

Applying AmI Technologies to Crisis Management: AmI 2012 Workshop Summary

Monica Divitini¹, Babak A. Farshchian², Jacqueline Floch², Ragnhild Halvorsrud²,
Simone Mora¹ and Michael Stiso²

¹ NTNU,
N-7491 Trondheim, Norway
{monica.divitini, simone.mora}@idi.ntnu.no

² SINTEF ICT,
P.O.Box 4760 Sluppen, N-7465 Trondheim, Norway
{babak.farshchian, jacqueline.floch, ragnhild.halvorsrud, michael.stiso}@sintef.no

Abstract. The AmI4CM workshop was organized as part of AmI 2012 in Pisa, Italy. This short paper summarizes the workshop content and the discussions that took place during the workshop.

1 Introduction

The workshop aims to bring together researchers and practitioners working on the application of AmI (Ambient Intelligence) to crisis and disaster management. Because of their pervasiveness and ease of use, AmI technologies hold a great potential to support crisis management in an efficient and effective way. The focus of the workshop is to better understand (1) the strengths of the AmI paradigm, (2) challenges to its application, and (3) its potential in the development of innovative solutions. The workshop is open to participation from different standpoints, including platform and user interaction issues, methodological approaches, and specific applications.

The workshop is jointly organized by three projects that investigate ICT support for crisis management from different perspectives. BRIDGE¹ aims at building a system to support interoperability – both technical and social – in large-scale emergency management. MIRROR² aims at developing ICT tools for supporting workplace reflection and learning. Training of crisis workers is also a core application domain of the MIRROR project. SOCIETIES³ aims at extending the application of pervasive computing beyond the individual to communities of users, developing the concept of Cooperating Smart Spaces. Disaster management is chosen as one area for

¹ <http://www.bridgeproject.eu/en>

² <http://www.mirror-project.eu/>

³ <http://www.ict-societies.eu/>

the evaluation of the proposed solutions in SOCIETIES. All three projects are funded by the EU Seventh Framework Programme.

2 Workshop Organization

Papers: The workshop has an open call and is advertised in a long range of relevant lists and communities. Organizers use easychair.org to do the review process. The workshop papers are peer-reviewed by the organizing committee⁴. Eight papers were received by end of deadline for submission in 2012. All eight were accepted for participation in the workshop. As you can see in the proceedings, the papers represent diverse aspects of AmI in crisis management, including tools, platforms, studies and observations.

Workshop participation: The workshop was divided into two parts: presentations in the morning and a SWOT analysis in the afternoon. All accepted papers were presented by the authors during the workshop, and all but one of the authors participated in the SWOT session in the afternoon. The SWOT session was interactive and involved all the participants at equal level.

Preparations: In addition to the paper review process we also asked the participants to create profile cards for themselves, which turned out to be very useful during the workshop (see Figure 1). We also asked Jacqueline to give the workshop an overview of AmI, how it was defined in the literature, and what applications it had. The presentation was given in the beginning of the workshop in order to create a common understanding of the subject.



Figure 1: Profile cards prepared by the participants, showing their research interests and backgrounds.

⁴ Since this is the first time we organized this workshop we did not extend to a larger reviewer group. This will be done for future editions.

3 The SWOT Analysis

Besides the papers that are presented in these proceedings, the other major deliverable from the workshop is a SWOT analysis⁵ that we did during the workshop. The process consisted of two parts, one brainstorming part and one clustering part.

In the brainstorming part the participants were given a 20 minutes individual task of writing down their contribution to the analysis on Post-It notes. Afterwards each participant was asked to present the contribution to the others. We used the windows in the room to hang the notes. Table 1 at the end of the paper shows a raw format of the contributions.

The clustering part was about grouping the contributions to major thematic groups. This task was also done involving the whole group of participants (see Figure 2). At the end we documented the results in a mind map. A portion of the map is shown in Figure 3. The groups under each heading included the following:

- Strengths: Support for situation awareness, support for non-experts, diffused enabling technologies such as smart phones, relevance for the society.
- Weaknesses: Technology-driven focus, inherent technological complexity, contribution to information overload, lack of robustness in the available technology and systems.
- Opportunities: Emerging technological trends that can help AmI4CM, can contribute better to organizational aspects and logistics, can help in analysing large amounts of data, can be used also for preparedness.
- Threats: Methodological weakness (real world evaluations and validations almost possible), integration and standardization challenges, technological challenges (e.g. infrastructure failure during disasters), lack of acceptance (e.g. big brother issues, usability issues).

If you need the complete mind map document please contact one of the co-organizers.

4 Future work

The workshop home page⁶ will work as a blog for the community of the participants. We believe the workshop contributed positively to the field. The participants were very active before and during the workshop. We hope the workshop will continue as a series as part of the AmI conferences or elsewhere. We thank all the participants for the cooperation.

⁵ SWOT analysis (alternately SWOT Matrix) is a structured planning method used to evaluate the Strengths, Weaknesses, Opportunities, and Threats involved in a project or in a business venture. (Definition from Wikipedia)

⁶ <http://research.idi.ntnu.no/ami4cm/>



Figure 2: SWOT analysis, clustering phase.

