Scenarios + Touchpoints = A Method for Analyzing Crisis Situations and Designing Management and Rescue Services

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ABSTRACT

The increase of natural, industrial disasters and diverse crisis has stimulated more research interest to developing new forms of services support in the decision making process. To effectively prepare, mitigate and deal with such disasters, the prior of the people experiences involved in crisis preparedness and rescue need to be captured and used as a basis knowledge in existing and innovative services design. In this paper, we propose a scenario-based method for collecting and structuring the service user experience (UX), taking into account of the relevant user-service encounter through service touchpoints. The proposed method is applied to a crisis management case study.

Keywords

Scenario, persona, user experience, service design, crisis management.

INTRODUCTION

A crisis can range from major to catastrophic disaster affecting many segments of the society (Jaques, 2009). Natural disasters (e.g. earthquakes, tsunamis, twisters, fire, floods, etc.), accidents (plant explosion, pollution emergency, a car crash, etc.), and technological disruptions are some unpredictable examples of crisis situations that can lead to severe after-effects unless handled immediately (Vescoukis et al., 2012).

The need for crisis preparedness and rescue systems (PRS) has grown significantly over the last decade. Traditionally, PRS is defined as a decision making system to identifying, assessing, handling and recovering from a crisis situation (Jacques, 2009). Recently, a new generation of services has emerged to support effective and sustainable cooperation between all stakeholders involved in a crisis including experts, citizens, public organizations (fire department, police, security, transportation, emergency services). However, very often PRS had established uncontrollable and dynamic scenarios that can be dealt with especially by people who have previous experience of such situations (Jia et al., 2012). Thus, a PRS should provide services that facilitate this process while mediating the communication line between most of the involved people (Vescoukis et al., 2012).

It is important that the diversity of people's experiences to be taken into account not only for the management and response to a current crisis, but also for the design of innovative services, the improvement and evolution of the existing ones. Moreover, there is a lack of researches emphasizing on how to capture and organize the UX and the encounter service of the actors involved in the crisis outcome. Therefore, incorporating the knowledge about UX and user-service encounter into service design project can provide new approaches and innovative ideas to improve the related PRS services.

Consequently, we propose a service design method based both on structured scenarios (Yanagida et al., 2009) and service touchpoints design (Moritz, 2005). The purpose is to allow the discovery and identification of users' real needs and constrains on one hand, the challenges of the stakeholders to create positive experience values following the use of the crisis management based services on the other hand.

The remainder of this paper is organized as follows. The next section describes briefly different systems and

processes in the Crisis Management and presents the main related works on UX modeling in service design. Afterward, we describe the proposed method followed by its application to a preliminary disaster case study. Finally, we present our conclusions and some future work perspective.

RELATED WORK

Crisis Preparedness and Rescue System (PRS)

In many crisis situations, the caused disasters (natural, industrial, etc.) undergo a great threat to people and present mainly negative impacts to the local economy and environment. Therefore, the development of crisis preparedness and rescue systems (PRS) has been expanded in last decade to efficiently handle, forecast, mitigate and understand such disasters (Tzeng and Yin, 2008).

According to many theoretical crisis management models (Jacques, 2009; Quillian et al., 2009; Crandall et al., 2009), a service infrastructure is necessary to provide not only a knowledge support and learning, but also to bring closer the affected population with the management organizations when a crisis situation occurs, in particular with the crisis cell.

A crisis management system based services offers several advantages by offering a multitude service access interfaces for the users based on their needs (Web site, mobile application, telephone…) (Jia et al., 2012). Moreover, the composite and dynamic nature of the services facilitates coordination and collaboration among all the implied crisis management stakeholders (coordinator, government, police, etc.) (Quillian et al., 2009).

UX modeling for service design

Service Design concerns both the improvement of services and the creation of new ones. It involves the "overall experience of a service as well as the design of the process and strategy to provide that service" so that to develop a "useful, usable, desirable, effective and efficient service experiences" (Moritz, 2005).

From a service design point of view, Touloum et al. (2012) have addressed in depth many approaches aiming to modeling the UX through several fields. They have mentioned that actually the shift in product (or service) development has taken place for usability (utility, efficiency, and satisfaction) toward user experience (Hassenzahl and Tractinsky, 2006; Idoughi et al., 2012).

Thus, a good UX means that users' interactions with every service touchpoints are satisfied (Vaananen et al., 09). A touchpoint as a contact point between a service provider and a customer aims at exchanging information in two forms: person-to-person or person-to-technology (Katzan, 2011). In fact, a design for the service user experience (SUX) distinguishes four elements (Moritz, 2005): a touchpoint (web site, mobile application, etc.), an information exchange channel (Internet, Call-center, etc.), a user terminal (computer, Smartphone, etc.) and the user-service interaction through one or several touchpoints. Thus, to give a clear picture about service UX, we must take into account such user-service encounter through the provided service touchpoints.

