

Education, ICT and the use of Mobile Study Centers

By Mrunal Chavda

Arvind Virmani says, “There has been a convergence of technologies relating to different areas of communication such as telephone, telegraph, radio, TV, internet and data networks. Multimedia is rapidly becoming reality, and a digital revolution is in the offing. Even electricity wires are usable for simultaneously carrying information.” (Virmani, 2003, 1907) The relationship between education and poverty is quite clear; educated people have higher earning potential and are better able to improve the quality of their lives, which means they are less likely to be marginalized within society at large. Education empowers a person and it helps them to become more proactive, gain control over their lives and to broaden the range of available options. (Khan, 2007, 82) Educational technology and use of newly emerged technological gadgets have put no limit in its wide use in ODL. Education and learning are the vital means for productive and sustainable development across the globe. ODL has come as an option to many who can't manage to get into the mainstream education system due to many reasons. Emergence of information infrastructure and info highways, knowledge pits have given the option to chase the dream of lifelong learning. The virtual communities interact over the internet has given the enormous amount of knowledge to be shared, edited and used. ODL has opened a new avenue for the induction of technology to remove some adamant obstacles to reach to the learners, overcoming common causes of dissatisfaction among the target audience. “E-learning is highly appropriate for poverty groups and can help those who are usually deprived of education or other social services. It can provide education to populations in rural areas without schools, women facing social or cultural barriers that limit their access to educational institutions, socially disadvantaged groups that include minorities who are usually marginalized, and students with disabilities.” (Singh, 2004, 90) However E-Learning is for those who can access internet in the nearby area /school/govt. agencies but those who are in the remotest regions are still deprived of education, MSC will be a boon for them.

“... a quarter century after the ODL system started in our country, it is rare to find well staffed and well equipped study centers which also don't have the necessary equipments. On all the counts, IGNOU which was to act as a model for all other institutions is guilty of serious lapses in the management of these centres.” (Singh, 2004, 130-131) Neglect of study centers brings discouragement among students. “In our country, where the study centre, even when they were relatively speaking, well run – a rare case- were neither well staffed, nor well equipped. Students hardly felt attracted to them and did not visit them unless it became unavoidable.” (Singh, 2004, 132)

The present paper is an attempt to find the answer to the age old question of reaching to the students and solving their problems with the help of advance technology, i.e. RFID. The idea is to bring study centre/regional study centre to the reach of farthest located students with the aid of new technology. The primary data was collected from IGNOU and BAOU students from all over Gujarat. Around 1500 respondents were sent for responses via mail survey out of which

1000 respondents mailed their responses back. Close-ended as well as open-ended Questionnaire was aimed to get internal-level response and semantic differential questionnaire was used. The data revealed that the students' of the Open and Distance Education System were dissatisfied with many issues i.e. counseling, Study Material, Faculty Guidance and Time factor. All were unanimous on the issue of the wastage of the time. Out of 1000 respondents 85% believed that they are wasting time in commuting whereas 79% observed study material is obsolete. Interestingly 94% felt the urgency for the Counseling. These responses prompted the author to look out for an alternative.

The main natural resource in the field of communication is the spectrum, particularly the radio frequency segment of this spectrum. This ownership right is normally with governments. There can be free usage for Distance Education sector. With the 4th wave of information and technology, Radio Frequency Identification (RFID), a technology similar in theory to barcode identification, is steadily finding acceptance and adoption across verticals. Retail ports, industries, warehouses, parking lots, toll roads, travel/car fleet units, banks, airports, judiciary and government are a few of the significant adopters of this technology. With RFID, the electromagnetic or electrostatic coupling in the RF portion of the electromagnetic spectrum is used to transmit signals. An RFID system consists of an antenna and a transceiver, which read the radio frequency and transfer the information to a processing device, and a transponder, or tag, which is an integrated circuit containing the RF circuitry and information to be transmitted. RFID systems can be used just about anywhere, from clothing tags to missiles to pet tags to food -- anywhere that a unique identification system is needed. The tag can carry information as simple as a pet owners name and address or the cleaning instruction on a sweater to as complex as instructions on how to assemble a car. Some auto manufacturers use RFID systems to move cars through an assembly line. At each successive stage of production, the RFID tag tells the computers what the next step of automated assembly is. RFID is also called dedicated short range communication (DSRC). RFID scanning can be done at greater distances.