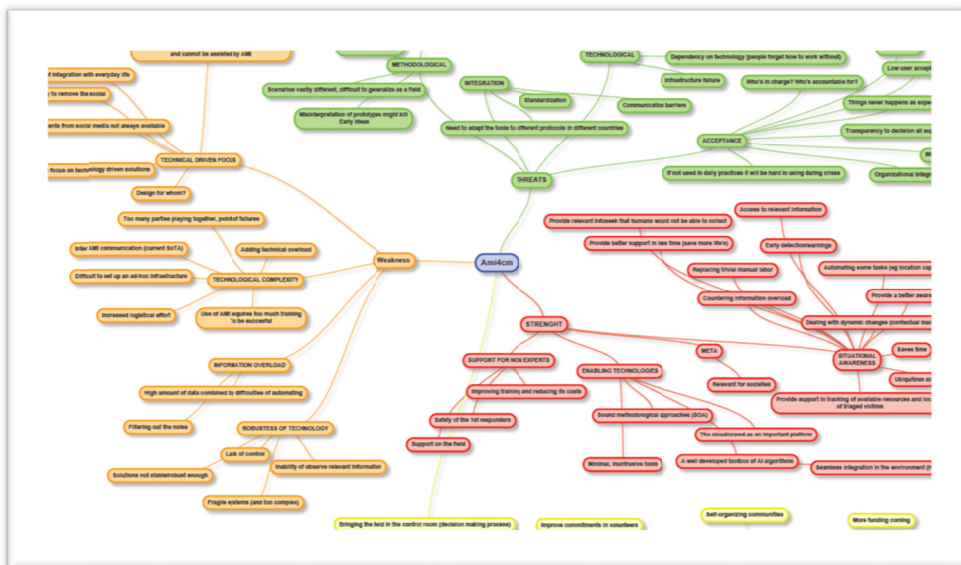


Figure 3: A portion of the mind map after the clustering exercise.

Table 1: Raw data from our SWOT analysis.

	Helpful	Harmful
Internal origin	<p>Strengths: Possibility to automate, to collect and distribute relevant information, to monitor stress level, situation awareness, information feathering, correct information in correct time, peripheral technology, early detection and early warning, replace trivial manual labour, improve training and reduce cost of training, countering information overload, sound methodological approach, sound algorithms, the cloud as an emerging platform, possibility for support in tracking of resources during crisis, knowledge integration and dynamic access to information, tools for supporting crisis management in the field, in addition to support at organizational level, seamless integration with practices using HCI methods, provide better structure, response, use of human capacity, coordination, ubiquitous access to information, relevance for society</p>	<p>Weakness: Lack of trust in automation, Lack of privacy, Infrastructure to set up, Many prototyped solutions are not stable enough, e.g. network, Security/privacy, Inability to observe relevant information, Introduce additional technical overhead, A tendency to remove the social, A tendency to focus on the technical, Non-technological issues might hamper use of technology during crisis, Too much reliance on infrastructure, Provide useful information, Saving time, Regional differences, need to do lots of adoption work, Access to social data might be limited in rural areas, Lack of common framework/middleware for integration, Problems making sense of a lot of collected data, Weakness in the design process, with multiple stakeholders, Lack of robustness, Rising complexity of the systems, and integration with existing infrastructures. Complex systems with a lot of risks, Lack of integration with everyday life for normal people, Fragile and too complex systems</p>
External origin	<p>Opportunities: Good body of knowledge available, both technical and socio-technical, Possibility of including crowds (as sensors and processors), Nanotechnology, Improve situation-awareness, Can get rid of unnecessary organizational overhead, Leverage the need for testing of tools, and introduce more realistic training, Improving logistics, e.g. water supply, patient logistics, Focus on pervading practices instead of replacing them, Complex calculations on demand, that can be done by computers, Searching for information in big repositories, Discipline of developing AmI, maybe only for training and simulation, is important, Information overload, Lack of control. Devices do stuff but we might not understand what and why, Making volunteers aware of what they contribute to, Can use mobile app stores to deploy applications more easily, To build self-organizing communities, more automation, Preparedness linked to environment (e.g. level of water in a river) and people (e.g. who is expert in what), Can bring the different phases of crisis management together, e.g. integrating data from crisis field to post-crisis, Smart phones, mobile internet, More funding is coming</p>	<p>Threats: Communication barriers among agencies, There is a gap between technical and application-related knowledge, Infrastructure threats, Dependency on technology can become a problem when technology not available, Low user acceptance, Misinterpretation of prototypes because they are often too mature for user involvement, Network and service availability, Difficult to get tools in daily practice, Successful use of this type of technology might require too much costs, Accountability, Lack of acceptance due to privacy issues, Users not allowed to do real crisis, barrier, Invasiveness of AmI technologies, Acceptance and the difficulty of it, Trust in technology when there is no continuous usage, Integration into existing organizational patterns and existing technologies, Difficulty with standardization, Lack of transparency, Very different scenarios; challenge for generalizing, Methodologically weak when it comes to evaluation, Big brother</p>