U.PORTO

FEUP FACULDADE DE ENGENHARIA
UNIVERSIDADE DO PORTO

Integrated Master's in Informatics and Computer Engineering
Information Systems 2020/2021
360º Company Dashboard
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Project Report

Class 1 Group A

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1. Project Overview

This project consists of a web application capable of presenting important information, such as key performance indicators (KPIs) and data relevant to the business of Tesla.

Tesla, Inc. (formerly Tesla Motors, Inc.) is an American electric vehicle and clean energy company based in Palo Alto, California. Tesla's current products include electric cars (the Model S, Model 3, Model X, and Model Y), battery energy storage from home to grid scale (the Powerwall, Powerpack, and Megapack), solar products (solar panels and solar roof tiles) and related products and services.

After 11 years in the market, Tesla ranked as the world's best-selling plug-in and battery electric passenger car manufacturer in 2019, with a market share of 17% of the plug-in segment and 23% of the battery electric segment. Tesla global vehicle sales increased 50% from 245,240 units in 2018 to 367,849 units in 2019. In 2020, the company surpassed the 1 million mark of electric cars produced. The Model 3 ranks as the world's all-time best-selling plug-in electric car, with more than 500,000 delivered. Tesla cars accounted for 81% of the battery electric vehicles sold in the United States in the first half of 2020. Tesla sells cars and equipment both by stock or/and by order.

The use of a dashboard and drill down functionalities will allow information such as sales, finances, inventory and procurement to be displayed in a way that facilitates their understanding. The application will also be interoperable with Primavera Software.
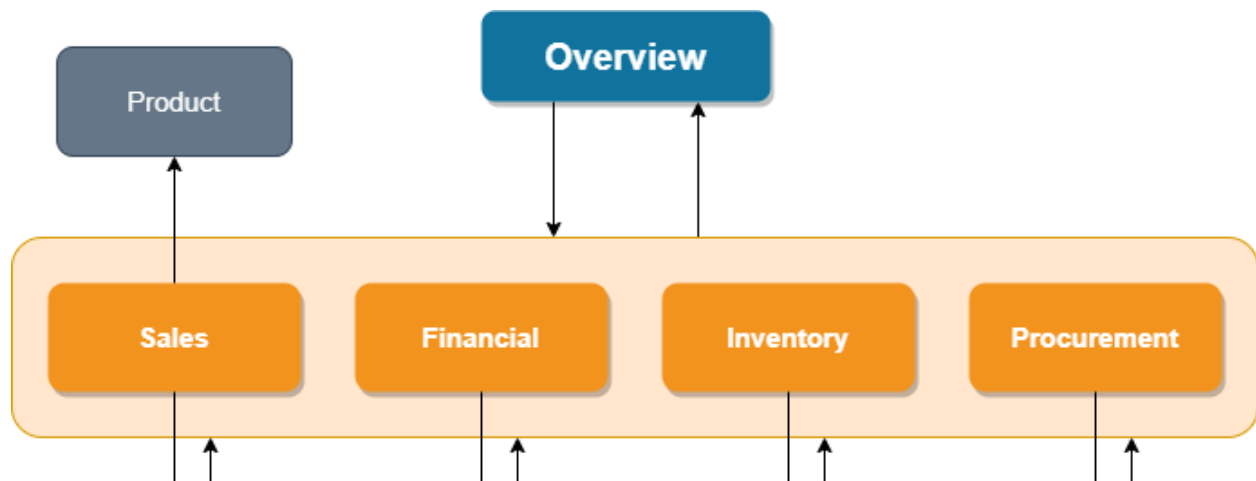

Fig 1 - Simplified site map

2. Functionalities

2.1 Overview

Functionality	Description	Value	Associated Dashboard
Sales Gross Total	Value representing annual sales gross total	Understand the grand total of all sales within a year	OVERVIEW
Sales Net Total	Value representing annual sales net total	Understand the gross sales minus 3 types of deductions, allowances, discounts and returns	OVERVIEW
Gross Profit Margin	Value representing annual gross profit margin	Give a general overview of the efficiency of the business	OVERVIEW
Net Profit Margin	Value representing annual net profit margin	Measures how much of a company's net income (profit) is generated from revenue	OVERVIEW
EBITDA	Value representing the company's overall financial performance	Represents the profitability of a business	OVERVIEW
Net Income	Value representing the income after taking taxes and deductions	Represents the revenue that exceeds the expenses of the company	OVERVIEW
Sales summary	Bar chart listing the sales volume for each month	To understand if and when there is more sales (seasonality)	OVERVIEW
Sales per Region	Circular chart to determine locations where we sell more products	Determine best locations where our products succeed the most	OVERVIEW
Balance sheet	Bars chart representing Assets, Equity and Liabilities	Check the balance sheet of the company and determine the health of the company	OVERVIEW
Top products	List of top selling products	Know the most popular products	OVERVIEW

2.2 Sales Report

Functionality	Description	Value	Associated Dashboard
Gross Profit Margin	Line chart for each month representing the gross profit margin	Give a general overview of the efficiency of the business	SALES_REPORT
Net Profit Margin	Line chart for each month representing the net profit margin	Measures how much of a company's net income (profit) is generated from revenue	SALES_REPORT
Average Order Value (AOV)	Value for AOV	Understand average order amount to understand better the business	SALES_REPORT
Cost of Goods Sold	Value for COGS	See how much the company is spending on labor and raw materials	SALES_REPORT
Sales per Region	Circular chart to determine locations where we sell more products	Determine best locations where our products succeed the most	SALES_REPORT
Top products	List of top selling products	Know the most popular products	SALES_REPORT

2.3 Financial Report

Functionality	Description	Value	Associated Dashboard
Gross Profit Margin	Line chart for each month representing the gross profit margin	Give a general overview of the efficiency of the business	FINANCIAL_REPORT
Net Profit Margin	Line chart for each month representing the net profit margin	Measures how much of a company's net income (profit) is generated from revenue	FINANCIAL_REPORT
Balance sheet - Assets	Bar representing the value of assets divided into noncurrent and current assets and tangible and intangible assets	Access to the total amount of assets and its divisions between different categories	FINANCIAL_REPORT
Balance sheet - Equity & Liabilities	Bar representing the value of Equity and Liabilities. Liabilities divided into noncurrent and current.	Access to the total amount of equity and liabilities and its divisions between different categories	FINANCIAL_REPORT
Revenue and Expenses - Revenue	Bar representing the total amount of revenue	Check the total amount of revenue	FINANCIAL_REPORT
Revenue and Expenses - Expenses	Bar representing the total amount of cost	Check the total costs	FINANCIAL_REPORT
EBITDA	Bar representing EBITDA subdivided into each category	View of net income with interest, taxes, depreciation and amortization	FINANCIAL_REPORT
EBITDA Margin	Value representing EBITDA Margin	Know the company operation profit as a percentage of its revenue	FINANCIAL_REPORT
VAT Paid / Deducted	Bar chart representing both values for each month	Understand how the company is paying taxes and deducting them	FINANCIAL_REPORT

2.4 Inventory Report

Functionality	Description	Value	Associated Dashboard
Total Assets in Stock	Value to represent the value of the total assets in stock	Overview of the total asset the company has on stock	INVENTORY_REPORT
Monthly Inventory Turnover	Bar chart representing the inventory turnover for each month	Check how many times inventory has been sold and replaced, monthly	INVENTORY_REPORT
Monthly Average Inventory	Bar chart representing the average inventory for each month	Used to estimate the amount of inventory the company has, monthly.	INVENTORY_REPORT
Average Days to Sell Inventory	Value representing the average number of days to sell inventory	Understand how long it takes the company to turn its inventory into sales	INVENTORY_REPORT
Top products	List of top selling products	Know the most popular products	INVENTORY_REPORT

