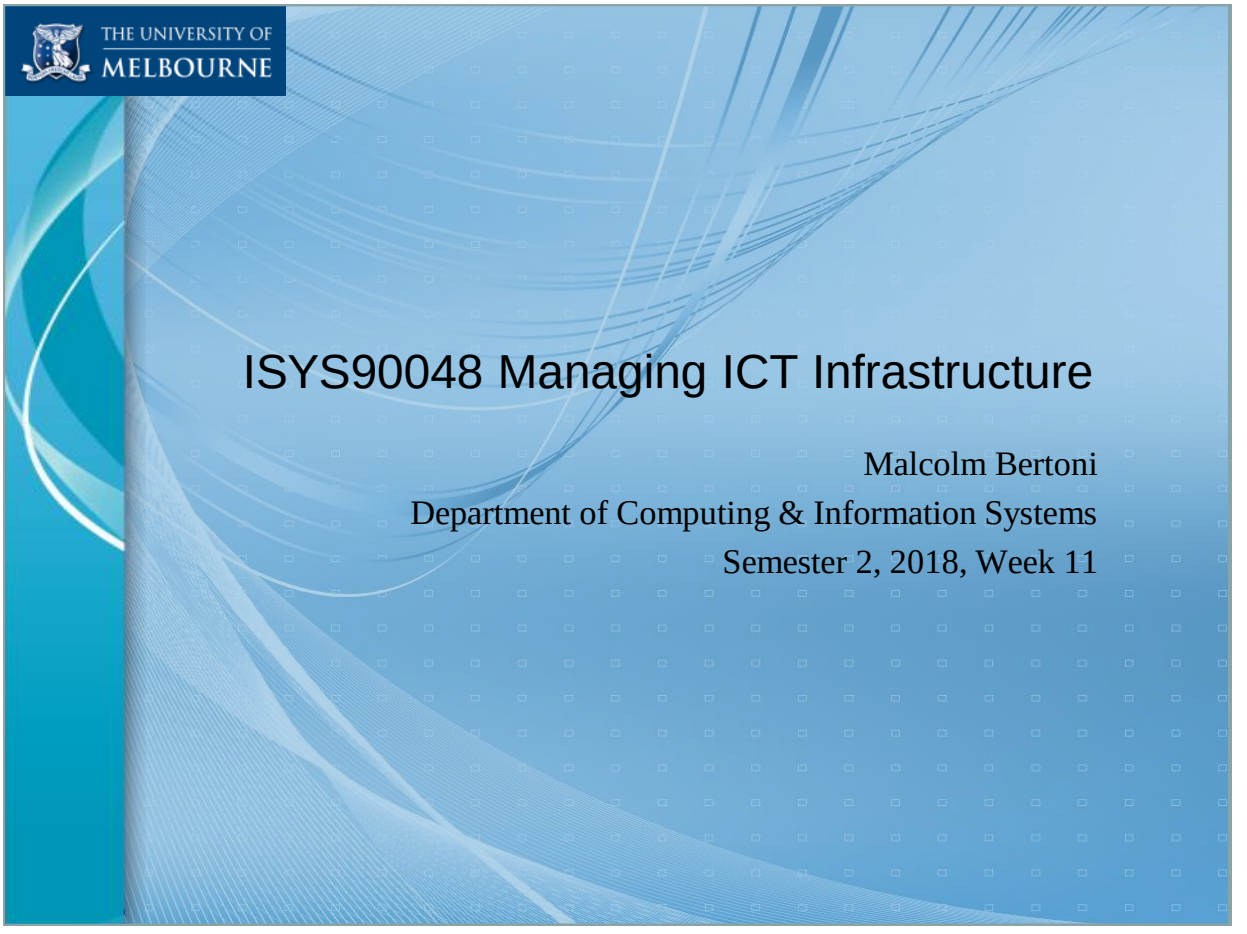
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ISYS90048 Managing ICT Infrastructure
Malcolm Bertoni
Department of Computing & Information Systems
Semester 2, 2018, Week 11

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Teaching Session 11

- Gartner's Top 10 Technology Trends Impacting Infrastructure & Operations for 2018
- Implications for ICT Infrastructure Management
- Skills & knowledge base required for the acquisition and ongoing management of telecommunications products, services and contracts

