RESEARCH INTO PODCASTING TECHNOLOGY INCLUDING CURRENT AND POSSIBLE FUTURE USES

Kerry Matthews
Electronics and Computer Science
University of Southampton
Southampton, Hampshire, SO17 1BJ
klm304@ecs.soton.ac.uk
www.ecs.soton.ac.uk/~klm304

ABSTRACT

This report is an investigation into the technology behind podcasting. It also studies the current and possible future uses of this emerging technology, including its future impact in education. It is identified that a high quantity of research has gone into the study of e-learning through the use of podcasts and that there is the possibility for its future inclusion in academia.

Keywords

Podcast, E-learning, Automated Speech Recognition

1. INTRODUCTION

Podcasting is a relatively new phenomenon within the information technology sector. As more people understand the principle and concept its popularity is continuing to increase. By businesses embracing the technology podcasting standing is only going to further increase. Current podcasting uses are extensive. Radio shows, museum walk through tour guides and use even within the church are proving to be popular. Future uses are continuing to be investigated and offer some interesting concepts. Podcasting is being introduced into academia as an e-learning tool and businesses are already seeing the potential to their organisations. An evaluation of the technology is offered to the reader, including basic information such as how to publish and subscribe to podcasts as well as a look into the current and future uses of this emerging technology.

2. HISTORY OF PODCASTING

Podcasting is derived from the terms broadcasting and the iPod. The new Oxford American dictionary named it their word of the year in 2005. [2]

The dictionary defined the term as 'a digital recording of a radio broadcast or similar program, made available on the Internet for downloading to a personal audio player.' [2] The word has caused controversy however as it suggests that an iPod must be involved. This is not the case, as any media device will play podcasts including other brands of mp3 players. It is a fact that 4 out of 5 podcasts are not listened to on a portable device at all. [5]

Podcasting technology was first suggested in the year 2000. Initially Really Simple Syndication (RSS) technology was developed. RSS was designed to automatically refresh Internet content, without the user having to re-search for updates, an example included news headlines. Initially RSS was only suitable for text files. Overtime RSS was adapted for use with audio files; this alteration made podcasting a possibility. This addition encouraged Adam Curry to develop podcasting software. Curry realised the potential flexibility in downloading and finding audio files by using the RSS technology. Curry used AppleScript to develop a software application called iPodder. This software was open sourced and made available to other programmers. These programmers developed the software creating a complete software product. As a result podcasting could now evolve.

There are legal concerns regarding the audio content of podcasts. Many copyrighted music and similar material are a concern to podcast publishers. Sheri Crofts et al state that three legal restraints apply to podcasting; Public Performance Rights, Mechanical Rights and Master use licenses. [4] These regulations are established and therefore do not take into account newly developed technologies such as podcasting. Record companies are said to be concerned at the prospect of licensing podcasts. Licensing copyrighted music could impact their profits and sales as new legislations could legally allow many people to share one audio purchase.

3. PROCESS OF CREATING AND SUBSCRIBING TO A PODCAST

A podcast is compiled of audio files, which are wrapped in RSS extension tags. As previously explained RSS feeds were designed to allow automatic updating of text. (See section 2) RSS is a tried and tested technology, which is a great benefit for its use in podcasting. Podcasting is suitable for both PC and MAC machines and is greatly benefiting from the high quantity of free open source software available to users. [7]

3.1.1 Publishing a podcast –

Firstly the publisher needs to create an audio file. This needs to be in mp3 format and can be created using software such as Macintosh's Garageband or Microsoft's sound recorder. If the software is unsuitable for the creation of mp3 files then an encoder can be used to create this format. Stage two is the creation of the RSS file for the extension tags. A text editor is needed to achieve this. The basic code needed to create an RSS tag is shown below [10] -

```
<?xml version="1.0"?>
<rss version="2.0">
<channel>
<title>My Program</title> ----- change
the title
<link>http://url</link> -URL of
location of podcasting file
<description>my first
podcast</description>
<language>en-us</language>
<lastBuildDate>Wed 7th
Nov</lastBuildDate>
<webmaster>Name</webmaster>
<item>
<title>Todays show</title>
<description>here is my podcast
</description>
```

```
<pubDate>Wed 7th Nov</pubDate>
<enclosure>
url='url for mp3 file'
</item>
</channel>
</rss>
```

This code is saved with a .RSS extension and suitable file name. For less competent publishers software is available for the creation of RSS tags. An example is FeedForAll, which operates by simply asking a set of questions to the user in order to create a suitable RSS file. For a successful podcast the publisher needs to upload the RSS file and the created mp3 file to the same server. Both files must exist in the location stated within the RSS file. The RSS feed is validated before the user can publish the URL for Internet users to access the podcast.

It is useful to note that podcasts can support any type of audio file. However mp3 files are the standard format used. By using mp3 the majority of subscribers can use the podcast and pass the broadcast from device to device with no continuity problems. Podcasts are also able to support mp4 file formats. These formats are suitable for video podcasting, also known as vodcasting. These files can be created using basic software supplied with digital cameras and camcorders. Publishing of vodcasts is as simple as publishing a podcast in the more common mp3 format.

