Advanced Journal in Wireless and Mobile Communication

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Aims and Scope

Advanced Journal in Wireless and Mobile communication welcomes the original research papers, review papers, experimental investigations, surveys and notes in all areas relating to software engineering and its applications. The following list of sample-topics is by no means to be understood as restricting contributions to the topics mentioned:
- LTE
- 4G
- 5G
- Ultra wide band communications
- Nnovel mobile applications
- Mobile communications and networking
- Energy-efficient communication networks
- Molecular communications

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Performance and Problems in Online University Examination System

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A B S T R A C T

In this paper, we propose a system that provides security to improve on-line examination by utilizing technologies such as internet-firewall, cryptography, network protocol and object oriented paradigms. Furthermore, we propose a framework for conducting online exams through insecure internet backbone. However, the proposed system will provide a secure communication based cryptography and group communications. In our research paper, we discuss the performance of student's online course exam with respect to security and main challenges faced by online course exams within the university. We conclude that by improving the security system using biometrics face recognition that can be incorporated into the proposed system to fulfil the challenge of online exam.

Keywords—Online Exam, Security, University Course, Camera.

I. INTRODUCTION

Online exam has expanded rapidly [1], [2]. Even so, the off-line exam is usually chosen as evaluation method for both on-line and off-line exams. Online course examinations are useful to evaluate the student's knowledge using modern computer technology without any effects on the traditional university course exam that uses Pens, Papers and invigilators. Online exam can improve the standards of student's examination whereas the traditional examination system using the pen and paper requires more effort on the part of students and invigilators. Online examinations are considered an important source for university exam, and the development of network technology polices has given the possibility to conduct the exams online. Thus, the university students can benefit from these services. University course exams , using the multiple choice questions and allowing the students to choose only one answer from alternative answers or the true/false questions, are traditionally using the paper and pens and they have always been a heavy load for both students and lecturers. Computer new technology has been

II.   Literature Review

Most modern online education uses Web-based commercial courses management software [3] such as Web CT [4], blackboard [5], or software developed in-house. This software is not used widely for online exams, due to security vulnerabilities, and the system must rely on students' honesty or their having an honour code [6]. Online course exam nowadays becomes more efficient than before; online course exam need for enhancing the security. Jung, I.Y proposes an enhanced secure online exam management environment mediated by group cryptography using remote monitoring and control of ports and input[7].Holding the Online course exam for any substance requires more preparations, whether the teacher or through the support of university students. University on the duties assigned to it to provide the necessary environment entrusted to them. Everyone is there to serve the student and we have to encourage students and train them psychologically for a computerized exam, note that many universities in the world of the complexity of computerized tests on its campus. More of recent research shows the advantage and disadvantage of using online course exam on the university campus such as Al-Mashaqbeh, I.F. and Al Hamad, A. in the Dept. of Computer. Educ., Al al-Bayt Univ., Mafraq, Jordan reached to good results showed that there was a positive perception towards the adopting of online exam. They measured students' perceptions toward the use of online exam as an assessment tool on university campus within a Decision Support System Course at Al-Bayt University [8].

A study has been conducted on online exam and traditional exam which indicates that an online exam has better results than traditional exams. [9] Considerable discussion has taken place on group protocols and group-mediated communications to ensure secure communications among group members [10], [11]. This discussion has included the consideration of secure group composition, secure intergroup communication using a public key, and secure intragroup communication using the symmetric key through the Diffie-Hellman key exchange [12]. This paper adopts two groups for secure communication between distributed entities in the online exam system. The intergroup communication is protected through public key infrastructure (PKI), while intragroup communication uses several symmetric Diffie-Hellman Keys. The "group" in this paper is a concept for entities with similar roles. [12]. In this research, we try to bring out the challenges and some best solutions that may solve the problems. This paper considers the Challenge of personal identity and unauthorized invention of other users in the network using other clients.

III. SYSTEM SOLUTION

The special exam group is created by grouping the hostnames / IP of clients for a specific location (Computer Lab) and time.

To avoid the malpractice in the exams we use different types of biometrics as a means to log into the exam. We use the camera and finger print scanner to identify the students. The user after identified login into the system uses the user-id and password provided by the university, which are authenticated by the server. This gives him/ her permission to open the exam from the server otherwise the students cannot login into the system.

The unauthorized users attempting to log into the system from remote computers are blocked by the proposed system.

Once the session begins the timer is on, the student completes his exam within the allocated time and once the time is up the system send an alert and logs the user off.
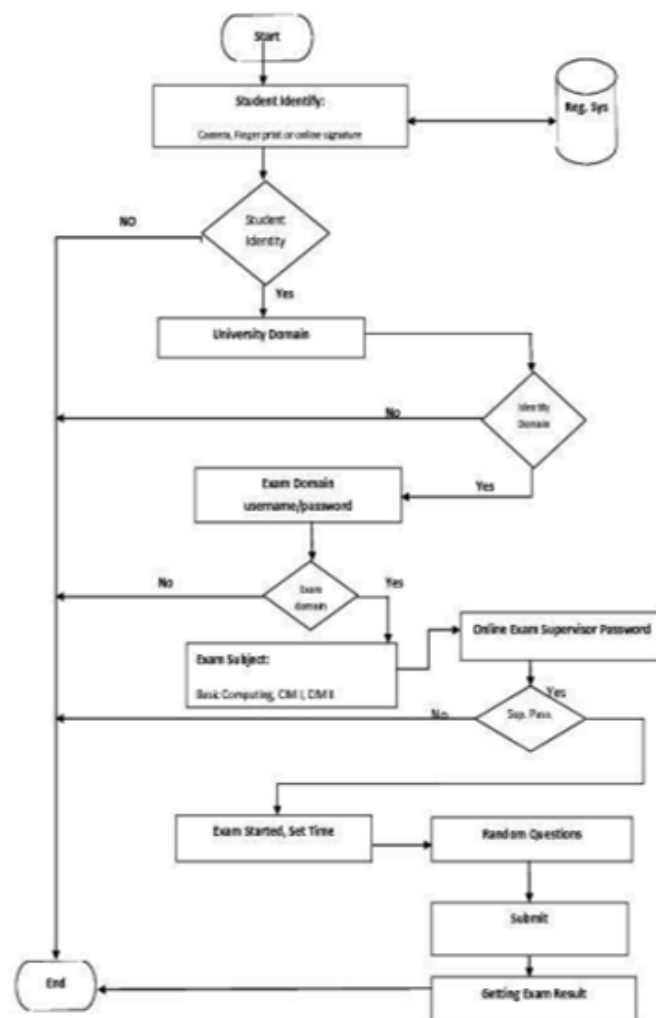

Figure 1. Flow diagram for secure Online Exam

Figure 1: The figure 1 shows the flow chart of the secured online exam system proposed. It shows the series of steps of online exam starting with the secured login using biometrics and system login through server till the end of exam results.

