FBD_BMODEL
FASHION BIG DATA BUSINESS MODEL

D 6.1

Interfaces for B2C & B2B Gateways (M26)

Project Information

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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)*
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Project Coordinator	Xianyi Zeng (ENSAIT)
Project Website	http://www.fbd-bmodel.eu

Deliverable Information

Deliverable n°	D 6.1
Deliverable title	Interfaces for B2C and B2B Gateways
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	DSS
Contributors	Fitizzy
Reviewers	Project Coordinator
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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)	✔

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1 Executive Summary

The first 18 months have been focused on developing 2 B2C gateways and 1 B2B Gateway that provide secure communication between the consumers and industry partners and the cloud data management and protection system.

Highlight points:

- Mobile Interface design has been completed
- Website Interface designs have been completed
- Development of UI components completed for both B2C Gateways
- Sample data has been tested through interfaces to ensure smooth operation
- API has been developed with the required input and output parameters to enable smooth data transfer between the cloud data management system and the gateways.
- The products for the business cases (chosen by the Consortium) have been digitally designed and visualized on the cloud platform ready to integrate with B2C gateways
- Next step towards the realisation of the FBD Model project is the integration of the data end points and data input and output parameters from partners in the cloud data management system so it can be viewable in the interface gateways.

2 B2C Mobile and Web Gateways

Desap and Fitizzy developed user friendly interfaces for consumers to act as gateways to access the FBD_BModel digital platform.

Through B2C Website and Mobile App gateway, global consumers will be able to get high performance textile and apparel products for specific purposes by specifying their lifestyle requirements and demographic details in order to get professional advice on how to buy and guide them how to select and wear garments.

These built interfaces include world class user journeys for the following:

- Consumer Onboarding (Identify consumer's demographic and anthropological profiles and their lifestyle needs identification)
- Consumer Profile Setup and lifestyle needs
- Product Evaluation
- Product Fitting/Comfort Evaluation
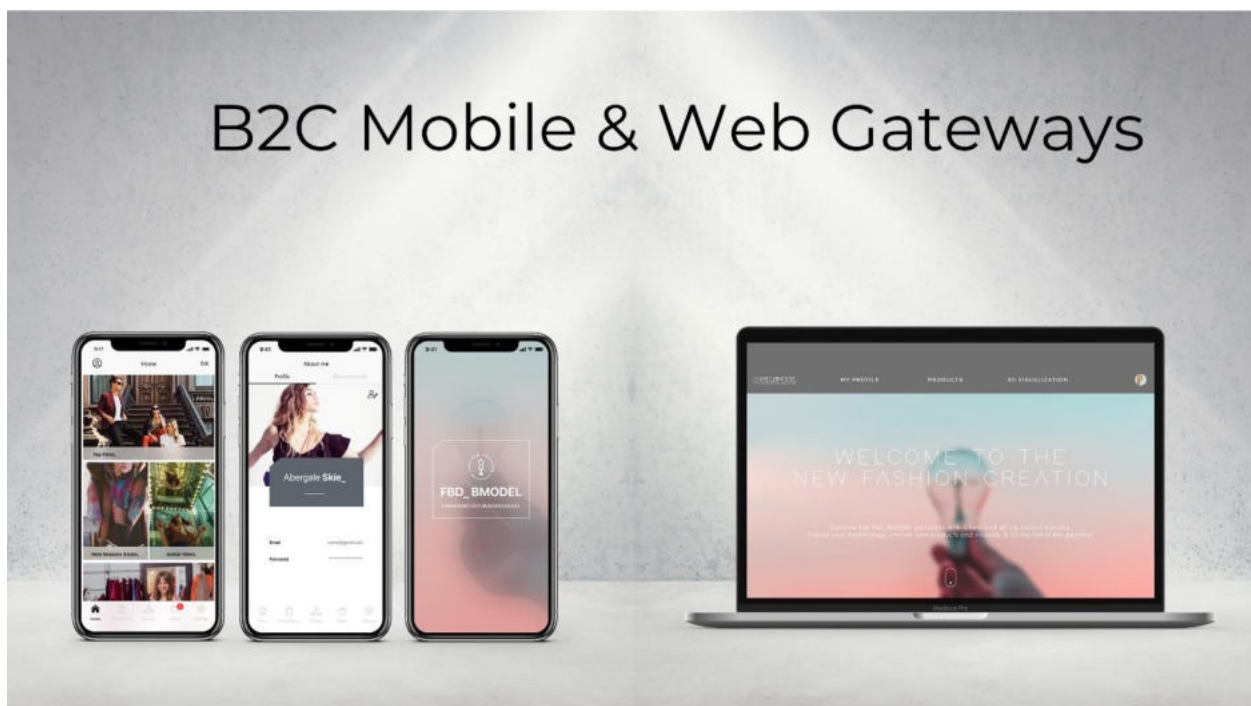
Mobile App – B2C Gateway

The mobile App gateway will be used by global consumers usually those people who are always on the move and prefer to make their purchasing decisions on the mobile phone other than on a desktop computer.   The Percentage of global users using the mobile phone to shop is 53% therefore building the mobile gateway is crucial for the FBD_B platform.

2.1.1 Mobile Platforms

The mobile gateway has been developed to run on iPhone (iPhone App) and Android phone (Android App)

3.1.1.1 iPhone App

An iPhone App Interface has been developed to run on the iPhones currently sold and supported by Apple.

iPhone Models

iPhone 11	iPhone 8
iPhone XR	iPhone 11 Pro Max
iPhone 11 Pro	iPhone 8 Plus

The App interface has also been built to run on Apple Operating systems: iOS 11, iOS 12 and iOS 13

The orientation of the App is portrait.

