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Title of the project

by

Name

A Semestral Project for
NI-MEP - Modelling of Enterprise Processes

Prague, September 2025

The objective of this semestral project is to analyze a selected domain in its current, as-is state—i.e., how the process functions today. Based on this analysis, you will propose improvements by designing a software-supported to-be process that enhances efficiency, smoothness, and overall performance. Finally, you will develop a prototype of a software system that implements and supports the proposed to-be process.

Abstract

This section should serve as an executive summary of your project. Briefly describe what you accomplished, emphasizing how your work advances the current state of the art.

Keywords:
DEMO methodology, BPMN model, process execution

License

Contents

Organization Essence Revealing (As-Is)

The goals of this chapter are to perform an Organisation Essence Revealing (OER) analysis as described in [1, 2]. We will only do the following steps:

1. Provide the domain description and perform the OER analysis in order to identify transactions.
   (a) Write the project domain description into this document. The domain should have at least 5 ontological transactions. Each transaction needs to have defined at least 5 act.
   (b) Perform the OER analysis and find ontological acts, informational acts and documental acts.
   (c) Identify all transaction kinds and explicitly highlight them in the text, including their identification (preferably numerical) and the specific ontological act involved in the transaction. For example, [TK1/rq] indicates that the ontological act is a *request* belonging to *transaction kind no. 1*.
2. Create an extended Transaction Result Table (e-TRT). Map the identified ontological acts from Step 2 to their corresponding transactions and specific transaction acts, organizing them into coherent and complete transaction structures. Refer to table 1.1 for an example. For each transaction, also provide a properly formulated name, its resulting product, and the (DEMO) actor roles of both the initiator and executor. If any transaction act lacks a corresponding ontological act identified in the domain description, it may be left empty—however, indicate explicitly that it is missing and verify carefully that this is indeed the case.
3. Create a Subject-Actor Table to clearly distinguish between domain-specific roles and their corresponding DEMO actor roles within the transactions. See the table 1.2.
4. Produce diagrams, all needs to be in English.
   (a) Produce the Coordination Structure Diagram (CSD) at the ontological level only, see the fig. 1.1.

(b) Produce the Process Structure Diagram (PSD), see the fig. 1.2.

(c) Produce the Object Fact Diagram (OFD). The result should be detailed enough for someone to derive a database model from it. Ensure it includes at least 5 entities and 15 attributes. See the fig. 1.3.

5. Summarize your modeling thoughts and revelations.

Correct models are not created on the first iteration, one must go through the steps many times, combine and split transactions to achieve the final result.
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1.1 OER Step 1: Distinguishing Performa-Informa-Forma

Legend:

- Ontological Act [Transaction Kind/Act type]
- Informational Act
- Documental Act

The process description of the Volley Case and it's OER analysis was taken from the Enterprise Ontology book [2]

§1 Preliminary Rules

(1) One can become member of the tennis club Volley[TK1] by sending a letter[TK1/rq] to the club by postal mail. In the letter one has to mention one's surname and first name, birth date, gender, telephone number, and postal mail address (street, house number, zip code, and town). Adam, the administrator of Volley, empties the mailbox daily and checks whether the information provided is complete. If not, he makes a telephone call to the sender in order to complete the data. Once a letter is complete, Adam writes an incoming mail number and the date on the letter, records the letter in the letter book, and puts it in a folder.

(2) Every Wednesday evening, Adam takes the folder to Eve, the secretary of Volley. He also takes the member register with him. If Eve decides that an applicant can become member of Volley[TK1/pm], she stamps 'new member' on the letter and writes the date below it. She then hands the letter to Adam in order to add the new member to the member register. This is a book with numbered lines. Each new member is entered on a new line. The line number is the number by which the new member is referenced in the administration. Next, Eve calculates the fee that the new member has to pay [TK2] for the remaining part of the calendar year. She asks Adam for the

annual fee, as decided at the general assembly [TK out of scope], which Adam has recorded on a sheet of paper. Then, she asks Adam to write down the amount in the member register.

(3) If Eve does not allow an applicant to become member[TK1/dc] (e.g. because he or she is too young or because the maximum number of members has been reached), Adam will send a letter[TK2/rq] in which he explains why the applicant cannot (yet) become member of Volley.

§2 Some Other Rules

(1) When all applications are processed, Adam takes the letters and the member register home and prepares an invoice to all new members for the payment of the first fee[TK2]. He sends these invoices[TK2/rq] by postal mail. Payments have to be performed by bank transfers.

(2) As soon as a bank statement is received[TK2/da], Adam prints a card on which the member number, the starting date, the name, the date of birth, the gender, and the residence are mentioned. The card is sent[TK1/da] to the new member by postal mail.

