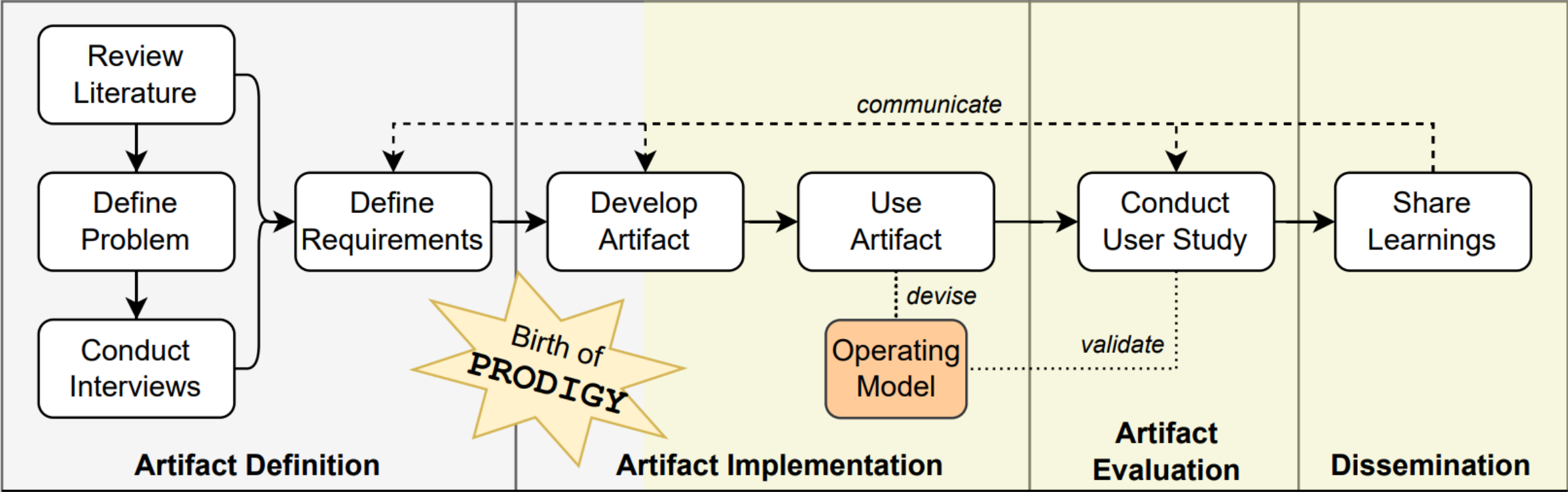


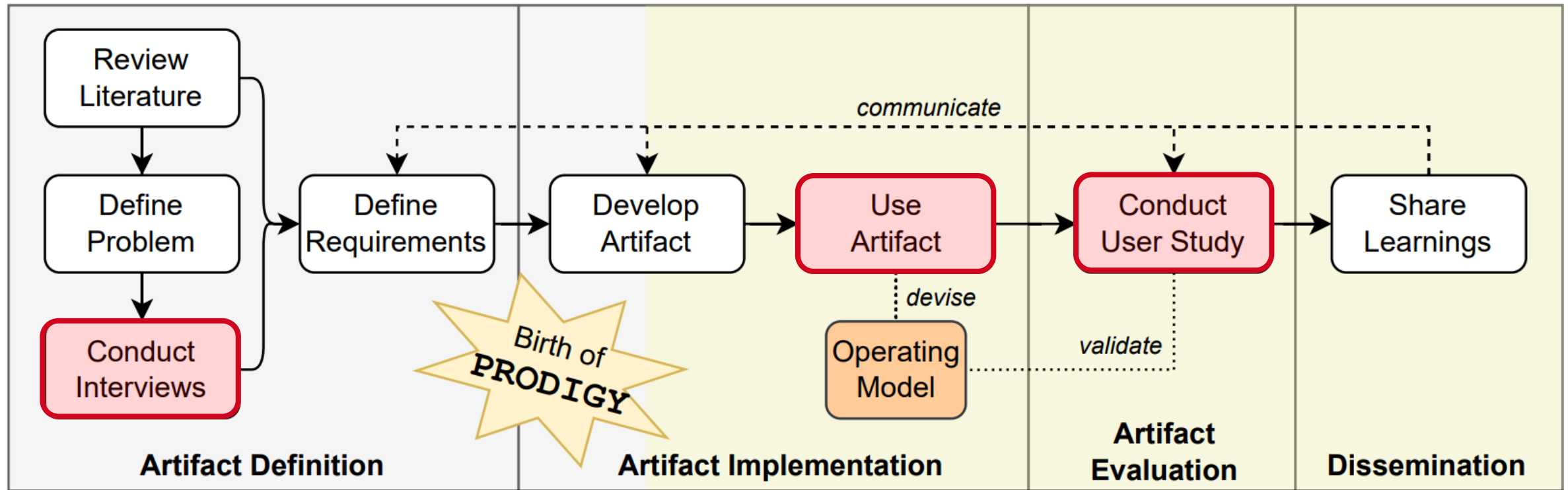
# LLM4PM: A case study on using Large Language Models for Process Modeling in Enterprise Organizations

