Mobile Devices & Multimedia:

SUMMARY:

Introduction

Multimedia services available on mobile devices include audio/video playback and recording. Two types of multimedia capabilities are prominent—playback of locally stored media, and playback of streaming media. Streaming multimedia is an emerging technology with a great potential. Factors that must be considered: physical handset capabilities; compression and streaming technology; and communication between different entities involved like carriers, service providers, and manufacturers.

Opportunities

The key to successfully deploying multimedia services is the relevance of the streams to the users and the amount of control users can have over them. Streams like news broadcasts, weather and traffic updates would be more valuable to mobile users than entertainment broadcasts. Also, the more users control what they can play, the more attractive is the service, and the more money they will be willing to pay for it.

Challenges

1. There are no set of standards that entities in the industry (carriers, manufacturers, service providers) agree upon.
2. Multimedia broadcast to mobile devices requires a large bandwidth, and thus, several different network types can be used—this makes switching between different network types and services (that will depend on bandwidth available) tough for devices and carriers in terms of infrastructure.
3. Multimedia services can also be limited by handset-specific problems like screen size, battery-life, operating systems, and processing capabilities.
4. The type of service offered will also be a factor because people may not necessarily be keen on watching movies or sitcoms on their cell phones. Advertising on cell phones can prove to be a nuisance and waste of battery life.

Future Research Areas

Can the industry come to a common (or at least inter-compatible) solution for multimedia services? What kind of infrastructure would be required for successful deployment of these services? What kind of services could be possible?

FULL WRITE-UP:

Mobile phones have evolved from being just communication tools to being highly personalized and integrated mini-computers with a range of styles and features. Emergence of new transport technologies like 3G, EDGE, and soon-to-come 4G has revolutionized the vision for future services. Users have a whole host of services at their disposal, one of them being audio/video playback and recording. Users are most likely to use multimedia functions during "dead time," [1] which is the short period of time that users have to spend waiting for transport or in transit. Users are likely to have a voice conversation, play a game, send a text/multimedia message, listen to music/radio, check email, catch up on current events, or watch short video clips.

In a study conducted in the U.K., participants were given prototypes of various multimedia services. Based on the usefulness of the services, participants were asked to rank the services. The results were as follows [1]:

1. News/weather information.
2. Disaster management information (traffic updates, storm alerts).
3. Live services, particularly sports broadcasts and news.
4. Music—audio and video.
5. On-demand services like short tutorials.

Feasibility of these services depends on many factors.

Current Technology

Compression

Compression facilitates extremely small file sizes, which is crucial for streaming content. Although mobile bandwidth is limited, one advantage it does have is its small screen size, which translates into very small file sizes, easily transmitted using current bandwidth capacity.

One problem with compression technology is that there is no uniform standard or platform in the industry. The major players in this field are Microsoft, Real Networks, and Apple (Quicktime)—each of them is vying to be the preferred platform.

Handset audio/video technology

Locally stored content: Many handsets have a built-in media player for audio and video files. Media is usually transferred from a personal computer and stored on the phone's memory. Although this capability lets the users have total control over the content, it requires users to download and pay for their music and/or video files. Apple's iTunes is one of the leading sources for content download on the Internet, having a huge selection of music and videos, including movies. Some phones are 'iTunes-enabled', allowing the iTunes program to manage files on the phone.

Streaming content: Streaming content involves a non-GSM medium like EDGE, GPRS, 3G, etc. to broadcast media wirelessly to mobile devices. Streaming content can be classified into three categories:

- Basic, with little or no revenue-generation. E.g. e-tickets, e-flowers.
- Light, with low-value content. E.g. ringtones, graphics.
- Rich, with high-value content. E.g. music, videos, e-books.

Usually, the carriers embed a multimedia playing application that is used to view all audio/video content.

Success of streaming media is dependent on the carrier tariffs, not only for Web access, but also for playing media. Current services include limited clips from television programs and radio channels, depending on the provider. Radio can be either streaming or conventional (which requires the phone to have a receiver). Given the fact that phones are so small, it would be pretty unrealistic to expect users to watch entire programs on it. Besides that, other considerations must be taken into account like the battery life of phones, the processing power required and so on. Thus, competitive pricing will definitely be a factor in determining the success of streaming media.

Emerging Technology

"Personal Server" lifestyle

The concept of a personal server is centered round the user. Users will have a central store of data, which would also include audio/video files. Personal servers can also be connected to regular cable, and be capable of streaming TV as well (e.g. Slingbox). This data from personal servers can be accessed anywhere in the world with a fast Internet connection. This concept also allows the user to be in complete control rather than carriers or service providers.

Increased Collaboration

Better collaboration between service providers and carriers can benefit customers as well, besides the collaborators. For example, Sprint/Nextel and four cable operators formed a venture to combine their services and offer television [2], information, and other features to mobile phone subscribers. This type of partnership is mutually beneficial, where cable companies get an edge over their satellite competitors and help them gain access into the mobile industry. Conversely, carriers also get access into the cable market. This kind of collaboration furthers the idea of the mobile device as a "third screen" after the PC and TV.

Network-awareness

The concept of network-awareness [3] involves having an infrastructure of more than one network type (GPRS, broadband, 3G…). The mobile device will switch seamlessly between networks, depending on its location. For example, when inside a building, the device can switch to a wi-fi broadband network for enhanced content delivery. The device would adjust its resource demands in response to network variations. Multimedia content demands higher bandwidths, which can be achieved relatively easily by

using different network types—good quality streaming video is quite realistic in LAN or 3G/UMTS environments.

Homogenization of services and transport protocols

This concept [4] envisions that all services like communication, entertainment, and information will be integrated—so will the transport protocols, thus allowing any service to be accessible on any device (TV's, mobile phones, PC's…).

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