

INEDIT

open INnovation Ecosystems
for Do It Together process

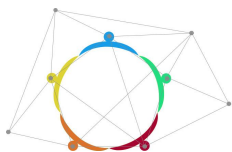
D3.1. FRAMEWORK FOR INTERACTIVE TEHNOLOGIES


WP3 T3.1

Version 1.3

March 2020



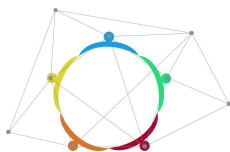


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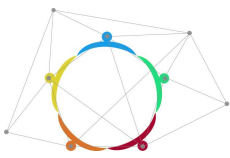


EXECUTIVE SUMMARY	4
1. INTRODUCTION	5
2. ORGANISATION OF TASK 3.1	6
2.1. OVERVIEW OF THE ACTIVITIES.....	6
3. INTERACTIVE TECHNOLOGIES IN THE INEDIT PLATFORM	7
3.1. SPECIFICATIONS MAPPING WITH WP2	8
3.1.1. <i>Mapping the needs identified in WP2</i>	8
3.2. ACHIEVEMENTS OF THE FIRST PERIOD.....	10
3.2.1. <i>Technology exploration</i>	10
3.2.2. <i>Early tests with users</i>	12
3.3. TECHNOLOGIES RELATIONS / INTERACTIONS WITH OTHER MODULES AND TASKS.....	16
4. ORGANISATION OF THE FRAMEWORK.....	18
4.1. SCANNING PROCESS	18
4.1.1. <i>Technical developments</i>	18
4.1.2. <i>Application requirements and future developments</i>	19
4.2. CREATIVITY ENVIRONMENT	19
4.2.1. <i>Technical developments</i>	19
4.2.2. <i>Application requirements and future developments</i>	22
4.3. AUTOMATED SHAPE GENERATION MODULE	22
4.3.1. <i>Technical development</i>	22
4.4. DESIGN ENVIRONMENT	23
4.4.1. <i>Technical developments</i>	23
4.4.2. <i>Overview of the design Output</i>	26
4.4.3. <i>Studies and assessment of the process</i>	27
4.4.4. <i>Application and requirements</i>	27
4.4.5. <i>Current limitations</i>	27

List of figures

Figure 1: T3.1 structure representation	5
Figure 2. T3.1 subtasks planning	6
Figure 3. T3.1 in technology map represented in the red frame.....	7
Figure 4. Interactions between T3.1 and WP2.....	8
Figure 5. Needs representation from interviews made in WP2	9
Figure 6. Example of technology mapping based on DIT processes description. The scanning module responds to the need of sharing the problem of a consumer.	10
Figure 7. Draft storyboards to prepare platform specifications and technologies framework integration.	10
Figure 8. Experiments regarding pre-existing furniture modulon assembly in VR.....	12
Figure 9. Experiment: Influence of environment on creativity.....	13
Figure 10. Sample interaction metaphor of a using a jigsaw to cut wood panels in Vr.....	14
Figure 11. Environment for parts assembly. Three pilot pieces of furniture have been described and tested there in VR	15
Figure 12; Pilot testing of the process from scan to creativity with students from the ESB	16
Figure 13. Representation of the different connections between tasks of WP3.....	17
Figure 14. Scanning to design framework illustrated in three views	18
Figure 15. Scanning module integrated by TTPSC in an INEDIT mobile application	19
Figure 16. Illustration of a sketch in a scanned environment: the user not only draws the furniture but contexte elements inside to help communication and design requirements	20
Figure 17. Scans viewer feature	20
Figure 18. Sketcher interface	21
Figure 19. Project Management interface.....	21
Figure 20. Capture feature: the user can pick a camera and take a picture with a small preview directly from the VR environment.....	21
Figure 21. 3D models of the different HMDs configurations	22
Figure 22. Sample 3D models outputs of the Generative module	23
Figure 23. Environment developed for furniture design and assembly. Can be used in combination with the scans acquired by the mobile application.	23
Figure 24. Sample wood panels with different cutting operations	24
Figure 25. Assembly process description in the Immersive Design module	25
Figure 26. Outputs generated by the immersive design tool.....	26
Figure 27. Evaluation macro planning for the Immersive Design tool.....	27





Executive summary

Description of the task 3.1 from the proposal

Task 3.1: Interactive & immersive technologies supporting co-creation

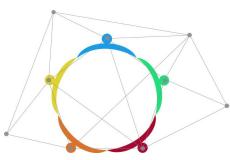
T3.1 considers the state of the art of both hardware and software available in terms of co-creation using interactive technologies to assist the 3D creation of shapes, and the 3D creation of furniture. Different stages and constraints will be considered (e.g. room measurements and acquisition, ideas/trends/shapes inspiration, creation, collaboration, design generation, manufacturing constraints).