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Top 10 Technology Trends Impacting Infrastructure & Operations for 2018

- Strategic
  - Trend 1: Disappearing Data Centers
    - By 2020, more compute power will have been sold by infrastructure as a service (IaaS) and platform as a service (PaaS) cloud providers than sold and deployed into enterprise data centers
  - Trend 2: Interconnect Fabrics
    - A data center fabric is a system of switches and servers and the interconnections between them that can be represented as a fabric

Top 10 Technology Trends Impacting Infrastructure & Operations for 2018

- Trend 3: Containers, Microservices and Application Streams
  - Containerisation is, in effect, OS-level virtualisation
  - Applications are constructed as a suite of small services that run as separate processes and communicate through lightweight, agile, fast network-based mechanisms

www.gartner.com

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Top 10 Technology Trends Impacting Infrastructure & Operations for 2018 cont

- Tactical
  - Trend 4: Business-Driven IT
    - Up to 29 percent of IT spend comes from business units rather than traditional IT, and this will increase over the next few years
  - Trend 5: Data Center as a Service (DCaaS)
    - Where the role of IT and the data center is to deliver the right service, at the right pace, from the right provider, at the right price
  - Trend 6: Stranded Capacity
    - Stranded capacity – things that are paid for, but not really used – can be found both in on-premise data centers and in the cloud

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Top 10 Technology Trends Impacting Infrastructure & Operations for 2018 cont

– Trend 7: IoT

- The Internet of Things (IoT) will change how future data centers are designed and managed and how they evolve as massive volumes of devices stream data, constantly or periodically

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Top 10 Technology Trends Impacting Infrastructure & Operations for 2018 cont

- Organisational
  - Trend 8: Remote Device (Thing) Management
    - Growing trend for many organisations with remote sites/offices is the need to manage remote assets centrally
  - Trend 9: Micro and Edge Computing Environments
    - Micro data centers—self-contained, stand-alone rack-level systems at the edge
    - Edge computing is a method of optimising cloud computing systems by performing data processing at the edge of the network, near the source of the data
  - Trend 10: New Roles in IT
    - New positions required for infrastructure and operations
      - Eg: ICT cloud broker, IoT architect, integration expert

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Knowledge & Skills

- Technology
  - Systems development & maintenance, systems administration, ICT architectures, such as service oriented architectures
- Acquisition/Procurement, Contract Management & Outsourcing, Service Management
  - Contracts (drafting, negotiation & maintenance, SLAs), outsourcing as an financial/investment strategy
- Project Management
  - Project breakdown, task scheduling, resource allocation and resource scheduling, PERT and Gantt charts, planning and re-planning under uncertainty

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Knowledge & Skills

- Communication
  - Clarity of verbal and written communication, critical thinking, political sensitivity
- Configuration Management/System Analyst
  - System administration, capacity planning, system performance evaluation, client liaison, management of outcomes
- Asset Management
  - Maintenance of asset registers, planning and administration of whole of system life cycle, investment analysis

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Talents

- Ability to deal with complexity
  - Multidimensional, multilevel complexity
  - Ability to decompose and see structure in chaos
- Ability to abstract
  - Derive models that permit analysis and design
  - Gain insight through abstraction
- Ability to deal with the future
  - Envisage and evaluate future scenarios
  - Project from experience to unfolding possibilities
  - Through:
    - Professional development, self development, practice, experience

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Career Advice

- Practise career visualisation
- Take advantage of professional development
- Join professional associations
- Read business and technical material
- Develop a group of professional associates
- Get involved in large, complex projects
- Take risks
- Find a mentor
- Enhance your personal skills through a range of social, sporting & professional activities

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Major skill streams

1. Strategy and Architecture 28%
2. Business Change 25%
3. Service Management 20%
4. Solution Development & Implementation 15%
5. Procurement Management and Support 9%
6. Client Interface 2%

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COBIT 5 Certification

- **COBIT 5 Foundation: (**3 days, $1560)
- **COBIT 5 Implementation:** (3 days, $2150)
- **COBIT 5 Assessor:** (3 days, $2150)
  - You can choose between Assessor and Implementation paths or do both
- Other one-day ($550), COBIT 5 courses:
  - COBIT 5 for Risk
  - COBIT 5 for Assurance
  - COBIT 5 for Information Security
  - Governance of Enterprise IT

