FBD_BMODEL
FASHION BIG DATA BUSINESS MODEL

D 6.3

Integrated FBD_BModel digital platform

Public version

"This project has received funding from the European Union's Horizon 2020

Project Information

Grant Agreement Number	761122
Project Full Title	A Knowledge-based business model for small series fashion products by integrating customized innovative services in big data environment *(Fashion Big Data Business Model)*
Project Acronym	FBD_BModel
Funding scheme	RIA
Start date of the project	December 1st, 2017
Duration	36+3 months
Project Coordinator	Xianyi Zeng (ENSAIT)
Project Website	http://www.fbd-bmodel.eu

Deliverable Information

Deliverable n°	D 6.3
Deliverable title	Integrated FBD_B Model digital platform
WP no.	WP6
WP Leader	Fitizzy
Contributing Partners	DSS, UoM, ENSAIT, GZE, BIVOLINO, KUVERA SPA
Nature	**R:** Document, report (excluding the periodic and final reports) **DEM:** Demonstrator, pilot, prototype, plan designs **OTHER:** Process
Authors	Fitizzy
Contributors	ENSAIT, DEL, UoM, HB
Reviewers	Project Coordinator
Contractual Deadline	M30
Delivery date to EC	M36+3

Dissemination Level

PU	Public	✓
PP	Restricted to other programme participants (incl. Commission Services)	
RE	Restricted to a group specified by the consortium (incl. Commission Services)	
CO	Confidential, only for the members of the consortium (incl. Commission Services)	

Document Log

Version	Date	Author	Description of Change
1	**M13-M16**	Fitizzy/ all partners	Preparation of - the UX/UI Design of the platform, - design of videos and Adobe XD version to share comments and suggest amendments Meeting in **Boras (Sweden) - M15,** presentation of - the Mock Ups and Advanced versions UX/UI designed to the consortium
1.2	**M19-M21**	Fitizzy/Premaccess	Production phase of the platform according to architecture plan - The UX/UI design has been developed in **REACT** (one of the best current language in front development)
1.3	**M21** 05/08/2019	Fitizzy	Production of the API to ensure connectivity with consortiums' partners ICT. An **application programming interface** (**API**) is an interface or communication protocol between different parts of a computer program intended to simplify the implementation and maintenance of software.
1.4	**M22** 24/09/2019	Fitizzy/Premaccess	Meeting in **Paris M22,** - Presentation of the platform and providing log- in for users (customers and brands) to test and trial the platform - Presentation about security of the data to consortium members + 1to1 advice session for the interested partners on how to ensure & reinforce their own security
1.5	**M1-M24**	Fitizzy/Premaccess/All	Final outcome for 6.4 : Up and running platform ready for integration with consortium partners' datas (Task 6.4) : architecture cloud management and protection of the datas are completed
1.6	**M24**	All	Meeting in **Milano - M24,** Work with partners for the integration of datas within the platform as planned
1.7	**M25-29**	Fitizzy/Premaccess	During the period M25- M27, significant progress has been made by the group in regards to WP6. Deliverable 6.2 and 6.4 were completed; Integrations with University of Manchester, Ensait and University of Boras have been delivered. Different technical meetings have been held to ensure the full success of this implementation.
2.1	**M30-M34**	Fitizzy	After an overall review of the actual work provided by the partners (UoM, HB, Ensait), a decision has been made by

			Fitizzy and Premaccess to fully rebuild a second platform for better efficiency, connectivity through API, enhance security and reinforce engagement with the scalability of the platform in mind, better the workflow of the users within the platform. User paths design, workflow for integration of the data services (IDS and SCPMS). Design of the front has been fully improved using best practices of UI/UX in relation to a SaaS platform. Latest features integrated to the platform.
2.2	**M35- M36+1**	Fitizzy	With the work of the first platform, architecture, security concept, build of the platform, creation of a new full workflow for better design. Update of situation with partners in regards to progress made. Connectivity with the mobile app
2.3	**M36+2**	Fitizzy/All	Presentation to the partners of the second and final version of the platform for an overall review with integration of all features and exchanges with partners on improvement, connectivity with dedicated features
2.4	**M36+3**	Fitizzy/ Premaccess/DSS/ HB/UoM /Ensait	Final FBD_B Model platform up and running. Presentation made to the public on the 19th of February 2021.
3	April 2021	Fitizzy	Following final review meeting, addition of section 3.8 3D Avatar/Garment visualized on PC/Mobile app

Table of Contents

1 Executive Summary

The deliverable 6.3 Integrated FBD_BModel digital platform is about integrating the Interactive Design System (CC_IDS) and Supply Chain and Production Management System (SCPMS) into a unified cloud management system.

This deliverable is the creation of an operational FBD_BModel digital platform not only by integrating the models and algorithms of the two systems (CC_IDS and SCPMS) but also by implementing a solid integration platform between the industrial partners involved in the operational supply chains.

The **result is a highly performant SaaS Platform designed for Fashion Retail and Textile Industry integrating IDS and SCPMS.** A Software as a service (SaaS) is a method of software delivery and licensing in which software is accessed online rather than bought and installed on individual computers. The FBD_BModel platform enables the dynamic interactions among consumers, designers and producers by setting up multi-user interactive interfaces and virtual product demonstration platforms, which are able to channel personalised smart orders of high value fashion textile products to the production networks **(2 - Demonstration of the FBD_BModel platform (Desktop and Mobile, API documentation, links to the different IDS and SCPMS services.**

To understand the process, we will also look in more depth into the technological choices made. **(3- Technical choices made to achieve scalable and commercial viable business**

In order to carry out the integration, an API has been designed **API connection, interfaces, mobile app, motivation for launching a second version of the platform, UX/UI design**

Finally, this document integrates a user guide for the platform as it is. **(4 User guide to the FBD_BModel platform)**

2 Demonstration of the FBD_B Model platform

Results of the deliverable

The result of this deliverable is a highly performant SaaS Platform designed for Fashion Retail and Textile Industry integrating IDS and SCPMS**.**

A Software as a service (SaaS) is a method of software delivery and licensing in which software is accessed online rather than bought and installed on individual computers. The FBD_BModel platform enables the dynamic interactions among consumers, designers and producers by setting up multi-user interactive interfaces and virtual product demonstration platforms, which are able to channel personalised smart orders of high value fashion textile products to the production networks.Note that demonstration is available on rquest for the authorized persons.

3 Technical choices made to achieve scalable and commercial viable business

3.1 Model adopted (architecture) and upgrade of the platform

Here is an overview of the actions taken during the creation of this platform.

The 3 key principles adopted when creating this platform

1) An intermediation platform to help users move through design and production stages, and get results quickly
2) A secure process for exchanging and storing data, which is necessary for the calculation for end users
3) A secure environment with a data encryption process and an authorization process to share them or not, to one or some of the partners.

For more information, see deliverable 6.4.

Following a more in depth review of the partners needs, it has been decided in March 2020 to completely change the platform initially proposed for three main reasons.

Firstly, for technical reasons: offer a real SaaS experience and autonomy to the users.

Secondly, taking into account the evolution of the platforms in terms of integration, scalability, costs and security.

Finally, design UX/UI, customer experience and journey was at the heart of the second version developed with an in depth research on best practices in this field.

As a result, we have a fully functional platform ready to be launched on the market and fitted to the real needs of potential customers.

You will find below the key technical concepts used for

3.2 Development of a unique infrastructure for all partners

At the start of the project, Fitizzy and Premaccess along with all partners focused on the IT infrastructure to manage the various risks:

- risk of non-harmonization of data management tools,
- risk of additional costs during the development, implementation and maintenance of services,
- risk of failure of the platform and its performance, if the various databases are not correctly interconnected.

For this, the AWS services offered to develop and manage the platform, in order to efficiently collect, gather, consolidate, use and analyze the data of each partner.

3.3 Management of the Data Management Plan

The Data management plan has been adopted to ensure that:

- partners use the platform correctly,
- integrate secure data,
- all the bricks developed by the other partners are integrated and can be integrated into FDB BModel,
- and above all that the platform is scalable and compatible with the data services of the entire supply chain of the project.

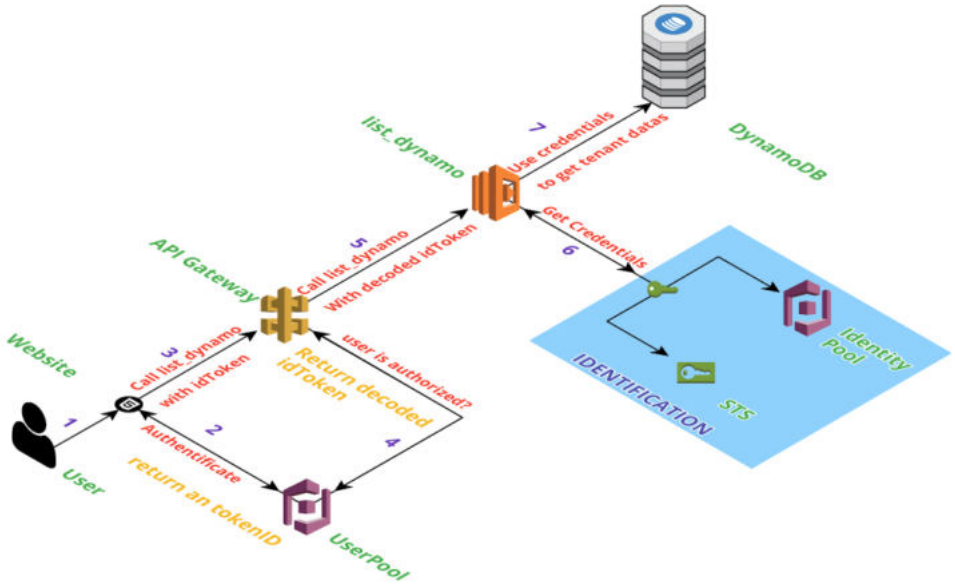
3.4 User management and data protection on FBD BModel

- A user belonging to a specific company and having a specific role wants to access certain data. The user accesses the web platform, he logs in and navigates to the page containing the data he wishes to consult. This action generates a call to a secure API to retrieve this data.

The strategy is:

- The API is called and the request is granted with the user's authorization code.
- The user's authorization code is verified and a tokenId is returned if the authorization code is valid.
- The request is now granted with the user's tokenId.
- The tokenId is checked to determine if the user has the right to perform this type of operation on this type of data.
- Once validated the right, the database operation can be executed

- The tokenId is exchanged by identifying information related to the scope (tenant) of the data authorized for that user.
- The database operation is performed with these credentials, only data authorized for this tenant is returned.



3.5 Development of an API allowing smooth data transfer between the cloud data management system and the various gateways

A user belonging to a specific company and who has a specific role wants to import new data into the platform:

The user uploads this data to their authorized bucket.

Once this data is downloaded, an event is triggered to notify that there is new data.

According to the specific rules of the company, certain steps must be taken:

- Encryption
- Mutation
- Consolidation

- Analysis

Once the steps have been completed, this data can be accessible in the platform for the tenant or other scopes if it has been clearly authorized by the tenant.

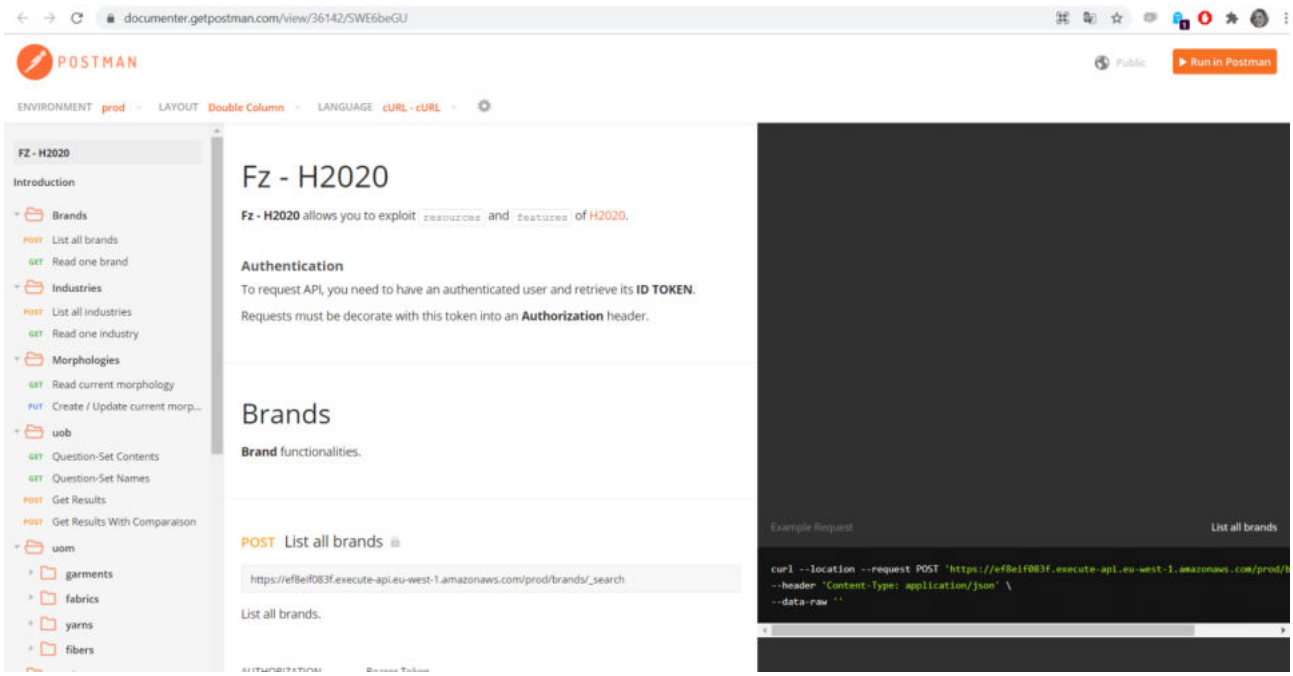
Additional stages can be configured in the pipeline as a beta environment if context is needed.

