of much needed formal policies around cryptocurrency use, in particular, and digital money and emerging technologies in general.
6 Conclusion, Limitations and Future Research

Our work addressed substantial gaps in knowledge related to the previously un-explored practices with which individuals drive digital transformation in the context of financial services. However, our work is not context-independent. Future longitudinal work could investigate actors’ practices and institutional arrangements over time and in different Fintech contexts, for example P2P lending (Breidbach and Ranjan, 2017) or other types of financial service platforms (Breidbach and Brodie 2016), to provide complementary insights. Similarly, contexts and phenomena outside the Fintech space might be fruitful for future investigations of cryptocurrency use. One of these is ICT4D (Ramadani et al., 2018) and the intersection of human development and IS more broadly (Ramadani et al., 2017). We acknowledge that there might also be additional practices that drive digital transformation we did not highlight here. Investigating online cryptocurrency transactions and the resulting experiences individuals have in doing so (Breidbach et al., 2015), could help add new insights here. We also suggest that future work uses new methods and new sources of data. For example, computational techniques to mine large unstructured bodies of text (Antons et al., 2021) could be used to analyse cryptocurrency transactions to gain insight that may complement our work. Another set of questions pertain to issues like regulation and ethics, that could equally affect transformation through cryptocurrencies (Breidbach and Maglio, 2020; Breidbach et al., 2019).

References