2.5 Procurement Report

Functionality	Description	Value	Associated Dashboard
Types of Suppliers	Bar chart representing the number of short-, medium- and long-term suppliers	Understand how dependent the company is of certain suppliers	PROCUREMENT_REPORT
Product Order Cycle Time	Line chart representing the average purchase order cycle time from previous months	Give a general understanding on how fast the company can complete orders	PROCUREMENT_REPORT
Supplier Quality Rating	Bar chart representing the quality rating of each supplier	Know how reliable the products of a supplier are, in order to discuss future contracts	PROCUREMENT_REPORT
Suppliers	Circular chart to check all the suppliers and how much they supply the company	Give a general understanding on the biggest suppliers	PROCUREMENT_REPORT
Product Order Lead Time	Line chart representing the average lead time in days each month	Know how long it takes on average to fulfill an order	PROCUREMENT_REPORT

2.6 Product Page

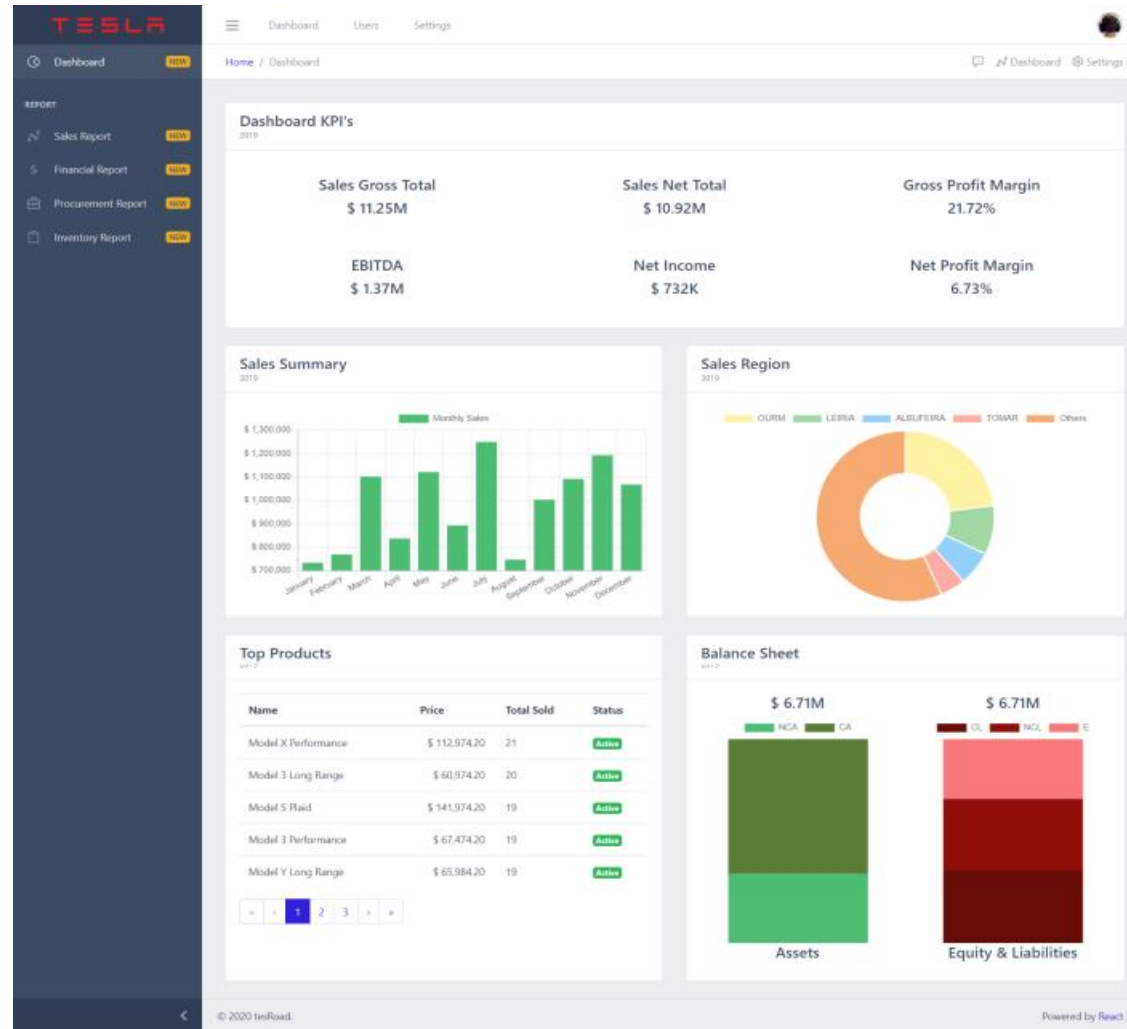| Functionality	Description	Value	Associated Dashboard
Product Information	Values representing the general product information	To check for general information regarding a product	PRODUCT_PAGE
Top Clients	Table with a list of top clients for a given product	To know the most reliable clients and understand the value they bring to the company	PRODUCT_PAGE
Gross Profit vs Net Profit	Line chart comparing the gross profit and net profit of a given product for each month	Compare how the two values stack against each other to analyze where improvements need to be made	PRODUCT_PAGE
Units in Stock	Value representing Units in stock for a given product	To check the inventory stock of a given stock	PRODUCT_PAGE
Units Sold	Value representing units sold of a given product	To check the number of sales of a given product	PRODUCT_PAGE
Annual Product Net Profit	Value representing the annual product net profit	To understand the annual net profitability of a given product at any time	PRODUCT_PAGE

User and Business Goals
- General company overview (Sales Gross total, Sales Net Total, Margins)
- Swift view of the company's status
- Used as a management tool

3. Information Architecture
3.1 CORE_OVERVIEW

Inward Paths / Trigger Words

Aside navigation menus

Outward Paths / Calls to Action

Provide the user with a broad view for a given year/period information about the company's activity (sales, accounting, KPIs)

Close look into the information of Products, Customers, all KPIs (ex: Top products)

