

**LECTURE 2: BUSINESS ARCHITECTURE ASPECTS: BUSINESS PROCESS MGMT & WORKFLOW MODELLING**

Lecture Contents

- Where are we now? Introduction to Workflow and Workflow Modelling
- Sharp & McDermott’s Method for Modelling WF: Preamble
  - Sharp & McDermott’s Method in the context of processes
  - Business Processes: What they are in organization, their enablers (ie. makes them work)
  - Example #1.1: A sample workflow: student application submission
- Sharp & McDermott’s Method in Detail:
  - Step #1: Framing the process: the what (what’s in scope/ SHs involved)? Example #1.2
    + Framing the process: +the why (why are we doing this? what’s wrong?)
    + Importance of learning from SH assessments
  - Steps #2,3: Understand process now (as-is) & design what will be better (to-be)
    + Looking at process enablers, the organization,
    + The organization’s environment & culture, Charles Handy on culture
    + A one-page poster with example #1.3 to clarify/publicize the new process
  - Step #4: Develop use-cases for the to-be process: UML-use case diagrams refresher
Business Architecture: Objectives

- This topic focuses on the BPs in the context of a business strategy.
- From business needs/strategy, working with different organization lines, the Enterprise Architect can start to model the major enterprise BPs.
- This helps them understand the global & major processes of an enterprise.
- Using BPM tools, business analysts can
  - simulate the business processes,
  - providing a measure of the optimization possible in doing BP reengineering.
- The business processes plan is owned by the business.
- The architect's role consists mainly of
  - capturing the business needs and
  - identifying common business services usable through different business lines in an organization.

Business Architecture (/2): BPM

- BPM is a management practice providing for governance of a BP environment with the goal of improving agility & operational performance.
- It is a structured approach employing methods, policies, metrics, management practices and software tools to manage and continuously optimize an organization's activities and processes.
- Main Mission
  - Initiate the review and assessment of existing Business Processes end-to-end with Business Process Owners and Sponsors;
  - Help design and implement process changes with a view to:
    o unlock hidden savings,
    o enhance performance and
    o improve customer experience thro efficient organizational changes/ effective IT
  - A number of possible BP change methodologies, as we will see later.
Business Architecture (/2): BPM

- Subtle relationship between BPM & Business Architecture
- Architecture V BPM: the notion of the process

Zachman defines process very narrowly

- BPM notion of Scope is wider than general architectural one
- In BPM Business Process comprises info, WF, HR, tools, time & objectives
- Thus capabilities term is redundant in BPM.

Business Architecture (/3):
Business Process Terminology and Hierarchy
**SECTION 3.1: SHARP & MCDERMOTT’S METHOD FOR WORKFLOW MODELLING**

**Sharp & McDermott’s Method of Workflow Modelling**

1. **Frame the Process**
   - identify the process & clarify boundaries
   - perform an initial assessment
   - establish goals as expected by stakeholders

2. **Understand the current ("as-is") process**
   - model workflow
   - perform a more specific assessment

3. **Design the new ("to-be") process**
   - devise/assess potential improvements
   - design new workflow
   - decide on action

4. **Develop use-case scenarios**
   - how would actors interact with system?
   - identify main paths through new WF
Workflow Modelling in the World of Processes

- In the beginning was the Process...
  - Start point is the **Process Identification phase**
  - Followed by **Process discovery**, etc, etc
  - Sharp & McDermott take you as far as **Design**
Process Enablers

- **Workflow design**
  - Workplan for responding to an event

- **Information technology**
  - Focus on information systems

- **Motivation and measurement**
  - Explicit and implicit reward systems
  - People do what they are measured on

- **Human resources**
  - Knowledge, skills and experience
  - Training, organisational structure, job definitions ...