3.1.1.2 Android App

An Android Interface has been developed to run on hundreds of Android phones currently on the market. Unlike the iOS, the Android operating system has hundreds of phones on the market and therefore it has been tricky and time consuming to optimise the mobile app gateway to be compatible with the different shapes and sizes of the hundreds of android phones available on the market.

2.1.2 Systems And Technologies

The mobile gateways have been developed using a combination of React Native, Swift and Android Java.

The following technologies were selected because they have a lot of benefits. These are:

- The interfaces are more intuitive and Interactive

- Good security

- Optimal performance

- Code reusability

- Modular architecture

- Cost Effective

- Smooth user interfaces

- Third party plugin support

2.1.3 Security

The mobile platforms and processes are developed and managed with a security first approach utilising security by design methodology.

Every single unit of data that is exchanged over the app is encrypted. Encryption is the way of scrambling plain text until it is just a vague alphabet soup with no meaning to anyone except those who have the key. This means that even if data is stolen, there's nothing criminals can read and misuse. All data stored and transmitted is encrypted under the 256-bit Advanced Encryption Standard to ensure absolute data security while in transit over the net. We utilise a combination of client-side data encryption & data integrity authentication to ensure data is always safe.

We utilised Key management or our encryption. We made sure no keys are hard coded as that makes it easy for attackers to steal them.

We used tokens instead of device identifiers to identify sessions. Tokens can be revoked at any time, making them more secure in case of lost and stolen devices.

2.1.3.2 Authentication
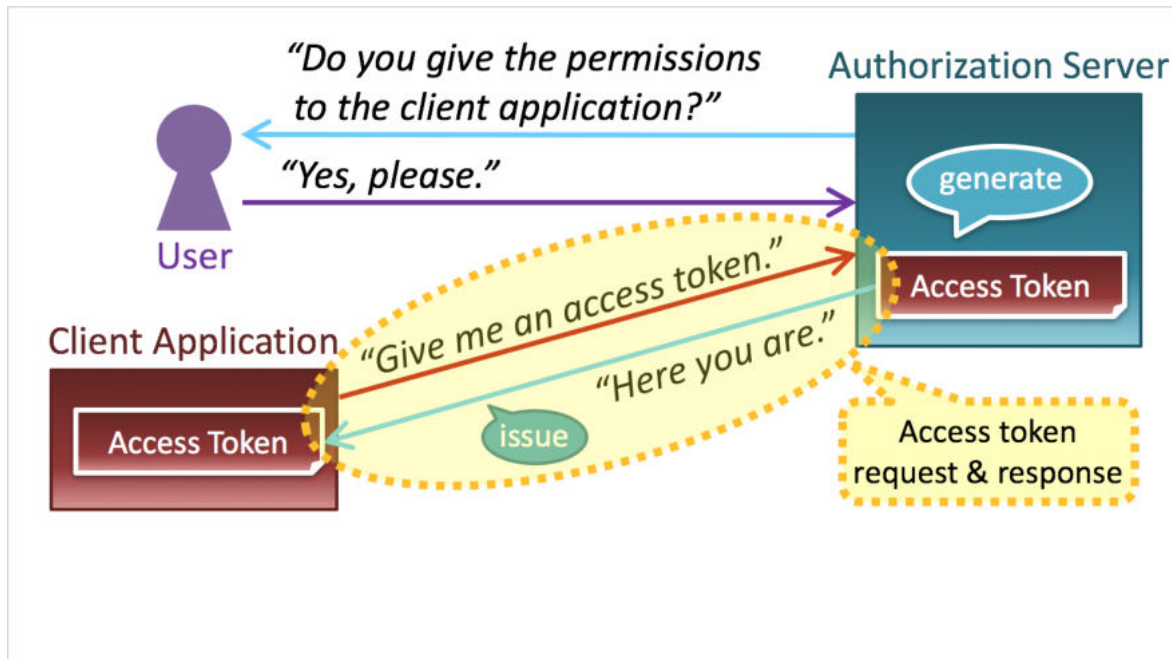
Our authentication model of choice was OAuth 2.0. an industry standard for consumer web and mobile applications. It works by delegating user authentication to the service that hosts the user account and authorizing third-party applications to access the user account. OAuth 2 provides authorization flows for web and desktop applications, and mobile devices.

Here is a more detailed explanation of the steps in the diagram:

- The application requests authorization to access service resources from the user
- If the user authorized the request, the application receives an authorization grant
- The application requests an access token from the authorization server (API) by presenting authentication of its own identity, and the authorization grant
- If the application identity is authenticated and the authorization grant is valid, the authorization server (API) issues an access token to the application. Authorization is complete.
- The application requests the resource from the resource server (API) and presents the access token for authentication

- If the access token is valid, the resource server (API) serves the resource to the application

2.1.4 Distribution

The app will be rolled out at launch via the Apple and Android app stores respectively. Please note this will need an Appstore and Play store account setting up. For testing purposes .IPA files and APK files have been generated for manually installation on test devices. These devices have to be enrolled and provisioned accordingly.

3. Discovery Research and Analysis

The main goal of this phase was to expand upon the initial captured and to help understand the vision behind the concept. In this phase we understood:

- Analysed and understood the requirements, needs and project context
- Analysed the functional and non-functional requirements
- Design research and thinking to create the user experience (UX) and the User Interface (UI)

The outcome from this discovery was:

A prototype for the app (Prototype being defined as representations of the look and feel of the end products) that was demoed to all project partners and stakeholders.

4. Design & Quality Assurance

The design team were involved from the very early stages of a project to grasp a clear understanding of the user journeys.

