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Introducing podcast in library service: an analytical study

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Introducing
podcast in
library service

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Abstract

Purpose – The purpose of this paper is to provide an overview of the application of podcast in academic and public libraries, focusing on its purposes and characteristic features. It seeks to measure the degree of adoption of podcast in different types of libraries across the continents.

Design/methodology/approach – A content analysis method was used for data collection. Convenience sampling method was followed to select four samples of population, one from each of the four continents. Data were collected along the checkpoints developed by Nguyen and Tripathi and Kumar, and subsequently modified by the researcher. Microsoft Excel was used to analyze data.

Findings – The analysis revealed that library podcasts have some basic features and are implemented for specific purposes. It also revealed that adoption of podcast varies along the geographical regions. The study found that extension of implementation of podcast is high in North American libraries whereas intension of adoption of podcast is high in Australian libraries. However, the reason of disproportionate use of library podcast may be attributed to the differential internet penetration rate along the regions. The paper also identifies areas where podcast is being effectively used by libraries across the world.

Research limitations/implications – The present study was limited to North America, Europe, Asia and Australia, and the survey was completely internet-based, conducted on web sites available in English only. A combination of questionnaire and interview method may enable future researchers to measure the impact of podcast on users' and librarians' attitude and perception, which in turn, will determine the extent to which podcast is capable of motivating and engaging users to harness library facilities.

Originality/value – Based on the research findings, the scope of the present study may potentially be expanded with the inclusion of different dimensions to gain a comprehensive understanding on the practicability and usefulness of podcast in different libraries belonging to diverse socio economical levels. The findings will also guide future librarians and web developers alike in designing library web pages so that traditional library services could be provided in an innovative way to meet the expectations and information needs of the users.

Keywords Academic libraries, Public libraries, Web 2.0, Podcast, User studies

Paper type Research paper

1. Introduction

The advent of the digital era has largely changed the needs and expectations of library users. As documents are increasingly and ubiquitously available on the internet, the distinctiveness of libraries is gradually diminishing. To be relevant to the present day context, libraries need to go beyond their physical boundaries and working hours, to potentially expand library services and facilities to users located far-off. This necessitates libraries to introduce Web 2.0 technologies, with an emphasis on dynamic or interactive web sites, to encourage users' involvement in promoting web-based library services. One of the Web 2.0 applications is podcast. Podcasts are being gradually adopted by libraries to create freely downloadable audio contents and reach out to users, even when they are located a long way from the library building and are



busy doing something else. Podcasts provide enhanced support to auditory learners, constituting 30 percent of total learners (Ralph and Olsen, 2007) and are commonly used to describe and promote various library resources (Bradley, 2007; Bierman and Valentino, 2011). They relieve users of the task of going through lengthy text, and instead enable them to listen to information, guide them on the use of library resources, gives vital research tips at their leisure, and much more.

Although recent publications on podcasts have identified a long list of possible fields where podcasts are being successfully implemented, the present study focuses on their use in the library where the technology has immense potentiality to enrich communication, foster librarian-user interaction, expand the scope of librarians to offer quality online experiences in their web sites with a view to providing library resources to the users' community in an innovative and attracting way.

1.2 Podcast – a brief overview

Podcast is considered as a series of digital audio files (voice recording), distributed over the internet, released with episodes and downloaded through web syndication. There are several audio formats available on the internet, but podcast differs from them because podcast files are identified and downloaded automatically as soon as they are released via special software, called pod catchers and are made available to iPods, computers, PDAs, cell phones, and other digital devices for offline use.

The term podcast is derived from the combination of term iPod and broadcast. Adam Curry, the developer of the first podcasting program "iPodder", with the cooperation of RSS feed developer, Dave Winer, created podcasting to make audio content available to listeners anytime and at anywhere they liked. The first podcast in human history was the RSS-fed interview, which Winer recorded with Christopher Lydon, a television and radio personality from the Boston in July 2003, and which arrived Adam Curry's iPod in Europe and sparked the imagination of iPodder launching (Doyle, 2005).

Podcasting is a process that regularly posts audio contents featuring a range of new topics of interest to the users. The person whose voice is recorded in a podcast file is called podcaster. Ralph and Olsen (2007) opined that podcasts are different from usual web-hosted audio files because they require users to subscribe to the podcast through RSS or another web syndication tool. Later on Balleste *et al.* (2006) further expanded the scope of podcast to include web syndication of video files (vodcasting). Podcasting has become popular because it is easy to create and is a convenient way of providing access to data (Bradley, 2007).

2. Research questions

During the last few years podcasting technology has received increasing attention in the higher education sector as an evolving educational tool (Evans, 2008; Fernandez *et al.*, 2009; Lazzari, 2009; O'Bannon *et al.*, 2011). It is widely implemented in the business and corporate world (Copley, 2007), is becoming more common in health education (Dysart, 2006) and has sharp inroads in libraries (Ragon and Looney, 2006; Bierman and Valentino, 2011). However, most of the research on podcasts carried out so far, in relation to their use in library, either concentrated on guiding librarians to implement Web 2.0 tools, focusing on podcasts along with other Web 2.0 applications (e.g. Nguyen, 2008; Tripathi and Kumar, 2010; Harinarayana and Raju, 2010) or

describing the use of this technology in a particular library (e.g. Lee, 2006; Balleste *et al.*, 2006). Still less is known about how different libraries are harnessing this technology to enhance library services in different geographical regions.

Podcasting is being considered to have immense potential for improving the teaching-learning process (Richardson, 2008) and allows users flexibility to access to instructional information while on the move (Vogt *et al.*, 2010). Despite calls for implementing podcasts and podcasting technology as a novel way of communicating and attracting a users' community (e.g. Bradley, 2007), hitherto little work has been made to examine the extent of use of podcasting among libraries across the continents (Chua *et al.*, 2008). Therefore, the present study has been undertaken to develop a good understanding of how podcasting technology is being implemented in libraries to encourage users to utilize library resources and facilities. Given the context stated above, the following research questions have been raised:

RQ1. In what ways are podcasts being used by libraries?

RQ2. To what extent podcasts are prevalent in libraries?

2.1 Research objectives

In order to address the research questions, the following research objectives need to be achieved:

- To study the characteristics of library podcast and to investigate its purpose of use.
- To measure the degree of implementation of library podcast across the continents.

