Table of Contents

Title of the Report 3
Abstract 3
List of Acronyms 3
Introduction 3
Project Context 3
Challenge and Objectives 3
Methodological Overview 3
Report Structure 4
State of the Art 4
Introduction 4
Domain Overview 4
Existing Solutions 4
Relevant Technologies and Approaches 4
Gap Analysis 5
Design Implications 5
Summary 5
Project Management 5
Scope 5
Time 5
Cost 6
Quality 6
People & Stakeholder Management 6
Communications 6
Risk 6
Procurement 6
Project Plan 6
Sprint Outcomes 7
Sprint Evaluations 7
Summary 7
Marketing Plan 7
Introduction 7
Business Idea Formulation 7
Business Model 7
Market Analysis 7
SWOT Analysis 8
Strategy 8
Strategic Objectives 8
Segmentation and Targeting 8
Positioning 8
Marketing-Mix 8
Brand 8
Marketing Programmmes 8
Programmes 8
Budget 8
Control 8
Summary 8
Eco-efficiency Measures for Sustainability 8
Introduction 9

Environmental 9
Economical 9
Social 9
Life Cycle Analysis 9
Summary 10
Critical Thinking and Ethical Considerations 10
Introduction 10
Stakeholders and Impact 10
Risks and Concerns 10
Design Implications 11
Summary 11
Development 11
Introduction 11
System Architecture 11
Data Pipeline 11
Backend Development 11
Analytics Components 11
Front-End Development 11
Integration 11
Summary 11
Conclusions 12
Achievements 12
Limitations 12
Future Work 12
Acknowledgements 12
Bibliography 12

Title of the Report

- Author1
- Author2
- Author3

2026/02/16 22:34 · epsatisep · 0 Comments

Abstract

2026/02/16 22:31 · epsatisep · 0 Comments

List of Acronyms

Acronym	Description
CRISP-DM	Cross-Industry Standard Process for Data Mining
ISEP	Instituto Superior de Engenharia do Porto
MADS4Engineering	Minor in Applied Data Science to Engineering

2026/02/16 22:32 · epsatisep · 0 Comments

Introduction

Project Context

MADS4Engineering provides a project-based learning and intercultural multidisciplinary teamwork experience; the real-world challenge; the composition of the team; the relevance of multidisciplinary and intercultural collaboration.

Challenge and Objectives

Describe very briefly the challenge addressed; main project objective; key expected outcome.

Methodological Overview

Just a paragraph explaining that: Design Thinking supported problem framing and user-centred design; CRISP-DM structured the data science activities; Scrum supported project execution. No methodological details.

Report Structure

Chapter	Description
1	…
2	…
3	…
4	…
5	…
6	…
7	…
8	…

2026/02/16 21:05 · epsatisep · 0 Comments

State of the Art

This chapter provides the reader with the relevant technical-scientific background as well as existing related products and research, also known as the state of the art, in the field(s) of the project.

Introduction

Provide here an overview of the contents (structure) of this chapter.

These are examples of citations to books **[1]** and **[2]**, a chapter on a smart companion **[3]**, articles on IoT **[4]**, blimps **[5]**, cloud computing **[6]**, gas emissions **[7]**, pedestrian crossing behaviour **[8]**, smart bicycles **[9]** and diaper moisture **[10]**, and to Web resources **[11]**, **[12]** and **[13]**.

Domain Overview

Existing Solutions

Commercial solutions

Open-source solutions

Research prototypes

Compare selected solutions considering the requirements of your own solution

Relevant Technologies and Approaches

Data sources and acquisition

Data analysis and modelling techniques

Data visualisation techniques

UI/UX approaches

Development technologies

Gap Analysis

Summary of limitations of existing solutions

Identified opportunity

Positioning of the proposed solution

Design Implications

Summary

Provide here the conclusions of this chapter and make the bridge to the next chapter.

What did the you learn from the state of the art and how did it influence the proposed solution?

2026/02/16 21:06 · epsatisep · 0 Comments

Project Management

Provide here an overview of the contents (structure) of this chapter. Explain the project management approach your group followed and justify why you think it is a good approach.

Scope

Document the boundaries of your project. Document the product scope (the extent of what your project will produce) and the project Scope (summary of the work needed to produce it). Make sure you clearly define what is part of the project and what is outside of its scope, justifying as needed.

Time

Explain how you managed the schedule of your project. Document the key milestones of your project, mapping key phases to reference deadlines.

Cost

Describe your project budget and its key components. Explain how your budget was managed throughout the project. Document the planned vs. effective costs of your project.

Quality

Document quality metrics that will apply to your project deliverables, associated thresholds and how they should be reviewed.

People & Stakeholder Management

Enumerate all people relevant to your project, including the project team and key stakeholders. Document their roles and responsibilities. Document your stakeholder management plan and strategy.

Communications

Document how your team will manage communications, describing communication channels, meetings, etc.

Risk

Identify key risks (product and project level), evaluate them and define how they should be handled (responses) and monitored. Perform quantitative and qualitative risk analysis and use the results to define the appropriate risk responses.

