U.PORTO
FEUP FACULDADE DE ENGENHARIA
UNIVERSIDADE DO PORTO

P3 - 360º Company Dashboard

Final Project Report

Integrated Master in Informatics and Computer Engineering

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1. Project Overview

The theme of this project is 360º Company Dashboard.

The project's objective is to develop a web app which provides relevant information about the company status.

The project will take a *SAF-T file* as input and show information about sales and the company's financial situation. It'll also have information about the company's purchases, which will be accessed through *Jasmin's API*. There will also be shown information relative to each product, so that the user can analyse how it has been doing in terms of sales, and to each supplier.

The use of comprehensive visualizations in the web app aims to simplify the analysis of the large amount of data inherent to the business, thus easing the decision making process.

1.1. Functional Architecture

We decided to divide the information between the following sections:

- **Financial Area:** To allow the user to evaluate the company's financial position, by checking the balance sheet and other variables related to the income statement.
- **Sales:** To allow the user to check how the sales are doing, by seeing the top sold products and top consumers.
- **Purchases:** To allow the user to check on its most purchased products and top suppliers.
- **Inventory:** To allow the user to check on the company's stock information
- **Product:** To allow the user to check a product's information.
- **Supplier:** To allow the user to check a supplier's information.

The following **sitemap** specifies how these pages interact with each other:

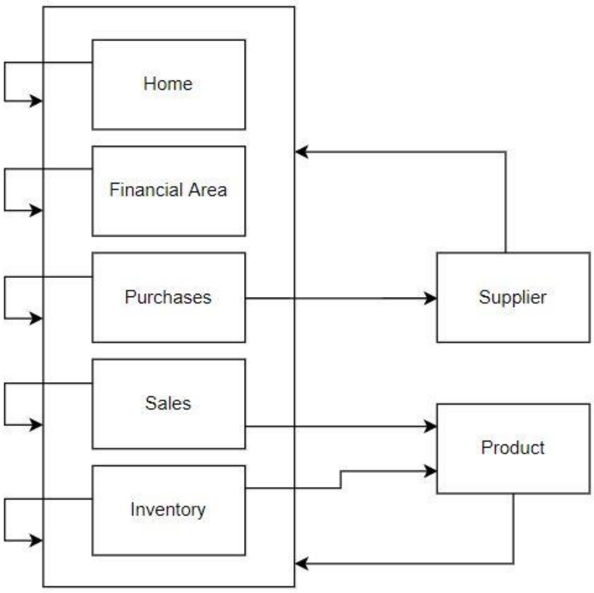


Figure 1: Sitemap of the project.

2. Functionalities

2.1. Authentication

There is an authentication system that allows the user to visualize different pages according to the type of user. The types of users available are:

- **CEO**: has access to all pages, since he might be interested to check every KPI of the company if a problem arises in any of the different sections of the company.
  - email: *ceo@snif.pt*
  - password: *ceo*

- **Head of Finances:** has access to the Financial Area page.
  - email: *finances@snif.pt*
  - password: *finances*

- **Head of Sales:** has access to the Sales page and to each Product's page.
  - email: *sales@snif.pt*
  - password: *sales*

- **Head of Purchases:** has access to the Purchases page and each Supplier's page.
  - email: *purchases@snif.pt*
  - password: *purchases*

- **Head of Logistics:** has access to the Inventory page and to each Product's page.
  - email: *logistics@snif.pt*
  - password: *logistics*

- **Shareholder:** has access to the Financial Area, where he can see KPIs that are normally public, such as the balance sheet and other variables of interest such as EBITDA and EBIT.
  - email: shareholder@snif.pt
  - password: *shareholder*

2.2. Financial Area

2.1.1. Functionalities

- **Profit and Loss (P_01):** contains the following KPIs calculated based on the income statement:
    - **Sales and Services Provided (KPI_01):** refers to the earnings that the company got simply by selling products and services.
    - **Cost of Goods Sold (KPI_02):** refers to the direct costs of producing the goods sold by a company. This amount includes the cost of the materials and labour directly used to create the good. It excludes indirect expenses, such as distribution costs and sales force costs.
    - **EBITDA (KPI_03):** Earnings Before Interest, Taxes, Depreciation and Amortization.
    - **EBIT (KPI_04):** Earnings Before Interest and Taxes.
    - **EBT (KPI_05):** Earnings Before Taxes.
    - **Net income (KPI_06):** income that the company earned after subtracting all the expenses and costs, related to taxes and many other variables.
- **Sales Over Time (G_01):** is a graph that shows how the Sales and Services Provided have changed throughout the fiscal year.
- **Balance Sheet (P_02):** is a financial statement that reports a company's assets (KPI_07), liabilities (KPI_08) and equity (KPI_09) at a specific point in time.

2.3. Sales

2.3.1. Functionalities

- **Sales Information (P_03):** contains KPIs taken from the balance sheet and income statement that are important from a sales perspective:
  - **Sales and Services Provided (KPI_01).**
  - **Cost of Goods Sold (KPI_02).**
  - **Accounts Receivable (KPI_07):** refers to the money that the company still has to receive from its customers.
- **Sales Over Time (G_01):** is a graph that shows how the Sales and Services Provided have changed throughout the fiscal year.
- **List of top products (T_01):** a list of top products with a description, number of units sold, price per unit and total earnings with that product.
- **List of top consumers (T_02):** a list of top consumers with their name, the most bought product and the total spent.

2.4. Purchases

2.4.1. Functionalities

- **Purchases Information (P_03):** contains KPIs that are important relative to purchases:
  - **Total Spent (KPI_08):** total of money spent buying products over the fiscal year.
  - **Accounts Payable (KPI_09):** refers to the money that the company still has to pay to its suppliers.
- **List of top purchases (T_03):** a list of top purchases with a name, number of units sold, price per unit and total earnings with that product.
- **List of top suppliers (T_04):** a list of top suppliers with their name, the most bought product and the total spent.

2.5. Inventory

2.5.1. Functionalities

- **List of Products (T_05):** contains all the products available on stock, with the quantity available and each product's unit price.

