A SURVEY ON EVOLUTION OF WIRELESS TECHNOLOGY IN EDUCATION ADMINISTRATION

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Abstract— Wireless communication technologies allow users to communicate with each other via their handheld communication devices at their fingertips, at anytime and anywhere. This paper explores the different ways in which wireless technology works and the required prerequisites to integrate it into the various aspects of educational administration. This paper analyses the past present and future aspects of wireless technology into education services. Additionally, this paper highlights various challenges pertaining to security and data delivery aspects together with the strategies of implementing wireless technology thoroughly in higher education institutions.

Keywords—Wireless, Administration, Security, Data Delivery

I. INTRODUCTION

The wireless communication systems have become the most important communication devices in our daily life [1], due to its portable & compact behaviors. These devices with advanced wireless communication technology can be a great vehicle especially to deliver the needy services in the various sectors of the system. Education is one such key sector where the implementation of the wireless technology can be done with the purpose of upgrading the existing system to provide all sorts of services tirelessly. “Anytime, anywhere” access feature of the wireless communication device has widened the reach to the targeted users. Currently in major education institutions the administration is done through wire line devices. The current system has number of demerits and the major drawbacks can be resolved by the inception of wireless policy in administration. The primary idea of implementation of this policy is not to convert all wire-line tasks to wireless. But to consider how best the wireless technology can be used to strengthen overall administration policy in spite of the major hurdles such as data delivery, data and device security issues.

II. EVOLUTION OF WIRELESS TECHNOLOGY

PAST
Evolution of the Wireless technology is based on the penetration in engineering science made by several pioneering monsters during the 19th century and also at the early part of the 20th century. The developments during that era are the foundation of our present development in communications technology. Many have contributed to this wireless world. Hans Christian Oersted (1819) and Andre Marie Ampere (1820) were credited with discovering that electricity could produce magnetism, coupled with the innovation of Michael Faraday (1831) that magnetism could produce electricity, all these lead the progression in communication technology to the discovery of James Clerk Maxwell and experimental validation of his four laws by Heinrich Hertz to the commercialization of these models by Guglielmo Marconi through transmission into space by radio waves which Guglielmo referred to as the “wireless”.

PRESENT
In 1979, the AMPS standard was revealed in the United States. AMPS was and still is the basis for almost all cellular telephones in the United States. NMT, the first multi-national cellular system, was launched in 1981. Digital cellular was first unveiled in the United States in 1990. Digital standards were defined by IS-54 and allowed for a dual analog/digital system. GSM of Europe also launched digital service in the same time frame. Within a few years, GSM has spread service into 52 different countries. The third generation of cellular telephones was soon to follow. The first details of CDMA technology were evident as early as 1993 in the United States. The third generation cellular systems were the first cellular networks to utilize and implement a soft handoff feature.

FUTURE
A general rule of thumb is that the future of anything is very hard to foresee. This rule applies also to the IT technologies. The future of wireless communication technologies is completely unknown. Despite the fact that one can explore market trends, review the past technologies, and hypothesize a guess as to what the future might hold. It is almost guaranteed that the future holds great promise for the growth of the
cellular and wireless markets. It is estimated that by 2020, approximately 60% of the global population will possess some form of wireless communication technology. Technologies 20 years from now will be as different as today’s technologies would have appeared to a person 100 ago.

III. WIRELESS TECHNOLOGY IN EDUCATIONAL SYSTEM

Wireless networks will play an important role in education. The infrastructure of wireless networks mainly spotlights on wireless ad-hoc networks. This sort of network will offer autonomy from place limitations, flexibility, dynamic interaction, group communication, manifold services etc. It enhances collaborative learning & training also. Wireless ad-hoc networks can provide a dynamic edifying environment. Still it will cause new research problems. As mobile communication devices, which are fundamentally easily accessible & economic, are widely in use these days, it can be extended effortlessly in the field of education to enhance administration along with teaching and learning. 3G Technology proffer faster data transfer rate with better multimedia quality than 2G wireless technology. Simple text messages (SMS), multimedia messaging services (MMS) and Internet access can be used in all the sectors pertained to education.

IV. WIRELESS-ADMINISTRATION

The Information Technology (IT) is widespread by now in the world and the common man has benefited from the wireless-governance applications provided by the government & private units. Administration with wireless technology involves the use of ICT (Information and Communication Technology) in order to develop administration processes and the internal functioning of the departments within an educational organization. Wireless communication in administration augments the add-on facilities such as E-services, E-participation as well as it enhances the delivery of services to the students, staff and administrators by providing interactive facilities. The wireless based technologies are constantly evolving and the following channels can be easily used for delivery of services / data through wireless handheld devices especially in educational administration.

- SMS (Short Message Service)
- IVR (Interactive Voice Response)
- WAP (Wireless Application Protocol)

This paper mainly highlights the two major issues concerned to the Wireless Communication with respect to the Education Administration.

- Data Security
- Data Delivery Issues

Data Security

Current Electronic devices are very special due to its storage features. Wireless communication devices store the valuable data and it needs strong security. The privacy of sensitive data must be given at most priority. The extensive use of wireless devices has contributed to the increased security incidents. As user stores the precious data the more and more on wireless devices, the security risks are increasing enormously. The lack of people awareness about security policies ranked as having the greatest impact on the security of wireless data. The careless users are a greater security threat than hackers.