3. Review of related literature

While discussing podcasting technology Lum (2006) noted that, in USA, since 2004 many universities have started using podcasting technology to air course lectures and tutorial discussions. While studying the popularity of podcasting Bradley (2007) noted that the search for the term "podcast" with Google returned 24 hits on 28 September 2004, 526 hits two days later and over 100,000 by October that same year. In October 2006 the same search yielded over 153 million results which clearly indicated the growing acceptance of this technology worldwide. Griffey (2007) opined that easy availability of audio files (MP3 format), video files (MPEG and AVI formats) and electronic devices that support those file formats together contributed to the increased delivery of content via podcasts. The reason behind the steady increase of the use of podcasting technology may also be attributed to the fact that many universities gradually started embracing podcasts at the institutional level. For example, from late 2002 onwards many universities in the USA started introducing "iPod-enhanced" audio-contents ranging from lectures to audio books. To promote the use of podcasts, Duke University distributed 20 GB i-Pods, preloaded with orientation information, to its 1,650 new entrants in August 2004 (Lee *et al.*, 2008). In March 2005, John Udell (as cited by Campbell, 2005) identified five major factors behind the rapid growth of podcasting:

- (1) Pervasive nature of internet.
- (2) Rapid growth of broadband to easily accommodate large media objects.
- (3) Easy availability of personal computer with multimedia.

- (4) The obliteration of distinction between the streaming and downloading of media contents.
- (5) Growing acceptance of MP3 playback devices.

Present day users have a different sort of mind set. They have great expectations, prefer customization, are technology savvy, and use new modes of communication (Gardner and Eng, 2005). These attributes of young learners might have increased the acceptance of podcasting as an effective medium of distance learning (Ralph and Olsen, 2007). The growing popularity of podcasting among the student community has been reflected in several studies examining users' satisfaction with podcasting (Evans, 2008; Fernandez *et al.*, 2009; Heilesen, 2010; Zanten *et al.*, 2010). While studying application of podcasting in the higher education sector, Vogele and Gard (2006) categorized podcasts into administrative podcasts (general information, instructions, and guidance), special lecture podcasts (guest lectures, etc.) and traditional lecture podcasts (usual classroom teaching). Library podcasting is concerned with all sorts of podcasts. Additionally, libraries encourage podcast creation by users, to develop "cognitive and social connection between users and librarians" (Chua and Goh, 2010), and thereby to promote library services.

The majority of the early library literatures on podcasting published online, stressed several features of the podcast, with some articles focusing on podcast projects undertaken by specific libraries, highlighting the mechanical ways of creating, editing and distributing podcasts. Later publications are basically research-oriented work, providing guidelines on how the podcast could be introduced in library. One of the earliest works on the use of podcasting in the library has been reported by Balas (2005) and describes the Online Programming for All Libraries (OPAL) project offering its archived contents via web syndication as a podcast. Explaining the podcast initiative of Claude Moore Health Science Library, Ragon and Looney (2006) highlighted the effort of the project to make health science lecture series accessible to users through podcasting. While discussing Lancing Public Library's podcasting effort, Lee (2006) addressed podcasting as a catchy tool for promoting library services which attracts new users to specific programmes. Berk *et al.* (2007) studied the utility of podcasting as a tool in the provision of information literacy in Curtin University Library. The study revealed that podcasting series could be created with minimal expense and a simple production method, and it also pointed out that the popularity of receiving information through a podcast was increasing steadily over the course of the semester. Jowitt (2007) studied the perception and usage of library instructional podcast by staff and students of Universal College of Learning (UCOL) and identified areas where podcasting was most effective, discussing its merits and demerits. Griffey (2007) demonstrated the podcasting initiative of the University of Tennessee in providing instruction to the target users. Murley (2007) provided an example of monthly legal news podcast, among others, from King County Law Library, Seattle.

Barnes (2007) described a podcast project undertaken at Mississippi State University (MSU) Libraries to promote academic resources and services to the students, faculty and staff, with special emphasis on government documents collections. The article guided librarians to gain basic knowledge about podcast technology and to identify possible resources that can be marketed via the podcast medium. Berk *et al.* (2007), and Kajewski (2007) described how to create a podcasting

series with minimum resources, including computer, headset, microphone, software for recording and mixing, software for encoding, along with suggestion on legal issues involved. King and Brown (2009) pointed out that libraries can share events and instructions with its users effectively using podcast. Tripathi and Kumar (2010) opined that podcasting is used to exchange and share audio programmes among patrons over the internet. At present, many public libraries and libraries in higher education institutions in several countries have started introducing podcasting to market library services and developing audio books, indicating the increasing popularity and usefulness of this technology.

Besides these, a few piece-meal surveys were also conducted on podcasting in conjunction with the entire gamut of Web 2.0 technology to determine its prevalence and usage in some libraries. Nguyen (2008) conducted a survey on 32 Australian libraries to study the applications of Web 2.0. Chua *et al.* (2008) studied the prevalence of use of Web 2.0 in academic and public libraries. Aharony (2009) examined whether personality characteristics (resistance to change, cognitive appraisal, empowerment and extroversion or introversion), as well as computer expertise, motivation, importance and capacity towards studying and integrating different applications of Web 2.0 in future, influence librarians' use of Web 2.0. Tripathi and Kumar (2010) studied several university libraries in Australia, Canada, the USA and the UK to find the strength of Web 2.0 tools in improving library services. Harinarayana and Raju (2010) surveyed 100 top universities from the ranked list of the *Times Higher Education* web site and provided concrete evidence on the use of Web 2.0 technologies in university libraries.

Bierman and Valentino (2011) studied the podcasting initiatives by American research libraries, identified the areas where podcasts are being implemented and concluded with an appeal for the librarians to explore avenues where this technology can be effectively expanded.

Most of the studies conducted so far reflect either the initiatives of specific libraries, or the usability aspect of podcast as a part of other Web 2.0 tools, basically only among academic libraries. Hitherto little research-based literature is available, focussing on a survey and evaluation of podcasts in academic and public libraries, which demonstrates solely how different libraries are harnessing the potentiality of this technology across the globe. Therefore there remains a gap in this area that calls for attention of further research.

The present study was conducted on podcasting technology, one of the most entertaining forms of providing web-based library services, encouraging users to listen to web-based audio-contents, focusing on academic as well as public libraries covering four continents, to study the characteristics and purposes of using podcast in different types of libraries and the prevalence of its use across the continents.

4. Research methodology

The survey was restricted to academic and public libraries in four geographical regions – North America, Europe, Asia and Australia, as these continents constitute that part of the universe of population that is accessible to the researcher; because of large number of library web sites that are available in these regions.

Content analysis methodology was used for the present study. Content analysis is like an observation study, but analyses what is observed in a text, television, etc. and

requires a checklist to be developed to count how frequently certain ideas, words, phrases, images or scenes appear (Dixon *et al.*, 1987). The above characteristics have made this methodology appropriate for adoption to this research.