RFID uses radio frequency waves to transfer data between a reader/scanner and a movable item to identify, track or locate it. RFID does not require physical sight or contact between the reader and the tagged item, making it more efficient than traditional bar codes. However, it is not merely a better substitute for bar codes, RFID as a technology has varied applications across industries and business functions. RFID allows a device, called a tag, to be affixed to some object and accessed by a special reader using radio waves. RFID allows information to be encoded in a very small form.

- a) They can store more information, and that information can be updated.
- b) They can be accessed several inches away from the reader.
- c) They can be read almost simultaneously – an entire shopping cart full of merchandise could theoretically be read in a single scan.
- d) Like bar codes, most RFID tags do not require their own power source

RFID (Radio Frequency Identification) technology has been its infancy as it has come up to the surface in around 2004 as the time for RFID take-off and industries converging on developing RFID applications and services. Radio frequency identification (RFID) is a technology that

allows automatic identification and data capture by using radio frequencies. The salient features of this technology are that they permit the attachment of a unique identifier and other information – using a micro-chip – to any object, animal or even a person, and to read this information through a wireless device. When linked to databases and communications networks, such as the Internet, this technology provides a very powerful way of delivering new services and applications, in potentially any environment. Radio Frequency Identification (RFID) is evolving as a major technology enabler for tracking goods and assets around the world.

RFID systems consist of tags, readers and a range of applications that track, monitor, report and manage items as they move between physical locations. These devices and software must be supported by a sophisticated software architecture that enables the collection and distribution of location-based information in near real time. Tags contain a unique identification number called an Electronic Product Code (EPC), and potentially additional information of interest to manufacturers, healthcare organizations, military organizations, logistics providers and retailers, or others that need to track the physical location of goods or equipment. All information on RFID tags, such as product attributes, physical dimensions, prices or laundering requirements, can be scanned wirelessly by a reader at high speed and from a distance of several meters. The basic components of any RFID system include:

- Tags (or transponders), which can be either active or passive. Active tags have their own means of sending a signal, whereas passive tags rely on power from tag readers
- Data stored on tags, which could be a simple ID number relating to an online catalogue or complex information such as manufacture date, lot number, serial number and so on
- Readers (or interrogators) are used to identify all tags within the reception coverage area and aggregate and “smooth” the data collected
- IT infrastructure to support the collection, management and use of key RFID data

In 1998 researchers at the Massachusetts Institute of Technology (MIT) Auto-ID Center began to research new ways to track and identify objects as they move between physical locations. This research, which has a global outlook, centered on radio frequency technology and how information held on tags can be effectively scanned and shared with business partners in near real time. The work of the Auto-ID Center focused on:

- Reducing the cost of manufacturing RFID tags
- Optimizing data networks for storing and delivering larger amounts of data
- Developing open standards

The interrogators send all the tag data they collect to software provided by Vue Technology, an RFID solution provider focused on item-level tagging applications in retail environments.

Electronic Product Code (EPC): a unique number reference for a physical object be it a product, case or pallet.

1• Electronic tags: that uniquely identifies an object, to which it is attached, via a unique EPC number that can be read without contact by a (RFID) reader.

