

Sustainability Engaging Empathic Dwellers Furniture Design Platform For a Flexible Use of Dwellings

Principal Investigator / PI

Rute Gomes

Integrated Researchers of CIAUD

José Silveira Dias

Marco Neves

Paulo Dinis

Collaborating Researchers of CIAUD

External Researchers

Keywords

Sustainable Product Service System (SPSS); Design for Adaptability; Design for Sustainable Behaviour.

Partner Institutions

Expected Future Partner Institutions

Portuguese regional business nucleus;

Local Councils

OBJECTIVES

Main Goal – To outline design guidelines for adaptable furniture systems, and strategies to promote adaptable furniture as an appealing option for consumers to meet their changing needs while making a sustainable choice.

G1: To establish a deeper understanding on the subjects of Design for Adaptability, Design for Sustainable Behaviour and Sustainable Product Service System (SPSS);

G2: To systematize operational and conceptual strategies for developing adaptable furniture systems, in its function and visual dimension;

G3: To Develop a Prototype;

G4: To Develop a pilot virtual platform for testing and simulating the system's functional and visual adaptability;

G5: To develop a Guide for designing adaptable furniture systems;

G6: To disseminate the achievements near Furniture Makers Associations, providing them wider knowledge on Adaptability as a sustainable solution.

G7: To create a Map of small/medium Portuguese furniture makers (and maintainers) for the future implementation phase of the furniture system.

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Dwellings often seem inadequate for households' functional and spatial needs. Factors such as family dynamics, increase of population working from home, and new ways of living contribute towards a change of the use of domestic space and the need of its reconfiguration. It has been proven that adaptable furniture Design can contribute to optimize space and to increase the quality of life of households that live in overcrowded dwellings. As a result of her PhD, the IR has developed and registered a modular furniture concept that maximizes the use of domestic Space, by adapting the module units in their depth and width. Allowing households to adapt their domestic space to their functional needs, by the reconfiguration of the modular system, into a great number of possible configurations [1].

Although an adaptable furniture solution may allow households to adapt their spatial configuration to their functional needs, households may feel the need to refresh their domestic environment into new trend solutions and dispose of their furniture, getting a new solution [2]. Being so, the fact that a product can last longer, doesn't mean that it is actually desired for as long [3][4]. This problem leads to the need to create strategies that generate empathy from users towards their furniture. Engaging users through an online dedicated platform may be a way to do so, as this can provide the space for users to share their experiences on modular furniture systems configuration, stimulate their creativity with the experiences of others, share modular parts and access a network of local manufacturers for maintenance and supply [5]. Such a platform may contribute to a more empathic consumption and use of furniture.

This project, named Sustainability Engaging Empathic Dwellers (SEED), represents the effort to engage households into a more sustainable way of living, generating strategies to use domestic furniture for longer periods. Moreover, SEED brings the meaning of a germinating element that will grow into something bigger, as a contributor to a new way of consuming.

Following the previous achievements, the main research question is: Which are the main strategies to be adopted, for the development of a virtual platform for an adaptable furniture system, that enhances towards users the empathy for a domestic object or system, contributing to their longer usage period? And to the following secondary, that will guide the plan tasks: i) How to increase the value of adaptability to the furniture system? ii) Which strategies can be adopted to raise consciousness towards the sustainable value of maintenance and sharing products? iii) Which are the requirements to structure a platform that communicates in different fronts: Users; Production; Local institutions? iv) Supplying open access to the modular furniture system project, how can a national network of

furnituremakers be managed in order to produce the system units, ordered directly from end users?

