

Emerging Trends in ICT

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Abstract:

We are in a digital era. It is difficult to think of any event in our daily life that is not using Information and Communication Technology. The role of Information and Communication Technology in the current era is growing very fast. The technologies are being used by all the sectors, in all the dimensions and in all disciplines of application of the Business Processes, science, agriculture and defence. The paper has tried to highlight mainly the emerging trends in Information and Communication Technology and which trends are emerging in the all the fields.

Keywords: ICT, Trends, components, intelligent, digital technology

I .Introduction

We live in a world of internet and the new generation in the wireless world. As a result the world around us also has changed dramatically over the years. This dramatic change in the field of ICT is a result of innovations in the field of science, defense and business. These innovations have reduced the sizes of the technological tools and increased the speed in which they operate to process data and communicate information. The 21st century has been defined by application of and advancement in information technology and communication. Information technology has become an integral part of our daily life. UNESCO has defined ICT as forms of technology that are used to transmit, process, store, create, display, share or exchange information by electronic means. ICT, or information and communications technology, is the [infrastructure](#) and components that enable modern computing. Information and communication technology (ICT) is playing a vital role in advancing economic growth and improving governance. It's the technology that instantly connects to the resources around the world. ICTs are a platform to deliver education around the world. Information technology has served as a big change agent in different aspect of business and society. It has proven game changer in resolving economic and social issues.

II. Components of ICT:

1. Software
2. Hardware
3. Internet
4. Data
5. Cloud computing
6. Communications and networking
7. Transactions

Advancement and application of information technology are ever changing. Some of the trends in the information technology are as follows:

- *Cloud Computing*

One of the most talked about concept in information technology is the cloud computing. Clouding computing is defined as utilization of computing services, i.e. software as well as hardware as a service over a network. Typically, this network is the internet. Cloud computing offers 3 types of broad services mainly Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS).

Some of the benefit of cloud computing is as follows:

- Cloud computing reduces IT infrastructure cost of the company
- Cloud computing promotes the concept of virtualization, which enables server and storage device to be utilized across organization.
- Cloud computing makes maintenance of software and hardware easier as installation is not required on each end user's computer.
- Some issues concerning cloud computing are privacy, compliance, security, legal, abuse, IT governance, etc.

- *Mobile Application*

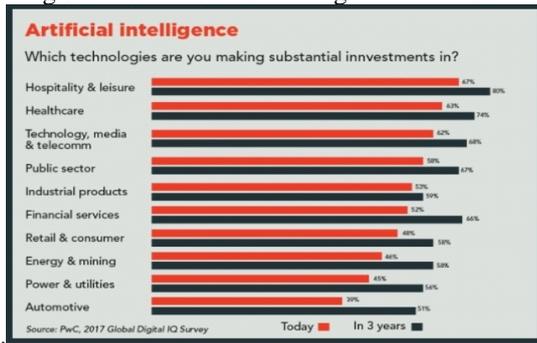
Another emerging trend within information technology is mobile applications (software application on Smart phone, tablet, etc.) Mobile application or mobile app has become a success since its introduction. They are designed to run on Smartphone, tablets and other mobile devices. They are available as a download from various mobile operating systems like Apple, Blackberry, Nokia, etc. Some of the mobile app are available free where as some involve download cost. The revenue collected is shared between app distributor and app developer.

- *AI & Advanced Machine Learning*

AI and machine learning (ML), which include technologies such as deep learning, neural networks and natural-language processing, can also encompass more advanced systems that understand, learn, predict, adapt and potentially operate autonomously. Systems can learn and change future behavior, leading to the creation of more intelligent devices and programs. The combination of extensive parallel processing power, advanced algorithms

and massive data sets to feed the algorithms has unleashed this new era.

Following sectors are used to making investments in AI in



2017.

In banking, you could use AI and machine-learning techniques to model current real-time transactions, as well as predictive models of transactions based on their likelihood of being fraudulent.