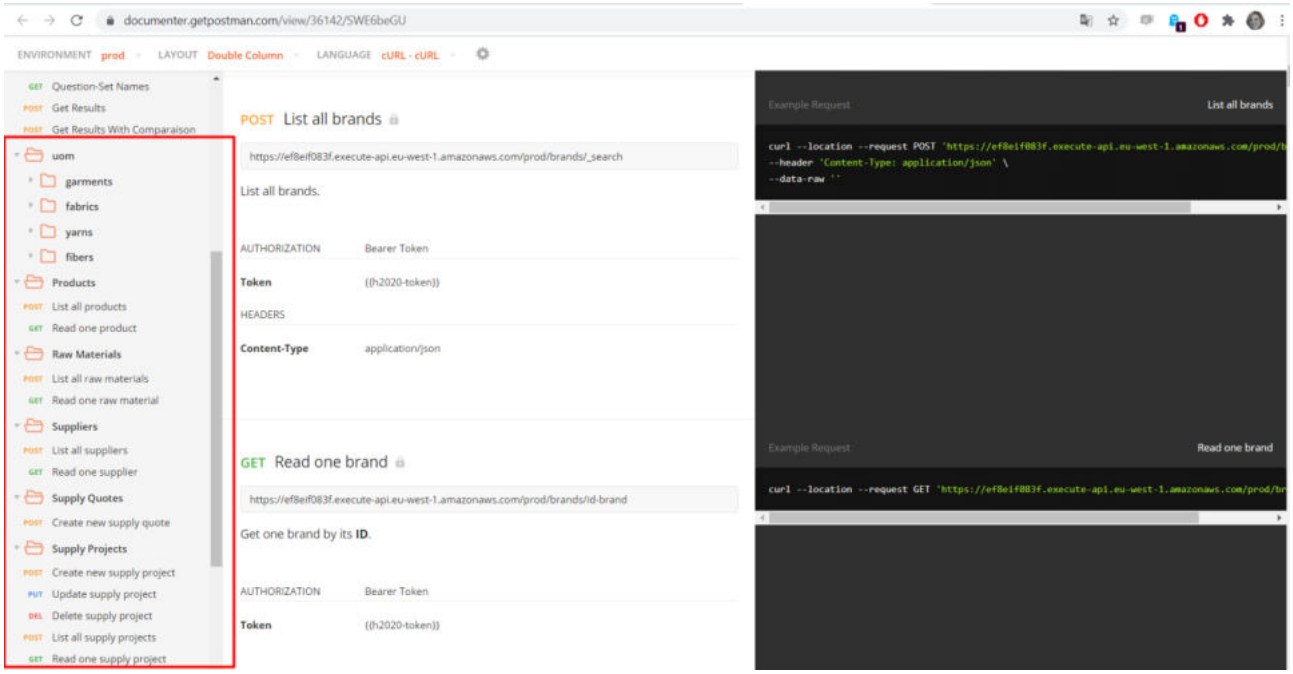
The tenant can be notified by email while the process is complete and the data is accessible**.**

Postman connectors of the FBD_B Model platform :

https://documenter.getpostman.com/view/36142/SWE6beGU

Caption of the FBD_B Model API documentation

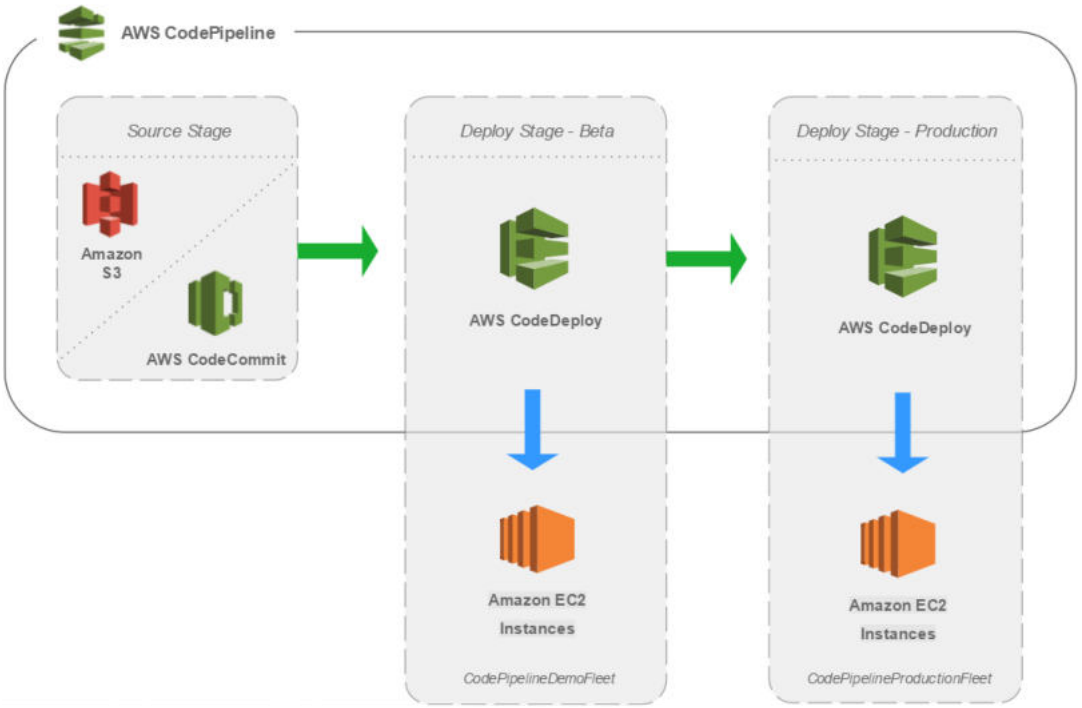




3.6 Scalability and Automation

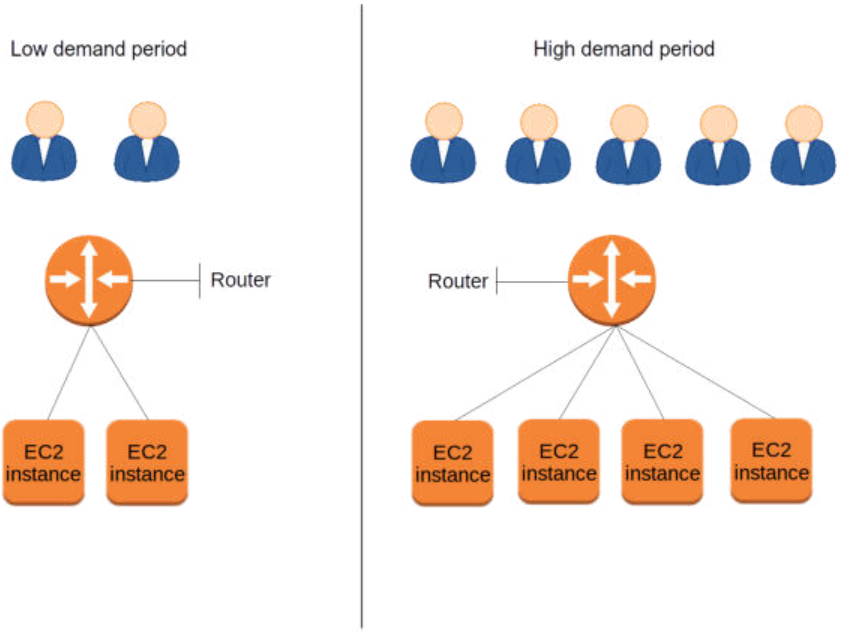
The main objective of the project is to target business opportunities through an innovative service. This is why it was thought to be scalable over time.

Example CI / CD policy on AWS:



Moreover, if the platform is used by many users and therefore generates significant traffic, it is able to adapt its infrastructure (by increasing the instances) to adapt to the new demand required. Ditto when traffic decreases. It is the concept of pay as you go.

Through this process, the cost of the FBD_B Model infrastructure is directly impacted.

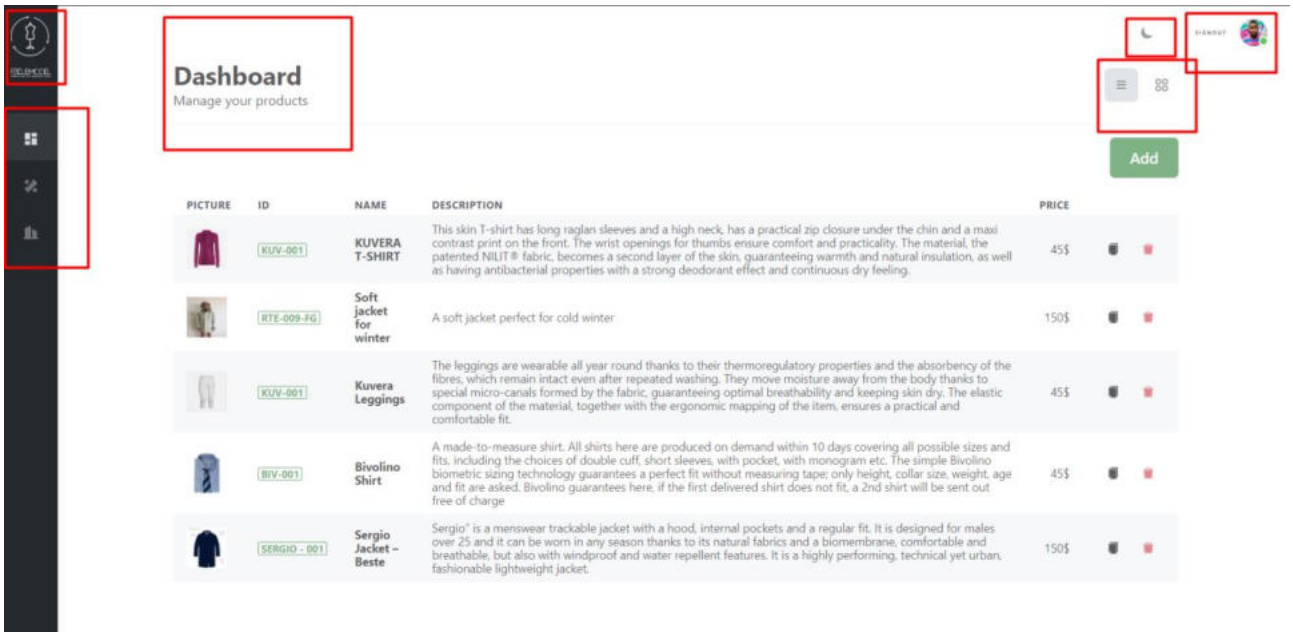


3.7 UX/UI Design of the FBD_B Model Platform

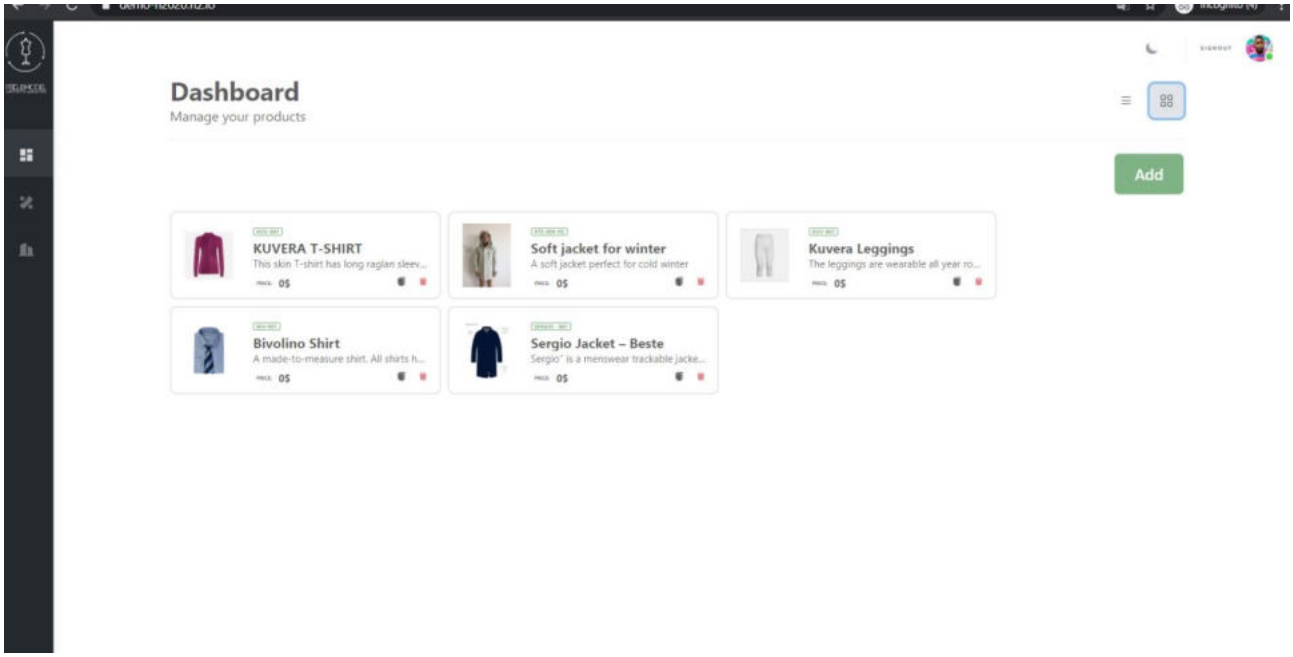
UX design refers to the term “user experience **design**”, while **UI** stands for “user **interface design**”. Both elements are crucial to a product and work closely together. On the design platform, user path have been used by defining a workflow for users, ensuring that the integration of the data services are relevant, coming at the right time, pushing the right information keeping in mind the needs of the user.