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ITIL certification

- There are six levels of qualifications
  1. **ITIL Foundation**: consists of 40 multiple-choice questions, no prerequisites required (3days, $900-$1700)
  2. **ITIL Practitioner**: to those who have already passed the ITIL Foundation exam (2 days, $1800)
  3. **ITIL Intermediate Level:** Requires ITIL Foundation and have completed an accredited training course (5 days, $4500)
  4. **ITIL Managing Across the Lifecycle (MALC)**: Requires Foundation and Intermediate exams (5 days, $4500)
  5. **ITIL Expert Level**: open for those who have passed the ITIL Foundation, Intermediate Level and MALC exams (5 days, $4500)
  6. **ITIL Master Qualification:** requires the candidate to already be ITIL Expert-level qualified & worked for 5 years (online, $500)

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PRINCE2 & PMP Certification

- PRINCE2 Foundation
  - 3 days
  - $1,454
- PRINCE Practitioner
  - 2 days
  - $1,270
- PMP online 4 week course
  - $659
- Project Management Institute Agile Certified Practitioner (PMI-ACP) Certification
  - 3 days
  - $5499

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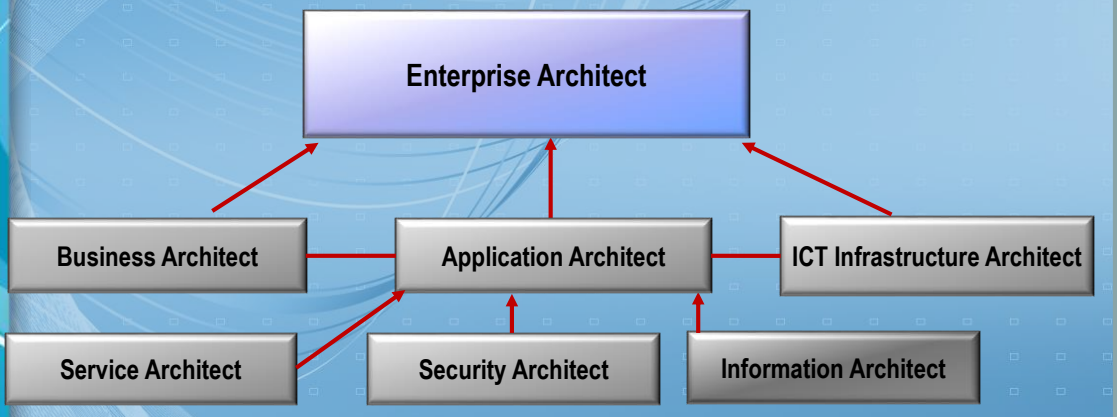
Enterprise Architecture: Architectural Roles



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Architect roles

- **Enterprise Architect** – oversight, EA project director, governance
  - Enterprise architects are tasked with documentation and analysis, strategic planning and control of one section of the current and future landscape model
  - Ensures that Enterprise Architectures are developed, maintained and integrated with the processes of governance, strategic planning and business alignment
- **Business Architect** – define & interpret business goals & processes
  - Responsible for the business landscape model, and liaises closely with other architects, in particular the application enterprise architect
  - Concerned with business process models and enterprise design; how the business functions and enterprise activities are supported; governance of the enterprise processes and roles and responsibilities

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Architect roles cont

- **Infrastructure Architect** – define & maintain ICT infrastructure architecture

  Concerned with the physical technology and support for virtual structures; the ICT components and their interrelationships; choice of technologies, products, interfaces and protocols

  Infrastructure architects take the requirements and constraints defined by the enterprise architect, collaborate with the solutions architect, and design the supporting environment for the solution defined by the solutions architect

  Provide strategic coordination of the ICT infrastructure development

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Architect roles cont

- **Solutions Architects** – The solution architect is concerned about the technical decisions being made regarding the solution and how they impact the business outcomes
- **Information Architects** – develop Information Models, ontologies, and adapt these to meet business, service and communication requirements

