

Linking Existing IS Architecture to the Business Model

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Outline

- ✦ Background and objectives
- ✦ A linkage framework
- ✦ Difficulties in tying existing IS implementation to the business model
- ✦ A linkage methodology
- ✦ Status and experience of the work
- ✦ Conclusion and future work



My BC Tel Mobility Experience

- ✦ Spent one year sabbatical (98-99) at BC Tel Mobility
 - ✦ **The problem** (facing applications developers):
 - How to identify reusable objects?
 - How to reuse?
- It seems to take more time and effort in using the object-oriented technique!
- ✦ **My task:** *suggest whatever I can to resolve or to reduce the problem*
 - ✦ **My Initial reaction:** *something along the line of CIS*



What I Found (Challenges)

⚡ Facing the business

- Deregulation, alliances, mergers, etc.
- The big uncertainty of tomorrow.
- How to stay alive?



⚡ Facing the IS department

- How to develop IS under great uncertainty?
- How to reduce the time and effort needed to modify IS when the business changes?

Findings ➔ Hypothesis

⚡ An interesting story:

Marketing people develops their plans by first understanding the limitations of the billing system.



⚡ Objects (or agents) of the business is totally different from those of the IS – *more later*

⚡ The three-facets view of IS (our CACM paper)

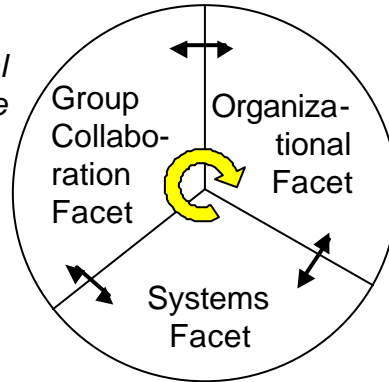
⚡ The proposed solution and also a Hypothesis:

need business model to drive reuse & evolution



A Three-Facets View of IS

*Practical
Perspective*



*Managerial
Perspective*

Operational Perspective

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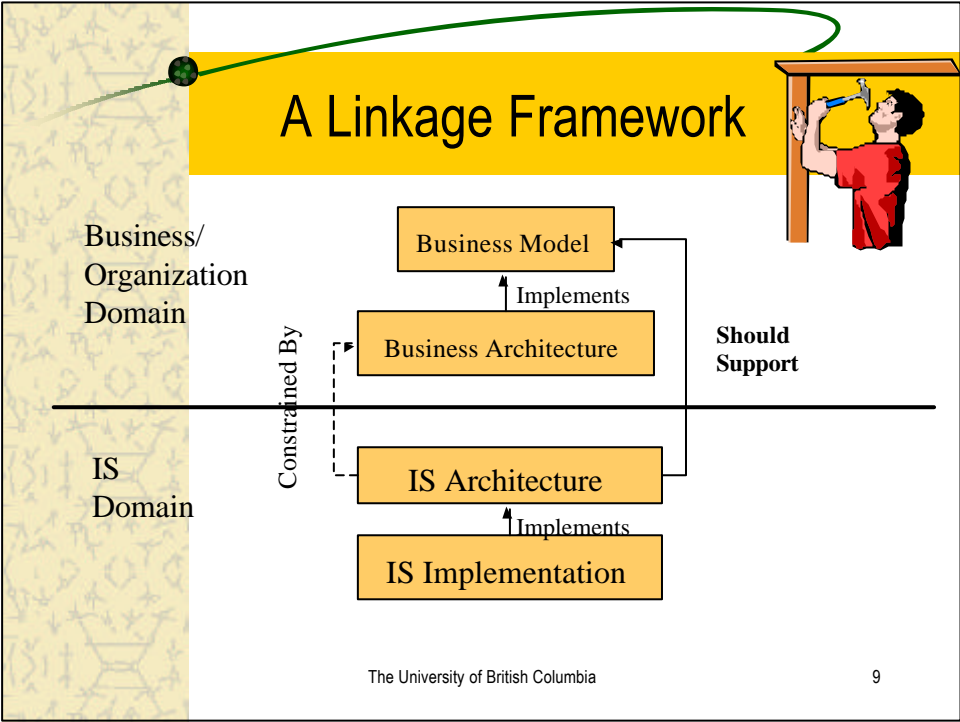
Foci of This Presentation

- ✦ Our representational framework of an organization
- ✦ The representational differences of business and IS implementation models
- ✦ A strategy to tie the business model to the existing IS implementation