2.6. Product

2.6.1. Functionalities

- **Product's Information (P_04):** contains the product's basic information such as its name, code, barcode and description.
- **Stock Information (P_05):** contains the following KPIs:
  - **Quantity in Stock (KPI_10):** refers to the quantity of the product available in stock.
  - **Quantity sold (KPI_11):** refers to the quantity of product sold over the year.
- **Sales Information (P_06):** contains the following KPIs:
  - **Unit Price (KPI_12):** refers to the product's average unit price.
  - **Total Earned (KPI_13):** refers to the total of money earned with the product.
- **Sales Over Time (G_02):** graph of the sales over the product over the fiscal year.

2.7. Supplier

2.7.1. Functionalities

- **Supplier's Information (P_07):** contains the supplier's basic information such as its name, tax ID, address and contacts.
- **Purchases Information (P_08):** contains the following KPIs:
  - **Units Bought (KPI_14):** refers to the total of units of products bought.
  - **Total Spent (KPI_15):** refers to the total of money spent purchasing the supplier's products during the fiscal year.
- **List of products supplied (T_06):** a list of products supplied with a id, name, number of units bought and price per unit.

3. Information Architecture

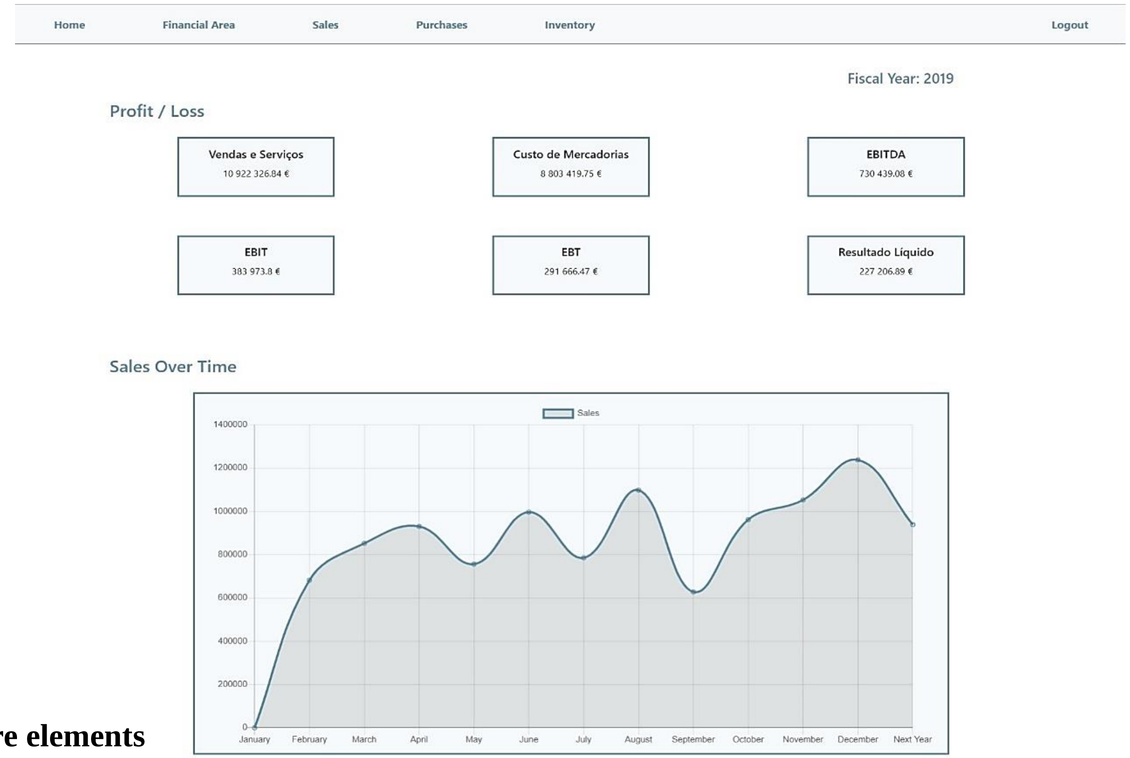
3.1. Core_Financial_Area

User and Business Goals

- View to be used as a financial management tool.
- View in detail the company's financial status.

Inward Paths / Trigger Words

- Navbar navigation
- Sign-in / Sign out



Outwars Paths to action

- Provide the user a financial view of the company's current state.
- See **Home** page.
- See other pages depending on account used.

Core elements

- **P_01**(Profit/Loss panel) contains **KPI_01**, **KPI_02**, **KPI_03, KPI_04, KPI_05** and **KPI_06**
- **KPI_01** – Sales and Services **KPI_02** – Cost of Goods Sold **KPI_03 -** EBITDA
  KPI_04 - EBIT **KPI_05 –** EBT **KPI_06** – Net Income
- **G_01** (graph) **-** Sales Graph

***Note: KPI** – key performance* indicator

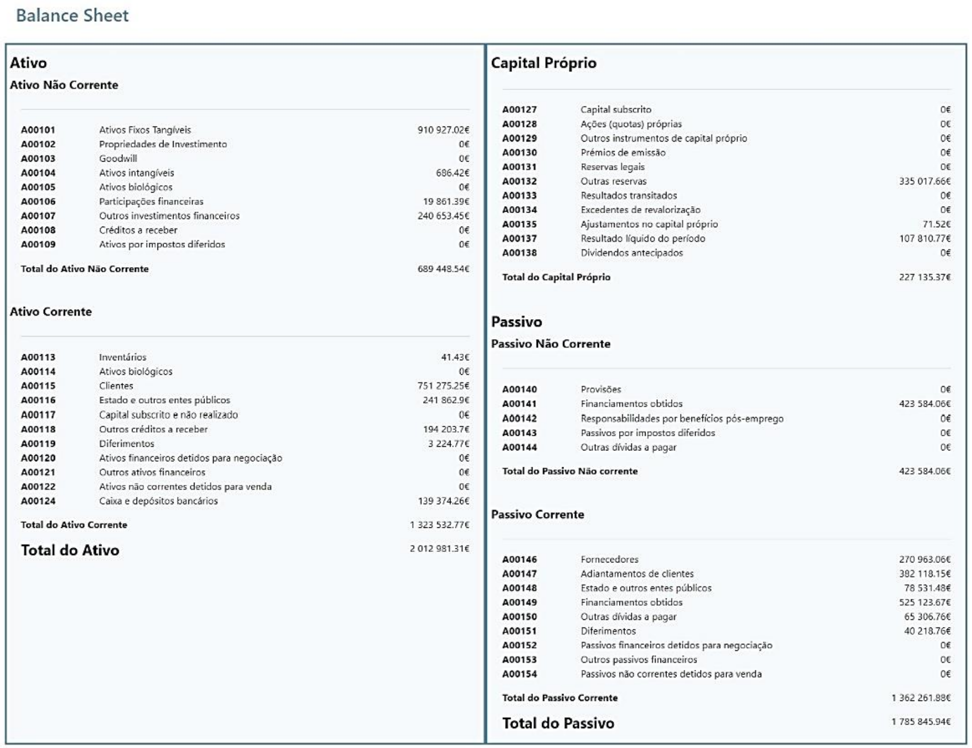
***Core_Financial_Area** (continuation)