Once we had a solid understanding of the project needs and any existing branding, colour codes or images, our creative team beautifully created and expanded upon the existing branding for the final product whilst adding in a bespoke touch. This was mapped out in the brainstorm phase where the designers laid out their innovative ideas and broke down what could be used for the MVP.

The designers then put together the prototypes, adding in some of the colour and styling, all inspired from the initial research and meetings with the consortium. Once reviewed by the team for feedback, the designers refined the designs and made improvements.

As creative thinkers, the designers tend to think outside of the box and so the developers were brought in at this stage to gather technical advice on whether the designs or animations are feasible for the application. Working with the developers in the design stage avoids any problems arising when the project is passed into the development process.

4.1 Quality Assurance

In this stage we defined the test cases to meet the acceptance criteria as set out in the discovery, research and analysis phase

We defined test plans to cover:

- Sanity / Smoke
- User Acceptance / Usability
- Functional
- System Integration
- Performance
- Regression

Undertake testing according to the test strategy set out in the first phase using a mixture of manual and automated testing using industry standard software and devices.
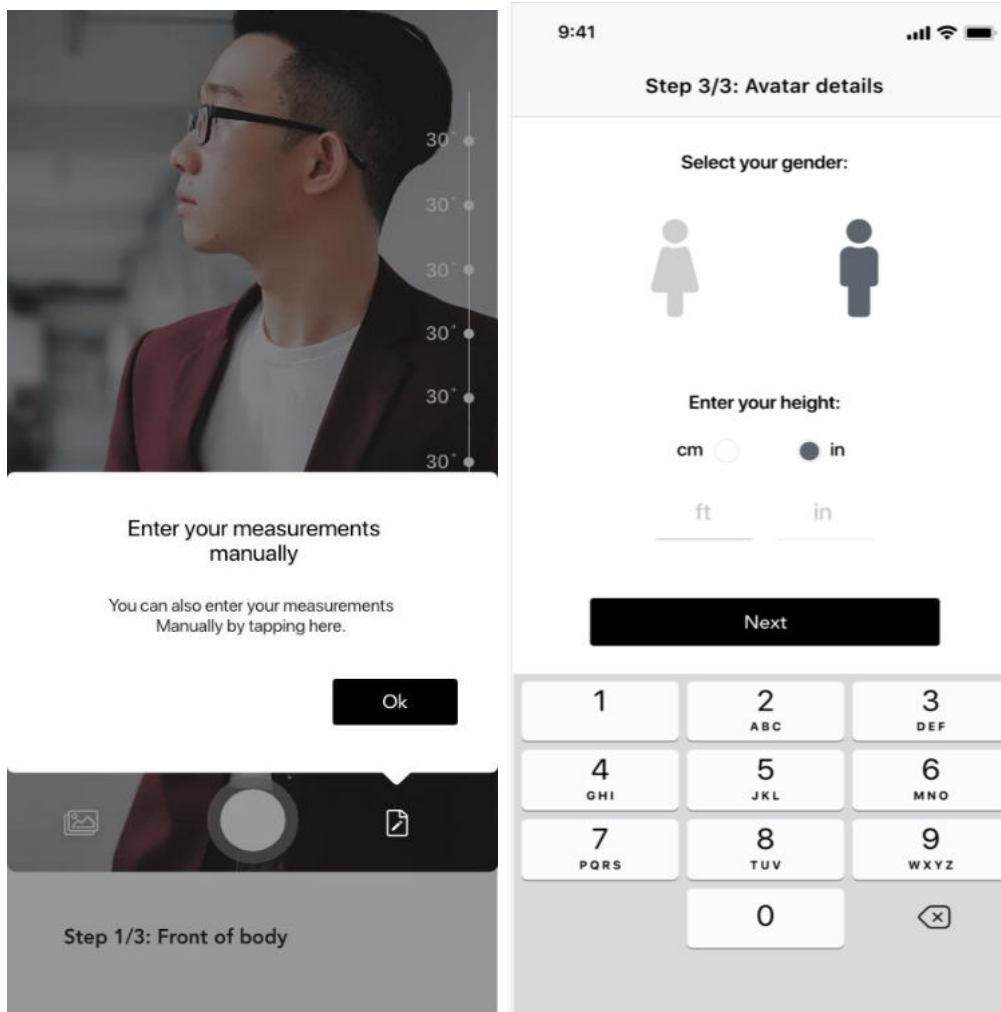
5. Consumer Onboarding