IV. ALGORITHM

Step 1: Student Identification: The system will check the identity of the student by using biometrics which will take the picture and the fingerprint before entering the exam. This will also check whether the student is eligible for that particular exam.

Step 2: University Domain Login: The student will log into the domain of the university with the user name and password provided by the university domain login (Ex: username: SUC, Password: suc).

Step 3: Special login into exam domain: The system asks the user to write the user name and password. If the user name and password are correct, then the user will be able to log into the exam.

Step 4: Access the Exam: The user will complete the exam file that is located in the domain desktop window (Online Exam)

Step 5: Online Exam Supervisor Password: The supervisor password is given to the students who are successfully logged into the exam domain. This gives them access to the exam and the exam session begins for that specific exam.

Step 6: Random questions and Results: The random questions are given to the students, who submit the answers to the server; when the session is completed, the system generates the result of the exam.

Step 7: End.

V. CONCLUSION

We believe the online format is considerably superior to paper-and-pencil exams for our courses. We have come to the conclusion that the above mentioned challenges can be solved by introducing the following security systems. Using biometrics we overcome the traditional way of checking the ID cards of the students after they start the exam. Biometrics will identify the student as he enters the exam hall. The IP address check allows as follows:

1-Using online signature or displaying student photo

2-Using fingerprint

3-We can provide more security to identify the students by using online cameras which are more useful than the traditional method of checking the ID cards. Since we check the identity before the start of the exam, there are some more security problems regarding the questions and answers which are for a further research.

This type of online exam system reduces the examination work.

The future scope of this research can be the security of online remote exam systems.

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Green Libraries: The Sustainable Libraries

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A B S T R A C T

Due to the continuous use and easy availability of the information & technology more and more digital libraries are evolving all over the world. They are providing numerous opportunities to us for quick retrieval of correct information within a short time but on the other hand, they are causing environmental and health problems due to e-garbage and other bad energy released due to the computer & communication assisted technology in the libraries. Hence, a new revolution in the form of 'green libraries' is emerging that is not only thought provoking but also needs to be followed for long time sustainability in the library world. This paper attempts to discuss this new emerging thought along with the librarian's role in making the libraries more greener for good and healthy environment.

Keywords—Digital libraries, Green libraries, Library buildings, Sustainable buildings

INTRODUCTION

Libraries are said to be started with the Vedic era when the students were used to learn and collect the information on the bhoj patra, stones and the clay tablets. Later, the libraries could grow well during medieval period, but their real development started with the introduction of the modern libraries during 19th and first half of 20th century. At that time, the libraries were given the monumental structure to impress and attract their users.

Most of the activities were handled manually but with the introduction of information & communication technologies (Dhiman, 2003: Dhiman & Rani, 2012), especially in the first decade of 21st century made significant changes in the operation and services of the libraries. As a result, digital libraries exist either partially or in whole (Dhiman, 2010) almost in every part of the world. Majority of the academic and special libraries, especially the university libraries are being operated with the help of electronic and computer gadgets. Information and technology based infrastructure and services has made possible to have information at the finger tips of the users and library staff. Almost each and every information is now available either online on the internet or offline in electronic storage devices, such as CDs/DVDs, pen drives and the internal and external hard disks etc. At one hand, this technology has nurtured us with

numerous benefits but on the other hand, it is creating challenges among us.

The energy being generated from electronic & computer technology based gadgets and the garbage being generated by e-waste are some of the major problems. We need to develop sustainable environment so that coming generation could survive well and 'green libraries' are one of the solutions.

WHAT ARE THE GREEN LIBRARIES?

On hearing 'Green' word, one thing quickly strikes in the mind is that whether the libraries which are green in colour are the green libraries? But really it is not the situation; rather green or sustainable libraries are the "structure that is designed, built, renovated, operated, or reused in an ecological and resource efficient manner" (Anonymous, 2008).

Hauke et al., (2013) mention that "lending, the sharing of books and other media, and also the sharing of computers, the move from printed to electronic resources, common spaces for learning and socializing, retaining cultural heritage, offering information and a variety of materials about a responsible way of life" may constitute the green libraries.

A simple and clearly explained definition is given by (Helsinki City Library, 2013) states that a green library is that "which recycles, saves environment, shows examples of green values and sustainability, has been designed ecologically sustainable and offers public space that is free of charge for everyone". Therefore, a green library may be a library that uses latest and cutting-edge technology in designing a library building, dispose of its e-garbage and providing services to its customers in user-friendly and eco-friendly environment.

WHAT CAN BE DONE FOR A GREEN LIBRARY BUILDING?

Sahavirta (2013) mentions that creating a visible green image for the library is an important part of the environmental work. Therefore, it should be achieved for making the environment sustainable. Broadly speaking, there may be two ways to develop or making a library green or sustainable.

First way is that if we are going to establish a new library building, all the points to make the libraries sustainable must be kept in mind just from starting. Hauke & Werner (2013) mention that with a new library building - sustainable aspects of the structure of the building, the façades, the building climate, ventilation, heating and cooling, the lighting, the interior fittings, green information and communication

technology - are all features that you can point for green libraries for several years.

But we cannot rebuild or re-establish all the existing libraries once again to make them energy efficient and sustainable. Therefore, we have to find other ways. Another way may be that we should take steps and some measurements to alter the present building structure so that they could be made sustainable and energy efficient. "Reduce, Reuse and Recycle" is the fundamental slogan that should be given due weightage in making the environment eco-friendly. There should be a proper discharge of all the electronic garbage consisting of the batteries, printer cartridges, fluorescent & LED lamps and the offline electronic books. As far as possible, efforts should be made the paper work less by sending e-mails and attachments in 'pdf' formats in all correspondences. Automatic switching system fitted with miniature circuit breaking system should be installed in all electrical wirings to stop dangerous blasts in the building. Environmentally friendly products should also be used in the library. Besides, there is a need of educating the staff and public aware of environmental threats.

