



The short message service (SMS) for schools/conferences

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Mobile technologies have come a long way, with a total of 1.52 billion mobile users world wide as of September 2004. In particular the Short Message Service (SMS) has revolutionized the way people communicate, not least in schools. Television programs like Pop Idol and Big Brother in the UK have witnessed millions of subscribers to the SMS service sending in text messages to vote for who they wanted to win or lose. One use of SMS that this research has focused on is that of using SMS in schools or at conferences so that the teacher (schools) or presenter (conference) can interact with the audience

Keywords sms; gsm; stickies; frames; schools; mobile phone; presentation; mobile learning

1. Introduction

The short message service (SMS) was developed as part of the Global System for Mobile Communications (GSM) and it allows mobile systems and other network-connected devices to exchange short text messages with a maximum length of 160 characters. The length limit is caused by the way that SMS is transmitted. It usually rides on the control channels, the same frequencies or time slots used for call setup information by mobile phones. This means that users can send or receive SMS messages while they are making a phone call, though they need a hands-free kit to read the screen or type on the keypad [1]. SMS was commercially introduced in 1992 and in 2001, an estimated 102.9 billion SMS messages were exchanged worldwide [2]. With the proliferation of mobile devices, there has been an explosion in the use of the short message service, with a total of 1.25 billion global GSM users as of September 2004 [3]. Although SMS is quick and easy to use, it comes at a cost, not only in monetary terms, but also in the maximum number of characters that can be used for a message. This limitation is countered by each handset having a predictive text input mechanism (T9), which allows text to be entered rapidly. This mechanism anticipates which word a user is trying to enter by analysing the most recent characters or symbols which have been typed in and checking these against entries of a static or dynamic dictionary. Entries from the dictionary which closely match the partially entered word are then presented to the user, who can select one of them if appropriate. This significantly reduces the number of keys to be pressed for the composition of a message.

SMS is a well established technology which has widespread use around the globe, is quick, efficient and reliable. It can be used to access banking details and has been used for voting in the UK local elections in Spring 2002 [4]. It is also being used for accessing local information services like traffic announcements, weather forecasts, etc, etc. It has also been used in television programmes like pop idol, big brother, etc, in the UK, to vote for people to stay in the show or be removed.

There is much to discover about the adoption of mobile learning. Stone et. al. have shown that SMS has a quicker response time for interactive activities in education than email on the web. As young mobile phone users move on from education to the work place, there is a great potential to provide them with resources with future generations of mobile devices [5]. In this research, we focus on how SMS can be used in learning environments or the business place.

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2. Methodology

Pupils/students or delegates can send SMS comments/messages to their teacher or the presenter in schools or company/university seminars or presentations or conferences. The teacher or presenter can then select each message which will be displayed on a large screen and interactively deal with the question or comment. The application receives the SMS(s) and stores them in a database. It then adds other formatting information to allow the SMS to be displayed on the computer screen as small “posted notes” (nicknamed stickies), which can be tiled, cascaded or arranged in any order. The term “*stickie*” is derived from the idea of a posted note, which people can scribble a message on, and then stick onto someone else’s desk, computer, wall, notice board, etc., etc. The stickies or small frames are colour coded and fade their colours from a bright yellow to grey depending on how long they have been displayed. They can be saved with state information, and when the application is started again, the position, size and colour of the stickies is preserved. When being used in earnest, a projector is connected to the computer, say a laptop, and then the stickies will be projected onto a large screen which everyone can see. This has also been developed to run as a Java Applet. When the SMS has been displayed, the presenter can interactively deal with each SMS message and give feedback to the participants.

3. System design

The system uses java servlets, a Tomcat Servlet container, an oracle database, html and an open source SMS gateway called kannel [6], which runs on a UNIX platform. When an SMS message is sent to the SMS gateway using an SMS centre number provided, the servlet which is running on the Tomcat server receives it and does the following:

1. It retrieves the SMS message plus other information associated with the sending mobile phone, like the phone number, time stamp, etc, from the SMS server and stores that in the database.
2. It then creates a frame the size of the computer screen as shown in Figure 4, in which the SMS text is to be displayed.
3. The application then computes the (x,y) co-ordinates, the length and width of the message frame for that message, starts a thread to track the time the message arrived and displays the message as bright yellow within the larger frame as shown in Figure 4. As more messages are sent to the SMS server, they are processed on the fly and displayed on the screen as small message frames embedded inside a larger frame. We call these small frames stickies. Each stickie has a thread tracking its duration and over discreet timer intervals of say 5 minutes each, the colours of the stickies gradually fade to grey.