To achieve an effective onboarding flow for the app we had to keep the process as simple as possible so that consumers have a pain free way to access the functions of the app.
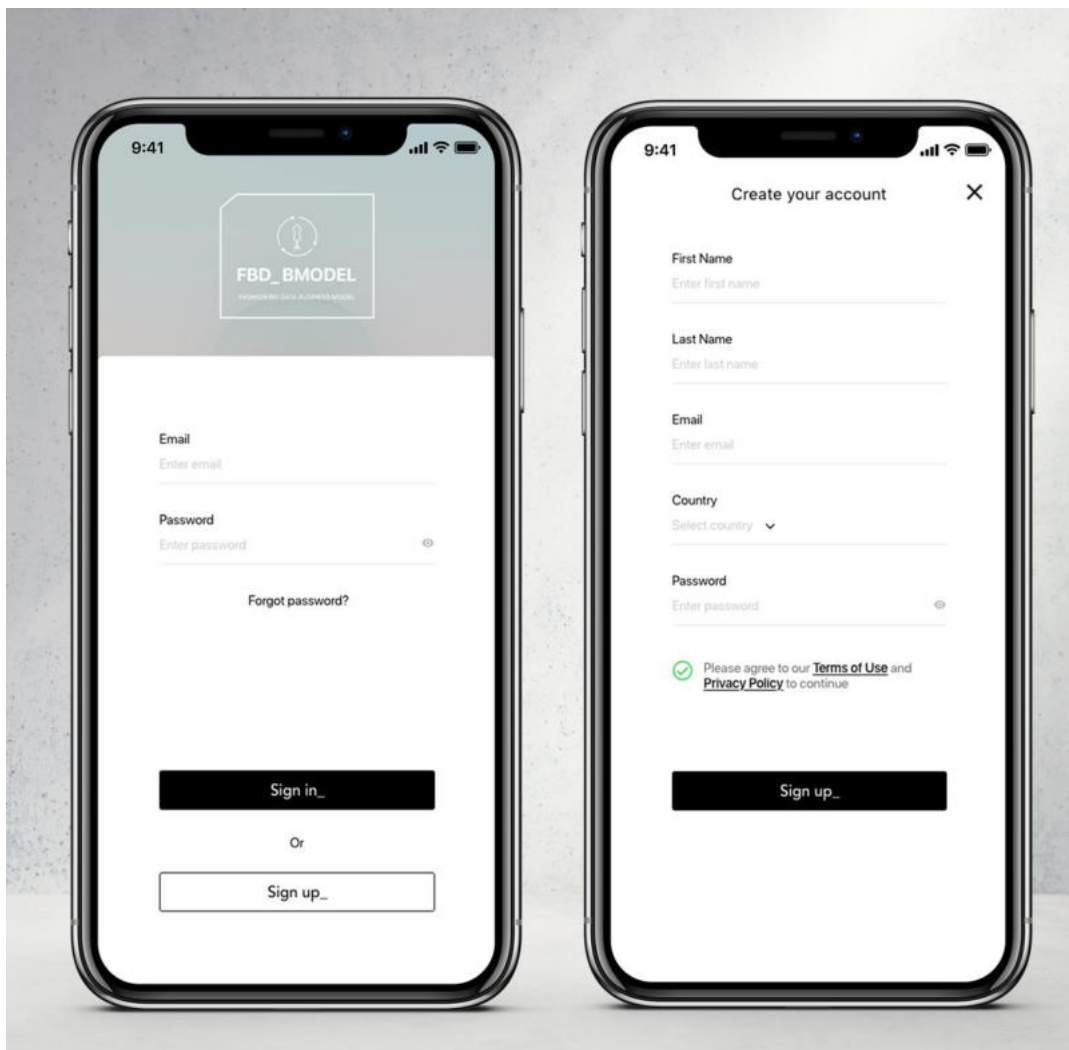
Mobile app users are always on the move and therefore in a rush. With this in mind we wanted to offer a very fast and pain free onboarding process to let users sign up and start shopping within a minute or less. We focused on asking the user to enter only the most essential details to enable them to create a shopping account. Once the user is in the app, they can complete the rest of the profile information as and of when those details are required to perform a specific function in the user journey. This method has been utilised to ensure the best user experience and pain free.

## 5.2.1 Customise consumer profiles

Consumer profile section is designed to ask the user to enter their specific human anthropological features such as height, size, gender and age. This information is used to tailor the product to this specific profile needs.

5.2.2 Brand Selection

Consumers can choose from the brand of choice and visualise the products supplied by that specific brand.

5.2.3 Product Selection and Visualisation
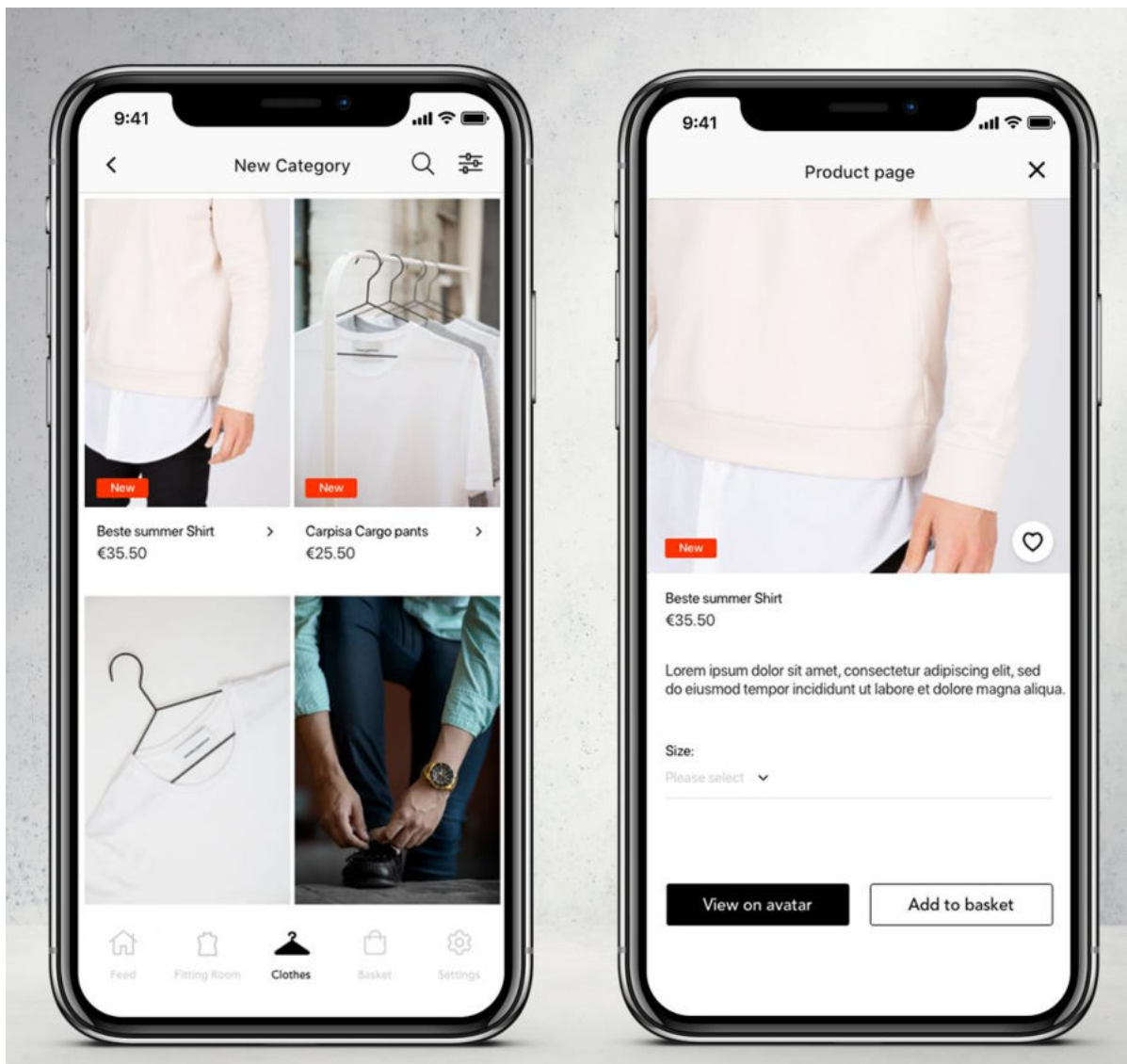
Once you have selected a product of choice, you can visualise the digital product on an