STANDARDS OF GREEN LIBRARY BUILDINGS

Now, Indian libraries started to have the provisions for natural lights as much as possible, energy saving bulbs in the reading rooms and other places within library premises, provision of natural air, emphasis on cleanliness, hygienic toilets, adequate provision of waste bins at appropriate places, proper disposal policies for weeded library materials/equipments etc. (Chakraborty, 2013). But there are available standards and specifications, which must be given due respect.

Leadership in Energy and Environmental Design (LEED) is a performance standard, which allows a building owner or planner to choose how to meet certain benchmark numbers without prescribing specific measures (http://www.leed.net/). It encourages and accelerates global adoption of sustainable green building and development practices through the creation and implementation of universally understood and accepted tools and performance criteria (McBane Mulford & Himmel, 2010). Yudelson (2007) mentions that there are currently six types of building certification under LEED including:

- ❖ LEED for New Construction (LEED-NC),
- ❖ LEED for Commercial Interiors (LEED-CI),
- ❖ LEED for Core and Shell (LEED-CS),
- ❖ LEED for Existing Buildings (LEED-EB),
- ❖ LEED for Neighbourhood Development (LEED-ND), and
- ❖ LEED for Homes (LEED-H)

Many libraries at the international levels have achieved this certification including Atlanta, Canada, England, Japan and USA, but Clinton Presidential Library in Arkansas has the highest green rating of any library in the world. If we talk about India, only two libraries have achieved this certification. These libraries are Perma Karpo Library, Laddakh in Indian Himalayas that was completed in 2010 and National Library of India, Kolkata that is yet to be completed (Agashe, 2013).

Further, IFLA library building guidelines on the developments & reflections edited by Latimer & Niegaard (2007) can also be consulted for the purpose of making library green and sustainable. Indian Standard design of library buildings – recommendations relating to its primarily elements (1992) and Indian Standard specification for library furniture and fittings (1978) also can be consulted for building and designing furniture etc. for Indian library system.

ROLE OF THE LIBRARIANS

The libraries have always been a key contributor to community learning efforts, and it is appropriate that they take a leadership role in the sustainability movement on campus (Miller, 2010). Though, this may be difficult at institutions with well-defined and fully built-out facilities, but every time there is a renovation or expansion to the library and sustainable approaches can improve the environmental impact of the building. Green libraries are all about "adopting library and librarians responsibility as well as visible leadership through ecological sustainable buildings and equipment, operations and education" (Hauke et al., 2013).

Miller further adds that unlike other buildings, libraries have specific needs and unusual challenges in the fight to become greener. However, librarians can help to overcome the situation in making a library sustainable in present environment in several ways. Agashe (2013) has assigned following roles to a librarian which he can play in making 'Green Libraries'.

❖ The Green Librarian's role is most extraordinary here called Eco-librarian who has to handle the budgets to support the organizations.
❖ The resources should be provided on site help to the people to locate library materials and many documents and organizations that are oriented toward a hopeful future.
❖ There are the two most important things- Economy and Ecology for making healthy and prosperous sustainable libraries. Librarian has to keep them in mind essentially.
❖ Saario and Oja (2012) has further suggested following ways for making sustainable library of the future.

- ❖ Information must be distributed and established by bringing out the best practices and introducing them to wider use and environmental guide and work methods that motivate people to participate.

- ❖ An individual employee must be supported in implementing sustainability through commitment and mandate of the management of the organization for activities. It can be achieved by commitment at the city level, through environmental programme and targets and peer support network, for example through eco-support activities. Also environmental training, tips for best practices and instructions on how to measure success and encouragement are essential.

- ❖ Indicators and monitoring methods should be developed for sustainable libraries.

- ❖ Cooperation between different operators and between agencies should be developed. The library can also encourage sustainability internally.

- ❖ Customer communication should receive more attention because libraries have considerable opportunities to improve their customers' environmental awareness through communication and environmental education as well as acting as an example.

- ❖ The intrinsic role of the library in sustainable development should be emphasised more. Library activities are in themselves ecological, which deserves to be highlighted more. However, the role of the library in promoting social sustainability needs to be reinforced.

Further, Wikipedia (http://en.wikipedia.org/wiki/Green_library) and blogs like The Green Library Blog (http://thegreenlibraryblog.blogspot.co.uk/) and Going Green @your library (http://greeningyourlibrary.wordpress.com/) also discuss the topics in details and they can be consulted for further use.

GREEN LIBRARIES – INDIAN SCENARIO

The movement for 'green library' was started in the United States in the early 1990s, when the librarians, libraries, cities, towns, college and university campuses have committed to greening libraries and reducing their environmental impact. This innovation is realized by building green library buildings, by greening existing library facilities, providing green library services and embracing environmentally supportive and sustainable practices within the libraries (Antonelli 2008). Now, many countries all over the world have been enjoying the benefits of 'green libraries'.

But if we talk of India, a very few attempts have been made in the country to develop sustainable library buildings. A survey made four old university libraries by Chakraborty (2013) reveals that although measures were taken care off a long time ago at their establishment time but some suggestions also need to be adopted to solve the problems in current environment. A summary of her survey results reveals that:

- ❖ Calcutta University Library system is one of the oldest library systems in India, where the use of open space and pot plants is soothing as well as eco-friendly. Its great height, vast open areas and thick walls, windows all through the eastern wall are some green gestures that are in built in this heritage structure as well as nurtured even today by the present library leadership. Its wooden furniture is also eco-friendly and attractive that gives pleasant feelings.

- ❖ Mumbai University Library has taken measure to make its library green. Its library and Rajabai Clock Tower above it are located in a heritage building with a height of 280 feet. The architecture itself makes it more environment-friendly as it boasts than the recent low-height, less-width, non-thick walls. Its heavy wooden furniture mostly with antique values mingles well with the environment. Natural light comes through the wide windows that run through the wall is supplemented with the electric lights subtly to facilitate reading but not to cause glares or any other discomforts.