Special attention has been given to the following principles:

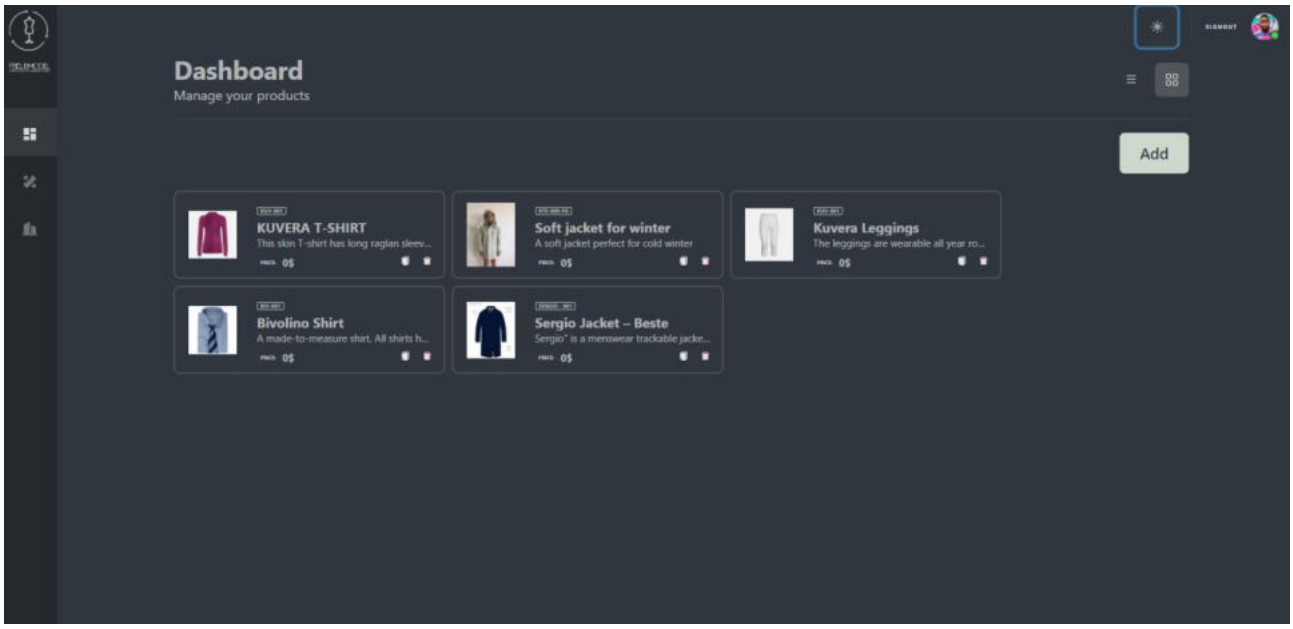
- Simplification of the user paths
- Navigation is easy to do, referring to many similar SaaS website: landing page, dashboard, profile section, menu on the left hand side, icon research for a better illustration of the features
- Design is sober while efficient
-
- Dynamic Sorting
- Easy Sign-Up process
- Focus on FBD_B Model Target Audience.
- Dark and light options
- Different display option
- Unicity of the design environment throughout the platform no matter who’s partner’s work is integrated



Example of visualisation of data

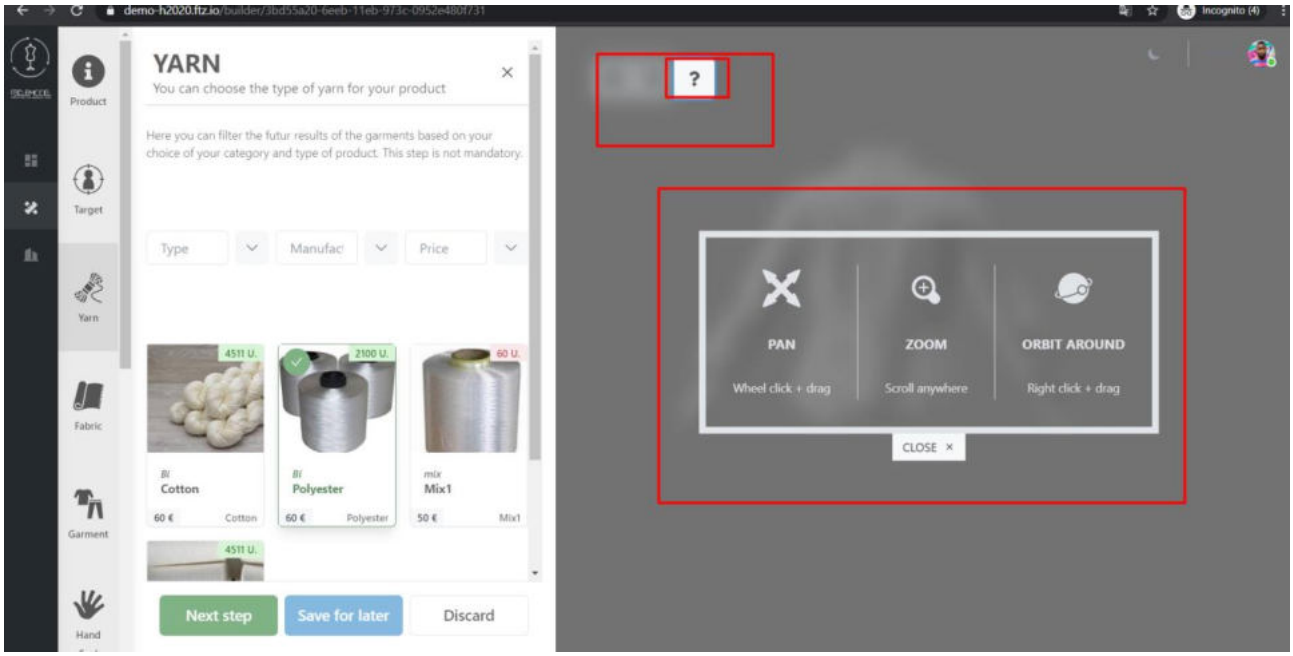


Caption of the Dark version

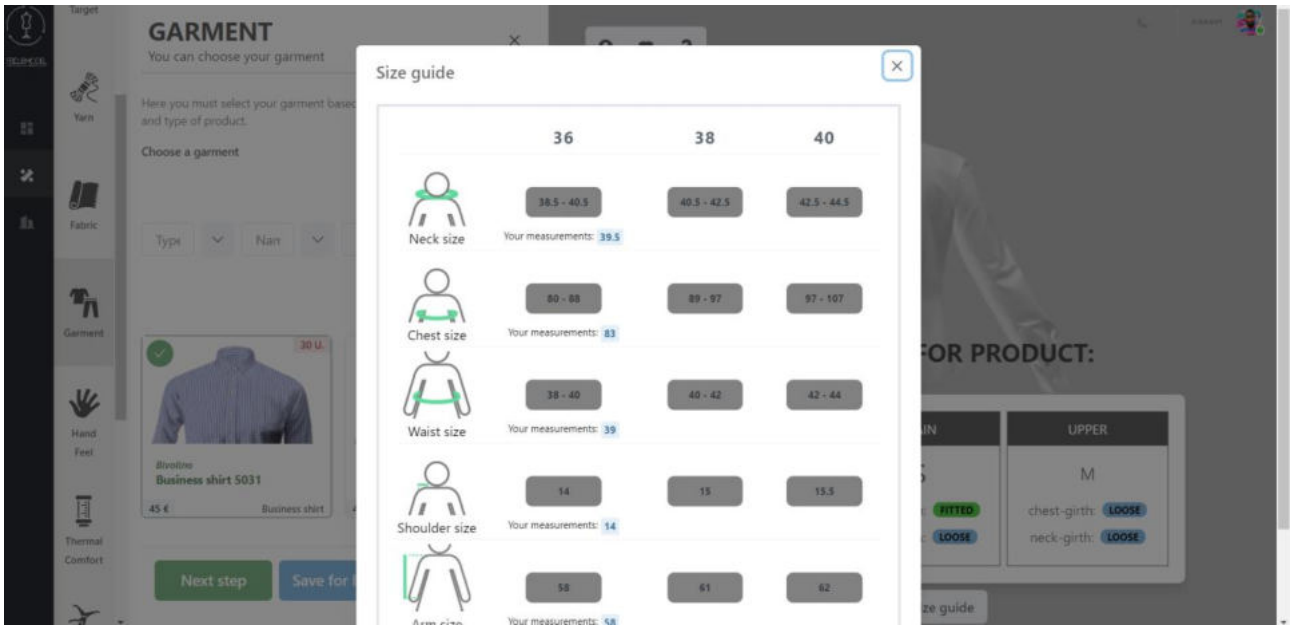


Caption of the information display

Example how to visualize 3D garment



Example of size guide



3.8 3D Avatar/Garment visualized on PC/Mobile app

One of the challenges of the integration of the different data services was the visualisation of the 3D avatar and garment. The generated 3D visualizations are converted into ZREST file format which is a format containing 3D geometry and material information to enable the FBD_B Model platform to visualise them on web browsers and smartphones.

The platform uses javascript libraries to see the objects in 3D. A JavaScript library is a library of pre-written JavaScript that allows for easier development of JavaScript-based applications.

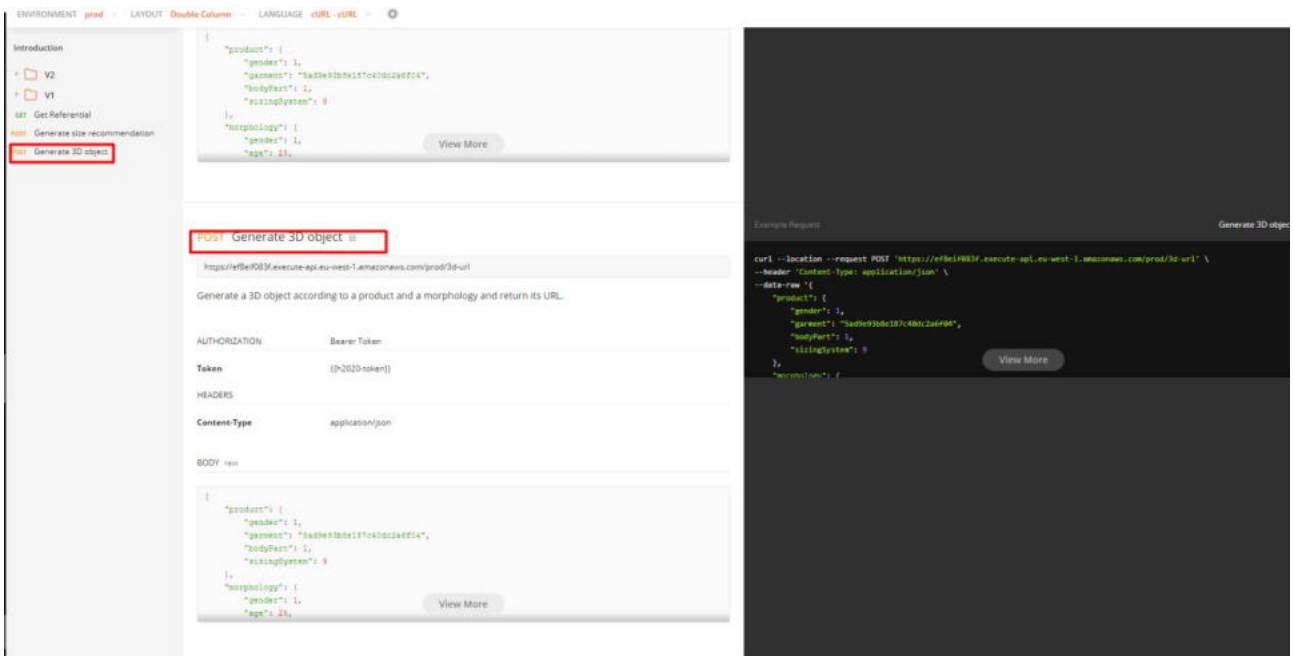
The 3D Viewer is a JavaScript library to see the object in 3D on any web pages or applications supporting HTTPS and JavaScript.