User and Business Goals

- View to be used as a financial management tool.
- View in detail the company's financial status.

Inward Paths / Trigger Words

- Navbar navigation
- Sign-in / Sign out



Balance Sheet

Ativo

Ativo Não Corrente

A00101	Ativos Fixos Tangíveis	910 927.02€
A00102	Propriedades de Investimento	0€
A00103	Goodwill	0€
A00104	Ativos intangíveis	686.42€
A00105	Ativos biológicos	0€
A00106	Participações financeiras	19 861.39€
A00107	Outros investimentos financeiros	240 653.45€
A00108	Créditos a receber	0€
A00109	Ativos por impostos diferidos	0€
Total do Ativo Não Corrente		689 448.54€

Ativo Corrente

A00113	Inventários	41.43€
A00114	Ativos biológicos	0€
A00115	Clientes	751 275.25€
A00116	Estado e outros entes públicos	241 862.9€
A00117	Capital subscrito e não realizado	0€
A00118	Outros créditos a receber	194 203.7€
A00119	Diferimentos	3 224.77€
A00120	Ativos financeiros detidos para negociação	0€
A00121	Outros ativos financeiros	0€
A00122	Ativos não correntes detidos para venda	0€
A00124	Caixa e depósitos bancários	139 374.26€
Total do Ativo Corrente		1 323 532.77€
Total do Ativo		2 012 981.31€

Capital Próprio

A00127	Capital subscrito	0€
A00128	Ações (quotas) próprias	0€
A00129	Outros instrumentos de capital próprio	0€
A00130	Prémios de emissão	0€
A00131	Reservas legais	0€
A00132	Outras reservas	335 017.66€
A00133	Resultados transitados	0€
A00134	Excedentes de revalorização	0€
A00135	Ajustamentos no capital próprio	71.52€
A00137	Resultado líquido do período	107 810.77€
A00138	Dividendos antecipados	0€
Total do Capital Próprio		227 135.37€

Passivo

Passivo Não Corrente

A00140	Provisões	0€
A00141	Financiamentos obtidos	423 584.06€
A00142	Responsabilidades por benefícios pós-emprego	0€
A00143	Passivos por impostos diferidos	0€
A00144	Outras dívidas a pagar	0€
Total do Passivo Não corrente		423 584.06€

Passivo Corrente

A00146	Fornecedores	270 963.06€
A00147	Adiantamentos de clientes	382 118.15€
A00148	Estado e outros entes públicos	78 531.48€
A00149	Financiamentos obtidos	525 123.67€
A00150	Outras dívidas a pagar	65 306.76€
A00151	Diferimentos	40 218.76€
A00152	Passivos financeiros detidos para negociação	0€
A00153	Outros passivos financeiros	0€
A00154	Passivos não correntes detidos para venda	0€
Total do Passivo Corrente		1 362 261.88€
Total do Passivo		1 785 845.94€

Outwars Paths to action

- Provide the user a financial view of the company's current state.
- See **Home** page.
- See other pages depending on account used.

Core elements

- **P_02** (Balance sheet panel) contains **KPI_05**, **KPI_06**, **KPI_07**
- **KPI_05** (KPI) - Assets **KPI_06** (KPI) - Liabilities **KPI_07** (KPI) - Equity

3.2. Core_Sales

User and Business Goals

- View to be used as a sales management tool.
- View in detail the company's sales status.

Inward Paths/Trigger Words

- Navbar navigation
- Sign-in / Sign out
- Product's name

Outwars Paths to action

- Provide the user with detailed data of the company's sales state.
- Drill down to know more about each **Product**.
- See **Home** page.
- See other pages based on the type of account.

Core elements

- **P_03** (Sales Information Panel) – contains **KPI_01**, **KPI_02**, **KPI_07**
- **KPI_01** – Sales and Services **KPI_02** – Cost of Goods Sold **KPI_12** – Accounts Receivable
- **G_01** (graph) – Sales over Time

Note: KPI *– key performance* indicator

***Core_Sales** (continuation)*

User and Business Goals

- View to be used as a sales management tool.
- View in detail the company’s sales status.

Inward Paths/Trigger Words

- Navbar navigation
- Sign-in / Sign out
- Product’s name

Top Products

Top	Product	Units Sold	Price per Unit	Total Earned
1	Lenços tecido básico	13 000	2.00 €	26 000.00 €
2	Pacotes de lenços suaves	11 000	1.00 €	11 000.00 €
3	Lenços de papel fino	6 000	0.90 €	5 400.00 €
4	Pacotes Floridos	5 000	1.00 €	5 000.00 €
5	Lenços folha dupla	5 000	1.20 €	6 000.00 €
6	Lenços ultra suave	2 600	1.81 €	4 700.00 €
7	Lenços floridos	2 500	1.00 €	2 500.00 €
8	Lenços aniversário	2 500	3.00 €	7 500.00 €
9	Lenços pocket	1 500	0.75 €	1 125.00 €
10	Lenços perfumados	1 200	0.20 €	240.00 €

Top Consumers

Top	Consumer	Most Bought Product	Units Bought	Total Spent
1	Sonae Corporate, S.a	Pacotes de lenços suaves	10 000	10 750.00 €
2	LIDL & COMPANHIA	Lenços tecido básico	10 000	26 750.00 €
3	CONTINENTE HIPERMERCADOS, S.A.	Pacotes Floridos	5 000	17 990.00 €
4	JUMBO - EDITORES, LDA	Lenços folha dupla	2 000	4 500.00 €
5	MINI MERCADO BOM PREÇO, LDA	Lenços tecido básico	2 000	8 135.00 €
6	SUPERMERCADOS FROIZ PORTUGAL, LDA	Lenços ultra suave	2 000	5 500.00 €

Outwars Paths to action

- Provide the user with detailed data of the company’s sales state.
- Drill down to know more about each **Product**.
- See **Home** page.
- See other pages based on the type of account.

