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Community resilience towards disruptions in the payment system.

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ABSTRACT

This paper presents a study where nine Swedish citizens were interviewed about their concerns and expectations, from a customer perspective, in relation to a 10 day disruption in the payment system. The purpose of the study was to understand the customer's perspective in order to provide input to the development of a simulation environment. This simulation environment aims at allowing different stakeholders to experience how a disruption in the payment system affects the local community and thereby create understanding of how resilience is built and affected. The research questions were: What do customers expect to get access to? When? What are customers prepared for? How does this differ among different customer groups? The results indicate some understanding of how such a crisis affects the local community and what the informants expects to happen. The respondents represented a diversity of socio-economic backgrounds from rural and urban parts of the municipality.

Keywords

Community resilience, customer perspective, payment system, crisis management

INTRODUCTION

Disruptions in the payment system in societies where cash is no longer king may lead to dire consequences with unexpected cascading effects. In a society where many business owners have chosen to avoid cash payments, relying on credit cards or internet payment solutions (for example, Swish, Apple pay, Google pay, Paypal etc.) a disruption in the payment system lasting over several days will have unpredictable consequences. For example risks with interconnectedness of supply-chains, breakdown in the transport system due to lack of fuel for cars and trucks, social unrest and hoarding, failures in human handling of complex socio-technical system (Chopra & Sodhi, 2004; Reason, 1990; van Laere et al., 2017; Wears, Cook, & Perry, 2006).

The study is a part of the project Creating Collaborative Resilience Awareness, Analysis and Action for the Finance, Food and Fuel Systems in Interactive Games (CCRAAAFFFTING), commissioned by MSB (the Swedish Civil Contingencies Agency). Earlier papers from the CCRAAAFFFTING project have focused on different aspects of disruptions in the payment system and how to build a simulation environment for this (van Laere et al., 2017; Johansson, van Laere, & Berggren, 2018; 2017; Berggren, van Laere, & Johansson, 2018; Johansson et al., 2018; van Laere et al., 2018). This paper takes on the customer perspective. The study reported in this paper is based on a bachelor thesis (Lundberg, 2018). Within the CCRAAAFFFTING project, gaming-simulation is used to simulate this interconnected infrastructure in the payment system. Simulation generally aims at designing a model of a system in a complex problem area in order to perform various experiments (Grune-Yanoff & Weirich, 2010). The simulation approach used in CCRAAAFFFTING is described in detail in Johansson, Laere, and Berggren (2018). In short, the simulation comprise a number of grocery stores (ranging from local convenience stores to mega-stores), petrol stations, banks and the flows of goods, fuel, and payments (both cash and by other transfers) that occur between these. Gaming-simulation is used to gain deeper insight in the behaviour of the participants by evaluating various operating strategies against each other in one or multiple scenarios (Laere et al., 2006). It also creates a deeper learning opportunity since the participants are active

participants in the simulation and are not just passive observers.

Resilience is used to describe how a system critical to society, such as industry, infrastructure, finance or ecology, can absorb changes or disturbances and still persist (Holling, 1973; Foster, 1993). Community resilience is defined as a “process linking a set of networked adaptive capacities to a positive trajectory of functioning and adaptation in constituent populations after a disturbance” (Norris et al., 2008, p. 131). A community is defined as “an entity that has geographic boundaries and shared fate. Communities are composed of built, natural, social, and economic environments that influence one another in complex ways” (Norris et al., 2008, p.128). Community resilience is about the community’s ability to identify, summon, and address social problems and to use resources held by the community such as knowledge, skills, and systems to handle a disturbance. The customers are part of a community and can thus contribute to community resilience. A disturbance can be seen as a crisis, which might develop into a disaster. No matter if a disaster is natural or human-induced (Shaluf, Ahmadun, & Mat Said, 2003), it might affect the citizens access to cash. Parker (1992) suggested a definition of disaster as “an unusual natural or man-made event, including an event caused by failure of technological systems, which temporarily overwhelms the response capacity of human communities, groups of individuals or natural environments and which causes massive damage, economic loss, disruption, injury, and/or loss of life”. Despite the effort to understand risks and develop routines for preventing and easing the effects of serious disruptions in the payment system in Sweden, there is still a lack of insight into how numerous actors in society (e.g. citizens, food stores, petrol stations, voluntary organizations, and so on) will act in case of a temporary or complete breakdown of the payment system (Johansson et al., 2018). Several key actors in the payment system have articulated that they will take a larger responsibility than their formal responsibility (MSB, 2009). How then, would the general public react to a prolonged disturbance in the payment system? More specifically:

How is the customer prepared for disruption in the payment system?

What does the customer expect to get/have access to?

When does the customer expect to get/have access?

How does this differ among different customer groups?

The answers to these questions will be used to inform the continued development of the simulation platform and scenarios for the CCRAAAFFFTING project. This will allow for a gaming-simulation, as the knowledge source is rooted in empirical findings. In addition, participants will feel more at ease relying on the stated behaviors of real customers.

METHOD

This was carried out as an interview study with different customer groups.

