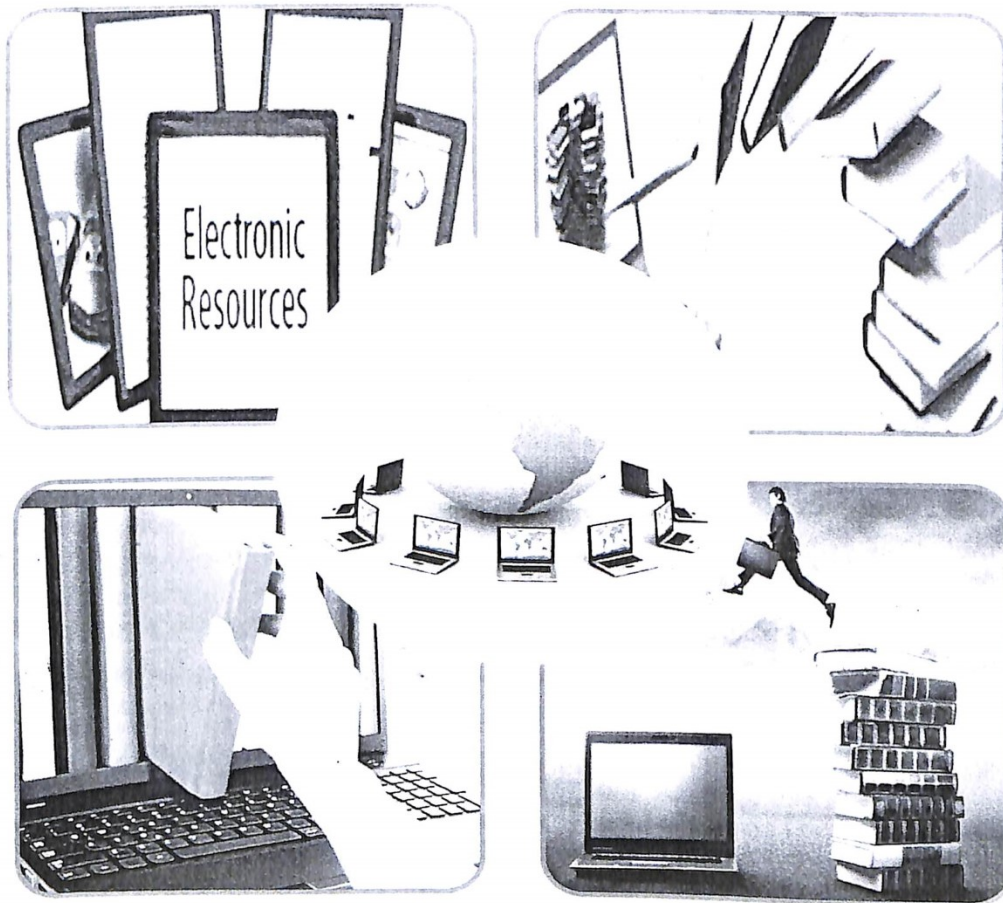


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Mobile technologies changing trends in Academic Libraries: An Overview

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Abstract:

Technology has fundamentally altered how we live and work as well as we learn together in the world of higher education. Mobile technology has been also influenced by the life style and culture of human being i.e. because of impact of Information Communication Technology (ICT) on each and every sector of life. Cell phones are used by millions and billions of users worldwide. In an environment where expenses continue to rise and profits continue to be strained, it's crucial for businesses that are investing heavily in new mobile solutions and social media to clearly understand if/how each initiative will contribute to growth and create value for customer. The purpose of this paper is to describe the changing trends of mobile technologies from 0G to 5G. This article is mostly focused on 5G technology features and benefits. Mobile phone Library is a kind of digital library model, which can provide for mobile users to receive the provided library services by using mobile phone through wireless access at all times and places. This paper makes review of and sums up the concept of mobile library and their development process, and does a further study of the phone application in the digital library and development trend.

