SMSVoiceIt

The SMS-to-Speech Gadget

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Abstract:

SMS messaging is universal, instant and cheap. SMSVoiceIt is a SIM-Card SMS vocalization agent, which functions as an appendage to mobile voice-mailer systems.
It transforms received SMS messages into voice soundwaves, which can be auditioned and manipulated through the mobile hands-free / car-kit apparatus automatically. Moreover, it supports broadcast of SMS-to-Voice messages to fixed-line telephones from a mobile set. The typical usage scenario of this gadget involves reception and auditioning of SMS messages through the hands-free / car-kit set; when the user is busy driving or involved in activities that prohibit browsing the mobile's in-folder easily. The SMS vocalization function is also useful to mobile users with visual impairments; who cannot access SMS content on their mobile phones efficiently. People with hearing impairments rely heavily on SMS messaging for their communication needs. SMS-to-Voice messaging is our reciprocal supported function for them, which allows them either to send vocalized messages to any fixed telephone line, or turn their cell-phones into instant speech synthesizers – thus bridging the silent with the speaking world.

Whenever I am driving and receive a SMS message by a friend or colleague, I always feel distressed at not being able to access it immediately, till I reach my driving destination or stop the car. Initially SMS was envisioned as a low priority cheap communication medium. It is certainly not low priority any more!

Having had prior development experience in creating voice services on mobile phones, I felt that something more efficient had to be worked out, to address the hands-free SMS access problem. Why not create a tiny applet that would reside on the SIM card – which would act as an agent, vocalizing the SMS content and get-it red-out through the hands-free or car kit set, when the user selects to do so? That way you could have both your hands on the wheel, and still be able to access the SMS that has been sent to your phone. What to answer back the SMS? Say "Call" at your phone's speaker and you will be connected to the SMS sender – plain and easy. Such a contraption might be useful to people with visual impairments. They do rely on voice recognition phones to perform dial-a-number operations; but till now, visual impairment mostly meant limited use and access to SMS mailers. This might also work conveniently for them too. And then comes the question.

Supposing we got an SMS vocalization engine in place, who else might find a similar function useful? Would it not be nice to get a reciprocal function support for

deaf people as well? It is the same vocalization engine involved, after-all. Why not allow them to use this small tool to send vocalized messages to fixed line phones from the same cell-phone they send SMS messages from?

A very small number of fixed line connections can receive and submit text SMS messages, even today. In the described guidelines followed the development of SMSVoiceIt, as this applet has been appropriately named – a compact SMS vocalizing agent on a SIM card. As evident from this text, the application presented is very simple and quite easy to build.

Development guidelines

Upon instantiation of the SMSVoiceIt applet and switching on of the mobile phone, the applet should enter into SMS-vocalization reception mode. This would be useful for visually impaired people as they would have nothing particular to do to get the applet working.

A user should have the possibility of turning the system on/off at will.

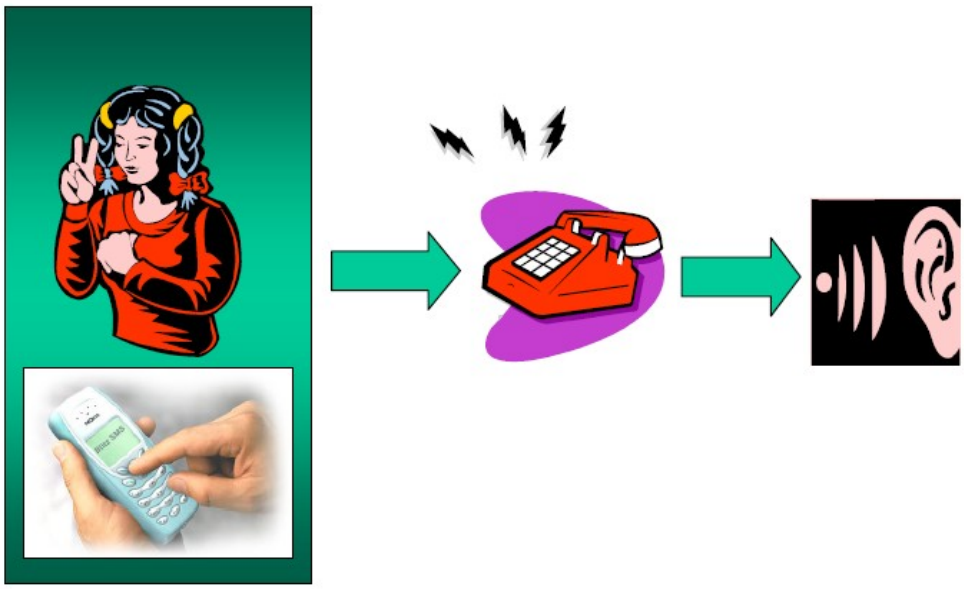
The system should be selection persistent.
All SMS messages sent/received regardless of their vocalization status should be registered on the SIM card's file-system for future access.
The system should include a SMS parser module on its server side, because SMS messages tend to contain abbreviated words.
The system should be multilingual in design and should be functional in as many languages as it is possible.

Development went on smoothly. The Axalto Views package was used to prototype a SMSVoiceIt applet, with a very minimal interface. The user is given four basic selections.

1. Send a Voice SMS
2. Normal SMS reception mode
3. Vocalized SMS reception mode
4. About

The first choice (Send a Voice SMS) is pretty much self-evident. It is meant for people (whether deaf or not) who need to send a vocalized message to a fixed line number. The user is prompted to enter the destination number and the text message to be vocalized – through an interface which is SMS-alike.