avatar.

5.3 Next Steps

Now that all the interfaces of the Mobile gateway for both the iOS and Android App have been fully developed with dummy sample data. The next step is to connect the Mobile App gateways with the ready Cloud Databa management system developed by Fitizzy to release real time data exchange and communication from gateway used by consumers into the cloud data manage system data that can then be accessible to the B2B partners.

This will involve connecting the mobile gateway accordingly as demonstrated in diagram below:
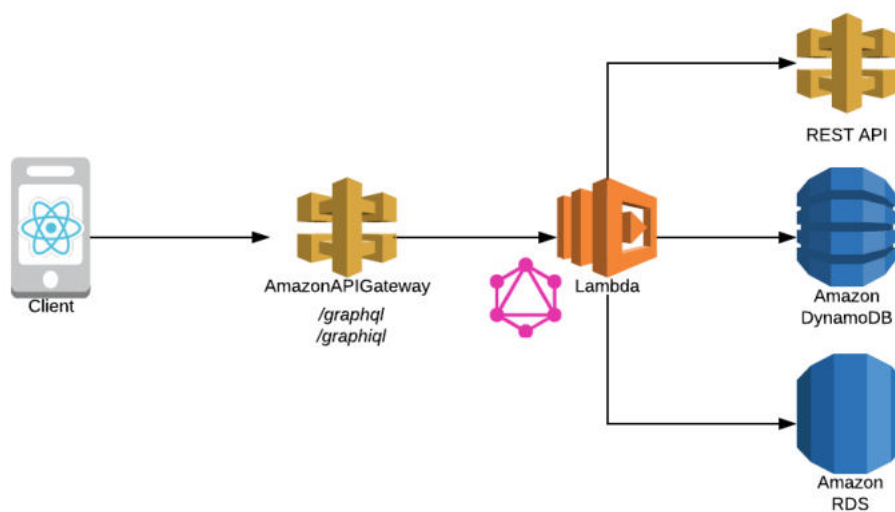
6 Website – B2C Gateway

The website gateway will be used by global consumers usually those people who are on desktops and laptops sat at home of in an office. These users prefer to make their purchasing decisions on a desktop computer.
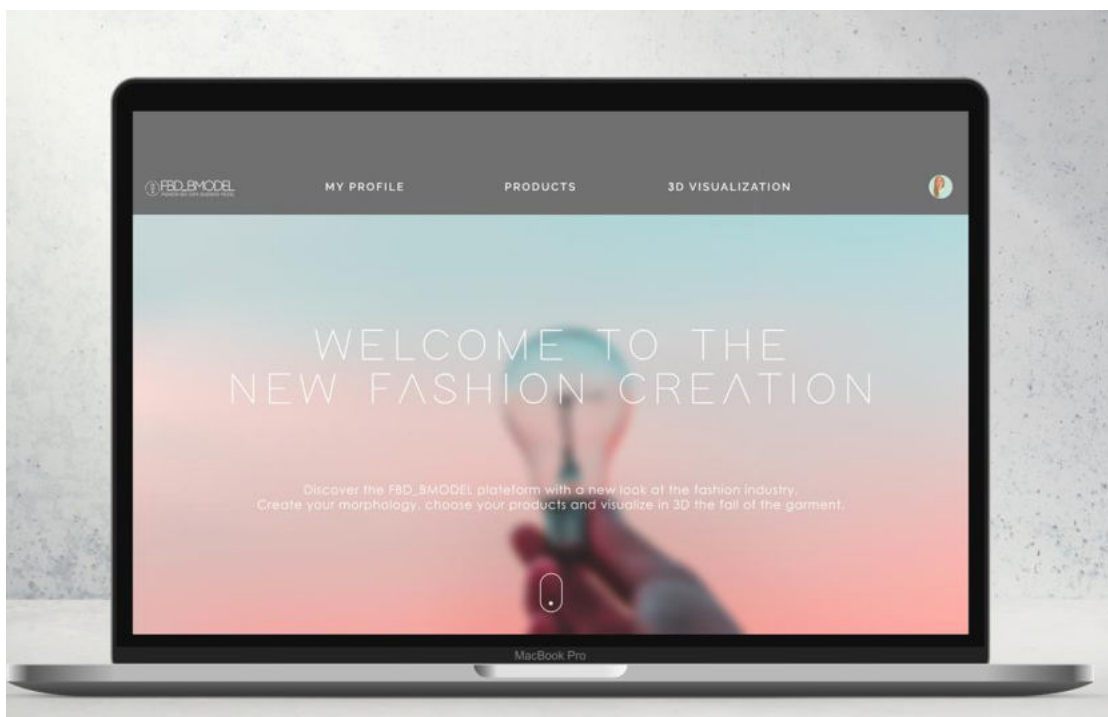
6.1 Platform

