BPMN - BUSINESS PROCESS MODEL AND NOTATION

CSC100 Introduction to programming in C/C++ (Spring 2024)

1 README

- In this section of the course, we go beyond simple statements and turn to program flow and evaluation of logical conditions
- This section follows chapter 3 in Davenport/Vine (2015) and chapters 4 and 5 in King (2008)
- Practice workbooks, input files and PDF solution files in GitHub

2 Process models

- Understand what a process manager (software) is and does
- Learn the basics of Business Process Model and Notation (BPMN)
- Learn how to create simple models in BPMN
- Apply modeling skills to creating pseudocode models
- Adding Pseudocode/BPMN models to future programming assignments will give you bonus points (5 extra points per assignment)

3 Overview

- Flowcharts are popular among computing analysts and programmers
- Flowcharts are a special case of **process models**
- Process modeling is a key 21st century skill, because **process** is the central paradigm of modern work organization

- Rather than use flowcharts, we use BPMN - Business Process Model and Notation - see figure below for an overview of the whole language (you can get this poster at SAP Signavio).

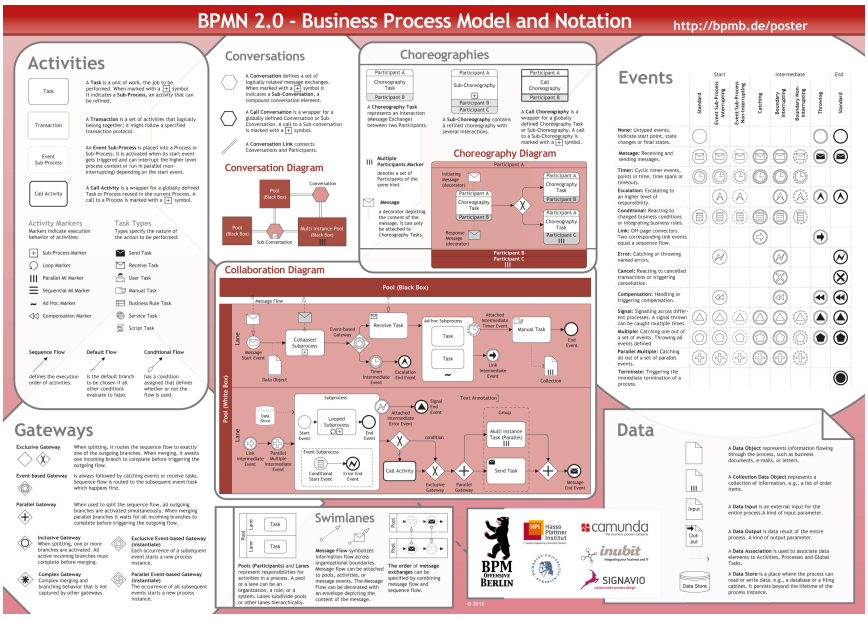

Figure 1: (Free) BPMN 2.0 poster from SAP Signavio

4 BPMN platform - extended example

- We use `bpmn.io` for free process modeling.
- Example process:
  1. start with a (named) **pool.**
  2. **name** the pool according to the process owner (e.g. "Programmer").
  3. begin the pool with a **start** event, e.g. **Start**.
  4. append a **task** or an **event** (e.g. an **end** event)
  5. **name** all elements of the process (including flow and gateways)
  6. model decisions as **gateway** (and rejoin the flow)
  7. model **external** participants as (empty) pools

8. connect pools with **message** flow
9. connect elements inside a pool with **sequence** flow

- Example diagram for the following process:

```
// Process model for the creation/storing of a process model

Begin
   - Create process model -- note: use bpmn.io
   - Decide to save model as SVG image or as XML file
   - Store model as .svg or as .bpmn file on PC
End
```

- Implementation:

1. Process owner = "Programmer"
2. Start process
3. First task = "Create process model"
4. Gateway = "Save process model as image?"
   - YES: "Save model as image file"
   - NO: "Save model as BPMN file"
5. Store model as SVG image or as BPMN model file
6. End process

- Final result:

[width=.9]../img/bpmn$_{m}odel$

5 Points to remember

- Every model needs a pool = process owner
- Conditions/decisions become gateways
- Use active sentences for tasks ("Make model")
- Use status description for events ("Process starts")
- When the flow is split, it must be rejoined
- All elements must be named

- Do not change the size of elements
- All elements can be "overloaded"

6 BPMN elements

- Roles (pools, lanes, participants)
- Tasks (things to do)
- Events (status)
- Flow (between tasks or events)
- Gateways (decision points, condition check)

7 Let's practice

- Download the practice file in the GitHub repo: tinyurl.com/bpmn-org

8 References

- Camunda (2023). Web-based tooling for BPMN, DMN and Forms. URL: bpmn.io.
- Davenport/Vine (2015) C Programming for the Absolute Beginner (3e). Cengage Learning.
- GVSUmath (Aug 10, 2012). Proving Logical Equivalences without Truth Tables. URL: youtu.be/iPbLzl2kMHA.
- Kernighan/Ritchie (1978). The C Programming Language (1st). Prentice Hall.
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