- **Policies and rules**
  - Internal and external
  - May be obsolete

- **Facilities design**
  - Workplace design and infrastructure

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Enablers (as name implies) enable the Business Process (i.e. make it possible)
## Context Framework

*Puts the analysis of Business Processes in context with analysis of IS Requirements*

- **Mission, strategy & goals**
- **Business process**
- **Information system**
  - Presentation
  - Logic
  - Data management

### Framework Layer

<table>
<thead>
<tr>
<th>Layer</th>
<th>What it covers</th>
<th>The Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Objectives</td>
<td>The mission, strategies (customers / markets, products / services, differentiation), goals, objectives, and measures (eg ISO / SI, Mission, Strategies, Goals, Objectives).</td>
<td>Project Charter</td>
</tr>
<tr>
<td>Business Process</td>
<td>The activities the business carries out in order to meet its objectives. Includes the actors involved, the sequence of steps they carry out (workflow), and the result(s) produced.</td>
<td>Workflow Modeling</td>
</tr>
<tr>
<td>Presentation Services</td>
<td>A mechanism through which an actor in a business process interacts with a system. Usually a GUI (graphical user interface) and reports, but could involve systems, TR (telephone) systems, etc.</td>
<td>Use Cases</td>
</tr>
<tr>
<td>Business Services</td>
<td>A &quot;service&quot; offered by a system — a specific function. Includes the business rule and data updates it is responsible for. Requires Event Analysis, State Transition Analysis, etc.</td>
<td>Service Specification</td>
</tr>
<tr>
<td>Data Management Services</td>
<td>Files and databases that provide a system's record-keeping functions. Determines the things a system &quot;knows&quot; about and the data that is maintained about these things. Data Models establish the language and basic rules for all other requirements.</td>
<td>Data Modeling</td>
</tr>
</tbody>
</table>

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**SECTION 3.2: A SAMPLE WORKFLOW TO ILLUSTRATE THINGS**
Process Workflow Model Example #1

**Student**
- Submit registration by post
- Deliver post
- Open post, decide if misdirected
- Sort post by department
- Deliver post

**Mailroom**
- Sort post by department
- Deliver post

**Department secretary**
- Sort post by department
- Submit registration by post
- Deliver post

**Enrollment assistant**
- Sort registrations by advisor
- Decide if form is complete
- Resubmit registration

**Registrar’s office**
- Request admission status
- Print student summary report
- Batched and run overnight

**Department advisor**
- Actor: An organization, job or system with a role in achieving the process’ result
- Decide if registration is complete
- Request admission status
- Print student summary report

**Flow**: A sequential dependency between steps
**Handoff**: A flow from one actor’s swimlane to another’s

**Lecture 2: Workflow Modelling**
CA4101 Lecture Notes (Martin Crane 2017)
A Modified Sharp & McDermott
WF-Driven Methodology

• Somewhat modified form of Sharp & McDermott’s Methodology

1. Discover a set of related processes and develop an overall process map.
2. Establish the scope of the target process (process “what”/“who”/“how”)
3. For the target process, review/document process mission, strategy, goals.
4. Perform an initial process assessment (Stakeholder- & Enabler-based).
5. Document process vision and performance objectives
6. Some observations on culture, core competences, management systems.
7. Look at some actors and how they would interact with the system.

Aside: What is a Business Process?

• A collection of inter-related work tasks, initiated in response to an event, that achieves a specific result for the customer of the process.

achieves a specific result
for the customer of the process
initiated in response to a specific event
work tasks
a collection of inter-related

or... Hammer & Stanton (1990)’s def:
If it doesn’t drive at least 3 people crazy, its not a process
Aside (/2): Some Examples of What is and What is Not a Business Process

<table>
<thead>
<tr>
<th>Suggested Process?</th>
<th>Actually Called</th>
<th>If not a Business Process, why not?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Relationship Management</td>
<td>Process Area</td>
<td>Doesn’t deliver a single, specific result.</td>
</tr>
<tr>
<td>Acquire new Customer</td>
<td>Business Process</td>
<td>Delivers a single, specific result and meets all other</td>
</tr>
<tr>
<td></td>
<td>Subprocess</td>
<td>criteria. End-to-end BP.</td>
</tr>
<tr>
<td>Setup new Customer</td>
<td>Activity/ step/ task...</td>
<td>Too small – delivers specific results but they are</td>
</tr>
<tr>
<td></td>
<td></td>
<td>intermediate results in an end-to-end BP.</td>
</tr>
<tr>
<td>Calculate Credit Limit</td>
<td></td>
<td>Much, much too small – a single step or instruction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possibly one line in a procedure or step in a use case.</td>
</tr>
<tr>
<td>“Oracle CRM Process”</td>
<td>System</td>
<td>Doesn’t deliver a single, specific result; a system that</td>
</tr>
<tr>
<td></td>
<td></td>
<td>supports multiple Business Processes.</td>
</tr>
<tr>
<td>“Our e-business process”</td>
<td>Technology</td>
<td>Doesn’t deliver a single, specific result; technology</td>
</tr>
<tr>
<td></td>
<td></td>
<td>employed by multiple BP’s.</td>
</tr>
</tbody>
</table>