Participants

Nine persons volunteered to participate (5 women and 4 men). Their age varied between 23 to 76 years. The participants represented several different customer groups. All participants lived in a mid-sized Swedish municipality (> 100 000 inhabitants). They all were the primary provider of food for the household they belonged to (or shared the responsibility equally with another person). Two were students at the local university, one person was retired, and seven persons were employed. Six participants lived in or next to a larger city, one in a smaller town, and two were living in the countryside. Hence, the respondents represented a wide diversity of socio economic backgrounds and came from different parts of the municipality

All participants were informed about the study and gave informed consent to participating. No reimbursement was given. The study complies to ethical research regulations (Vetenskapsrådet, 2002) and the GDPR (the General Data Protection Regulation effective in EU). No ethical approval was necessary for this study according to Swedish law.

Material

A semi-structured interview approach was used (Howitt, 2013). Pre-identified questions were used, which were supplemented with questions that evolved during the interview. The pre-identified questions were identified through walk-throughs of identified payment disruption scenarios and piloted with persons who took the roles as customers when responding. The proper interviews were recorded and later transcribed. All interviews were held in Swedish.

Analysis

After the material had been transcribed, it was analyzed using thematic analysis. Thematic analysis is a method for identifying, analyzing, and reporting patterns in data (Braun & Clarke, 2006). Howitt (2013) states that thematic analysis is studying what is being said, rather than how it is said. Themes are found through an inductive approach, or using a bottom-up perspective, where the quality of statements in relation to the research questions is important (Braun & Clarke, 2006).

RESULTS

Four main themes were identified. These had ten sub-themes connected to them. The main themes and sub-themes can be seen in Table 1 (below).

Table 1. Themes and sub-themes identified using thematic analysis.

Main theme	Sub-theme	Comment
At home (A)	Having cash is random (A.1)	This theme is about the preparedness of the customers
	To manage 72 hours without shopping (A.2)	
When the crisis is present (B)	Durable products (B.1)	This theme focus on types of products the customers would look for and desired information
	The importance of information (B.2)	
When the debit cards does not work (C)	Worry about cash machines running out of money (C.1)	This theme focus on concerns regarding not being able to use bank cards
	Anticipations when cash runs out (C.2)	
	Alternative solutions to the problem (C.3)	
Who is responsible (D)	The responsibility of the stores (D.1)	This theme is about expectations on how society and the community will react
	The responsibility of the banks (D.2)	
	The responsibility of the government and the state (D.3)	

The first main theme *At home* (A) is about the preparedness of the customers. It includes the subthemes *Having cash is random* (A.1) and *To manage 72 hours without shopping* (A.2). *Having cash is random* (A.1) is about that many persons do not have any cash at home or in their wallet. The majority of the informants usually did not carry any cash, and if they had cash it was mostly from when other people had paid them cash. One informant explained that cash was from older relatives who had paid for something with cash or that the kids had cash to better understand how money works. *To manage 72 hours without shopping* (A.2) concerns if the informants would manage without shopping for 72 hours. All informants claimed that they would. However, people living inside the cities, close to grocery stores, said that that was about the limit of their food stored at home. Persons living further away from the grocery stores or outside the cities said that they would be able to cope for a longer time without shopping. They had a stock of food and fuel, and would be able to cope for up to

a week.

The second main theme *When the crisis is present* (B) focus on types of products the customers would look for and what information is desired. The first subtheme *Durable products* (B.1) emerged as a response to the question “If you know there was going to be a disruption in the payment system, what would you buy?”. All informants said that they would buy durable basic products; eggs, canned food, milk powder etc. Only people living outside the cities would buy fuel. This subtheme points at that the customers are looking for durable products that are easy to stockpile so that they won’t have to shop as often as they usually do. This demonstrates that a resilient behavior emerges as the crisis has already happened. *The importance of information* (B.2), the second subtheme, is about what information the informants think they need. A majority of the informants considered that information should be available through newspapers, internet, and television, while also on billboards outside shops. What information is needed differs, but they think that information about how to go about paying without bank cards is central.

When the debit or credit cards does not work (C) the third main theme focus on concerns regarding not being able to use bank cards. Three subthemes were identified: *Worry about cash machines running out of money* (C.1), *Anticipations when cash runs out* (C.2), and *Alternative solutions to the problem* (C.3). Under the subtheme *Worry about cash machines running out of money* (C.1) some informants would anticipate that cash machines would run out of cash and that the amount of cash in the Swedish society was not enough in relation to expected need. This could lead to higher rate of criminality and a “we against them” feeling. At the same time some informants did not think that there would be any problems with access to cash from cash machines. From the next subtheme *Anticipations when cash runs out* (C.2), in direct opposition to the previous subtheme, some informants thought that collaboration and support among the public would increase. People might car pool, use public transportation, or stay with friends (closer to work) to save fuel. One informant thought that trading possessions might be a way of getting around not being able to shop. *Alternative solutions to the problem* (C.3) was a subtheme where the informants stated different alternative solutions that they saw possible; use credit, invoice, ration cards, Swish (a Swedish digital system for exchanging money between users), or manual reading of bank cards.

