FACULTY OF ENGINEERING OF THE UNIVERSITY OF PORTO

MASTER IN INFORMATICS AND COMPUTING ENGINEERING

Sales Force Automation

Deliverable 2 - Final Document

(4th Year – 1st Semester)

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Summary

Identification

Team class: 3
Team identification: Grupo K
Project identification: P4 - Sales Force Automation
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Overview

Sales Force Automation systems are information centers used in the customer relationship management (CRM), controlling the marketing and the management of the business services, automating sales and sales force management functions. A SFA is a system that records the stages in a sales process, being able to access the history of actions executed, tracking the contact made with a giving customer, the purpose of the connection made and any follow up related to him. This improves the relation with the clients, reducing the risk of displeasure and ensuring that the efforts made don't end up duplicated.

This project's main goal is to manage the agenda of the sales force to better suit the needs of the company and its customers, developing a web application to integrate these functionalities, adopting the pretended methods from the PRIMAVERA ERP.

The mentioned software is a portuguese Enterprise Resource Planning system produced by PRIMAVERA BSS that incorporates all the data and processes of an organization in a single platform. This kind of softwares are essential to the management of a company allowing direct access to data and information flow. The PRIMAVERA ERP ensures reliability, integrity and security, including a set of connected modules that grant fluidity between the covered areas (Financial, Logistic, Human Resources, CRM, Assets, Projects, …).

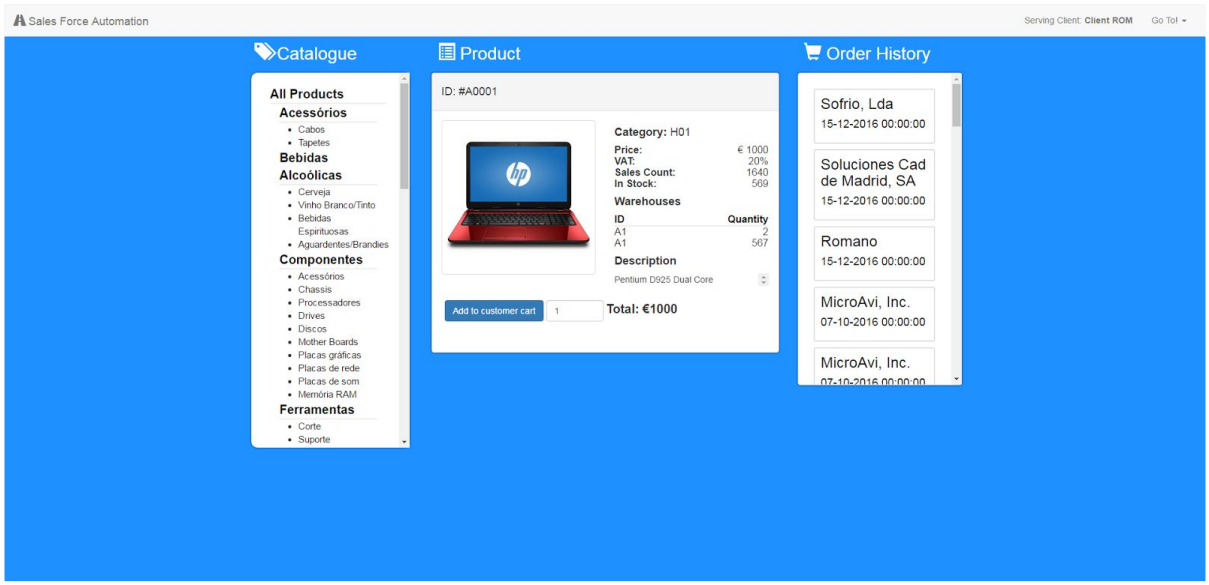
The web application aims to enhance the sales representative performance by providing useful and detailed information on a clear and intuitive interface. During this report we will mention its functionalities as well as the relations established with the PRIMAVERA ERP software.

Core Views

CORE_VIEW_1

User and Business Goals:

The product overview of the most important and essential information as to give a substantial help to the sales representative to better sell the product to the client.



Inwards paths: search product page, search in product catalogue, sales order page product table, client's cart, manager dashboard top products.

