IS FUTURES AND CHALLENGES

- CIOs are coming more and more in the frontline of business
- IT is primarily an enabler, and its potential as a source of competitive advantage is best realised when combined with business innovation
- Adaptable and flexible people required

Challenges
- IT systems are too complex, projects are too long. IT cannot respond fast enough
- The IT org is high cost and low on quality/dependability
- The IT budget is increasing but the value added to the business is not clear
- IT never seems to finish anything on time
- Why can't we get the ICT people we need

Changes
- Technology changes are happening faster and faster
- ICT fundamental principles do not change:
  - Aligned strategies
  - Appropriate governance and organisation
  - Like enterprise architecture
  - Flexible planning
  - Excellent portfolio and project management
  - Effective business analysis
  - Strategic use of IT
  - Real value driven business cases

Changing Role of IS
- Four major IS activities
  - Daily operations of IT infrastructure
  - Development and maintenance of new application systems
  - Digital convergence and integration
  - Search for innovative business ideas and systems requirements

Performance metrics: Traditional - measured based on creation, provisioning and operating technology

IS Lite - based on service level agreement and performance level

Lean IT - Measured (against change) in business performance

Gartner hype circle

Technology Trigger
- Breakthrough, product launch or other event that generates significant press and interest
- First generation products, high price, lots of customisation needed
- Early adopters investigate - mass media hype begins
- E.G Smart robots, Connected home

Peak of Inflated Expectations
- A frenzy of publicity typically generates over-enthusiasm and un-realistic expectations
- Early publicity produces a number of success stories - often accompanied by scores of failure
- Some companies take action, most don't
- E.g autonomous vehicles, IoT

Trough of Disillusionment
- Technology that fail to meet expectations and quickly become unfashionable
- Press usually abandons the topic and the technology
- Investment continue only if the surviving providers improve their products to the satisfaction of early adopters
- Negative press begins and 2/3 round of venture capital funding
- E.G. Augmented reality

Slope of enlightenment
- More instances of how the technology can benefit the enterprise start to appear and become more widely understood
- 2nd and 3rd generation products appear from providers
- Methodologies and best practice developing
- E.G. enterprise 3D printing

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Plateau of Productivity
- Mainstream adoption starts to take off as the benefits of it become widely demonstrated and accepted
- Technology becomes increasingly stable and evolve in 2nd and 3rd generation
- The final height of the plateau varies according to whether the technology is broadly applicable or benefits only a niche market.
  E.G. 2014 - Speech Recognition

Gartner 2016 Planning Assumptions
- By 2018:
  • 20% of all business content will be authored by machines
  • 6 billion connected things will be requesting support
  • 3 million + workers will be supervised by robo boss
  • 20% of smart buildings will have suffered from vandalism
  • 50% of faster growing companies will have fewer employees than instances of Smart machines
  • 2 million employees will be required to wear health and fitness tracker as condition of employment

By 2020:
  • Autonomous Software agents outside of human control will participate in 5% of all economic transactions
  • Smart agents will facilitate 40% of mobile interactions, and the post app era will begin to dominate
  • Through 2020, 95% of cloud security failure will be the customers fault.

Gartner - Top 3 Overall Trends (w individual trends)

The Digital Mesh
1. The Device Mesh: All devices are connected in any expanding set of end points people use to access applications and information, or interact with people, social community, government and business. We will see significant development in wearable and augmented reality, especially virtual reality.

2. Ambient User Experience: All of our digital interactions can become synchronised into a

continuous and ambient digital experience that preserves our experience across traditional boundaries of device, time and space. Organisations will need to consider their customer's behaviour journeys to shift the focus on design from discrete apps to the entire mesh of products and services involved in a user experience

3 3D Printing Materials : We'll see continued advances in 3D printing with a wide range of materials. Recent advances make it possible to mix multiple materials together with traditional 3D printing in one build. This could be useful for field operations or repair when a specific tool is required and printed on demand. Biological printing - such as printing of skin and organs - is progressing from theory to reality, however politicians and the public don't have a full understanding of the implications

Smart Machines

4 Information of everything: Everything surrounding us in the digital mesh is producing, using and communicating with virtually unmeasurable amounts of information. Organisations must learn how to identify what information provides strategic value, how to access data from different sources, and explore how algorithms leverage linformation of everything to find new business designs

5 Advanced Machine Learning: Advanced machine learning is what makes smart machines appear "intelligent" by enabling them to both understand concepts in the environment and also to learn through machine learning. a smart machine can change its future behaviour For example, by analysing vast database of medical case histories, "learning" machine can reveal previously unknown insights into breakthrough effectiveness This area is evolving quickly and organisations must assess how they can apply these technologies to gain competitive advantage

6 Autonomous Agents and things: Advanced machine learning gives rise to a spectrum of smart machine implementations - robots etc - that act in a semi/autonomous manner. This feeds into the ambient user experience in which an autonomous agent becomes the main user interface Instead of interfacing with menus, forms and buttons on a smartphone, user speaks to an app, which is really an intelligent agent

The New IT Reality

7. Adaptive Security Architecture: The complexities of digital business and the algorithmic economy, combined with an emerging "hacker industry", significantly increase the threat surface for an organisation IT leaders must focus on detecting and responding to threats, as well as more traditional blocking and other measures to prevent attacks

8. Advanced System Architecture: The digital mesh and smart machines require intense computing architecture demands to make them viable for organisations. They'll get this added boost from ultra-efficient neuromorphic architectures Systems built on GPUs and field programmable gate arrays (FPGA) will function more like human brains that are particularly suited to be applied to deep learning and other pattern matching algorithms that smart machines use. FPGA-based architecture will allow distribution with less power into the tiniest IoT endpoints, such as homes, cars and even human beings

9. Mesh App and Service Architecture: The mesh app and service architecture are what enables delivery of apps and services to the flexible and dynamic environment of the digital mesh This architecture will serve users' requirements as they vary over time It brings together the many information sources, devices, apps, services and micro services into a flexible architecture in which apps extend across multiple endpoint devices and can coordinate with one another to produce a continuous digital experience

10. Internet of Things Architecture and Platforms IoT platforms exist behind the mesh app and service architecture The technologies and standards in the IoT platform form a base set of capabilities for communicating, controlling, managing and securing endpoints in the IoT. The platforms aggregate data from endpoint behind the scenes from an architectural and a technology standpoint to