Module design: a team effort in system context

Introduction
This training aims to equip system design professionals with a comprehensive understanding of essential concepts, processes, methods, and techniques. It focuses on designing subsystems/modules, emphasizing an interdisciplinary approach to develop functional modules from ideation to disposal. The process begins with comprehending the broader system and organizational context. The system designer identifies stakeholders’ needs, defining functionality, performance, behavior, and interfaces of the module(s). Subsequently, the designer transforms this understanding into a coherent design. The approach also encompasses solution verification and transitioning to subsequent engineering disciplines.

Learning objectives
- Gather requirements from stakeholders for functional modules.
- Design system behavior to meet specified requirements.
- Translate design into module requirements and communicate with component teams.
- Develop a test plan based on the design and communicate with the integration team.
System Design Training

Intended for
Lead engineers and system designers that collaborate closely with system architects, integrators, engineering teams, and other stakeholders throughout the system’s life cycle. They play a crucial role in translating requirements into module designs, ensuring compatibility within the broader system architecture.

Program
Participants will work in small teams of 2-4 people on a company-specific, self-selected system design case. The training consists of five modules, each with a three-week duration. Each module concludes with a case-related deliverable. Online lessons will cover theory and provide additional information about the required deliverables. Additionally, team coaching sessions will be available for extra team support in each module. At the end of each module, teams will present their completed deliverables to fellow trainees. The training will culminate in a final presentation.

Training Modules and Deliverables
The training consists of 4 modules, focusing on different phases of the design process. At the end of each module, all teams are expected to present their (intermediate) deliverable.

Module 2: Design overview
The second lesson centers on the design of the module, with each team expected to present an A3 design overview covering:
- **Introduction**
- **System partitioning, block diagrams, and interfaces**
- **Functional decomposition**
- **Physical overview**
- **System concerns**
- **Key parameters and requirements**
- **Design strategies, issues, and concerns**

Module 3: Refine project and design overview
The third lesson delves deeper into the design, focusing on aspects such as:
- **Performance**
- **System qualities**
- **Conflicting KPPs, trade-offs, and decisions**
- **Risks and uncertainties**

Module 4: Project integration plan and update
The final lesson concentrates on integration of the module into the broader system. Key topics include:
- **System Integration fundamental**
- **Integration strategies**
- **Incremental integration, KPPs, uncertainties, and risks.**
- **Balancing system quality and time. Integration plan and visualization.**

Design Case Specification
The training employs a self-selected system design case. General specifications for the system design case are:

**Context**
- The module is a part of a larger system.
- The module has multiple interfaces.
- Multiple stakeholders (across the lifecycle) are involved.
- **Real-life case (product/module) from daily work.**
- The case must be challenging and specific enough to entail design decisions/dilemmas (not too obvious).
- The problem domain must include quantitative requirements.
- Envision at least 2 or 3 specific use cases.

**Sponsor**
The case must have a “sponsor” or “case-owner” who requires the case and is available to answer questions/present the customer or business view.