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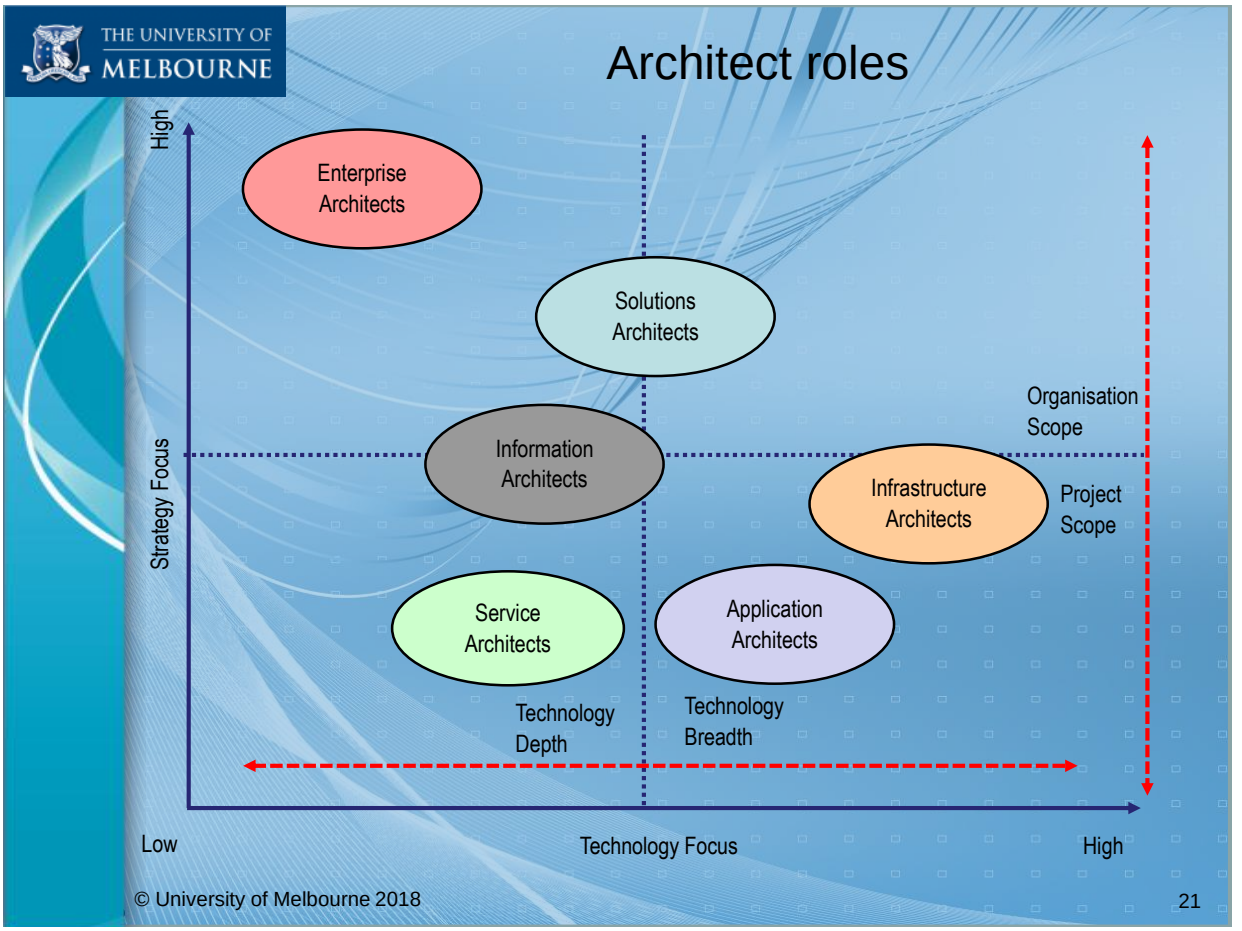
Architect roles cont

- **Application Architect** – design and analysis of software projects

  Concerned with the application and information models and architectures; support for the business processes; completeness of the SOA and the composition of services to support business processes

  Uses UML (Unified Modelling Language) and BPM (Business Process Management) methods

- **Service Architect** – define & monitor service delivery, assure quality, service management, service desk, outsourced contracts & SLAs
  - Especially useful for ITIL
- **Risk & Security Architect/Manager** – design & enforce security, ensure compliance with regulations, maintain business continuity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Architect roles
High
Strategy Focus
Enterprise Architects
Solutions Architects
Information Architects
Infrastructure Architects
Service Architects
Application Architects
Organisation Scope
Project Scope
Technology Depth
Technology Breadth
Low
Technology Focus
High
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Infrastructure Architecture