4.1 Sampling method

The present study followed a convenience sampling method. It is based on non-probabilistic sampling technique, which has some limitations of not certainly ascertaining any basis of estimating the probability that each item in the population has equal chance of being included in the sample (Kothari, 2004). As there is large number of web sites falling in the universe of population, and no single online directory that comprehensively includes each and every element of the population, the researcher resorted to choose elements of population from the constructed sampling frame in an unstructured way. The researcher opted for convenience method because the elements of population can be selected from the sampling frame on the basis of convenience to access. Needless to mention, those libraries not having web sites were not considered for study. Therefore only the web sites of those libraries which were easily accessible were selected from the sampling frame. Moreover, web sites that provided podcasts in not in the English language were excluded from this study. Web sites with restricted access were also not considered for the study, like University of Toronto Library podcasts.

The convenience sampling method is generally used for the pilot study, to gain an overall idea about the outcome. This method is preferred to random sampling in order to minimize the expenditure and lessen the time required to conduct a survey. In the present study the choice of convenience method is justified because both of the above criteria are equally applicable here.

Four samples of population, one from each of the four continents were drawn: 120 libraries (70 academic and 50 public libraries) from North America; 90 libraries (40 academic and 50 public libraries) from Europe; 40 libraries (20 academic and 20 public libraries) from Asia; and 60 libraries (25 academic and 35 public libraries) from Australia.

4.1.1 Sampling frame. To minimize systematic bias that might have crept in due to adoption of non-random sampling technique, the researcher ensured that samples were drawn from appropriate sampling frame. Various online databases were consulted to gather information on academic and public libraries. Web sites having a ranked list of higher educational institutions were primarily considered for accessing academic libraries. However, for public libraries there is only one web site, Hennen's American Public Library Ratings (2010 edition), having an updated ranked list of public libraries in the USA. Therefore, the researcher preferred various online public library directories for accessing public library web sites. Finally the sampling frame, encompassing following web resources, was constituted for taking four samples of public and academic libraries, one from each of the four regions.

- (1) Public libraries in North America were drawn from Public Libraries.com (www.publiclibraries.com) for American public libraries and Canadian Library Gateway-Canadian Public Libraries (www.collectionscanada.gc.ca/gateway) maintained by Library and Archives, Canada. It is a knowledge institution formed by the National Archives of Canada and the National Library of Canada.

- (2) European public libraries were accessed from The European Library (<http://search.theeuropeanlibrary.org/portal/en/libraries.html>), having information on national libraries in Europe and hosted by the National Library of The Netherlands, UK Public Libraries (<http://dialspace.dial.pipex.com/town/square/ac940/weblibs.html>), compiled by Hardens and updated latest in 2008, and Directory of Ireland Libraries (<http://lists.webjunction.org/libweb/Ireland.html>).
- (3) Asian and Australian public libraries were browsed from Libraries of Asia-Pacific Directory (www.nla.gov.au/apps/lapsdir?action=LapsBrowse), an initiative of the Conference of Directors of National Libraries of Asia and Oceania (CDNLAO) and supported by the National Library of Australia, Libraries on the Web, Australia (http://lists.webjunction.org/libweb/Aus_Australia.html), and Directory of New Zealand Libraries (<http://directory.natlib.govt.nz/library-symbols-web/>).
- (4) Academic libraries were accessed from multiple directories: Academic Ranking of World Universities (2010) (www.arwu.org/ARWU2010.jsp), which is published by the Centre for World-Class Universities and the Institute of Higher Education of Shanghai Jiao Tong University, China; Times Higher Education: the world university ranking (www.timeshighereducation.co.uk/world-university-rankings/) (2011), is based on worldwide survey, with more than 13,000 experienced academics from 131 countries provided their inputs; International Colleges & Universities (www.4icu.org/), a directory of colleges and universities around the world featuring reviews and web-ranking of accredited universities and colleges in 200 countries; and US Universities (www.utexas.edu/world/univ/alpha/), a directory of higher educational institutions in the USA published by the University of Texas.

Adequate care was taken to ensure that the sampling frame was exhaustive covering the whole universe of population under study. The selection of libraries from across the continents ensured inclusion of libraries from different socio economic conditions.

4.2 Data collection method

As the present research comes under social science research, it relied on a survey method for data collection. "Survey refers to a method of securing information concerning a phenomenon under study from all or selected number of respondents of the concerned universe" (Kothari, 2004). Among several methods of data collection under survey research, the researcher chose two-step content analysis. This method is appropriate when the study is conducted to examine the existence of a particular phenomenon on each item selected for the study, followed by the degree of prevalence of the phenomenon on the same. The present study was to be conducted to ascertain both of these criteria. Hence the two-step content analysis method, adopted for the present study was quite appropriate.

At first the contents of selected web sites under each sample were analyzed to locate the existence of podcasting, which was binary coded either "yes" or "no" depending on its presence or absence. The web sites that were coded "yes" were subjected to the second step of content analysis through collecting information on checkpoints of the research instrument.

Podcast-related data were retrieved from the library's web sites, where podcasts were either linked directly to the library's home page or to linked page. Some library podcasts were hosted by names other than the name of the library not even directly linked through that library home page, and were difficult to locate from library's web site. The researcher used Google search engine to find those links to podcasts in the library's web site.

4.3 Research instrument used

A checklist with checkpoints was used as research instrument for the present study. It was revealed from the literature review that there are many research papers published with the tools to evaluate Web 2.0 applications, but until now none of the instruments has had a complete set of parameters or standards to measure and evaluate all of the Web 2.0 technologies.

The checklist used in this study was based on the checklist developed by Nguyen (2008) for evaluating various Web 2.0 applications in the universities of Australia and the checklist proposed by Tripathi and Kumar (2010) for evaluating the use of Web 2.0 applications in university libraries of a few countries. Nguyen (2008) has used 95 checkpoints in his checklist and Tripathi and Kumar (2010) used 70 checkpoints covering various Web 2.0 applications. The checkpoints were primarily based on usability criteria of the Web 2.0 applications.

A checklist consists of series of statements called checkpoints, each with provisions of alternative answers, either "yes" or "no". Checkpoints from both the previous studies that dealt with podcast, were put together to eliminate duplication. The modified checklist emerged through merging of the above two, and was further updated with the inclusion of additional checkpoints derived from browsing various library podcasts and synthesized ideas from literature survey.

The checklist, thus prepared, was circulated among a few library professionals who had exposure on information technology. This kind of cross checks by the experts helped in removing ambiguities and finalized items selected for inclusion into the instrument. Thus a final checklist has been constructed through merging of checkpoints from Nguyen (2008), and Tripathi and Kumar (2010) along with some fresh inputs, with altogether 20 checkpoints.

In order to ascertain its usability, the research instrument was variously tested.

4.3.1 Test of face validity. Face validity is the ability of an instrument to measure exactly the extent of an item that it is supposed to measure. It can be simply assessed by using the evaluator's own judgment. Face validity was tested as the checkpoints were made to pass through consensus approach with regard to their relevance to the topic and unambiguous nature.