Clara Ziche and Giovanni Apruzzese  
University of Liechtenstein

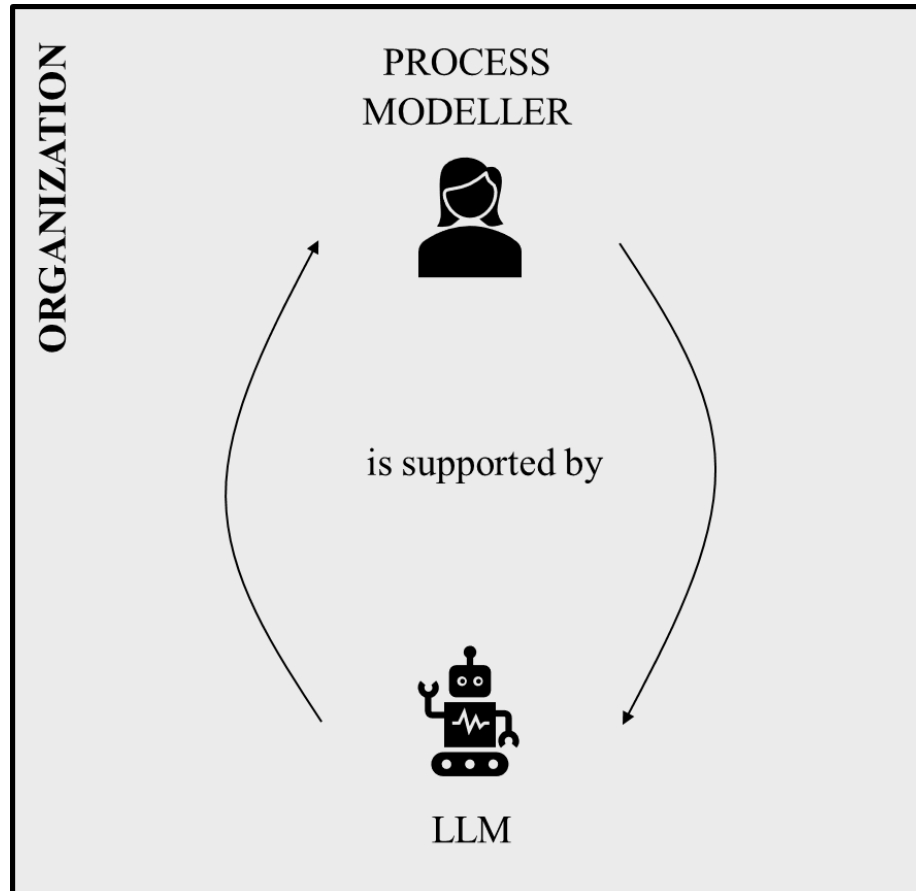
# OUR RESEARCH METHODOLOGY



# OUR RESEARCH METHODOLOGY



# WHAT IS OUR POINT OF FOCUS?



# PARTNERS OF OUR USER STUDY

#	Job Title	Functional Area	Location
1	Business Process Excellence Manager	Corporate	Schaan, FL
2	Global Process Manager	Communications	Schaan, FL
3	Business Process Excellence Manager	Quality Management	Schaan, FL
4	Business Process Excellence Senior Manager	Corporate	Schaan, FL
5	Business Process Excellence Expert	Corporate	Schaan, FL
6	Regional Process Manager	Customer Service	Plano, US
7	Regional Process Manager	Logistics	Kaufering, GER
8	Business Process Excellence Lead	Corporate	Schaan, FL
9	Global Process Manager	Repair	Schaan, FL
10	Global Process Manager	Repair	Schaan, FL

# PRELIMINARY INTERVIEWS

11. What challenges or frustrations do you experience when modelling processes? Please clearly specify some key-terms that can be used to identify these.