- Infrastructure Architecture is responsible for ensuring the technical systems and ICT infrastructure are designed to support business requirements
- A key outcome for a structured approach to infrastructure architecture includes well documented and integrated infrastructure models, with the correct level of detail
- Understanding the interconnectedness of the technical infrastructure with the rest of the business is one of the core value propositions of infrastructure architecture
- This allows infrastructure architects to get a view of the impact of change in business strategy on infrastructure requirements and, conversely, the impact on the business of any changes to the infrastructure
- The four Principles of ICT Infrastructure Architecture are: Agility, Interoperability, Open Standards and Empowerment

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Enterprise Architect vs Information Architect vs Solutions Architect vs Infrastructure Architect

- Enterprise Architect (EA) is a planning role that is responsible for identifying the future state of an organisation's ICT environment and to help guide project teams to deliver toward it
- An Information Architect organises, categorises and maps information so that it is easier for users to use, find and manipulate
- A Solutions Architect focuses on delivery of a particular solution
  - The solution architect is responsible for implementing a strategic IT program within the framework laid down by the enterprise architecture (EA) team
- An Infrastructure Architect specialises on a particular technology or inter-related technologies

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Green Computing: Managing Complexity & Lowering Emissions

- Challenges
  - As part of meeting government carbon reduction targets, business transformation often requires radical upgrades to its ICT Infrastructure
  - Energy cost are sky-rocketing
    - Historically energy cost accounted for less than 10% of ICT budgets, but these costs are projected to reach 50% by 2020
    - Data Centres are the biggest components (18%), followed by PCs (15%)
    - ICT is responsible for 3% of the world's total global emissions and this is expected to rise to 10% by 2020
    - Demand for ICT and Data Centre services is currently growing at more than three times the rate of supply
    - Australia is one of the worst in terms of energy efficiency

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Green Computing: Managing Complexity & Lowering Emissions cont

- Solutions:
  - Energy efficient/smart power-down & virtualised environments
    - Servers, Storage, Desktops & Applications
    - Consolidation of Data Centres or Communications Rooms
    - Energy Efficient Design Services
  - Secure Unified Communications & Mobility
    - Home working reduces physical office requirements
    - Reduces Contact Centre footprints – Smarter Staff Locations
  - Audio & Video Conferencing
    - Reduces corporate travel costs
    - Telemedicine – "Care closer to home"
  - Consultancy, Outsourcing & Managed Services
    - Remote Monitoring, Reporting & Control
    - Requirements planning, design, implementation & support
    - State-of-the-art disaster recovery & business continuity

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Green Computing: The Future cont

- Green Computing and sustainability
  - Developing an efficient ICT Infrastructure to achieve carbon reduction
    - High energy costs – projected to reach 50% of total operating costs by 2020
    - Data Centres: energy accounts for 70% of Data Centre costs:
      - Cooling & electrical systems, air management
  - Five steps:
    1. Develop a sustainable green computing plan
    2. Recycle
    3. Make environmentally sound purchase decisions
    4. Reduce Paper Consumption
    5. Conserve energy

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Green Computing: The Future cont

- Cloud Computing has a role to play
- Future proof infrastructure to support the "Super Organisation" through the deployment of:
  - Wireless
  - Roaming voice & data communications
  - Collaboration tools
  - Video
- Benefits
  - Efficiency gains
  - Reduced number of ICT failures/incidents
  - Reduction in travel

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Data Centres

- Five primary areas on which to focus energy efficient data centre design best practices:
  - Information and Communications Technology (ICT) systems
  - Environmental conditions
  - Air management
  - Cooling systems
  - Electrical systems

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Australia's Digital Pulse

- Digital economy worth $139 billion by 2020
  - 7 percent of GDP
- Job growth of 3 percent per annum compared to 1.6%
  - Boom in ICT workforce
- In-demand roles:
  - ICT project managers, business analysts, business development managers
- Shortage of people with requisite skills
- Australia's digital revolution is primarily driven by consumers and businesses, who have taken up increasingly convenient and cheaper digital tools such as social media, and mobile and cloud technology
- Telecommuting: teleconferencing, ecommerce, online shopping

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