4.3.2 Test of criteria validity. Criteria validity is the ability of a new instrument to score same points as that of old scale while measuring the same concept (Jain, 1998). As the face validity of the earlier scale of Nguyen (2008) was proved through usage, the concurrent validity of the present scale was compared with that of Nguyen (2008). Because of the fact that the response categories of some of the checkpoints of earlier scales were found to be poor and slightly difficult to answer, the need for construction of a new scale in tune with the earlier scale maintaining criteria validity was justified.

4.3.3 Test of reliability. According to Kothari (2004) a measuring instrument is reliable if it provides consistent results. Consistency of the scale was tested by

deploying two colleagues who have knowledge on new web-based technologies to carry out a survey on checkpoints of ten specific academic and ten public libraries independently to compare their observations of the same events. The results were compared using Cohen's Kappa. The pair-wise inter-rater reliability for 20 checkpoints calculated separately was found to fall within 0.85 to 0.94, indicating a very good non random agreement in observation among the raters.

4.3.4 Test of practicability. A measuring instrument's practicability can be decided in terms of economy, convenience and interpretability (Kothari, 2004):

- The checklist was economical because the number of checkpoints was 20, which requires little observation time.
- The checklist was also convenient to use because of the presence of proper layout and clear instructions.
- Again the checklist was easy to be interpreted as was evident by its successful execution by the two raters.

The positive outcome of the above tests conceivably testified the validity, reliability and practicability of the instrument for measuring the concept under study.

4.4 Data analysis

Data gathered from the web sites were put on to an Excel sheet to perform analysis. All the library web sites selected for the presence of podcasts were again individually studied. The value of the characters and purposes of use of podcast was calculated on the basis of data gathered along the checkpoints in the checklist.

Each checkpoint was marked with a value of either 1 or 0 depending on the "yes" or "no" answers. Out of the 20 checkpoints, ten were used to measure the characteristics of podcast and an equal number of another ten checkpoints were used to measure the purposes of use of podcast. The values were put into an Excel sheet for further analysis. Checkpoints with cumulated values collected across the continents were shown in Tables I and II.

The "application index" used by Nguyen (2008) for measuring degree of adoption of Web 2.0 applications was introduced to measure the degree of prevalence of podcasting in libraries:

Sl	Checkpoints: characteristic of podcast	North America	Europe	Asia	Australia	Percentage
1	Links to library's homepage	31	14	1	12	70
2	Instructions on how to use podcasts	22	10	1	14	57
3	Podcasts are browsable by keyword	9	2	0	7	22
4	Podcasts are searchable by topics	12	7	1	12	39
6	Podcasts are browsable by date	11	8	1	10	36
6	Archives for podcasts	12	5	0	4	25
7	RSS feed for podcasts	26	12	0	15	64
8	Transcripts with podcasts	10	2	0	6	22
9	Useful links to podcasts of different libraries	12	6	0	8	31
10	Feedback on podcasts	14	9	0	6	35
	Total score	159	75	4	94	

Table I.
Characteristic features of
library podcast across the
continents

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Table II.Purposes of using
podcast as found in
libraries of four
continents

Sl	Checkpoints: purposes of podcast	North America	Europe	Asia	Australia	Percentage
1	Library orientation tours	24	9	0	10	52
2	General searching skills	14	8	0	12	41
3	Searching library catalogue	16	7	0	11	41
4	Guidance to use library resources	27	8	1	15	61
5	Guidance to use library facilities	25	7	0	14	55
6	General information	22	12	1	10	54
7	Using research tools	13	6	0	8	33
8	Book reviews	7	5	0	6	22
9	Lectures	10	7	0	9	31
10	Interviews/ speeches	8	4	0	6	22
	Total score	166	73	2	101	

Application index (podcast) =

$$\frac{\text{Total points calculated considering the value of 1 against each of the checkpoints/}}{\text{Total number of checkpoints used}} \times 100$$

It is clear from the above equation that a library having all checkpoints on podcasting with “yes” answers will have a 100 percent application index for podcasting. Similarly the lower the number of checkpoints with “yes” answers, the less will be the application index. The application index for podcasts reflects the degree of implementation of podcasts in a particular library.

However, in the present study the researcher measured the region-wise mean application index for library podcasts to determine the extent at which libraries at a particular region implement podcasts on an average i.e. region-wise average podcast implementation rate:

Region-wise mean application index (podcast) =

$$\frac{(\text{Total checkpoints calculated with “yes” answers of all libraries in a region/}}{\text{Total number of checkpoints used} \times \text{Number of libraries with podcast in that region selected for study)}} \times 100$$

Total checkpoints on library podcast along the geographical regions have been calculated as shown in Table III.

5. Research findings and discussion

The study covering academic and public libraries of four continents encompassing 310 libraries revealed that 83 libraries (27 percent) use podcast, though the characteristic features of podcast and purpose of using it, varies from library to library.

Some libraries produce podcast in more than one language to cater to the needs of international students coming from across the world, e.g. podcast guides to the Robinson Library of New Castle University are broadcasted in – English, Arabic, Chinese, French, German, Japanese, Russian and Spanish.

A few libraries are found to have more than one web site for providing podcasts. Massachusetts Institute of Technology Library produces audio and video-casts on scholarly publishing (<http://info-libraries.mit.edu/scholarly/mit-open-access/open-access-at-mit/podcasts-videos/>) as well as producing podcasts from its blog (<http://news-libraries.mit.edu/blog/category/podcasts/>).

In some cases it was also found that libraries use both audio and video podcasts simultaneously and provide instruction in a more lively and attractive way, e.g. RMIT University Library, Bill Robertson Library of University of Otago, Kankakee Public Library, and New South Wales State Library. The video podcasts or vodcasts are digital media files in video formats that are released with episodes and can be downloaded automatically with RSS. As file size of video podcast is larger than that of audio podcast, each video podcast event is generally restricted to three to five minutes duration to minimize downloading time. Swiss National Library produces video podcasts of musical events and Wyoming State Library provides video podcasts of patents and trademark information to its clientele.

While navigating through a wide range of library web sites, it was noticed that podcasts in some libraries are provided under variant names such as webcast, libcast, netcast, screencast, etc. Sarawak State Library Webcast produces a combination of podcasts and vodcasts and Boulder Public Library Teen Webcast produces video shows destined for the young members of the library. Cornell University Library's Libcast features audio and video recordings of the library events, lectures, conferences, exhibitions, research tips and services. Yale University Library's Netcast archives episodic events since 2008 to present. University of Sheffield Library Screencast provides library orientation training to the users, showing them how to access the reading lists online, and find books in the library.

Interestingly University of Bristol Library and University College Cork Library themselves do not produce podcasts, but have useful links with web sites that do.