Procurement

Document your procurement management strategy including make vs buy decisions, materials/services to be acquired, sources, costs, timings, etc.

Project Plan

Document the project schedule, and the key project phases, using a Gantt Chart. Highlight the key project phases and milestones.

Describe how your plan was mapped to multiple iterative sprints.

Document how the sprint backlog was planned and managed for each of the sprints you have created in Planner.

Describe how prioritization was done.

Document how the estimation process was implemented, and any underlying challenges.

Provide a summary of the sprints that were executed, along with sprint goals.

Sprint Outcomes

Include the outcomes of all sprint reviews (what was the sprint backlog, completion status, planned capacity vs. achieved velocity).

Sprint Evaluations

Include the summary of all the sprint retrospectives, including any actions implemented as part of the team's continuous improvement strategy.

Summary

Provide here the conclusions of this chapter and make the bridge to the next chapter.

2026/02/16 21:07 · epsatisep · 0 Comments

Marketing Plan

Introduction

Provide here an overview of the contents (structure) of this chapter.

Business Idea Formulation

Business Model

Market Analysis

SWOT Analysis

Strategy

Strategic Objectives

Segmentation and Targeting

Positioning

Marketing-Mix

Brand

Marketing Programmmes

Programmes

Budget

Control

Summary

Provide here the conclusions of this chapter and make the bridge to the next chapter.

Based on this market/economic analysis, the team decided to create <specify the type of product> intended for <specify the market niche> because <specify here the relevant market-related reasons>. Consequently, the team decided to design a solution with the following <specify here the features added for market reasons>.

2026/02/16 21:08 · epsatisep · 0 Comments

Eco-efficiency Measures for Sustainability

Sustainability is a widely used concept that is applied by companies, organizations and politicians in various contexts. This chapter deals with specific measures to minimize the environmental footprint. An overview of the most important aspects of sustainable development and eco-efficiency. The eco-efficiency measures for sustainability provide a foundation for understanding our environmental responsibility and resource efficiency.

Introduction

Throughout history, geo-resources have served as crucial elements in providing all kinds of raw materials. However, excessive consumption has inflicted significant damage on the ecosystems, resulting in pollution and resource depletion. Sustainable engineering presents itself as a solution to this pressing issue, aiming to reconcile the demands of environmental preservation with economic growth. Sustainable engineering plays a fundamental role in these processes as it is rooted in the three pillars of sustainable: environment, society, and the economy. In simple terms, sustainability means to satisfy existing needs, without eliminating the needs of future generations. This correlates also with the 17 sustainable development goals (SDGs) from the United Nations. By adapting to nature, rather than trying to control it, more sustainable practices and products can be created.

Environmental

The environmental influence of products is of high importance in many aspects such as by depleting natural resources or emitting greenhouse gases. Concerning the product, it is important to try to reduce negative influences on the environment. This is achieved by reducing, reusing and recycling raw materials; taking into consideration the energy consumption in all phases of the project, as well as by minimizing transport.

Economical

The economic aspect of sustainability relates to the efficient and cost-effective utilization of resources, aiming to minimize environmental impact while ensuring long-term economic viability. The goal is to strike a balance between environmental responsibility and financial success by devising products, processes, and business models that are both ecologically and economically advantageous. Thus, the sustainable economy focuses on the responsible management of economic, social, and environmental resources to support the well-being of current and future generations. The goal of economic sustainability is to achieve economic growth without making the negative environmental trade-offs that traditionally occur. It also means that the price of the product matches the time the product fulfils its purpose.

Social

Social sustainability is about identifying and managing business impacts, both positive and negative, on people. It refers to the ability of a project or initiative to foster positive and inclusive social interactions while considering the long-term effects on society. The social aspect of sustainability deals with the community, education, equality, justice, social resources, health, well-being, quality education and quality of life. The product should meet those social aspects.

Life Cycle Analysis

One crucial task is to assess how each stage of the life cycle contributes to the overall environmental impact. This analysis is typically aimed at prioritizing enhancements in products or processes and comparing various products for internal purposes. Life Cycle Analysis (LCA) is a method for evaluating the environmental impact of a service or product throughout its life cycle, from design to end-of-life management. LCA or life cycle assessment is an essential tool to support sustainable development decision-making, as well as to assess the potential environmental impacts of a product, material, process or activity.

Summary

Provide here the conclusions of this chapter and introduce the next chapter.

Based on this sustainability analysis, the team chose <specify here the design, technique(s) material(s), component(s)> for the following <specify here the relevant sustainability-related reasons>. Consequently, the team decided to design a solution with the following <specify here the features added for sustainability reasons>.

2026/02/16 21:09 · epsatisep · 0 Comments

Critical Thinking and Ethical Considerations

Introduction

Provide here an overview of the contents (structure) of this chapter.