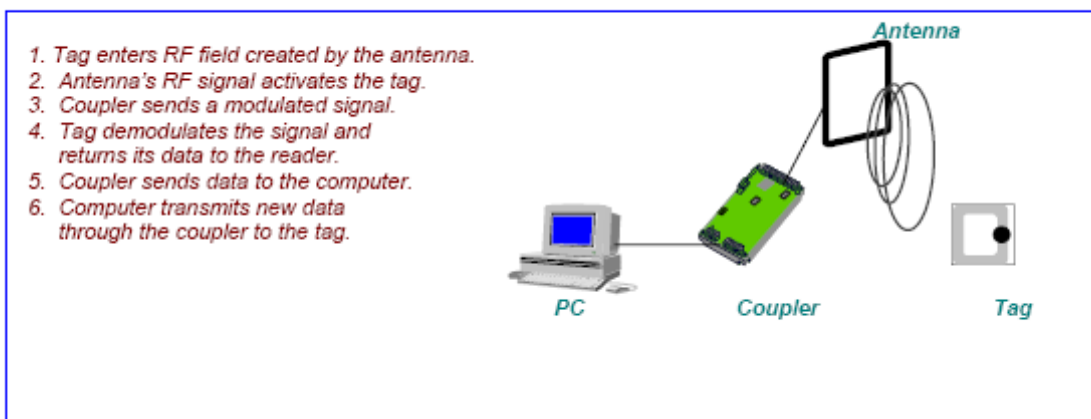
2• Object Naming Service (ONS): an application run on a host computer/system that collects the read EPC number and informs the host computer/system where to find information about the object. Typically this information may reside on the host computer, host network, or on other computer systems accessed via the Internet.

3• RFID Air Interfaces – specifying radio communication protocol between tags and readers.

It is a form of identification that is contact-less and does not require line of sight.

The RFID Solution is a revolutionary application of automatic identification and data capture (AIDC) technology. A standard RFID system consists of four main parts:

- RFID Tags - Flexible, paper-thin smart labels that are applied directly to library items. Each RFID tag contains a tiny chip, which is both readable and writable and can store information to identify items in your collection. In library applications, it also stores a security bit and if needed, information to support sorting systems.
- Antenna - A conduit between RFID tags and the coupler. RFID antennas emit radio waves that activate RFID tags as they pass through the activation field. After a tag is activated, it can send information to or receive information from the coupler.
- Coupler - The link between RFID tags and the PC. The coupler can send information in two directions: It can read information from a tag and send it to the PC (read mode), or it can read information from the PC and send it to an RFID tag (write mode).
- PC - The link between the coupler and your library automation system. VTLS has developed software that runs on your PC to provide an interface between the RFID hardware and your library automation system.

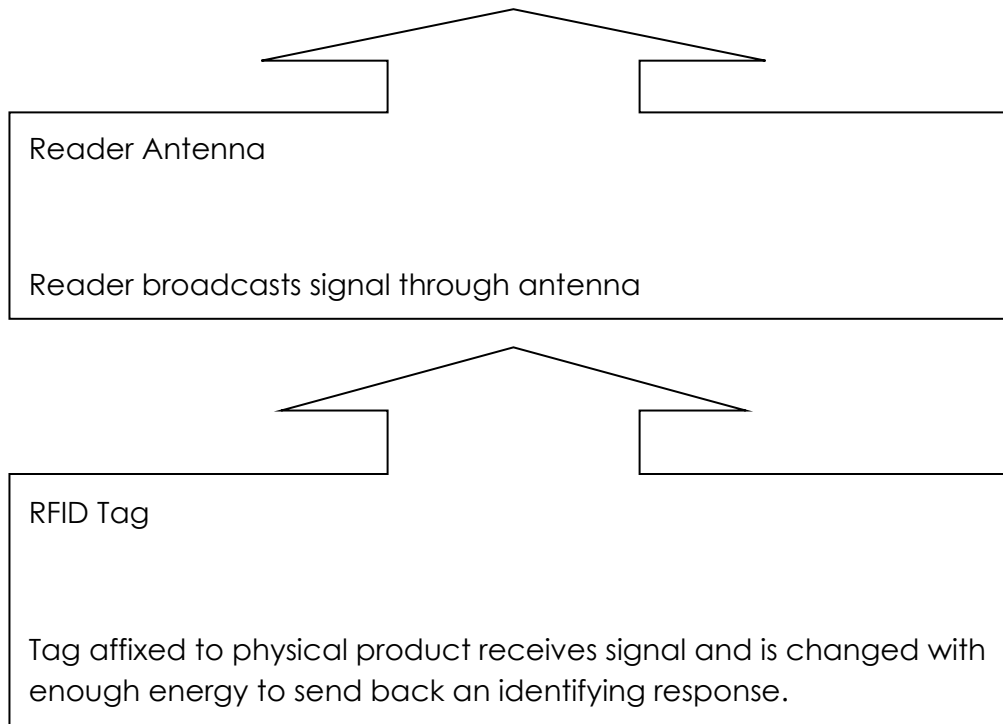


An RFID system consists of a tag made up of a microchip with an antenna, and an interrogator or reader with an antenna. The reader sends out electromagnetic waves. The tag antenna is tuned to

receive these waves. A passive RFID tag draws power from the field created by the reader and sends waves that the tag sends