The website gateway has been designed and developed to run on the most popular browsers on the internet i.e. Google Chrome, Mozilla Firefox and Safari and IE. Browser compatibility ensures a great user experience every time. User experience (UX) was the ultimate priority when it comes to providing the optimal web experience for our page visitors. This entails quality performance and user-friendly navigation no matter which platform they may be using.

Not everybody uses the same browser platform. Whether page visitors are browsing the internet on Google Chrome, Mozilla Firefox, Safari, or Internet Explorer, we have to ensure the website gateway was compatible on all platforms. Each browser displays websites differently, which means we had to create the platform to accommodate accordingly.

6.2 Systems and Technology

The website gateway was developed using ReactJS for the front end. React is a JavaScript library for building user interfaces. It is one of the most popular front-end development languages maintained by Facebook.

We used React.Js due to a number of reasons:

- Boosts productivity and facilitates further maintenance

One of the best features with React is the ability to reuse system components in React js. We employed this technique with finest components (checkbox, button, etc.), then to move to wrapper components comprised of these tiny elements and moved forward until the main, root component. All components have their internal logic, what makes it easier to manipulate and define them. Such approach ensures consistent look and facilitates codebase maintenance and growth.

- It ensures fast Rendering

Building a high-load application it was essential to consider how the structure will impact the overall app performance. Even latest platforms and engines can't ensure the absence of annoying bottlenecks, because DOM (document object model) is tree-structured and even small changes at the upper layer can cause awful ripples to the interface. To solve the issue React has Virtual DOM – currently, one of the benefits of using React for heavy loaded and dynamic software solutions.

As the name suggests, it is a virtual representation of the document object model, so all the changes are applied to the virtual DOM first and then, using diff algorithm, the minimal scope of necessary DOM operations is calculated. Finally, the real DOM tree is updated accordingly, ensuring minimum time consumed. This method guarantees better user experience and higher app performance.

- It guarantees stable code

To make sure that even small changes that take place in the child structures won't affect their parents, ReactJS uses only downward data flow. Changing an object, developers just modify its state, make changes, and, after that, only particular components will be updated. This structure of data binding ensures code stability and continuous app performance.

- It is SEO friendly

Another React js benefit is its ability to deal with a common search engine failure to read JavaScript-heavy apps. As a solution, React can run on the server, rendering and returning the virtual DOM to the browser as a regular webpage.

- It is a Robust framework

React.Js is maintained by Facebook and a strong community of developers to ensure the robustness of the framework.

- Ease of Testability

The component creation aspect of this library allowed us to efficiently perform unit testing, making sure no system crashes occur. Code reuse enables for curtailing time performing redundant tests. Adding such tests improves standards in code quality; hence, platform stability.

- Great Performance

The Virtual DOM mentioned earlier emphatically increases speed of the web applications because it eliminates the usage of code heavy frameworks such as Jquery and other bootstrapping libraries. React itself is sufficient in creating awesome looking front-end designs and combined with its super-fast rendering capabilities is a natural fit for companies to utilize it in their services.

6.3 Security

We utilised industry standard third party Secured Service APIs and Authenticated Access

All services are managed through a secured global API gateway infrastructure created by Fitizzy. This API serving infrastructure will only be accessible over encrypted SSL/TLS channels

Data Encryption Standard - All data stored and transmitted is encrypted under the 256-bit Advanced Encryption Standard, and each encryption key is itself encrypted with a regularly rotated set of master keys.

