

# Devices, Mobility and Networking

## Industry-view

Raj Bala

*Chief Technology Officer,  
Cognizant*

# We are entering an important new era for business and technology

What are the changes?  
What should we all do about them?

# An era of great head scratching....



# THE PERFECT STORM OF DATA, DEVICES, DEMOGRAPHICS, AND ECONOMICS



**NEW TECHNOLOGIES  
ARE TRANSFORMING  
WORK**



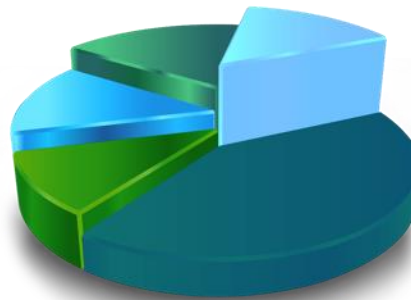
**THE DIGITAL ENTERPRISE  
EMERGES**



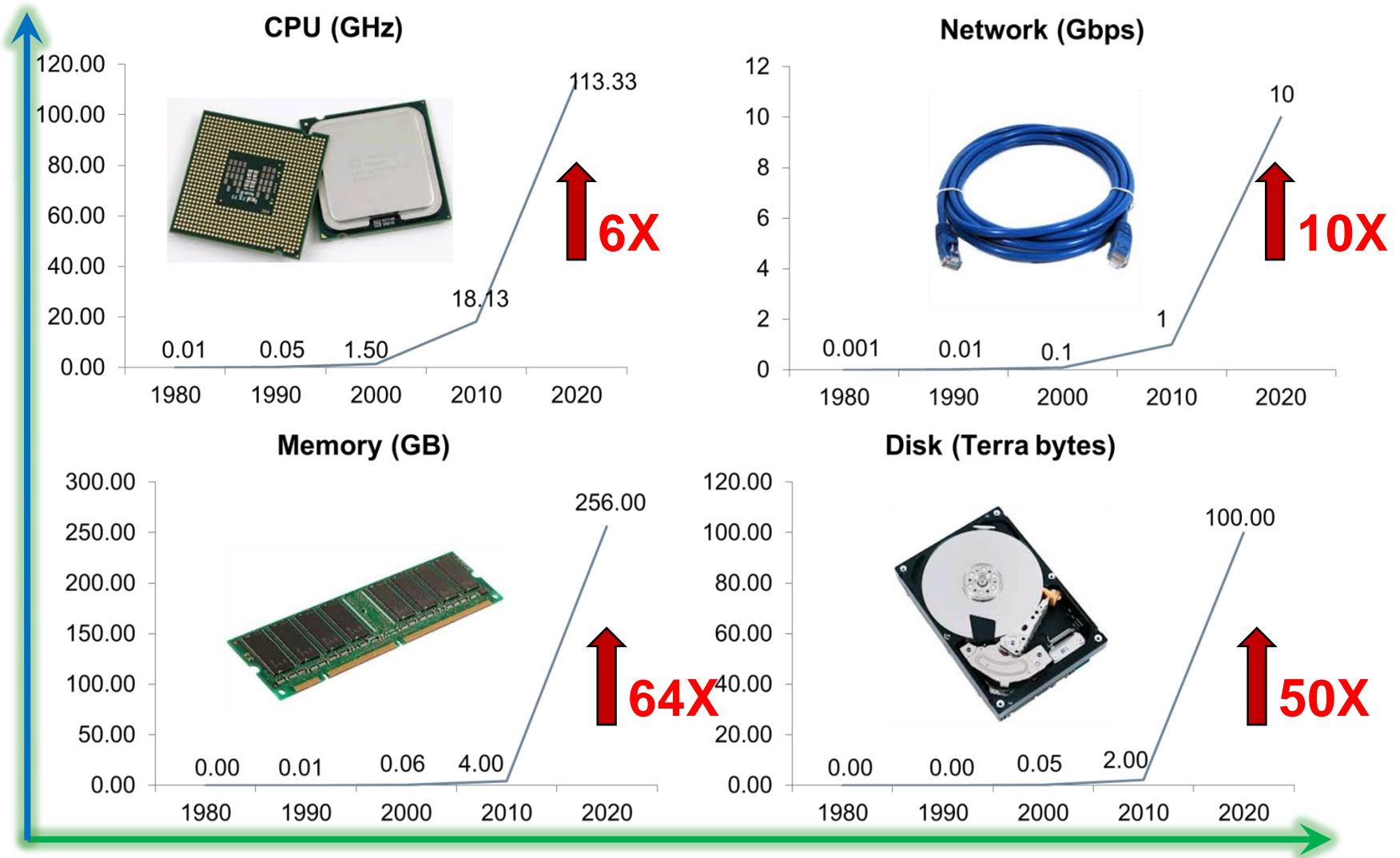
## Based on the SMAC stack....

