

IoT

What does it mean to the world, India and you

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May 4, 2017

Talk outline

- First wave of IT – faster, better, cheaper m/c's that talk
- Second wave of IT – networking computers to connecting people
- Third wave of IT – connect computers, people and things
- What does it mean to the world – the best is yet to come
- What does it mean to India – the real beneficiary will be India
- What does it mean to you – re-invent yourself
- Summary

First wave of IT – faster, better, cheaper m/c's that talk

- Mainframe, Mini, PC's (thousands, hundreds of thousands, millions)
- Making computers run faster and connect computers
 - Why?
 - computer speed & efficiency (faster & cheaper, better)
 - How?
 - 2 NIC cards into a PC What you got?
 - Remote login, file transfer
- 50's to 60's (IBM HP BUNCH), 70's to 80's (Intel, Microsoft, Novell)
- Cisco was born around Dec 1984 - new “asset class” called “router”
- By 1995 most computers were connected

Second wave of IT – networking computers to connecting people

People were getting connected thru computers

- WWW / Internet / Mobile
- Email
- Online applications – e-commerce, e-ticketing, e-library, e-books..
- 1990 Nokia (connecting people 24/7 basis with a device that stays with them)
- Sep 4, 1998 Google (organizing data becoming more important than data & computing)
- Feb 2004 YouTube (organizing people thru data becoming more important)
- 2007 Apple iPhone, 2009 Uber, 2010 WhatsApp (organizing people & services)
- Scale (nearly every human being, nearly all the time, nearly everywhere)

Interesting development in parallel

- Factory automation (60's to today)
 - DCS
 - Refineries, power plants
 - Humans only for control
 - Expensive
 - Class market
- Irony of factory automation
 - Crude oil, liquor, steel, electricity generation measured accurately
 - Water & electricity poorly measured in quantity, air and water poorly monitored for quality!
- ERP systems (mid 90's onwards) did a great job of measuring “money” but stayed out of factory automation
- Office automation and factory automation did not have much in common

Third wave of IT – connect computers, people and things

- IoT
- Intelligent things getting connected
 - Many disparate developments
 - Samsung fridge, HP Internet printing, Nest thermostat, IP camera, IP-based ATM network, voIP, IP-TV, track cows to monitor Himalayan glaciers..
- Connected car, autonomous vehicle, “driver-less” car...
- Connecting things not so intelligent by on-boarding intelligent enough
- Connecting people, things and computers has a much larger scope – million times more powerful than connecting computers to people

What does it mean to the world

- Office automation, factory automation will merge
- Edge of the enterprise and the core of the enterprise will merge
- Financial world & physical world will merge
- IT will become the very core of every business (IT as “infra” of “infrastructure”)
 - Operating the next generation IT infra will unleash new opportunities
- More importantly
 - Much larger opportunities for next generation IT

What does it mean to India

- Much larger opportunities
 - 70's dozens of CAD/CAM engineers with CADAM/ CATIA skills and IIT students
 - 80's hundreds of software engineers were hired from India
 - 90's thousands of software engineers were "body-shopped & bodily shipped"
 - In the last decade hundreds of thousands of Indian engineers were hired in India and abroad
 - Currently about 5 million Indian IT professionals are moving around in India and the world
 - IoT will create opportunities that are much larger (may be 50 million – still small for billion-strong India!)
- Current pure IT services opportunities will shrink
- Need re-skilling
- Opportunities for all - beyond CS engineers
- Much larger productivity and quality of life improvement
- Core sector will see dramatic growth
- Growth beyond metros
- "Digital India" "Make in India" "Clean India"... will get "real"; "smart" will not remain "dumb slogans"
- "Bharat" shining

What does it mean to you

- Look at integrated IT (computers, things and people)
- Look at new opportunities
- Look for integrated skills – value creation, innovation and not routine "computerisation"
- Business process automation is important but reinventing business will be more important
- Dive deep into
 - Big data
 - Analytics
 - Machine learning
 - Artificial intelligence
- Indians start solving India's problems

Summary

- Exciting times ahead
- Much larger opportunities globally and in India
- IoT and network tools will be very important
- Can you ride the wave?
- Thank you very much

- Any questions?