6.4 Consumer Onboarding

Just like the App gateway, to achieve an effective onboarding flow for the website we had to keep the process as simple as possible so that consumers have a pain free way to access the functions of the website gateway.
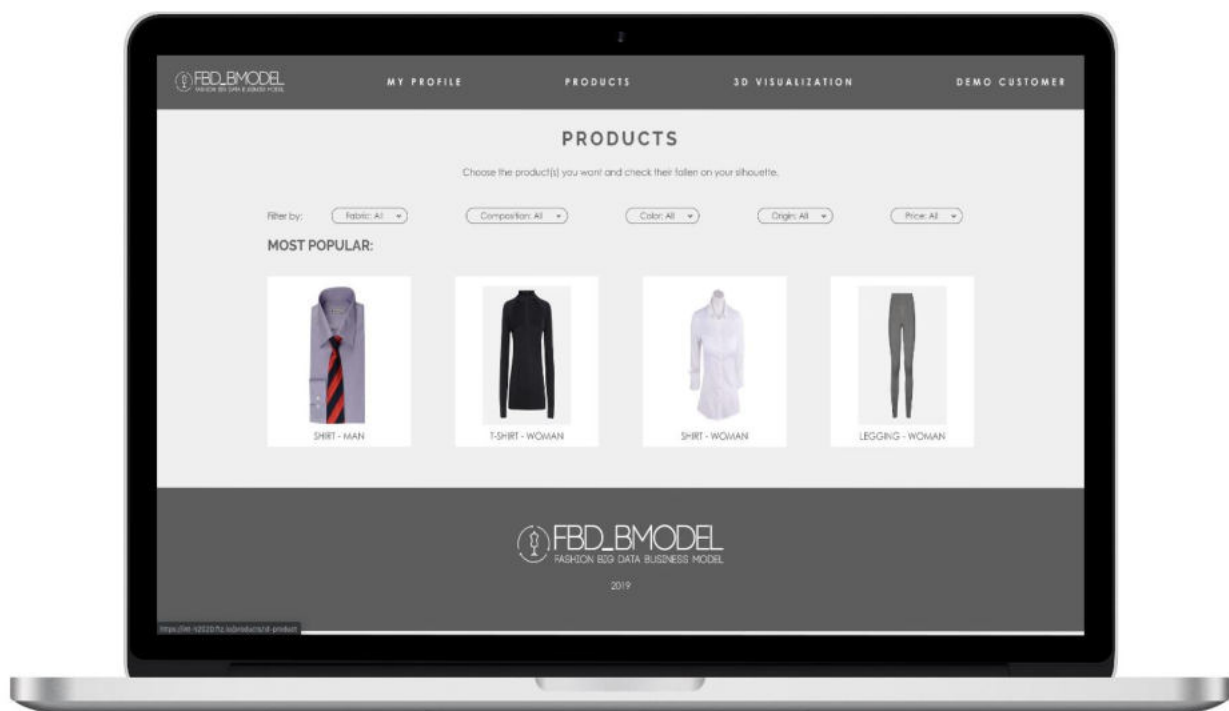
6.4.1 Consumer Profile
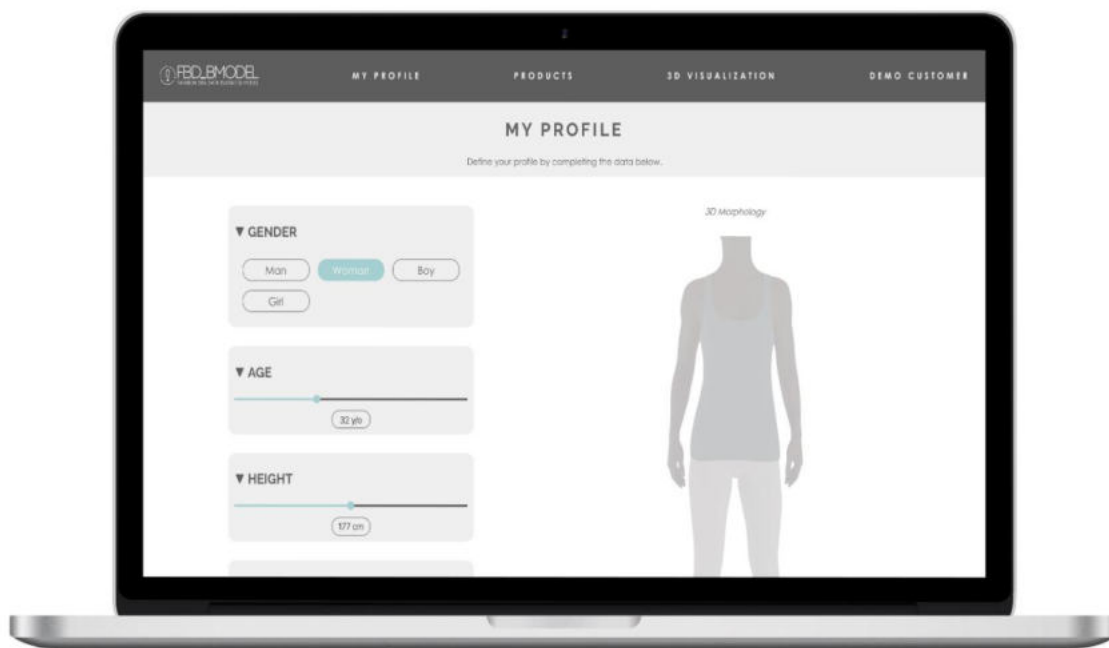
The consumer profile page has been designed to allow the users to enter and tailor their human anthropological features such as height, size, gender and age. This information is used to generate their 3D profile, fitting evaluation and tailor the products according to their needs.
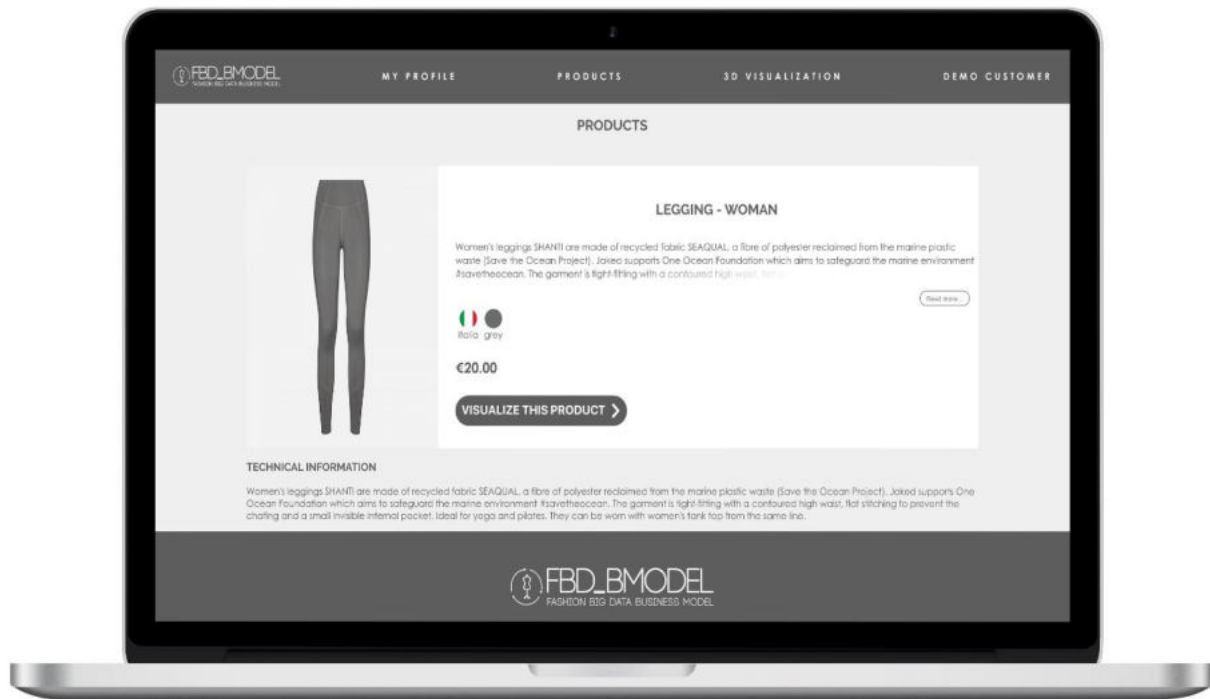
6.4.2 Product Selection

