Enterprise Architecture and Education
Education and Enterprise Architecture

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Architecture and Education

- Education, especially universities at the forefront of interoperability
  - Standard components
  - Standard interfaces
  - Architectures

- Examples
  - World Wide Web
  - Communication, Internet, Internet 2
  - Federated libraries, electronic exchange of information
  - Electronic learning environments

- Projects to date appear to be technology driven
Case Study: Schools Interoperability Framework

- US based initiative

- Seamless integration of instructional, administrative and communications tools

- Supported by the SIF Specification and a Certification program for products conforming to the specification
The Scope of SIF

- Zone Integration Server (ZIS)
- SIF Agents
- Applications
- SIF Data Objects

The SIF “ZONE”
New Student Registering for Enrollment into:
*Student Information System
*ID Card System
*Cafeteria Management System

**Typical School**
- 49 minute task
- 10 times data entered

**SIF School**
- 4 minute task
- 1 time data entry

45 minutes/student x 18,000 students = 6 FTE’s!

1/10th the Time – 1/10th the Risk
SIF: State Return on Investment

- Eliminate 23 Aggregate Reports
- Reduce 8 hours per school per report
- Reduce 16 hours per district per report
  - = 70,000 hours school staff
  - = 18,000 hours district staff
  - = $1,760,000 est. state report savings
Case Study - Blackboard

- The educational equivalent of an ERP product
- Industry architecture based around a Commercial Off-the-Shelf product
- Open Architecture allows integration with wide variety of electronic learning environment functions
  - E.g. “Turnitin” plagiarism detection system
Opportunity

- IT represents a major cost for Education
- Enterprise Architecture represents a major opportunity for education establishments
  - To manage costs
  - To share costs
Education and Enterprise Architecture

- Growing recognition that Enterprise Architecture is important
- Rapidly growing demand for all types of Architect
- Protracted process for development of Architects
- There is a shortage of top class Enterprise Architects
  - Great for architects
  - Not so great for business
- The Education System has a role to play in developing quality Enterprise Architects
Education and Enterprise Architecture - Baseline

- Focus at all levels of Education is still primarily technology based.
- The demand is increasingly for a more balanced curriculum for graduates who have Business and Technology skills.
Case Study – e-Skills UK

- UK Sector Skills Council
  - “The voice of employers on IT and Telecoms to create the skills environment that businesses need to be productive and competitive”.

- Defined a curriculum for a combined Business and Information Technology undergraduate degree course
  - Mandatory Business Content
  - Mandatory Management Content
  - Mandatory Technology Content
  - Mandatory Industrial Experience
  - Certification mark for conforming courses
Case Study – e-Skills UK

- Results to date have been disappointing
- Little promotion to potential students and career advisors in schools
- No government support in terms of “student numbers”
  - Means no funding
Case Study: Information Technology at Reading

- Course developed in response to the needs of Industry
  - Less computing
  - Less coding
  - Less programming
  - More business
  - More integration

- Three strands
  - E-Business
  - Commercial Off-the-Shelf-Software
  - IT Support
Introduction of Architecture (and TOGAF) into the Syllabus

- 2003: Used Enterprise Architecture as an informal framework within which to introduce issues relating to E-Business
  - The concepts of business requirements
  - Multi-level Enterprise Architecture
  - Migration Planning
  - The role of COTS, Open Source

- 2004: Formal TOGAF course introduced as a final year undergraduate option
  - 20 lectures
  - Coursework
  - An examination
  - Much more rigorous than the base requirement for TOGAF certification
  - 18 TOGAF certified practitioners in 2005 (potential architects)
  - 17 TOGAF certified practitioners in 2006
Introduction of Architecture and TOGAF into the Syllabus

2005: Formal TOGAF course introduced as a option within a 1 year taught MSc course
- Intensive 1 week course
- 20 hours lectures
- 12 hours syndicate work based around a case study
- Practical use of an architecture tool
- Coursework
- An examination
- Much more rigorous than the base requirement for TOGAF certification
The Outcome

- Successful students have
  - An understanding of the concepts of Enterprise Architecture
  - A knowledge of TOGAF

- In general students have no practical experience

- A small number of students show a clear aptitude for Enterprise Architecture
Objective: Establish Enterprise Architecture as a recognized profession in its own right

- Recognized body of knowledge
- Recognized professional qualification based on knowledge, experience and proven competence
- Recognized career development path
How other professions operate

- **Acquire the knowledge**
  - Licensed undergraduate university courses built around a standard body of knowledge
    - Often involving periods of practical experience under supervision
  - Specialised postgraduate courses

- **Gain the experience**
  - Structured on-the-job training to demonstrate expertise and acquire experience (internships)

- **Accreditation**
  - Examination to achieve acceptance into the profession

- **Examples**
  - (Building) architects
  - Law
  - Medicine
  - Accountancy

- **Escape Routes**
  - Recognized routes for those who are not able to “stay the course”
  - Valuable roles as supporting team members
IT Architect Certification

- Launched by The Open Group in mid 2005
- Based on knowledge, experience and competence
- Certification based on peer review
  - Around 1500 architects have achieved certification in first year of operation
  - Supported by major companies
  - Program already has industry acceptance and critical mass
Developing an Architect

Aptitude

Specific Knowledge

Relevant Experience
TOGAF Certification

Potential architects & other valuable members of the architecture team.
IT Architect Certification

Aptitude

Specific Knowledge

Relevant Experience
Current Development of an Enterprise Architect

Unstructured career development process

Certified IT Architect
Possible Professional Development of an Enterprise Architect

Skills Frameworks

Industry

Academia

Standard Body Of Knowledge
- Technology
- Business
- Law
- Management
- Architecture

Structured Industrial Experience

Bachelor/Masters Enterprise Architecture

Certified IT Architect
Role of Academia - Long Term Goal

- Broad range of universities offering accredited Enterprise Architecture courses built around a standard body of knowledge
  - Undergraduate
  - Postgraduate
  - Combination thereof

- Broad range of industrial partners providing structured on-the-job training
  - For graduates
  - Also as integral part of degree courses
Short Term Hurdles

- We don’t yet have an agreed body of knowledge

- Creating a new degree course has significant lead time (especially undergraduate degrees)
  - Design course and get approval (1-2 years)
  - Promote to potential students (1-2 years)
  - First course (3-4 years)

- Lead time from concept to first graduate is between 5 and 8 years

- Enterprise Architecture is likely to take longer because of the need to involve multiple “schools” to cover the complete syllabus
We can start NOW

- Adding modules to existing courses is much easier than building new courses, especially optional modules.

- It may be possible to evolve existing course modules to meet the needs of the Enterprise Architecture body of knowledge within existing constraints.

- Some kind of register of university courses offering some Enterprise Architecture content would be valuable to potential students and industry.
Offer to Academic Institutions

- Become an Academic Partner of The Open Group
  - You must have some Enterprise Architecture course content or research
  - No fees involved

- Benefits
  - Promote your current courses
  - Participate in the development of the Body of Knowledge
  - Share experiences, share resources
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