Fig 2 – Overview page

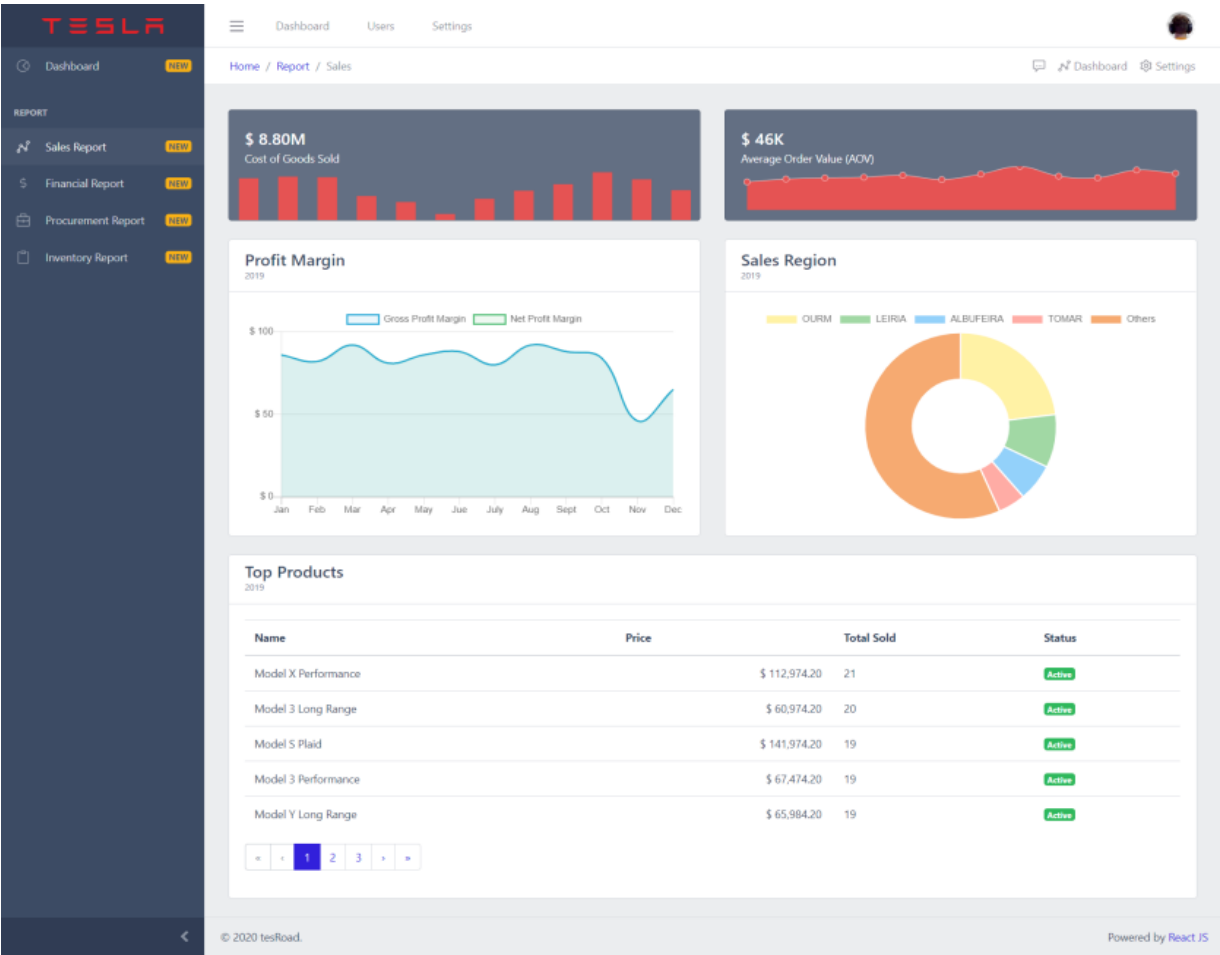| Elements of the core				Elements of the core	
KPI_01	KPI	Sales Gross Total	KP1_06	KPI	Net Profit Margin
KPI_02	KPI	Sales Net Total	BAR_01	Bar chart	Sales Summary
KPI_03	KPI	Gross Profit Margin	BAR_02	Bar chart	Balance Sheet
KPI_04	KPI	Earning Growth	CIR_01	Pie chart	Sales Per Region
KPI_05	KPI	Revenue Growth Rate	LIST_01	List	Top products

3. Information Architecture
3.2 SALES_REPORT

User and Business Goals
- Sales overview (cost of goods sold, average order value, top products, sales per region)
- Detailed view of the company's sales status
- Used as a management tool

Inward Paths / Trigger Words

Aside navigation menus

Outward Paths / Calls to Action

Provide detailed information about the company's sales situation for a specific year/period (COGS, AOV, top products)

Fig 3 – Sales page

Elements of the core

|		
KPI_01	KPI	Cost of Goods Sold
KPI_02	KPI	Average Order Value
LIST_01	List	Profit Margin
CIR_01	Pie chart	Sales Per Region
LINE_01	Line chart	Top Products

3. Information Architecture
3.3 FINANCIAL_REPORT

User and Business Goals
- Financial overview (VAT Paid/deducted, profit margin, balance sheet, profit and loss)
- Detailed view of the company's financial status
- Used as a management tool

Inward Paths / Trigger Words

Aside navigation menus
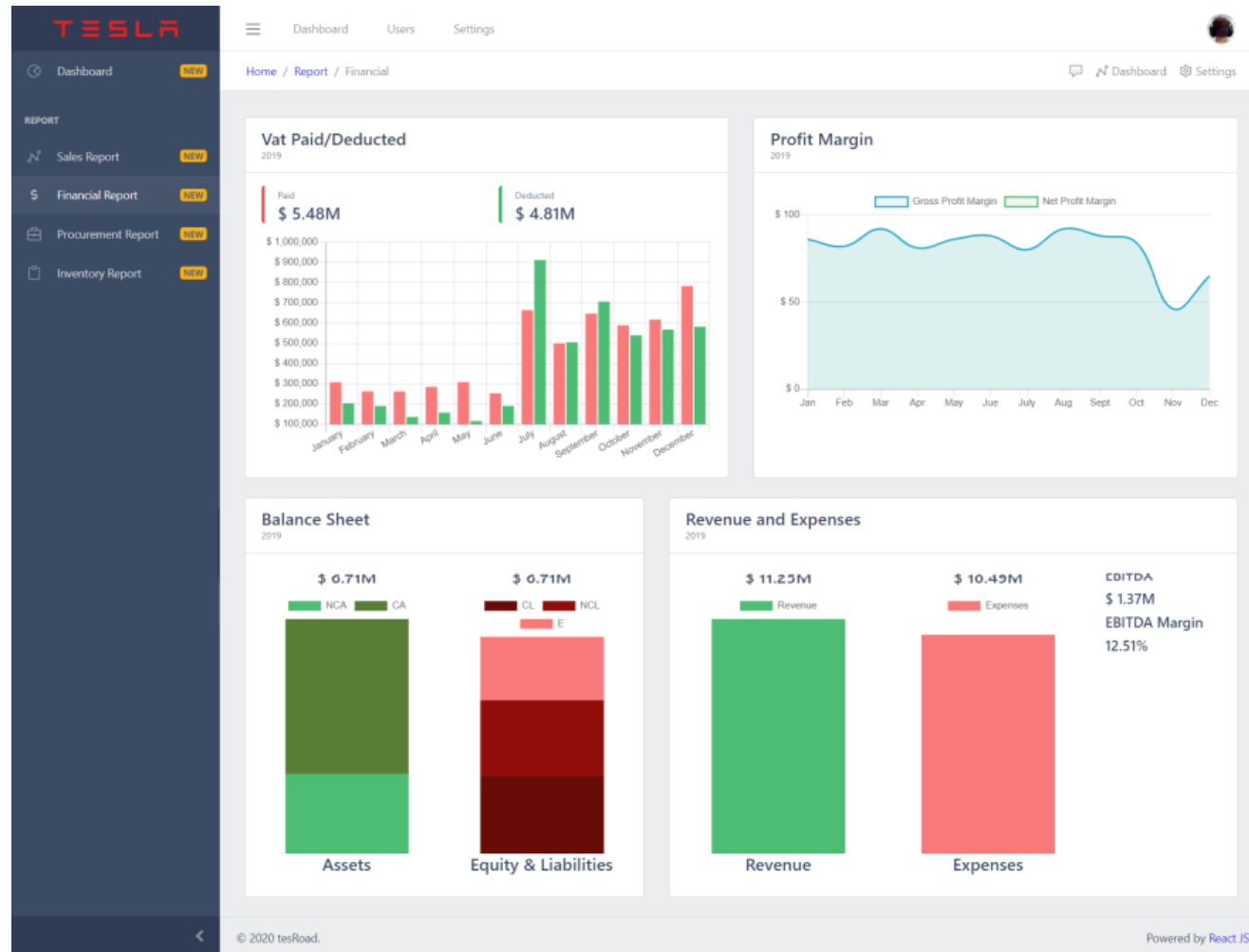
Outward Paths / Calls to Action

Provide the user with a detailed view of the company's financial state (sales, accounting, KPIs) for a given year/period

Close look into the information of Products, Customers, all KPIs (ex: Top products)

Fig 4 – Financial page

		Elements of the core				Elements of the core
BAR_01	Bar chart	VAT Paid / Deducted	LINE_01	Line chart	Profit Margin
BAR_02	Bar chart	Balance Sheet	BAR_03	Bar chart	Revenue & Expenses