Keywords: M-library, Mobile technology, e-library Services

Introduction:

The present cell phones have it all. Today phones have everything ranging from the smallest size, largest phone memory, speed dialing, video player, audio player, and camera and so on. Recently with the development of Pico nets and Blue tooth technology data sharing has become a child's play. Earlier with the infrared feature you can share data within a line of sight that means the two devices has to be aligned properly to transfer data, but in case of blue tooth you can transfer data even when you have the cell phone in your pocket up to a range of 50 meters. The creation and entry of 5G technology into the mobile marketplace will launch a new revolution in the way international cellular plans are offered. Wiki states that " a new generation of 5G standards may be introduced approximately in the early 2020s. However, still no transnational 5G development projects have officially been launched, and there is still a large extent of debate on what 5G is exactly about. Prior to 2012, some industry representatives have expressed skepticism towards 5G but the trends clearly changed since 2012". Libraries and museums are moving forward in providing access to digital collections via mobile devices. No longer do visitors have to visit a library or museum to find a computer with internet access. Now they can experience digital collections in the palm of their hand through a mobile phone. Duke University now offers the most comprehensive digital image collection especially form attend for an iPhone or i-Touch device, I-phones, Android devices and Windows phone.

Generations of Mobile technology:

First Generation (1G) mobile phones had only voice facility. These were replaced by second generation (2G) digital phones which added fax, data, and messaging services. The third generation 3G has added multimedia with highest speed. 4G, which is also known as "beyond 3G" or "fourth-generation" cell phone technology, refers to the entirely new evolution. Developers are now going for 4G (OFDMA), which will provide internet up to the speed of 1 GBPS. 4G promises voice, data and high-quality multimedia in real-time form all the time and anywhere. The gigantic array of innovative technology being built into new cell phones is stunning. 5G technologies which are on hand held phone offering more power and features than at least 1000 lunar modules.

Different Standards Used in Different generation of Mobile Technologies

Technology /Features	1G	2G/2.5G	3G	4G	5G
Start/Deployment	1970/1984	1980/1999	1990/2002	2000/2002	Soon probably 2020
Data Bandwidth	2kbps	14.4-64 kbps	2Mbps	200Mbps to 1Gbps for low mobility	1Gbps and higher
Standards	AMPS	2G:TDMA, CDMA,GSM 2.5G:GPRS,EDGE, 1xRTT	WCDMA CDMA-2000	Single unified standard	Single unified standard
Technology	Analog Cellular Technology	Digital cellular Technology	Broad bandwidth CDMA,IP, Technology	Unified IP and	Unified IP and seamless combination of broadband, LAN/WAN/PAN/WLAN and www
Service	Mobile telephony (Voice)	2G: Digital voice, Short messaging 2.5G: Higher Capacity packetized data	Integrated high quality audio, video, and data	Dynamic Information Access, wearable devices	Dynamic Information Access, wearable devices with AI capabilities
Multiplexing	FDMA	TDMA, CDMA	CDMA	CDMA	CDMA
Switching	Circuit	2G:Circuit 2.5G Circuit for access networks and air interface; Packed for core network and data	Packed except circuit for air interface	All packet	All Packet
Core Network	PSTN	PSTN	Packet network	Internet	Internet
Handoff	Horizontal	Horizontal	Horizontal	Horizontal and Vertical	Horizontal and Vertical

(*Source: Division of Computer Engineering, SOE, CUSAT)

The First Generation: "1G" mobile phones were based on the analogue system. The introduction of analogue systems in late 1970 was quantum leap in mobile communication. The prominent ones among 1G system were Advanced Mobile Phone System (AMPS), Nordic Mobile Telephone (NMT), and total access communication system (TACS). These devices help to carry out 800 MHz frequency band.

The Second Generation: The 2G Second Generation emerged in 90's in Europe. GSM provides voice and limited data service and uses digital modulation of for improved audio quality. Supplementary services

such as fraud prevention and encryption of users' data become standard features, comparable to those in fixed networks. It offers digital voice at a relatively low speed with very little bandwidth left over for data.

The Third Generation: The 3G was launched in 2000. It is third generation of mobile and it is meant to be newest multimedia technology for cell phones. The 3g technology adds multimedia facilities to 2G phones by allowing video- audio and graphics applications. The idea behind 3G is to have a single network standard instead of the different types adopted in US, Europe and Asia.

The Fourth Generation: The 4G provides mobile ultra broadband internet access through USB wireless to Smartphones. This technology is supported cloud computing, mobile web access, IP telephony, high definition mobile TV, video conferencing and 3D televisions. It gives speed upto 1Gbps for low mobility.