When the presentation is over, the stickies can then be saved not as stickies, but as text messages with additional information like size, colour and co-ordinates so that when the application is started the next time, it will retrieve the previous stickies and preserve their state information as well as accept new incoming messages.

The application also allows for the automatic detection of hyper links in the messages and by clicking on a hyper link, it automatically opens up the web page referred to in its own web browser, which runs independently of the main application.

4. Discussion

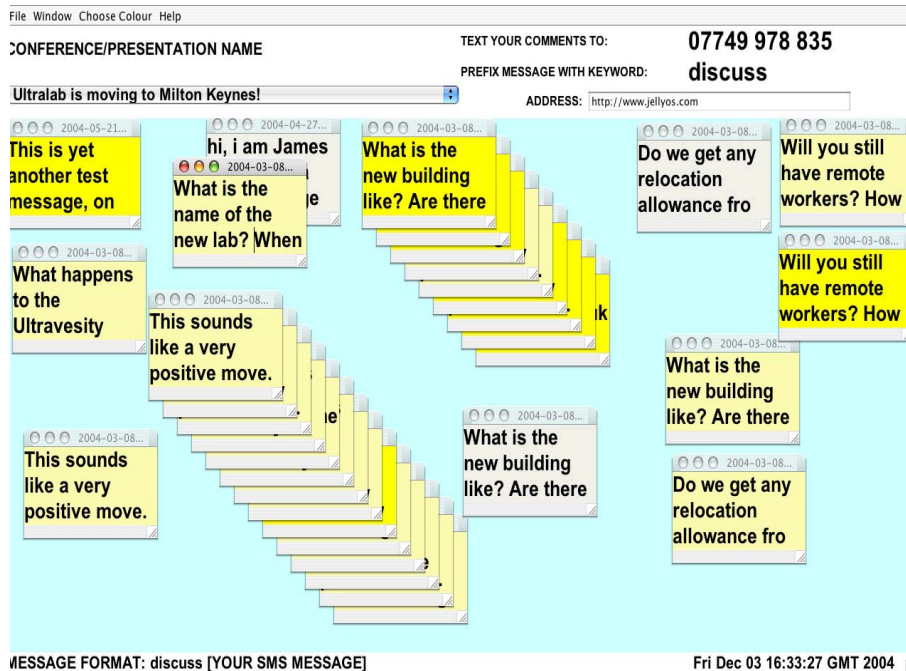


Fig. 4 SMS stickies results.

Figure 4 above shows results from multiple mobile phones sending SMS messages at a meeting/presentation conducted at Ultralab, Anglia Polytechnic University (APU), with around 60 people present. Several trials with a similar SMS system were carried out at the Ultralab summer schools with school children with very positive feedback. When being used in earnest, a projector is connected to the computer, say a laptop, and then the stickies are projected onto a large screen which everyone can see. The stickies are automatically arranged one after another when they first arrive, but they can also be rearranged i.e. cascaded or tiled within the bigger frame and they can also be resized. The main frame background colour can be changed while the application is running. The presenter can then click on a particular stickie to enlarge it to whatever size he or she wants, or minimise it. This way, one can deal with each message individually and give feedback to the participants, be they students, or delegates. Multiple presentations can be created and revisited at a later date and this can be an invaluable way to participate in discussions while preserving anonymity.

Lesley et. al. [7] on the e-Viva research project at APU, Ultralab, have shown that teachers believed that mobile phone usage made pupils much more aware of what they were doing and why they were doing it. Knowing that their work was going to be seen by others has a positive effect and increases their self confidence. Research in mobile learning in classrooms has also shown that the way forward in mobile learning in formal educational settings is the introduction of handheld devices [8]. The main caveat of using SMS in this way is that of potential abuse by unscrupulous users. One possible way of minimizing this problem is to filter out any abusive words from the text message and replace them with asterisks (*) and if say a text message has more than say 2 or 3 swear words, it is deleted and not displayed. A slight concern is the cost of sending an SMS message (about 10p/12p in the UK), but one assumes that everyone who can afford to buy a mobile phone can at least afford to spend 10p for a text message.

5. Conclusion and future research

We have shown that SMS can be successfully used in group discussions, be it in schools or business. It preserves anonymity, which allows people to articulate their views without fear of being criticised and is relatively easy to use. All that is needed is a mobile phone which is SMS capable. There is no need to take minutes as everything is kept in the database and can be retrieved in the same state that it was last viewed, including sticky positions and colours.

A possible idea for future research is to use mobile devices to send instant messages which can carry much more information than text messages, but would be free to use except for the price of getting online. If the instant message arrives while the user is not online, it can be stored in a database and when the user logs on, he or she can retrieve their messages, rather like email.

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