3. Information Architecture
3.4 INVENTORY_REPORT

User and Business Goals
- Procurement overview (purchases, supply information)
- Detailed view of the company's procurement
- Used as a management tool
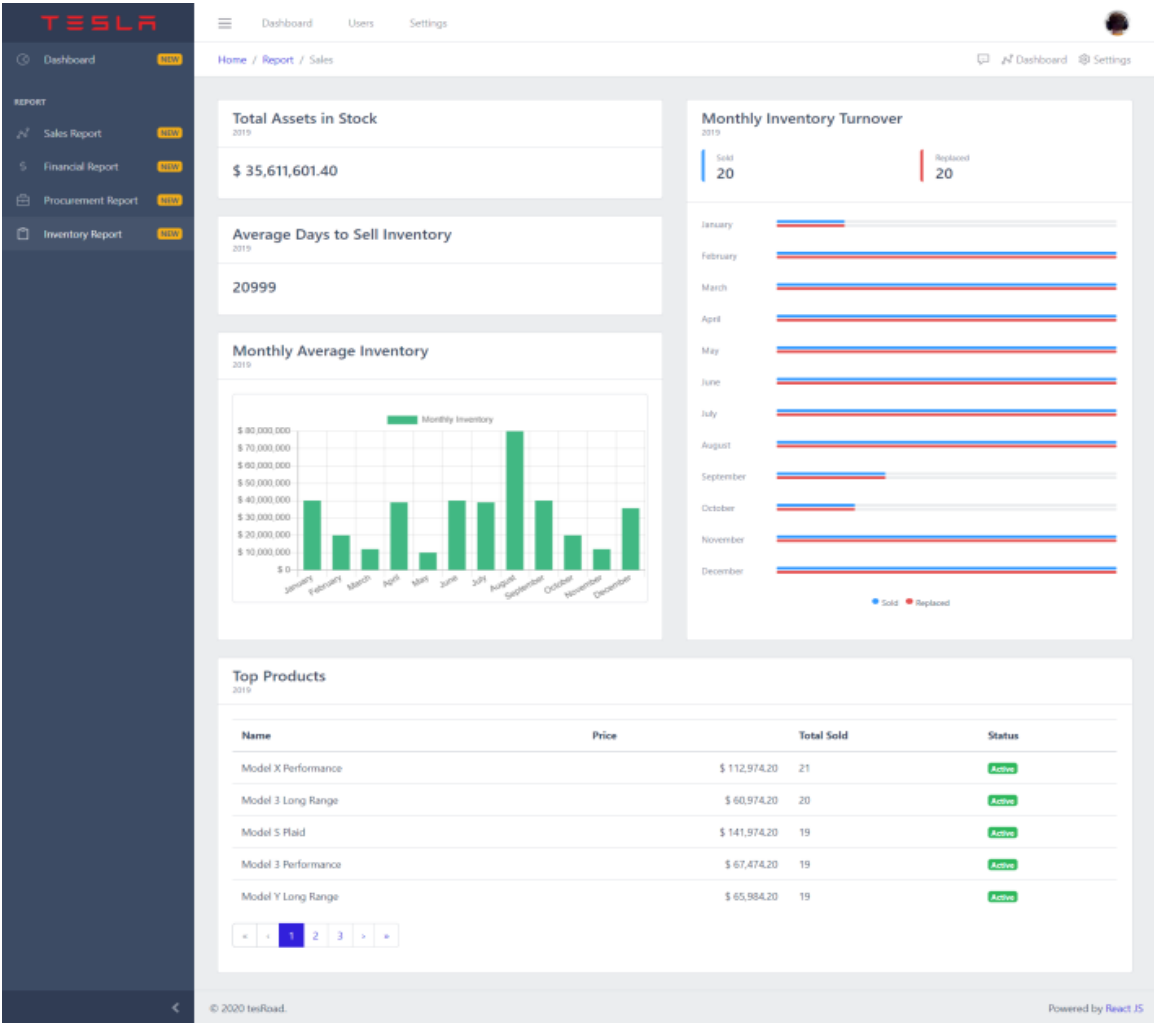
Inward Paths / Trigger Words

Aside navigation menus

Outward Paths / Calls to Action

Provide the user with a broad view for a given year/period information about the company's products performance

Dive deep into information about Products

Fig 5 – Inventory page

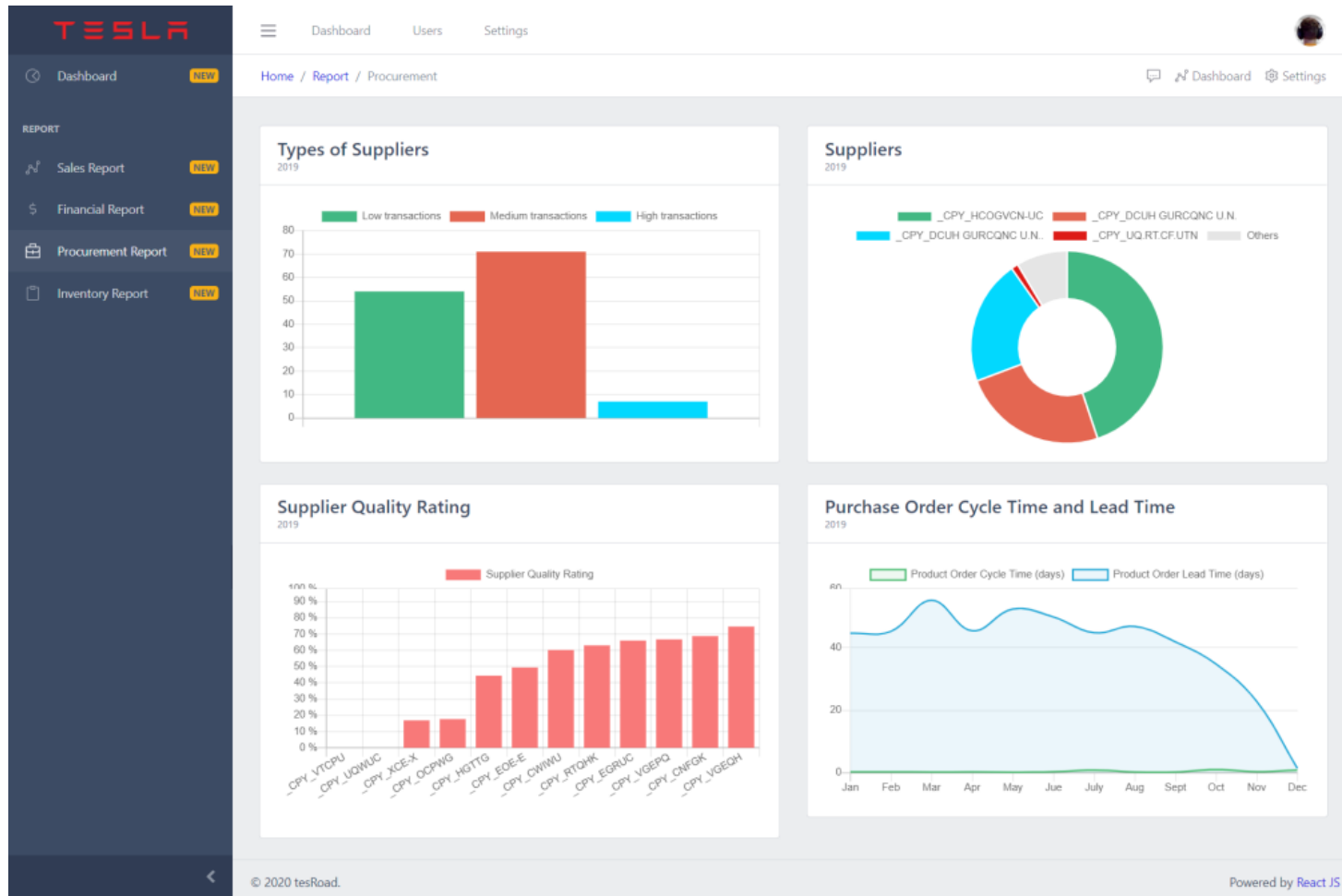| Elements of the core				Elements of the core		
KPI_01	KPI	Total Assets in Stock		BAR_02	Bar chart	Monthly Average Inventory
KPI_02	KPI	Average Days to Sell Inventory		LIST_01	List	Top Products
BAR_01	Bar chart	Monthly Inventory Turnover				

