Modeling Flexible Process Logic

Knut Hinkelmann
Classification of Processes

structured process
• structured process flow
• activities known in advance
• many repetitive elements
• no degree of freedom for people wrt process flow

can be modelled

process flow can partly be structured
• activities partly known in advance
• some repetitive elements
• some degree of freedom for people wrt process flow

partly translated from (Gadatsch 2005, S. 44)

ad hoc process
• process flow cannot be structured – new tasks on the fly
• activities partly known in advance
• few repetitive elements
• very high degree of freedom for people wrt process flow

cannot be modelled
Case Management

Case management is the management of long-lived collaborative processes that require coordination of knowledge, content, correspondence, and resources to achieve an objective or goal. The path of execution cannot be predefined. Human judgment is required in determining how to proceed, and the state of a case can be affected by external events.

- Synonyms for Case Management are
  - Adaptive Case Management (ACM)
  - Dynamic Case Management (DCM)

(McCauley 2010)
Case Management Processes: Examples

Case management processes: common in many industry segments, where activities and documents required depend on the circumstances of each case

♦ Benefits Administration
  ● Examples: welfare assistance, student financial aid, grants programs, disability benefits

♦ Underwriting
  ● Examples: commercial lending, life and disability insurance.

♦ Project Management
  ● Examples: launch of a new product/service, major IT system upgrade

♦ Dispute Resolution
  ● Example: customer demands a refund

(Silver 2011, p. 88f)
Case Management as Part of Routine Work

- Case Management can also occur in routine processes
- Examples
  - Distinguishing between routine and non-routine cases, e.g. for credit assessment, claims management
  - Doing something extra for the customer, e.g. offering an insurance product during claims management
  - Dispute resolution: Processing payments is a conventional structured process, but when a customer disputes a charge or demands a refund, case management is usually required
**Structured Business Processes vs. Case Management**

- **Structured BPM focuses on activities in a flow**
  - All the possible paths and permutations are defined in advance
  - As an activity occurs, the state of the process changes.

- **ACM focuses on events and outcomes**
  - Activities to reach completion cannot be predetermined completely
  - Events, content, human judgment, and business rules determine which activities need to be performed – either picked from a predefined menu or conceived on the fly

*(Palmer 2011)*
Content is Central for Case Management

- At the start, when an event occurs, a case file is opened.
- Activities create information and add it to the case.
- Ability is required to jump forward, jump backward, re-do or otherwise perform work in a sequence that cannot be determined in advance.
- The state of the Case is determined by the content within the case, not in which task the case is at any time.

Source: Nathaniel Palmer
ACM $\subseteq$ BPM
Case File

- The Case File is a virtual folder ultimately providing the permanent record of a case.

- The case folder provides overall coordination of the case as a whole. Just as you cannot predefine all the tasks needed to complete the case, you cannot specify in advance all of the documents required.

Source: Nathaniel Palmer
Differences of ACM from Conventional BPM

- Case Information Managed as Documents
  - case-related information is received and managed in the form of business documents rather than structured data

- Case Activities Added at Runtime
  - Some tasks and processes may be defined in advance, but ad hoc tasks—whether selected from a pre-defined menu or defined from scratch—are a critical distinguishing element

- Case Advancement through Events
  - External events include messages whose contents are added to the case folder, Internal events include assignments and business rule to create and assign tasks.

- Case Context through Shared Case Folder
  - All case information, which is required for human judgment about advancement or resolution of the case, is typically available in the form of a shared case folder.
Example of a Case Management System: Case 360
Modeling Business Processes

**Structured Process**
- BPMN

**Case**
- CMMN

**Ad Hoc Process**
- Process flow cannot be structured – new tasks on the fly
- Activities partly known in advance
- Few repetitive elements
- Very high degree of freedom for people wrt process flow

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Modeling Flexible Process Logic
Execution Procedure of Structured Processes - BPMN

- Follow sequence flow
- As soon as a task has a token
  - for human tasks: Add it to the worklist
  - for automated tasks: execute immediately
- For tasks on worklist
  - Human picks the task for execution
- Finishing a task
  - Tasks is deleted from worklist
  - Token moves to next item(s)
- Stop if
  - all started tasks are finished and
  - no task is in a worklist
CMMN
Case Management Model and Notation
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Focus of CMMN is on Modelling Flexible Process Logic

Two kinds of tasks

- **Structured process part:** Tasks which have to be executed if
  - events occur and/or
  - conditions are given

- **Flexible process part:** (Discretionary) tasks which can be executed if
  - they are chosen by a worker
  - they make sense
Design Time vs Run Time = Modeling vs Planning

- A Case has two distinct phases: design-time and run-time
  - **Design-time:** Business analysts define
    - Tasks of pre-defined segments
    - “discretionary” Tasks that are additionally available to the Case worker
  - **Run-time:** Case workers execute the plan
    - performing Tasks based on control flow criteria,
    - adding discretionary Tasks if needed.

(CMMN 1.0, p. 5f)
Execution Procedure of Case Management - CMMN

- There is no predefined sequence flow; tasks have Sentries (event and conditions)
- When sentry evaluates to «true»
  - for human tasks: add task to worklist
  - for automated tasks: execute immediately
- For tasks on worklist
  - Human picks the task for execution
  - Associated discretionary tasks are added to the worklist
- Finishing a task
  - Task is deleted from worklist
  - associated discretionary tasks are deleted from worklist
  - Sentries are checked if true
- Stop if
  - all started tasks are finished and
  - no non-discretionary task is in a worklist