14. How helpful is existing documentation usually when you model processes?  
(10: extremely helpful; 1: not helpful at all)

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

16. How much time do you spend **searching for** existing information or documentation before modelling a process?

# RESULTS FROM THE PRELIMINARY INTERVIEWS

- **Process modellers' routines and their challenges**  
→ What are the frustrations of process modellers? Where do they need support?
- **Helpfulness of existing documentation**  
→ Is existing documentation important in LLM-supported process modelling?
- **Process modellers' concerns and requirements**  
→ What features should our LLM-based artifact have?

**2 Design Objectives**

**9 Chatbot Functionalities**

# DESIGN OBJECTIVES FOR A LLM-BASED CHATBOT THAT SUPPORTS PROCESS MODELLERS

**1:** The chatbot should support process modellers in creating BPMN models. In doing so, the chatbot should hint at the larger picture, i.e., **emphasize and guide in purpose, usage, and value creation of the resulting models.**

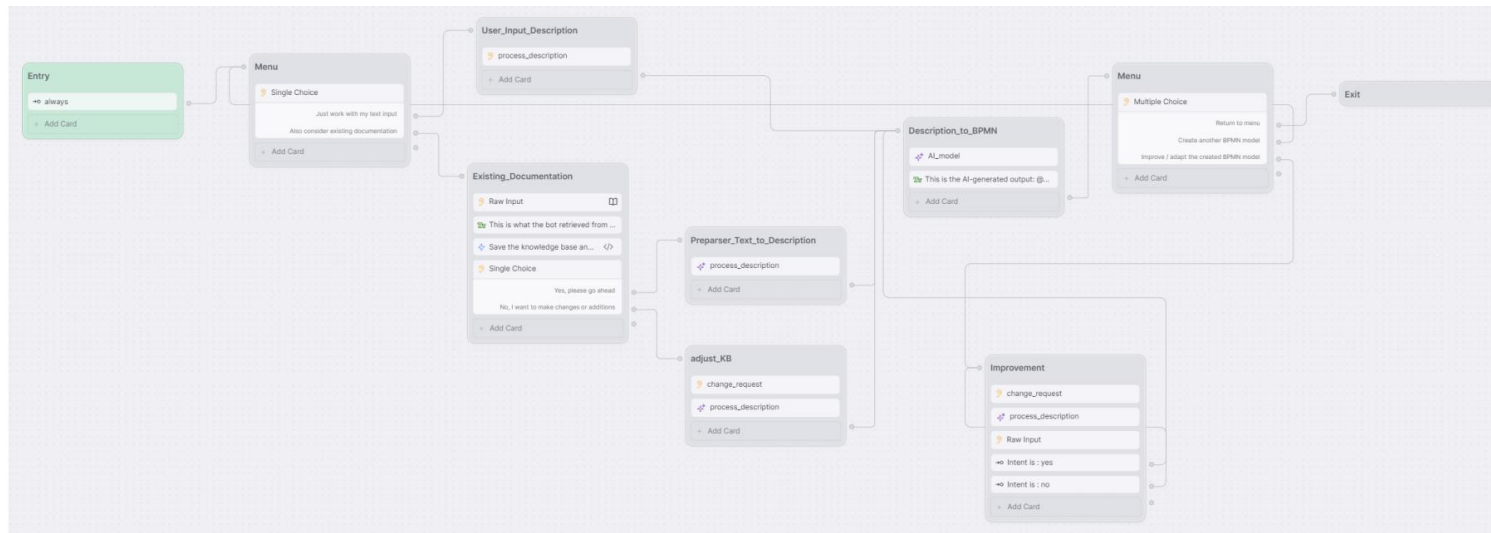
**2:** The chatbot should be able to **access and utilize existing documentation**, and hence be aware of organizational specifics. Such knowledge should drive the formulation of the output, which will be tailored to the organization.