5.1 Characteristics of library podcast and its purpose of use

5.1.1 Characteristics of podcasts. Table I shows characteristic of podcasts and Figure 1 represents comparative scores on respective checkpoints along the continents. Table I reveals that 70 percent libraries (58 out of 83 libraries) provide links to podcasts through the library home page, either directly or through drilled-down pages. However, podcasts not linked through library home pages are very difficult to locate, e.g. Kenton County Public Library podcast and Hong Kong University Libraries podcast. Figure 1 compares the extent of appearance of each of the characteristic features of podcast in

Continents	Total score on checkpoints (characteristics)	Total score on checkpoints (purposes)	Sum total score on checkpoints (characteristics + purposes)	Total number of selected libraries with podcast	Region-wise mean application index (podcast)
North America	159	166	325	39	42 percent
Europe	75	73	148	23	32 percent
Asia	4	2	6	3	10 percent
Australia	94	101	195	18	54 percent

Table III.
Region-wise mean application index of library podcast calculated across the continents

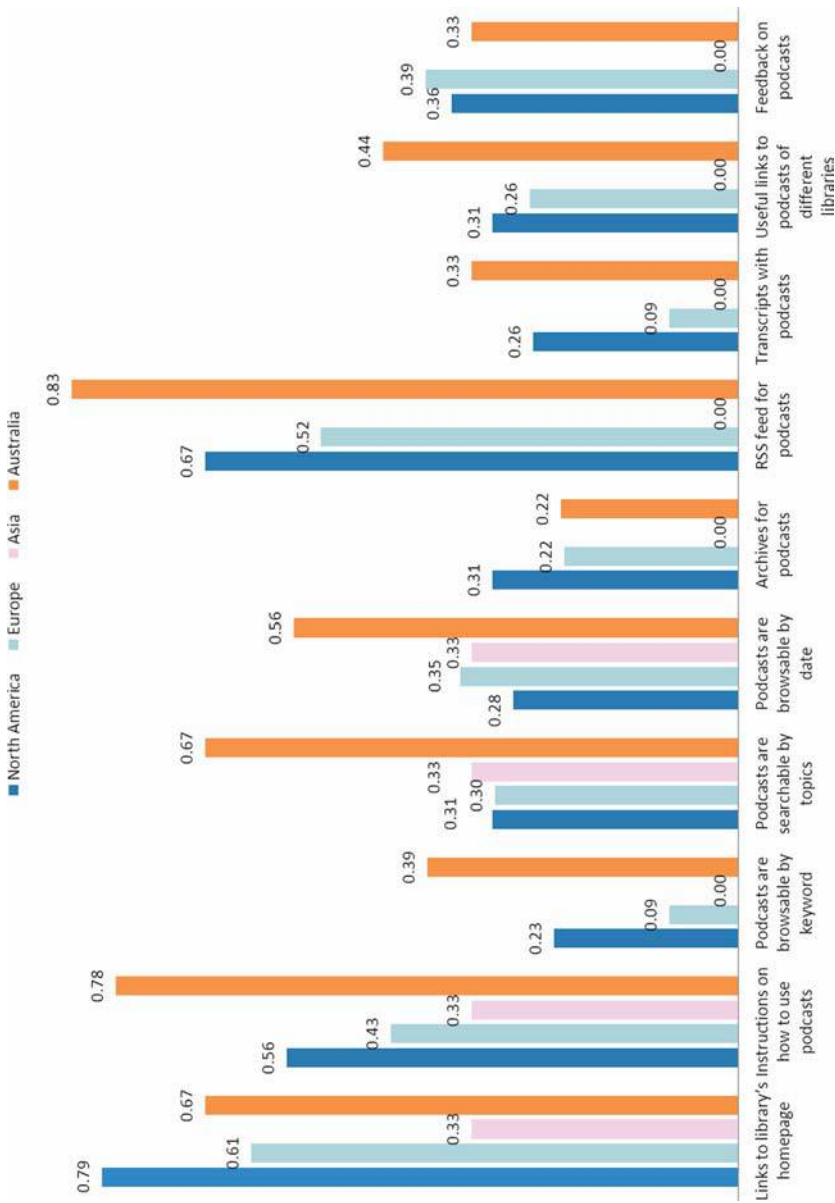


Figure 1.
Comparative scores on
checkpoints
(characteristics) of podcast
along the continents

libraries among different regions. First, the region-wise score on a checkpoint was calculated by collecting total “yes” answers (considering the value of 1 against each yes answer) along a checkpoint in each region. Then the score on a checkpoint of a region is divided by the total number of libraries with podcasts selected for study in that region. Thus the region-wise ratios derived on respective checkpoints are used for comparison. Therefore the comparative scores (region-wise ratios) on all the checkpoints compare the overall appearance of podcast characteristics across all continents and are illustrated in Figure 1.

As podcasting is a relatively new feature, users need to know how to use a podcast. A total of 57 percent of libraries (47 out of 83 libraries) provide instruction on how to interact with podcasts, e.g. Charles Sturt University Library podcast and Hennepin County Library podcast. Dún Laoghaire-Rathdown County Council Public Library provides podcast FAQ to let users know about the tit-bits of podcasting. Christchurch City Libraries podcast gives a clear idea of podcasts and podcasting, detailing how to listen to podcasts with step-by-step guidance, providing tips to create a podcast, discussing copyright issues, RSS feeds, etc.

A noticeable feature among podcasts is that 25 percent libraries archive their podcast contents. For example Utah Valley University Library podcast (LibCast) and Denver Public Library podcast have archived podcast entries since 2007.

Many library podcasts are not regularly updated and thus discourage users to visit that podcast. Providing the date of podcast entries facilitates users to keep a tract on the currency of the information, but unfortunately only 36 percent libraries provide a date of posting.

Another interesting feature is merging other Web 2.0 features with podcasts. As users are not in a mood to regularly search podcast for their desired content, it is very essential to feed podcast entries with RSS. Most of RSS are freeware which are very easy to install, and automatically download required audio contents for future use. It was found that 64 percent libraries use RSS, e.g. podcasts of Southern Cross University Library, Moreland City Council Library and Laurel County Public Library use RSS to feed entries and thus providing dynamic leaning opportunities to all.

In 39 percent of libraries, podcasts entries are browsable by topics. Mississippi State University Libraries categorize podcasts into record of various events, tutorials, library tours, episodic lectures, access services, borrowing privileges and fines, reserve services, inter-library loan, etc. Fairfield Public Library segregates podcasts into various categories, most interesting of which is the job series podcast, guiding prospective users into various topical aspects such as job searching, résumé, interviewing, career coaching, company research, self-employment and many more.