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Business Model

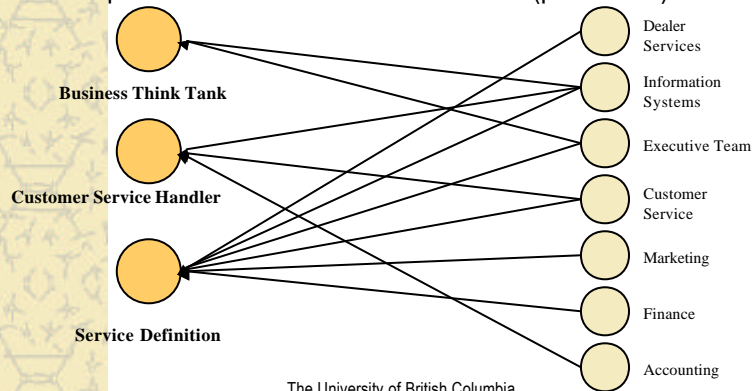
- ✦ Core Businesses
 - To satisfy customers' requests for services/products
- ✦ Role as a Business Object
 - Business Objects in BC Tel Mobility:
 - Customer Service Handler
 - Service Definition
 - Service Provider
 - Business Think Tank
- ✦ Characteristic: *Stable*

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Business Architecture



- ✦ An organizational layout of a company
- ✦ An implementation of the business model (processes)



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IS Architecture



- ✦ Logical composition of components; functional requirements of the systems.
- ✦ Example representations: ERD and DFD
- ✦ Theoretically, it supports the business model.
- ✦ Practically, it is driven by the business architecture.

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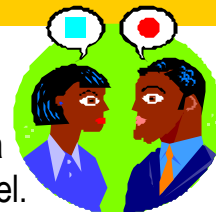
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IS Implementation



- ✦ Physical level of the information systems.
- ✦ Types of components in the design or implementation
 - Database
 - processing component
 - GUI

Difficulty in the Connection



Causes

- ✦ Philosophical difference in objects between a business model and an implementation model.
- ✦ The existing IS architecture focus on the implementation of the business instead of what the business is.
- ✦ The existing IS architecture reflects a data-centric view but not an object view.

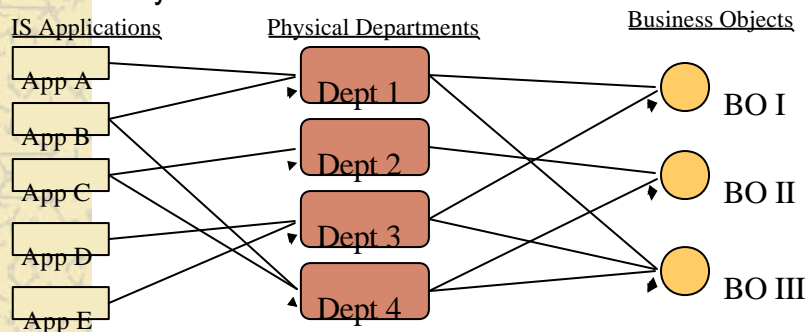
The Philosophical Difference



- ✦ A business object should reflect organizational roles/functions (e.g., a customer object talks to a customer representative.)
- ✦ An IS object incorporates a systems view on how an organization works (e.g., a customer account object talks to an item object.)
- ✦ Less natural, representative, and understandable from the perspective of non-technical users.

The Focus of Implementation

- ✦ IS applications support the operations of physical units which may have different roles.



The Data-Centric View



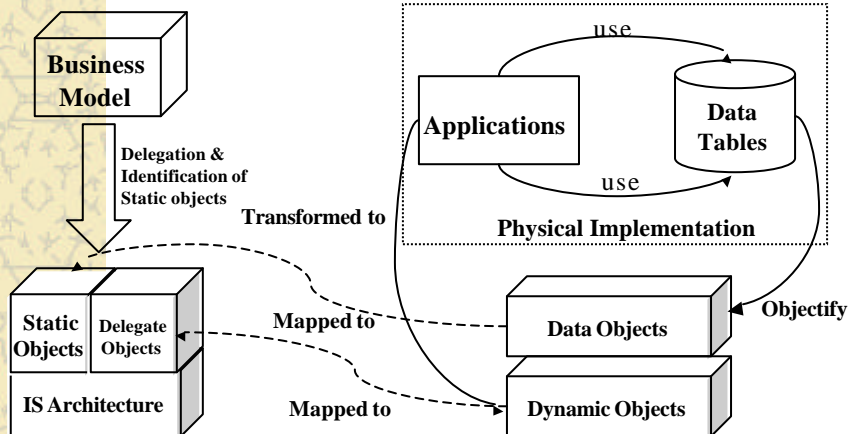
- ✦ Claim: *data remain stable regardless of changes*
- ✦ Construction of an enterprise database
- ✦ Design only reflects usage of data but not dynamics of business - loss of process semantics.
- ✦ Overlook interactions that do not require data.
- ✦ Contradicts the essence of objects:
 - no independence (every application can access data)
 - no encapsulation (access not through defined interface)

A Linkage Methodology

- ✦ Develop a business model for an organization
- ✦ Derive an IS architecture from the business model
- ✦ Reverse-translate the existing IS to a logical design
- ✦ Map the design to the derived IS architecture



A Linkage Methodology (Cont ...)



