Modeling Information and Business Systems Architectures – A Team Project

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Other Team Members:
 Kevin Schiller – team Lead, Kathleen Allour, Tony Lyons

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Presentation Overview

1. Project Charter
2. Teamwork Approach
3. Architectural Approach
4. Modeling Processes and Methodology
5. Discussion and Conclusions
6. Acknowledgements
PREAMBLE

Enterprises have several challenges

- Competitive global marketplace
- Need to gain strategic advantage
- IT systems can be the key enabler
- But IT continues to change rapidly
- IT systems are complex
- Modeling of IT system architectures is a complex process

Teaching IT systems architectures also poses a significant challenge

- Several approaches, frameworks, methodologies, process models
- Comprehensive theoretical body of Knowledge
- Context of enterprise architecture
- Integration with technical architecture
- Need appropriate pedagogy
**PREAMBLE (CONT.)**

**Pedagogy**

**Outcomes:**
- Theoretical – concepts, principles
- Informational - exploring leading edge approaches to development of architectures
- Enhancement of systemic thinking skills
- Problem solving through systematic application of an architectural approach

**Themes:**
- Bridging theory and practice
- Developing architectural solutions to business problems
- Process orientation
- Measurable objectives
- Alignment of project-level outcomes with strategic IT objectives
- Assuring quality
1. PROJECT CHARTER

Context

A Team Project
- Based on real world Case Study provided by Project Sponsor

Existing situation at sponsoring company
- Internal communication typically carried out through the use of corporate e-mail.
  - HR announcements and manufacturing facilities newsletter are distributed via fax, and posted in hard copy on various bulletin boards.
  - External communication with suppliers, partners, and customers has been limited to the traditional channels of e-mail, snail mail, and EDI where applicable.
- Need for a ubiquitous solution for collaboration with
  - Employees (associates),
  - Suppliers (over 4000)
  - Partners,
  - Customers
- Enterprise Information Portal (EIP) seen as a potential solution to address most collaboration and access issues
1. Project Charter (cont.)

THE CHALLENGE - MAKE IT REAL

- Approach - make the *Teamwork* experience realistic
- Roles – Sponsors, Project Manager, Analysts, QC
- Use of Charter, project plan, assigned tasks, deadlines, side issues/conflicts, intra-team dependencies
- Team and executive briefing meetings, minutes, status reports, conference calls, use of NetMeeting
- Choice of several approaches, frameworks, methodologies, process models
1. Project Charter (cont.)

Goals

- Demonstrate application of IT-oriented architectural theory.
- Illustrate how information and business systems architectures form part of the knowledge base of enterprise architecture.
- Develop a comprehensive set of specifications of information and business systems requirements for an EIP for a sponsoring organization, to be used to design the technical architecture.
1. Project Charter (cont.)

ENTERPRISE INFORMATION Portal

- EIP - a “window” to information and services.
  - The new Internet-based business desktop
  - Integrates most important electronic resources available to associates, suppliers, and customers
  - Simple enough for everyone to use.

- Portal resources include a large range of information and services:
  - Documents
  - Enterprise Applications
  - Internet Services such as Research, News, Financial Information, and Collaboration with suppliers.

- A common place for Enterprise wide collaboration.
Objectives

- Prepare a proposal for the Information Architecture and Business Systems Architecture of the EIP
  - Must be scalable, flexible and facilitate integration.
- Develop an Information Technology Strategy for the sponsoring organization giving priority to the establishment of the EIP.
- The project deliverables will serve as input for the technical architecture teams
2. TEAMWORK APPROACH (cont.)

Architectural Processes for Team Projects

Enterprise Strategic Planning Process

Strategic Planning Stage
- Enterprise
- Strategic Plan

Information Architecture Processes

IBSA Team
- TA1

Business Systems Architecture Processes

IBSA Team
- TA2

IT Strategic Planning Processes

IBSA Team
- TA1

IT Strategy Planning Stage
- IT Strategic Plan
- IT Initiatives
- Architectural Project Requirements

IT Architecture Processes

Teams 2, 3, 4
- TA 1
- TA 2
- TA 3

Modeling of Application, Data and Infrastructure viewpoints

Technical IT Architecture
2. TEAMWORK APPROACH

Four teams, each focused on assigned architectural viewpoint(s)

- Team 1: Information and Business Systems Architectures (IBSA)
- Team 2: Application Architecture
- Team 3: Physical IT Infrastructure
- Team 4: Enterprise Data Architecture
2. TEAMWORK APPROACH (cont.)

Critical Success Factors

- Cohesive teams (doctoral students in cohort)
- Prior team project experience of team members in their work environments
- Corporate politics not a factor because of academic environment
- Team size of four reduced number of communication channels
2. TEAMWORK APPROACH (cont.)

Team work allocation

Major roles:
- Faculty Sponsor - Steenkamp
- Team Leader - Schiller
- Information Analyst - Allour
- Architecture Modeler - Nnolim
- IT Strategist - Lyons
- Each member assigned as consultant to other technical architecture team
2. Teamwork approach (cont.)

Team Project Process

- Planning
- Section Assignments
- Section Deliverables
- Compile and Team Review
- Submit Deliverable

- Project Planning
- Project Execution

Revisions
2. Teamwork approach (cont.)