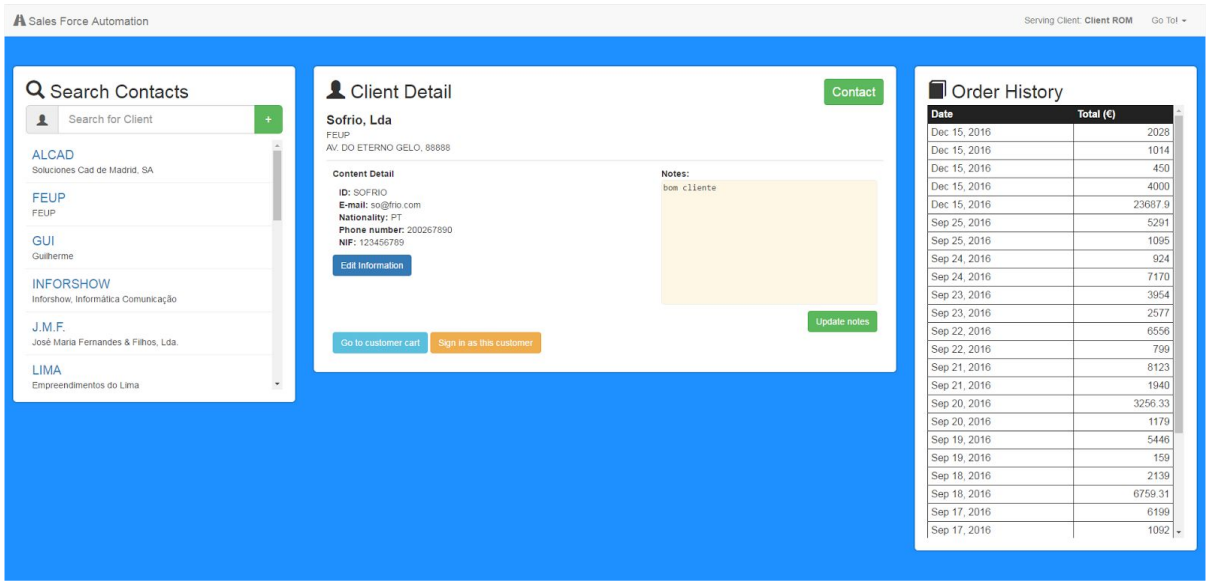
Outward paths: display important product information for the user, add ability to put the product order into a client's cart, check other sales order for this product to better understand this product's client type, ability to check the stock in each warehouse.

Elements of the core:

- Product catalogue panel (TREE_PANEL);
- Product info panel(name, id, price, ...) (INFO_PANEL);
- Product image panel (IMAGE_PANEL);
- Ordered order history panel by most recent boughts (SCROLL_PANEL);
- Add to client cart button (BUTTON);
- Choose quantity spinner (NUMBER_SPINNER);
- Total price panel (INFO_PANEL);

CORE_VIEW_2

Client information overview in order for the representative to learn more about his client and have more control so that the selling process can be more effective and lucrative.



Inward paths: client search page, sales order page, sales representative dashboard client's list.