Core elements

- **T_01** (table) – Top Products Table
- **T_02** (table) – Top Consumers Table

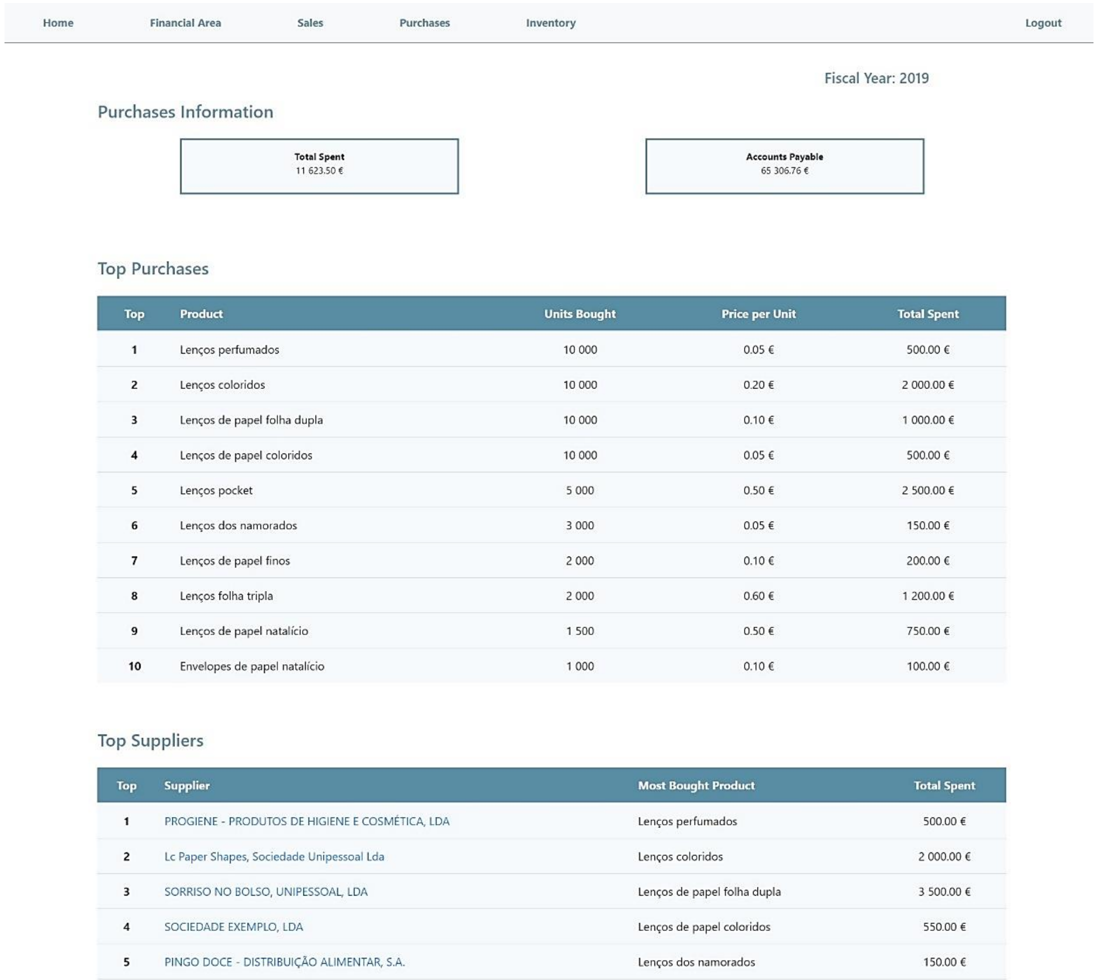
3.3. Core_Purchases

User and Business Goals

- View to be used as a purchase's management tool.
- View in detail the company's purchases status.

Inward Paths/Trigger Words

- Navbar navigation
- Sign-in/ Sign out
- Supplier's name



Top	Product	Units Bought	Price per Unit	Total Spent
1	Lenços perfumados	10 000	0.05 €	500.00 €
2	Lenços coloridos	10 000	0.20 €	2 000.00 €
3	Lenços de papel folha dupla	10 000	0.10 €	1 000.00 €
4	Lenços de papel coloridos	10 000	0.05 €	500.00 €
5	Lenços pocket	5 000	0.50 €	2 500.00 €
6	Lenços dos namorados	3 000	0.05 €	150.00 €
7	Lenços de papel finos	2 000	0.10 €	200.00 €
8	Lenços folha tripla	2 000	0.60 €	1 200.00 €
9	Lenços de papel natalício	1 500	0.50 €	750.00 €
10	Envelopes de papel natalício	1 000	0.10 €	100.00 €

Top	Supplier	Most Bought Product	Total Spent
1	PROGIENE - PRODUTOS DE HIGIENE E COSMÉTICA, LDA	Lenços perfumados	500.00 €
2	Lc Paper Shapes, Sociedade Unipessoal Lda	Lenços coloridos	2 000.00 €
3	SORRISO NO BOLSO, UNIPESSOAL, LDA	Lenços de papel folha dupla	3 500.00 €
4	SOCIEDADE EXEMPLO, LDA	Lenços de papel coloridos	550.00 €
5	PINGO DOCE - DISTRIBUIÇÃO ALIMENTAR, S.A.	Lenços dos namorados	150.00 €

Outwars Paths to action

- Provide the user with detailed data of the company's purchases state.
- Drill down to know more about each **Supplier**.
- See **Home**.
- See other pages depending on the type of account.

