

Speeding-Up Innovation Cycles in Emergency Management Using Mobile & Social Software

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Abstract. Mobile and web-based applications strongly gain influence in generating information relevant for fighting large and catastrophic incidents. Currently this information is not directly consumable for the command staff in emergency response organizations. We present ongoing work tackling this problem and sketch future research directions.

Previous Work

Crowd-sourced Incident Reporting & Rating

Currently ongoing research aims to improve the situational awareness of emergency responders. We build a platform for crowdsourcing incident reports by citizens and enabling the emergency management community to rate the submitted reports with respect to their relevance for the work of the command staff. We aim to support this collaborative crisis management process by using recent developments of mobile devices and social networks. The current research work takes place at SAP Research [1] in Darmstadt within the InfoStrom project [2].

The first part of this research resulted in a research prototype that is ready for field-testing. It features two core pieces of functionality – a mobile app & a community- based platform.

Mobile app for citizen-submitted incident reports. Citizens can submit information on incidents either by taking pictures, shooting videos, recording audio messages or describing a situation in text or by selecting information exchanged on social networks. Examples are reporting on a power outage in a home or reporting a fallen tree that blocks after a storm. The incident reports, either from just generated photos, videos or texts or existing information on social networks, gets directed to emergency responders to make them aware of this information. This functionality is included in a mobile app that gets distributed to citizens for free by the administration (local, regional or national) or companies, e.g., in the customer service app of a utilities provider.

Community-based platform to crowd source the relevance rating. Our platform enables a community to rate a large number of incoming incident reports for relevance. A potentially large volume of incident reports comes in with an unverified level of quality using the mobile app for incident reporting. Emergency responders can utter demand for help for handling the reports specific to a particular incident. This triggers a community rating process. Members of the community start rating existing incident reports with regard to the requested information. Multiple submitted ratings indicate how relevant the particular report is with respect to the information need of the command staff is. Emergency responders can access the ranked incident reports at any time. The reports appear in descending relevance, i.e., the most relevant reports appear at a glance. The community consists of, for example, trained, voluntary firefighters not at the incident location, i.e., spatially located out of reach of the incident but who are willing to help.

Consumerized Business Applications (Web 2.0, Viral Software)

The authors have vast experience in building consumerized web-based business applications. Web-based applications targeting end-consumers need to satisfy high usability standards, as many applications under the buzzword “web 2.0” expose. This trend now applies as well to business software, which for various reasons didn’t focus on usability in the past.

Core of this trend, see e.g., [3] is that for example social network functionality is integrated into business applications, e.g., an activity stream in a project management application. Another important aspect are features which make the application viral, i.e., users refer or invite other users, so that the application gets propelled through users.

In particular, the authors created a meeting management platform to increase knowledge worker productivity. The platform implements support processes to reduce the administrative time spent with preparing, executing and post

processing meetings of knowledge workers. Knowledge workers reduce their administrative overhead for meetings and thus can focus on the meetings' content.

At the core, knowledge workers can create meeting notes. The platform transforms these into a layouted protocol, extracts action items and can distribute action items to meeting participants.

The platform thereby incorporates functionality for collaboration (meeting participants interact on meeting content) and virality (invitation to meetings). Furthermore, a large amount of the design effort went into securing usability as described above.

Open Research Issues

User-Driven Problem Identification & Prototyping

We see the need of a collaborative problem identification process that helps improving and speeding up the software development process for the emergency management domain.

Currently, the need for IT-based solutions within the emergency management domains is not clearly visible. Core questions are:

- Which domain problems do need to be tackled based on IT-systems?
- How important is each of the problems?

In addition, understanding the problems within the emergency management domain require deep process knowledge of the specialists in this domain.

On the other hand, the trend towards mobile applications has lowered the entry barrier for new software vendors entering a market, as mobile applications tend to cover focused parts of processes and thus are of lower effort than, e.g., complete business suites.

Implementing a user-driven problem identification & prototyping process helps to identify and publish the domain's problems, which in turn can be better tackled by software developers. It fosters the understanding for current needs in the emergency management domain.

The emergency management community has a large number of voluntary members who can contribute to such an effort, e.g., in Germany there are about 1.3 million voluntary firefighters alone.

The proposed collaborative problem identification process focuses on the domain's problems and the corresponding descriptions as this leverages the emergency responders expertise best. The approach explicitly doesn't focus on describing solutions in the first place, as this would require deep information science expertise.

In a second step, this approach can be extended into developing a solution. In these later stages of software development, such as requirements gathering, software evaluation and testing, the community can prioritize and assist.

Prioritize Solution Development with Crowd Funding

Crowd funding allows the collection of funds for an identified domain problem or similarly for a proposed software solution from a large number of people. Such a platform covers the full software development process of problem identification to solution along with setting financial incentives.

Crowd funding platforms (e.g., [4], [5]) support the process of collecting money from multiple people for a particular topic. A vendor submits a funding-topic, in this case either the problem description with a call-for-solutions or a defined proposal for a software application tackling an emergency management problem. People interested in this funding-topic, including private persons and corporations, can invest into it by donating a chosen amount of money. The platform then can alert those people who have prioritized the related problem beforehand. The vendor can perform further marketing via the platform by promoting the funding-topic on social networks like Facebook & Twitter.

Using existing crowd funding platforms can quickly set up crowd funding for the emergency management domain. By combining it with the above described user-driven problem identification and periodization platform, the problem gets a chance to get funded. This funding is an alternative means for prioritization, as people spend money for the problems most relevant to them.

References

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