Project Management Plan - AutoRef

MSD cohort 2023 - 2025

February 2024

1 Introduction

This document describes the project management plan for the AutoRef system. The AutoRef system is a proposed autonomous referee for RoboCup Middle Size League (MSL) robot soccer under development at Eindhoven University of Technology. It is intended to accomplish all refereeing duties of human referees in MSL. Starting from 2015, MSD EngD has been assigned to AutoRef project as the first in-house project. The MSD cohort of 2023 - 2025 is responsible for this project in 2024. This project management plan is based the 7th version of the PMBOK guide. The document begins with an overview of the principles and performance domains of the 7th version of the PMBOK Guide, together with an overview of the system life cycle processes ISO/IEC/IEEE 15288:2023. A specific selection of these principles, performance domains and processes will be made to focus on within this project management plan, followed by more detailed explanations for the selected principles and performance domains.

2 Principles, Performance Domains and System Life Cycle Processes

Table 1: Selected principles and processes of the 7th version of the PMBOK guide.

Principles		**Performance Domains**	
Stewardship		Stakeholders	
Team	✓	Team	
Stakeholders	✓	Development Approach & Life Cycle	✓
Value		Planning	✓
Systems Thinking	✓	Project Work	
Leadership		Delivery	
Tailoring		Measurement	
Quality		Uncertainty	
Complexity			
Risk	✓		
Adaptability & Resilience			
Change	✓		

Table 1 shows the different principles and performances of the 7th version of the PMBOK Guide. The selected principles and performances are highlighted by a check mark. These principles and

performances are considered to be the most important ones for this specific project, and the ones we will focus on in this project management plan. These principles and performances are selected based on the relatively short time of this project and that the system is still under development.

Table 2: Selected System Life Cycle Processes based on ISO/IEC/IEEE 15288:2023.

Agreement Process		**Technical Management Processes**	
Acquisition Process		Business or Mission Analysis Process	✓
Supply Process		Stakeholder Needs and Requirements Process	✓
Organizational Project-Enabling Processes		System Requirements Definition Process	✓
Life Cycle Model Management Process		System Architecture Definition Process	✓
Infrastructure Management Process		Design Definition Process	✓
Portfolio Management Process		System Analysis Process	
Human Resource Management Process		Implementations Process	✓
Quality Management Process		Integration Process	
Knowledge Management Process	✓	Verification Process	
Technical Management Processes		Transition Process	
Project Planning Process	✓	Validation Process	✓
Project Assessment and Control Process	✓	Operation Process	
Decision Management Process	✓	Maintenance Process	
Risk Management Process	✓	Disposal Process	
Configuration Management Process			
Information Management Process			
Measurement Process			
Quality Assurance Process			

Table 2 shows the different System Life Cycle processes based on ISO/IEC/IEEE 15288:2023. Check marks indicate the processes that we are going to focus on in this project. Again, these processes have been chosen based on the fact that the project is very short and still in development.

3 Development approach & Life Cycle

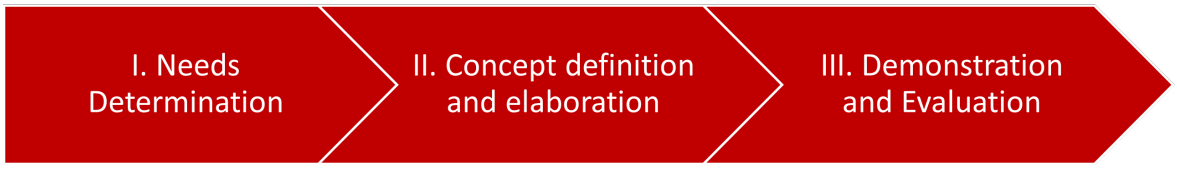

Figure 1: Project Life Cycle.

Figure 1 shows the project life cycle. In our case, we will go through the first phase in a linear fashion and the last two phases using an iterative approach, where Scrum has been chosen as methodology. The first phase includes mission analysis, identifying stakeholder needs and setting system requirements. The last two phases include architecture and design definition, implementation and validation.

4 Team

Weekly retrospective sessions will be held in order to create an environment of continuous improvement, open communication, collaboration and accountability. In these sessions, the team will come together to discuss what worked and what did not work. It can be a reflection on the sprint itself, people, and their relationships, and so on. The main goal of this session is to decide on what the team needs to improve and how to do it. This meeting will be led by the scrum master.

5 Knowledge Management

A shared Git repository is used for knowledge management, serving as a centralized hub for project documentation, codebase, and collaborative efforts. This repository not only facilitates real-time access and collaboration for the current team members but also ensures that knowledge is preserved for future generations working on the project. By utilizing version control and documentation practices within the Git repository, the project's evolution and codebase become well-documented and easily traceable. This approach not only enhances team coordination and efficiency but also acts as a valuable resource for future developers, enabling them to understand the project's history and intricacies, fostering a sustainable and collaborative development environment. Furthermore, every morning team gathers together to update the other members about their progress. Each person will have almost 2 minutes to talk about what they did yesterday, what they are going to do, and the possible challenges they have faced. This meeting is led by the Scrum Master. Furthermore, weekly knowledge sharing meetings will be held in order to share knowledge to the team. These meetings will be held every Thursday afternoon from 13:30 - 14:00 and will be led by the project manager. Two people from the team will present their work.