3.1.2 Subscribing to a Podcast -

Podcasts can be accessed in two main ways; direct downloading and web feeds. Direct downloading involves the download of a file by simply choosing to save the URL target. The disadvantage of this method is that the user fails to automatically receive any file updates or new podcasts linked to the subject. If the user wishes to receive these they must manually download them themselves.

Figure 1. Publishing and subscribing to a podcast [9]

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To maximise the benefits of podcasting users should use web feeds. Using suitable software such as iPodderX users can create subscriptions to URLs. By using such software any file updates or additional broadcasts can be automatically downloaded. If the user has synchronised their devices such as their Apple iPod these files will be automatically transferred to this hardware.

Figure 1 is a visual representation of the publishing and subscribing of podcasts.

4. CURRENT AND FUTURE USES OF PODCASTING

4.1 Current Uses
Podcasting popularity has increased since 2004. In February 2006 Internet researcher Emarketer claimed that by 2008 podcasting in the U.S will have an audience of 25 million and an estimated 50 million by the end of the decade. This is shown in figure 2.
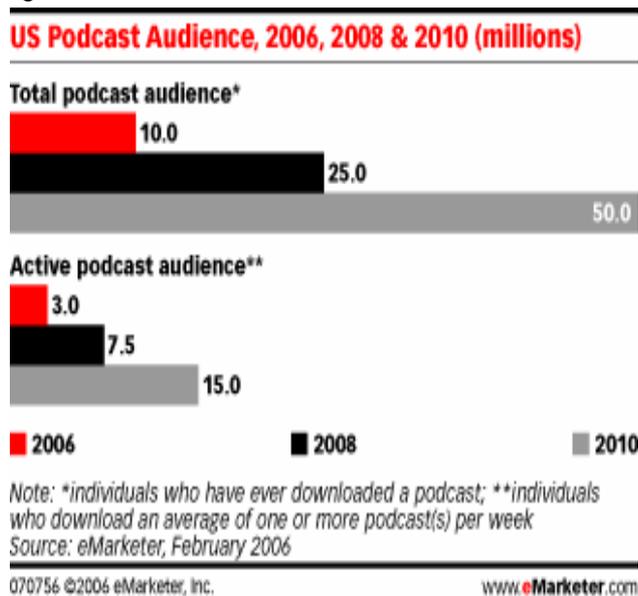
US Podcast Audience, 2006, 2008 & 2010 (millions)

Total podcast audience*
- 10.0
- 25.0
- 50.0

Active podcast audience**
- 3.0
- 7.5
- 15.0

2006   2008   2010

Note: *individuals who have ever downloaded a podcast; **individuals who download an average of one or more podcast(s) per week
Source: eMarketer, February 2006

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Figure 2: Estimated US Podcast Audience. [6]
© eMarketer

At launch podcasts were used primarily for radio shows. Listeners were able to subscribe and download their favourite shows and listen to the broadcast at a time convenient to them. The new technology also gave amateurs the chance to create their own radio shows. This was possible because all that was needed was a computer, a microphone and some basic software. Amateur radio has proved so popular that online radio stations are available, which are created and organised by just amateur podcast publishers. It is

now possible for listeners to also download music shows, talk shows and new broadcasts, which can be listened to at their own convenience.

The use of podcasting technology in museums and similar tourist attractions is proving interesting. Podcasts are being used as electronic guides for visitors. People are able to walk around the attraction listening to the recording. This gives people the convenience of a guided tour but with the flexibility of being able to start and stop the recording as they wish. It also means tours can be provided to visitors in a wide variety of foreign languages. A further interesting use is in stories, such as the BBC's book at bedtime. These podcasts appeal to a number of individuals for a diversity of reasons, there is particular interest from people with sight difficulties. Visually impaired individuals are now able to enjoy some of the biggest selling novels through this format.

Video podcasting is the most recent podcasting development. As explained in section 3.1.1 this technology works in a very similar way to conventional podcasts, except the use of mp4 file formats. Mp4 files provide the subscriber with visual and audio content. This technology is beginning to prove popular and a number of organisations are starting to embrace it.

This November the Scottish National Party has used vodcasts to launch their election campaign. This is in an attempt to attract younger voters, graduates and professionals. [1] The author believes this to be an excellent idea, as the Scottish National Party can target a wide audience very quickly. The obstacle will be getting the target audience to subscribe to their feed. To ensure viewers, the Scottish National Party may need to embed their broadcast within more popular podcasts currently available. The concept would work in a similar way as election campaign broadcasts on the television. These are transmitted prior to popular evening programmes. Other vodcasting uses include the ability to subscribe to television programmes, allowing viewers to watch their favourite shows again. An example programme is ITV's South Bank show, which users can download and watch at their convenience.

4.2 Future uses
Podcasting popularity is likely to continue to grow. This is a consequence of the fact that people can record anything to create a podcast and this flexibility is only rising due to the introduction of vodcasting.