Aside (/3): A Business Process: what it is and what it does

- Components of a business process:
  - Triggering event:
    - Action or decision
    - Time (temporal event)
    - Condition
  - Activities or Steps and decisions ("work")
  - Name: Action verb + noun
  - Workflow models will show the flow of work, from trigger to result:
    - who, does what, when
  - Result:
    - Product
    - Service
    - Information
Aside (/4): Business Process Example #2

Example of an actual business process:
- Note the Process and the component sub-processes

Framing the Process
(document the scope of the process)

- Put process name in verb-noun format
- So, need to identify:
  1. Event that triggers the business process
  2. Result achieved by the process
  3. Customer that receives the result
  4. Other stakeholders and the result(s) they expect
  5. 5 – 7 major activities or milestones
  6. Actors with a rôle in the process
  7. Mechanisms
  8. Timing and frequency
  9. Related processes
- In Class Example: the Student Registration Process
Framing the Process (/2): Example on Securing an Order

Overall process map

• Simply a set of related processes:

```
Define Item

Qualify Vendor

Establish Supply Agreement

Procure Item

Pay Vendor
```

Overall process map for Supply Management Area.

Framing the Process (/3):
How to Identify Processes from the bottom-up

1. Identify ‘milestones’ (any results from processes)
2. Link the milestones
3. Identify cardinality (1:1), (1:m), (m:1) - Set of (1:1)s identifies the process!
4. Name the process (transitive verb + direct object)
5. Identify the triggering event
6. Identify stakeholders and expected results
   – Owner (enterprise operating the process, aka “service provider”)
   – Performers/Actors
   – Customers* and other Stakeholders (aka “service recipients”)
   – Results for each of these!

* NB: Can be Internal or External
WF-Driven Methodology:
Framing (the ‘What?’)
Understand As-Is
Design To-Be
Develop Use-Cases

“Milestones”

Contract is established
Payment is received
Prospect is identified
Order is shipped
Marketing meeting is conducted
Invoice is issued
Order is assembled
Amount due is calculated
Order is received

WF-Driven Methodology:
Framing (the ‘What?’)
Understand As-Is
Design To-Be
Develop Use-Cases

Analyse Links

Identify Prospect 1:1 Schedule Marketing Meeting 1:1 Conduct Marketing Meeting 1:1 Establish Contract 1:M Receive Order 1:1 Assemble Order 1:1

Ship Order M:1 Calculate Amount Due 1:1 Issue Invoice 1:1 Receive Payment 1:1 Distribute Payment

(Add extra steps if necessary)
WF-Driven Methodology:
Framing (the 'What'?)
Understand As-Is
Design To-Be
Develop Use-Cases

Lecture 2: Workflow Modelling

WF-Driven Methodology:
Framing (the 'What'?)
Understand As-Is
Design To-Be
Develop Use-Cases

Lecture 2: Workflow Modelling
Name Processes

Acquire Customer
- Identify Prospect
- Schedule Meeting
- Conduct Marketing Meeting
- Establish Contract

Fulfil Order
- Receive Order
- Assemble Order
- Ship Order

Collect Accounts Receivable
- Calculate Amount Due
- Issue Invoice
- Receive Payment
- Distribute Payment

Identify stakeholders and expected results

- Remember:
  1. Results (deliverables) not same as objectives (performance targets)
  2. Customer may not be the only stakeholder or even most important
     - Who are the other stakeholders?
     - What results do they expect?
     - How should expectations be weighted?
  3. Results must satisfy customer, but also the organisation (i.e. cost)
  4. Other criteria may need to be considered e.g. Customer order is satisfied (customer receives goods) and paid for (other criteria met)
Initial Assessment

- Initial Assessment links understanding the “As-Is” & “To-Be”
- 2 Questions:
  - What’s wrong with the process anyway?
  - What will be better when we’re done?
- Take the following Perspectives:
  - Stakeholders
  - Enablers
  - Metrics