Controller System

Controller interacts with reader to collect tag data via data networks



Students' Kit can be inclusive of ipods, mike with headphones. And students and faculties can be trained also for the same. The benefits are speed, less paper work, interior reach and time saver. The setbacks are misuse of ipods; training is costly, negative attitude and technological barriers.

RFID technology advantages

- The tag can trigger security alarm systems if removed from its correct location.
Scanner/reader and RFID tag are not (so) orientation sensitive.
- Automatic scanning and data logging is possible without Operator intervention.
- Each tag can hold more than just a unique code.
- Each item can be individually 'labeled'.
- Tag data can be comprehensive, unique in parts/common in parts, and is compatible with data processing.

- With the right technology a plurality of tags can be concurrently read
- It can be read only or read-write.
- There is a very high level of data integrity (character check sum encoding).
- Provides a high degree of security and product authentication – a tag is more difficult to counterfeit than a barcode.
- The supporting data infrastructure can allow data retrieval and product tracking anywhere provided the scanner/reader is close enough to the tag.
- Since each tag can be unique they can act as a security feature if lost or stolen e.g. a stolen smart travel card can be cancelled.
- The technology is rugged and can be used in hostile environments
- The technology lends itself to being updated, for example, as a car goes through its life its service record can be electronically logged with the car.
- The technology can be used to increase security so that, for example, it may be construed that a child is at school as their tag in their school bag was logged when they came through the school gates.
- enrolled students' grievances will be removed and performances could be enhanced
- Confidence could be built among Existing students and new ones could be attracted
- Education at the door step in the real sense, empowering the least empowered
- Students part of the operation with new technology
- Improvement in ODL Communication, delivery methods and administration
- Cost saving on both sides[submission of assignments/projects/examination]
- Mini school/college
- Helping disabled /women and old people
- Geographical barriers removed
- Information hub for students
- Data transfer easy, faster and cheaper

DISADVANTAGES

- External influences such as metalwork, material dielectric properties and radio interference can constrain RFID remote reading.
- Currently there are not internationally agreed frequencies for RFID operation (other than 13.56 MHz, which is primarily used by smart cards but can also be used by other RFID tags) and permitted scanner/reader powers differ between countries. This limits product take-up. [For example, there are significant differences between the USA and European UHF frequencies.]
- There is a high cost (long pay-back) for integrating RFID technology into existing inventory control systems.
- Too costly and expensive to implement
- Government grants and policy
- Technological failure
- privacy issues

The world is living in which Knowledge is considered as growth engine. The ODL in world has long played a significant role in the country's educational scenario. The success of RFID technology depends largely on its integration with existing applications and enterprise solutions. It is critical that the user interfaces for RFID solution integrates seamlessly with the existing business applications and enterprise solutions thus creating least user dissonance as well as interoperability of data and systems for two different RFID sources, for example cross-checking employee-asset rights and confidentiality parameters. Deployment of such systems will also require careful estimation followed by balancing of multiple database access and transaction loads. Mobile Study Centre is bringing mixture of traditional brick and mortar education and e-learning where in e-learning portals are given to learners of the remotest area. ICT & RFID have the potential to achieve MDGS, a new way for F2F (face to face) education. In a knowledge based economy one needs to keep up to date over the skills and the latest info. Developed nations have an option of much use of ICT while developing nations and transitional ones, stills the problem persist of education for all. The digital divide of the world has to narrow it down. If people can't reach to education, even in ODL mode or E-learning then the author firmly believes that the education should or rather must reach to people even though it is costlier or through Mobile Study Center.

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