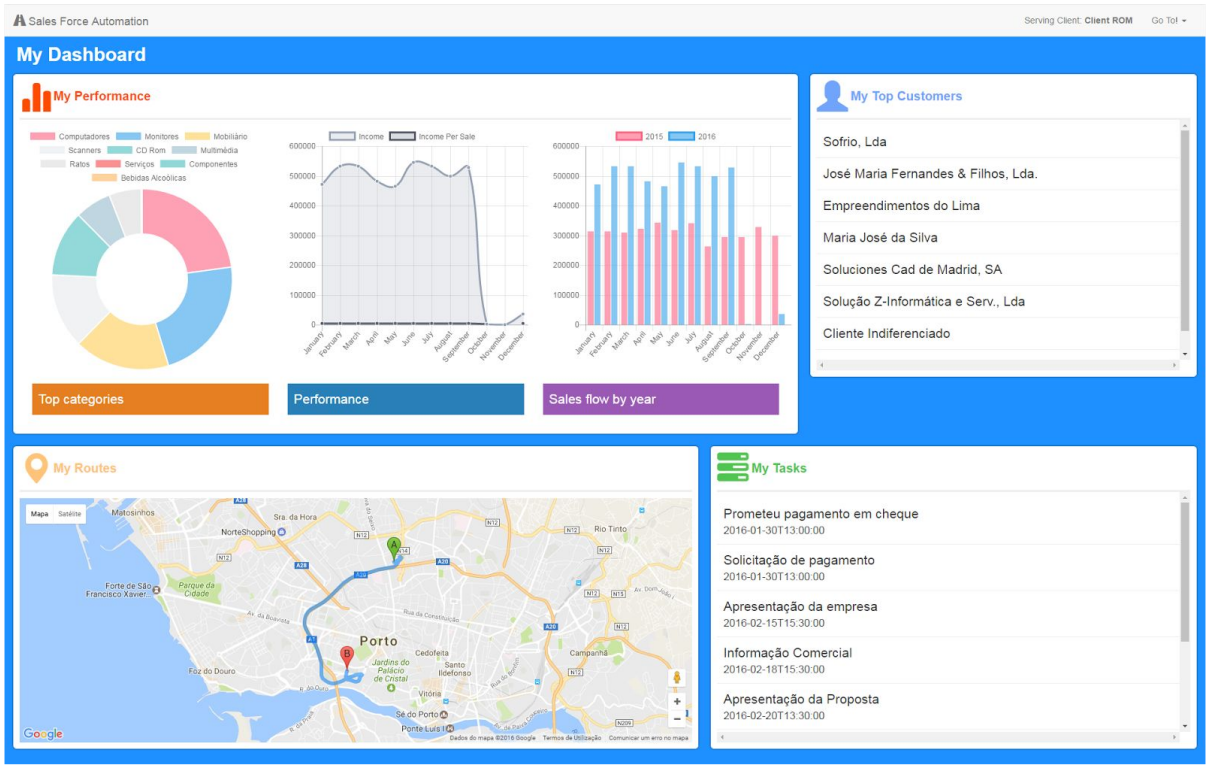
Outward paths: ability to edit a client's information; establish contact with the client; search for other clients; view client's order history; ability to register a new client; ability to go to the client's cart; ability to sign in as the client; add pertinent notes about the client.

Elements of the core:

- Search contacts panel (SCROLL_PANEL);
- Search contacts bar (SEARCH_BAR);
- Search contacts navigation buttons (NAV_BUTTONS);
- Add contact button (BUTTON);
- Client panel with his primary information(name, location, …) (HEADER_PANEL);
- Clients panel with more specific information (INFO_PANEL);
- Notes panel (FORM);
- Edit notes button (BUTTON);
- Client's history panel (SCROLL_PANEL);
- Edit client information button (BUTTON);
- Client cart button (BUTTON);
- Sign in as customer button (BUTTON);
- Contact client button (BUTTON).

CORE_VIEW_3

Dashboard of a sales representative with an overview of his information so that he can analyse his data about his performance and automate his daily functions in his sales force activities.



Inward paths: Home button, navigation options dropdown, manager sales representative panel, login.

Outward paths: provide the representative with data about his performance and statistics; display the sales representative top customers and ability to access their page; indicate upcoming tasks to be completed, display upcoming tasks list; show a route for the representative to make based on a task.

Elements of the core:

- Top product categories sold by the sales representative (PIE_CHART);
- Total income and total income per sales by the sales representative (LINE_CHART);
- Sales flow by year (BAR_CHART);
- Top customers panel ordered by most purchases (SCROLL_PANEL);
- Tasks list ordered by more proximate (SCROLL_PANEL);
- Tasks route map (MAP);

CORE_VIEW_4

Manager dashboard with general overview of the sales force in order to maximize management and to minimize efforts by calculating important metrics and statistics.

Inward paths: Home button, navigation bar, login.

Outward paths: inspect important data related to this sales force, analyse top performing representatives, analyse top products sold

Elements of the core:

- Top product categories sold overall (PIE_CHART);
- Total income and total income per sales (LINE_CHART);
- Total sales flow by year (BAR_CHART);
- Sales representatives list ordered by most profitable (SCROLL_PANEL);
- Top sold products list (SCROLL_PANEL);

Other Features

Search Functionality

- **Product Search:** Searching page for the product displaying results in a grid of product panels with its image, description and price. Also has on the left side a panel with all the product categories to choose from. Search is made with a query for the products description but also has category filters.
- **Client Search:** Page with both a search bar and a table showing the search results when searching for a client. Clients can be searchable by their names and those results can be filtered by choosing client label options in a panel besides the search results.
- **Sales Representative Search:** Searching page for the manager in which he can search for sales representatives by their name.

