PREFERENCES FOR NEXT GENERATION EMERGENCY SERVICES FOR PEOPLE WITH DISABILITIES

Harry Lew (BASc); Dan Leland; Dr. Gary Birch (PHD)
Neil Squire Society

ABSTRACT

Access to emergency services is a necessity to vulnerable populations, but many people with disabilities currently can not access emergency services due to the limitations of the current infrastructure in place. New initiatives in jurisdictions like the United States and Europe are exploring more inclusive services for the future, but are currently not in wide spread deployment. It is important to include actual users in the process of developing these new services to ensure that they are relevant to the end users. In Canada the discussion of the nature of these next generation services is still in the early stages. This paper describes a consultative process being used to find out more about the expectation and preferences of people with disabilities. In light of the aging population in western countries, there will be a new generation of older adults that are more comfortable with technology, having used it most of their working life. Included in this category are adults that are aging with a life long disability as wells as older adults that will acquire a disability as they age.

INTRODUCTION

In Canada we take it for granted that if we pick up the phone and dial 911 that help will be at the other end of the line (emergency response). While for the majority of the able-bodied population this is true, it is not true for many people with disabilities especially those that use mobile phones as their primary means for staying connected. Some of the accessibility issues have been addressed, such as supplying alternative formats for people with disabilities, for the traditional plain old telephone service (POTS) that many of us grew up with, but there are a large number of people with disabilities that simply can't access these services when it comes to wireless mobile devices.

The evolution of cell phone technology has radically changed the expectations of how services are delivered and what these services can do. In many cases the expectation exceeds the reality of what the service can provide. The most dramatic examples are for people who are deaf. While text messaging has become the preferred method of communication, besides sign language, for this community, they can not summon help by sending a text message to 911. This particular issue is not specific to only the disability community. During the shooting at Virginia Tech in 2007 many people actually sent text messages to the 911 number when they could not get through on their cell phones due to the increase in voice traffic that was overwhelming the cellular network. [1] None of the nation's Public Safety Answering Points (PSAPs) which handle 911 calls have the ability to receive text messages. [1] The situation is similar in Canada. The 911 Industry Alliance recently conducted a survey in the US which found that 75% of the nation's youth think they can reach 911 via a text message. [1]

The overall rate of Canadians' adoption of cell phones is growing. In a 2006 survey, among those households which owned or had access to a wireless phone, 57% reported actually having access to two or more wireless phones, up from 25% in 1997 [2]. Furthermore, as of December 2005, 4.8% of households reported relying only on cellular as opposed to landline phones - this compares to 1.9% in mid-2003. [3] The trend is stronger for lower income Canadians, as 7.7% of households below Statistics Canada's low-income cutoff relied solely on a cellular phone at the end of 2005. [3]

The evolution in cell phone technology has radically changed the way that consumers use them. Short text messaging, wireless e-mail, personal digital assistants, MP3 players, Internet browsers, and digital cameras are now common cell phone functions, in addition to traditional voice capability. Text messaging in particular has exploded, as the number of person-to-person text messages sent by Canadians reached 1.5 billion in 2005 (CWTA 2006), up from just 174 million in 2002 (CWTA 2005). [4]

The rapidly changing nature of information and communication technologies, the complexity of the technologies and the lack of insight by service providers and manufacturers into the real needs of people with disabilities means that there is a persistent lag in the usability of new technologies following their introduction that we call the 'Accessibility Gap'. This accessibility gap creates and aggravates economic and social deficits for people with disabilities. This has a lasting and tangible impact on this population that leads to poverty, a lack of independence and poor mental health

A preliminary literature search indicates that there is currently very little published formal research that explores issues faced by people with disabilities and how they access emergency response services and the barriers that they face. Much more additional research is needed in order to create best practices and standards to inform the creation of new products and services and in order to improve first generation technologies to make them accessible from the outset.

To look at the impact of wireless on emergency response services one only needs to look at the call volumes that come from mobile phones. A 2002 report indicated that close to 50% of all calls received by 911 centres in Canada were from mobile phones. [5] As more Canadians subscribe to mobile services, the ability of mobile carriers and emergency service agencies to properly respond and locate mobile subscribers is becoming critical

METHODOLOGY

The study is using focus groups to collect initial data from users with disabilities. Participants will be recruited from three disability groups: individuals who are blind, deaf and have upper limb mobility impairments. Participants will also be drawn from three geographic regions in order to try to detect any regional differences in expectations which may exist due to differences in wireless providers' scope of service, specific population distribution issues and the scope of emergency services support. As the numbers of focus groups are limited due to funding, the researchers chose to use a pre-screening process that included participants with only the most extreme forms of the conditions in the focus groups. These users face the most extreme challenges to accessing the services.

Participants of the focus groups were presented with three methods of communicating with emergency services: a video call, a real time text message and a symbolic based method of communicating pre-determined messages. Participants were also asked about their past experiences with accessing emergency services. For those that had not access emergency services before, the facilitator explained the existing process so that all participants would have the same context for the follow up discussion.

Information from the focus groups will be used to create survey questions. The survey will be administered to a broader range of participants in the disability community through phone surveys, mailed out surveys, email surveys and web-based surveys. Unlike the focus groups participants with all levels of disability will be included in the survey portion of the study.