Searching podcast contents through search options helps users find matters with minimum expense of energy and time, and 22 percent libraries have been found to have search option for podcast entries. Links to other web pages help users use the podcast as a gateway to required information and 31 percent libraries are doing just this. Bridgewater State University Library and State Library of Iowa maintains a podcast directory that is hyperlinked to various subjects. University of Auckland Library, while maintaining various episodic podcasts, also uploads a directory of podcasts facilitated with a search function. Dekalb County Public Library maintains a podcast search option as well as link to a podcast directory of educators.

The accompanying transcripts corresponding to podcasts help library users to comprehend new information, and are particularly helpful for students who are not fully comfortable with the accent used in podcast. A total of 22 percent of libraries use a transcript of podcasts, e.g. La Trobe University Library podcast and Rice University's Fondren Library podcast transcripts audio content, University College Dublin Library podcast has web page links for visual content and Knox County Public Library displays a full text book with its audio content.

Users are encouraged to air their views on library resources and facilities through online feedback which are found in 35 percent of libraries. Online feedback helps library staff to gauge how effective the audio contents are, and based on response, the library could change the content to make it more effective to the user community. Thus it acts as a useful and lively link between the library staff and users' community, e.g. podcasts of University of Leeds Library, University of Southampton Library, Contra Costa County Library, State Library of Queensland and Pekin Public Library.

While designing a podcast it is to be noted that accessibility of podcasts could be improved through putting up a relatively visible podcast icon, updating the audio content at regular intervals, making it attractive to the users, with its content made accessible through search options and providing its link through the library home page with accompanied transcripts wherever applicable.

5.1.2 Purposes of using podcasts. Table II shows the purposes for which podcasts are being used in libraries and Figure 2 represents comparative scores on respective checkpoints. It is clear from Table II that 52 percent of libraries (43 out of 83 libraries) use podcasts to conduct a library orientation tour and 55 percent libraries (46 out of 83 libraries) use podcasts to provide guidance to library facilities, like the borrowing facility, reading room facility, reprographic facility, and internet facility, e.g. podcasts of Seattle Public Library, University of Surrey Library and University of Aberdeen Library.

New comers can be introduced to the library in a very exciting way through a floor-wise audio library tour provided by the library podcast, e.g. London School of Economics and Political Science Library and the State Library of Victoria. A combination of podcast along with video-clippings is highly preferred to a text and still image combination in acquainting new users with the collection and services provided by different sections of the library.

Some libraries use podcasts as a tool to guide library users, and to search for information. British Library podcast features an audio guide to assist users to search exhibitions among other things. It is noticed that 61 percent of libraries use podcasts to guide users on library resources. University College of London Library podcast highlights the library's special collection. John Hopkins University's Sheridan Libraries podcast is on library collections and services, and provides tips on how to use the library effectively. Juneau Public Library uses a podcast as a medium to communicate with the users' community about facilities, including upcoming events, workshops, book reviews, tutorials and others.

Significantly 41 percent libraries are found to use podcasting as a medium of searching the library catalogue, e.g. University of St Andrews Library podcasts serve as a very useful medium of database search. Goldsmiths University of London Library's catalogue podcast guides users in searching three separate databases of books, journals and DVDs.

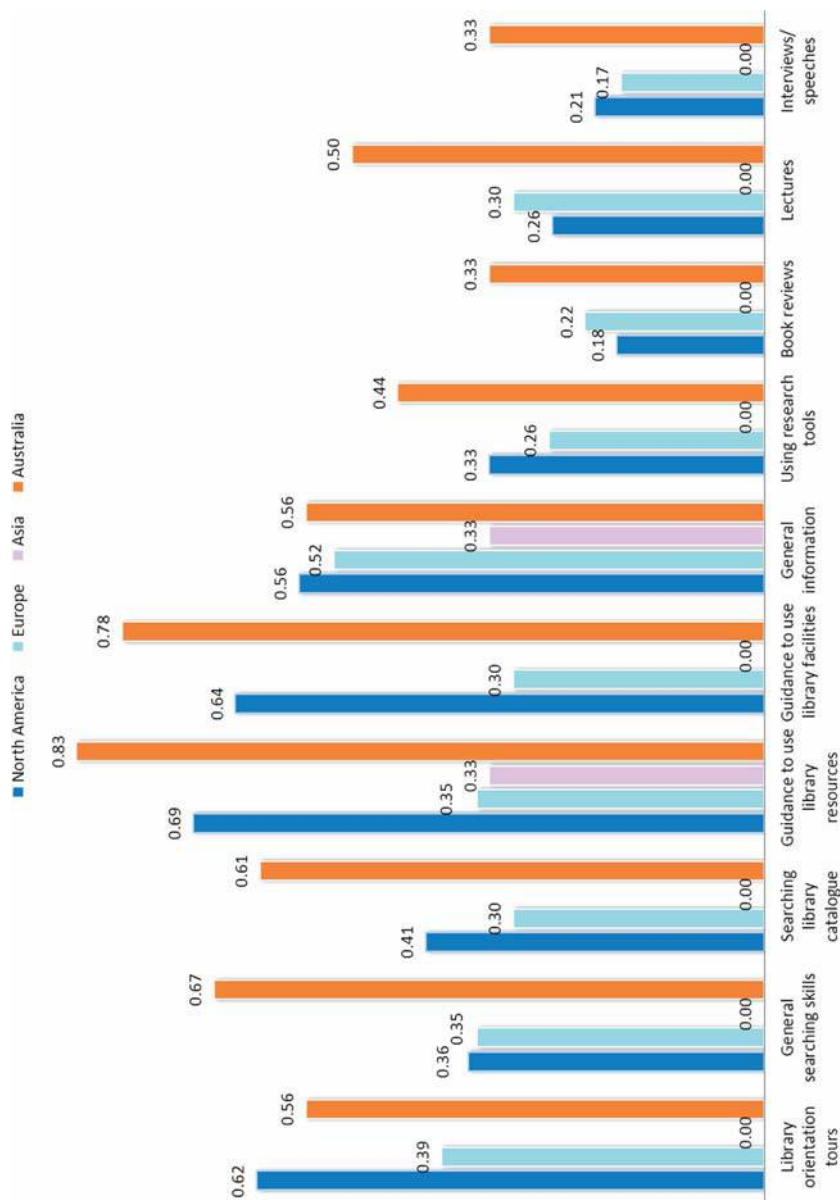


Figure 2.
Comparative scores on
checkpoints (purposes) of
podcast along the
continents

It was found that 33 percent of libraries use podcasts as tools for receiving research tips, e.g. podcasts of Los Angeles Public Library, Washington State University Library and the University of New England Library.

However, 54 percent of libraries convey general information through podcasting. A total of 22 percent of libraries use podcasting as a platform for online book reviews and discussions, such as the book review podcast series of Cuyahoga County Public Library and New Mexico State University Library. The book review of Pierce County Library System's podcast blog has a comments link to entertain feedback from users. Manchester Public Library provides video podcasts of book reviews featuring local teens talking about their favorite books. Because of the large size of audio files, libraries were found to be relatively choosy in selecting services and facilities to be provided through podcast. Hence most of the libraries used other Web 2.0 applications like blogs, social networking sites, mashups, etc. to focus on book reviews and discussions.