1. Process Modelling Advisor & Planner
2. BPMN Wording Support
3. Process Knowledge Extractor
4. Next Element Recommender
5. BPMN Template Generator
6. Process Modelling Guide
7. Process Model Creator
8. Modelling Conventions Navigator
9. Human Support Request Receiver



# RAPID IMPLEMENTATION WITH BOTPRESS WORKFLOWS AND BOTPRESS AI TASKS

- „most intuitive“ low-code environment: Botpress Studio
- „cheapest“ available LLM: GPT-3.5 Turbo
- „simplest“ customization option: few-shot prompting
- „built-in“ retrieval-augmented generation with knowledge base



Task Instructions

Task Input

Example Pairs

Example Input #1


Desired Output #1

Example Input #2


Desired Output #2

Example Input #3










Desired Output #3


**PRODIGY**
↻ ×


Process Modelling Guidance for You



**PRODIGY**

-  Help me formulate BPMN labels
-  Help me motivate, scope & plan my modelling activities
-  Extract process knowledge from existing documentation
-  Recommend a next element for my unfinished BPMN model
-  **Generate a BPMN template from scratch**
-  Guide me through an entire modelling session
-  Create a BPMN model from text input
-  Answer questions about BPE or our modelling guidelines
-  I need help from a human


Chat with PRODIGY


 For creating the process model, should we also consider existing documentation in the knowledge base or should we solely work with your text input?

Just work with my text input

Also consider existing documentation

Just work with my text input


 Please describe your process in detail.

My process starts when I receive an application for admission. First, I check the completeness of this document. If the application is incomplete, I need to send a request for clarification back to the applicant. Otherwise, I forward it to the academic committee. I then receive a response from the academic committee which can be either of the below:

- A notification of acceptance from the academic committee. In this case, I prepare a letter of offer and send it to the applicant via post to collect his or her signature. Most of the times, I receive a signed offer back from the applicant, but sometimes I don't.
- A notification of rejection. In this case, I send a rejection letter to the applicant via

**BPMN Sketch Miner** | Sketch | Tutorial | Examples | Help | Feedback

Layout: ↓ → | Zoom: 1:1 **Fit** | Share: Link | Export: SVG PNG BPMN

Receive application for admission  
Check completeness of document  
Incomplete application  
Send request for clarification

Receive application for admission  
Check completeness of document  
Complete application  
Forward to academic committee  
Receive response from academic committee  
Notification of acceptance  
Prepare letter of offer  
Send offer to applicant via post  
Receive signed offer

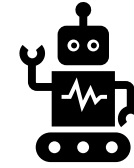
Receive application for admission  
Check completeness of document  
Complete application  
Forward to academic committee  
Receive response from academic committee  
Notification of acceptance  
Prepare letter of offer  
Send offer to applicant via post  
Offer not signed

Receive application for admission  
Check completeness of document  
Complete application  
Forward to academic committee  
Receive response from academic committee  
Notification of rejection  
Send rejection letter to applicant via post

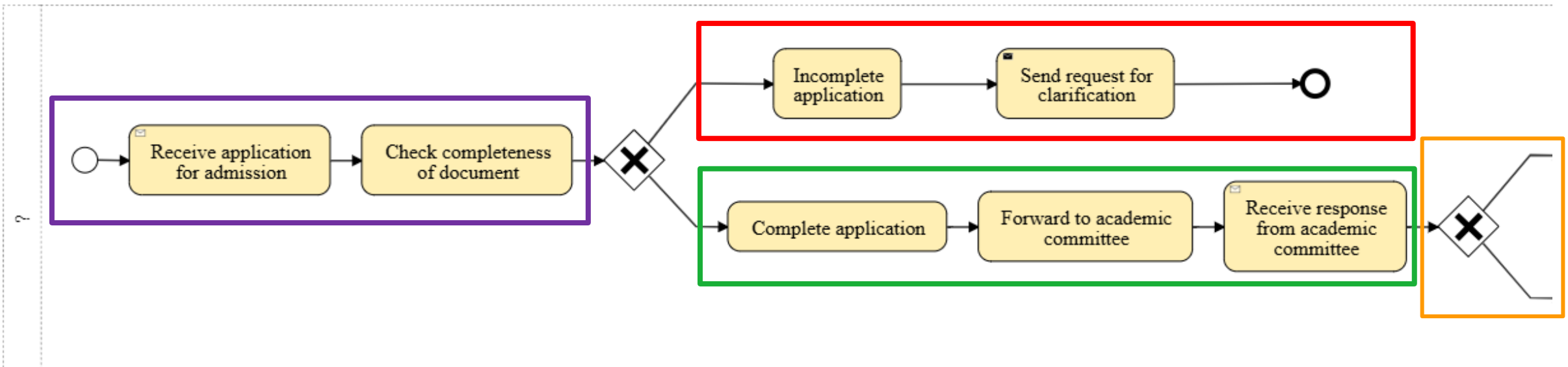
```

graph LR
    Start(( )) --> A[Receive application for admission]
    A --> B[Check completeness of document]
    B --> C{ }
    C --> D[Incomplete application]
    C --> E[Complete application]
    D --> F[Send request for clarification]
    F --> Start
    E --> G[Forward to academic committee]
    G --> H[Receive response from academic committee]
    H --> I{ }
    I --> J[Notification of rejection]
    I --> K[Notification of acceptance]
    J --> L[Send rejection letter to applicant via post]
    L --> Start
    K --> M[Prepare letter of offer]
    M --> N[Send offer to applicant via post]
    N --> O{ }
    O --> P[Receive signed offer]
    O --> Q[Offer not signed]
    P --> Start
    Q --> Start
    
```