Assessment by stakeholder

- 3 essential groups:
  - Customers
  - Performers
  - Owners
- May also consider:
  - Suppliers
  - Government & other regulatory agencies
  - General public
  - Industry bodies
Stakeholder Assessment 1 - Customer

- Have to ask:
  - Has the product/service got the right characteristics? Does it still suit?
  - How much effort is required of the customer? Does the process require too many interactions with customer? Even: is the customer the only one monitoring the process?
  - Does customer service have enough training?
  - Are the rules & requirements reasonable?
  - Ultimately: how will customer answer question: “do they want my business?”

Stakeholder Assessment 2 - Performers

- A very diverse (often diffuse) group – no longer just “employees”
  - Any contracted organization, temporary staff, contracts... CIDs
  - Gives rise to questions of info availability, measurements, process workflow

- Again, ask the questions:
  - “Is this how you’d do it if you had a choice?”
  - “Does this process help you meet your goals?”

- Remember:
  - Performers are not the customers!
  - But listening to your staff is important for incentivising them.
  - Ultimately a trade-off between customers and staff interests for the process.
Stakeholder Assessment 3 - Managers & Owners

- From Managers’ & Owners’ Viewpoint:
  - Reputation of organization is paramount – process shouldn’t (frequently) lead to issues for management to deal with.
  - Should be straightforward to understand and easy to maintain.
  - Resources-wise process must be:
    o Efficient and profitable.
    o Non-problematic to staff nor lead to organizational memory issues.
    o In a not-for-profit setting, it must still be fiscally responsible.
    o Consider opportunity cost as well as actual cost.

Stakeholder Assessment 4 - Suppliers

- Length of supply chain far longer than it used to be as processes of an organization exist in a web of interdependencies.
- Cooperation of suppliers, vendors, contract manufacturers, staffing agencies, subcontractors and others necessary.
- Occasionally only find this out when something goes wrong!
- Ask the Suppliers
  - “How easy is it to do business with us as compared to other customers?”
  - “What errors or actions on our part cause difficulties for you?”
- Supplier (not ‘Customer’) Service is also vital.
- Need their flexibility & responsiveness.
Stakeholder Assessment 5 - Other groups

- Have to also consider:
  - General public – ethics, safety, environment.
  - Local community – PR/outreach, involvement in local initiatives.
  - Regulators.

- Don't assume a group has no interest in the output of your process - ask!

Process Enablers (Review)

All ENABLERS MATTER!
Enabler perspective 1: Workflow design

- Examine
  - steps
  - Precedence ordering
  - flow
  - handoffs
  - decision points
- As per Stakeholder Assessment, ask the performers:
  - What is the one thing you would do to improve this process?
  - What aspect of this process causes you the most problems?
- They are the ones who know the process.

Enablers 2: Information Technology

- Primarily manifested as systems often the system is the business process.
  - What's old and doesn't work?
  - What's new and might work? ... or has become a necessity?
- Not only need to do things right – need to do the right thing. Many application development projects automate the root cause of the problem.
- Work from the bottom up in the framework:
  - Are the right data being maintained, and is the right info being presented to each step?
  - Are the right activities being automated?
  - Are the user interfaces appropriate for the task and the person using them?
  - Is the flow of work automated wherever possible and appropriate?
Enablers 3: Motivation and Measurement

- Includes at a basic level how a process is measured.
- Also (and more important) how performers are measured and how those measures motivate people to perform in a particular way.
- People don’t pay much attention to what management says; they pay attention to what management measures.
- Do the measures of performers support or impede process goals?
  - Can’t replace individual’s measures with BP metrics; may not motivate them!
- NHS example – waiting lists!

Enablers 4: Human Resources

- How do organisational structures, job definition and skills impact on the process?
- Amounts to:
  - “Are the right people, with the right skills & aptitude, in the right job and assigned to the appropriate activities?”
  - Will workforce need to change?
  - Will new staff skills and training be required?
  - Have some people been promoted beyond their level of competence?
  - Should outsource some/all of process?
Enablers 5: Policies and Rules

- Rules reflect the organisation’s bias. e.g. two possible policies in DCU could be:
  - “Postponement of Assessment/Examination forms should be submitted 14 days before exam to Registry for signature by Chair of Programme.”
  - “Otherwise Chair’s signature on completed Extenuating Circumstances forms and then submitted to Registry.”