3D objects integration

A process has been established to import the 3D files in the platform: Concerning the integration of the results in the platform, it has been proven that is feasible to implement an API between the platform and the solution Clo3D easily, thanks to the Clo-set service, which is part of the solution Clo3D. The process was: the designer export the files in one the following format : ZPrj, ZPac ou AVT uploading of the files in clo-set requesting the clo-set API to get the ZREST Url of the file using the ZREST Url in the library

For more information, see: https://www.npmjs.com/package/@closet-viewer/closet-viewer

You can find below screenshots of the FBD_B Model API documentation on the 3D objects



BODY Raw

```
{
    "product": {
        "gender": 1,
        "garment": "5ad9e93b8e187c40dc2a6f04",
        "bodyPart": 1,
        "sizingSystem": 9
    },
    "morphology": {
        "gender": 1,
        "age": 25,
        "height": 183,
        "weight": 73,
        "shape": "H",
        "ease": 2
    }
}
```

Example Request

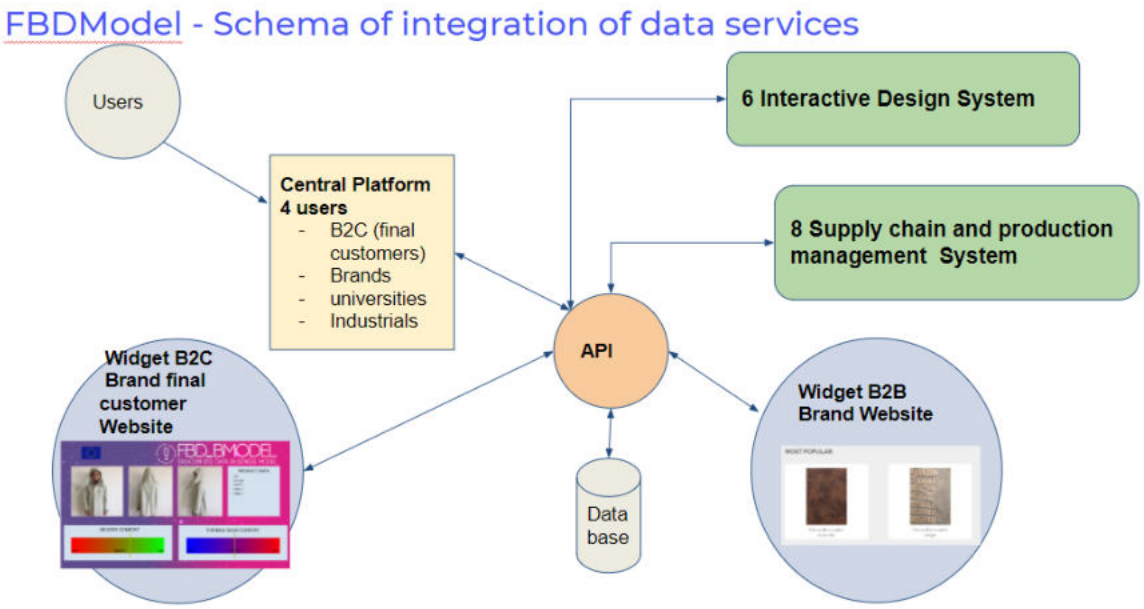
```
curl --location --request POST 'https://ef8eif083f.execute-api.eu-west-1.amazonaws.com/prod/3d-url' \
--header 'Content-Type: application/json' \
--data-raw '{
    "product": {
        "gender": 1,
        "garment": "5ad9e93b8e187c40dc2a6f04",
        "bodyPart": 1,
        "sizingSystem": 9
    },
    "morphology": {
        "gender": 1,
        "age": 25,
        "height": 183,
        "weight": 73,
        "shape": "H",
        "ease": 2
    }
}'
```

4 User guide of the FBD_B Model platform

4.1 How this data-driven platform works ?

The FBD_B Model comprises two interconnected knowledge-based subsystems:

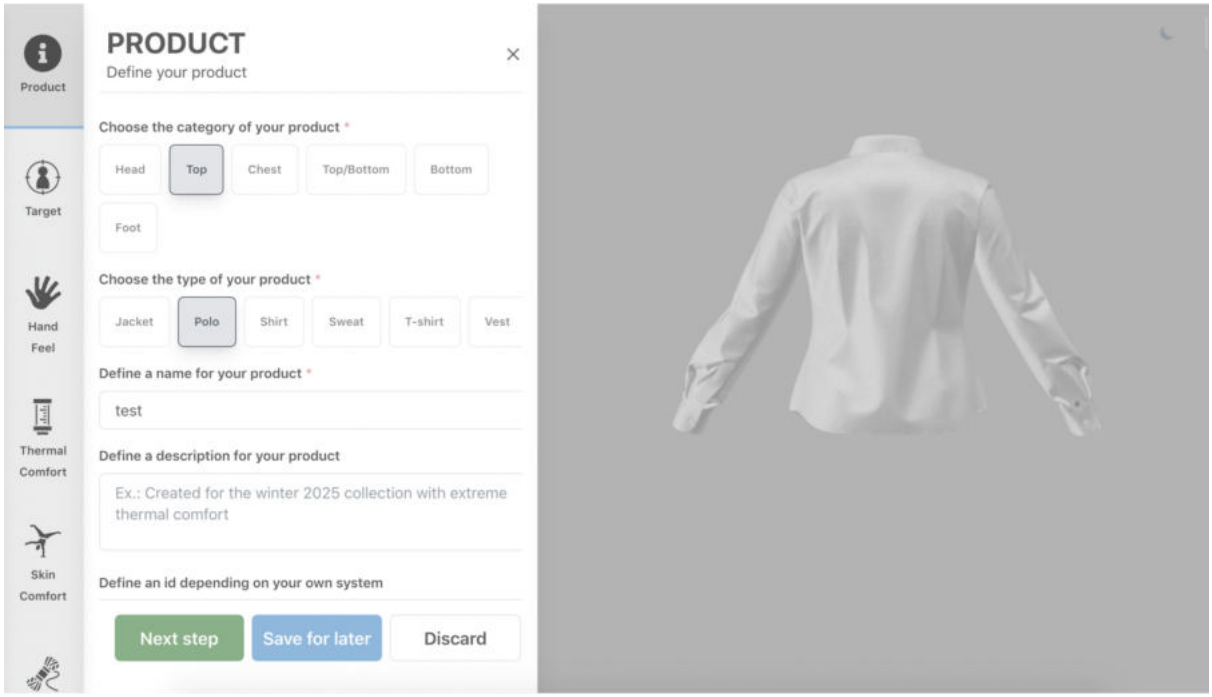
- an interactive design system, (IDS)
- and a supply chain and production management system (SCPMS).



Once connected to FBD BModel, the textile professional, wishing to produce a new collection, goes to the "Builder" interface. Interface in which he or she will enter several information concerning the product he plans to make: what type of product (polo shirt, jacket, pants, etc.), for what target, what experience to the touch (soft, smooth, etc.), what thermal comfort, which fabrics.

During this design phase, the product is presented in 3D with the requested characteristics.

A range of data-based services is made available to it (product and design recommendation, supplier selection, dynamic task planning, production simulation, etc.).

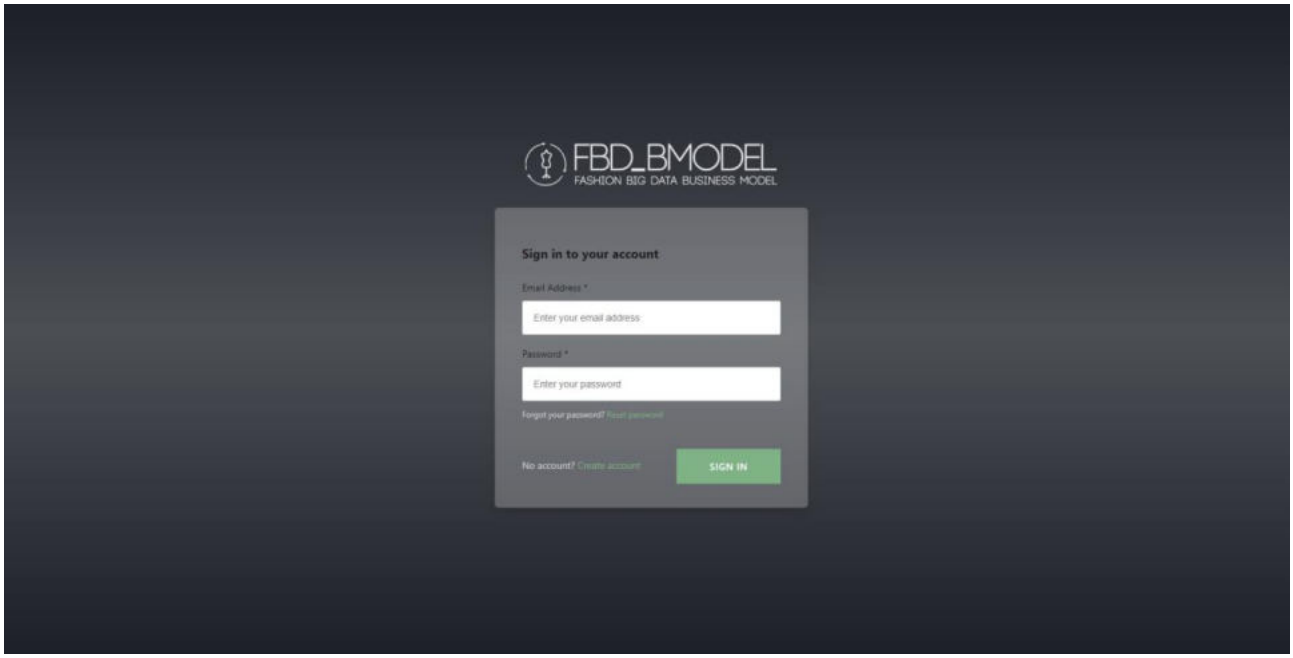


- An extended virtual space is provided to visually display and assess the “fashion” and “functional” performances (thermal comfort, comfort to the touch, etc.) of products integrating the “consumer lifestyle” parameter into their design process.

This portal has many advantages:

- It brings together the players in this market (brands, suppliers, manufacturers, researchers), for more transparency between them.
- It enables the development of small series of innovative functional garments through a local supply chain based in the European Union, and meeting the personalized requirements of consumers.
- It optimizes the activities of the supply chain.
- It supports and promotes local know-how (thanks to the data sharing of each actor, there is less waste in the production chain).

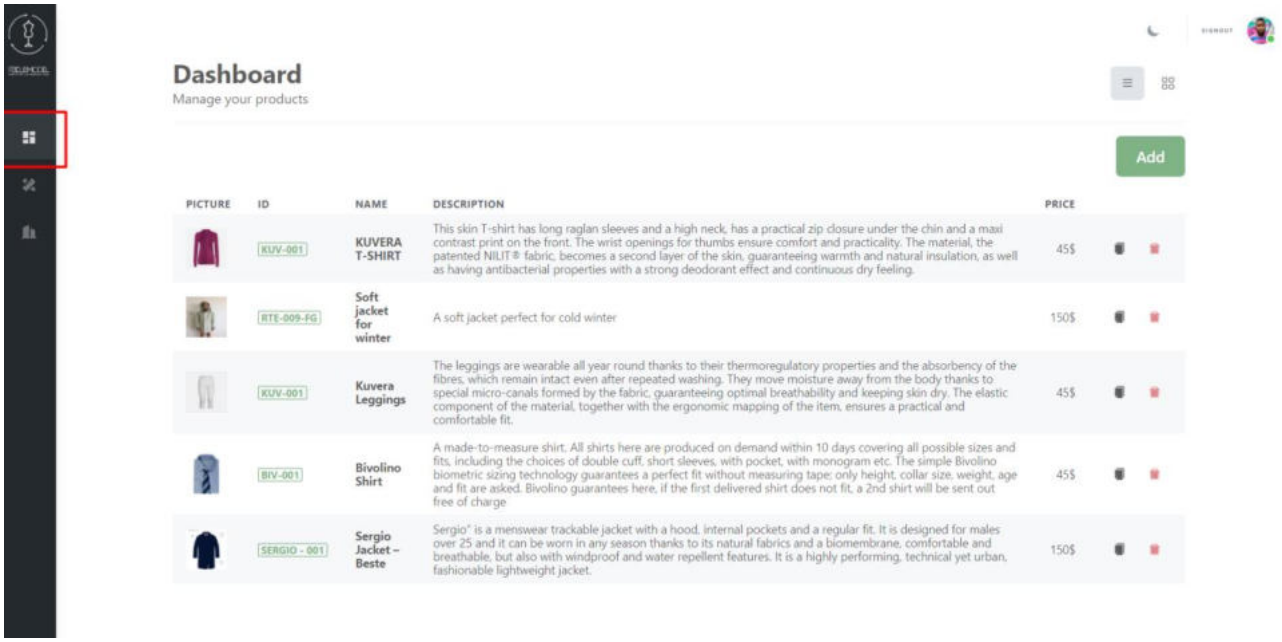
4.2 Connecting to the platform : main login page



Depending on the rights granted, the user will have access to different information.

See deliverable 6.4 for more information.

4.3 Dashboard view of existing projects



4.4 Builder's mode : creation of a technical document of a garment

Creation of a global feature Builder's mode allowing the creation of a scenario around a technical document of a garment to be ready to be submitted to suppliers for quotes

- Enhancement of the 3D garment
- Real time updates of informations, APIs and 3D reader

4.5 Approaches per data services (IDS and SCPMS)

Digital product visualizations:

1. by creating Textile Product Prototypes,
2. by digitizing fabrics offered by suppliers
3. by digitizing clothes: this allows brands to view the clothes they want to produce through this interface.

