

# The role of technologies for manipulating communicated information

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## Abstract:

Information and communication technologies in education deal with the use of Information and Communication Technologies (ICTs) within educational technology. The purpose of ICT in education is generally to familiarize students with the use and workings of computers, and related social and ethical issues. Any technology that requires the masses to own a PC, in its present form, to access information is unlikely to be successful in the foreseeable future. Possibilities appear to exist, however, in the mobile phone technology, which is fast becoming very affordable by the masses, is voice based and can be integrated with the Information Technology at the server end of a computer network. This paper is intended for manipulation of communication information while we are integrating voice, video and text with the graphical interface.

## Keywords:

ICT, information technology, Communication Technology, devices.

## 1. Introduction:

**Information and Communication Technologies (ICT)** is an umbrella term that covers all advanced technologies in manipulating and communicating information. The term is sometimes used in preference to information technology (IT), particularly on these two communities: **Education** and **Government**. The common usage ICT is synonymous and is assumed to the fact that ICT encompasses all mediums, to record information (magnetic disk/tape, optical disks (CD/DVD), flash memory etc. and arguably also paper records), technology for broadcasting information - radio, television, and technology for communicating through voice and sound or images - microphone, camera, loudspeaker, and telephone to cellular phones. It includes the wide varieties of computing hardware (PCs, servers, mainframes, networked storage). Rapidly it develops personal hardware market and comprises of mobile phones, personal devices, (MP3, MP4, MP5 and MP6) players, and so much more. The full usage of this application software, from the smallest home-developed spreadsheet to the largest enterprise packages and online software services and the hardware and software needed to operate

networks for transmission of information, again ranging from a home network to the largest global private networks operated by major commercial enterprises and, of course, the *Internet*. Thus, "ICT" makes more explicit that technologies such as broadcasting and wireless mobile telecommunications are included. Looking at the other side of the ICT, it can sometimes be referred to as **information technology (IT)**, as defined "the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware." IT deals with the use of electronic computers and computer software to convert, store, protect process, transmit, and securely retrieve information. When computer and communications technologies are combined, the result is information technology, or "*infotech*". *Information technology* is a general term that describes any technology that helps to produce, manipulate, store, communicate, and/or disseminate information. Presumably, when speaking of Information Technology (IT) as a whole, it is noted that the use of computers and information are associated. Today, the term **information technology** has ballooned to encompass many aspects of computing and technology, and the term has become very recognizable.

## 2. Information and Communication Technologies Education:

**Information and communication technologies in education** deal with the use of Information and Communication Technologies (ICTs) within educational technology. The purpose of ICT in education is generally to familiarize students with the use and workings of computers, and related social and ethical issues. ICT has also enabled learning through multiple intelligence as ICT has introduced learning through simulation games; this enables active learning through all senses. ICT in education can be broadly categorized in the following ways:

- ICT as a subject (i.e., computer studies)
- ICT as a tool to support traditional subjects (i.e., computer-based learning, presentation, research)
- ICT as an administrative tool (i.e., Education Management Information Systems/EMIS)

In developed countries, the use of ICTs in education is no longer considered an experimental enterprise. While research and experimentation continues, the use of ICTs in education has become mainstream, largely irrespective of social, economic, or geographical factors. In India, ICT is utilized everywhere in education—to some degree and in some form, in schools at all levels, from coast to coast. Developed countries have evolved their own set of international standards for design, delivery, and evaluation. ICT applications have been tried in hundreds of educational environments, at every level. Certainly there have been some failures and some partial successes, but there have been many clear successes, and few would question the value of utilizing ICTs for education, when properly applied. One of the very great advantages of ICTs over earlier modes of education in both developed and developing countries is that once a country has developed an echelon of properly trained ICT-competent teachers, technologists, course designers, trainers, and administrators sufficient to create a social and political awareness and acceptance of the value of ICTs, and an adequate communications infrastructure, the incremental cost per student of expanding the system is, in relative terms, very low. In most of the developed world, millions of people now enjoy opportunities that have never before been available. They are the first generation that can say: it no longer matters where I live or work, what is my age or health, my financial situation, or my educational level; I have access to another level of learning if I want it. It is time the billions in developing countries had the same opportunity.