Team Project Process (cont)

- Weekly face-to-face team meetings, virtual meeting sessions supported with e-mail and the Blackboard Discussion Board.
- The Blackboard Digital Drop box was used to share project deliverables.
- Initial project meetings were devoted to establishing and interpreting the project requirements, and subsequent meetings to monitor progress and determine status of project work.
- The team also collaborated with the project sponsors and the other three teams to resolve overlapping requirements and determine levels of integration of the evolving architectures.
- Minutes of all project team meetings were kept, note-taking responsibilities were shared in turns and minutes were included as part of the final project folder.
2. Teamwork approach (cont.)

Quality Control

- Develop Quality Management Plan
- Draw on team members’ prior project management and leadership experience
- Perform joint reviews of all team work, artifacts, and deliverables.
3. ARCHITECTURAL APPROACH

- Identify and verify architectural principles
  - Relevant to organization, information and business system viewpoints
  - Derived from enterprise goals
  - Guiding the enterprise strategy
  - Supportive of the IT strategy

- Adopt architectural framework
  - Index model: provides definition of key elements of enterprise IT architecture, i.e. information, business systems, & organization.

- Adopt architectural process model

- Apply architectural methodology
3. ARCHITECTURAL APPROACH (cont.)

**Index Model**

- Each element defined in terms of viewpoints, inventory, principles, models, and standards

<table>
<thead>
<tr>
<th>Viewpoint</th>
<th>Inventory</th>
<th>Principles</th>
<th>Models</th>
<th>Standards</th>
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<tbody>
<tr>
<td>Information</td>
<td>Primary sources</td>
<td>Information related</td>
<td>Related to information architecture</td>
<td>Information related</td>
</tr>
<tr>
<td>Business Systems</td>
<td>Existing business systems serving all user types</td>
<td>Business systems related</td>
<td>Related to business systems architecture</td>
<td>Business Systems related</td>
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<tr>
<td>Application</td>
<td>Existing applications</td>
<td>Application related</td>
<td>Related to application architecture</td>
<td>Application related</td>
</tr>
<tr>
<td>Data</td>
<td>Existing enterprise data</td>
<td>Data related</td>
<td>Related to enterprise data architecture</td>
<td>Data related</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Existing infrastructure</td>
<td>Infrastructure related</td>
<td>Related to infrastructure</td>
<td>Infrastructure related</td>
</tr>
<tr>
<td>Organization</td>
<td>Existing DSS EIS ERP systems</td>
<td>Overarching principles, guidelines</td>
<td>Related to organization</td>
<td>Organizational Intranet</td>
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<td></td>
<td>-Strategy</td>
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<td>-Planning</td>
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<td>-Structure</td>
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4. Modeling Processes and Methodology (cont.)

EIP Strategy Process Model

Enterprise Strategy
## 4. Modeling Processes and Methodology (cont.)

### Summary of Methodology Steps

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Key Deliverables

- Organizational challenges to consider in terms of:
  - Business
  - IT operations
  - IT infrastructure
  - User interfaces
  - Collaboration
  - Physical & geographical

- Information requirements of EIP
  - Strategic information – executive management
  - Tactical information – middle management
  - Operational information – operational level

- Business processes for the EIP
- Portal implementation strategies
- Information flow models for all sub-portals
4. Modeling Processes and Methodology (cont.)

Hierarchy of Information Requirements
4. Modeling Processes and Methodology (cont.)

SYSTEM BLOCK DIAGRAM
3. Modeling Processes and Methodology (cont.)

Information Flow: Core Business Portal
Proposed EIP Physical Application Model

1. Presentation Layer

2. User Interface Layer
5. Discussion and Conclusions

Key outcomes

- Cultivation of modeling competencies
- Enhancement of managerial skills
- Improved interpersonal communication and collaborative skills
- Ability to develop an integrated architectural solution to a complex real-world problem
- Identifying of enabling opportunities for new business processes
- Managerial and technical competencies
  - problem and process analysis
  - architecture modeling
  - documentation and teamwork
5. Discussion and Conclusions

- Value of previous experience on similar projects
  - Reduces learning curve on project
  - Enhances team dynamics
  - Some students were informed by architectural approaches of their companies

- Additional skills and knowledge acquired
  - Identification of enabling opportunities for new business processes
  - Best practices in the field of IT architecture design (standards)

- Provided useful and practical perspectives that combined both “Theory and Practice” into the learning experience
  - Knowledge and understanding of architectural principles, frameworks, processes, architectural modeling, knowledge of industry standards, and methodology strengthened

- Improved understanding of real world business problems and information requirements
ACKNOWLEDGEMENTS

- Industry sponsors
- Students for contributions in team projects
- Outcomes of team projects as reported in separate papers by Steenkamp and Kakish, co-authored with teams
  - Application Architecture Team
    - Buchheidt, M., Li, J., Rajabion, L. and Van, D.
  - Enterprise Data Architecture Team
    - Warner, D., Chen, G. and Foster, R.
  - Infrastructure Architecture Team
    - Basal, A., Dawwas, M., Konda, D. Shulaiba, R.

THANK YOU