3. Information Architecture
3.5 PROCUREMENT_REPORT

User and Business Goals
- Inventory overview (products, turnovers, …)
- Detailed view of the company's inventory situation
- Used as a management tool

Fig 6 – Procurement page

Elements of the core				Elements of the core		
BAR_01	Bar chart	Number of Suppliers		PIE_01	Pie chart	Suppliers
KPI_01	KPI	Supplier Quality Rating		LINE_01	Line chart	Purchase Order Cycle Time and Lead Time
BAR_02	Bar chart	Purchases in Time and Budget				

User and Business Goals
- Product overview (product information, stock, clients, profit)
- Detailed view for each of the company's products
- Used as a useful management tool
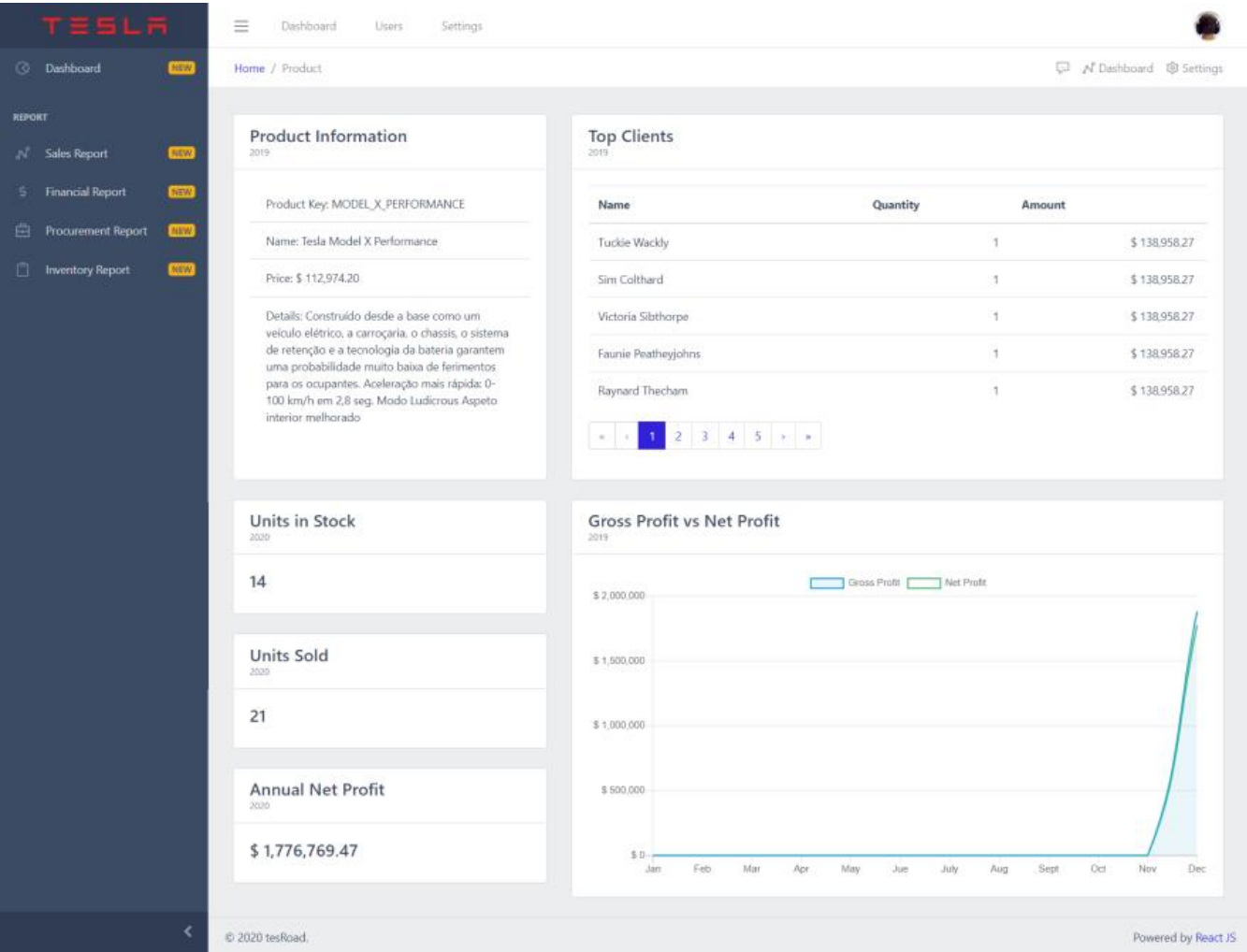
3. Information Architecture
3.6 PRODUCT_VIEW

Inward Paths /
Trigger Words

Aside navigation
menus

Outward Paths /
Calls to Action

Provide the user with a
broad view for a given
year/period information
about the company's
activity (sales, accounting,
KPIs)

Close look into the
information of
Products, Customers,
all KPIs (ex: Top
products)

Fig 7 – Product view page

Elements of the core		
KPI_01	KPI	Sales gross total
KPI_02	KPI	Sales Net Total

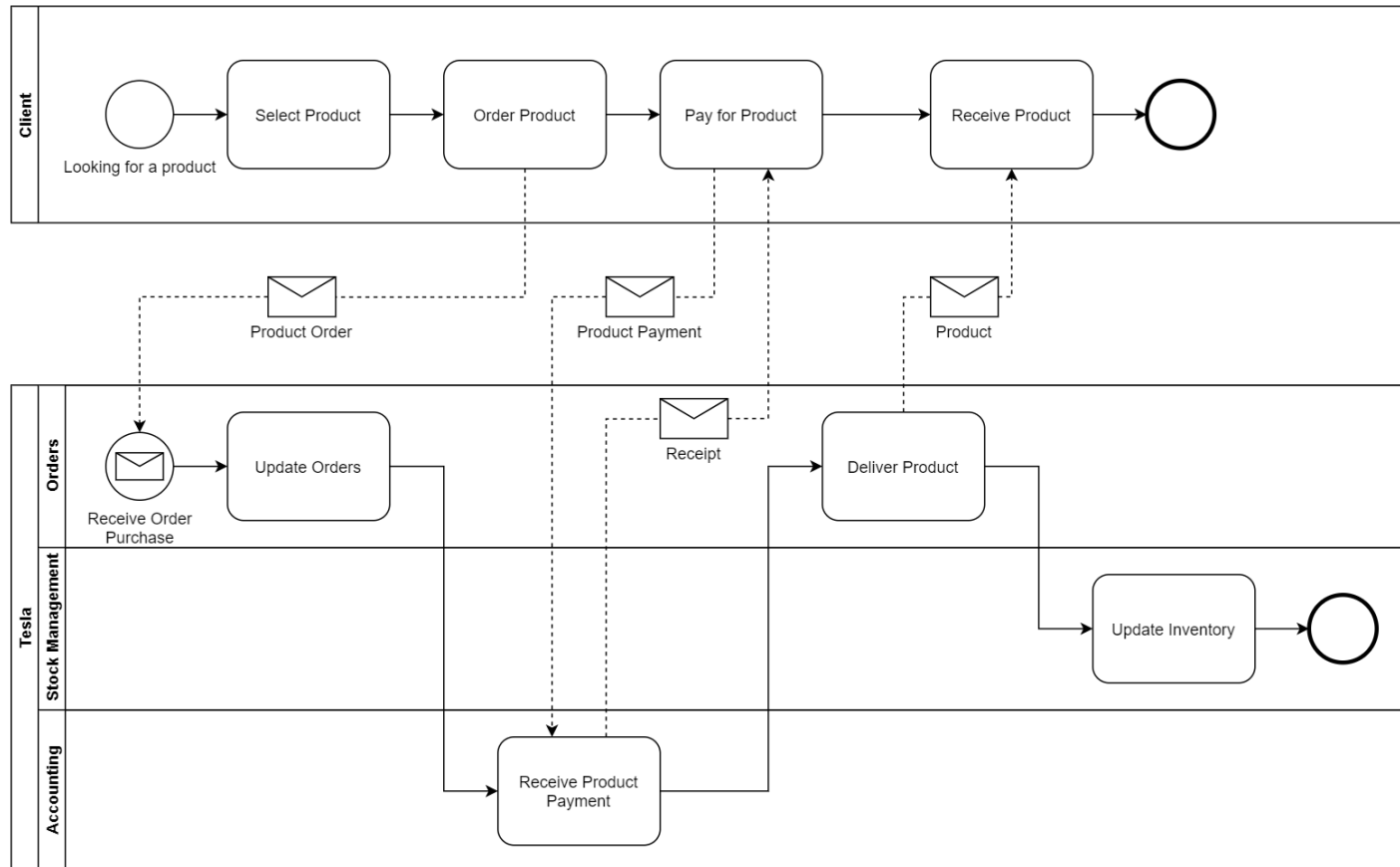| Elements of the core		
KPI_03	KPI	Gross Profit Margin
LINE_01	Line chart	Net Profit Margin