Core elements

- **P_03** (Purchases Information panel): contains **KPI_08** and **KPI_09**
- **KPI_08:** Total Spent
- **KPI_09:** Accounts Payable
- **T_03** (table) – Top Purchases
- **T_04** (table) – Top Suppliers

***Note: KPI** – key performance* indicator

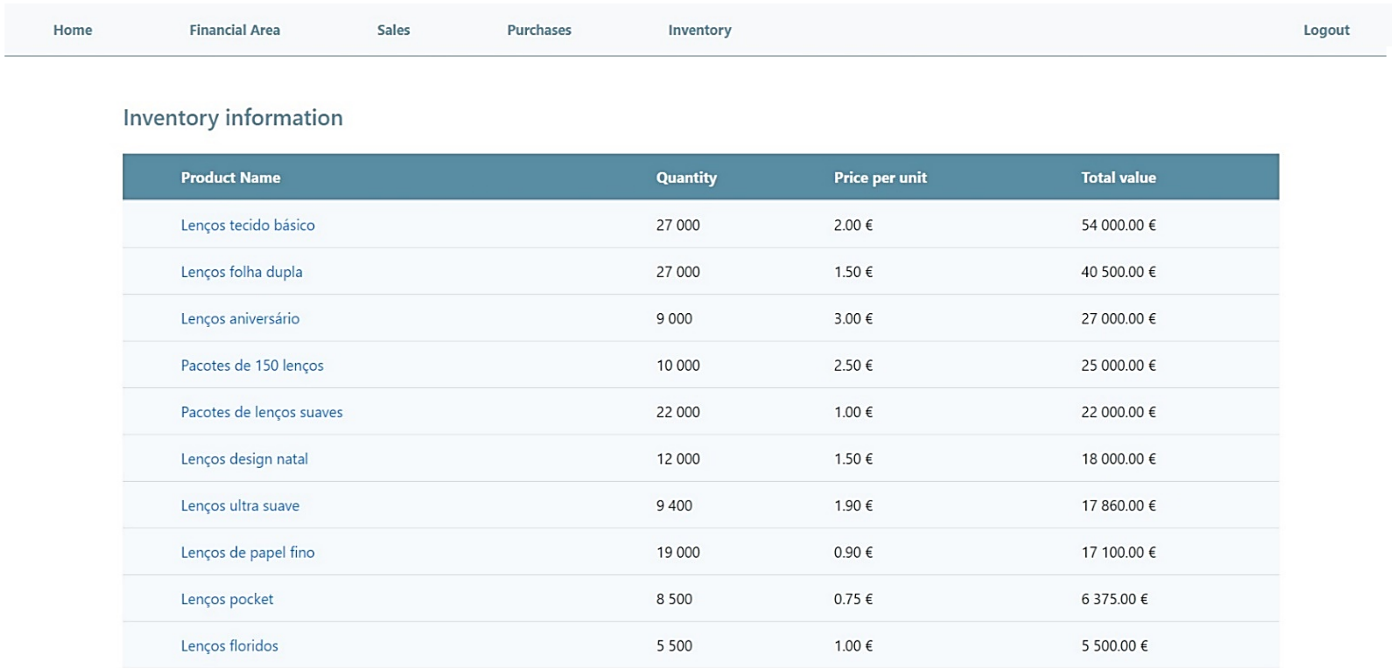
3.4. Core_Inventory

User and Business Goals

- View to be used as a inventory's management tool.
- View in detail the company's inventory.

Inward Paths/Trigger Words

- Navbar navigation
- Sign-in/ Sign out
- Product's name



Product Name	Quantity	Price per unit	Total value
Lenços tecido básico	27 000	2.00 €	54 000.00 €
Lenços folha dupla	27 000	1.50 €	40 500.00 €
Lenços aniversário	9 000	3.00 €	27 000.00 €
Pacotes de 150 lenços	10 000	2.50 €	25 000.00 €
Pacotes de lenços suaves	22 000	1.00 €	22 000.00 €
Lenços design natal	12 000	1.50 €	18 000.00 €
Lenços ultra suave	9 400	1.90 €	17 860.00 €
Lenços de papel fino	19 000	0.90 €	17 100.00 €
Lenços pocket	8 500	0.75 €	6 375.00 €
Lenços floridos	5 500	1.00 €	5 500.00 €

Outwars Paths to action

- Provide the user with data of the product's available in stock.
- Drill down to know more about each **Product**.
- See **Home**.
- See other pages depending on the type of account.