1. Social Computing
2. Mobility
3. Advanced Analytics
4. Cloud

# TRANSFORMING THE ENTERPRISES

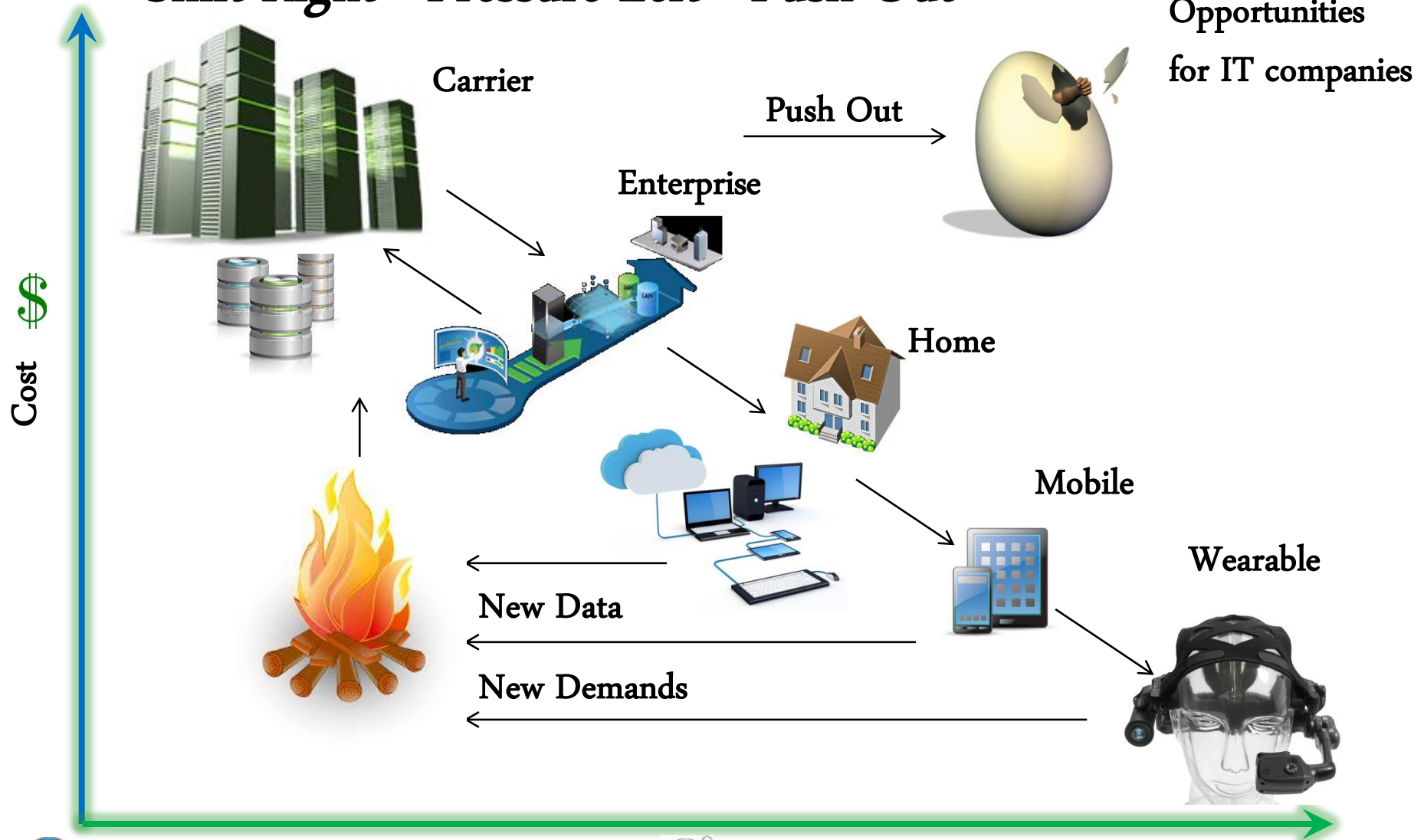


# Computing Evolution



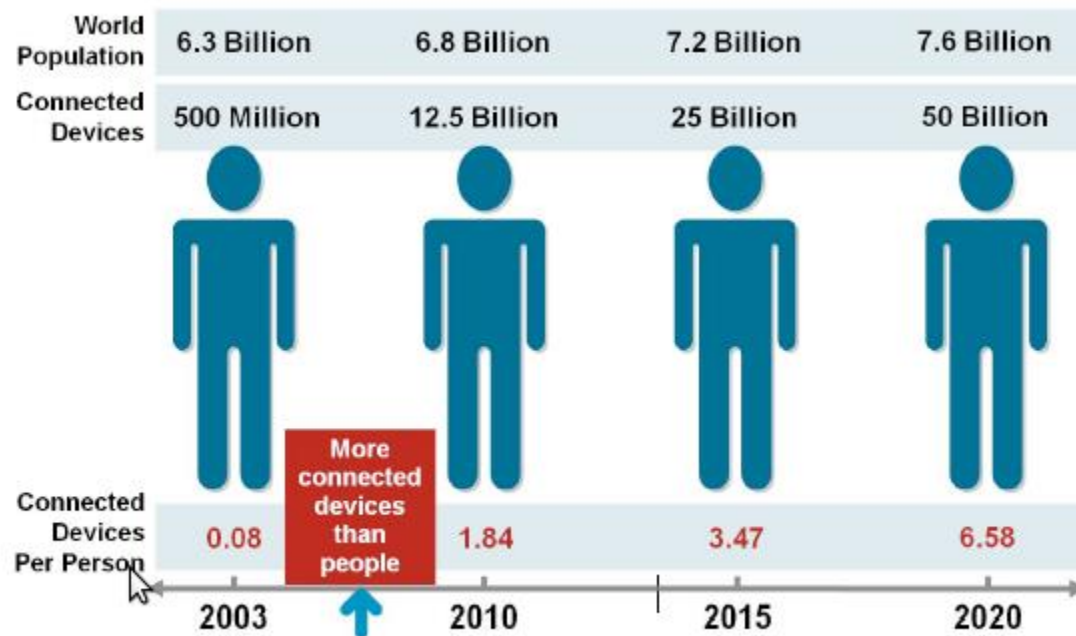
# New Business Opportunities

*Shift Right - Pressure Left - Push Out*





# Internet of Things (IoT)



Source: Cisco IBSG, April 2011

More objects are becoming embedded with sensors and gaining the ability to communicate. The resulting information networks promise to create new business models, improve business processes, and reduce costs and risks.

