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Introduction

This project was developed as part of the European Project Semester (EPS) at ISEP. The EPS programme gives engineering students from different countries and academic fields the opportunity to collaborate on a multidisciplinary project during one semester. Working in an international team allows students to share their knowledge, approach problems from different perspectives, and develop practical solutions to real engineering challenges.

Throughout the semester, the team worked under academic supervision while managing the project and its development. The outcome presented in this report was produced by the group of students listed in Table 1.

Presentation

An overview of the team members and their backgrounds is presented below in Table 1.

Table 1: Team Members and backgrounds.

Group member	Background	Origin
Carlota Isabel Alcaraz Miralles	Mechanical Engineering & Industrial Design	ES
Amalie Hjorth Wyke	Health Technology	DK
Jordan Kai-ko Jeroen Dorigoni	Architecture & Town Planning	NL
Lena Schilling	Information Technology	PL
Timon Niedergriese	Data Science	DE
Mohammad Yousef Ghaleb Jaber	Computer Engineering	JO

Motivation

During one of the first sessions, several possible project themes were presented to all of the groups. Each team selected three topics that seemed the most interesting. Our main preferences were Smartification of Buildings, Smart Health & Wellbeing, and Smartification of Everyday Objects. Before making the final decision, the team briefly discussed possible problems and potential solutions within these areas in order to better evaluate which direction could be the most suitable. After the preferences were collected, the topic assigned to our team was Smartification of Buildings. However, the specific problem we eventually decided to address within this theme turned out to be different from the idea we had originally considered during the first brainstorming discussions.

Individual Motivation

- Carlota: I chose the EPS program because, after finishing my individual final degree project, I really wanted a new experience that focused more on teamwork. I was looking for the chance to see how a real project comes to life while working together with people from different backgrounds.
- Amalie: I chose EPS to have the opportunity to work on a project with group members from diverse educational and cultural backgrounds. This collaborative environment creates a dynamic workspace that includes a wide range of perspectives and skills.
- Kai-Ko: I chose the EPS project to have the experience of studying abroad with people from

different cultures and education backgrounds. I want to get in touch with the Portugees culture and developing me personally by living abroad and meeting new people.
- Lena: I picked the EPS program to get some hands-on experience and move away from just doing exams. As an IT student, I usually work on digital things, so helping build something tangible while collaborating with people from different countries sounded like a great challenge.“
- Timon: I chose the EPS because it offers the opportunity to work on a practical project instead of focusing solely on exams. In addition, I was interested in meeting people from different backgrounds and see it as a great way to develop personally.
- Mohammad: I chose the EPS program because I believe it is the perfect way to spend an Erasmus semester, gaining practical experience without focusing all my energy on regular exams. I also like the idea of being part of a group throughout the semester to spend time together.

Problem

Mental health conditions such as anxiety, depression and chronic stress are the biggest concerns in modern society and workplaces. According to the World Health Organization (WHO) about 1 out of 8 people experience a mental health disorder once in their life **[1]**. This can occur from high workloads, lack of control or poor support. These mental health issues are not only a personal problem, they also have a high impact on the economy and productivity of companies. WHO estimates that only from depression and anxiety there is a loss of 12 billion working days annually, which is equal to about 1 trillion $ each year due to loss of productivity **[2]**. In addition poor mental health results in increased absenteeism, difficulties with decision-making and higher turnover rates.

Research shows that even very short breaks during the workday can have a meaningful impact on employees’ well-being and energy levels. These so-called microbreaks are brief, voluntary pauses from work activities. A study by Kim, Cho, and Park (2022) found that employees who took short breaks throughout the day were better able to manage their energy and stay engaged with their work, particularly on days when they already felt tired **[3]**.

Objectives

With Bloem the objective is to design a small, enclosed space where people are able to take a short break from their stressful daily environments. Often it's difficult to find a relaxing spot in the office. The idea behind Bloem is to create a capsule that reduces the outside noises as well keeping sound in the capsule, so users have a safe space where they feel undisturbed and without affecting others. This shall be achieved with different layers of various materials.

The space should be used for short sessions up to 15 minutes. During that time the user should be engaged to do simple activities like meditation, breathing exercise, stretching or just relax to nature sounds. Soft lightning and calm interior is supposed to back up the whole experience. At the same time the design should be practical and fit into existing spaces.

Overall, Bloem aims to offer a simple way to create moments of calm in otherwise busy environments.

Requirements

The requirements were defined from the user & buyer perspective (not the same), focusing on creating a space that allows short moments of relaxation and mental recovery in busy environments. As a user, I want:

- a quiet and enclosed space where I am not disturbed by outside noise
- a place where I can relax without feeling observed or interrupted
- a noticeable reduction of sound from both inside and outside the capsule
- a comfortable interior where I can sit, lean, or just relax for a few minutes
- a calming atmosphere that helps me relax quickly
- soft, adjustable lighting that is not too bright or distracting
- a space that is easy to enter and use without instructions
- a short-use experience (around 5–15 minutes) that fits into my daily routine
- enough room to feel comfortable, but still compact
- natural or sustainable materials that feel pleasant and not artificial
- a design that feels safe, clean, and inviting
- a space that can be placed in offices or shared environments without taking up too much space

Tests

Functional Tests

- F1 – Acoustics: Assessing the extent to which external noise is reduced inside and how much sound escapes to the outside.
- F2 – Lighting Environment: Evaluating whether the lighting creates a pleasant and calming atmosphere.
- F3 – Ventilation: Ensuring that there is sufficient air circulation and that users feel comfortable while using the space.

Technical Tests

- T1 – Door Functionality: Testing ease of use (opening/closing), stability and sound insulation.
- T2 – Stability & Material Performance: Check structural stability, durability, resistance to everyday use and how easy the materials are to clean.

Usability Tests

- U1 – User-Friendliness: Check whether the capsule can be used intuitively without instructions.
- U2 – User Experience: Gather feedback on comfort, atmosphere and perceived relaxation.

Report Structure

Chapter	Description
1. Introduction	Overview of the project, team, and objectives.
2. Background and Related Work	Key research and existing solutions.
3. Project Management	Team organization and workflow.
4. Marketing Plan	Target audience and promotion strategy.
5. Eco-efficiency Measures for Sustainability	Environmental and social considerations.

Chapter	Description
6. Ethical and Deontological Concerns	Moral and ethical implications.
7. Project Development	Steps and iterations from concept to solution.
8. Conclusions	Summary of results and lessons learned.