Abstract

In this study, a ubiquitous foreign language listening environment, particularly for mobile phone users, is designed and tested. For the purpose of improving students' foreign language listening ability, the authors are setting up an analogue FM radio station and a digital web radio station with English language listening materials as their main broadcasting content. Students can choose to use the FM radio or web radio according to their location and convenience. As more and more mobile phones and audio players tend to embed FM functions into them, supporting streaming audio downloads and online play, these types of radio systems will undoubtedly increase in popularity in the future.

1. Background

In Japan, as of January 2007, contracts with mobile phone companies (mainly AU-KDDI, NTT DoCoMo and Softbank) exceeded 95,315,200 [1], roughly 78.5% of Japan’s total population. Considering that there might be several mobile phones being used by members of the same family on one contract, this represents a much larger percentage of the population actually using cell phones. In the authors’ classes, 100% of Japanese students have mobile phones with an Internet connection via WAP or i-mode. A recent survey in Japan shows that 49.2% of those owning mobile phones with audio player functions use these functions [2]. Further, the use of portable audio players is decreasing as the use of mobile phones for audio listening increases. This is manifested in the fact that 84.3% of mobile phone audio player users will no longer use portable audio players. Lastly, 40% of current mobile phone users tend to replace their mobile phones with new ones yearly [2]. The other inspiration for us to conduct this research comes from the current enthusiasm with the TOEIC (Test of English for International Communication) in Japan and the dire need for Japanese university students to improve their listening abilities [3].

2. FM Radio Station

Objectives: At the author’s university, students tend to stay on campus in between their classes; intervals that can last up to 4-5 hours a day. The FM radio envisioned for this project will play mainly English listening programs during lunch time (one hour), English songs or news during class intervals (15 minutes), and a series of other listening programs at other fixed times. Preparation: Setting up any type of analogue radio station in Japan requires taking a government exam in order to get a license. After obtaining a license, an agreement with the local telecommunications authorities has to be reached in order to be assigned to a certain range of available FM frequencies. Technical design: Considering the geographical location of the university, we decided to build an FM radio station which can cover an area of 9 square kilometers. The FM system consists of the following parts: sound sources, a transmitter, a signal transmission cable, an antenna for transmitting signals, accessories, and receiver terminals. The key part of the system is the FM transmitter. It plays the role of changing and adjusting sound sources to audio signals and sending out processed audio signals via FM frequencies. The FM system quality is mainly decided by an FM transmitter [4].
In light of some of the drawbacks of FM radio signals (i.e. they are easily affected by the weather, and the coverage area is limited), we can consider alternatives to replacing FM radios for language listening training. One possibility is the use of web radio.

3. A Low Cost Web Radio Station

Japan has shifted its mobile phone technologies to 3G generation. Telecommunication companies have all promised to increase their internet connection speed. Therefore, a fast connection to the Internet in Japan has formed the main premise for ubiquitous foreign language listening on mobile phones. With the infrastructure problem solved, there are reasons to believe technology on mobiles will be more and more advanced so that the users can quickly download audio files into mobile memory or attached SD mini cards whose capacity is continuing to increase. With the above pre-conditions, building a web radio station not only for wired PCs on the Internet, but also for mobile phone users should be possible and helpful, especially for foreign language listening.

Objectives: A web radio station should be easily accessible by PCs, PDAs, i-PODs, MP3/MP4 players, and particularly mobile phones which have WAP or i-mode functions. The content of the web radio station will be foreign language listening materials for learners of various proficiency levels. Currently, the station is scheduled to broadcast mostly TOEIC listening materials, as university regulations state that every student must take the test. A primary concern for foreign language teachers is to have a low cost, but highly functional radio station that can assist learners in their goal of becoming more proficient listeners in the target language. Technical Design: Bearing the above objectives in mind, the authors designed a low-cost, but highly functional web radio station. Hardware preparation: A server (for web host and sound encoding, processing and storing) with a high speed CPU: AMD Sempron; 2 GB system memory; a large hard disk capacity (250 GB); a 100Mbps Internet connection; and a telephone control device that is used in conjunction with a phone system that can handle multiple lines through the same phone. Software: Linux Fedora Core 6.0 + Apache 2.2 + Mysql 5.0; freeware Audacity for creating and processing sound sources for an audio server; and Icecast 2.3.1 as the audio server. All of the above software are available as either free downloads or as open source software.

Being open source software, the Icecast 2.3.1 audio server is a key part of this system, as it is capable of supporting OGG and MP3 audio formats. MP3s are now the most supported sound format that can be played by any mainstream audio player. Further, the OGG audio format is supported by many models of mobile phones and is very compact.

4. Conclusion

The FM and web radio systems proposed here are based on the current situations of the authors at their university. Testing and evaluation of the systems will commence in the spring of 2007. When both systems are completed, the authors plan to integrate both the FM and web radio stations so that they can serve English language learning purposes more conveniently. Although the technologies for these systems are not revolutionary, the authors believe that the idea of creating FM and web radios for language listening purposes are nonetheless creative, and will prove to be effective for language learning purposes.

5. References