4.2.1 Education

Podcasting is beginning to have an impact in academia. Continual research is being undertaken into e-learning and m-learning techniques. E-learning is defined as "delivery of a learning, training or educational program by electronic means. [8] E-learning offers the benefit that it removes two major educational barriers; time and money. [13] Podcasting is considered to be a new e-learning tool. Educational podcasts could be made available to students, with the addition of being suitable for download to mp3 players, mobile phones and PDAs, which also makes podcasting an m-learning tool.

Podcasting offers the advantages that students have the convenience to learn when and where it is suitable for them. This could increase subject popularity and uptake. Podcasts also gives students the chance to educate themselves in the way they find most suitable and successful. This is important as some students find listening a more effective learning method than reading. The recording of lectures allows students to have a vast amount of material when revising for exams and control over the playback, by being able to rewind and listen to key facts again.

Visually impaired students can also find audio recordings of lectures useful. Students are able to listen to lectures in their own time and listen again to identify the tone and emotions used by the lecturer to convey key points. A concern with offering recorded lectures is that students may not attend the original lecture, as they know they can listen to the recording when suitable for them. Therefore a concern would be how does a tutor record the lecture if no students attended.

Podcasts must be reusable, accessible and searchable [3], which creates a problem, as all students must have access to the information. In an attempt to resolve this problem, students in America were given free iPods during podcast trials. This does however create additional problems. Providing all students with ipods would be very costly for universities, especially when recent media suggests university funds are already overstretched. Universities could suggest that students use their own mobile devices, such as PDAs and mp3 players, but this could exclude some students. Further considerations include the subject being taught. It can be argued that certain subjects will benefit from podcasts more than others. It is important however that universities are not seen to discriminate against certain departments and

students. Universities must decide to offer ipods to everyone or no one.

There are some disadvantages in using podcasts within academia and these are discussed in section 5.

4.2.2 Business

Businesses will want to capitalise on podcasting as the technology continues to emerge and grow. Rodney Rumford states that by businesses adding podcasting to their marketing mix it will have a positive impact on their business. Rumford suggests six advantages of incorporating podcasting with business [12] –

1. Building of Brand;
2. Industry News and Insights;
3. Customer Loyalty;
4. Public Relations;
5. Increased market messaging reach;
6. Distribution of company news.

One could come to the opinion that all these points are interlinked, through an increased visibility of the business. Customers can be kept informed and up to date on breaking industry and company news, which offers an important selling point to consumers and improves customer loyalty over comparable businesses. These factors contribute in developing the company's brand and market status. Ana Rincon states that the main advantage of podcasting to business is the convenience it offers. [11]

Organisations can use podcasting for employees as well as their customers. Employees can be offered training courses via podcasts. This offers convenience for employees, as they are not forced to attend specific courses at set times and locations. It can also reduce company overheads, as the cost of training is the production of one podcast, rather than the hosting and organisation of many training sessions. Organisations have been formed, where businesses can purchase podcast-training courses for their employees, these have proved very profitable.

5. DISADVANTAGE OF PODCASTING

Downloaded podcasts are just audio and video, which can create problems. It can be difficult for subscribers to identify an exact phrase or point of

reference within a podcast, if they wish to refer back. An example of this may be a student who has listened to a lecture recording via a podcast and then wishes to re-find a phrase or fact later. The only way to achieve this would be to re-listen to sections of the podcast, through searching using chapters and timestamps. This can be difficult if the student has no idea where the phrase may be. The ideal technique would be the use of a simple find function to search a transcript offered with the downloaded podcast. The transcript and podcast could be synchronised so when a phrase is located within the transcript the audio could begin from this point. This would work in a similar way to automated speech recognition software currently available and under development. An example system would be IBM's Viascribe software, which is being developed for use in academia. Viascribe is able to produce real time synchronised transcripts to accompany audio and video. [14]

Transcripts can be obtained for podcasts; however these are often very expensive. Transcripts are obtained through independent profitable companies who charge per word or audio duration, such as in 30-second segments. These transcripts are not synchronised with the audio meaning users are unable to begin the audio based on finding a phrase within the text. Accompanying transcripts would allow subscribers to decide whether a podcast was worth subscribing to. This would save time, which is currently wasted by people subscribing to podcasts and then realising their content is unsuitable. Research into search engines for podcasts is currently being undertaken. The first of these offered on the market came from podscope. These offer searching for suitable podcasts for users to download, but they do not offer the functionality to search within specific downloaded podcasts.

6. CONCLUSION

Podcasting originated in 2004 as a consequence of a development in RSS technology. This development allowed audio files to be subscribed to and downloaded. Podcasts can be listened to on a number of devices, but are most commonly listened to on the desktop computer. Users can also synchronise and download the audio files to mobile devices such as mp3 players and mobile phones. As more people are becoming familiar with podcasting technology its popularity is continuing to increase, as popularity increases its uses are continuing to develop. Originally podcasts were primarily used for radio shows, which then expanded into talk shows and news broadcasts. Vodcasting has further increased the popularity of this technology and expanded its uses further. Podcasts are now used to subscribe to television

shows and election broadcasts. In the future it would appear that podcasting will become an effective tool in e-learning and business.

As previously mentioned one area of future work and research would be into the possibility of synchronised transcripts. This could be very effective particularly with the introduction of more advanced mobile devices such as the Apple's video iPod.

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