4. BPMN Flows

4.1 Sales BPMN

Fig 8 - Sales BPMN diagram

The BPMN diagram above demonstrates the process that occurs when a client buys a product from Tesla. The client must first select a product from the available range of products and order it. Tesla then receives the order and waits for the client to pay. After payment is received, the product is delivered to the client and then the inventory is updated.
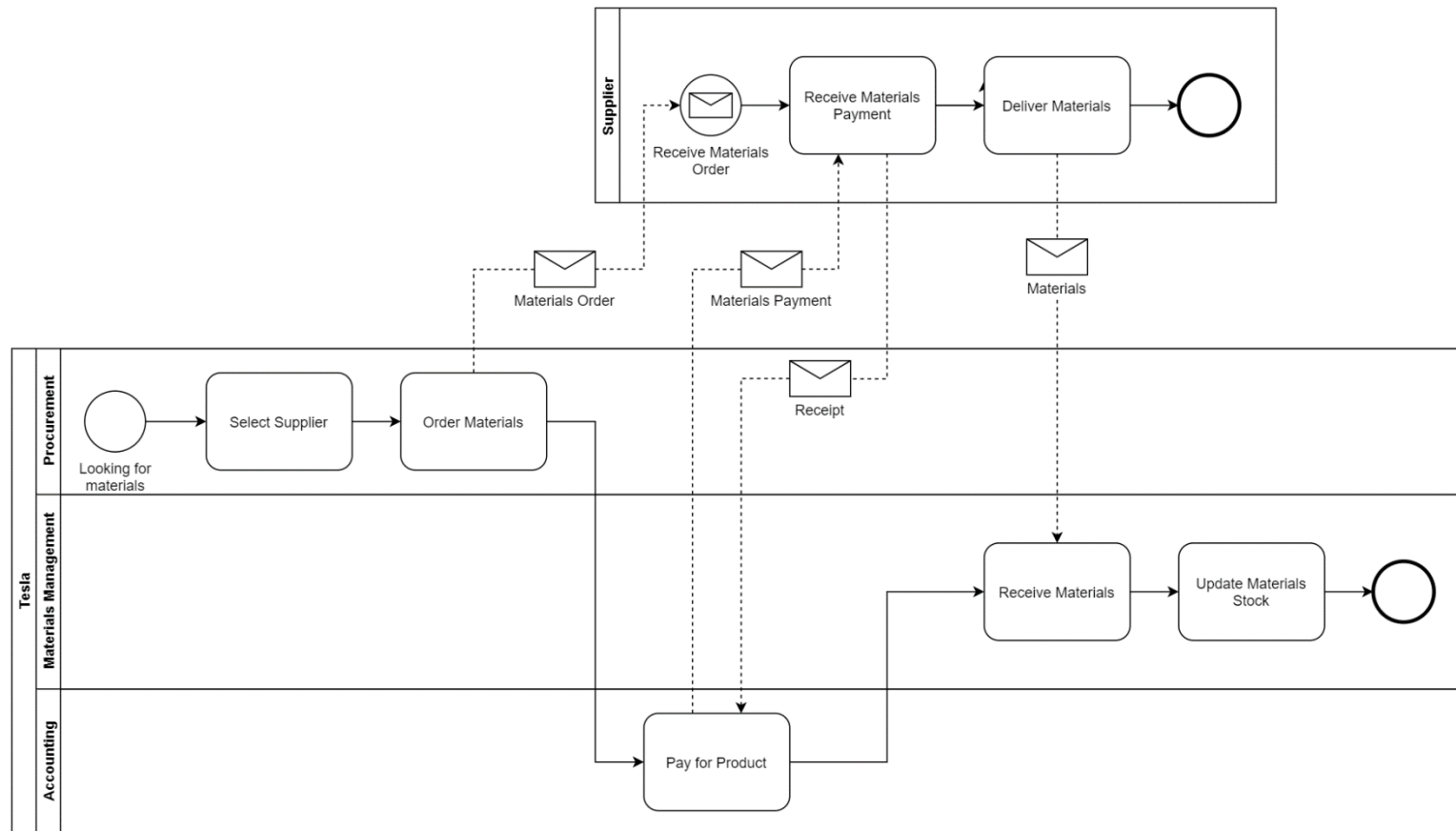
4.2 Suppliers BPMN

Fig 9 - Suppliers BPMN diagram

The BPMN diagram above demonstrates the process that occurs when the procurement department buys materials from its suppliers. The procurement department must first select the supplier from which to buy the materials and then order them. The supplier then receives the order and waits for payment from the accounting department of Tesla before sending the materials. The materials management team then receive the materials and update the stock of these materials.
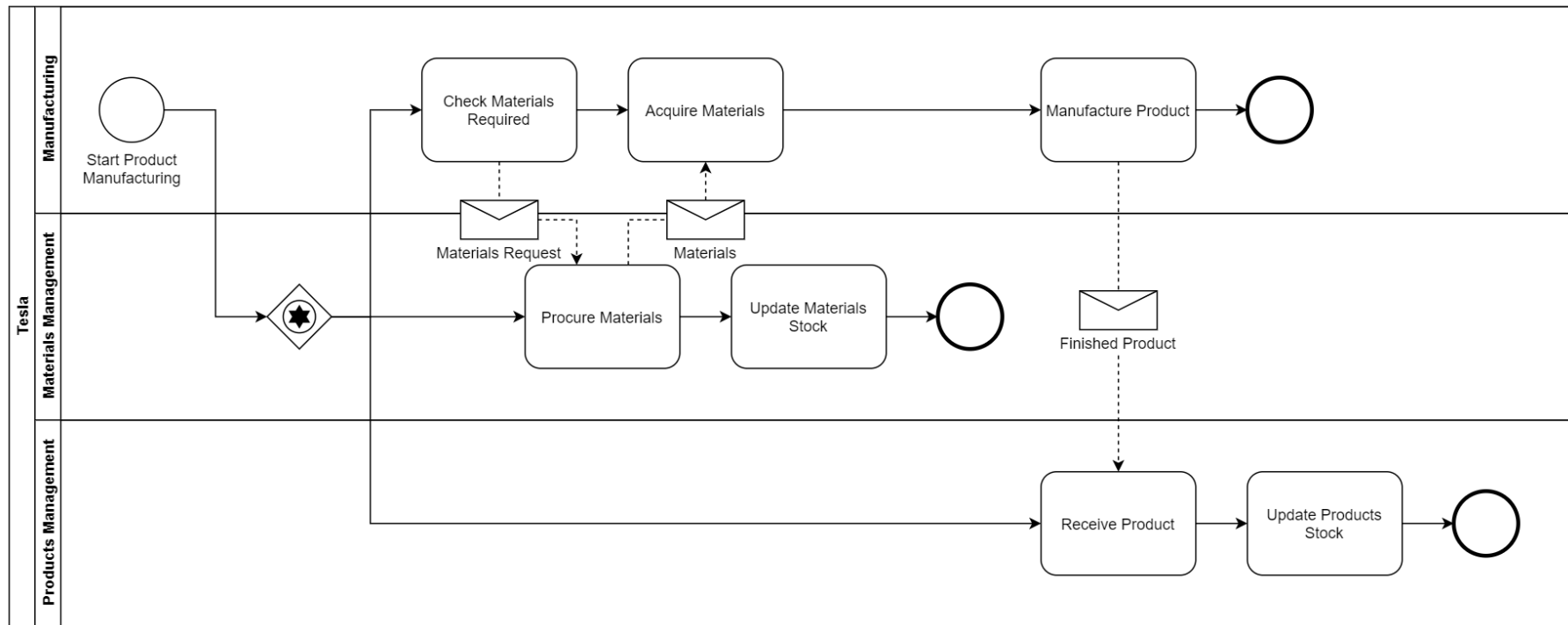
4.3 Manufacturing BPMN