- ❖ Madras University Library has also taken some measures to make the building sustainable. Its granite arches and domes with octagonal base make this building pleasant to the readers. Its Islamic architecture has also come in the inclusion of kiosks. An ample scope for letting in natural air has been provided. Its wide corridor makes a buffer zone for the entry of hot and humid air. Windows are large and too many accelerating both fresh air and sunlight. Wood is extensively used in making the building luxurious and pleasant.

- ❖ Delhi University Library is also among the few olden libraries which took measures since its initiation. Its olden days' building is naturally cool and pleasant with broad opening for natural lights. 'Desert Coolers' are being used to prevent the excessive heat of the summers. This library has neighbourhood greens. It also arranges pot plants in different locations inside and outside the library both as a decorative as well as a green measure.

But the author has suggested something more that can be adopted in modern times. These include - photovoltaic (solar) panel system, very-low ozone depletion refrigerants, vertical fin walls to minimize solar heat gain, aluminium sunshades, large clear coated glass windows and the skylights to make the building looks and feels pleasant.

But if we talk about the new establishments, the establishment of Anna Centenary Library building that has been made by LEAD Consultancy & Engineering Services (India) Private Limited (www.lcsind.org/images/news/Chennai-Library.pdf) presents a 'state of art' of library building in the country. Some of the measures that have been taken in making its building green and sustainable are listed below:

- The project is located in a well developed area and has access to all the basic amenities, which channels development to urban areas with existing infrastructure. The project is provided with 341 numbers of car parking spaces, in which 18 car spaces have been earmarked for car/ van pool spaces. Besides, 11 number of 15 amp sockets has provided in the parking lot to encourage the use of electric vehicles.

- Extensive landscape is provided to an area of 6361 Sq.m. to address the heat island effect. An adequate rain water harvesting structures to ensure the good rain water harvesting and increase in ground water table is provided. Further, a collection well/ sand filter is provided at the lowest point of the site, which helps to remove the sediments from storm runoff moving out of the site.

- The library terrace area is painted with high albedo paints to reduce the heat ingress in to the building and green roof is provided to Auditorium terrace and Library terrace level at 1st, 2nd and 3rd floor.

- Efficient lighting system is also designed to ensure that no light pollution from the project interfere the library system.

Further, the project uses high efficient air cooled chillers with COP of 3.11. Energy saving heat recovery wheels and demand control ventilation are provided. Day light controls for perimeter areas are provided and building is provided with glazing (DGU) with low Solar Heat Gain Coefficient of 0.2. High efficient motors, pumps and fans are also provided. CFC and HCFC free HVAC and Fire suppression system are also there. Energy and water meters also provided at strategic locations to quantify the energy and water usage. Overall, this project has achieved 17.5 percent of energy use reduction as compared to a standard building.

It is claimed that this building would consume 30 percent less energy and 20 percent less potable water consumption without affecting the indoor condition and occupants comfort. Besides as mentioned earlier, two more libraries namely, the Perma Karpo Library, Laddakh and National Library of India, Kolkata are moving towards attaining sustainability. These are also LEED certified for their efficiency.

CONCLUSION

Now, information & communication technology is available at very cheap cost but at faster speed all over the world. That is why, we are moving towards more and more digital libraries. The days are not so far away when paperless society will be a reality. But to manage the harm, bringing an environmental awareness for "green" libraries is an important factor that does not necessarily require a big budget. Hauke & Werner (2013) rightly mention that 'there are [available] a lot of ideas and realized projects from all over the world on "how to green" the library's building, management, and services.

But there is "a need of attention for a meeting point between the principles of environmental studies and library studies in the merging modern library management process" (Ephraim, 2003). Also the need is that the technology used should be durable, recyclable able, re-usable, long-lasting, as far as possible based on indigenous materials, energy-saving among other qualities as suggested by Chakraborty (2013). Hence, this is the right time when we, the librarians should not only choose the methods for 'green libraries' but also make the public aware about the 'green libraries' for sustaining in the near future.

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Application of Mobile Computing in Library Service

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A B S T R A C T

Latest technological developments present an overview of trends in mobile tools and applications for libraries, including the internet mobile, mobile multimedia and SMS etc. The paper presents an application of mobile computing and its possible applications that can be Mobile with library services on the web based environment. This study may be helpful in identifying and generating Mobile based service for libraries.

Keywords—Mobile Computing, GSM, Library SMS, Palm OS

I. INTRODUCTION

The quickly growing technology of cellular communication, wireless LANs, and satellite service will make information available anywhere and at any time. Despite of size, most Mobile Computing will be equipped with a wireless connection to the fixed part of the network and perhaps to other Mobile Computing. The resulting computing no longer requires users to retain a fixed and commonly identified position in the network and enables nearly unrestricted mobility. Mobility and portability will create an entire new class of application and possibly new massive markets combining personal computing and consumer electronics.

Fig.1 Mobile Computing Application

Fig. 2.M-Library

Mobile computing is an umbrella term used to explain technologies that facilitate people to access network service anytime and anywhere.

- Fixed and Wired: This configuration describes the typical desktop computer in an office. Neither weight nor power consumption of the devices allow for mobile usage. The device use fixed network for performance reasons.
- Mobile and Wired: Many of today's laptops fall into this category; users carry the laptop from one hotel to the next, reconnection to the company's network via the telephone network and a modem.
- Fixed and Wireless: This mode is used for installing network, e.g. 'in historical building to avoid damage by installing wires or at trade shows to ensure fast network setup.

MOBILE TECHNOLOGY VERSUS LIBRARIES

Mobile technology has now come up with" libraries in hand "trend. Our librarians are in move to mobile determine how these devices are affecting information access and ensure that they are communicating with patrons and providing web content in the most appropriate and effective ways. Our librarians must be prepared to take this challenge and put this effort to increase the market and demand for mobile access to personalized facts and information anytime, anywhere on one s own handheld device. Since mobile

handled devices truly are personal devices, search histories and physical locations can be harnessed to produce more accurate, individualized information and services users on the go don't want to wait for list of web result, libraries today are covering most of the technologies given by mobile industry like PDA s Blackberry, iPod, Cell Phones, UM PC s (ultra mobile PC) and mobilizing library contents in a portable from suit able for small screen and delivering short service in the form of contents/information with device s multiple searching features. Librarians will need to become proficient in using these devices to enable users to access them anywhere from anyplace.

