

Systems Analysis & Design

Semester 2026-I

Workshop No. 3 — Robust System Design and Project Management

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Welcome to the third workshop of the *Systems Analysis & Design* course!

In **Workshop #1**, you conducted a comprehensive **systems analysis** of your assigned real-world system through primary data collection and systematic investigation. In **Workshop #2**, you developed a detailed **system design** that addressed the challenges and opportunities identified in your analysis. Now, you will strengthen your system design by applying robust engineering principles and introducing project management strategies to ensure your solution is viable, sustainable, and implementable.

This workshop focuses on refining your architecture through quality assurance methodologies, risk management frameworks, and establishing a comprehensive project management plan for successful implementation.

General Workshop Definition: Robust system design combines engineering excellence with effective project management to ensure systems meet quality standards, mitigate risks, and can be successfully implemented and maintained. This workshop integrates quality assurance principles, risk management strategies, and project management methodologies to transform your design into a production-ready solution with clear implementation pathways.

Workshop Scope and Objectives

- **Robust System Design:** Refine your system architecture to address reliability, scalability, maintainability, and usability, incorporating quality guidelines and

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industry standards (e.g., ISO 9001, CMMI, IEEE standards).

- **Risk and Quality Management:** Identify potential risks, failure points, and quality challenges in your system, proposing comprehensive mitigation strategies using established frameworks.
- **Project Management Foundations:** Develop a detailed project management plan including team structure, milestones, resource allocation, and management methodologies to guide implementation.
- **Continuous Improvement Integration:** Demonstrate how feedback from previous workshops has influenced your design evolution and establish mechanisms for ongoing system improvement.
- **Implementation Readiness:** Prepare your system for practical implementation through comprehensive planning, quality assurance, and risk mitigation strategies.

Design Enhancement and Management Methodology

1. System Architecture Refinement:

- Update and enhance your architectural design from Workshop #2 to incorporate robust engineering principles (modularity, fault-tolerance, scalability, maintainability)
- Apply relevant quality standards and guidelines (ISO 9001, CMMI, IEEE standards, Six Sigma principles) to strengthen your design
- Clearly document how each architectural component supports system quality objectives and performance requirements
- Address integration challenges and interface specifications identified during your design process

2. Comprehensive Risk and Quality Analysis:

- Conduct systematic risk identification covering technical, operational, security, and project management risks
- Develop detailed mitigation strategies for each identified risk using established risk management frameworks (PMBOK, ISO 31000)
- Define quality metrics, acceptance criteria, and validation approaches for your system components
- Establish monitoring and control mechanisms for both development and operational phases
- Include contingency planning for critical failure scenarios

3. Project Management Plan Development:

- Define comprehensive team structure including roles, responsibilities, and accountability frameworks
- Develop detailed project timeline with key milestones, deliverables, and critical path analysis
- Include resource planning, budget considerations, and stakeholder communication strategies

4. Evolution and Continuous Improvement:

- Synthesize feedback and lessons learned from Workshops #1 and #2, demonstrating clear design evolution
- Document how your understanding of the system has matured through the analysis-design-refinement process
- Establish mechanisms for ongoing system improvement, user feedback integration, and adaptive management
- Define success metrics and evaluation criteria for measuring system effectiveness post-implementation

5. Implementation Strategy and Readiness Assessment:

- Develop phased implementation approach addressing deployment, testing, and rollout strategies
- Define technical infrastructure requirements, dependencies, and prerequisite conditions
- Establish change management procedures for system updates and modifications
- Include training plans, documentation requirements, and user adoption strategies

Deliverables and Documentation

1. Enhanced System Design Document:

- *Executive Summary:* Comprehensive overview of design evolution, quality enhancements, and management approach
- *Robust Architecture Design:* Updated architectural documentation incorporating quality standards and engineering best practices
- *Risk Management Plan:* Detailed risk analysis with mitigation strategies and monitoring approaches
- *Quality Assurance Framework:* Quality metrics, validation methods, and acceptance criteria
- *Implementation Strategy:* Phased approach to system deployment with timeline and resource requirements

- *Evolution Summary*: Documentation of design improvements and lessons learned from previous workshops

2. Project Management Documentation:

- *Project Charter*: Clear definition of project scope, objectives, stakeholders, and success criteria
- *Team Structure and Roles*: Detailed organizational chart with responsibilities and accountability frameworks
- *Project Timeline*: Comprehensive schedule with milestones, dependencies, and critical path analysis
- *Resource Management Plan*: Budget considerations, resource allocation, and capacity planning
- *Communication and Control Plan*: Stakeholder communication strategies and project monitoring approaches

3. Visual Representations and Tools:

- Enhanced system architecture diagrams reflecting robust design principles
- Risk management matrices and mitigation strategy visualizations
- Project timeline visualizations (Gantt charts, milestone charts)
- Quality assurance process flows and validation frameworks
- Use professional tools such as *draw.io*, *Lucidchart*, *Microsoft Project*, *Visio*, or *TikZ* in \LaTeX

4. Repository Management and Documentation:

- Create a `Workshop_3_Management` folder within your existing GitHub Course repository structure
- Include all design documents, project management plans, and supporting materials in PDF format
- Provide updated README.md documentation covering all three workshops with clear navigation and project evolution summary
- Include project management tool exports, risk registers, and quality assurance checklists

Submission Requirements

- Submit your complete Enhanced System Design and Project Management Document as a single PDF through the designated course platform
- Include your GitHub repository link with updated Workshop 3 materials and comprehensive project documentation

- All documentation must be in **English** and follow professional technical writing standards
- Ensure proper citations for quality standards, project management frameworks, and risk management methodologies referenced
- Document must clearly demonstrate evolution from Workshops #1 and #2 with explicit references to previous findings and design decisions

Important Guidelines and Considerations

- **Continuity and Evolution:** Your enhanced design must clearly demonstrate progression from analysis through design to robust implementation planning. Show explicit connections between workshops and design improvements.
- **Quality and Standards Integration:** Apply recognized quality standards and engineering principles appropriate to your system domain. Justify your choices with clear rationale.
- **Risk Management Rigor:** Conduct thorough risk analysis using established frameworks. Ensure mitigation strategies are practical, specific, and measurable.
- **Project Management Professionalism:** Apply established project management principles and methodologies. Demonstrate understanding of project management best practices and tools.
- **Implementation Feasibility:** Ensure all proposals are realistic and implementable within reasonable resource and time constraints while maintaining quality standards.
- **Stakeholder Consideration:** Address needs of all stakeholders identified in your analysis and design phases, including end users, operators, and management.
- **Documentation Excellence:** Maintain professional documentation standards that would be suitable for actual project implementation and stakeholder communication.

*Good luck, and continue developing your expertise in comprehensive **systems engineering** by creating robust, well-managed solutions that bridge the gap between analysis, design, and successful implementation!*