(Add to this multiple versions of forms on web, hard copies of med-certs etc.)

- The process will be different in each case so each has a separate pathway and an individual workflow.
- Ultimate results: frustrated students & staff and possible errors downstream

Enablers 6: Facilities Design

- Does the workplace/equipment enable or interfere with the process?
- Design of e.g. Offices detrimental to work being done
- Questions to ask:
  - Does distance btw people with linked tasks introduce transport /communication delays?
  - If work is collaborative, are there suitable facilities (meeting rooms)?
  - Does the physical environment make the job more difficult/unpleasant than it would be otherwise (ventilation, glare, noise, interruption)?
- Space, quiet, privacy & ability to avoid interruptions are key productivity enablers frequently ignored in modern office layouts (open-plan)
Metrics Perspective

- Enablers are a *Guide* where to focus efforts - no point in optimising a process that occurs infrequently, or uses few resources.
- They should allow us to evaluate success.
- Collect all the metrics available:
  - Volumes
  - Frequencies
  - Efforts
  - Exceptions
- Need to be appropriate for the process, not the function
- Example: enabler-based assessment shows real problems are:
  - inappropriate staff performance metrics (rewarded for finding trivial faults) and
  - narrow job definition (too many people examining too small a part of problem).

Metrics Perspective (/2): What metrics?

- Have to ask such *basic* questions such as:
  - How many?
  - How long?
  - How much effort?
  - Who’s involved?
  - Efficiency
  - Cost
- At this stage don’t look too deeply – just need *indication* of process performance, in measures that matter to stakeholders.
- Also could get baseline as-is measures to compare with to-be measures.
- Collecting a lot of statistics is seldom helpful at this point—quite likely that detailed metrics will measure the wrong things.
SECTION 3.3: THE ENVIRONMENT
The Environment

- Any redesigned process must fit into the environment and ‘culture’ of the organisation.
- Issues:
  - Mission and strategy, especially strategic differentiation.
  - Organisational culture.
  - Core competences.
  - Business context and focus.

Business Mission, Strategy & Goals

Mission:
- What do we do, and who we do it for?
- Aren’t just in business to make money.

Strategy:
- Why would a customer choose us?
- What differentiates us from competition?

Goals:
- Overarching targets, to focus effort and gauge progress.
- Don’t confuse with Objectives (intermediate performance targets)
Strategic Discipline

- Study by Treacy & Wiersema (in *The Discipline of Market Leaders*) shows that leading companies choose to excel in one of three disciplines:
  - Operational excellence
  - Product leadership
  - Customer intimacy

- “Also rans” make no choice or choose to be good at all three.
Mission, Strategy & Business Models

More on Business Models

- **Business Models & Capabilities** Templates shown below:
  - Can be seen to map onto Value Discipline Orientation model:
    - ‘Operational-excellence’: combination of supplier-facing (left-side) and self (centre) in Capabilities Template
    - ‘Product-leadership’: emphasis on self (centre)
    - ‘Customer-intimacy’: emphasises customer-facing (‘right-side) Canvas
Choosing a Strategic Discipline (1/2)

<table>
<thead>
<tr>
<th>Core business processes that...</th>
<th>Sharpen distribution systems and provide no-hassle service</th>
<th>Nurture ideas, translate them into products, and market them successfully</th>
<th>Provide solutions and help customers run their business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure that...</td>
<td>Has strong central authority and a finite level of empowerment</td>
<td>Acts in an ad-hoc, loosely-knit and ever-changing way</td>
<td>Pushes empowerment close to the point of customer contact</td>
</tr>
<tr>
<td>Management systems that...</td>
<td>Maintain standard operation procedures</td>
<td>Reward individuals’ innovative capacity and new product successes</td>
<td>Measure the cost of providing service and maintaining customer loyalty</td>
</tr>
<tr>
<td>Culture that...</td>
<td>Acts predictably and believes “one size fits all”</td>
<td>Experiments and thinks “out of the box”</td>
<td>Is flexible and thinks “have it your way”</td>
</tr>
</tbody>
</table>

The Three Disciplines
- Operational Excellence
- Product Leadership
- Customer Intimacy

The Environment
- Mission and strategy.
- Organisational culture.
- Core competences.
- Business context & focus.