# World is now Instrumented, interconnected and intelligent



*A world where physical and virtual objects are seamlessly integrated into the information network, and where the physical objects can become active participants in business processes*

- **Sensors and devices are everywhere, more devices getting connected**
  - Examples: BP monitors, heart rate sensors, weather beacons, temperature sensors
- **Technological advancement makes them 'smart' and enable them to communicate to the outside world**
- **60nm to 45nm to 20nm fabrication processes turn the devices into small and portable ones**
- **We are surrounded by time series data**
  - Examples: Stock market, patients vitals, data centers, weather, track and trace, telematics

# User Interfaces are changing by Gamification

*Creating template-based games makes it easier to plug them into any scenario to provide a game-based interface..*



[Back](#)

# Human-computer interface devices are changing...

*Incorporating Devices to bring in a richer level of engagement..*



Kinect



Google Glass



Head Mounted  
Display

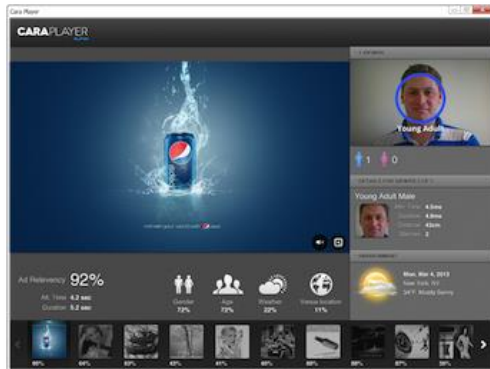


Leap Motion



Neuroheadset

# User Interfaces are becoming Intelligent...



## Adaptive Content

- Using a standard webcam and the Cara software allows you to transform existing screens into displays that react to audiences in real-time. Measure anonymous demographic data such as gender and age.
- Billboards in Japan peer back at passersby, assessing how they fit consumer profiles, and instantly change displayed messages based on those assessments



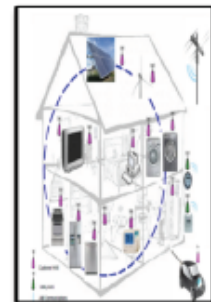
## Real World Analytics

- Measure physical spaces such as retail stores, end caps, vending machines, door way entrances and cash registers. Know audience demographics and foot traffic from all your locations in real time. The process is simple, streamlined and is the easiest solution to gather continuous audience analytics



# Internet of Things – Some Industry examples...

- **Hospitals** - Healthcare devices are becoming personal  
- Patients are given devices that connect to their body and transmit data to the stakeholders. Patient's vitals are being monitored by his physician remotely (Proteus)
- **Insurance** - Telematics data collection and analysis for an insurance companies (PAYD – Pay As You Drive)
- **Agriculture** – Detection of crop diseases by taking a picture and sending it for processing and communicate remedial measures back to farmers over phone
- **Engineering** - Tracking and monitoring of electro mechanical parameters to identify the drift and hence their potential failure points for quicker service / preventive maintenance
- **M2M** - Devices talking to devices (M2M) results in quicker action since it by passes human intervention and hence delays associated with it
- **Data Center** - Data center's critical parameters are transmitted remotely and monitored by a team. The data are shown on a dashboard and
- **Transportation / Logistics** - Transportation are automated and the location of the buses, cabs along with associates are transmitted back to the Transport Help Desk and to an App