To answer these questions, we will adopt a theoretical and practical approach organized in four main research phases: i) The State of Art, ii) Adaptable Furniture Prototype development, iii) Virtual Platform Development and iv) Generating a Furniture Makers Database. In the first phase, the State of Art will comprise a literature review on the design areas of Design for Adaptability, Design for Sustainable Behaviour and SPSS (Sustainable Product Service System). It will also include Case Studies on Adaptable Product service systems that contribute to further the period of usage of a product. In the second phase, focused on how to add value to adaptable furniture systems, we will be conducting surveys on existing visually adaptable products and their systematization to gain a wider understanding on strategies for furniture finishing adaptability. We will then prototype and use material leftovers from portuguese wood suppliers. The outcomes of this phase will include a guidebook with strategies to design adaptable products. In the third phase, centered on the structuring of a virtual platform, we will partner with local institutions which are familiar with the Sharing Economy to identify some of the requirements for the Platform in its "sharing dimension". The platform structuring will also comprehend assets as virtual simulation, experience sharing among users, mapping of local furniture makers and maintainers. The fourth phase, based on contacting furniture makers, will at first be centered on establishing partnerships with furniture local associations to promote seminars on the importance of long-lasting products, by valuing adaptability and maintenance services. Following these contacts, we will set a national database of furniture makers as future partners of our project.

The results will lead to the development of a design management guide to develop an adaptable PSS [5].

This research plan will build the pillars to the development of a Sustainable Service System Product, centered in a Platform where users can share their experiences, challenge their creativity, contribute near the design team to propose new upgrading solutions, as specialist users, adopt more a sustainable behaviour towards their consumption, generate partnerships with local institutions for sharing/exchanging/donating modular pieces, generate partnerships with furniture makers associations for the awareness of a more sustainable approach, and the creation of a database of makers, for product supply and maintenance will contribute positively for the economical development of small businesses nationwide (fig 1). This embryo project is aligned with a CEEind being carried by the IR. The results will contribute significantly to the future implementation of the platform.