Core elements

- **T_05** (table) – Products Table

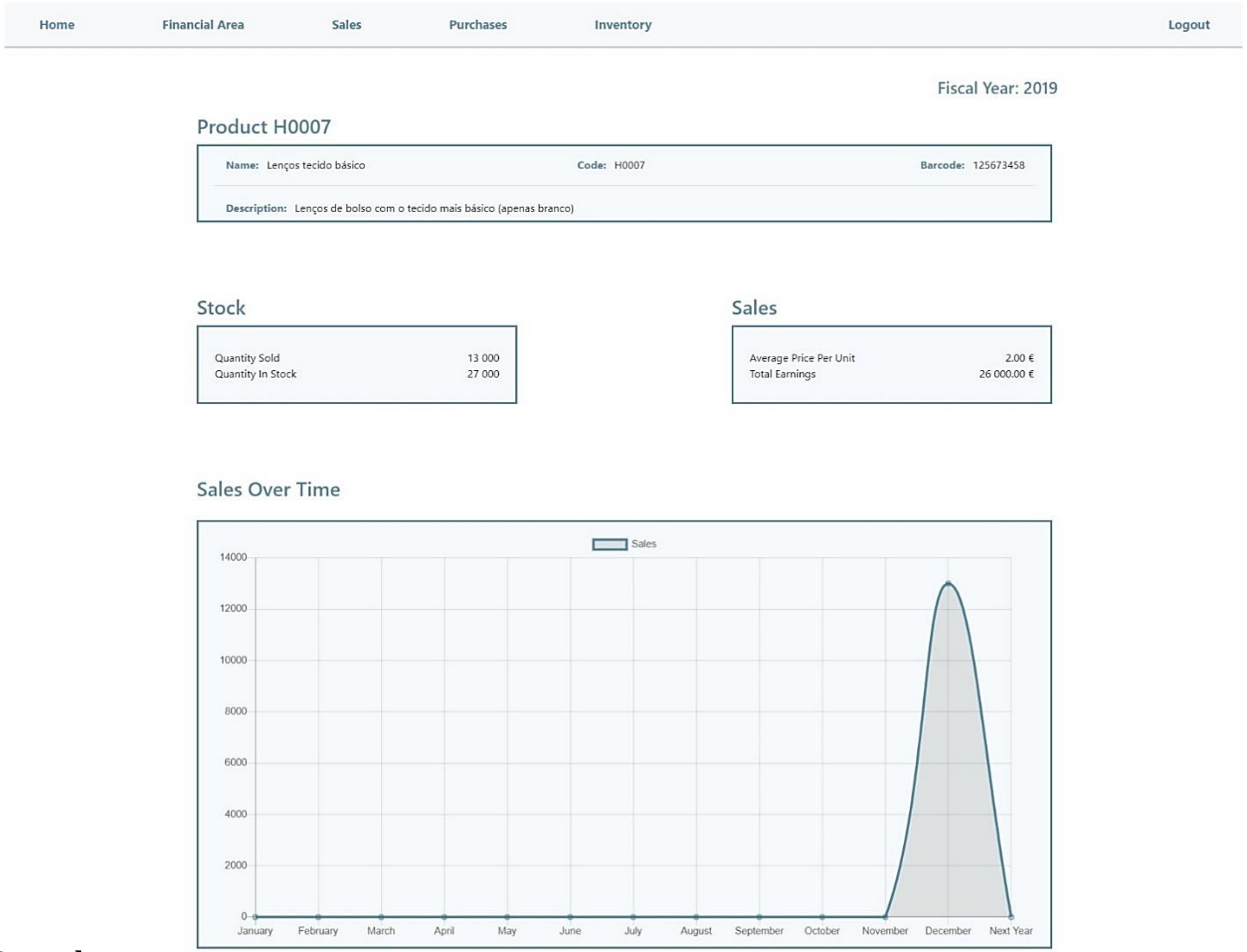
3.5. Core_Product

User and Business Goals

- View to be used as a product management tool.
- View in detail a product's information.

Inward Paths/Trigger Words

- Navbar navigation
- Sign-in/ Sign out



Outwars Paths to action

- Provide the user with detailed data of a specific product.
- See **Home** page.
- See other pages depending on the type of account.

Core elements

- **P_04** (panel) – Product details
- **P_05** (panel) – Stock contains **KPI_10** – Quantity in stock **KPI_11** – Quantity sold
- **P_06** (panel) – Sales contains **KPI_12** – Unit price **KPI_13** –Total earnings
- **G_02** (graph) – Sales over Time

***Note: KPI** – key performance* indicator

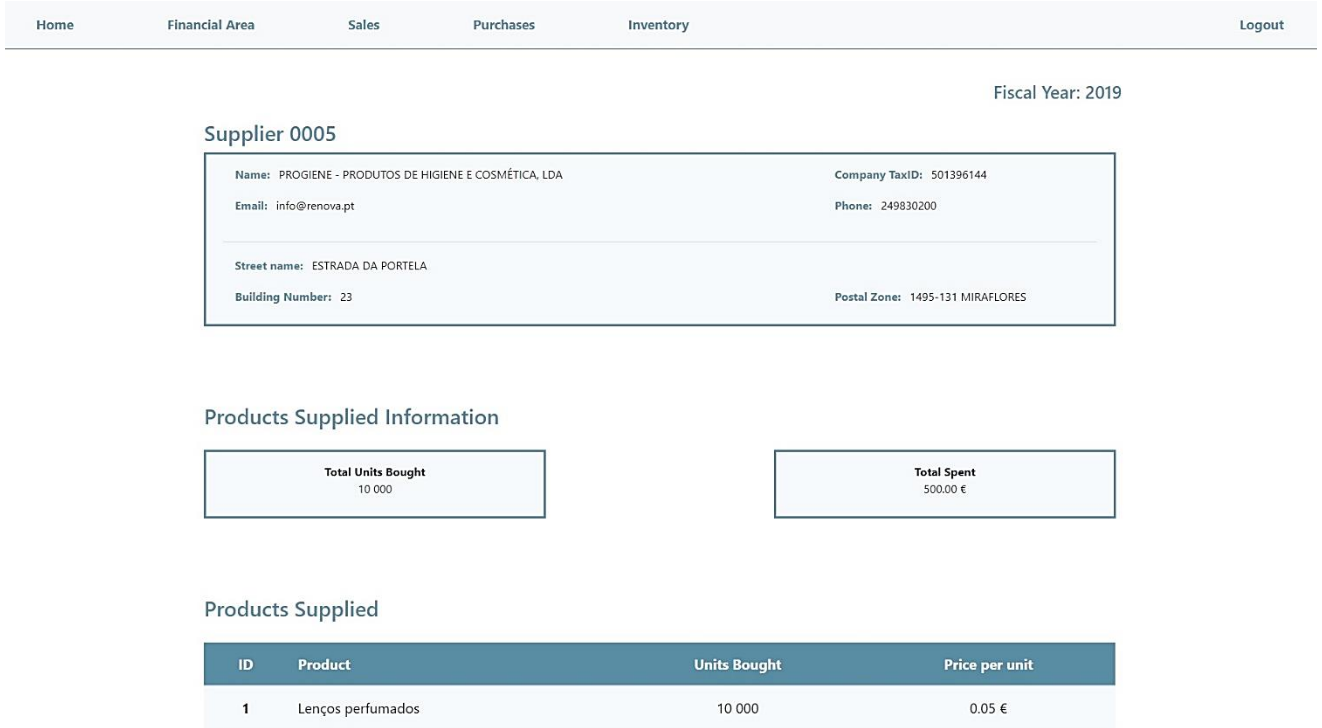
3.6. Core_Supplier

User and Business Goals

- View to be used as a supplier management tool.
- View in detail a supplier's information.