RESULTS AND DISCUSSION

These results are still preliminary as of the writing of this paper. Only a few of the focus groups have been completed, but all focus groups will be completed in the coming

months and some preliminary results from the surveys will be available for presentation during the RESNA conference.

Deaf Participants

40 percent of participants who were deaf had made an emergency call before from a landline. Though they were unable to communicate with the emergency services operator, they left the phone off the hook and waited for the dispatcher to send emergency services to investigate. This approach works for landlines as the address associated with the landline can be looked up by the emergency services operator. In some jurisdictions it is not a mandatory policy to dispatch a representative to check up on a call if an actual caller has not spoken to though, so this is not a universal solution to the issue. This is not possible with mobile phones as there is no fixed address and even though new regulations are supposed to allow wireless service providers to locate the phone to within 30 meters, in rural environments where the subscriber is not using an newer phone with GPS technology, often the caller's location can only be determined to the nearest cellphone tower. In those cases the caller can only be located to within a circular area that is several kilometers wide. This makes it difficult to locate the exact location of the caller. As a result there is currently no way for deaf individuals to communicate with emergency services via cellphones in Canada.

None of the participants in the study currently have access to TTY technology. Unlike the United States TTY services via cellphones is not available. When asked about the lack of TTY usage, the participants suggested that TTY usage is more actively used by older users and in rural environments over landlines. All deaf participants used text messaging extensive on their cellphones. There was concern expressed about the time it would take to send a text message in an emergency situation, but all participants agreed that they would I use text message to communicate with emergency service if it was available.

80% of the participants had placed a video call before on a computer. There was some concern expressed about the potential periodic slowness in access and the graininess and jerkiness of the video connection for video calls placed on a cellphone. The issue of signing with one hand while holding the phone in the other was also brought up as a concern. Most thought they could sign with one hand though some admitted it would not be the clearest conversation as some words would need to be spelled out. The cost of the services was a concern expressed by all participants. Currently many participants have to pay for plans that have voice minutes that they can not use. In some cases text messaging plans are cheaper when bundled with voice. 70% of participants liked the idea of video calls. For centralized emergency call centres, the issue of dealing with localized signs was brought up. Like the spoken language regional colloquial terms exist.

In regards to the symbolic method of communicating to emergency services, 70% of participants thought it was a move in the right direction. The remaining 30% thought text messaging was better. All participants noted that symbolic communication might not be appropriate for all situations as more details than could covered by the symbols might need to be communicated.

Blind Participants

57 % of the blind participants had used text messaging at one time. Of those that had used text messaging, they liked the immediacy of the technology and the fact that it provided privacy when they were in public settings.

28% of participants had used 911 services before, either on a landline or cellphone. The challenge of communicating exactly where they were if they were not in a familiar location was brought up as their landmarks were relative to familiar landmarks like bus stops as opposed to street signs. All participants preferred the speed of placing a voice call over sending a text message.

In the context of placing a video call to emergency services 57% thought access to video capabilities would be beneficial as it would allow them to show the operator their location and send images of details they could not describe. Pointing the phone's camera in the right position was identified as a challenge.

Symbols were not presented to this group of participants as it has no context given there disability. Blind participant were asked if they would use pre-programmed text message phrases to communicate with emergency services as an alternative.

Upper Limb Mobility Impaired Participants

All participants with upper limb mobility impairments had used email and instant messaging either on a PC or on a cellphone in the past. 75% of participants had great difficult accessing text messaging on their cellphone due to the lack of alternative access methods that accommodate their disability. All participants found using text based communications slow and difficult when compared to voice based communications. All participants preferred voice communications and rank it as their number 1 method of communication with emergency services. Text messaging was ranked third, but all participants said they would use text messaging if they absolutely had to.

75% of participants had made a video call before on a PC (personal computer) and all participants ranked this method of access as number 2 after voice communications. None of the participants saw a distinct advantage to this method communication over voice.

The icon based method of communicating with emergency services ranked number 4. Some users found the sample symbols that were created for the presentation confusing though they understood the advantages in using symbols when traveling internationally provided symbols were standardized.

ACKNOWLEDGEMENTS

The authors would like to thank the Canadian National Institute for the Blind, the Canadian Association of the Deaf, the Western Institute for the Deaf and Hard of Hearing, the Manitoba League of Persons with Disabilities Inc., the Independent Living Resource Centre and the Deaf Centre Manitoba Inc. This study was funded by the Government of Canada's Social Development Partnership Program – Disability Component.

REFERENCES

[1] http://searchunifiedcommunications.techtarget.com/news/article/0,289142,sid186_gci1317369,00.html

[2] "Decima Research. 2006. Usage of Wireless Technologies in Canada", prepared for: Canadian Wireless Telecommunications Association (CWTA) (April 2006).

[3] Statistics Canada 2006. "Residential Telephone Service Survey, December 2005", The Daily, catalogue number 11-001-XIE (April 5, 2006).

[4] CWTA, Canadian Wireless Telecommunications Association. 2005. "Canadians Now Sending 3.4 Million Text Messages Per Day (March 22, 2005)", available at http://www.cwta.ca/CWTASite/english/whatsnew_download/mar22_05.html

[5] Lemay-Yates Associates Inc. ; Report: Mobile 911 in Canada; February 2002