Podcasting serves as conduit for providing online resources such as tutorials, lectures, and presentations to the remote students. The most striking feature of the podcast is its facilitation of distant learning, e.g. audio-streamed lectures are available after the scheduled conclusion of lectures from Monash University Library podcast. Cheshire Public Library Podcast is a teen-driven audio cultural magazine featuring teen writers, musicians, reviewers, commentators, and many more.

Podcasting keeps librarians regularly updated with upcoming events, new acquisitions, conference activities, valuable links with useful sites, besides providing recent developments in library field and informing hundreds of job resources for the librarians, e.g. podcasts of University of Adelaide Library, Columbia University Libraries, National Library of Australia, and Multnomah County Library.

It was noticed that 22 percent of libraries provide interviews/speeches through podcast, e.g. Oxford Brookes University's Wheatley Library, Rapid City Public Library, and Birmingham Public Library. Everett Public Library podcasts book reviews along with interviews with local residents. Duke University's Medical Centre Library not only arranges resources by topic, but it also organizes weekly audio shows featuring contents of journal issues and interviews with the scientists.

5.2 Extent of implementation of podcast in libraries across the continents

The degree of adoption of podcast among the libraries has been examined from two angles:

- (1) Overall prevalence of podcasts in libraries across the continents.
- (2) Region-wise average podcast implementation rate.

5.2.1 Overall prevalence of podcast in libraries across the globe. The application of podcasting in academic as well as public libraries across the continents has been thoroughly examined and the findings revealed that adoption of library podcast varies significantly among different geographical regions. As the study was conducted among the public and academic libraries, it is pertinent to examine whether the acceptance of podcast is equally observed among the public and academic libraries or any specific kind of library shows a greater inclination towards embracing this technology compared to other, along the geographical regions. A chi-square test was conducted to determine any association between continents and types of library (academic and public library) regarding adoption of podcast. The calculated value of

chi-square (17.714) at three degrees of freedom and at 5 percent level of significance much exceeded the table value of 7.815, indicating a significant association between the types of library and geographical regions. Thus it may be inferred that the degree of adoption of podcast among continents depends on the category of library, i.e. on academic and public libraries.

The above study revealed that in North America, the use of public library podcast is high compared with the academic library podcast (see Figures 3 and 4). However, the situation is just the opposite in European and Australian libraries, where a considerable high number of academic libraries have been noticed using podcasts than public libraries. On the other hand the number of library podcasts in Asia is too low to be taken into consideration. The difference of podcast adoption between public and academic libraries may be attributed to the disparate profile of the users using different types of libraries. Users of the public library constitute a heterogeneous user group coming from different strata of social ladder, have a different level of understanding towards new technological advancement, and have diverse user needs. By contrast, academic library users are more conversant with new technology, usually share

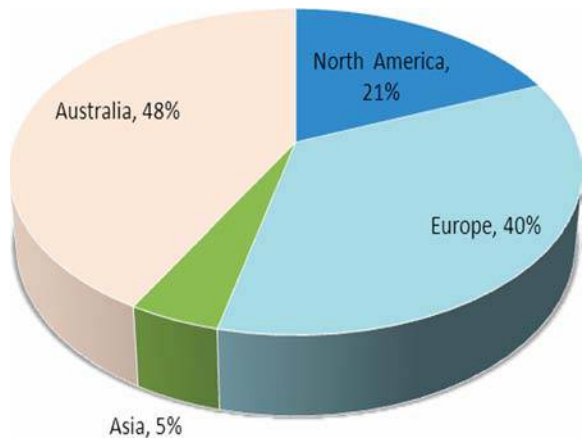


Figure 3.
Prevalence of podcast in
academic libraries

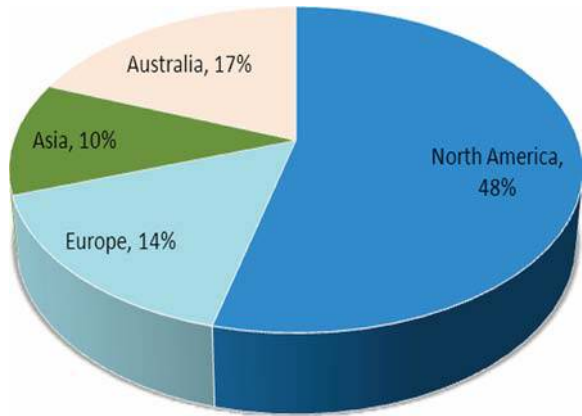


Figure 4.
Prevalence of podcast in
public libraries

common subject areas of interest and prefer a new mode of learning, receiving instruction and guidance. Thus the difference of attitude of two user communities might be a reason for academic libraries prevalently adopting podcast in many regions. Still, the way in which podcasting could be implemented in different types of libraries depends on the imagination, vision and decision of the librarians.

However, another study on the total number of libraries using podcast among the continents (Figure 5), revealed that a proportionately large number of libraries in North America (33 percent) are using podcasting, followed by the libraries in Australia (30 percent), Europe (26 percent) and Asia (8 percent). The study reflected the extension of podcast adoption by libraries along the continents.

5.2.2 Region-wise average podcast implementation rate. Region-wise the mean application index of podcast measures the average podcast implementation rate in a region. It reflects the intension of adoption of podcast in libraries in a region. Data on region-wise mean application index (podcast) showed that, although an overall adoption of library podcast (extension of adoption) is high in North America (33 percent) as shown in Figure 5, the mean application index of podcast (intension of adoption) is high in Australia (54 percent) as shown in Figure 6. It indicates that,