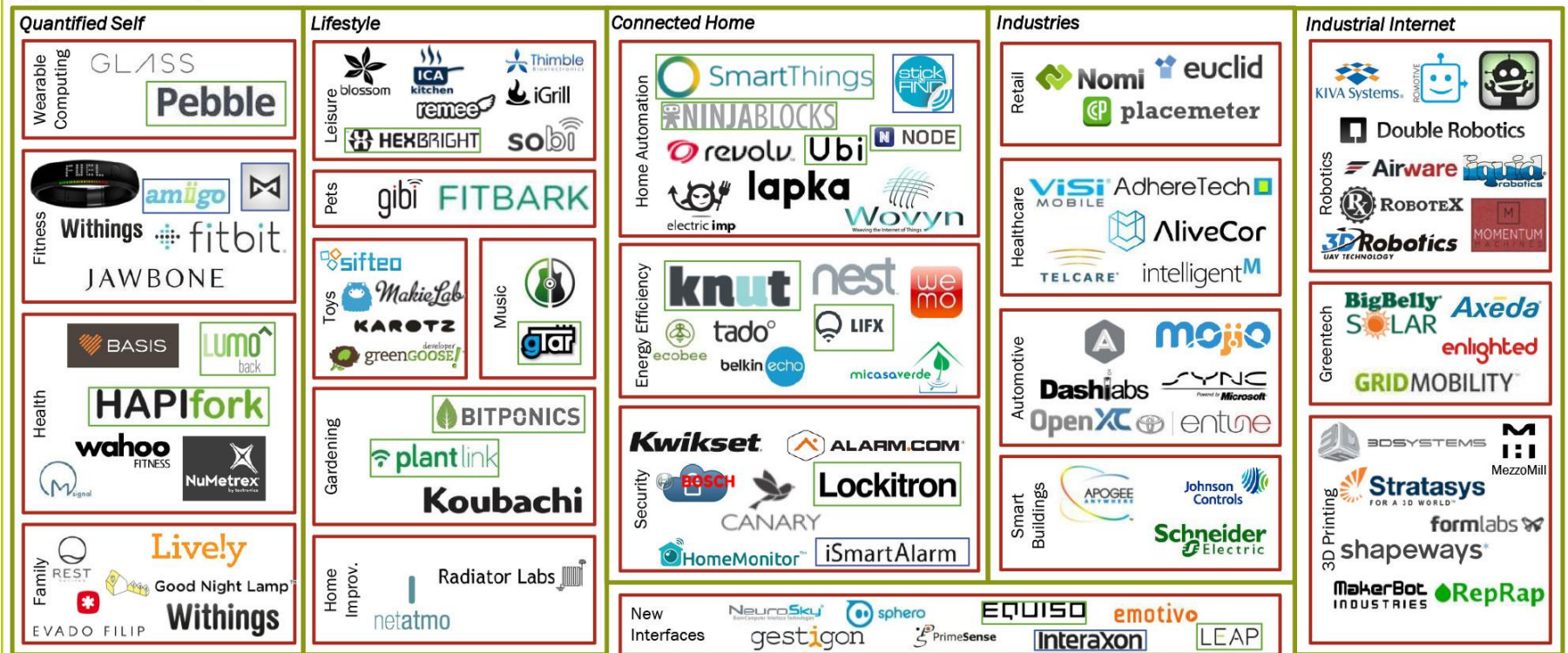
# Internet of Things – Ecosystem

## INTERNET OF THINGS LANDSCAPE

### Platforms & Enablement (Horizontal)



### Applications (Verticals)



### Building Blocks



# Internet of Things – Manufacturing Industry usages...

- Using sensors to track RFID (radiofrequency identification) tags placed on products moving through supply chains, thus improving inventory management while reducing working capital and logistics costs
- Manufacturing processes studded with a multitude of sensors can be controlled more precisely, raising efficiency. Quality Control can be dramatically improved. Preventive breakdowns can also be planned by predictive analytics
- When operating environments are monitored continuously for hazards or when objects can take corrective action to avoid damage, risks and costs diminish. Ex: Gas leaks
- Precision farming equipment with wireless links to data collected from remote satellites and ground sensors can take into account crop conditions and adjust the way each individual part of a field is farmed—for instance, by spreading extra fertilizer on areas that need more nutrients.

# Enterprise of the future







Companies that take advantage of these device capabilities stand to gain against competitors that don't.

**So, embrace Device enabled  
solutions and make use of  
SMAC opportunities as your  
Emerging Business  
Accelerator...**



# So don't get SMACked!!!



# Thank you

[Raj.Bala@cognizant.com](mailto:Raj.Bala@cognizant.com)

