Emerging Trends in Information Technology

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- Predicting Future (or Science Fiction?)
- Big Picture (Business Context, All Technology, IT, Financial Sector)
- Top Trends (What and Why, more than How)
- Not emphasized (Security, Payment Systems)

Interactive Heat Map (India 89th)

Income inequality, Jobless growth, Pollution, Global warming, Water footprint.

ICTs for Inclusive Growth: offers many solutions and examples of enabling policies and investments to help countries to better leverage ICTs for shared prosperity

Has Chapters on Digital Content and Services, Connected Healthcare, Education, Big Data Analytics ...
Technology is the usage and knowledge of tools, techniques, crafts, systems or methods of organization in order to **solve a problem or serve some purpose**.

Technology is not created in a **vacuum**. It has a context and is **socially relevant**.

**Mother:** Necessity  **Father:** Profit!

As can be expected, mother is always good, father can be very bad!  **IPR:** Boon or Bane?

**WEF Top 10 List of Emerging Technologies for 2015**


**HomeWork:** Evaluate above and the trends that follow in this context.
Wikipedia Definition

Technology is the usage and knowledge of tools, techniques, crafts, systems or methods of organization in order to solve a problem or serve some purpose. Technology is not created in a vacuum. It has a context and is socially relevant. Mother: Necessity Father: Profit!

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Wikipedia Definition

Network of physical objects or “things” embedded with electronics, software, sensors and connectivity to enable it to achieve greater value and service by exchanging data with the manufacturer, operator and/or other connected devices.

- **Sensors** (Location, Temperature, Motion, Sound, Vibration, Pressure, Current, ...)
- **Device Eco System** (Smart Phones, Communicate with so many servers!)
- **Ambient Services** (Maps, Messaging, Traffic modelling and prediction, ...)
- **Business Use Cases** (Ola Cabs, Home Depot, Philips Healthcare, ...)
- Impact on wireless bandwidth, storage, analytics (**velocity** of BIG data, not size)
- **Business Model** (API economy) and Collaboration
- **Security Implications** (Outsiders-Insiders)
Users Platform and Expectations

- **3rd Generation** platform after mainframe/terminal, PCs-client/server,
- **Mobile Devices and Apps** is everything: mobile broadband + social business + big data analytics + cloud
- Internet of “Me” (highly personalized) Business (no generic products!)
- **BYOx**: Device security, App/content management nightmare.
- **Data Loss Prevention** (Fortress Approach - Firewall, IDS/IPS - won’t work!)
**Infrastructure: Dockers, Containers, Cloud**

- **Containers** Analogy from Shipping
- **VMs** separate OS from bare metal (at great cost-Hypervisor, OS image)
- **Docker**- separates apps from OS/infra using containers.

  ![Containers vs. VMs](image)

  Finer granularity. Lightweight, scalable.

- **http://www.docker.com** Runs on most platforms and allows low cost identical development, test environments.
- Has revived *Cloud* hype significantly! **Hybrid** model possible (Public + Community + Private)
- **Software Defined Everything (SDx)** (Compute, Storage, Network, Security) promise to make standalone DC/DR/BCP as legacy systems!
- Like *IaaS, PaaS, SaaS* Have you heard of *CaaS*?

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Emerging Trends in Information Technology
Identity Management

Two broad approaches.

- **Trusted Third Party** (Centralized)
  
  Aadhar, Digilocker *https://digitallocker.gov.in/*

  Linked to Aadhaar number. To securely sign and store e-documents. Can provide e-Gov (and financial) services easily. Unified Payment Interface (NPCI + Aadhar, Virtual Payment Address)

- **Peer to Peer** (Block Chains)

  Used first in Bitcoin as secure, distributed ledger system.
  
  Sender, receiver verifiable. Nonrepudiation.
  
  No CAs or other middlemen
  
  Allows low cost payment systems, digital rights management, privacy, voting, ...
Revenue Models

- **Collaborative** business model (Customer needs full ecoSystem, but Security Aspects- outsider/insider)
- **Outcome** Economy (comedy show charges per laugh. Viewer’s face analyzed!)
- **Net Neutrality** (Hot Debate now: Send your inputs by Apr 24 to TRAI).
  - TSPs want more of the cake from OTT service providers.
  - Closer to home: Transcation charges based on value of transaction?
  - Analogy with Shipping, Railways, Post (by weight only)
- **Costs** due to Govt/regulators
  - BCP and DR drills
  - Data Privacy Requirements and Outsourcing Risks
  - Balkanization (IANA, DNS, Management of Internet)
This workshop will show you some of the gaps with state of the art in

- Digital (Online, Mobility) Channels, Social Media and Cloud
- Big Data and analytics
- Fraud Detection/Prevention
- Risk management
- Cyber Security

Catching up is very hard. Enormous cost and time. Since one can’t cross a well using many small jumps! 80-20 rule does not apply. Usually All or nothing. How to consolidate? (IDRBT, IFTAS). Can we leapfrog?