My process starts when I receive an application for admission. First, I check the completeness of this document. **If the application is incomplete, I need to send a request for clarification back to the applicant.** Otherwise, I forward it to the academic committee. I then receive a response from the academic committee which can be either of the below: ...



- Receive application for admission
- Check completeness of document
- **Incomplete application**
- **Send request for clarification**
- Receive application for admission
- Check completeness of document
- **Complete application**
- **Forward to academic committee**
- **Receive response from academic committee**
- ...



# TEMPLATE CREATOR: GENERATE A BPMN TEMPLATE FROM SCRATCH

## Process Modeller's Prompt

customer complaint handling  
process

[Outcome]

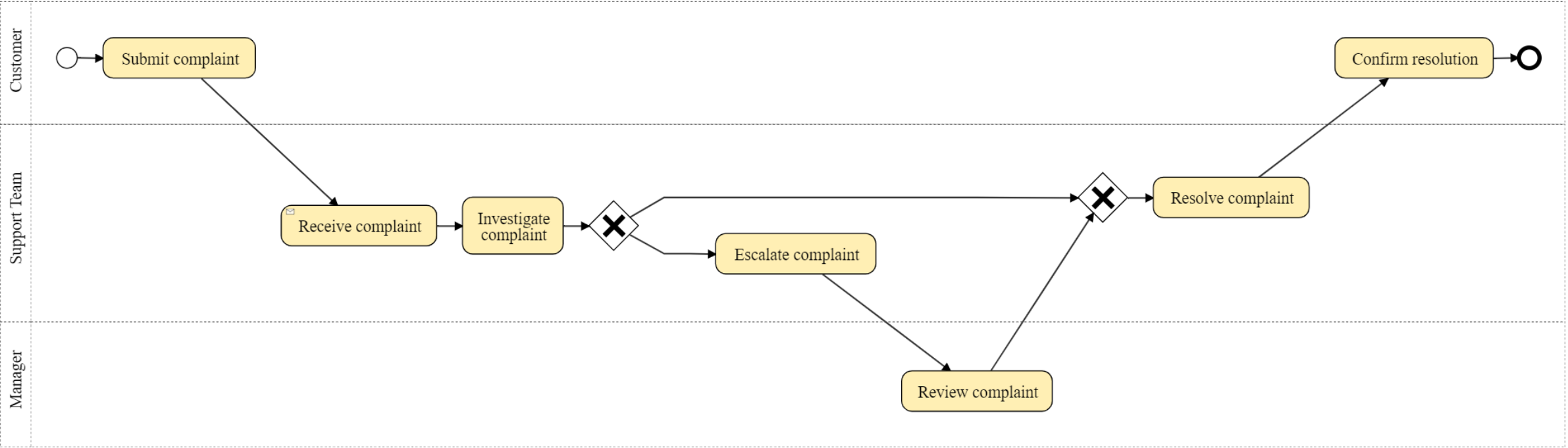
complaint resolved

## PRODIGY Output

```
Customer: Submit complaint
Support Team: Receive complaint
Investigate complaint
Resolve complaint
Customer: Confirm resolution
```

```
Customer: Submit complaint
Support Team: Receive complaint
Investigate complaint
Escalate complaint
Manager: Review complaint
Resolve complaint
Customer: Confirm resolution
```