Therefore we suggest a service design method based both on structured scenarios related to the service experience of different stakeholders and service touchpoints that articulate this experience. The objective of this paper is two-fold: (1) Encapsulate the UX facets in designing of crisis management services; and (2) Contribute broadly to filling the gap between theoretical UX models and practical service design methods.

THE PROPOSED APPROACH

Overview

We propose a service design method based both on a structured scenario approach (Yanagida et al., 2009) and a characterization of the user experience (UX) at each level of service design modeling. This method contains three main stages: (a) Personas development (b) Scenarios extraction and structure, (c) scenarios and UX quality factors association (Figure 1).

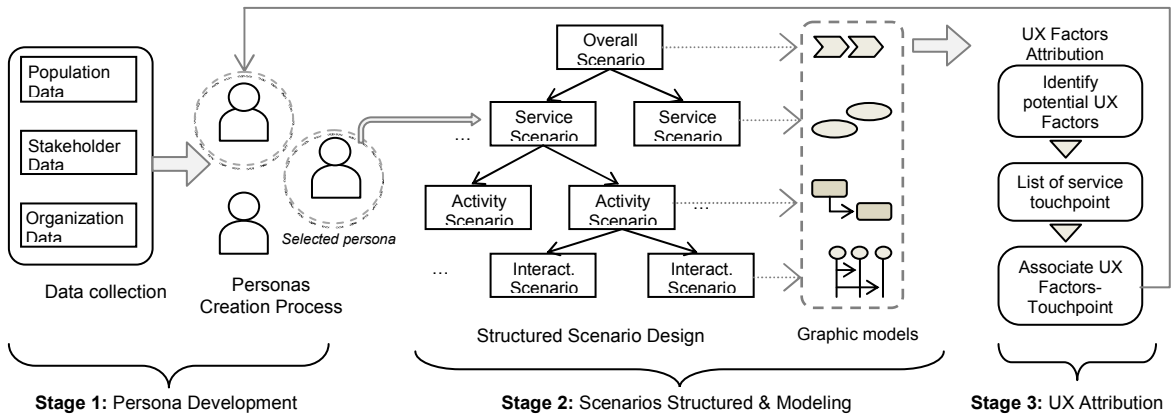

Figure 1. The service design method overview

The purpose of this method is to provide support design information, in a structured scenarios form, for service designers' team and implied stakeholders in the Crisis Management activities. This support includes a description of inner services system behavior (interaction between stakeholders and PRS, coordination between internal entities of crisis management services). Moreover, it provides an external behavior view of the whole crisis management services (medics, army, government services, etc.).

The above descriptions are structured through four scenario types: (1) overall that describes the whole service organization; (2) service scenario that gives a description about the generated value of a service; (3) activity scenario that demonstrates the relevant user's activities and persona's goals to be reached by the service and finally (4) interaction scenario that depicts each persona's interaction in terms of time sequence. However, to take effectively the different scenarios levels previously highlighted in service design process, we propose to use a persona tool (Cooper, 1999) as a model to encapsulate the fundamental user's scenario.

A persona is a narrative description of a class of people that may be involved in a crisis situation and has an important role in making different decisions (Seffah et al., 2012). Moreover, the authors have also highlighted the evidence link between a scenario description and a persona model. From this fact, we claim that scenarios can specify how a specific stakeholder (or simple user) would proceed to solve or deal efficiently with the raised outcomes (effects) of some disasters.

The following section, describes a potential application of the proposed method in a representative flooding crisis management case study.

APPLICATION

Stage 1: creation of personas

Table1 depicts some potential classes of actors involved in the case study. These are represented with a persona model. Those personas may be created by using some ethnography techniques (interview, survey, etc.). Afterward, exploring the different information sources from actors and organizations involved in the Crisis Management field yield to identifying major scenarios.

Name	Persona Role	Goals	Fragment of persona scenario
Malek	Coordinator (crisis cell)	Coordinate all management crisis operations	**Malek** establishes a preliminary statement on crisis situation. Then, **he** calls the civil protection services to immediately intervene and evacuate the affected people.
Reda	Agent in call center	Ensures the population and registers requests for assistance	When **he** receives the emergency call, **Reda** reports the current request and constantly informs the Coordinator on the received requests.

Table 1. Example of the developed Personas

Stage 2: scenario structuring and modeling

Description of overall scenario: flooding crisis management

It is assumed that a flooding disaster occurs in a limited geographical area. Its high severity degree implies

cooperation between several duty services (cell crisis, civil protection, police, etc.) to tackle and deal with this crisis. This may be broadly presented as follows:

"After studying the "flood control service" elaborated report and the weather forecast for the region, the crisis cell Coordinator ordered to instruct "civil protection and emergency services" to evacuate the affected population and the "police officer» to policing in disaster region. "Public works services" are also bound to clear roads to facilitate response operations. Finally, a "call center" is set up to receive calls from the affected population, and "communication cell" is established to inform the population and media."

