

3 Lecture 2

3.1 Exercise 1: Setting up your environment

Presentation from instructors about GitHub template, GitHub Actions, and general recommendations.

Deliverables:

- Each group has a GitHub repository with all group members as collaborators
- Your pipeline should run successfully, and generate the artifacts needed for the final hand-in

3.2 Exercise 2: Define Use Cases

Objective:

The goal of this exercise is to develop a deeper understanding of the case presented in the exam PowerPoint (see Lecture 1). You are to identify use cases and make assumptions based on the given information.

Tasks:

- *Examine the slides:* Based on the case study and requirements presented in the exam PowerPoint, list details that might be relevant when defining use cases.
- *List Assumptions:* Identify and enumerate any assumptions you make during your analysis. These could include:
 - Company details like size, products, departments, etc.
 - Scale, such as the number of sensors, actuators, and production facilities involved.
 - Challenges that the system may face.
- *Other Considerations:* Feel free to list any other considerations or variables that may affect the software architecture or use cases.
- *Define use cases:* Create a list of use cases for your system. It is better to list few well thought-out use cases that implies architecture relevant considerations than a long list of trivial use cases.

Example Use Case Format:

Use Case Name: Schedule Production Run *Actors:* Production Manager, Production Scheduler *Preconditions:* A verified production order exists. *Steps:*

1. Production Manager logs into the production software.
2. Production Manager selects the "Schedule Production Run" option.
3. Production Scheduler fetches available time slots and resources.
4. Production Manager selects appropriate time slot and resources.
5. Production Scheduler confirms the schedule and notifies related components.

Postconditions: A production run is scheduled, and all affected components are notified.

Deliverables:

- A document outlining all the identified use cases.
- A list of assumptions made, backed with justifications.

Assessment Criteria:

- Completeness and depth of use cases identified.
- Rationality behind listed assumptions.

3.3 Exercise 3: Identifying systems and subsystems

Objective:

The primary aim of this exercise is to explore the architecture of the Industry 4.0 production domain, as described in the course context. Specifically, you are asked to identify different systems and their comprising subsystems. Understanding these divisions will help you grasp how these units interact to fulfill the overall system requirements.

Tasks:

- *Examine the Context:* Based on the course context, production system requirements, and your use cases, note down details that could be relevant when defining systems and their respective subsystems. For example, what components need to work 24/7? Which parts need to be continuously deployable?
- *Identify Systems and Subsystems:* Evaluate and choose a method for system and subsystem communication.
 - Enumerate at least 3 primary systems that constitute the Industry 4.0 production domain (e.g., Production Management System, Supply Chain Management System, etc.).
 - For each primary system, identify subsystem(s) (e.g., under Production Management System: Scheduling Subsystem, Monitoring Subsystem).
 - Create a hierarchical diagram that illustrates these systems and their corresponding subsystems.

Example System and Subsystem Structure:

Primary System: Production Management System

Subsystems:

- Scheduling Subsystem
- Monitoring Subsystem

Deliverables:

- A document outlining the identified primary systems and their constituent subsystems.
- A diagram that visually represents the systems and subsystems.

Assessment Criteria:

The completeness, depth, and relevance of the identified systems and subsystems.