Business Processes Modelling

MPB (6 cfu, 295AA)

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03 - Examples
Insurance claim example

Sect.1.3 of Workflow Management: Models, Methods, and Systems
An example: insurance claim

1. recording the receipt of the claim
2. establishing the type of the claim
3. checking covering of client's policy
4. checking the premium (payments up to date?)
5. rejection, if 3 or 4 has negative result
6. producing a rejection letter
7. roughly estimate the amount to be paid, if 3 & 4 have positive results
8. appointment of an assessor, if needed
9. revision of the amount offered to the client
10. recording client's reaction
11. assessment of objection: decision to revise 9 or take legal action
12. legal proceedings
13. payment of claim
14. filing and closure of claim
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Some patterns
Sequence

1 recording -> 2 type
Parallel
Choice / Selection

7 estimate

5 rejection?

6 reject letter
Another selection
Iteration

9 revision → 10 reaction → 11 assessment

12 legal proc.
Ambiguity!

Both tasks 3 and 4 are always executed

Task 6 and 7 are possibly executed but not both
Ambiguity!

Both tasks 3 and 4 must be completed before task 5

Task 6 and 13 are possibly executed but not both
Disambiguation

1 recording → 2 type → + → 3 policy → + → 5 rejection? → x → 6 reject letter → x → 13 payment → 14 filing

3 premium → + → 5 rejection?

7 estimate

+ parallel split / join

x choice split / join
1. recording
2. type
3. policy
4. premium
5. rejection?
6. reject letter
7. estimate
8. assessor
9. revision
10. reaction
11. assessment
12. legal proc.
13. payment
14. filing
Business process models are performed in a single organization by definition.

Thus, the **ordering of activities** can be controlled by a **business process management system** as a **centralized** software component run by the organization.

This kind of control is called **orchestration**.
Orchestration

Orchestration is about describing and executing a single viewpoint model.

The analogy is with the conductor who centrally controls the musicians in an orchestra.
A process instance

1. Recording
2. Type
3. Policy
4. Premium
5. Rejection?
6. Reject letter
7. Estimate
8. Assessor
9. Revision
10. Reaction
11. Assessment
12. Legal proc.
13. Payment
14. Filing
Exercise

Travel agency orchestration:
define a series of task for
booking a flight, a hotel and optionally a car, with
the possibility
to change dates,
to cancel the booking,
to confirm the booking.
Then, draw a process diagram relating the tasks.
Buyer & Reseller example

Sect.1.1 of Business Process Management: Concepts, Languages, Architectures
Example: Reseller

We move to BPMN-like syntax

start event

Receive Order

Send Invoice

Receive Payment

Ship Products

Archive Order

end event
Example: Reseller

A **pool** is a rectangle that encloses a business process

(it can be divided in **lanes** to distribute tasks to different actors)
Example: Reseller

A reseller can use the business process model above to configure the business process management system accordingly.

All instances will be executed as specified (after receiving the order, send and ship activities are concurrently executed).
Example: Buyers

Different processes are possible, but... do they all make sense?
Buyer & Reseller

Separately developed processes need to communicate!
Cross-organization interaction

Each business process is enacted by one organization

Business processes can interact with each other

Interacting activities of business processes must be related together
Interacting processes can exchange information (electronic messages, physically transported objects)
Interacting processes

Message flow is represented by dotted arcs

We move to BPMN-like syntax
Choreography

The interactions of a set of business processes are specified in a *process choreography*

**Difference w.r.t. orchestration:**
the absence of a central agent that controls the activities in the business processes involved

For the interaction to be realized correctly, the interacting business processes better be **aware** and agree upon the choreography in advance
Choreography
Choreography

Choreography is about describing a global model (multi-point view)

The analogy is with the dancers who behave autonomously, but follow their parts in the choreography.
Choreography diagrams allow for multiple concrete implementations, with different software support

**Old-fashioned order:** a buyer browses a paper catalogue of a reseller, then fills a postcard and sends it by snail mail and pay by bank transfer

**e-commerce:** a buyer browses an online web catalogue, fills a virtual basket and an electronic form (billing information) and presses the submit button. The goods themselves may be intangible (e-books, music, video, software)
Interaction issues

As said, interacting business processes must be aware and agree upon the choreography.

In such cases, the realization of business processes by participants can change without affecting the overall behaviour.

On the other hand, if the change is not done correctly, then some problems may arise.
Question time

Buyer
- Place Order
- Receive Invoice
- Receive Products
- Settle Invoice

Reseller
- Receive Order
- Receive Invoice
- Send Invoice
- Receive Payment
- Ship Products

Work fine together!
Question time

Still working fine?
Question time

Still working fine?
Exercises

In previous slides, we have seen many variants of business processes for resellers (two) and buyers (four).

Build a “compatibility” matrix with two rows and four columns and mark all the combinations for which some problems may arise during the interaction because activities are not implemented in the expected order.

You are also free to consider other process diagrams, by adding the corresponding rows / columns to the matrix.
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<th></th>
<th>$B_1$</th>
<th>$B_2$</th>
<th>$B_3$</th>
<th>$B_4$</th>
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<td></td>
<td></td>
</tr>
<tr>
<td>$R_2$</td>
<td>ok</td>
<td></td>
<td></td>
<td>no</td>
</tr>
</tbody>
</table>
Exercise

Coffee break choreography:
Draw the process diagram for a vending machine that accepts a coin, then gives the possibility

(1) to get a coffee or
(2) to insert another coin and get either a cappuccino or a tea.

Draw the process diagrams for a compatible butler robot and a "problematic" butler robot.