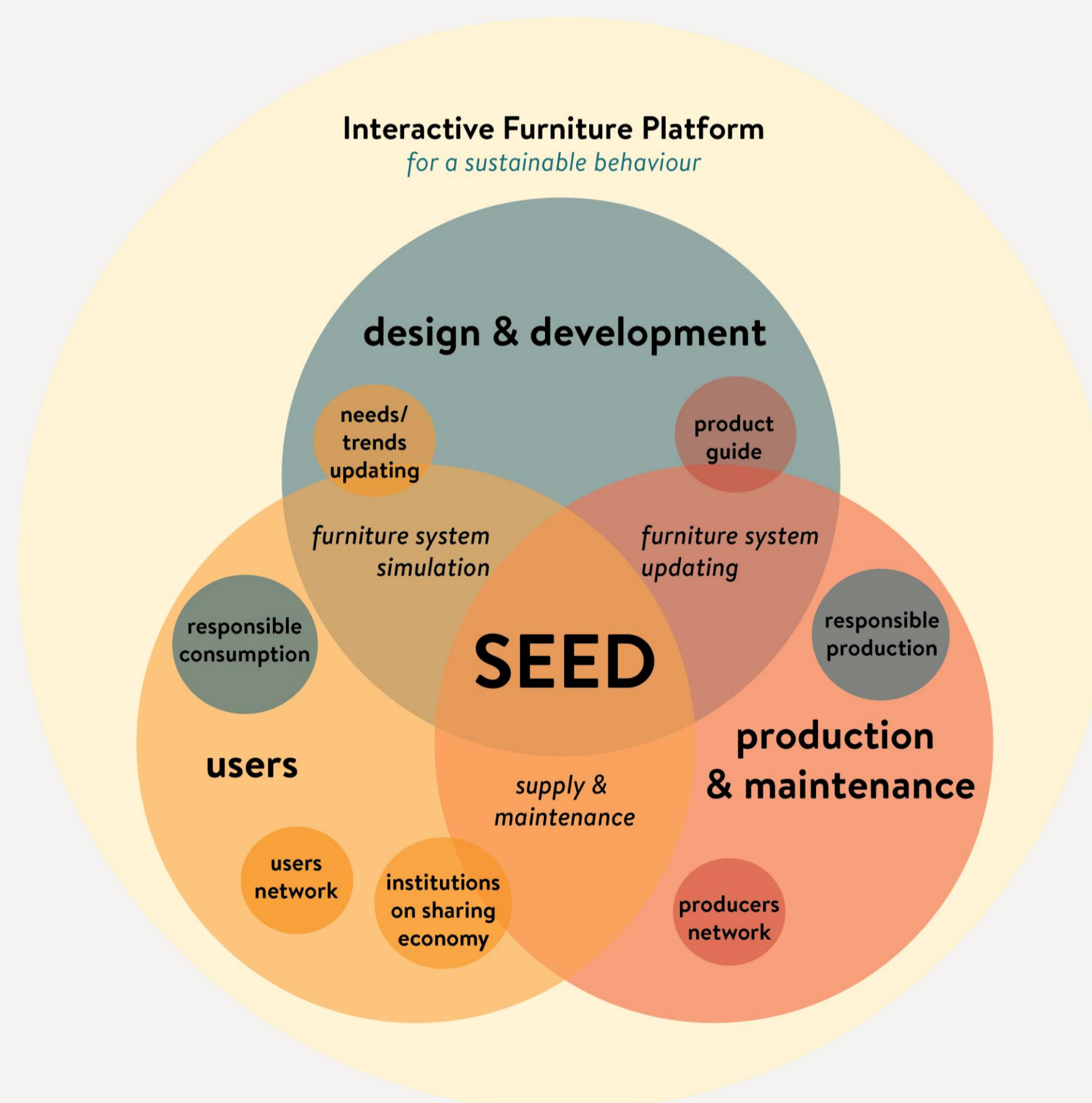
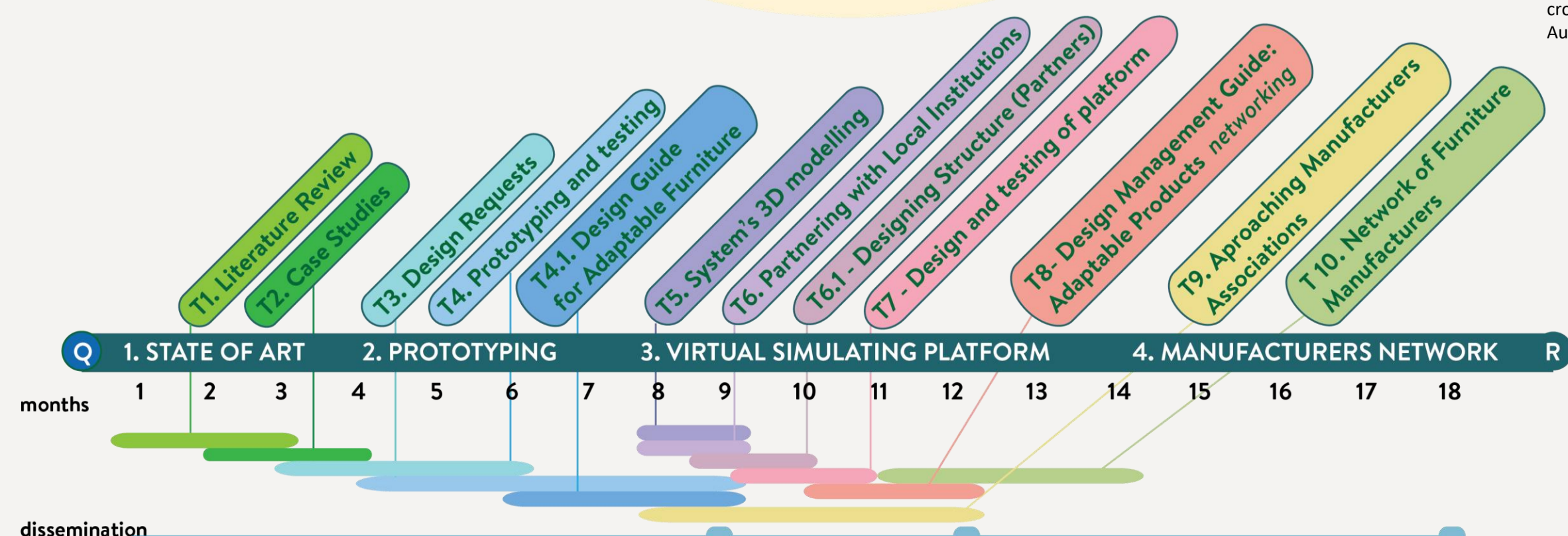


Fig.1. SEED's Thematic and Operational diagram. Source: SEED's Authors

Fig 2. SEED's research plan cronograma. Source: SEED's Authors



SCIENTIFIC RELEVANCE FOR THE DISCIPLINE

The research will underline Design Methodology and Practice as a medium to support a more sustainable behaviour within communities of users and producers.

