Emergency Messaging to General Public via Public Wireless Networks

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ABSTRACT

Warnings to the broad population in an emergency situation, irrespective of location and condition, is a public policy responsibility. Public wireless networks offer now the opportunity to deliver emergency warnings in this way with explanations, because in many countries the mobile penetration rates and coverage are higher than any other access form. The article summarizes the analysis of the selection process between Short messaging services (SMS) and Cell Broadcast (CB) messaging in the context of Denmark based on end user requirements, stakeholder roles and case-based analysis. It demonstrates the many technical, cost-benefit and other trade-offs needed in supporting the population now with a dependable and wide-spread technology. This research is the basis for a national policy. [Article copies are available for purchase from InfoSci-on-Demand.com]

Keywords: Cell Broadcast (CB); Crisis Management; Denmark; Emergency; SMS; Wireless Networks

INTRODUCTION

In many countries of the world (developed as well as emerging), the basic emergency warning system to the broad population is still acoustic, with a network of static or moveable horns activated by the public authorities and ranging to groups of inhabitants in order to achieve a high coverage .A variant thereof is acoustic messaging via the radio or possibly multimedia based warnings via the public TV networks. There is however still a long way to go before Internet fixed access points, alike TV sets, will be always-on and reach a large fraction of the general population, till such acoustic warning systems will be made entirely obsolete; the implied costs born by the users

from Internet or TV access, work patterns, mobility, as well as social factors such as age, handicap, connection behaviours, will together and for a while still prevent rather sizeable parts of the population from getting warned by Internet or TV alone when suddenly needed.

Separately, the critical analysis of public emergency situations all highlight the huge need for post-event information updates to be distributed in real time to the general population or selectively, whether people are exposed or not to the hazards, to ease rescue, evacuation, reduce panic levels, or for other tasks. Furthermore, at such post-event stages, central alarm notification is not enough, as individuals and groups need to communicate with other individuals or support points in a personalized way. This speaks in favour of personalized messaging (Ficora, 2005).

Finally, warning as well as post-event communication via resilient and redundant infrastructure should not flood communication capacity, especially if this has been reduced due to the events. Also it is not at all advised that the access terminals be made special, except for unique situations (lonely blind people, polytraumatic disabled persons etc).

SCOPE AND BACKGROUND

This research therefore has first been triggered by the concept of using widely adopted modern ubiquitous personal communications and messaging facilities such as those offered by public wireless networks. Whereas wireless networks such as those based on TETRA have the same properties, they are conceived and used as a private network usually by the public authorities

themselves. It should be highlighted that thanks to licensing requirements set by the national or multinational regulators, very high geographical coverage is granted in many countries, and wireless terminal penetration is very high.

The research has also been triggered by flaws found in Denmark by special interest groups in terms of the warning systems coverage in space and time, with the corresponding political and media outcry resulting from such issues being brought to the limelight. It was found that, after everything else possible had been done, there would still in Denmark be one out of thousand individuals, especially hearing impaired, who could not be warned with the planned national emergency resources (Beredskabsstyrelsen, 2005). Even if the terrain is not the issue in Denmark, just because of life behaviours, at any time 1/5 of the population are outside the range of the acoustic horns or not able to listen to radio/TV (Beredskabsstyrelsen, 2005). Also, it was found that over 60 % of the population nowadays does not know the meaning of the emergency horns signals or do not react to them, as evidenced by the large flow of requests to emergency numbers after routine tests.

The scope of this article is to summarize the findings of a project driven by emergency scenarios and cases , which specifies how public wireless networks can *in the present situation at short notice* enhance and possibly replace legacy warning systems to the general public while satisfying public interest and fast deployment requests (Simonsen, 2007). More precisely, were investigated in depth the operational, technical, cost-benefit and immediate availability aspects, of public emergency messaging via SMS or Cell Broadcast (CB) standard technologies in

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