The security can be provided by incorporating the following things [6]

- Securing E-mail
- Encrypting activities online using HTTPS
- Making Passwords Safer
- Using Anti-virus and anti-spyware

Securing Email

The email service providers such as Hotmail and Gmail offer secure email services. It provides connection encryption between the user and the service provider. HTTPS secures the connection between dual end and delivery towards the final destination can still be unencrypted and vulnerable. For higher security requirements the One Time Password can be used.

Making Passwords Safer

Passwords protect the user from unauthorized access. Password is the key to access the resources. So one must create good, strong passwords. Using combination of symbols, numbers, and letters is the easiest way to secure the password. Anti-virus and Anti-spyware The use of pirated software, operating system triggers the risk. The illegal usage software is the ease method for getting the work done, but it’s very unsafe as user will lose security on data and resource. If not the high-end, at least the primary anti-virus and anti-spyware software’s must be used to minimize your risks. Encrypting activities online using HTTPS During the online activity, always one has to keep identity and passwords secrete. Especially during the usage of social networking apps, money transactions safety should be given highest priority. The encryption of data, usage of virtual keypads is the basic safety mechanisms.

Wireless device Security is different from that of the normal devices, because of the following reasons [7].

- Connected to critical infrastructure
- Connected to people
- Multiple Stakeholders
The following are involved in security Measures

- Wireless Network
- Stakeholders
- Service Provider
- Device / OS manufacturer
- Application Developer
- End User

Data Delivery

Actually in education administration the most of the resources are designed for desktop computers and high-speed network connections. Moreover, for different user preferences in wireless environment, not all of the data are relevant and critical to the administration activity. It is a great challenge to deliver such complex resources to various devices with limited capability over low-speed wireless network while ensuring the reliable, high quality of data which is the core of educational administration. The implementation of wireless technology in educational administration will transform the following areas/sectors.

- Course Inquiry
- Admission
- Human Resource Management
- Inventory Management
- Information Management
- Transport Maintenance & Management.
- Library Automation
- Accounting
- Academic Management System

V. CHALLENGES & STRATEGIES

Due to low power consumption, flexible property, less cost, infrastructure and easy to deploy behaviour the wireless communication is widely used today. In spite of the above positive features, the wireless communications have numerous problems over the usual wired networks.

Contrasting the wired networks, the wireless networks face unique challenges due to their inherent vulnerabilities. The wireless signal is subject to interception, jamming, false command disruption, exposed to a range of intrusion attacks. The coverage area of wireless is entirely depending on the devices used. The bulky device may cover large area but it will be expensive, consume more power. Another critical bottleneck to security is the battery durability problem of the handheld devices. Attack, is also one of the main concern in wireless communications. The possible attacks can be categorized into two types. i.e. Internal or External attacks. These attackers may spoil the network resources such as encryption keys used by the network. In The main issues for deployment of wireless networks are security attacks, vulnerabilities, battery power and improper security models. The research on security issues and challenges in wireless communication comprises performance implications due to different factors. The effects of these factors or problem areas have been addressed by using different tools, algorithms, models, simulations and design modifications. Data Delivery is also another major challenge in wireless administration. The existing resources pertained to administration are designed basically for reliable wire line communication. These resources must be renovated to support the network with lesser capacity. Some other major challenges are

- Support for mobility – the compactness of the device.
  The Anytime, Anywhere access Feature.
- Context awareness – The omnipresent devices should perform actively as smart device in the continually changing situations.
- Support for collaboration – The services will be administrated and used by all sorts of users. Therefore the target should be on entire group.

The rapid growth in the field of education has made administration in education a composite task. The remarkable progress in technology has led to development in the administrative system. Wireless technology can be used widely for educational administration process. Wire-line administration is the pre-requisite for the successful implementation of wireless administration. Here the wireless handheld devices such as Cellphones, Tablet PCs, Laptops are used for the administration activities. The Wireless Administration can be implemented by various ways. Internet Access through handheld devices that too the use of mobile compatible site construction such as dot mobi websites. SMS Information system is another approach which can be prioritized in administration. It allows the users (Students, Parents, and Administrators) to interact easily. Fig-1 Organizational Construction of Education Institute where Wireless Administration can be implemented [13]

VI. ADVANTAGE OF W-ADMINISTRATION IN EDUCATION
• **Interaction:** The compact, handheld devices allow the users to interact with each other smoothly. As these communication devices are 24X7 accessible interaction will be much effective than wire line.

• **Portability:** the wireless handheld devices are lighter in weight, user can input data directly into the device regardless of location either typed, hand written or using voice.

• **Flexibility:** W-Technology is convenient, in the sense that it is accessible virtually from anywhere

• **Collaborative:** Enables several to work together on assignments even while at distant locations.

• **Increases Motivation:** Ownership of the handheld devices seems to increase commitment to using it. presently. Future work includes more study on implementation of wireless administration services, delivery & security policies to meet the new requirements of wireless administration.

• **Just-in-time-learning:** Increases work performance and relevant to the operator / user.

• **Autonomy:** W-administration provides all the more autonomy and flexibility

• 1 to 1 Ratio

**CONCLUSION**

The wireless technologies have the ability to reshape the quality of administration in educational institutions if accepted and used by the administrators. Although the use of wireless administration is very effective, however the level of adoption among the academic organizations is still low. Wireless communication networks can change the way administration processes are done in educational institutions. The administrators, faculty, technology staff, students, parents can utilize the wireless communication technology and take part in administration activity. Towards the successful administration of education institutions through wireless communication devices, this paper presents the various methods through which the administration can be implemented easily.

The organizational structure illustrates the various basic departments present in education institutions where the wireless administration can be applied effectively. And also discussed the challenges and various mechanisms used

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