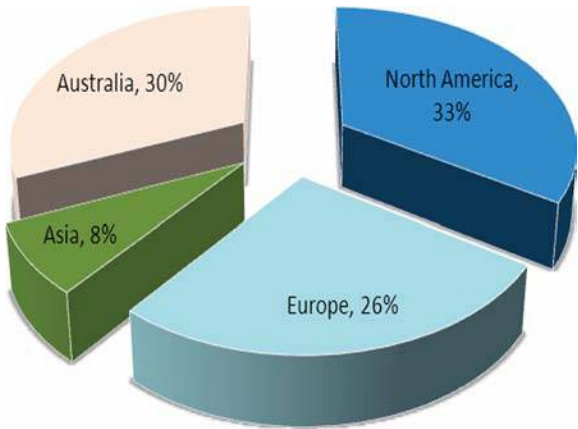


Figure 5.
Prevalence of podcast
along continents

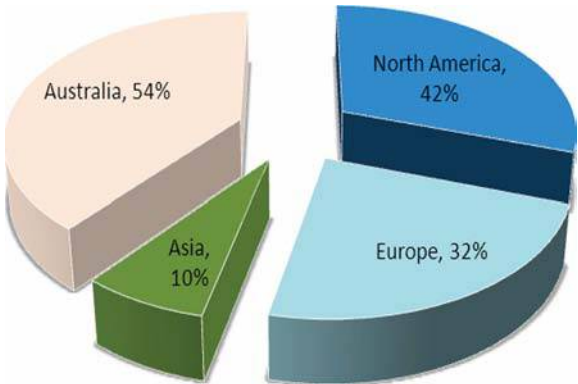


Figure 6.
Region-wise mean
application index

although more number of libraries in North America use podcasts compared to the libraries in Australia, the average implementation rate of podcasts among libraries is high in Australia. The finding suggests that, on an average, libraries in Australia, where podcasting is being used, have extended podcasting in more areas of library services compared with the libraries using podcasting in other continents. Table III points out that high implementation of podcast is found in libraries in Australia (54 percent), followed by that in North-America (42 percent) and Europe (32 percent). The Asian libraries on the other hand are lagging far behind in adopting podcasts. Thus we may infer that extension of adoption of podcast is high in North American libraries, whereas intension of implementation of podcast is high in Australian libraries.

However, the reason behind the overall disproportionate use of library podcast (extension of podcast adoption) may be attributed to the differential rate of internet access in libraries in different continents. As per statistics on internet usage derived from Internet World Stats: usage and population statistics (www.internetworldstats.com/stats.htm), 31 March 2011 (latest at the time author resubmitted the paper)), the internet penetration rate in North America (78.3 percent) is very high, followed by that of Australia (60.1 percent) and Europe (58.3 percent), with Asia (23.8 percent) lagging far behind. The high rate of internet usage in North America has impacted on libraries of that region to provide library service in an attractive way, using podcasts as one of the Web 2.0 applications, to meet the expectations and information needs of tech-savvy users. Libraries in Australia and European nations have been widely embracing podcasting technologies, commensurate with the rate of internet usage. Whereas the reason behind low internet usage rate in Asia may be attributed to the fact that computer and communication technology is still not affordable to all and most of the libraries in that region do not have accesses to the internet.

6. Limitations and future research

The study was restricted to web sites of libraries in four continents - North America, Europe, Asia and Australia, especially those available in English. As the population constitutes academic and public libraries scattered in different geographical regions, only convenience sampling method was employed. Since the study was fully internet-based, and among academic libraries, only the libraries of higher educational institutes were taken into consideration, the outcome may not accurately represent the whole population. Future work may be extended to all other regions and types of libraries not covered by this study, and non English web sites must be accessed and analyzed so as to gain an overall complete picture of the scenario. Moreover, the work was based on content analysis, emphasizing the presence or absence of podcast features, which gave only a quantitative measurement of the degree of adoption of podcasting. Future investigation may fully integrate other methods of data collection to gather the views and opinions of librarians and users in order to gain a broader perspective on podcast use within the library framework.

The present research with its findings, highlighting the region-wise prevalence of podcast, helps develop a valuable understanding of the extent to which podcasting is being implemented in academic and public libraries. With the introduction of podcasting, libraries have taken initiatives to market library resources and facilities to their clientele. However, it is pertinent to determine whether users are encouraged to utilize the technology. Mere adoption of podcast in libraries is no guarantee that users will be

highly interested using podcasts. Therefore it is more important to identify the target group and to measure how far libraries, using the web-based functionality, are able to meet the needs and expectations of the prospective users. Further study may explore the librarians' and users' cognitive appraisal in guiding their subsequent perception and attitudes towards acceptance of podcasting as a new way of information communication. The present study may be extended to incorporate other Web 2.0 applications with podcasts and investigate how libraries transform text-based tutorials to audio-lectures supplementing class-room teaching, and instructional podcasts, tagged with OPAC search alerts, enhances information retrieval technique. As the library is a service organization and library web site serves as a prime media of communication, podcasting will enhance users' interaction with the library through web sites. Thus the present study will also broaden the scope of future investigation on the effectiveness of podcasts in enhancing the online interactive quality of a library web site, which will not only ensure users revisit the library, but also play a significant role in creating networks of users and growing awareness of library resources and services.

7. Conclusion

Libraries have undergone a remarkable paradigm shift, embracing dynamic web-based technologies and have been transformed into places that are accessible beyond the library hours and their walls. Unlike textual matters, the audio contents available through podcasts keep users in touch with the library activities while they are busy doing something else. Podcasting ensures that users are not engaged in consulting a number of pages, but listen to audio files and follow instructions. It is very useful for distance learning and for persons with visual impairment. However, application of podcasts in libraries received limited scholarly attention with regard to its implementation across the continents encompassing academic and public libraries.

The paper has several contributions. First, the study focused on the characteristic features of podcasts used in academic and public libraries across the world and explained the purposes they serve, identifying the areas, with examples, where podcast is being highly and least utilized. Although a lot of research has been carried out on the technical and methodical aspect of introducing podcast in libraries, there has been no comprehensive research on its implementation in different types of libraries. Second, the present study, conducted across different social and educational cultures, not only compared the degree of adoption of podcasts in different geographical regions, but also between different types of libraries along the continents. The main objective of library is to provide service to its users. Most importantly, the findings will provide an overview of how libraries are using podcasts to meet the requirements and expectations of the diverse users' group belonging to academic and public libraries. The analysis revealed that adoption of podcasts among continents is heavily dependent on the library category and the overall prevalence of podcasts also varies significantly along the geographical regions. The study also measured region-wise average implementation rate of library podcasts. The study revealed that extension of adoption of podcasts is high in North American libraries, whereas intention of its implementation is high in Australian libraries, indicating that Australian libraries embrace more library initiated functionalities of podcasts than North American libraries. However, the reason behind the disproportionate number of libraries using podcasting in different continents may be attributed to the differential internet penetration rate among the regions.

Finally, on a theoretical level, the checkpoints will serve as a basis for framing a questionnaire/schedule for conducting future research, employing more comprehensive and in-depth methods to help measure qualitatively the degree of impact of podcast on users' and librarians' attitude and perception, which in turn, will determine the extent to which podcasts are capable of motivating and engaging users to harness library facilities. Based on the research findings, the scope of the present study may potentially be expanded and improved with the inclusion of different dimensions like human behavior in accepting new technological change, motivation, empowerment, cost, ease of access to technology, resources, staff strength, library policy, etc. to gain a comprehensive understanding on the practicability and usefulness of podcasts in libraries belonging to different geographical locations under varying socio-economical strata. On a practical level, the findings will encourage and guide future librarians and web developers in introducing podcasting technology so that traditional library services could be provided in an innovative way to meet the expectations and information needs of the users.

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