Outcomes include design guidelines for design professionals to develop product/ service solutions that contribute positively to sustainable consumption habits.

The dissemination of the outcomes will reach a wide audience, crossing the field of academia, through Design publications and educational environments (Design degrees classes), as well as near local institutions, by engaging them as mediating partners to implement the project near communities, and manufacturers associations, by urging producers to create long lasting solutions, as a contribution to increase that economy.

EXPECTED ECONOMIC AND SOCIAL IMPACT

The present proposal addresses two of the UN goals for a Sustainable Development:

Goal 9. The research will contribute to the implementation of a sustainable approach within the Portuguese Furniture industry. A national network of different scale producers will be built to organize sustainable production and distribution, using local and recyclable materials. The implementation of an adaptability mindset can further encourage users and markets to adopt a resilient approach to innovation.

Goal 12. This research will contribute directly to a more sustainable consumption and production habits, as we aim to develop a furniture system focused on promoting more longevity in the product's period of use, by making it flexible enough to keep being useful and necessary during households' lifetime, adopting strategies to generate more empathy from households to their furniture. Also, maintenance and upgrading services are integrated in this proposal, as a non-disposing solution.

RESEARCH PLAN AND TASKS

Given the research Goals, the plan will be guided by adopting a Design Management approach, developing and relating (in a further phase) three main areas: Product development, Communication and Production. This plan, organized in 18 months, aims to reinforce these three pillars, for a posterior implementation. Being so, this plan is organized in four main phases, i) State of Art; ii) Developing a furniture prototype, iii) Developing an interaction platform for the system's simulation and iv) Generating a furniture makers' network (fig.2):

PHASE 1 – State of Art

The State of art will focus on a deeper comprehension of the subjects of Design for Adaptability, Design for a Sustainable Behaviour and Sustainable Product Service System (SPSS).

This phase will contribute to answering the sub questions i and ii.

T1 - To carry a literature review on the referred subjects, comprehend what has been researched so far, and which concepts must be settled within our research.(Goal 1)

Active team members: RG; JSD; MN; PD.

T2 - To develop case studies on Adaptable Product Service Systems that contribute to a longer use period of a product. First, a survey on adaptable PSS will be made, to identify variables that may be important to systematize. A comparison on different dimensions within the sample will follow, which will contribute to a subsequent active phase. (Goals 1 and 2)

Active team members: RG.

PHASE 2 - Furniture Prototyping

Having as conceptual functional base the developed modular system, the second phase will be centered on the improvement, development and prototyping of a more adaptable furniture system.

This phase will contribute to answering the subquestion ii.

T3 – From the previous survey (T2), to identify design strategies for developing product solutions that have a long use period, by being adaptable to users changing functional and cultural needs through time. (Goals 2 and 3)

Active team members: RG

T4 - From the identified design strategies and the conceptual registered modular system, to develop an improved system, now featuring adaptable finishes. Tests will be

conducted in the FAUL's lab, and supplier companies will be contacted to donate surplus materials for the prototype development and functional testing. (Goal 3)

T 4.1. The results from previous tasks will lead to the construction of a Design Guide for Adaptable Furniture (Goal 2). (Dissemination Outcome)

Active team members: RG, PD, JSD.

PHASE 3– Virtual simulating platform

The third phase is focused on understanding the dimensions and factors that will structure a virtual platform for an adaptable PSS. The platform will not be a furniture supplier. It will provide multiple services, such as communicating to users the system possibilities, enabling them to communicate with each other, share their creative experiences and swap or pass on their furniture modules. It will provide information on the system's technical specs, on existing making/selling points (local manufacturers), and on available maintenance/upgrading services.