Adapted from Fortune, Feb. 6 1995, p. 96.
Beliefs and Culture

- Organisational behaviour stems from a few basic beliefs that should be made explicit at the beginning

1. A project with a company holding the beliefs:
   - “There’s always a better way”
   - “We have a bias towards informed action”
   - “Decision-making should be close to the action”

   Will likely be on the straightforward end of the spectrum...

2. On the other hand one with a company with the following (implicit):
   - “Our clients are trying to cheat us, the public misunderstands us and the media are out to get us.
   - “Our employees couldn’t care less”

   Will probably be quite tedious...

Charles Handy on Culture

- Charles Handy, a leading authority on organisational culture, defined four different kinds of culture:
  - Power culture
  - Role culture
  - Task culture
  - Person culture
Charles Handy on Culture (/2)

- **Power Culture:**
  - Quick decision-making, even if decisions aren’t in the best long-term interests of the organisation.
  - Strong culture, though it can swiftly turn toxic.
  - Collapse of Enron, Lehman Brothers often seen as due to power culture.

![Power Culture Diagram]

Charles Handy on Culture (/3)

- **Role Culture:**
  - Built on detailed org structures which are typically tall (not flat) with a long chain of command.
  - Results in slow decision-making in role cultures & org less likely to take risks...

![Role Culture Diagram]
Charles Handy on Culture (/4)

**Task Culture:**
- Task is paramount, so power within the team will often shift depending on the mix of the team members and the status of the problem or project.
- Whether culture works depends on team dynamic: With the right mix of skills, personalities and leadership, can be incredibly productive & creative.

Charles Handy on Culture (/5)

**Person Culture:**
- In such organisations workers see themselves as unique & superior to firm.
- The organisation simply exists in order for people to work.
- Such an organisation is really just a collection of individuals who happen to be working for the same organisation.
So, How to Identify Culture?

1. Are there stories or corporate legends that provide examples?
2. What factors continually get in the way?
3. What factors are seen as expediting progress?
4. How are decisions made?
5. Are all employees free to offer opinions or challenge decisions?
6. Is the orientation towards the individual or the group?
7. Whose opinion is valued?
8. Are there any identifiable behaviours that are rewarded or punished?
9. Is there a high tolerance for ambiguity?
10. Does the organisation favour results or following procedure?
11. Is the organisation cautious or will it take risks?
12. Is the emphasis on relationships and social interactions, or on tasks and getting on with the job?

Core Competences

- What is the company really good at?
- World-class organisations have up to five or six core competences that their core products or services are based on.
  - “Core competence is the collective learning of the organisation, especially the capacity to coordinate diverse production skills and integrate streams of technologies. Also a commitment to working across organisational boundaries.”
  - “organising around Strategic Business Units is problematic as they under-invest in core competences, imprison resources and bind innovation” (Prhalad & Hamel)
- Can scale down the idea of a Core Competence to the process level - design processes that play to the strengths of the performers.
Scoping questions

1. What is the primary business objective driving this project?
2. What is the current situation?
3. Is this essentially a business process improvement project?
4. What is the technical or project objective?
5. Which business data will or will not be involved?
6. Organisationally who will be impacted by this?
7. What areas outside the process will be impacted, or will require interfaces?

Scoping questions (/2)

8. Are there other initiatives we should be aware of?
9. What could go wrong?
10. What could go right?
11. Have any significant issues or difficulties arisen?
12. Are there any constraints we need to take into account?
13. Have any important decisions already been made?
14. Have project structure and personnel been identified?
15. Are you really the sponsor?
Some Process Improvement Goals…

• Flexible in meeting the needs of individual customers
• Easier for an entry-level workforce to adopt with little training & support
• Fewer customer interactions
• Absolute auditability and adherence to applicable regulations
• Accessible anytime, anywhere, via any medium
• Easier to standardise and maintain at international locations
• Less time and effort to integrate new suppliers or customers into the process
• More suitable for support by commercial off-the-shelf (COTS) software

Decide on Approach

Have now reached the stage that can decide on Process’ future – n.b. does not necessarily have to be redesigned - five possible courses of action:

1. **Drop/abandon**: Process isn’t needed, or benefit won’t justify the cost. Company could decide to abandon the process rather than reengineer it.
2. **Outsource**: Could be better use of resources for supplier to carry out process. Usually the choice for generic infrastructure activities e.g. cleaning and catering, but increasingly also in areas e.g. billing, help desk, networks, PC support etc.
3. **Leave as is**: The process is fine; the issues were elsewhere, for instance, no one follows the process, or training is needed.
4. **Improve**: Basic process structure is ok, but specific improvements are possible.
5. **Redesign**: The process should be fully redesigned.
SECTION 3.4: UML USE-CASE MODELLING WITH A FEW EXAMPLES

A Use-Case Model for UML Use Case Modelling

- Recall Use-Cases from Step 4 of Sharp & McDermott’s Methodology:
  - how would actors interact with new system?
  - what are main paths thro new WF (don’t show exceptions)?
- UML Use-Case Diagrams describe system functionality horizontally
  - UCDs can show all available system functionality and how these different functions are integrated not just show details of individual system features.
  - UCDs differ fundamentally from e.g. flowcharts by not trying to show the frequency/order systems’ actions/sub-actions should be executed
  - UCDs are a powerful starting point for a project discussion, as can easily identify the main actors involved and the main processes of the system.
- Examine below some graphical examples to revise what you have learned from CA228 Business Systems Analysis
Elements of a UML Use Case Diagram

- **Actor**
  - represents a role an outsider takes on when interacting with business system.
  - e.g. can be a customer, business partner, supplier, or another business system
  - Every actor has a name:

- **Association**
  - shows the relationship between an actor and a business use case.
  - indicates that actor can use a certain functionality of the business system—the *business use case*

- **Business Use Case**
  - describes, from actor’s viewpoint interaction btw actor & business system, (i.e. the functionality of the business system that the actor utilizes)
  - apart from the special use of the business use case as a use case within a business system, no difference between the business use case and a 'normal' use case.

Elements of a UML Use Case Diagram (/2)

- **Include Relationship**
  - a relationship between two business use cases signifying that the business use case on one side to which arrow points is included in the use case on the other side.
  - means that for one functionality that the business system provides, another functionality of the business system is accessed and is *mandatory*.
  - so functionalities accessed repeatedly can be shown as individual business use cases, usable in multiple ways

- **Extend Relationship**
  - similar to include above except that the functionality on the left hand side is complete in itself but that extra functionality is provided by the functionality on the right
  - business system functionality on the right hand side may be accessed and is *optional*

- **Subject**
  - describes a business system that has one or more business use cases attached to it.
  - shown by a rectangle surrounding attached business use cases & tagged with a name.
Example of a UML Use Case Diagram

- Shows UCD with actors: passenger (1), check-in rep (2), as well as the business use cases check-in (3), or express check-in (4).

- Depending on your interest, begin reading with actor or business use case:
  - starting with actor, passenger (1), we see associations (lines) to the two business use cases, check-in (3) and express check-in (4).
  - means passengers go through check-in or express check-in (no luggage).

- UCD doesn’t document any order in which business use cases are conducted
- However order matters for the description and linking of business processes.

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Example of a UML Use Case Diagram (/2)

- Actor check-in rep (2) also has association to check-in (3)
  - means not only passenger, but also their rep them can check in however, UCD can’t show that doesn’t mean they perform check-in together.
  - that the actor check-in rep (2) only has an association to check-in (3) means that at the UML Airport a representative of the passenger cannot perform an express check-in (4)

- So simple UCD can contain quite a lot of information:
  - the business use cases check-in (3) & express check-in (4) each have an include relationship with issuing boarding pass (5) UCDs.
  - both use issuing boarding pass during their own interaction i.e. sometime during check-in boarding pass issued and handed to the passenger or check-in rep.
Another UML Use Case Diagram Example

- A Use-Case Diagram of DCU Assignment Electronic Submission System
  - 2 actors: Student & Module Coordinator both with associations to Assignment Electronic Submission and Discuss Assignment
  - only Module Coordinator has association to Assignment and Plagiarism Check
  - Assignment Electronic Submission, Plagiarism Check and Mark Assignment

References