GLOBAL SYSTEM FOR MOBILE COMMUNICATION (GSM)

GSM is the most successful digital mobile telecommunication system in the world today. It is used by over 800 million people in more than 190 countries. GSM permits the integration of dissimilar voice and data service and the interworking with existing network. Service makes a network interesting for customers. GSM has defined three different categories of services: bearer, tele and supplementary services.

GSM MOBILE OPERATING SYSTEM

1. Android OS (Google Inc.)
2. Bada (Samsung Electronics)
3. BlackBerry OS (Research in Motion)
4. iPhane OS/IOS (Apple)
5. MeeGo OS (Nokia and Intel)
6. Palm OS (Garnet OS)
7. Symbian OS (Nokia)
8. Web OS (Palm /HP)
9. Windows Mobile (Window Phone 7)

(GSM Mobile Operating System: Example for Palm OS)

PALM OS

Palm Os is the most popular operating system that runs on personal Digital Assistants, also Known as PDA's. It can be Palm OS offers a variety of ways for the user to interact with it, with a user interface that fits most user' needs allowing for ease of use and convenience. For example, the applications limit the

amount of data that needs to be entered by the user since it is more difficult to enter data through the graffiti, graffiti 2, and the keyboard dialog on the PDA.

PALM OS SYSTEM ARCHITECTURE

1. Palm OS software
2. Reference hardware design
3. HotSync conduit data synchronization technology for one-button synchronization.
4. Platform component tools including an API that enables developers to write applications.
5. Software interface capabilities to support hardware add-ons.

Detailed view on Palm Components

Device applications and 3rd party Applications such as HTML-based web clipping applications allow websites to deliver compressed information to user in less than 10 seconds, on average.

Application Toolbox: provides interface to system utilities and libraries.

Examples:

· Code warrior interactive Development Environment (IDE) from 3Com
· Palm OS Software Development Kit
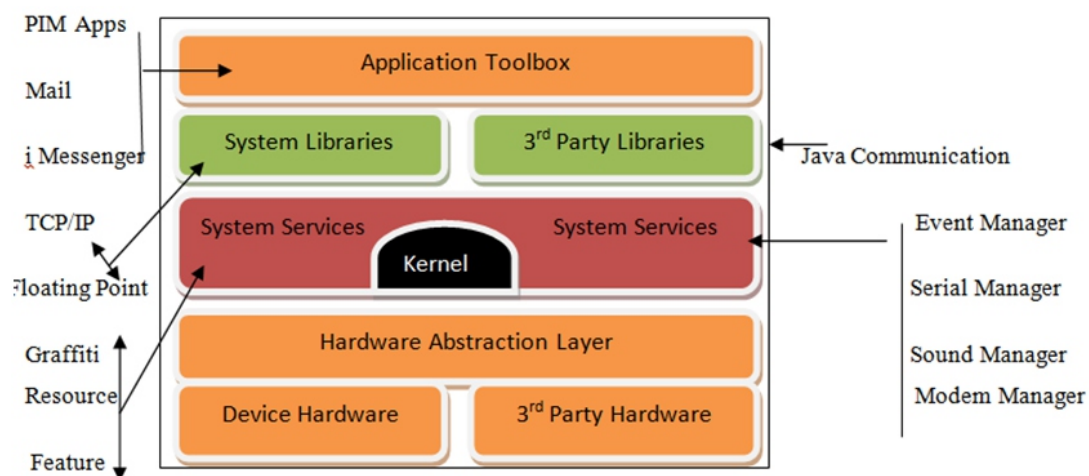
Palm OS Constructor to create UI resources.

Fig. 3.Palm OS System Architecture

MOBILE LEARNING FEATURES

M-learning have service key features that made it in the sight of researchers to focus on. These features comprise:

- Higher education institutions flexibility in the face of rapid change.
- M-learning reduces the barriers of time, place and distance. It provides learning opportunities to Individual learning and institutions.
- Mobile network operators probably play the most important role in enabling m- learning.
- Mobile technologies potentially create a wide Variety of uses and limitations that differ significantly from desktop and laptop technologies.
- Several access technologies provide internet access to all kind of learners via mobile phones.
- Some expected benefits from using the mobile devices such as mobility which is a primary Component of m-learning hardware.
- The availability of advanced mobile operating
- The majority of people live in deep rural areas or far from campuses with little or no fixed line telecom infrastructure where everyone can have a mobile phone.
- The rapid evolution of powerful convergent and connected wireless mobile devices with mobile Web browsers.
- There strong proponents of the notion that developing countries could find m-learning attractive simply because of the ubiquity of the mobile phone
- Universities need m-learning as a complement for their education method.

LIBRARY SERVICES

- M- Libraries offer the opportunity for the expansion of existing library- based services into the mobile domain.
- Two M-library services envisaged for implementation within this architecture being:
    a)   Library Catalogue, Loans & Reservations Service
    b)   The Interactive Library Map Service
    c)   Recommendations Service
- These Service enable users more efficient access to resources and information whilst moving throughout the library.
- This infrastructural system, and its inherent mobility, affords an ideal opportunity to enhance the user's library experience.

Mobile Based Library Services for Accessing Resources

- Audio Books
- Blog
- News
- E-Books
- Mobile Web Quick Picks
- RSS Feeds
- Search / Multimedia Search / Local Search Shopping Search / Visual/ Camera Phone Search / Voice Search

Use of SMS Services in Library

- Checking the availability of books via SMS.
- Renewing books via SMS.
- Requesting a list of loans via SMS.
- Requesting on overview of outstanding fines via SMS.
- Requesting the opening hours of the library via SMS.
- SMS if requested book is available (collect messages).
- SMS reminder if a book is due.