6 Team Roles

Our team consists of 8 individuals, each bringing different skills to the table. Every team member has specific responsibilities assigned to them. We will maintain a team register using an Excel file, where all members and their respective roles and responsibilities will be documented for easy reference. The project team consists of the following roles:

1. Project Manager
2. System Architecture
3. Team Leader
4. Scrum Master
5. Design Engineer

6.1 Project Manager

The Project Manager oversees the overall management, planning, and execution of the project. Additionally, they define specific roles tailored to the project's needs. The main responsibilities of the Project Manager include:

- Starts, leads, and closes the project

- Motivates the team for the project
- Bridges between stakeholders and the team for milestones and deliverables
  - Reports on progress with stakeholders
  - Responsible for requirements, deliverables, milestones, deadline
  - Discusses deviations of requirements etc. with team
  - Discusses deviations of plan/deliverables with stakeholders
- Responsible for scope, deliverables, milestones, and deadlines
- Prepares realistic time schedule with milestones and deliverables
- Responsible for the project management plan
- Responsible for working according to the project management plan

6.2 System Architecture

System architecture responsibilities encompass critical aspects of the project's technical framework and design. Here is an outline of these responsibilities:

- Leads development of system(s) design/architecture
  - Initiates meetings on system design/architecture with team
  - Ensures that appropriate tools and methods are available
  - Decides on selection of system design/architecture
- Ensures consistency with specified requirements
- Balance between functional, quality, (service), and systems management requirements
- Discuss shortcomings and necessary deviations with project manager

6.3 Team Leader

Team Leader plays a crucial role in steering the group towards success while prioritizing the well-being and effectiveness of its members. Their responsibilities encompass:

- Leads the team (people manager)
  - Divides tasks (what fits who: expertise, learning goals)
  - Makes a resource planning (who does what and when) in consultation with project manager, or work with SCRUM
- Monitors the quantitative and qualitative result that is to be achieved by the team
- Takes care of well-being of team members
- Participates actively in proper handling of team meetings
- Responsible for handing over final results/documentation to project manager

6.3.1 Scrum Master

As a key facilitator of efficient project management through the Scrum framework, the Scrum Master undertakes essential responsibilities, including:

- Prepares the scrum meetings
- Defines together with the team leader how the scrum meeting takes place
- Defines which tools will be used for keeping up with the progress

6.4 Design Engineer

The main responsibilities of a Design Engineer are the following:

- Performs content-related tasks:
  - Requirements, risks
  - Brainstorm, design
  - Literature search
  - Model and implement
  - Test
  - Write / present
- Communicates with other team members about progress
- Reports to the software/system architect and team leader

7 Systems Thinking

Our systems thinking approach is based on the Systems Thinking course PDSHA010 and PDSHA020. Every chosen Technical Management Process from Table 2 will be considered. Details will be written down in the System Architecture Document. The System Architecture document will be evaluated by Erjen Lefeber and René van de Molengraft in order to approve it.

8 Risk Management

The risks involved in this project will be registered in an Excel file. Each risk will have an ID, description, probability, impact, status and treatment. The risks will be evaluated using a Risk Assessment Matrix to determine whether actions should be taken to mitigate the risk. This risk register will be assessed every week and discussed in team and stakeholder meetings. When a new risk is identified, it will be immediately added to the risk register.

9 Stakeholder Management

Three stakeholders can already be identified at the beginning of the project. Two key stakeholders, Erjen Lefeber and René van de Molengraft, and Tech United. These stakeholders are registered in a stakeholder register. This register includes the roles in the project and the roles for decisions, their contact details, their power and interests. Each stakeholder will be put into a stakeholder matrix, indicating their power and interests. The stakeholder register will be updated when a new stakeholder has been identified or when an old stakeholder is no longer considered a stakeholder. Every week, a stakeholder meeting is held with the key stakeholders to present and discuss the current status of the project, a review of the previous sprint and the steps for the next week (the next sprint).

10 Change Management

In the case of facing any high impact changes during the project, it will be discussed with the key stakeholders at the weekly stakeholder meetings. Only after approval from the key stakeholders will we act on the changes. An Excel file will be used to register changes. This Excel file will have the change itself, whether it is approved or not and what actions have to be taken in order to implement the change. Newly identified changes will immediately be added to the change register. Only after approval of the key stakeholders, the actions will be added to the register.

11 Decision Management

If a decision needs to be made, the impact of the decision is evaluated first. Only on high impact decisions will be registered in a decision register. After evaluating the impact of the decision, it should be decided on how to made the decision. Is it based on majority, seniority, authority or a well-defined process (RACI model). If deemed necessary, a decision matrix can be used to support decision making. Each decision in this the decision register will include; what is the decision, when was the decision made, why was the decision made and who made the decision.

12 Requirements Management

An Excel file will be used to register the requirements. This file includes the high level requirements in a product backlog with user stories, which will be based on the user needs and updated after approval from the stakeholders after every stakeholder meeting. Each user story also has acceptance criteria, which is included into the register. This product backlog will be evaluated every week and if a new user story is identified, it will be updated immediatly.

13 Planning

Our planning process unfolds in the following manner. Initially, the Project Manager compiles a comprehensive list of user stories, termed the product backlog. This backlog undergoes regular updates and evaluations after each stakeholder meeting to incorporate any new user stories that may arise. At the beginning of each sprint, a subset of user stories is selected for immediate attention, forming the sprint backlog. During the sprint planning session, needed tasks, to achieve the sprint goal, will be defined and assigned to team members based on their preferences. Additionally, deadlines will be set to those tasks in each sprint. Besides the weekly planning, we will set higher level milestones with

deadlines for the whole project. This planning will also be supported by a work breakdown structure. This gives the team an indication where we currently are in the project. Furthermore, Trello has been chosen for monitoring individual assignments and overall progress. This approach ensures flexibility in adapting our plans and promotes transparency among team members, enabling everyone to stay informed about ongoing developments.