Project charter

Embedded application – Duck

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Version:

Date:

**Abstract:**

This project aims to develop an amphibious robotic duck that mimics the appearance and behavior of a real duck while freeing of the need for animal care. Designed for outdoor ponds, it offers a lifelike alternative for the presence of a duck without the responsibilities of keeping one. Additionally, the robotic duck can serve as a tool for birdwatching by integrating observation and monitoring capabilities. By combining embedded systems with autonomous movement and environmental adaptability, the project aims to create a functional, self-sustaining robotic companion for outdoor settings.

**Acronyms**

|  |  |
| --- | --- |
| **Abbreviation** | **Meaning** |

**Version history**

|  |  |  |
| --- | --- | --- |
| **Version** | **Date** | **Comment** |
| 0.1 | .... | First draft |

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# 1. Introduction

The project focuses on designing and building a functional prototype capable of autonomous movement on both water and land. The robotic duck will feature realistic behaviour such as floating, swimming, and quacking while maintaining energy autonomy for outdoor operation. Development efforts will include hardware design, embedded control systems, power and motor management, sensor integration, software implementation, etc.

Over the course of the semester, the project will progress through research, hardware development, software implementation, and testing phases. The hardware will primarily cover essential materials, including motors, sensors, waterproofing components, and embedded processing units. Key challenges include ensuring waterproofing and durability, achieving lifelike movement and other behaviours, as well as balancing autonomous behaviour with potential user control.

By addressing these challenges and delivering a reliable, autonomous system, the project aims to create an innovative and practical robotic companion for outdoor environments.

# 2. Business case

- The purpose of a business case description is to provide an overview of the justification for  
the project from a business perspective.  
– ...need or opportunity, the expected benefits and outcomes.  
– The business case description helps stakeholders understand why the project is being  
undertaken, what problem or opportunity it aims to address,  
– ...how it aligns with the organization's strategic objectives

# 3. Approach

– The purpose of an approach chapter in a business case is to outline the methodology or  
approach that will be used to execute the project  
– ...methodologies such as Waterfall, Scrum or a hybrid approach  
– ...provides details on how the project will be planned, managed, and implemented to  
achieve its objectives  
– -> to provide stakeholders with a clear understanding of how the project will be executed  
• In Scope  
– The purpose of an "In Scope" section is to clearly define and delineate the boundaries of the  
project.  
– This section specifies the deliverables, activities, and objectives that are included within the  
scope of the project  
• Out of scope  
– The purpose of an "Out of Scope" section is to explicitly define what is not included within  
the boundaries of the project.  
– ...avoid misunderstandings, prevent scope creep, and ensure that resources are focused on  
the critical objectives of the project

# 4. Deliverables

• ...is to clearly identify and define the tangible or intangible outcomes that the project  
is expected to produce  
• ...specific products, services, reports, or other results that will be delivered as a result  
of completing the project  
• ... the project team and stakeholders can align their expectations and understand what  
is expected to be produced by the project.

# 5. Quality management

...to outline the approach and processes that will be employed to ensure that the  
project's deliverables meet the required quality standards  
– Quality Objectives (e.g. ISO XXXXX, CE certified)  
– Quality Assurance (formal compliance checks with the standards)  
– Quality Control (pair programming, code review)  
– Roles and Responsibilities (quality representative, who is responsible in the end)

# 6. Prerequisite

to outline any specific requirements or conditions that must be met before the  
project can proceed successfully  
– Hardware Requirements  
– Software Requirements  
– Infrastructure Requirements  
– Skills and Expertise  
 -> Can be used later for requirements engineering

# 7. Success criteria

define the specific criteria or benchmarks that will be used to determine whether the  
project has been successful  
– Measurable Objectives (objectives or goal)  
– Acceptance Criteria (definition of done)  
– Key Performance Indicators (KPI) (Lines of codes, code coverage, test  
coverage...)

# Appendix

A diagram of a project

AI-generated content may be incorrect.