Given its sustainable value, and the possibility of sharing modular pieces with other users, it is important to create partnerships with local institutions that already supply sharing products, in a logic of green community economy. Following the previous achievements on the furniture prototyping, and the state of art on PSS, this phase will include the following tasks:

T5 - The developed furniture model will be refined and adjusted in 3D simulation. This will be the first operational step into building contents for the platform's furniture modular configuration simulation. For the development of the system's 3d model collection, an external consultant will be contracted. (Goal 4)

An interaction design master student (BI) will be integrated in this task, as part of his/her dissertation thesis. This integration aims to engage the student on the subject of adaptable product solutions within interaction design. He/she will be active in the development on the pilot platform, by understanding and operating the necessary dimensions to the development of a PSS.

Active team members: RG, MN, PD, JSD, BI.

T6 - To settle partnerships with local institutions experienced in the Sharing Economy. For this, a survey on the existing local sharing system will be conducted, to identify the ones that would embrace more appropriately our furniture modular service. (Goal 4)

T6.1- To understand, near the institutional partners, which may be the most appropriate structure and its dimensions for the virtual platform designing. (Goal 4)

Active team members: RG, MN, BI.

T7– To develop a virtual Platform Structure Pilot. (Goal 4)

T7.1 - To test the platform — in order to identify operational fragilities and opportunities for improvement — and refine it in two stages: the first with the partner institutions; and second through a Focus Group, concerning the platform's interactive simulation feature, usability and sustainability awareness. (Goal 4)

Active team members: RG, MN, BI.

T8 – Having settled and improved the pilot platform, we will systematize the achieved results into a Design Management Guide for Developing Adaptable Products based on networking. (Goal 5) (Dissemination Outcome)

This phase will contribute to answering the subquestion iii.

Active team members: RG, MN, PD, JSD, BI.

PHASE 4– Networking and disseminating

The last phase of this plan is defined by contacting furniture manufacturers in Portugal and establishing partnerships, to raise awareness towards the subject Adaptability and to create a network/ database of furniture manufacturers. One of the goals of this research, in a posterior implementation phase, is to give small/medium manufacturers an open access to the furniture's technical specs, so that they can produce the furniture system and enter the Network, as an available producer and manufacturer of the system. Being so, the contact with manufacturers will be carried in two main tasks:

T9 – To settle partnerships with Regional Enterprise Nucleus, and Furniture Makers Associations to make actions of awareness towards the value of "creating solutions that last longer in time", either for their adaptable dimension, and for having maintenance and updating services. This will drive to a first approach near manufacturers, for disseminating the theme and also as an opportunity for increasing small businesses activity. (Goal 6)

T10 – From the previous phase contacts, to develop a database of furniture makers partners. The collection of manufacturer partners will happen at first via regional nucleus and associations, and later using snowball technique. The database aims to be dynamic, as it will be constantly updated. (Goal 7)

This phase will contribute to answering subquestion iv.

Active team members: RG, JSD, PD, MN

EXPECTED SCIENTIFIC RESULTS

Main Result – Design guidelines for adaptable furniture systems, and strategies to promote adaptable furniture as an appealing option for consumers to meet their changing needs while making a sustainable choice.

R1 - Prototyping of a modular system that allows households to adapt their space into their changing functional and cultural needs throughout their lives.

R2- Conceptual Design Guide Strategies for the development of adaptable furniture systems, in its functional and visual dimensions, focused on the systematization of the Operational and Conceptual dimensions.

R3 – Virtual Platform pilot for simulating an Adaptable Product;

R4 – Guidelines for designing adaptable furniture systems, in a systemic dimension.

BUDGET: € 7.500

Two main phases will have budget allocated:

Phase 2 - For testing and prototyping materials: 1144,78€

Phase 3 - Where a grant for a master student (BI) in interaction design will be allocated for 6 months: 5855,22€;

For external consultant on developing the furniture 3D modular system collection: 500€

The total amount: 7500€