1.2 OER Step 2: Identifying Transaction Kinds

Table 1.1: Extended Transaction Result Table

Transaction	Membership Starting (TK1)	Membership Paying (TK2)
Product	membership is started	the first fee of membership is paid
Initiator	Aspirant Member (AR1)	Membership Starter (AR2)
Executor	Membership Starter (AR2)	Membership Payer (AR3)
Request	Sending a letter (§1/1)	Sends the invoices (§2/1)
Promise	Application decision (§1/2)	Not Specified
Decline	Does not allow an applicant to become member (§1/3)	Not Specified
Declare	The card is sent to the member (§2/2)	A bank statement is received (§2/2)
Reject	Not Specified	Not Specified
Accept	Not Specified	Not Specified
Revoke Request	Not Specified	Not Specified
Revoke Promise	Not Specified	Not Specified
Revoke Declare	Not Specified	Not Specified
Revoke Accept	Not Specified	Not Specified

1.3 OER Step 2: Identifying Actor Roles

Table 1.2: Subject Actor Table

	Aspirant Member (AR1)	Membership Starter (AR2)	Membership Payer (AR3)
Administrator		X	
Customer	X		X

1.4 OER Step 3: Producing the diagrams

1.4.1 Coordination Structure Diagram

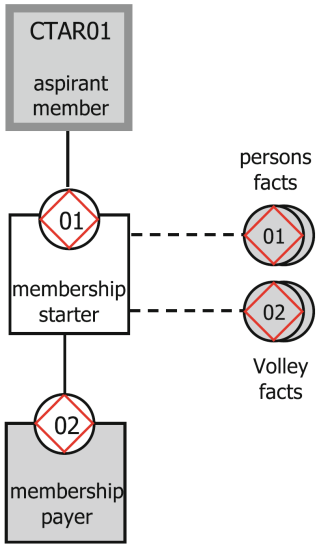

Figure 1.1: A CSD Model of Volley [2]

1.4.2 Process Structure Diagram

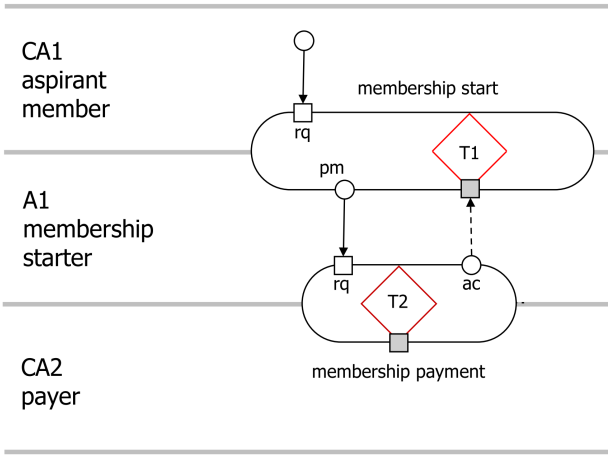

Figure 1.2: A PSD Model of Volley [2]

1.4.3 Object Fact Diagram

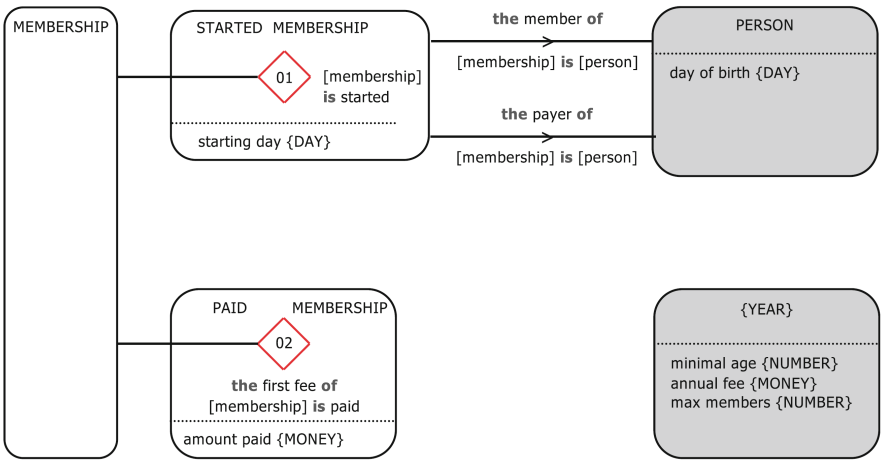

Figure 1.3: An Object Fact Diagram of Volley [2]

1.5 Summary

Summarize the analysis

Digitalization Analysis (To-Be)

This is the most critical phase for IT entrepreneurs, where real value is created. Now that we understand the domain, we can propose innovative software solutions to support and enhance the process.

1. Create a To-Be BPMN Level 2 model.
   (a) At least 20 BPMN activities.
   (b) You are free to introduce changes — the future process may differ from the current (As-Is) process and may include hypothetical improvements.
2. Create forms description for all the BPMN activities.
   (a) Provide a textual description of each form, including:

2.1 Analytical To-Be Models

2.2 Forms

2.3 Summary

Process Execution

In this final phase, software developers take over to implement the proposed solution.

i. Create an executable BPMN model (reuse the one created in) using Camunda Modeler. Refer to the Camunda tutorial for guidance.
   A. The application must support different user roles. Define these roles and assign BPMN activities accordingly, based on responsibilities within the domain.
   B. Each process step should include a form with appropriate validations as per the specification. Be creative! While advanced UI is welcome, simple text fields are also acceptable.
   C. Record a short walkthrough video demonstrating the process with multiple simulated participants. (Maximum duration: 5 minutes)

ii. Present the solution to the customer. Prepare a short, compelling presentation showcasing the To-Be process supported by your software solution. Imagine you are pitching to a customer who has invested 100,000 EUR in the project. Use your own voice. (Maximum duration: 2 minutes)

3.1 Walkthrough Presentation

3.2 Sales Presentation

Bibliography

[1] Jan Dietz. *The essence of organisation : an introduction to enterprise engineering*. Sapio Enterprise Engineering, Netherlands, 2015.

[2] Jan Dietz. *Enterprise ontology a human-centric approach to understanding the essence of organisation*. Springer, Cham, 2020.