This module shows real product examples of the four business cases. Each product has corresponding product information and specifications details to enable consumers make informed decisions when making their purchases.
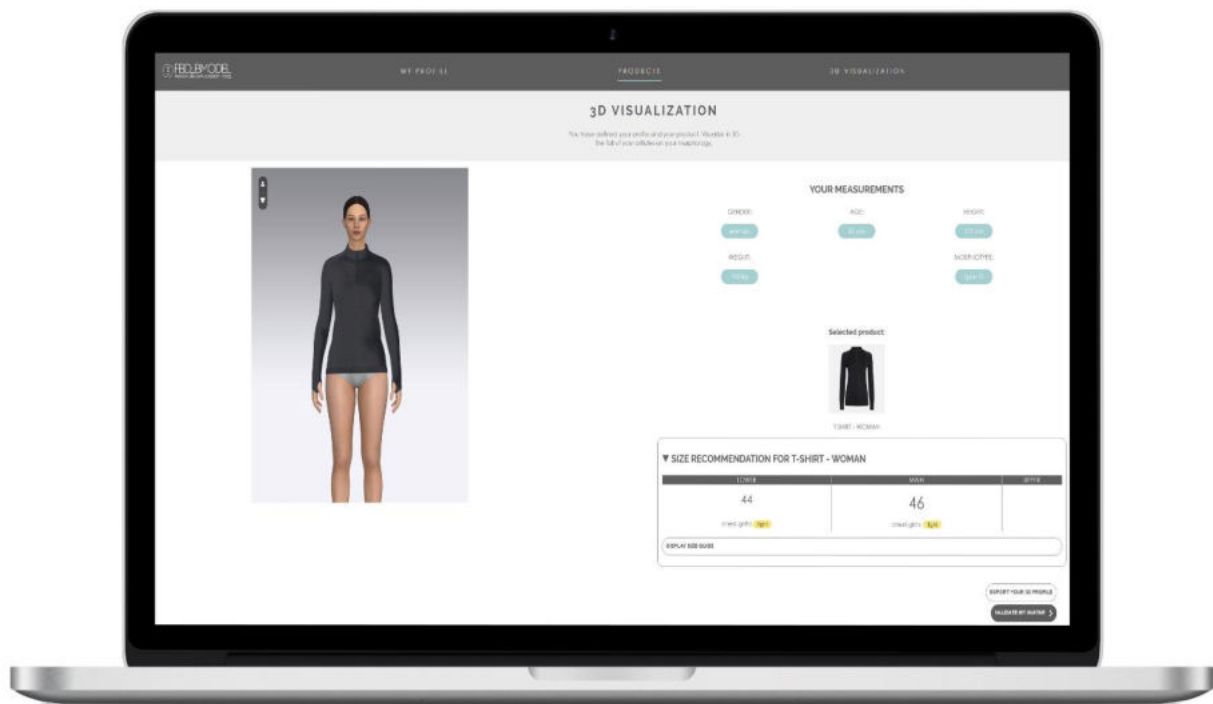
6.4.3 Garment/Product Simulation

A virtual space has been created for visually displaying the selected products in order to give the consumer a real time view and simulation of how the product will look with them wearing it. A process has been established to import the 3D files in the platform. An API has been used between the platform and the 3D microservice solution.

7. Demo Links

Mobile App Gateway:

B2C Mobile Gateway UI Design: https://xd.adobe.com/view/b4c9bfd4-5146-4609-6ed4-ce465f728e48-c2f8/screen/a9b57aed-483e-476c-85ec-ffb1c48046d3/Splash-screen-7

Android App UI APK file: https://drive.google.com/file/d/1rTcX_dKDiP0ttUjVDpKqRLP-mqdDxb7r/view

iPhone App UI IPA: https://drive.google.com/open?id=0B73jjl-G6sDmR2s3ZVZLWjZKZzNnQmQyOVh3SHJrZU9pOHQ0

 (this will only work with provisioned iPhones due to Apple security installation standards)

Website Gateway:

https://int-h2020.ftz.io/conception/product

Username: demo@fitizzy.com

Password: Fitizzy2020!!