MOBILE APPLICATION BASED LIBRARY SERVICES

- SMS Alert service: Existing e-mail alert services like bringing new books to the notice of users for suggestion, intimation of arrival of indented document by users, informing availability of reserved documents for collection, appraising about which/when books are overdue, library circulars e-journals subscribed, change in timings, information about important etc., can upgraded by sending through SMS alert services. SMS messages can be sent to group of users simultaneously through many free applications, and intermediary websites/clients. To send SMS to collect the request the opening the closing hours of the library.
- E-Contents: offers access to a variety of databases and digital resources such as e-Books, e-journals, Web databases, dissertations, and article databases. Users can get fast relevant answers whenever needed with e-Contents Search, search designed just for mobile user.
- Wi-Fi – Internet access: Mobile phones are available with 3G facility. Libraries can offer Wi-Fi facility to access electronic information sources.

ADVANTAGES AND DISADVANTAGE

- Cell phones and other mobile technology devices have created a way for library and users.
- Mobile technology is helping services providers increase habitual users. Library provide the increasingly using the complexity of their supported mobile technology to attract new users and retain old ones.
- The user can also sent request for ILL, reference query, suggestions and complains. Libraries will also reply the same though automatically mail and SMS.
- Application distribution: due to the nature of the connectivity between library and its user it would be impractical to expect users to regular upgrade of their mobile application. it will be expected that the mobile application itself check the upgrades and updates and download necessary patches(so called over the air updates).

CONCLUSION

Already mobile phones are no longer a luxury but a necessity not for simple voice or text communication, Mobile content delivery can grow at a faster pace as libraries are ready to provide value added services. A library may reach the remote users effectively by adopting of mobile computing in its services. Library professionals must keep pace with trend and integrate themselves into the mobile realm if they wish to deliver enhanced user services. With the increased use of Internet though mobile , libraries are required to redesign their web pages as mobile optimized interactive and participative library web pages to provide dynamic information services to users on a 24X7 basis via mobile devices. Library services should be flexible and satisfied the need of users using mobile computing .Though it provided easy access (24X7) to library resources, it is limited the slow seed of internet / Network congestion / Screen quality require application / Library staff have also limited number of character for reply to the use.

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Understanding of Open Source Software Development -Best practice for Computational science

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A B S T R A C T

Open Source Software is software which is available for anyone that is it is publicly used. Open source code is created as a collaborative effort in which programmers improve upon the code and share the changes within the community. Open source software is identified by the type of license it is released under. These licenses include the Apache 2.0 license, the Microsoft Public License, and the GNU General Public License. Most of the open source licenses require that the source code be freely available for the users so that they can modify the source code and redistribute the software and derived works. Non-open source software is called closed source or proprietary software. Software programs such as operating systems (e.g., Linux), digital circuit design (e.g. LogiSim, CPU Sim), applications (e.g., OpenOffice.org), games, and even programming languages (e.g., Python) can be open source. In this research paper we describe some Open-source technologies that is designed for education so that economic aspects of the community consideration can be taken .They are designed in the manner as free and open and licensed so that they allow their designs to be used, modified and distributed freely.

Keywords—Open source, Closed source, Open standard

INTRODUCTION

Open vs Closed Source

Many software programmers are spending incredible amounts of time and effort in writing and debugging software with no direct economic reward. Open source software free means without cost is a common misconception. It is not always true. Only program's source code is freely available, it means the program itself can still be sold commercially.

In computing, source code is a collection of computer instructions written using human-readable computer language. The source code of a program is specially designed to facilitate the work of computer programmers that specify the actions to be performed by a computer by writing source code. Developers create a software program in computer programming language, such as C++ or Java.

After that source code will be translated from the developer's programming language to a machine binary language (0s and 1s) that the computer can read.
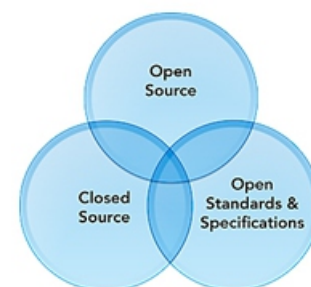

Figure 1. Hybrid relationship

This translation is done by a compiler, Assembler or interpreter. The compiler translates high level language programs into binary language that the computer can read and execute. Compilers not only run the program but also make the programs more efficient by optimizing the file sizes and checking for errors. Compiling helps protect the integrity of the source code.

The source code of closed-source model is not available for public use. Closed-source software is developed by team members of a company that produces their product in a compiled-executable state, which is what the market is allowed access to. This software is normally copyright or patented and is legally protected as intellectual property. The owner of the software distributes the software directly or via vendors to you the end user.

Best Practices for Computational Science as Open Source

A computational scientist today developed new software tools that help in research [1], new requirements for publication [2]. There is a rapid change occurring in scientific research, so the best practice recommendations given below

1. **Data and code should be open licensed.** By making the data and code available for free re-use can make best practice. This can be legally possible through the use of open licensing [3] means you have legal right to make data and code public i.e anyone can access and the Reproducible Research Standard [4].

2. **Data must be available and accessible.**
   I. Generate Version for Data: You must generate or collect minimum version for data. If you did not generate it yourself then provide a link and citation to the source of each dataset you incorporated, including which version of the data you used
   II. Availability of Raw Data: Raw data may come from observations, instruments, or data as accessed from a secondary source. Results should be reproduced from the earliest digital data. All data manipulations should be made transparent, beginning with the initial version of the data with which the researcher started working. Meta-data should accompany the raw data. Meta-data should be machine and human-readable.
   III. External and Redundant Storage: In simplest case like in simulation, there are no external data files. In some complex case, data are massive, distributed, and possibly updated in real time. And in intermediary cases data files can be readily downloaded and accessed by the user.

3. Workflow tracking during research: Derivation, workflow tracking, and publishing environments are important tools that help enable reproducibility and re-use by others that will minimizing the burden on the researcher.

4. Third party data and software should be cited: If you are using data that did not belong to you or you did not collect from scratch, or code you did not write, then you must cite it. The data or code that you used or accessed includes the source, author and date and time. Best practices indicate including a unique identifier in your citation.

OPEN SOURCE INITIATIVE (OSI)

OSI is defined as standard. It is an organization dedicated to promoting open-source software. Open Source is a certification standard issued by the Open Source Initiative. The standard shows that the source code of a computer program is made available publically free of charge. The product to be OSI Certified must meet the following criteria:

- The author of the license of the source code cannot collect royalties on the distribution of the program.
- The distributed program must make the source code accessible to the user.
- The author must allow modifications and derivations of the work under the program's original name.
- No person, group or field of endeavor can be denied access to the program.
- The rights attached to the program must not depend on the program's being part of a particular software distribution.
- The licensed software cannot place restrictions on other software that is distributed with it.