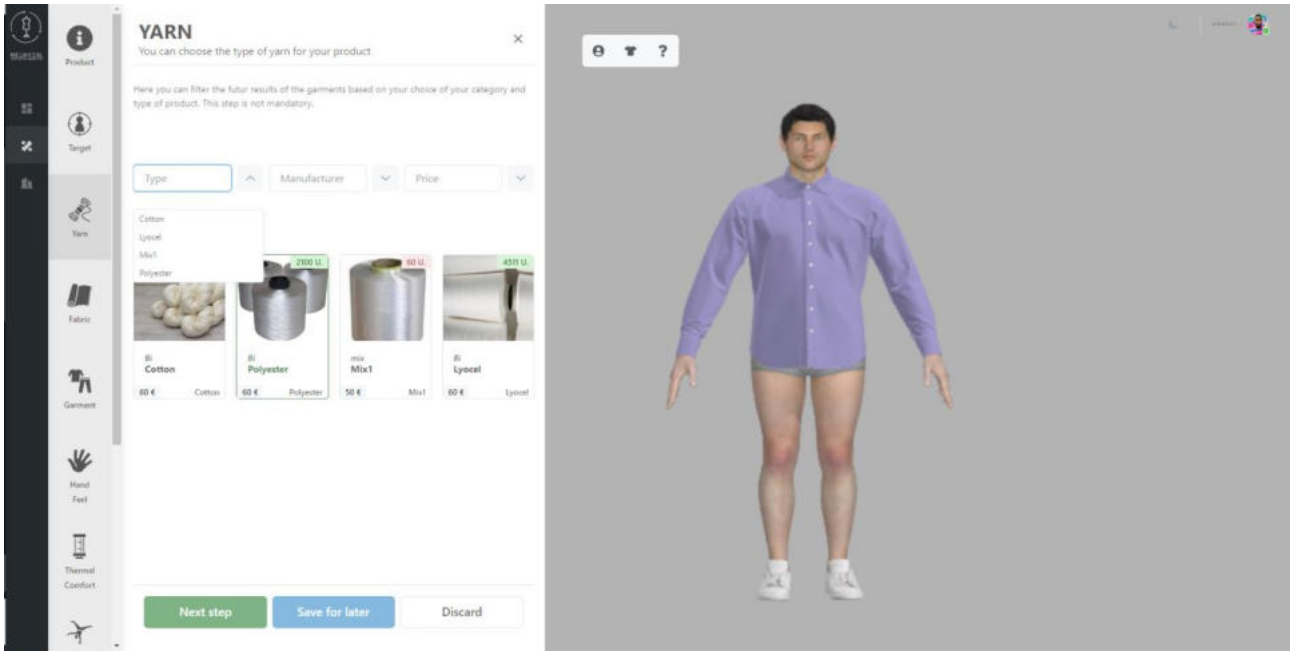
4.5.1 Uom - connecting with API

Integration of the work done by the University of Manchester with absorption of the datas

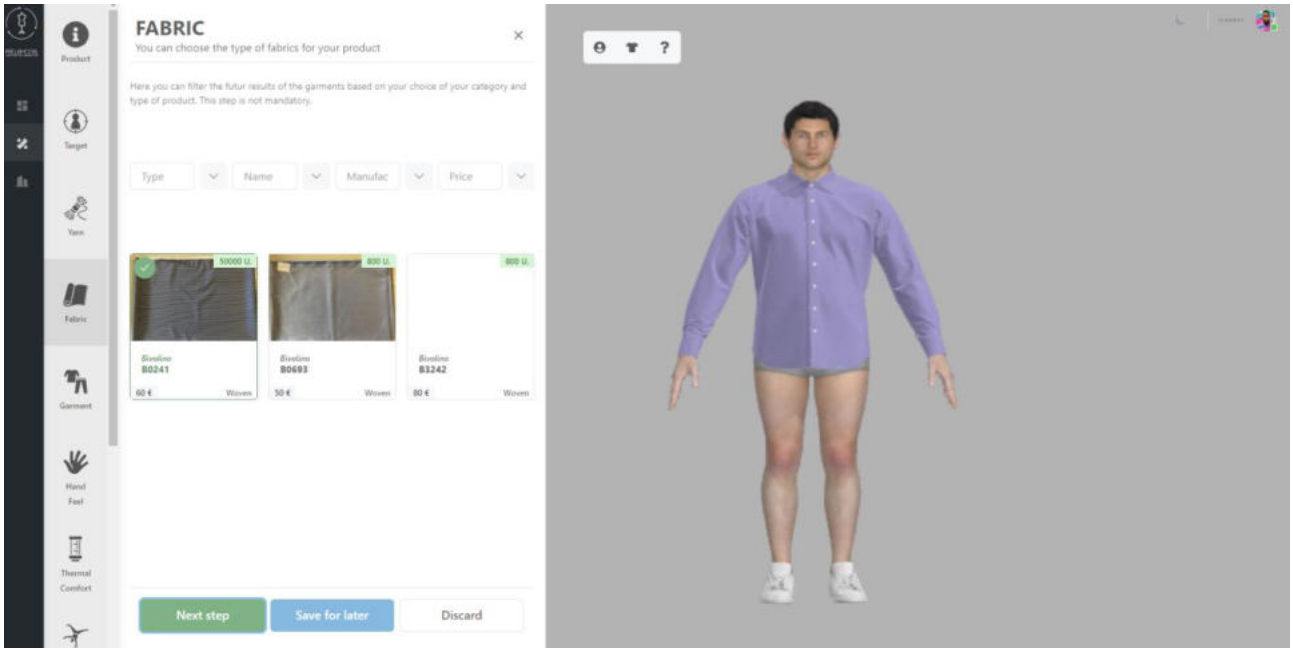
Taking into account the UoM pluggin recommendations on thermal, skin comfort, handfeel with triggers of the corresponding APIs

Showcasing the graphs with real time trigger of the API

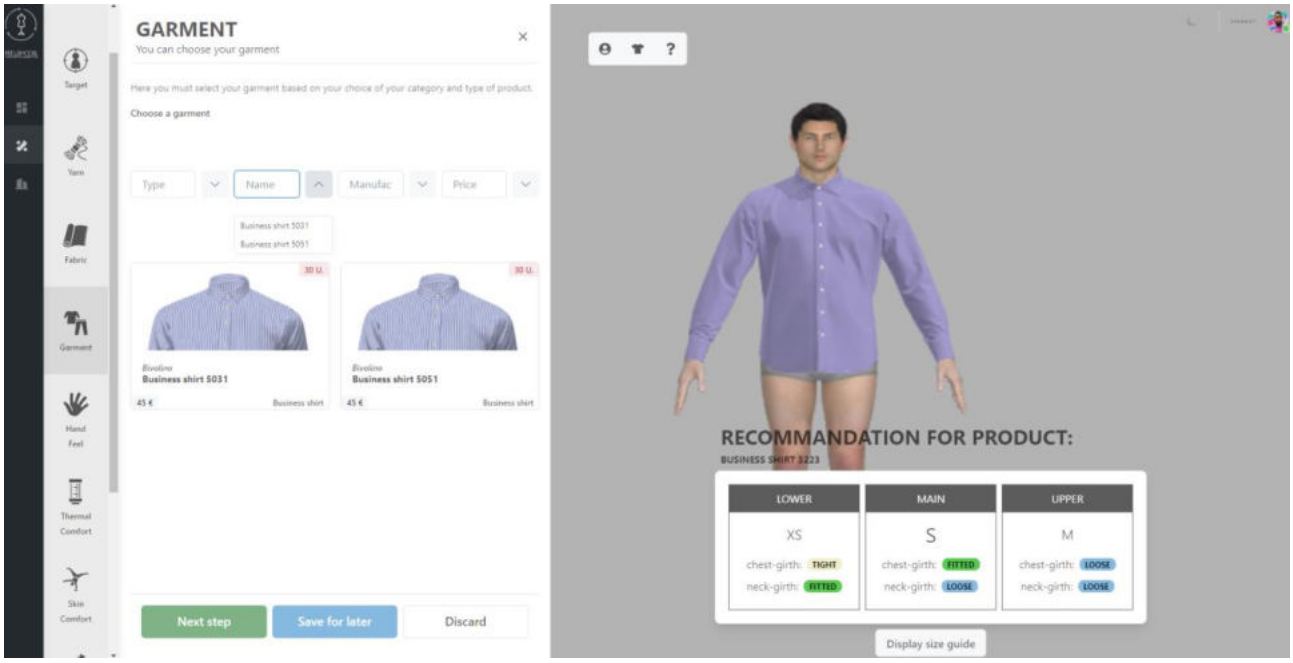
Caption of the Yarn filtration page



Caption of the Fabric Filtration page



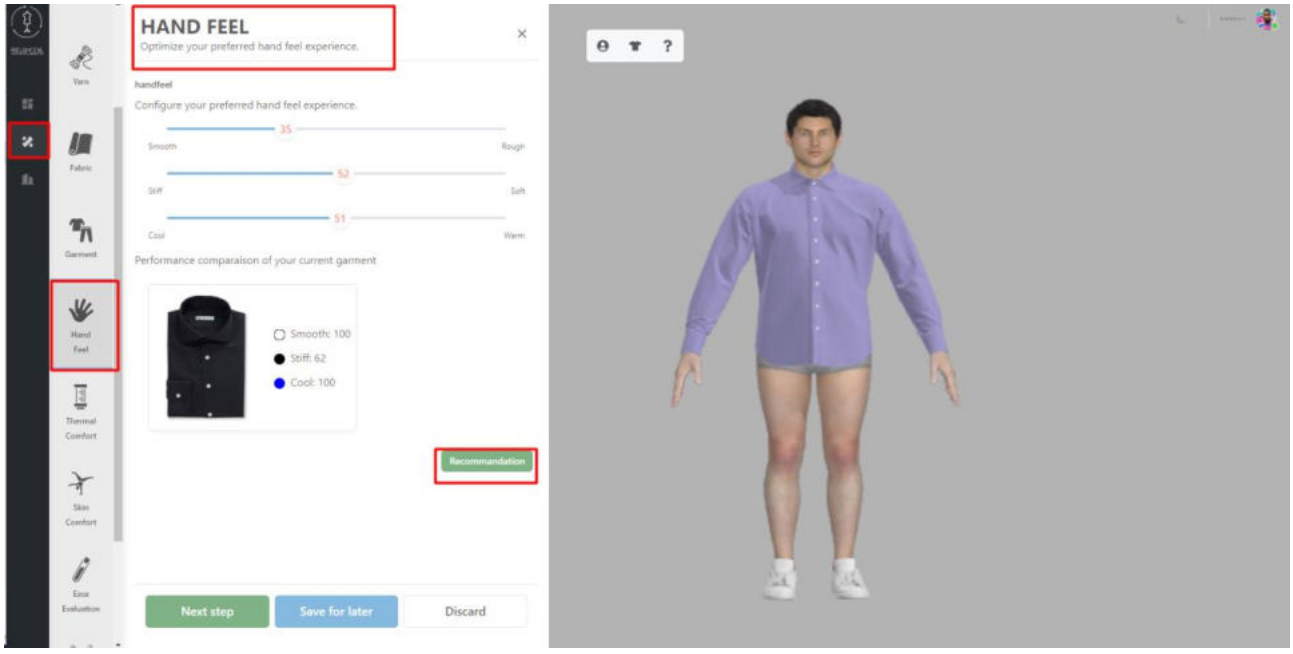
Caption of the Garment page

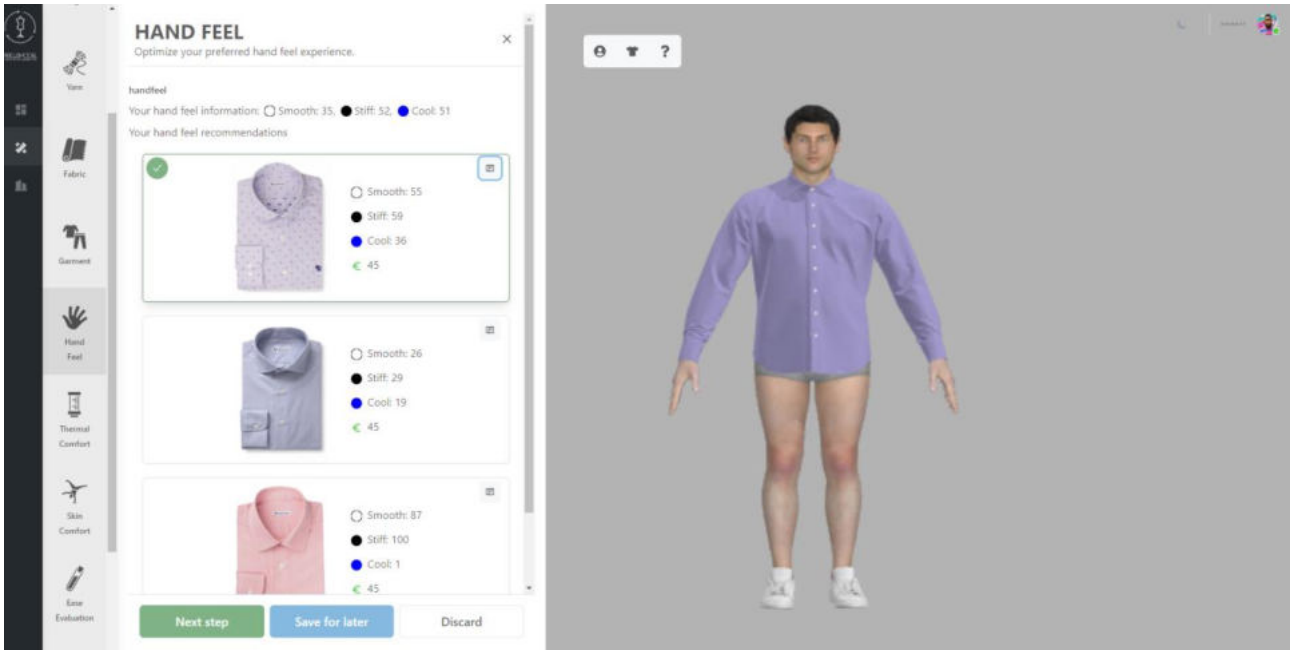


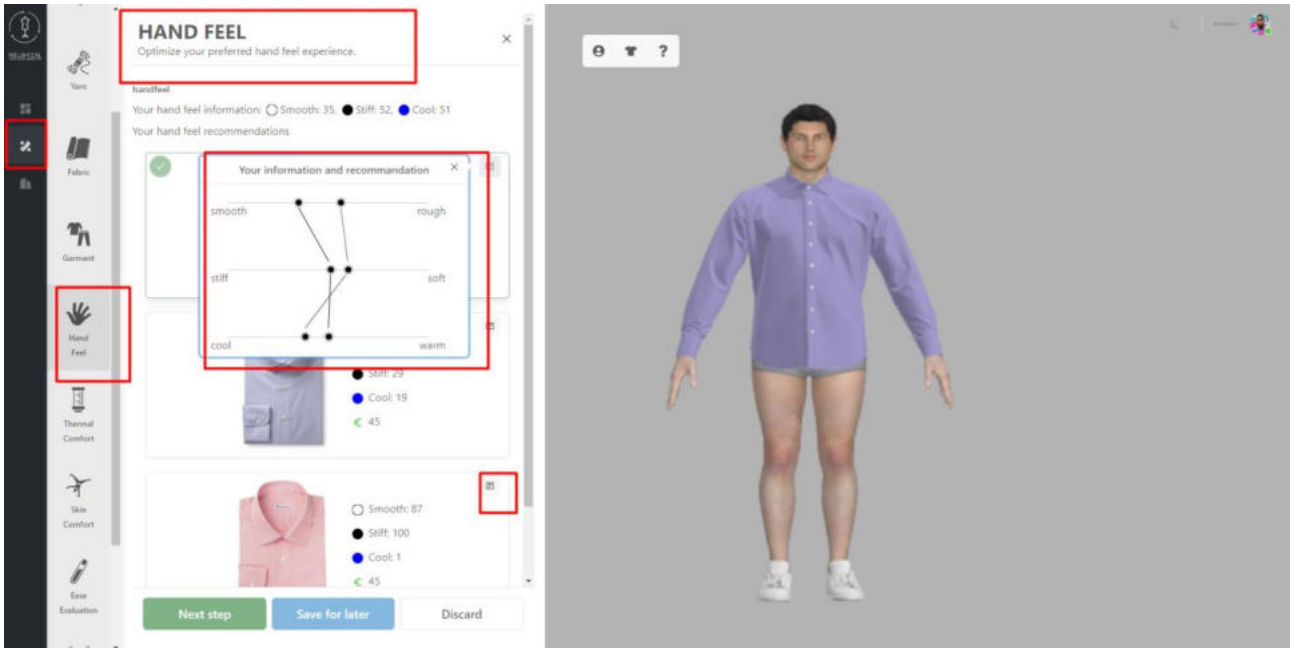
Data services around HandFeel, Thermal Comfort and Skin Comfort

Those data services allow the user to generate a recommendation based on choices made.