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Developing a Business Model

- ✦ External objects (e.g., customers, regulators, share holders) send requests to the system
 - Consider those that are independent of and play no roles in carrying out the business
- ✦ Important: **roles** and **business responsibilities**
- ✦ Decompose roles using requests (encapsulations)
- ✦ Aggregate services and decompose requests using state information and state transformation



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Delegate and Static Objects

✦ Delegate objects

- Assigning information processing responsibilities to a subordinate (e.g., a computer-based system or a human agent)

✦ Static objects

- Objects that keep track of the state of relevant but non-active things (e.g., a rental pager).



Data Objects

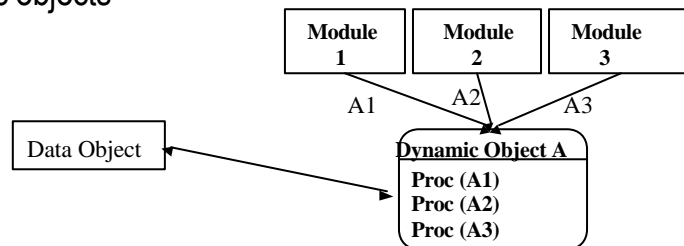
- ✦ Objects without operations
- ✦ Consider all major data entities as data objects
- ✦ Look for attributes that are distributed across several tables and assign these attributes to the objects
- ✦ Do not directly translate relationships tables into data objects; assign the attributes in the tables to the attributes of the related data objects



Dynamic Objects



- ✦ Encapsulate all operations against data objects
- ✦ Provide existing IS applications with data services
- ✦ Group and objectify actions against data objects into dynamic objects

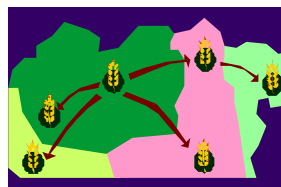


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Mappings

- ✦ M-N relationships between delegate and dynamic objects
- ✦ M-N relationships between static and data objects
- ✦ Can view the mappings via a two dimension table



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Summary of the Methodology

✦ Top-Down:

- Delegate: performs information processing activities;
- Static: keeps track of state of relevant, but non-active, things;

✦ Bottom-Up:

- Data - tracks a list of things with reference to the business ontology; It represents a major data entity;
- Dynamic - centralizes operations against a data object.

✦ Mapping:

- delegate \leftrightarrow dynamic; static \leftrightarrow data



What Is It Good For ?

- ✦ Understand how existing components can be used if business is implemented differently.
- ✦ Define the interfaces between the client side and the existing applications - support migration to client/server architecture using existing systems.
- ✦ Support the evaluation of a new application system (e.g., does SAP R/3 fit your business needs)
- ✦ Support the migration of application systems (e.g., from K2 to Amdocs)



Status and Experience

- ✦ A methodology for developing OO business models
- ✦ Developed a major portion of the business model for the customer services of a mobile phone company
- ✦ Verified it with several top management people
- ✦ Proven to be rather robust in that it survives the following tests:
 - BPR did not result in changes to the business model
 - Proved appropriate for the landline phone company



Status and Experience (Cont ...)

- ✦ A methodology for reverse-translating (objectifying) the existing IS to a logical design
- ✦ Objectified the prepaid service and linked to the business model
- ✦ The linkage seems to be useful



Conclusion



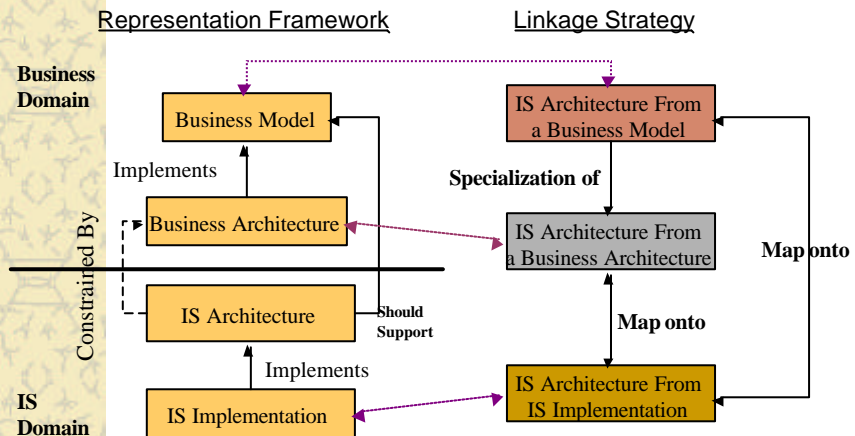
- ✦ The hypothesis: *need business model to evolve*
- ✦ The problem: *different viewpoints and representations*
- ✦ The proposed solution: *a linkage methodology*
- ✦ What are we trying to achieve:
 - Tie IS architectures to business model
 - Reuse existing architectures when business changes
 - Reuse existing applications when IS architectures change
 - Support move to the object/agent-oriented approach

Future Work

- ✦ Incorporate business processes into the framework
- ✦ Fully test the methodology
- ✦ A CASE tool to support the methodology
- ✦ A generic business model for the industry?
- ✦ Other generic business models?
- ✦ Agent-oriented business models?



Incorporating Business Processes



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Questions, Comments, Criticisms?



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