Inward Paths/Trigger Words

- Navbar navigation
- Sign-in / Sign out



Outwars Paths/ to action

- Provide the user with detailed data of a specific supplier.
- See **Home** page.
- See other pages depending on the type of account.

Core elements

- **P_07** (panel) – Supplier details
- **P_08** (panel) **–** Product supplied contains **KPI_14** and **KPI_15**
- **KPI_14** – Total units bought **KPI_15** – Total spent
- **T_06** (table) – Table of products supplied

***Note: KPI** – key performance* indicator

4. BPMN Flow

4.1. Process of selling a product

We decided to build our BPMN diagram based on how the company's sales process generally works, which is not directly applied to our project, since our theme involves only showing information and that is not exactly a business process. As a result, the following BPMN describes the process of a client ordering a product to our company, through a hypothetical website that would work as an online shop.

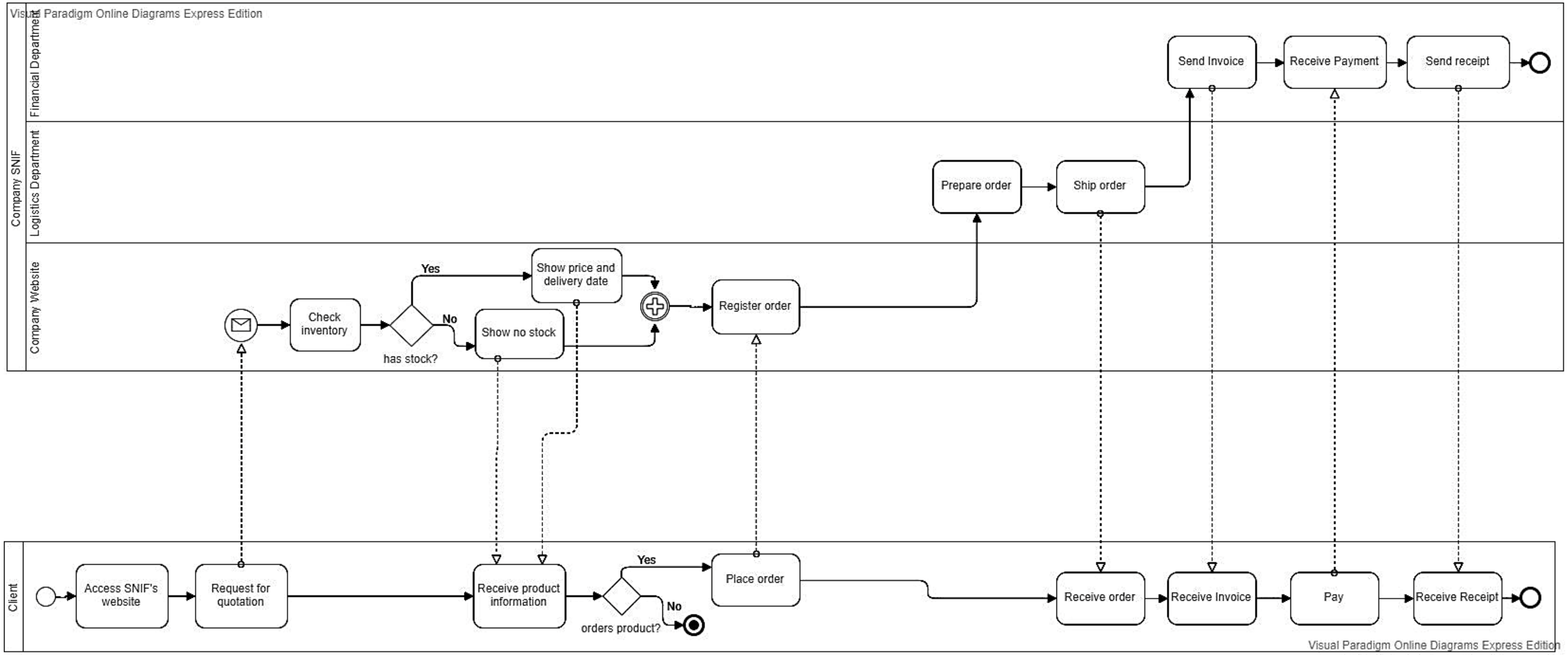


Figure 2: BPMN flow for the process of selling a product.

4.2. Process of purchasing a product

We also developed a BPMN diagram to describe the company's purchases process, which is also not directly applied to our project, like it was explained above. The following BPMN describes the process of the purchases department ordering a product to a supplier, which also uses the website to check a product's stock.