Open Standards Requirement for Software

In open source software implementations 'open standard' is not prohibited. It means larger group of programmers are not concerned with proprietary ownership and financial gain will produce a more useful and bug-free product for everyone to use

Open standard should satisfy the following criteria to fulfill Open Standards Requirement. If an "open standard" does not meet these criteria, then developers are not open source.

1. No Intentional Secrets: The standard should not withhold any detail necessary for interoperable implementation.

2. Freely distributed: The standard should be freely and publicly available. The license shall not restrict any party from selling or giving away the software

3. Patents: All patents essential to implementation of the standard MUST:
    *   be licensed under royalty-free terms for unrestricted use, or
    *   be covered by a promise of non-assertion when practiced by open source software

4. No license Agreements: There should not be any requirement for execution of a license agreement.

5. License Must Not Restrict Other Software The license must not place restrictions on other software that is distributed along with the licensed software.

6. Source Code: The program must include source code and must allow distribution in source code as well as compiled form

Development of Open-Source

One can develop open-source software that is source code is available publicly by open-source software development. The open source software products available with its source code under an open-source license so that one can study, change, and improve its design

Various open-source projects that are successful are different from each other for e.g. Apache Open Office is open-source software which is used for the purpose of presentations, word processing, spreadsheets, graphics and databases. It is domestic, commercial, and educational and is easy to use. AOO is available in many languages and works on all personal computers. Others example is MySQL is the most popular Open Source Relational SQL database management system where developers develop the software for company internally and then release the results. Both users and developers engage with each other in requesting new features, report bugs and discuss about the software.

Various Tools for Development of Open-Source Software

There are various tools available for open source development. Developers use open source tools for because they include expensive commercial tools, free which allows them to adopt new tools quickly and save money and also the can be modified as desired. Today there are thousands of tools available free online. Some of them are listed below that are used by programmers, web developers and software testers.

Eclipse - Eclipse is a open source and also known as Integrated Development tools that provides tools for coding, building, running and debugging applications. It is written in Java.

Notepad++ - Notepad++ is a simple text editor for Microsoft Windows. It is freely available that is easy-to-use note-taking application. It can perform searching, sorting and ability to send the note.

LogiSim- is a free educational tool for designing and simulating digital logic circuits. The basic concepts related to logic circuits can be understand and build by using its simple toolbar interface and simulation of circuits. With the capacity to build larger circuits from smaller subcircuits, and to draw bundles of wires with a single mouse drag, Logisim can be used to design and simulate entire CPUs for educational purposes.

Python-is an open numerical computational software for Science and Engineering Education. It is used in 3D animation and Gaming industry, Artificial Intelligence, YouTube, NASA, CERN, Yahoo and so on.

LaTeX- is a type setting software for preparing reports, letters and presentations - specially useful for persons engaged in writing/ publishing documents from science/ arts/ commerce fields.

ASCEND- is a free, open source, mathematical modelling system. Its main uses have been in the field of chemical process modelling, with its novel modelling language conventions and powerful solver. Useful for Chemical Engg and Chemistry students.

SoapUI -SoapUI is an excellent tool to test the web services. This tool is used for API Testing and is the world leading Open Source Functional Testing tool. It is flexible, ease of use and having vast number of features. It also supports functional tests, security tests, and virtualization.

Firebug - It is web development tool that integrates with Firefox while you browse. You can edit, debug, and monitor CSS, HTML, and JavaScript live in any web page.

Conclusion

In this paper we describe the concept of open source software development .We discuss that how they are useful in education as it is freely available and economical ,it means the program itself can be sold commercially. Further we elaborate various tools used by programmers, web developers and software testers. This study does not include that analysis, but could be extended by marketing survey on persons

those who are using open source software.

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Wi-Fi Direct API Building Blocks in Android

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A B S T R A C T

Anything that can be written in code can be encapsulated in a block. A block can represent a component, a function, and parts of a system or a protocol. Implementing unfamiliar functionalities in Smartphone applications can be a difficult and a complicated task. The Application Programming Interfaces (APIs) do not have a formal way of representing the sequence of events may be one reason. This research project describes the development process of various Arctis building blocks based on Android's API of Wi-Fi Direct. Arctis SDK now introduces easy sharing, additional building block libraries, and collaboration tools [12].The objective of these blocks was to simplify the implementation of Wi-Fi Direct by conning a predictable sequence of events.

Keywords—Wi-Fi direct API, Arctis building blocks, Smartphone, WPS, Arctis SDK

INTRODUCTION

Android provides several APIs to facilitate interaction between software components and the operating system. Each API contains a set of functions that together form its functionality.

Some of these APIs contains time-consuming functions that can take an arbitrary time to run, which must be executed simultaneously with other tasks. Using them is known as asynchronous programming and is essential in Android development where creativeness is a requirement. Without asynchronous programming only one task can be executed at once, resulting in the application to be blocked until the current task is finished. The sequence of executions and the awareness of the application's state during the reception of messages are important factors developers need to take into consideration when using such APIs. Modeling the application's behavior should therefore be a crucial part of the development.

By dividing an API into different generic templates based on pretended use-cases.

REVIEW OF LITERATURE

This is an introduction to the technologies and concepts that is relevant for this research project. Wi-Fi Direct is a new technology and is therefore thoroughly elaborated, both individually and together with Android. Wi-Fi Direct devices can connect in pairs or in groups. With Wi-Fi Direct only one of the devices needs to be compliant with Wi-Fi Direct to establish the peer-to-peer connection. So, for example, a Wi-Fi Direct-enabled mobile phone could establish a connection with a non-Wi-Fi Direct

notebook computer to transfer files between the two.