ENSAM will develop a framework for the customer to quickly scan his room, design pieces of furniture within the scan and visualize the result in augmented reality. This workflow will result in mobile applications using 3D scanning techniques and AR/VR depending on WP2 specifications. The creation process will be driven by the manufacturing specifications and in collaboration with the Task 4.4 regarding the creation of translation layers to create a seamless “Design to Manufacturing” process.

This task will also develop the AI aided design tool on top of the open-source project Blender and will train for each type of design (e.g.: wardrobes, tables, chairs...) a generative model based on deep neural networks that will be trained following an encoder-decoder approach. Both will be implemented independently using a deep neural network to perform complex non-linear operations. On the one hand, the encoder will subsample the initial representation of the 3D model into a normal distribution within the latent space; on the other hand, the decoder will be able to reconstruct the representation of the 3D furniture given its point in the latent space. Both systems will be trained in combination, optimizing the encoding-decoding error for all the 3D models stored in the INEDIT platform. A materials’ repository will be created for storing the available 3D printing filaments and link them with its final color, texture and properties (link to T6.3).

This report is divided in three parts.

- The first part focuses on the organisation of the work in task 3.1 and brief results of this part,
- The second part focuses on the description of the platform, and specifications mapping with WP2 outcomes,
- The third part focuses on the description of the framework itself, and the technological modules delivered to other partners for integration.



1. Introduction

D3.1 is intended to present to the consortium the methodology followed, and the technologies delivered for integration in the DIT process. Partners will find useful information to understand the purpose and capabilities of each technology, and better understand how to integrate them in such a DIT process. The interaction with other technical modules is also described to better shape the technical integration into the platform.

From the proposal stage, we have been identifying lacks in the furniture market regarding customization of furniture. An effective customization can result in a more sustainable product for consumers. On the other hand, more customisation generates risks at several levels in the design and production steps. The task 3.1 intends to propose solutions to improve the customization means for consumers and designers while thinking about furniture production itself.

Some objectives that were defined include:

1. Increasing creativity
2. Fostering communication between the different stakeholders (consumers and designers)
3. Democratising new engaging and natural ways of designing

To fulfil these objectives, we have brought our expertise in different fields trying to setup a framework to quickly design new pieces of furniture that are original, match user needs, while facilitating communication and understanding between stakeholders, and keeping in mind the production workflow for manufacturers.

WP3 is divided into six tasks that:

1. produce technical developments allowing cocreation (T3.1, T3.2, T3.3)
2. integrate the technologies together onto a platform (T3.4)
3. Make the link with open manufacturing processes (T3.5)
4. Assess the technologies developed with the cocreation perspective from pilot testing (T3.6)

This structure aims at delivering a robust cocreation framework using innovative tools and approaches.

The figure below describes the task T3.1 processes and work carried out during the first reporting period.

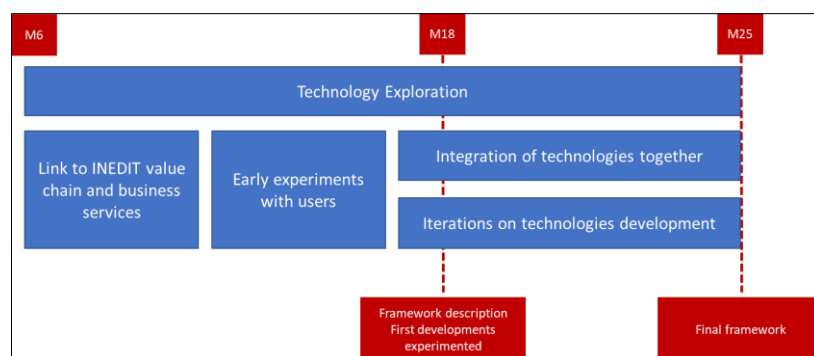


Figure 1: T3.1 structure representation