An encoded SMS is formed, which reaches the SMSVoiceIt OTA server. There, the user request is filtered, parsed and vocalized by a Text-to-Speech engine. The voice data is stored in a wav file. The OTA server calls the number specified by the mobile user, performs a play-back of the produced and recorded snippet, while waiting for some sort of feedback from the fixed line - most probably in DTFM tone signaling (e.g. press (#) -> OK , (*) -> reject/No etc). This response is sent back to the mobile user in the form of an acknowledgement SMS (eg SMS: voice SMS message delivered OK to No 9499939939)



When the mobile user enters his own number as the destination number, the voice audio content is enveloped in a MMS message and sent to his mobile phone for auditioning; by a hearing partner, with whom the deaf person is trying to communicate face-to-face. Thus, a casual cell-phone becomes a mobile speech synthesizer for deaf people through SMSVoiceIt, which can help them express themselves to people who cannot read the sign language.

The second option is 'Normal SMS selection mode', which makes the SMSVoiceIt applet transparent to the mobile phone. All incoming SMS messages can be viewed and manipulated in the normal text form, as is the usual case.

The third option initiates the Vocalized SMS reception mode, which is the core function of the SMSVoiceIt applet. It is meant to turn any incoming SMS message into the equivalent voice-mail, which can be manipulated and of-course auditioned on demand. As mentioned, the typical usage scenario is that of the car driver, who can not safely access SMS content behind the wheel. In a similar context visually impaired mobile users face a similar situation.

How does it work?

On receiving a SMS message, the SMSVoiceIt applet stores the incoming data on the SIM card's EF_SIM file (for future referencing) and forwards a copy of the incoming SMS to the SMSVoiceIt OTA service. There, the data is filtered, parsed and vocalized by a speech synthesis engine, and turned into a wav file. The OTA server calls back the mobile user's number and performs a play-back of the produced vocalized sequence.

Using an IVR portal (eg. say "call" to speak to the SMS sender), the SMS message's original sender can be called and connected with the mobile user to continue the communication exchange.

The described procedure is an augmentation of the hands-free operation on any mobile phone, which so far did not include SMS. It can be viewed as an extension and upgrade of the voice-mailer systems that are currently used; a function that not only ordinary users, but also several handicapped people could appreciate and use. The last option offered is ‘About’, which presents the identity of the application and possibly some usage instructions.

Business aspects.

SMSVoiceIt is a very simple mobile utility gadget. In certain aspects it makes life easier for drivers who use SMS messaging, and of-course handicapped people. There is significant development work on handicapped gadgets. To demonstrate the point, I am attaching an excerpt from Vodafone’s website on the development work by this leading mobile operator.

Customers who are Blind or Visually Impaired

The Vodafone Speaking Phone allows blind or visually impaired customers to use text messages on their mobile phones. The screen reader software converts text messages and screen content into speech. It also helps them check information such as battery life and signal strength.

So far, approximately 3,000 people have bought handsets with the Speaking Phone in the five countries where it is available – Ireland, Italy, Portugal, South Africa and the UK. During 2004, we negotiated a global contract with Scansoft to produce the software for sale worldwide.

Mobile Speak and Mobile Accessibility, similar text-to-speech software is available for customers in France and Spain. Other

The SMSVoiceIt solution does not in any way depend on the model of the mobile phone and the software it is running. Since it works on the SIM Card – it will work on any GSM phone; and can be downloaded through the OTA server instantly. Similar is the case with deaf users (also from the Vodafone site).

Customers who are Deaf or Hard of Hearing

We are developing text-based communication, specialist accessories and mainstream products for customers who are deaf or hard of hearing, or use sign language. Our operating companies are implementing a number of initiatives to improve accessibility for these customers.

Around one million people in Spain are affected by some kind of hearing disability, and of these around 90% use a hearing aid or a cochlear implant. Vodafone Spain is working with Research in Motion (RIM), the manufacturer of the BlackBerry® for Vodafone, to pilot an instant messenger application for their handsets. This will enable deaf users to have a real-time, mobile text conversation.

In the UK, our Mobile Textphone service enables deaf, hearing-impaired and speech-impaired customers to have real-time conversations with hearing people in text format. It uses the RNID (a UK charity for deaf and hard of hearing people) Typetalk service. The Textphone makes it possible for customers who are deaf or hard of hearing to call their bank or doctor – calls that people prefer to make for themselves. The service brings people closer together because all Vodafone customers can make calls to people who use Textphones, using their standard Vodafone mobile.

Our affiliate in France, SFR, launched specialised video tariffs for customers who are deaf or hard of hearing in June 2005.

SMSVoiceIt, provides basic functionality as a communication tool for deaf users; it is universal and generic in the sense that it works on any kind of GSM cell-phone present in the marketplace. Nothing special is needed and both correspondents (speaking and deaf) do not need special installations.

SMSVoiceit as a development prototype is new and probably needs further testing and refinement; it will be however submitted for evaluation in application portals of mobile operators– who have an interest in supporting SMS usage and access, not only among their handicapped users but also their car driver population, which is definitely a large user base!

Almost every adult person in the civilized world is a car driver and mobile phone

user; and almost all mobile users receive SMS messages. End-user billing can be expected to be similar or lower than voice-mail services offered by mobile operators; the voice snippets that are communicated by SMSVoiceIt rarely last longer than 15 secs. The application presented guarantees a minimal footprint and can be easily deployed in the market place._