The final main theme *Who is responsible* (D) is about expectations on how society and the community will react. Here, three subthemes become apparent. The subtheme *The responsibility of the stores* (D.1) involved that most informants considered that the stores had the major responsibility for resolving the situation. That is, some informants thought that the stores were to settle the issue with the payment system, while others considered that the store’s responsibility was to set up a temporary solution for payment. Some informants expected the stores to close down during the payment disruption. Another subtheme was *The responsibility of the banks* (D.2). Here, the informants thought that the banks had a large part in handling the disruption, both in terms of resolving the actual cause of the disruption as well as expecting that the banks support society in providing cash and making offices and cash machines available through extended opening hours. *The responsibility of the government and the state* (D.3) concerned how the government and governmental agencies needed to step in and take control of a situation so that everyday life of individuals could continue.

DISCUSSION

This study aimed at answering the following questions:

- How is the customer prepared for a disruption in the payment system?
- What does the customer expect to get/have access to?
- When does the customer expect to get/have access?
- How does this differ among different customer groups?

This section will first present the answers to the research questions and then provide a general discussion.

How is the customer prepared for a disruption in the payment system?

Most informants were not prepared if the debit or credit cards stopped working. Few had any cash readily available, while some had food stocked lasting for up to more than a week. Most informants said that they could last 72 hours without shopping (a time frame that citizens are expected to cope without the government providing food in the event of a crisis; MSB, 2015).

What does the customer expect to get/have access to?

Expectations point in different directions; some informants hoped that the banks and stores could resolve the problem, others thought that cash would not be available as the cash machines would run out of cash. All informants anticipated information needs on the development and escalation of the crisis. The information should be accessible through usual information channels, be clear and concise, should focus on facts about the situation and how to act as citizens in order to not increase the crisis escalation. The informants foresaw that durable food products would be in demand, as it is easier to store and keep. However, informants in the cities expected that food would be accessible and available through shops as they did not have large stocks of food at home (more than 72 hours of food).

When does the customer expect to get/have access?

The 72-hours recommendation from authorities seemed to be a rule of thumb for informants' expectations. Hence, a longer crisis would burden community resilience to larger degree. Most informants would not manage a 10-day crisis without support from the authorities.

How does this differ among different customer groups?

Citizens living inside cities have expectations and preparedness that indicate a less resilient behavior, as they are less prepared with stored food and consumables with short turnover in their homes. They are used to visit the shop frequently next to their home to purchase products that they need. One reason might be since living in city centers, every square meter is more expensive. Hence, to keep costs down, less money is spent on storage space where durable food can be stored. Further, the fact that stores are available, usually within walking distance, decreases the need to stockpile food and other consumables. People in the cities are more dependable on food, while people outside the cities seem to have more need for fuel in order to be able to move around.

General discussion

The interviews suggest that people living in the countryside are more resilient than those who live in the city, in a situation where the payment systems stop working. People need more information about payment systems to be more resilient and to reduce concerns and social unease regarding what might happen. A disruption in the payment could lead to distrust in the payment system including the authorities and businesses responsible, even if it is just an expected responsibility. Welch et al., (2005) state that "trust makes market behavior possible by allowing people to exchange money, a scarce re-source, without great levels of risk or uncertainty being incurred" (p. 466). Declining trust in government leads to reduced support for government action (Chanley, Rudolph, & Rahn, 2000). The validity and authority of a democratic system becomes hollow when citizens withdraw support for government and become less willing to comply with governmental decisions. Brehm and Rahn (1997) showed a correlation between social trust and civic participation. Hence, a disruption in the payment could lead to distrust in the payment system causing lower levels of trust in the government and in lower levels of civic participation. This would decrease community resilience, the community's ability to identify, summon, and address social problems and to use resources held by the community such as knowledge, skills, and systems to handle a disturbance. Such a decrease in community resilience could become a downward spiral into social disorder. From the sociological literature we assume "that stable social relationships cannot exist for long in the absence of social order. However, it is equally apparent that trust is a requirement for both social order and social relationships" (Welch et al., 2005, p. 467). This dependence on trust in social relations on the individual level have shown to affect and be transferred to group and community level (Welch et al., 2005).

Future work

Including citizens with different backgrounds would provide alternative experiences. For example, interviewing citizens/refugees who have fled from warzones could bring a different perspective on what is essential in times of crisis.

CONCLUSION

The themes identified in this interview study provides input to the larger CCRAAFFFFTING project in that they offer empirical findings as input to the gaming-simulation so that the realism is as truthful as possible, and that the injects and their effects in the simulation environment are authentic and reasonable. The current simulation utilizes an agent-based model, implemented in the AnyLogic™ platform. Customer agents shopping needs are modeled based on available statistics and assumptions. These agent-models can be altered to better reflect customer expectations during the disruption event. The findings from this study also suggest that the

community resilience and social trust can have a grand effect on the escalation and cascade effects initiated by a disruption in the payment system.

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