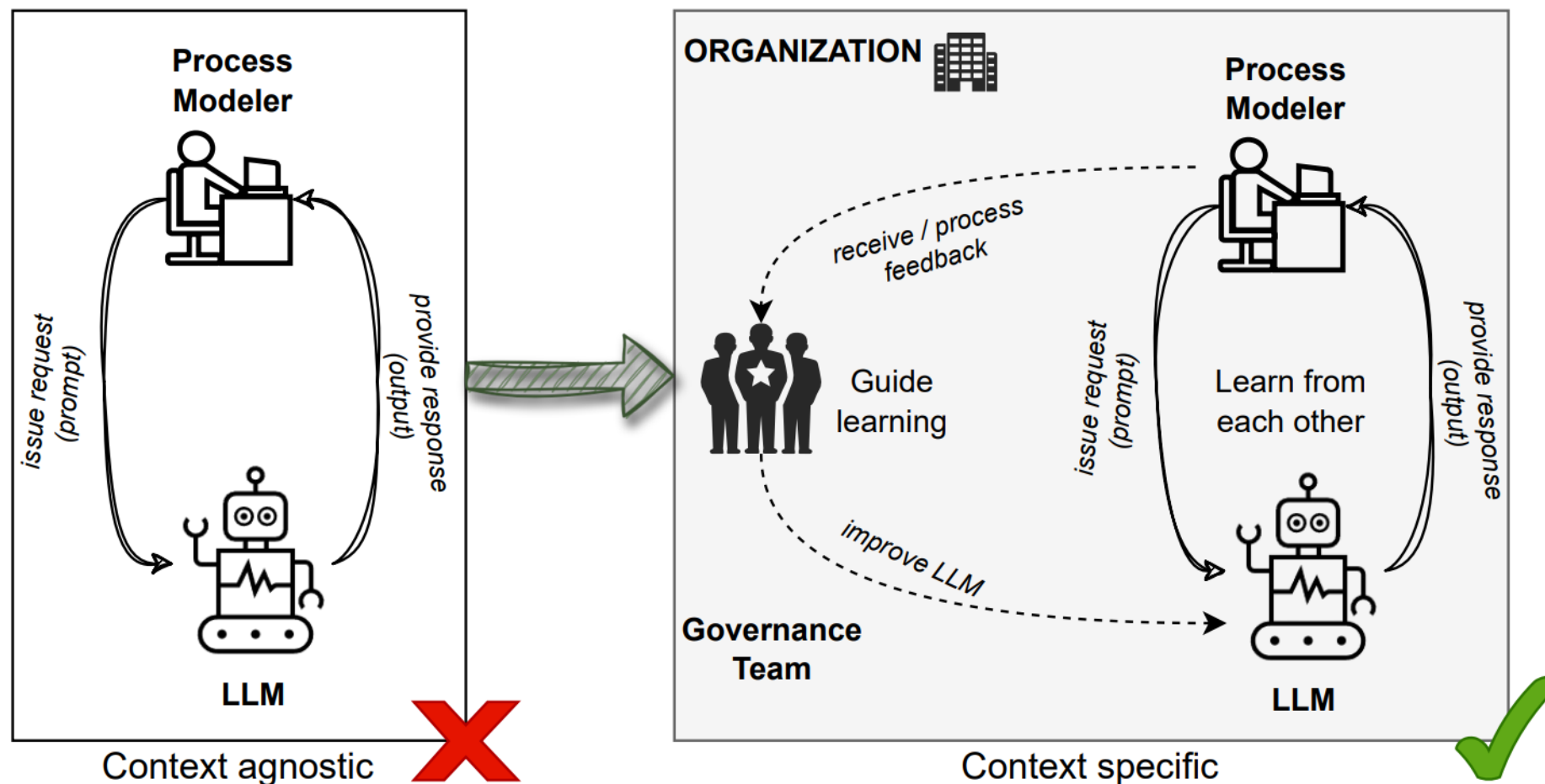
# BPMN SKETCH MINER VISUALIZATION



# EVALUATION INTERVIEWS

2. Let's try all features one by one. Please comment on your steps and thoughts as we go along.
10. Which of your improvement hopes are **not** fulfilled by the chatbot?
13. How often would you use PRODIGY?
14. What would you use PRODIGY for?
15. Please state your opinion on this statement:  
"Using PRODIGY would enable me to accomplish process modelling tasks **more quickly**."

# THE MORE CONTEXT AN LLM IS ABLE (AND ALLOWED) TO UTILIZE, THE MORE USEFUL IT WILL BECOME IN THE ORGANIZATION







# THANK YOU!

Clara.Ziche@oebb.at

Giovanni.Apruzzese@uni.li



# BACKUP

■ Extremely unhelpful  
 ■ Somewhat unhelpful  
 ■ Neither helpful nor unhelpful  
 ■ Somewhat helpful  
 ■ Extremely helpful

**Text-to-Process Model**

- Process Modelling Advisor & Planner
- BPMN Wording Support
- Process Knowledge Extractor
- Next Element Recommender
- BPMN Template Generator
- Process Modelling Guide
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