Fig 10 - Manufacturing BPMN diagram

The BPMN diagram above demonstrates the process that occurs when manufacturing of a product happens in the Tesla company. The manufacturing department first checks if it has the materials required, sending a request for materials to the materials management team and then receiving them before proceeding to the manufacturing of a product. The management team after sending the materials to the manufacturing department updates the materials stock. The products management team when receiving the product makes it available for purchase by updating the stock of the product received.

5. Planning

Gantt Chart

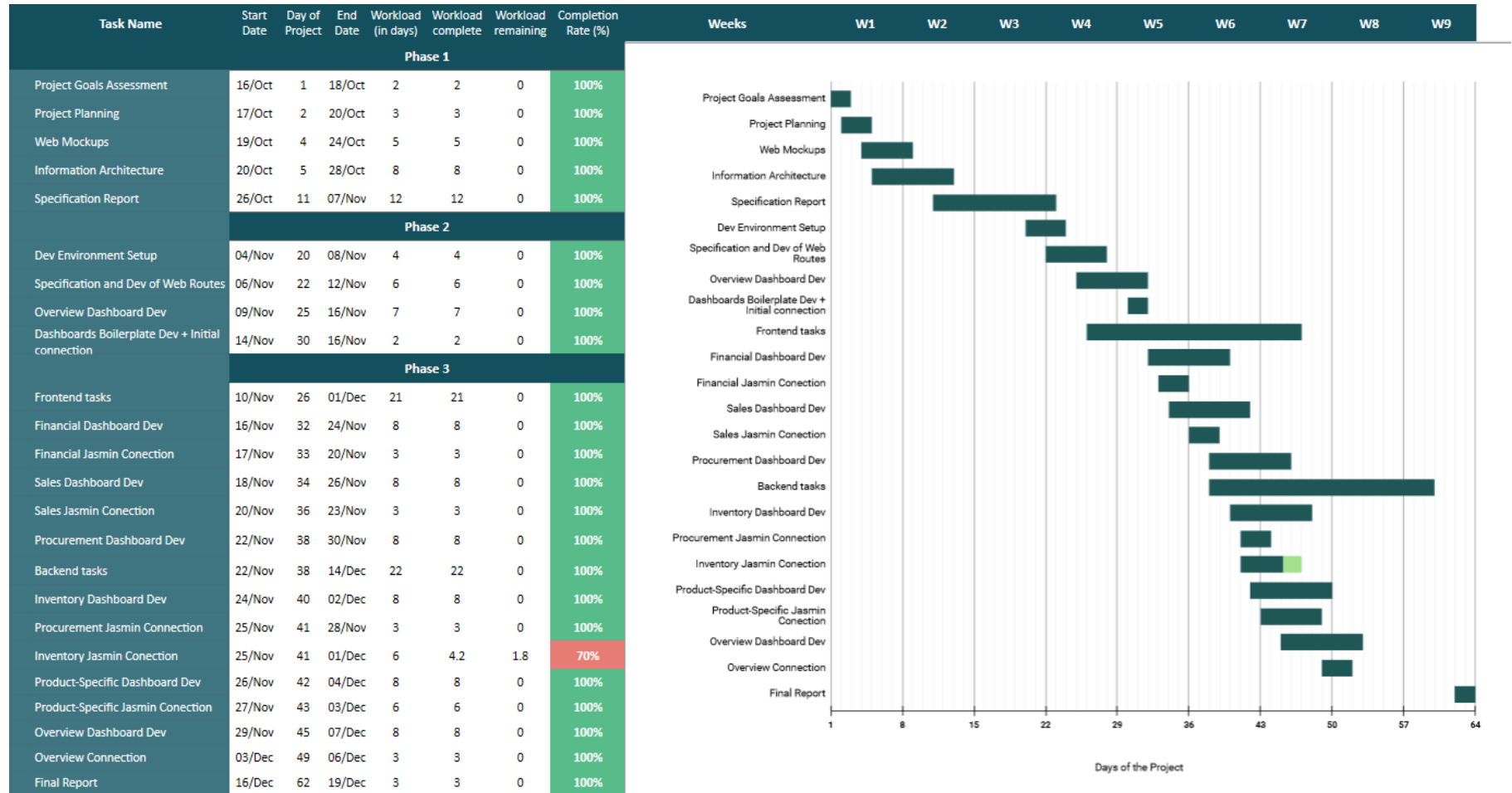| Task Name	Start Date	Day of Project	End Date	Workload (in days)	Workload complete	Workload remaining	Completion Rate (%)
Phase 1							
Project Goals Assessment	16/Oct	1	18/Oct	2	2	0	100%
Project Planning	17/Oct	2	20/Oct	3	3	0	100%
Web Mockups	19/Oct	4	24/Oct	5	5	0	100%
Information Architecture	20/Oct	5	28/Oct	8	8	0	100%
Specification Report	26/Oct	11	07/Nov	12	12	0	100%
Phase 2							
Dev Environment Setup	04/Nov	20	08/Nov	4	4	0	100%
Specification and Dev of Web Routes	06/Nov	22	12/Nov	6	6	0	100%
Overview Dashboard Dev	09/Nov	25	16/Nov	7	7	0	100%
Dashboards Boilerplate Dev + Initial connection	14/Nov	30	16/Nov	2	2	0	100%
Phase 3							
Frontend tasks	10/Nov	26	01/Dec	21	21	0	100%
Financial Dashboard Dev	16/Nov	32	24/Nov	8	8	0	100%
Financial Jasmin Conection	17/Nov	33	20/Nov	3	3	0	100%
Sales Dashboard Dev	18/Nov	34	26/Nov	8	8	0	100%
Sales Jasmin Conection	20/Nov	36	23/Nov	3	3	0	100%
Procurement Dashboard Dev	22/Nov	38	30/Nov	8	8	0	100%
Backend tasks	22/Nov	38	14/Dec	22	22	0	100%
Inventory Dashboard Dev	24/Nov	40	02/Dec	8	8	0	100%
Procurement Jasmin Connection	25/Nov	41	28/Nov	3	3	0	100%
Inventory Jasmin Conection	25/Nov	41	01/Dec	6	4.2	1.8	70%
Product-Specific Dashboard Dev	26/Nov	42	04/Dec	8	8	0	100%
Product-Specific Jasmin Conection	27/Nov	43	03/Dec	6	6	0	100%
Overview Dashboard Dev	29/Nov	45	07/Dec	8	8	0	100%
Overview Connection	03/Dec	49	06/Dec	3	3	0	100%
Final Report	16/Dec	62	19/Dec	3	3	0	100%