- *Intelligent Apps*

Application intelligence is the process of using machine learning technology to create apps that use historical and real-time data to make predictions and decisions to deliver rich, adaptive, personalized experiences for user's intelligent apps, which include following technologies

- *Virtual Personal Assistants:* Siri, Google Now, and Cortana are all intelligent digital personal assistants on various platforms (iOS, Android, and Windows Mobile). In short, they help find useful information when you ask for it using your voice; you can say Where is the JSPM Hadapsar college?, "What's on my schedule today?", "Remind me for 1.30 lecture," and the assistant will respond by finding information, relaying information from your phone, or sending commands to other apps.
- *Video Games :*One of the instances of AI that most people are probably familiar with, video game AI has been used for a very long time—since the very first video games, in fact. But the complexity and effectiveness of that AI has increased exponentially over the past several decades, resulting in video game characters that learn your behaviors, respond to stimuli, and react in unpredictable ways.
- *Smart Cars:* You probably haven't seen someone reading the newspaper while driving to work yet, but self-driving cars are moving closer and closer to reality; Google's self-driving car project and Tesla's "autopilot" feature are two examples that have been in the news lately.
- *Purchase Prediction:* Large retailers like Target and Amazon stand to make a lot of money if they can anticipate your needs. Amazon's anticipatory shipping project hopes to send you

items before you need them, completely obviating the need for a last-minute trip to the online store.

- *Fraud Detection:* Have you ever gotten an email or a letter asking you if you made a specific purchase on your credit card? Many banks send these types of communications if they think there's a chance that fraud may have been committed on your account, and want to make sure that you approve the purchase before sending money over to another company. Artificial intelligence is often the technology deployed to monitor for this type of fraud.
- *Online Customer Support:* Many websites now offer customers the opportunity to chat with a customer support representative while they're browsing—but not every site actually has a live person on the other end of the line. In many cases, you're talking to a rudimentary AI. Many of these chat support bots amount to little more than automated responders, but some of them are actually able to extract knowledge from the website and present it to customers when they ask for it.
- *News Generation:* the AP, Fox, and Yahoo! all use AI to write simple stories like financial summaries, sports recaps, and fantasy sports reports.
- *Smart Home Devices:* Many smart home devices now include the ability to learn your behavior patterns and help you save money by adjusting the settings on your thermostat or other appliances in an effort to increase convenience and save energy. For example, turning your oven on when you leave work instead of waiting to get home is a very convenient ability.
- *Intelligent Things*
Intelligent things are a term for everyday objects that incorporate autonomous. In other words, intelligent things can respond to real world conditions automatically. The following are theoretical examples.
 - *Infrastructure:* Self-replicating solar panels that automatically repair and regenerate as required to cover a surface such as the exterior of a building.
 - *Transportation:* Bicycle lanes that automatically size for traffic patterns. For example, if there are 100 bicyclists traveling north and 10 bicyclists traveling south the lanes will flex to be wider going north to allow for passing.
 - *Home Automation:* A secured door that automatically opens when you arrive home based on factors such as your face, manner of walking and an electronic card in your pocket.
 - *Architecture:* A building that prepares itself for an earthquake [seconds before it arrives](#). For example, smart windows that goes into a safety mode to prevent shattering.

- *Farms:* A [farming robot](#) that responds to the health of each individual plant. For example, if a particular radish plant looks like it is wilting the robot may decide to give the plant more water.
- *Sustainability:* A [swarm](#) of robotic submarines that clean up [ocean plastic](#) without interfering with navigation or ocean ecosystems.
- *Interfaces:* A sound system that can respond to requests such as "what's that song I like with the heavy drums from the 1970s."
- *Toys:* A small toy car that can think of new stunts to try based on conditions such as an obstacle course set up by a kid.
- *Travel:* Luggage that follows you around without bumping into people.
- *Security:* A vehicle, aircraft, machine or tool that refuses commands likely to result in injury to life.
- *Sports:* Ice skates that adapt to conditions and customers to be slightly easier to use without being fully automated.

- *Virtual Reality*

Virtual Reality (VR) is the use of computer technology to create a simulated environment. Unlike traditional user interfaces, VR places the user inside an experience. Instead of viewing a screen in front of them, users are immersed and able to interact with 3D worlds.

Here are five practical, but exciting uses for virtual reality that might just blow your mind.