The Fifth Generation: This technology is not officially announced but the sources said that this generation launched probably in 2020. The 5th wireless mobile multimedia internet networks can be completed wireless communication without limitation, which bring us perfect real world wireless – World Wide Wireless Web (WWWW). 5G is based on 4G technologies, which is to be revolution to 5G. The 5th wireless mobile internet networks are real wireless world which shall be supported by LAS-CDMA, OFDM, MC-CDMA, UWB, Network-LMDS and IPv6.

- **Audio Books:** Audiobooks Digital audiobooks continue to grow in popularity. It is difficult to believe that the service was initially offered in libraries only as recently as 2005. Audiobook vendors, such as Net library, online library using various licensing models. Until recently, most mobile devices did not have the memory needed to house huge audiobook files. As mobile devices have increased storage and memory. The number of phones and other devices that can now accommodate audio files continues to increase. Audiobook vendors now offer downloadable audiobooks compatible with the iPod. Playaway offers libraries the opportunity to loan out audiobooks on a portable player so an individual does not have to have a computer or even own a mobile device.
- **WorldCat Mobile Beta:** OCLC World Cat Mobile allows users to search for library materials and libraries, to call libraries, and to map a route to libraries. WorldCat partnered with mobile technology leader to increase the number of search channels that allow users to access popular web applications. Users are invited to <http://worldcatboopsie.com/home/worldcat/> to test the application.
- **Mobile-Friendly Websites:** In recent days the creation of website is not only web browser enabled but also people are thinking about the mobile view of site. This site is helpful to reach the end user.
- **Library SMS Services:** News and event reminder service: This service sends reminders to patrons about important news, exhibitions, instructions, and so on.
 2. Due-day reminder and renewal-request service: This service sends reminders to patrons when their borrowed items are coming due.
 3. New title notification service: This service lets patrons get informed of newly acquired titles. This service accompanies the preview and reservation of new titles introduced in Section.
 4. Multimedia borrowing notification service: The OIT Library stores her multimedia collection (including CD, VCD, and DVD) in a CD/DVD management system. After entering his/her PIN ID and password, a patron can discover and check-out any discs they want from the CD/DVD management system. At the same time, an SMS alert will be sent to the patron so as to prevent from account compromise.
 5. Request arrival notification service: This service reminds patrons about the availability of reserved items.
 6. Overdue notification service: This service reminds patrons about overdue items. All the above SMS services are opt-in. Patrons only need to login to the library website and fill in their mobile phone numbers to avail of these services. Currently, patrons can use these services free of charge. This study aims at evaluating patrons' acceptance of the first five services.
- **Quick Response (QR) Codes on mobiles** QR Codes are two dimensional barcode which can be scanned by a cell phone camera prompting the cell phone to load a webpage or display text contained in the code. In order to make use of QR codes it requires.
 1. A cell phone with a camera, QR code reading software.
 2. Search for QR code readers by cell phone manufacture and model
 3. Get the free QR App

Advantages of Mobile Access for Academics:

- Time saving

- It is a personalized service
- It is user friendly
- Limitless access
- User Participation
- Location Awareness
- Ability to access information
- Providing students with freedom of location and time
- Students have access to campus information
- Increasing space in teaching and learning
- Enabling one to one learning based on individual educational histories or test results

Conclusions: Mobile Technology has become a very important part of our lives nowadays. Mobile phones were developed primarily for communication purpose. Mobile phones have gained importance in both the developed and developing countries. The mobile phone is a device that enables users to communicate, connect, transact and innovate. Mobile devices and mobile technologies have potential to facilitate the teaching and learning process in a great way. Mobile applications can support learning by making library resources more omnipresent, by bringing new users to the library through increased accessibility to the library resources, and by creating a new way to enhance connections between patrons and libraries. This increased use of mobile phones provides an untapped resource for delivering library resources to patrons. The mobile web is the next step for libraries in providing universal access to resource and information.

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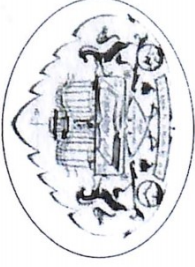
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Vivek D. More

This is to certify that Dr./Prof _____ of _____

C. S. Jain College of Commerce, Shrirampur has attended the conference as Resource Person / Participant and Presented Paper titled *Mobile technologies Changing trends in Academic Lib. An overview* in the National Level Conference "Role of Librarians in promoting E-information Literacy" Sponsored by B.C.U.D., Savitribai Phule Pune University, Pune & organized by Department of Library & Information Center on 24th and 25th January 2017.


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