Fig 11 – Gantt chart

6. Instructions

In order to run the app, the user needs to have Node.js installed. Node.js is an open-source, cross-platform, back-end, JavaScript runtime environment that executes JavaScript code outside a web browser. To download Node.js access the following link https://nodejs.org/en/ and press the green download button then after downloading the installation, execute it and install Node.js.
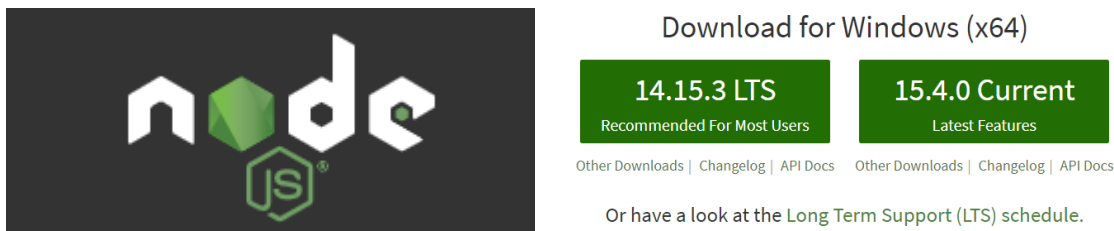
After the installation is complete, access the root folder of the project and run the following commands on the terminal (cmd, powershell, bash, …) by the following order:

> npm install

> npm start

The first command installs modules necessary to run the project

The last command starts the application on port 3000 of localhost and the Web API for the SAF-T information on port 5000 of localhost

Note: Don't copy the > symbol and the information between parentheses.

After starting the app, open your preferred browser and type http://localhost:3000 to access the app.
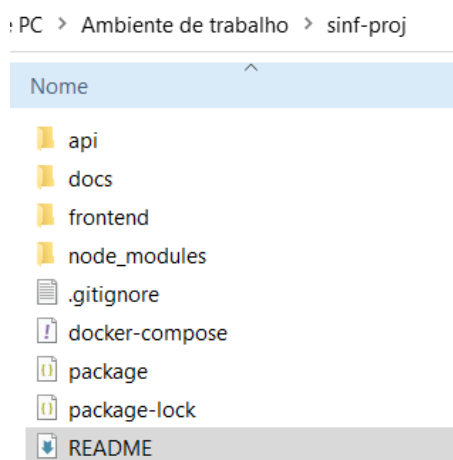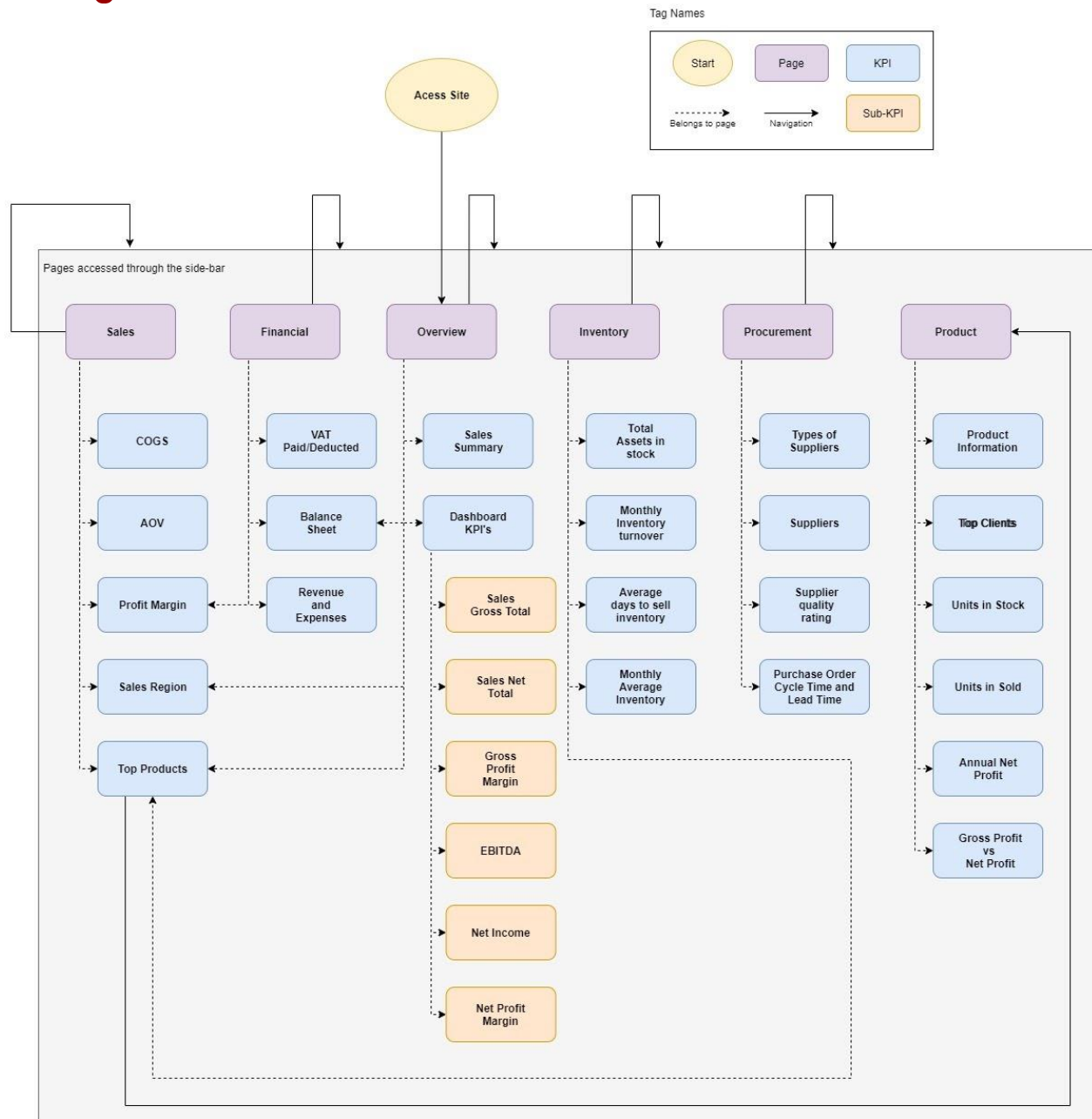
7. Pages

Fig 12 - Site paths

A user can access all of the pages by using the website's sidebar, except the product page, that can only be accessed when pressing one of the entries on the top products table present on the overview, sales and inventory pages.

Fig 13 – Website sidebar

Besides this, the user can also access any page by their respective url:

- Dashboard - http://localhost:3000/#/dashboard
- Sales Report - http://localhost:3000/#/report/sales
- Financial Report -http://localhost:3000/#/report/financial
- Procurement Report - http://localhost:3000/#/report/procurement
- Inventory Report - http://localhost:3000/#/report/inventory
- Product Page - http://localhost:3000/#/theme/products/{Product_Designation}

Example: http://localhost:3000/#/theme/products/MODEL_X_PERFORMANCE

8. Final Considerations

In comparison with the project specification, we achieved all of what we planned, except for a small part of the inventory report. This was due to time constraints. We also improved on some aspects that were not previously mentioned on the project specification, to improve the overall project such as, but not only, changes in some chosen KPIs, UI/UX improvements, using backend to store the accounting SAF-T file, etc. We also tried to focus on every aspect of a company, making in the process a more difficult task to complete our project, including procurement, inventory and specific product information (it would be much easier to solely focus on financial and sales points), to make the development as rich as possible, since it required from us, attention to all parts of the company and not just one or two.

Learning how to work with a piece of software like Jasmin was definitely one of the highpoints of the project. Going through the process of understanding how a company stores and processes its most valuable data was very informative and allowed us to have a better understanding of the intricacies it takes to be able to manage a proper company.
Besides this, working with the accounting SAF-T and learning how to read and understand the taxonomy codes was also another highpoint. It was fascinating to learn the amount of information and content a file like this can harbour. This knowledge will be very useful, for the future, if some of us decide to start their own businesses and/or companies.

We managed to conclude the project with great success although some minor things are left to be improved in a possible future work. We believe the app in its current state could be used on the professional landscape, for a real company, and that makes us very proud.