Structuring and modeling of the service scenario

After listing the personas of crisis management services, we give a description of the scenario service that implies one or many personas in each service. A typical service scenario is related to invocation by the crisis cell of some external stakeholders, in particular public workers and civil protection services. The part of description of the service scenario can be as follows:
"Malek is the Chief Coordinator and his team studied the reports and plans to manage the crisis situation. As a result, it contacts the public-works services to clear the roads to facilitate emergency response and deliver aid to the victims. He also ordered the emergency and civil-protection services for a possible evacuation of the affected population."

The figure 2 depicts a possible service design for the given scenario description, using a flowchart of service blueprint (Patricio et al., 2009). This model shows all interactions flow between stakeholders and the most activities of designed service. The different lines of visibility from service user are also denoted in this model. In addition, the relevant service touchpoints are presented on the left part of the service blueprint model.

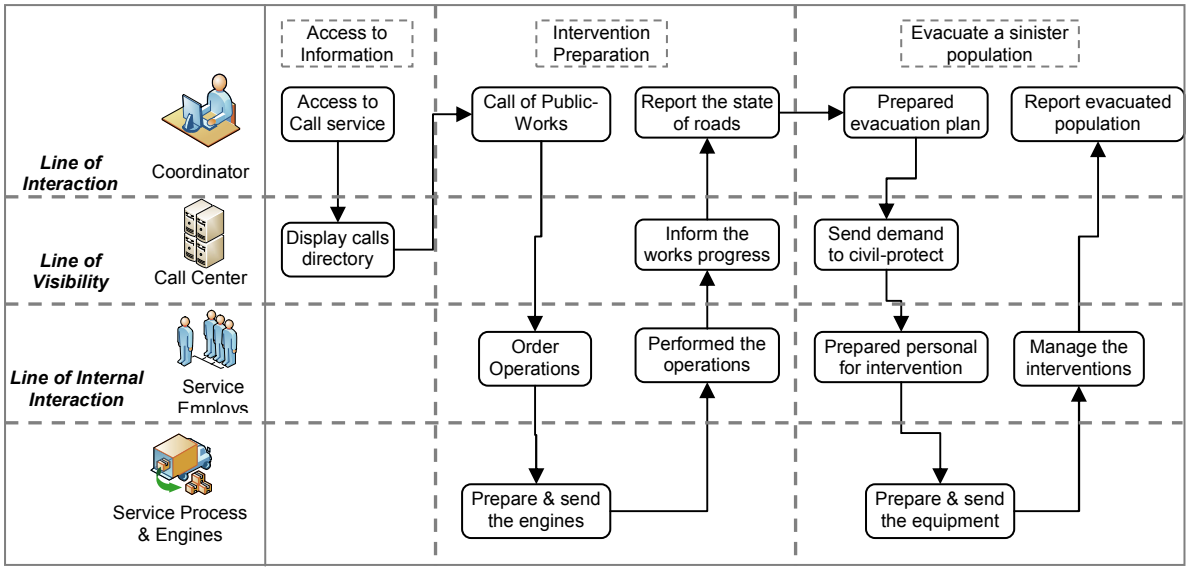

Figure 2. A service blueprint flowchart for the coordination service

Finally, we complete this design stage by extracting the activity scenario that demonstrates in depth the activities that must be carried out by a specific designed service. Furthermore, the developed activity scenario is mapped to one ore many interaction scenarios that depict the user tasks in a chronological sequence form.

Stage 3: Attribution of UX quality factors

The aim of this final stage is two folds: to identifying all the touchpoints for each crisis management service associated with their channel used in user-service interaction and to attributing a set of important UX factors that evaluate quality of UX generated at each service touchpoint.

Moreover, the evaluation of UX factors can be performed using a specific questionnaire about the psychological and experiential needs of users (Hassenzahl et al., 2010). For example, by asking the following questions to the service users: "What is your opinion on response relevance?"; "How it is important for you to use Facebook site to communicate with affected population?"; "How do you feel after having experienced the flooding disaster?".

CONCLUSION & FURTHER WORK

In this paper, we provide new opportunities for the crisis preparedness and management dedicated services designers to improve the service design process. This helps to constantly ensure a significant and beneficial experience for all the involved actors in a crisis management. We characterize the UX to provide a systematic design tool to generate a service model based both on personas goals and significant UX factors for enhancing the service user experience. We broadly presented a novel approach to structure the scenario service in activity and interaction scenario associated with a graphical notation. The approach shows how to assign the potential of service user experience factors to the designed service touchpoints. The main advantage of the structured scenarios-based method is to allow to identify how the crisis management service functions enable a positive or negative experience for the stakeholders, and to approve the *Design Thinking* by offering a panorama of suitable functions to generate the service model.

As a research perspective, we aim to develop a tool for supporting the structured scenario method to extract the most important UX factors as well as the service touchpoints that shape the UX in the Crisis Management field.

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