

Sapienza Università di Roma

Process Management and Mining

A.A. 2026/2027

Guidelines for the projects

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Last update : 23/09/2026

General Information

- ▶ The **project** can be conducted in groups of 2-4 students, or – in exceptional cases – individually.
 - It can be done on specific dates set by the teacher or, preferably, online by requesting an appointment with the teacher.
 - It **can not** be presented during the exam dates.

Project

- ▶ Students are required to propose their **own project ideas**.
 - To proceed, you must send an email to the teacher requesting validation of your idea and formal assignment of the project.
 - Do not begin working on the project until it has been officially assigned.
- ▶ The project must cover the phases of process (1) modeling (2) simulation (3) RPA (4) mining.
- ▶ Projects involve applying the tools explored during the course to one or more realistic case studies.
- ▶ A **presentation** of the project (possibly performed with slides) is required. **Estimated duration: 15 minutes**.
- ▶ The presentation should also include a **working demo** of the developed project, performed in front of the teacher.

1. Modeling phase

slides: *Process Modeling with BPMN*

- ▶ Once the description of a procedure is validated by the teacher, students can start modeling the associated process model in BPMN.
- ▶ The use of editors such as [BPMN.io](https://bpmn.io) or [Signavio](https://signavio.com) is highly recommended.
- ▶ An appropriate model should consist of:
 - 2 or 3 pools.
 - the **process model of a single pool** and the message exchanged with the other pools (considered as black-boxes).
 - around **30 flow objects** (events, gateways, activities).
 - only the **relevant business objects** for the process, if any.
 - **At least an exceptional case** to be modeled with error/message/timer events or with an event sub-process.

2. Simulation phase

slides: *Process Analysis*

- ▶ Once the BPMN process model is complete, the student can use a simulation tool (such as [Signavio](#) or [BIMP](#)) to run simulations by configuring a specific scenario:
 - Processing times of activities
 - Conditional branching probabilities
 - Arrival rate of process instances and probability distribution
 - Resource classes
 - Name and size of the resource class (how many resources belong to it)
 - Cost per time unit of a resource in the class
 - Availability of the class (working calendar for employees)
 - Assignment of activities to resource classes

3. Robotic Process Automation phase

slides: *RPA and UiPath*

Starting from the process model in BPMN, select **two different tasks** that can be emulated using a RPA tool ([UiPath](#) is recommended).

- ▶ Identify the main user interface (UI) actions required to emulate the task on the UI of a PC.
- ▶ Use UiPath to model the flowchart representing the concrete behaviour of the activity in terms of UI actions.
- ▶ Generate a SW robot that emulates the execution of the routine underlying the flowchart.
- ▶ Define a short example to show the feasibility of your SW robot.

4. Mining phase

slides: *Process Mining*

- ▶ Finally, starting again from the process model used for the simulation phase; students can generate an event log of the process (1000 traces are enough).
 - The generation can be performed using tools like [BIMP](#)
 - To use BIMP, export your process in the «BPMN» format using BPMN.io
- ▶ Once generated the event log, the students will run:
 - [DISCO](#) (or similar tools), which helps to describe the proper behavior of the process.
 - At least two among the discovery algorithms available on ProM, to obtain a Petri Net version of the model (in “PNML” format).
 - The trace aligner on ProM, to identify the deviations between the model discovered with the discovery algorithms and the event log.