Stakeholders and Impact

Identification of affected stakeholders

Expected benefits

Potential risks

Risks and Concerns

Ethical issues

Privacy and security issues

Bias and fairness issues

Sustainability issues and SDG alignment

Applicable regulations

Design Implications

How the identified concerns influenced the design

Requirements derived from ethical and critical thinking considerations

Summary

Provide here the conclusions of this chapter and make the bridge to the next chapter.

2026/02/16 21:10 · epsatisep · 0 Comments

Development

Introduction

Provide here an overview of the contents (structure) of this chapter.

System Architecture

Data Pipeline

Backend Development

Analytics Components

Front-End Development

Integration

Summary

Provide here the conclusions of this chapter and make the bridge to the next chapter.

2026/02/16 21:11 · epsatisep · 0 Comments

Conclusions

Achievements

Discuss here what was achieved (wrt the initial objectives) and what is missing (wrt the initial objectives) of the project.

Limitations

Identify here the limitations of the solution and prototype.

Future Work

Provide here your recommendations for future work.

2026/02/16 21:12 · epsatisep · 0 Comments

Acknowledgements

2026/02/16 22:33 · epsatisep · 0 Comments

Bibliography

Will be added automatically by citing, in the body of the report, entries specified in BibTeX format and stored in the https://www.eps.dee.isep.ipp.pt/doku.php?id=refnotes:bib file

PS - *If you have doubts on how to make citations, create captions, insert formulas, etc. visit this page with examples and select "Show pagesource" to see the source code.*

---

[1] Rita Thapa, Hom Bahadur Rijal, Masanori Shukuya, Hikaru Imagawa, 2019. Study on the wintry thermal improvement of makeshift shelters built after Nepal earthquake 2015. *Energy and Buildings*, 199, pp.62 - 71, ISSN 0378-7788.
[2] Kazuko Obayashi, Shigeru Masuyama, 2020. Pilot and Feasibility Study on Elderly Support Services Using Communicative Robots and Monitoring Sensors Integrated With Cloud Robotics. *Clinical Therapeutics*, ISSN 0149-2918.
[3] Alexandre Soares dos Reis, Elien Gielen, Ko Wopereis, Marcel Pasternak, Vaido Sooäär, Tobias Schneider, Abel J. Duarte, Benedita Malheiro, Jorge Justo, Cristina Ribeiro, Manuel F. Silva, Paulo Ferreira, Pedro Guedes, 2020. Smart Companion Pillow – An EPS@ISEP 2019 Project. *Robot 2019: Fourth Iberian Robotics Conference*, Cham: Springer International Publishing, pp.465–476, ISBN 978-3-030-36150-1.
[4] Abdelbaset S. Hamza, Rahman Tashakkori, Bejamen Underwood, William O'Brien, Chris Campell,

2023. BeeLive: The IoT platform of Beemon monitoring and alerting system for beehives. *Smart Agricultural Technology*, 6, pp.100331, ISSN 2772-3755.
[5] Manuel Mahn, Markus Kemper, 2006. A BEHAVIOUR-BASED NAVIGATION SYSTEM FOR AN AUTONOMOUS INDOOR BLIMP. *IFAC Proceedings Volumes*, 39, pp.837-842, ISSN 1474-6670.
[6] B. Sotomayor, Ruben S. Montero, I.M. Llorente, I. Foster, Sept 2009. Virtual Infrastructure Management in Private and Hybrid Clouds. *Internet Computing, IEEE*, 13, pp.14-22.
[7] Ranjith, V. Velmurugan, S. Thanikaikarasan, 2020. Prediction of Exhaust Gas Emission characteristics using Neem oil blended bio-diesel in diesel engine. *Materials Today: Proceedings*, 21, pp.870 - 875, ISSN 2214-7853.
[8] Anae Sobhani, Bilal Farooq, 2018. Impact of smartphone distraction on pedestrians crossing behaviour: An application of head-mounted immersive virtual reality. *Transportation Research Part F: Traffic Psychology and Behaviour*, 58, pp.228 - 241, ISSN 1369-8478.
[9] YeongKyun Lee, Jongpil Jeong, 2018. Design and Implementation of Monitoring System Architecture for Smart Bicycle Platform. *Procedia Computer Science*, 134, pp.464–469, ISSN 1877-0509.
[10] Tareq Khan, May 2018. A Smart Wearable Gadget for Noninvasive Detection and Notification of Diaper Moister. *2018 IEEE International Conference on Electro/Information Technology (EIT)*, pp.0240-0244, ISSN 2154-0373.
[11] Android Open Source Project, 2014. *Android Developers: Android 4.1 APIs.* [Accessed in April 2017].
[12] Cloud Expo, 2008. *Twenty-One Experts Define Cloud Computing.* [Accessed in April 2021].
[13] Gartner, 2021. *Gartner Magic Quadrant for Data Science and Machine Learning Platforms.* [Accessed in April 2021].

From:
https://www.mads4e.dee.isep.ipp.pt/ - **MADS4Engineering**

Permanent link:
https://www.mads4e.dee.isep.ipp.pt/doku.php?id=report&rev=1783444507

Last update: **2026/07/07 18:15**