### 3. Information and Communication Technologies for Development

**Information and Communication Technologies for Development** is a general term referring to the application of Information and Communication Technologies (ICTs) within the field of socioeconomic development. ICT for Development concerns itself directly with overcoming the barriers of the digital divide. ICTs can be applied either in the direct sense, where their use directly benefits the disadvantaged population in some manner, or in an indirect sense, where the ICTs assist aid organizations or non-governmental organizations or governments or businesses in order to improve socio-economic conditions. In many impoverished regions of the world, legislative

and political measures are required to facilitate or enable application of ICTs, especially with respect to monopolistic communications structures and censorship laws.

ICT for Development can be interpreted as dealing with disadvantaged populations anywhere in the world, but it is more typically associated with applications in developing countries. It is becoming recognized as an interdisciplinary research field as can be noted by the number of conferences, workshops and publications in the field. Such researches have been spurred on in part by the need for scientifically validated benchmarks and results, which can be used to measure the efficacy of current projects. Many international development agencies recognize the importance of ICT for Development. A good example of the impact of ICTs on development are African farmers getting better market price information and thus not being impoverished by unfair corps buy-out people. Another example includes mobile telecommunications and radio broadcasting fighting political corruption.

### 4. Information and Communication Technologies: Building Peace

*“Information and communication technologies can be a huge aid in the effort to build lasting peace, by helping people communicate, view information, make decisions, and understand each other better.”*

Peace is not created with a one-time act: the cease-fire, accord, or reconciliation is just a public point on a timeline between war and durable peace. True peace is built over time, with many different processes and approaches that move conflict into lasting, peaceful relationships. It requires action at many different levels, by different people, in different ways, and at different points in a conflict.

Activities can be as diverse as alternative dispute resolution (arbitration, mediation, negotiation), reconciliation, peacekeeping (both civilian and military), conflict prevention, post-conflict reconstruction, institutional and organizational capacity building, demobilization and reintegration, monitoring and advocacy, conflict transformation, psychosocial rehabilitation, and rule of law. These peace-building methods, as part of a cohesive long term strategy, target both the root causes of a conflict and the violence that may result.

Information and communication technologies (ICTs) – hardware and software that helps people communicate, understand data, and learn, via tools such as computers, the internet, mobile phones, and more - can be a tremendous help in implementing these peace-building methods. As with all technologies, these tools are just a means to an end. In order to effectively employ them, it's crucial to start by thinking through the goals of your peacemaking efforts. What type of peace are you trying to build? With whom do you want to build the peace? Where do you want to focus your efforts? When is the most appropriate time to intercede? What do you want to achieve? How best can you reach your target audiences?

In general, information and communication technologies can be used in peacemaking efforts in six different ways:

- To provide information
- To help people process information
- To improve decision making
- To reduce scarcity
- To support relationships
- To help people understand each other.

## 5. Information and Communication Technologies: A Priority for Women

The majority of women still do not have access to information and communication technologies (ICTs) which are appropriate to their needs, and neither are they active participants in the process of science and technology development. Women's effective access to information and communication technologies can help them achieve increased participation in production and productivity thereby contribute more to economic development. This article looks at the current situation of women and the digital divide. How can ICTs support social development? How can they be used by women to help meet livelihood needs? After a survey of the current efforts to increase women's access to ICTs, this article concludes that using ICTs to support women's productive activities should be seen as a priority area.

## 6. Globalization and ICT

One of the major trends in the global economy is the movement of material industries from developed to developing countries. This process involves information industries as well. While this change is positive in many ways, the distribution of wealth is unequal and much of

the world continues to suffer from severe problems of poverty, hunger and illiteracy. At the same time, more countries have a chance to take leading roles in the new information or knowledge society, which generally assumes a multi-centrist and multi-cultural worldview. ICT can help educators achieve this kind of society by creating opportunities for:

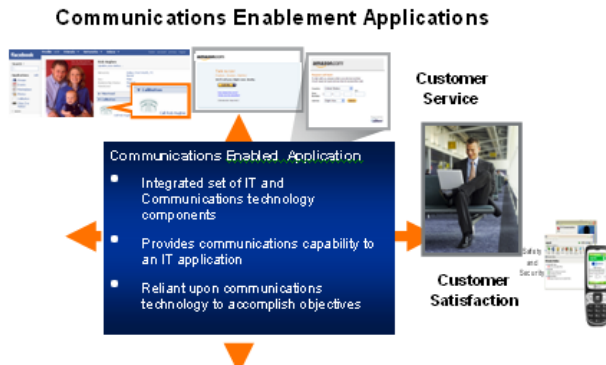
- Greater individual success, without widening the gap between the poorest and the richest;
  - Supporting models of sustainable development;
- and
- More countries to build and use information space, rather than having a few countries and mass media monopolies dominate dissemination of information and culture.

The world's most serious problems – the growing demand for food, shelter, health, employment, and quality of life – cannot be solved without highly efficient new technologies. With the advantages of being nature-protecting, non-polluting, less energy consuming, and more human-friendly, ICT applications are becoming indispensable parts of contemporary culture, spreading across the globe through general and vocational education.

## 7. Information and Communication Technologies: Applications

A Communications Enabled Application (CEA) is a set of information technology (IT) components and communication technology components that are integrated using a particular Service-Oriented Architecture (SOA) to increase the productivity of an organization and/or improve the quality of users' experiences.

Communication enablement adds real-time networking functionality to an IT application. Providing communications capability to an IT application: removes the human latency which exists when (i) making sense of information from many different sources, (ii) orchestrating suitable responses to events, and (iii) keeping track of actions carried out when responding to information received.



CEA are important for at least four reasons:

1. The convergence of (i) CEA, (ii) broadband and (iii) millions of different devices connected to the network is expected to significantly affect the communications industry.
2. CEA introduce a fundamental change in the way that information communications technology (ICT) applications and services are designed, developed, delivered, and used. To date, SOA has focused on building IT applications only and the network has been mostly deemed to be a transport pipe.
3. CEA bring together the richness of IT applications with the sophistication and intelligence of communications networks. This enables greater customization, greater simplification of interactions, and automatic adaptation to users' environments and preferences.
4. Making network components from multiple vendors work in a mashup will be a major challenge. The service level agreements (SLAs) for these mashups will be difficult to define and deliver upon.

What distinguishes a CEA from other software applications is its intrinsic reliance upon communications technologies to accomplish its objectives. A CEA depends on real-time networking capabilities together with such network oriented functions as location, presence, proximity, and identity. Another distinguishing characteristic of a CEA is the implicit assumption that network services will be available as callable services within the SOA frameworks from which the CEA is constructed. To provide callable services, the network services which are available today must be made virtual and component-like. CEAs apply to business processes as well as instances where no obvious business process which requires improvement exists (e.g., games, entertainment video).

CEAs that apply to business processes are referred to as communications enabled business processes or communications enabled business solutions.

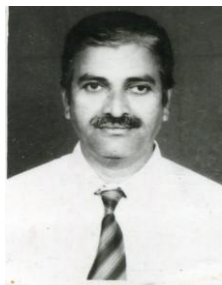
## 8. Conclusion:

**Information and Communication Technologies (ICT)** may not survive in its present form for long. sooner than later, developing countries would get over the PC mania prevalent now, unless there is a remarkable change in the economy of having a desktop PC. Any technology that requires the masses to own a PC, in its present form, to access information is unlikely to be successful in the foreseeable future. Possibilities appear to exist, however, in the mobile phone technology, which is fast becoming very affordable by the masses, is voice based and can be integrated with the Information Technology at the server end of a computer network. The emerging 3G and 4G mobile phone technologies can indeed facilitate such developments. An alternative technology could be to integrate the mobile phone with the television screen, so that visual information can be viewed easily. Similarly, there is a possibility for developing interactive radio, on the lines of interactive TV.

Now personal computers, cellphones and the Internet are the ICTs central to how we live our lives and conduct our business. New ICTs are being developed and marketed, older ones are being improved and transformed, and we are devoting more money and time working, playing and communicating with them.

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