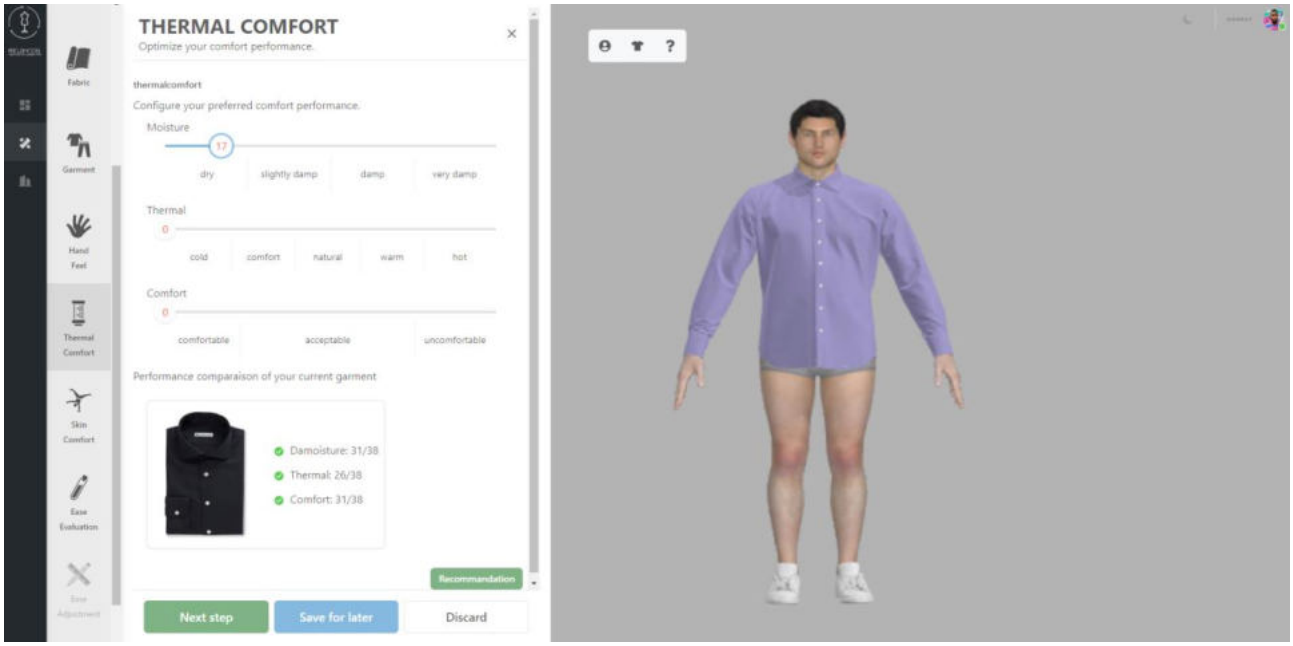
Caption of the recommendation for hand feel

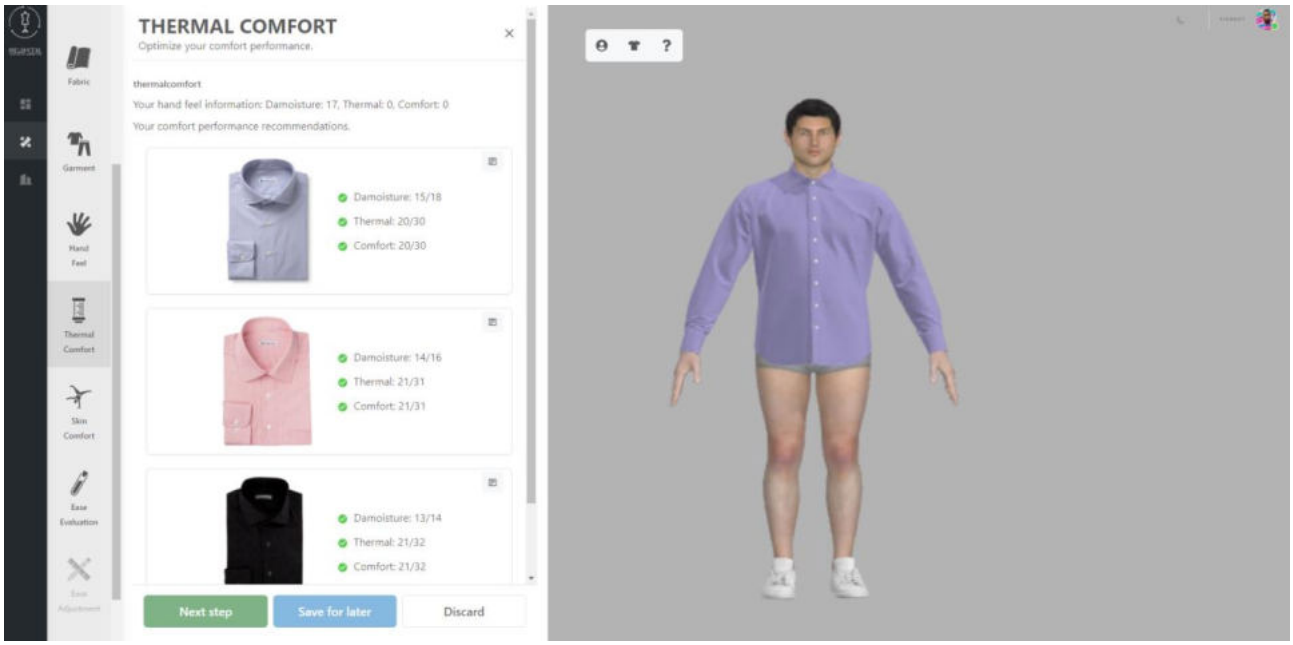


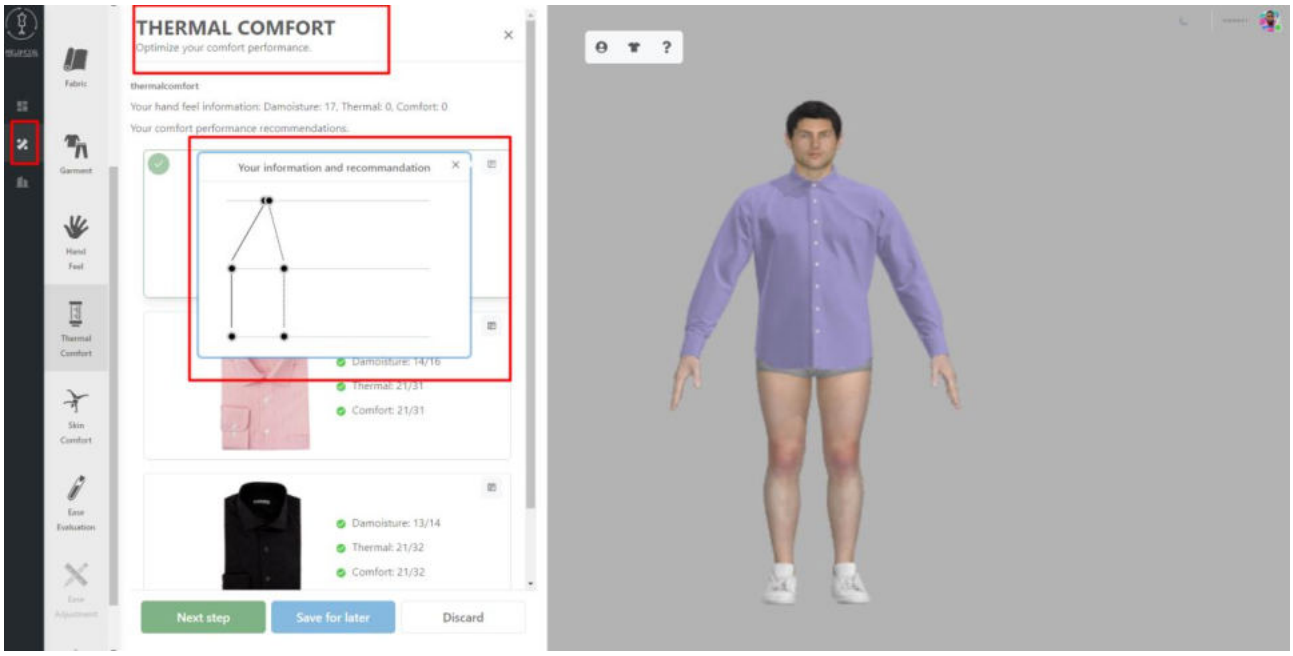

HAND FEEL
Optimize your preferred hand feel experience.
handfeel
Your hand feel information: Smooth: 35, Stiff: 52, Cool: 51
Your hand feel recommendations
Smooth: 55
Stiff: 59
Cool: 36
45
Smooth: 26
Stiff: 29
Cool: 19
45
Smooth: 87
Stiff: 100
Cool: 1
45
Next step
Save for later
Discard


HAND FEEL
Optimize your preferred hand feel experience.
handfeel
Your hand feel information: Smooth: 35, Stiff: 52, Cool: 51
Your hand feel recommendations
Your information and recommandation
smooth
rough
stiff
soft
cool
warm
Cool: 19
45
Smooth: 87
Stiff: 100
Cool: 1
45
Next step
Save for later
Discard

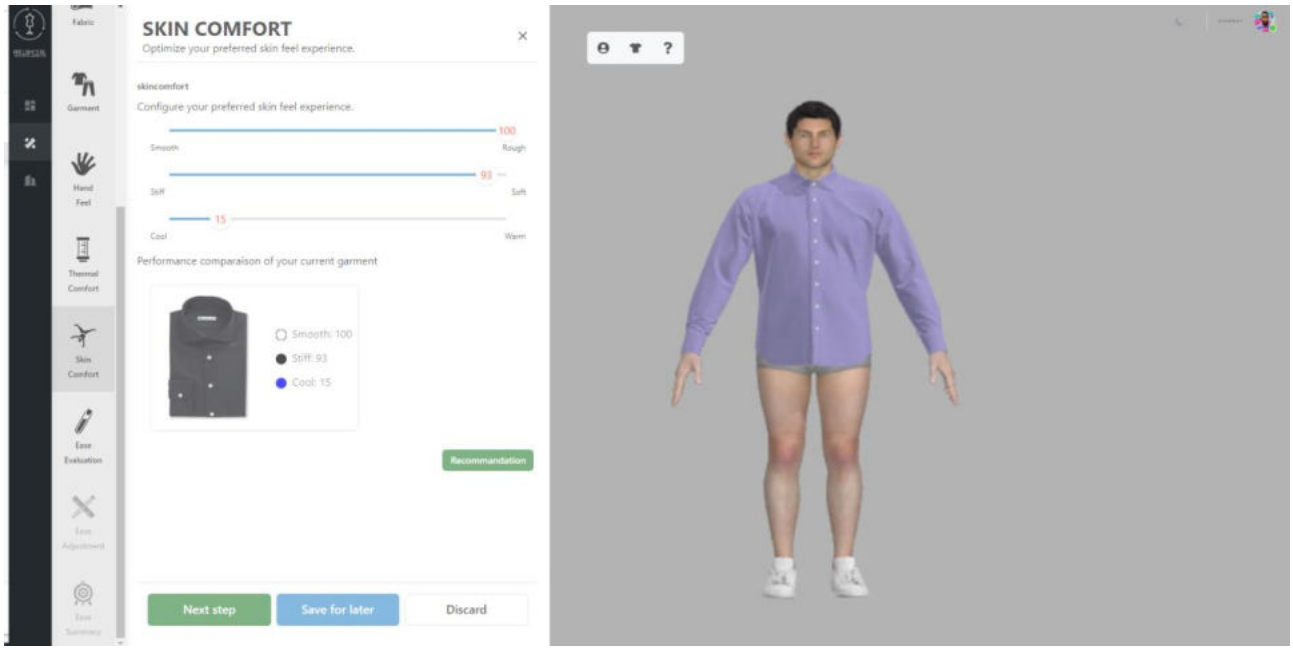
Caption of the recommendation for thermal comfort