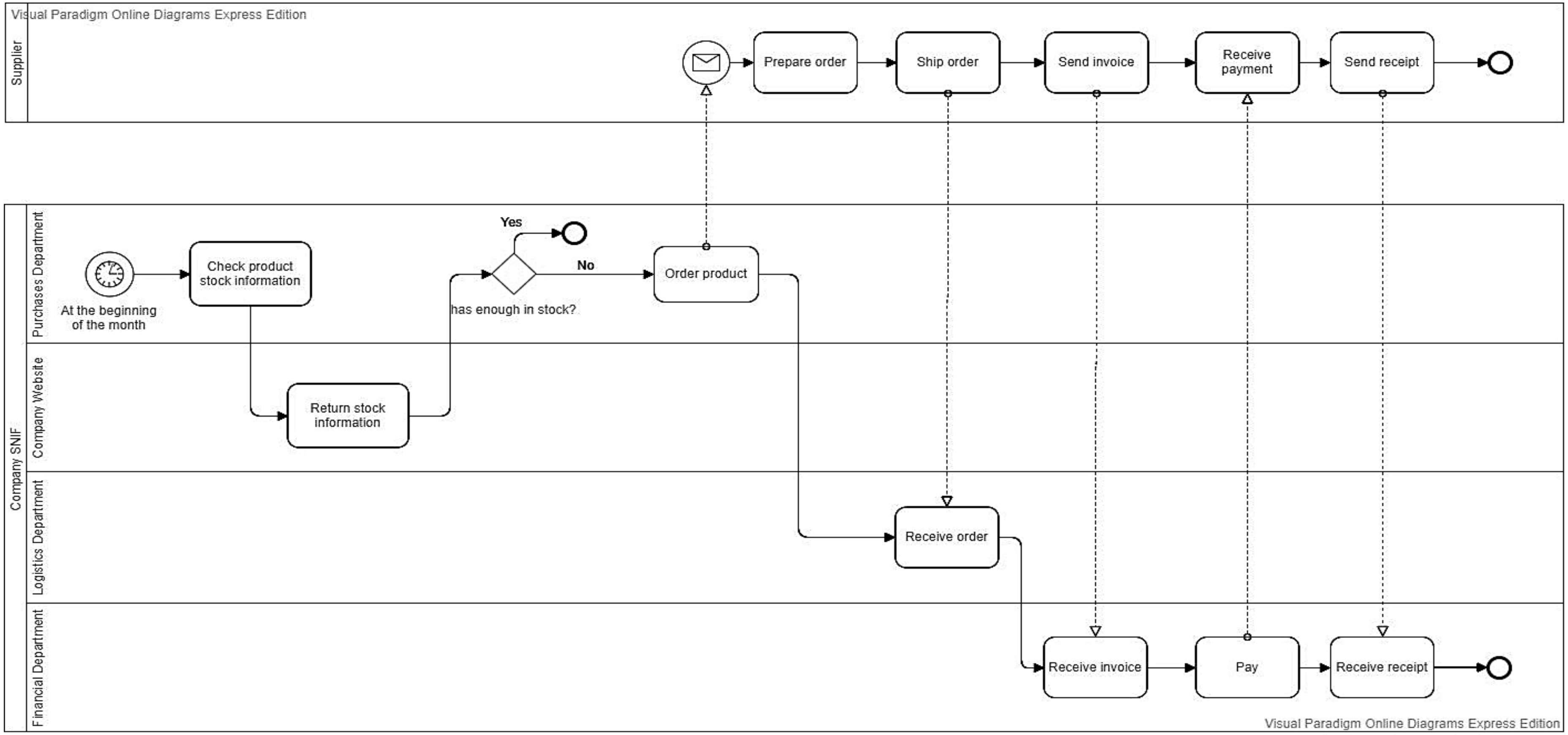


Figure 3: BPMN flow for the process of purchasing a product.

5. Planning

5.1. Gantt Chart

Figure 4: Gantt chart of the project development

6. System Architecture

The project was developed using the following technologies:

- **React** and **Bootstrap** – front-end development.
- **Express** (**NodeJS**) – back-end development which includes parsing a *SAF-T* and making calls to *Jasmin's API*.

The way these technologies work in the project is:

- Initially, the back-end parses the *SAF-T* and fetches the access token to make calls to the *Jasmin API*.
- When a user asks for a page, the front-end makes calls to the back-end, asking for information.
- The back-end either fetches the information from the *SAF-T* content which is saved in its database or makes a call to the *Jasmin API* using the saved access token and sends it to the front-end.
- The front-end receives the information and shows it to the user.

This process is described in the following image:

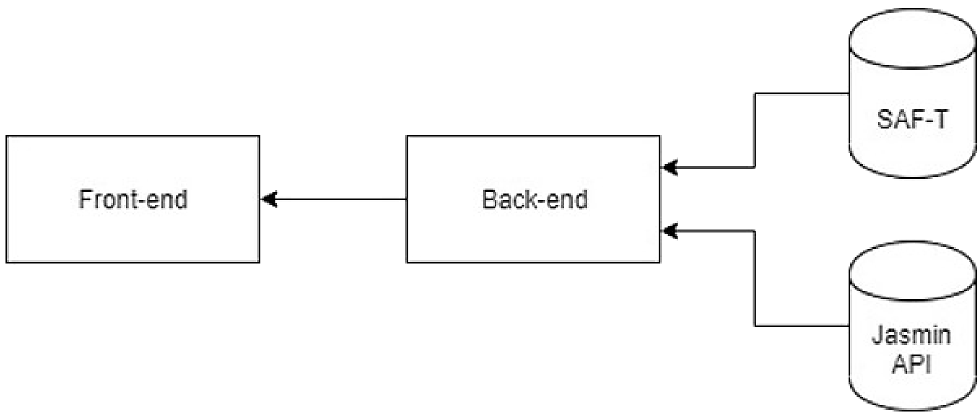


Figure 5: System Architecture Diagram

7. Interoperability

The project accesses the *SAF-T* to obtain:

- Fiscal Year.
- Balance Sheet, Profit and Loss and Sales Graph. For this, the project fetches the general ledger accounts and the transactions in general ledger entries in which the type is different than "A".
- Accounts Payable, Accounts Receivable, Sales and Services Provided and Cost of Goods Sold, shown in the Sales page and in the Purchases page.

The project accesses the *Jasmin API* to obtain:

- Invoices information for both sales and purchases, in order to obtain the products sold / purchased, the top of consumers and suppliers and adjacent KPIs.
- Products and Suppliers information for the respective pages.
- Materials Items, to obtain the products available in stock for the Inventory page.
- Company's information for the Home page.

8. Instructions to execute the project

In order to run the project, you need to have npm installed.

To run the project, open a terminal, enter the api folder and call the following instructions:

- ***npm install***
- ***npm start saft_2019.xml***

On a different terminal, enter the frontend folder and call the following instructions:

- ***npm install***
- ***npm start***

9. Final Considerations

With this project not only did we get a better understanding about how an ERP works, we also understood which information is valuable to a company, from a management point of view, and how to represent it in a way that makes the process of making decisions easier.

We worked with the *Jasmin API*, to which we had to adapt and understand how to fetch the information we wanted and how it organizes information. We also had to learn how to input information into *Jasmin* and what happened internally when we added a new invoice or a new product to the system.

We also worked with *SAF-T* files, which allowed us to understand which information each type of *SAF-T* contains and how to use this information to calculate important key performance indicators such as the variables present in the Profit and Loss and Balance Sheet.

On top of this, we learned to work with new technologies (React and Express) which most of us never used before.

In the end, the development of the project allowed us to gain extensive knowledge and contributed to our growth as engineers.