Wi-Fi Direct-certified devices can be used for all kinds of applications - to share content, synch data, socialize, play games, play audio and video, and more - all the things you do with your Wi-Fi devices today, only easier and without worrying about finding an internet connection. Wi-Fi Direct-certified devices can form connections with nearly all the Wi-Fi CERTIFIED™ devices you already have. Now, Wi-Fi isn't just about accessing the internet - but about connecting all the Wi-Fi devices you and your friends have - anytime, anywhere - to enable your connected life [13].
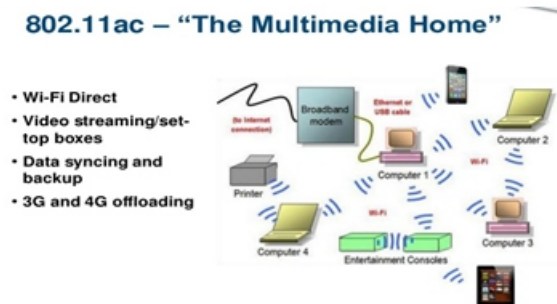

Figure 1: Basic Overview of Wi-Fi direct[15]

SECURITY

Wi-Fi Direct certified devices are using Wi-Fi Protected Setup (WPS) when they are connecting with each other. WPS is a setup mechanism that let users add Wi-Fi compatible devices to Wi-Fi networks more seamlessly, and with the same level of security as with traditional manual Wi-Fi setup procedures [1].

METHODOLOGY

This is a discussion on which method we opted to follow is carried out. Furthermore, a description of how we preceded the development of the building blocks, based on the chosen method is presented. In addition, an issue we encountered during the testing procedure is discussed. This issue is worth mentioning because it affected the testing process, and it persisted during the entire development process. Finally, a short description of which tools we used in order to obtain the objective is presented. So now we choose the method of waterfall model because it follows the sequences of phases.

THE CHOICE OF METHOD

The developers need to have a distinct separation between design and implementation. To be precise, developers need to be finished with the design of the models before they are implemented. This method of development follows the waterfall model, where the different activities are preceded sequentially through various phases [9]. Every activity that belongs to a phase must be completely finished before

the next phase starts. Since there are many uncertainties in the design phase, this method is quite difficult to follow.

API BUILDING BLOCKS

Design of reusable building blocks for Wi-Fi Direct was achieved by the use of Arctis SDK. The objective was to end up with blocks that are easily implementable in other applications. As a result, the requirement of comprehending the technological details of Wi-Fi Direct and Android's Wi-Fi Direct API would be relaxed. Hence, these blocks were made generic in such a way that they can be used independent of application's use-case. In this manner, the restriction of functionality relies in how the blocks are combined, not the blocks itself.

Now these building blocks in details, as well as how they are composed to structure the complete functionality. The most important functions of Wi-Fi Direct are the following:

Be able to find peer devices in range.

Send connection requests.

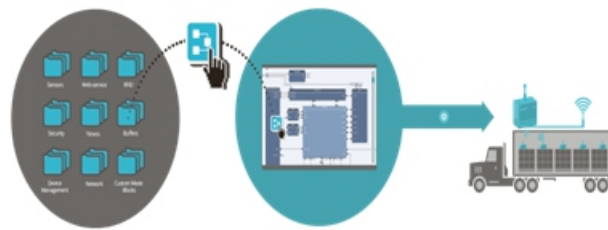Listen for connection requests by peer devices [12].

Figure 2: Process for using building blocks

Discover existing building blocks.

Build your application by combining the blocks.

Deploy the application package that is built automatically.

This means that the after the method used for the discovery has been executed, the application should expect either an on Success or an on Failure. The block is initiated by the start pin being triggered. When the block is in state active, it will execute the method for discovery and wait for an on Success or an on Failure to be triggered. When this happens, the corresponding output pin is triggered
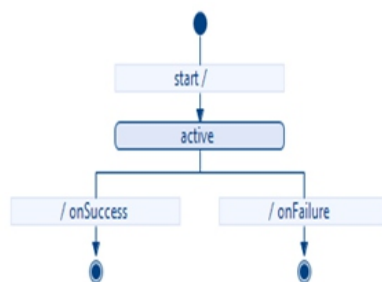

Figure 3: The state machine for discovering the block

Here are some main points about the blocks:-

Make Applications from Building Blocks

You can use blocks from existing libraries by simply dropping them into a new application.

Code What Works Best in Code

Details and advanced algorithms are programmed as traditional Java code. Graphics and code are kept in sync automatically.

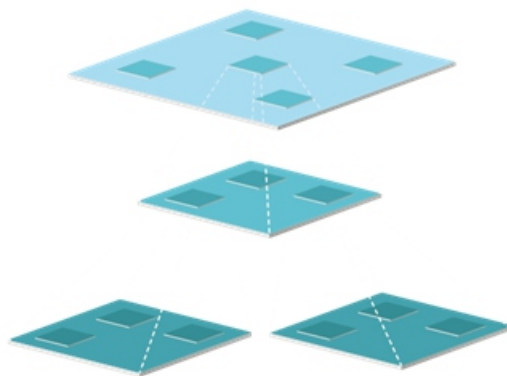Applications are structured in a Hierarchy of Building Blocks

Figure 4: Hierarchy of Building Blocks[12]

CONCLUSION

Wi-Fi Direct is one of many technologies which have recently made its entrance to the Android platform. In order to utilize and implement such up-to-date technologies, developers need to gain sufficient knowledge. This is sometimes challenging and much time is therefore spent on understanding them. By using Arctis SDK, we have developed building blocks to ease the interpretation of this functionality.

The building blocks emerged through an iterative process between establishing the requirements, analysis and design, implementation and evaluation. In order to prove the utility of the blocks, they were implemented in an example application. This application was further tested and evaluated before the requirements once again were examined. This iterative process continued until the blocks covered a satisfactory amount of functionality according to the requirements.

A significant amount of development time will be reduced by using the building blocks we have presented in this thesis. This is due to the following reasons:

Using a graphical notation to present the expected behavior will enhance the understanding. As a result, the time developers need to spend in to gain sufficient amount of knowledge will decrease.

The blocks add contracts to the behavior, which makes it less prone to design flaws. Thus, the testing and

error correction time will be reduced.

The implementations of functionality from the Android's Wi-Fi Direct API are already completed within these blocks.

By using these results as a foundation, further development of building blocks can be realized by exploring more APIs and use-cases. It is hoped that this way of thinking will inspire other developers to see the value of incorporating graphical models in the development process.

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