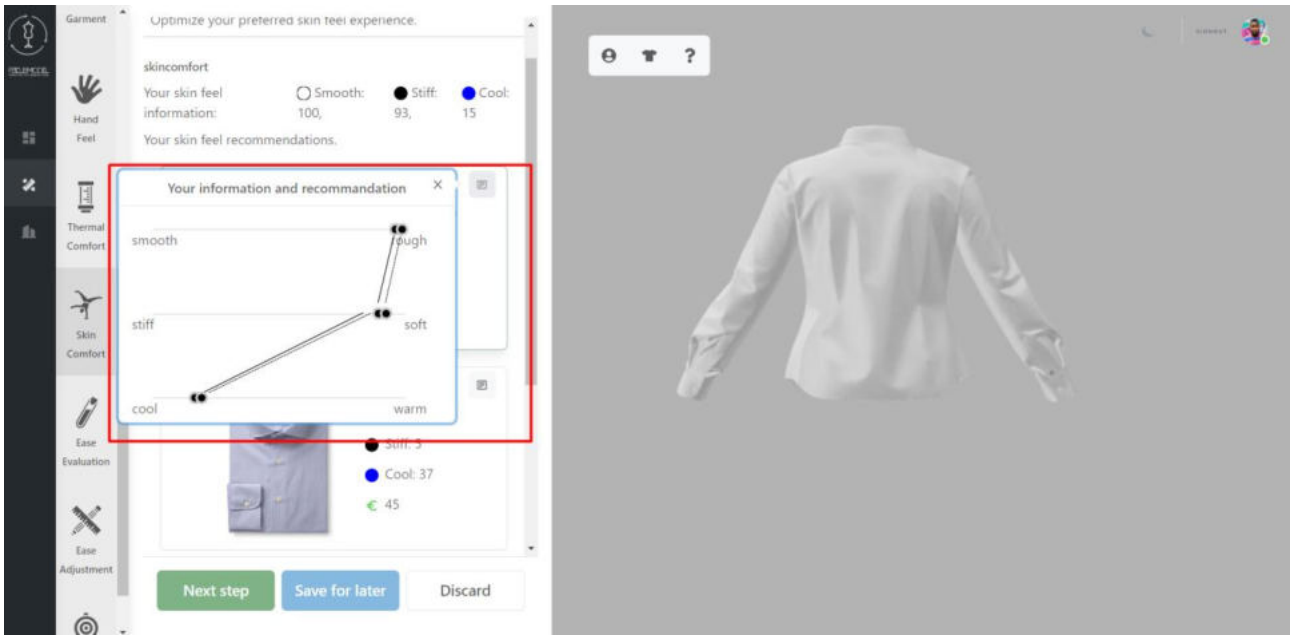






Caption of the recommendation for skin comfort





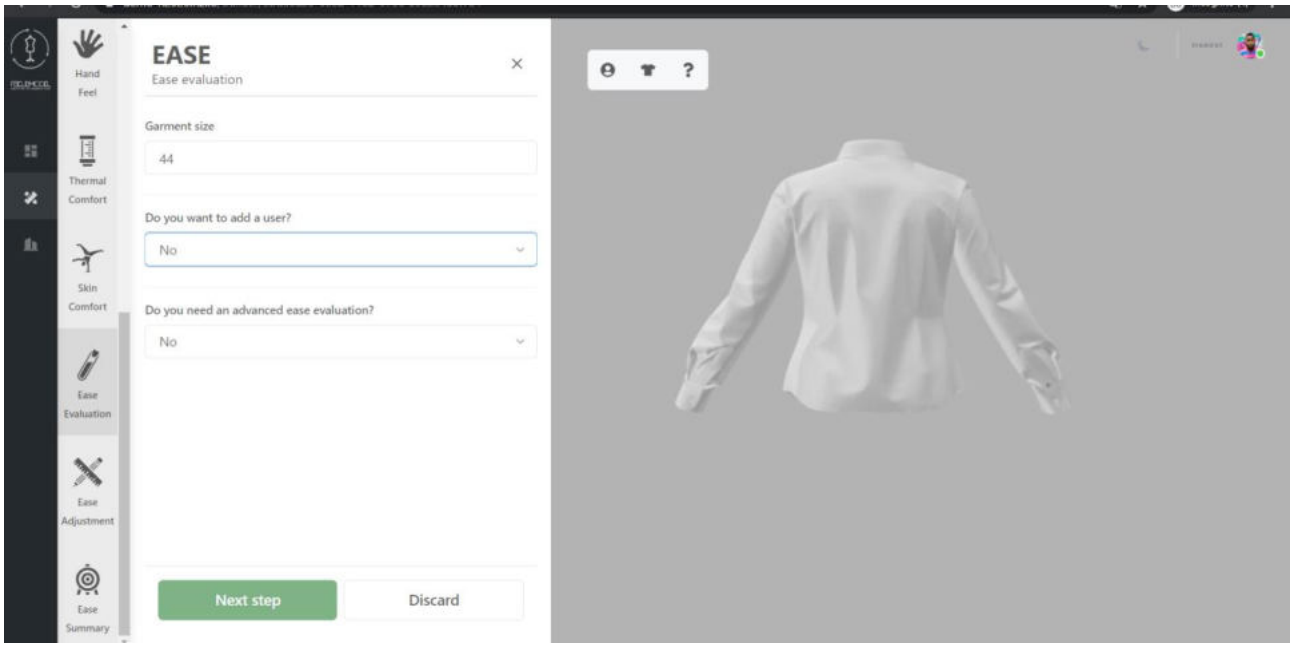
4.5.2 ENSAIT - connecting with an API

For the integration of the work done by the ENSAIT via API within the workflow, it was relevant to consider 3 scenario possible :

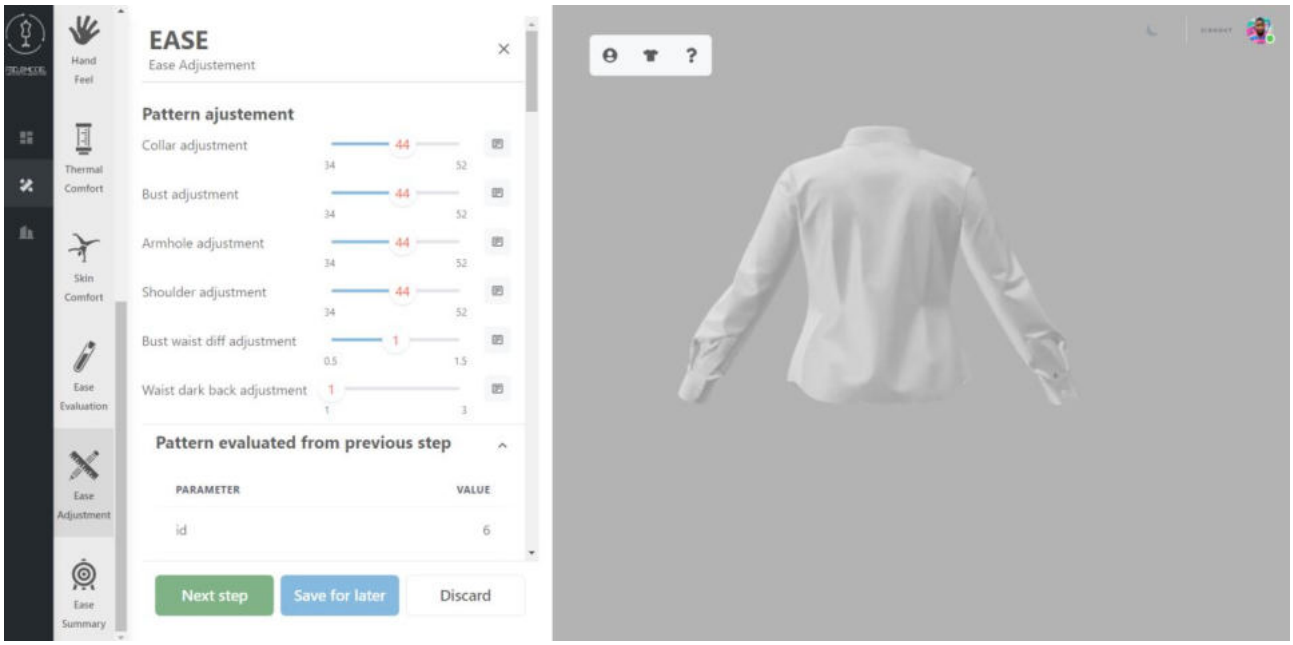
- Newcomers with a recommendation only made based in the size
- Intermediate based on the creation of a use profile through the ENSAIT API
- Advanced based on the adjustment of the pattern

Refactorization of some API because of the download of the datas integrated such as on the UoM website

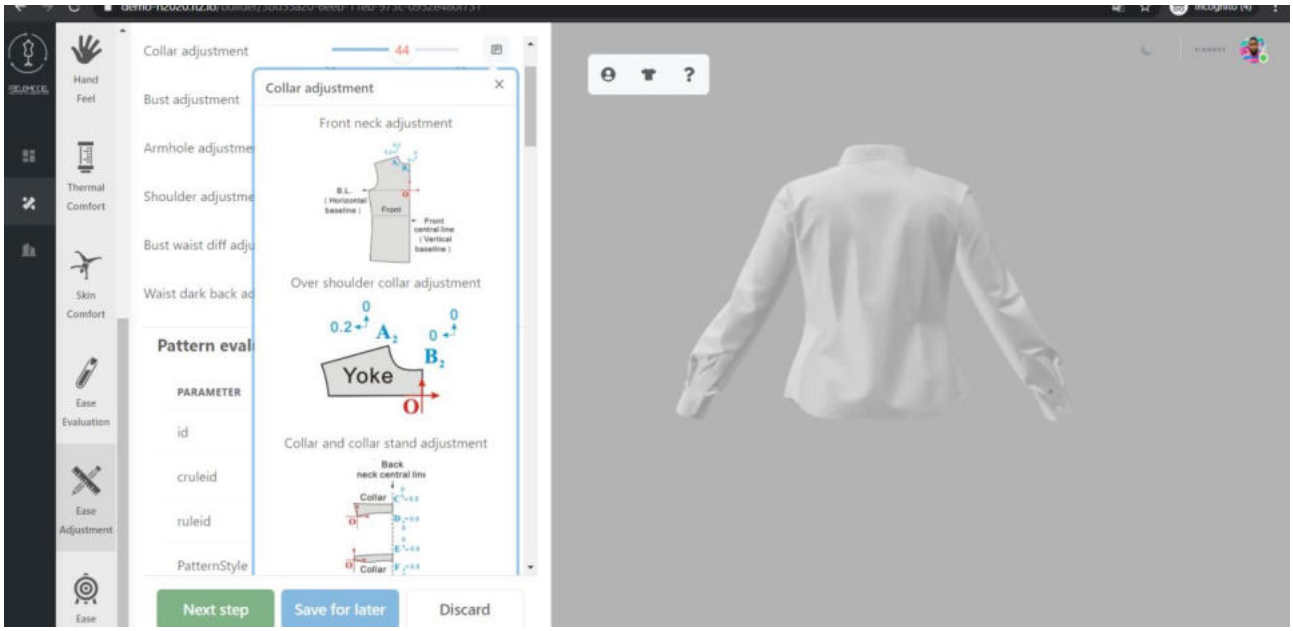
Caption of the ease evaluation



Caption of the ease adjustment



Caption of the sewing pattern and seams measures for improved ease adjustment



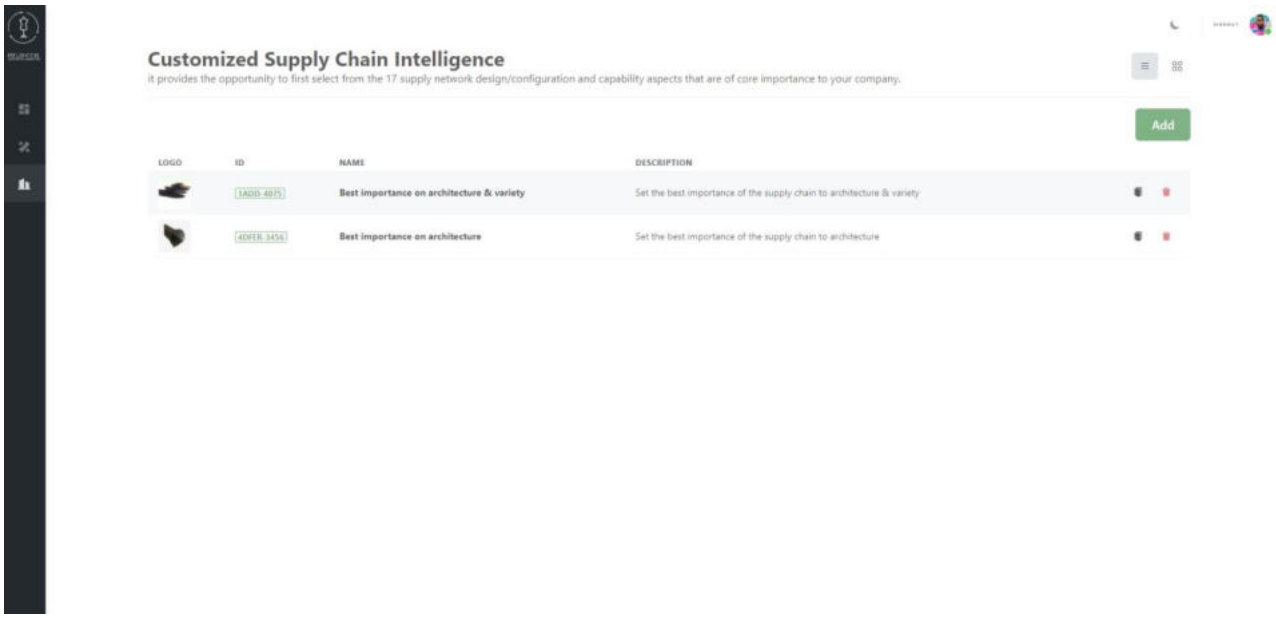
4.5.3 HB - connecting with API

The work around WP5 within the new platform was to ensure the creation of a global feature "suppliers" allowing to generate recommendations on suppliers: to achieve the deliverable, it was necessary to integrate the API of the University of Boras into the system.