1. Military Training
2. Education
3. Nuclear Specialist Training
4. Crime Scene Reconstruction

- *Digital Twin*

Digital twin refers to a digital replica of physical assets, processes and systems that can be used for various purposes. The digital representation provides both the elements and the dynamics of how an Internet of Things device operates and lives throughout its life cycle. A digital twin also can be used for [monitoring](#), [diagnostics](#) and [prognostics](#) to optimize asset performance and utilization. In this field, sensory data can be combined with historical data, human expertise and [fleet](#) and simulation learning

Examples of industry applications:

- Aircraft Engines
- Wind Turbines
- Large Structures e.g. offshore platforms, offshore vessels etc.
- HVAC control systems
- Locomotives
- Buildings

- *Blockchain*

A blockchain – originally block chain is a continuously growing list of [records](#), called blocks, which are linked and secured using [cryptography](#). Blockchain technology is like

the internet in that it has a built-in robustness. By storing blocks of information that are identical across its network, the blockchain cannot be controlled by any single entity. Has no single point of failure. The blockchain network lives in a state of consensus, one that automatically checks in with itself every ten minutes. A kind of self-auditing ecosystem of a digital value, the network reconciles every transaction that happens in ten-minute intervals. Each group of these transactions is referred to as a "block". Two important properties result from this:

Transparency data is embedded within the network as a whole, by definition it is public. It cannot be corrupted altering any unit of information on the blockchain would mean using a huge amount of computing power to override the entire network.

- *Dialog system*

A dialog system is a computer system intended to converse with a human, with a coherent structure. Dialog systems have employed text, speech, graphics, haptic, gestures and other modes for communication on both the input and output channel.

Dialog systems fall into the following categories

- *By modality:* [spoken dialog system](#)
[Graphical user interface](#)
- *By device:* [PDA](#) systems
In-car systems
[Desktop /laptop](#) systems
- *By style:* [Natural language](#)

- *Mesh App and Service Architecture*

Digital business ecosystems demand a new approach to application architecture. Enterprise architecture and technology innovation leaders must embrace the mesh app and service architecture to deliver adaptable systems that maximize current and future business value. Mesh App and Service Architecture needs to be flexible enough to allow for the rapid evolution of users' needs and methods of interacting with their technology. It has to be able to link up numerous endpoints including devices, apps, services, micro services and other information sources in a way that provides a cohesive and consistent user experience.

- *Digital Technology Platforms*

The basic purpose of digital technology platform is that it should provide technology-enabled services to the business. In that context, let's see some of the beneficial digital platforms which provide some great business model. The social media platforms like Facebook, Twitter, LinkedIn, Pinterest, Instagram and much more are used by many business organizations for advertising their products. These platforms do not only allow you to advertise your products but also provides the opportunities to build a social connection with your followers.

There are other advertising platforms like Google Search Engine, popular blogs, and websites where you can

advertise your products to reach to the wider audience by paying some charges. There are E-Commerce business models such as Flipkart, eBay, Amazon etc. You can reach to your customer beyond any boundaries without having a physical store. Your customer buys your products online sitting at the comfort of their home. Cloud computing service platforms like Amazon Web Services (AWS), Microsoft Azure are another digital revolution which provides digital storage, technology sharing, and hosting services, which can be used by the users by paying some charges without actually owning the servers and software.

- *Adaptive Security Architecture*

The adaptive security architecture is a useful framework to help organisations classify existing and potential security investments to ensure that there is a balanced approach to security investments. Prevention and detection are key pillars of a traditional approach to cyber security. To fight against advanced [cyber threats](#), Enterprises should build a comprehensive security model which is also adaptive in nature. Adaptive Security is a real-time network security model that employs modern tricks and tools to counter the threats over a network by cyber criminals. Adaptive Security scrutinizes and identifies a network for malicious traffic, anomalies or vulnerabilities in real-time and automatically implements endpoint security. Adaptive Security comprises of four most important category of competence - preventive, detective, retrospective and preventive.

Some of the important objectives of an Adaptive Security Architecture are as follows:

- Reduces the surface area for the attackers
- Decrease the rate of attacks
- Quick response to attacks thus reduces the remediation time
- Facilitate attacks that try to limit resources
- Promote correctness by responding to attacks that intend to compromise data or system integrity

IV. Conclusion

The every changing field of information technology has seen great advancement and changes in the last decade. And from the emerging trend, it can be concluded that its influence on business, agriculture, education and defence, news etc. is ever growing, and it will help all people to serve better. This paper has concluded that a deeper analysis of ICT emerging trends and trends in ICT in the context of all fields.

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