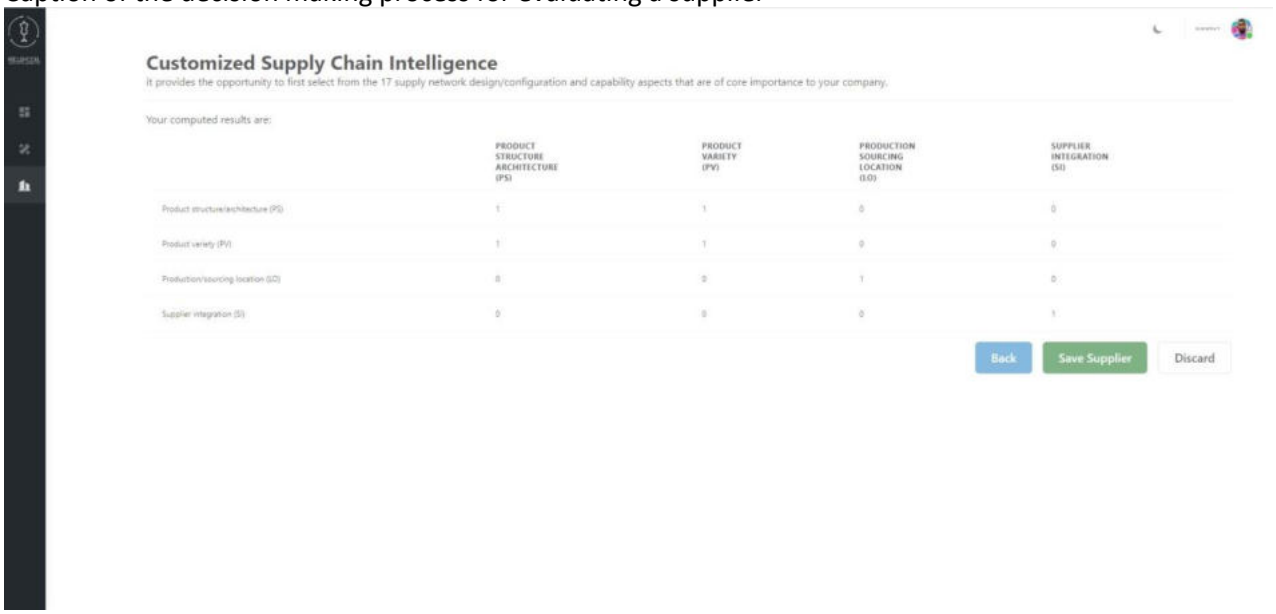
One of the main challenges was to ensure that the FBD_B Model could showcase the results and integrate graphs instantaneously. As it is possible to see on the demo and in the captions below, the platform is able to integrate the feature.

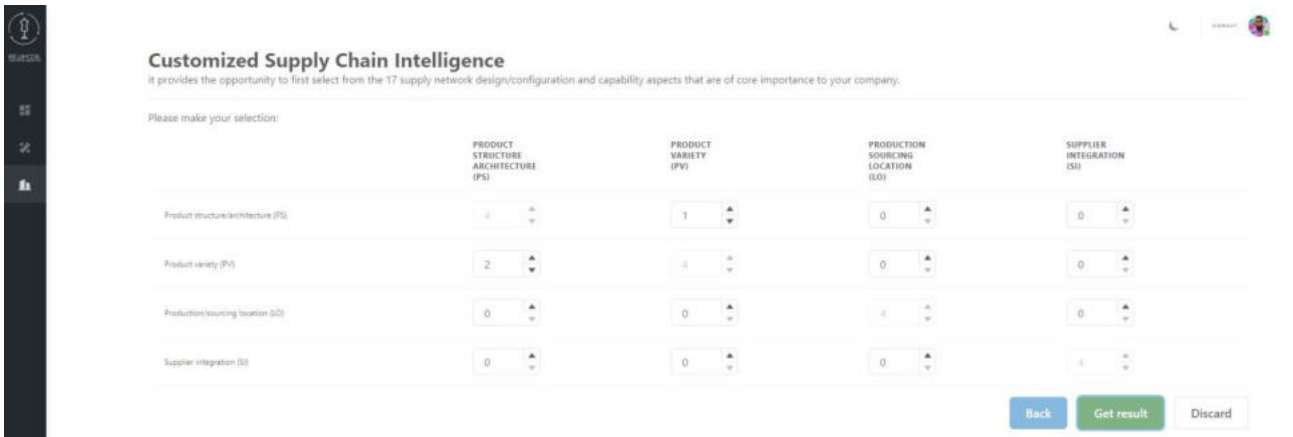
Demonstration of the suppliers functionality :

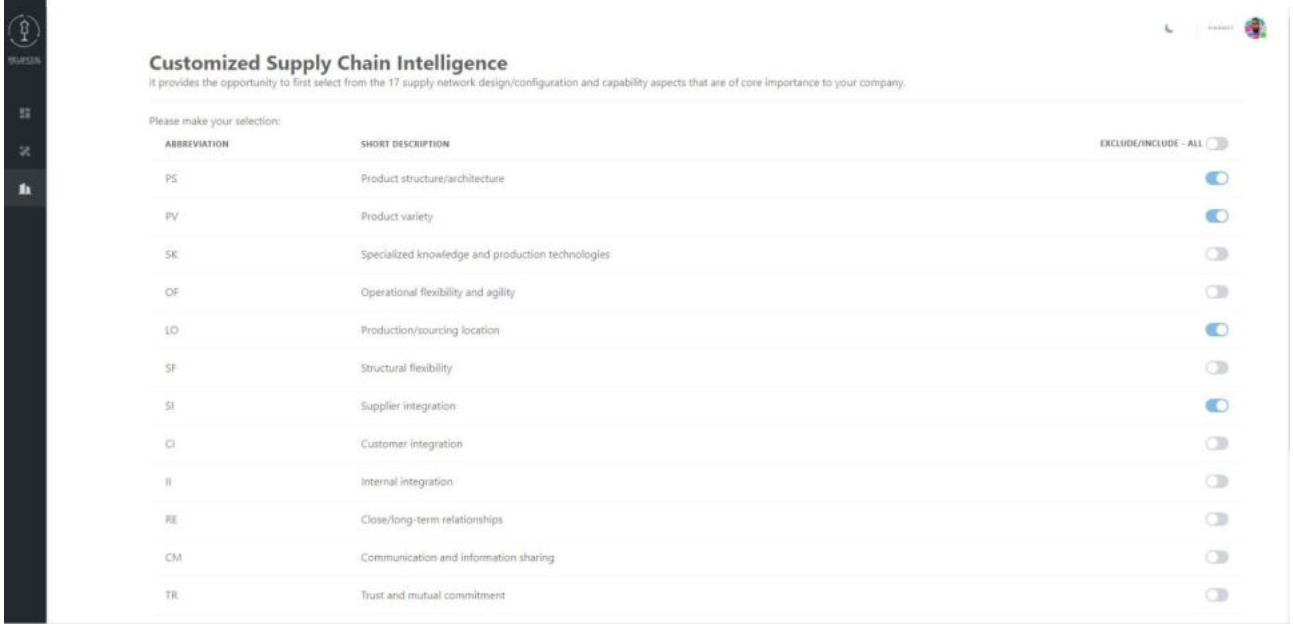
Caption of already created projects



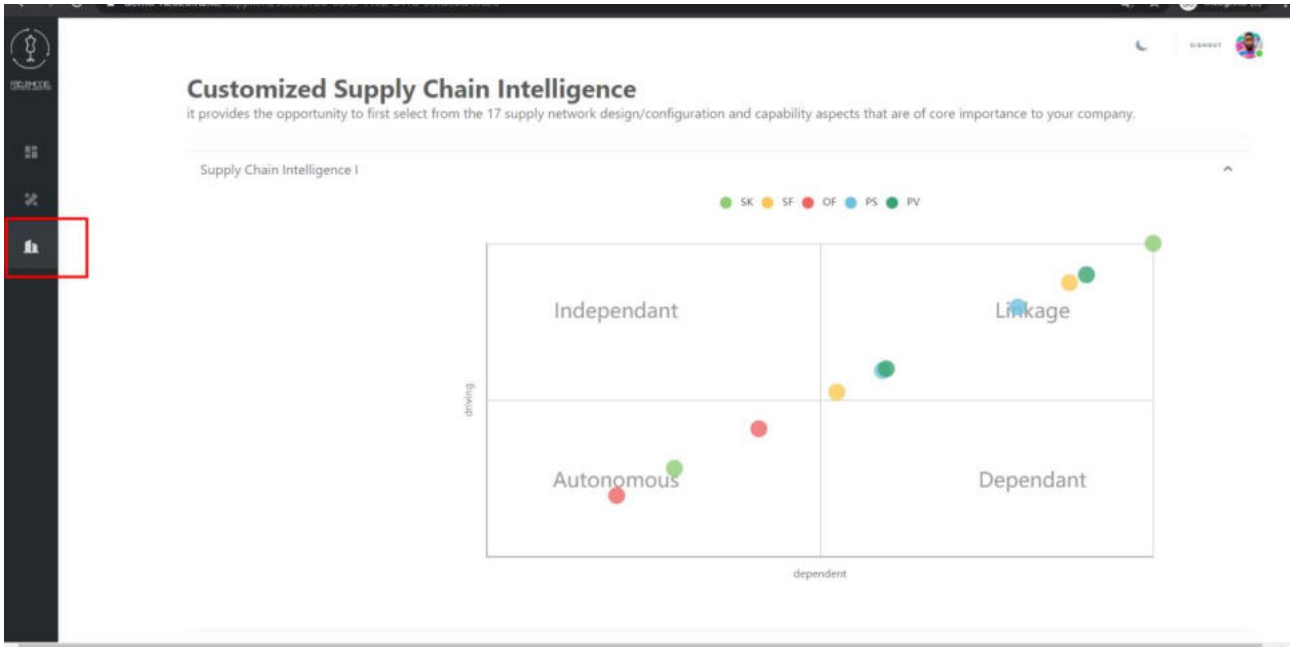
Caption of the decision making process for evaluating a supplier




Customized Supply Chain Intelligence
It provides the opportunity to first select from the 17 supply network design/configuration and capability aspects that are of core importance to your company.
Please make your selection:
PRODUCT STRUCTURE ARCHITECTURE (PS)
PRODUCT VARIETY (PV)
PRODUCTION SOURCING LOCATION (LO)
SUPPLIER INTEGRATION (SI)
Product structure/architecture (PS)
Product variety (PV)
Production/sourcing location (LO)
Supplier integration (SI)
Back
Get result
Discard


Customized Supply Chain Intelligence
It provides the opportunity to first select from the 17 supply network design/configuration and capability aspects that are of core importance to your company.
Please make your selection:
ABBREVIATION
SHORT DESCRIPTION
EXCLUDE/INCLUDE - ALL
PS Product structure/architecture
PV Product variety
SK Specialized knowledge and production technologies
OF Operational flexibility and agility
LO Production/sourcing location
SF Structural flexibility
SI Supplier integration
CI Customer integration
II Internal integration
RE Close/long-term relationships
CM Communication and information sharing
TR Trust and mutual commitment

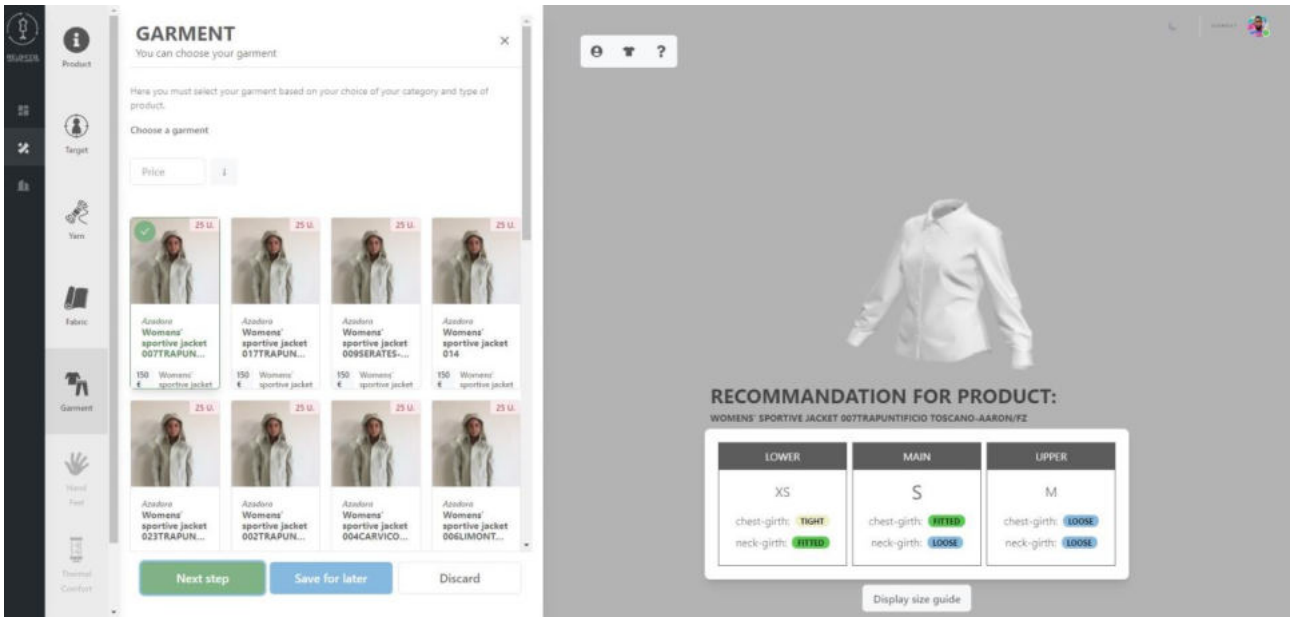
Showcasing the results of the evaluated supplier



4.5.4 Fitizzy - connecting with an API

Integration of the data service evaluating the right size and morphological recommendation algorithm of Fitizzy has been connected through an API.

Caption of the size and morphological recommendation service



***