Two User Groups

There are two types of users in this application that can be accessed through the login page. One is the sales representative which can access all pages except the manager's dashboard for obvious reasons. The other type is the manager that can do everything the sales representative can but has an additional global dashboard associated with him and a page to search for sales representatives.

Manage client cart

Every time that the sales representative is signed in as a client he can add products, with a given quantity, to the respective client's cart. While in the client's cart page the sales representative can change the quantity or/and remove a given product from it. There is also the ability to checkout the items in the cart to then create a sales order. To do this the sales representative can check or uncheck products in the shopping cart page so that the ones which are checked are the ones that get selected for the sales order and press the 'checkout' button. After inserting some extra information the sales order is created. The not checked products for the sales order remain at the customer cart so a next time a sales representative visits a customer, he can check the products that the customer has previously shown interest.

Create and check sales orders

After checking out a client's cart a sale order is created. To check its status the sales representative can go to that sale order page. This page displays all the information of the sale order such as the client information that requested it as well as their delivery address and fiscal address, the representative that made that sale, the products sold and their quantities and the state of that sale(if its open or closed).

Intuitive interface

The interface of the application has the property of being very simple and intuitive to navigate. The use of panels makes a distinction between the many different functions of the interface elements(important information is in a bigger panel with lists and secondary information on side panels). The use of bright colors gives the sense of distinction between different panels and helps to give the application a comfortable sight for the user. It also makes use of big buttons with distinct colors to help the user make decisions more rapidly and uses notifications in the upper center of the screen to indicate changes or new additions.

Mobile adaptable interface

The application interface can also be adapted to be used on smartphones that have access to the internet and have a browser. It uses a grid system that collapses multiple columns in a single one, while in mobile, so that the user won't have to waste time zooming in and out and moving the viewport of the page.

Interoperability with Primavera

In this topic we will be specifying the details related to the interoperability established with the PRIMAVERA ERP, explaining which properties of the system we adopted to implement each of the functionalities.

Customer

To manage our customers' information, we used the CLIENTES table, selecting only a portion of the fields we found more relevant to work with and display in our sales force services. In this case, we work with this table to create, consult and update any client, as well as searching for specific entities by their name or to edit only their notes.

	Function	Description
1	ListCustomers	Lists all the customers of the system
2	GetCustomer	Given and ID, retrieves the corresponding customer
3	GetCustomerByName	Given a string, retrieves all the customers which ID or name match the pattern
4	GetTopCustomers	Given a number, gets the same amount of the customers that generated more sales
5	UpdateCustomer	Given an ID and a JSON, updates the customer with the corresponding id with the new set of info
6	UpdateCustomerNotes	Given an ID and a text, updates the customer with the new dedicated notes
7	CreateCustomer	Given a Customer model, creates a new entity CLIENTE in the system

Product

For the products, the table ARTIGO fitted perfectly our needs to store the info and manage the sales services of the software.

	Function	Description
1	ListProducts	Lists all the products of the system
2	ListProductsByHint	Given a string, retrieves all the products which description match the pattern
3	GetProductsByCategory	Given a category name, retrieves all products of the same type
4	GetProductsBySubCategory	Given a category name, retrieves all products of the same subtype
5	GetProduct	Given and ID, retrieves the corresponding product
6	GetTopProducts	Given a number, gets the same amount of the most sold products
7	GetSalesCount	Given a product ID, returns the amount of sales of the corresponding product

Category

In order to surf through the extensive catalogue of products to be sold, we implemented some functionalities that supported the sales representative to reach the kind of products we wants, as fast and simple as possible, displaying a list of categories and the respective subcategories. The used ERP' tables were the FAMILIA and SUBFAMILIAS.

	Function	Description
1	CategoryList	Retrieves all the categories and the respective subcategories

Sales Representative

This is the type of the entity we are focusing on. The salesman can be perfectly controlled by table VENDEDORES, which can be tracked through the many services provided by the software.

	Function	Description
1	ListSalesRepresentative	Lists all the sales representative of the system
2	GetSalesRepresentative	Given and ID, retrieves the corresponding sales representative
3	GetTopCustomerBySalesRepresentative	Given the ID of a sales representative and a number, retrieves the same amount of customers that created more sales subscribed by him
4	GetTopProductsBySalesRepresentative	Given the ID of a sales representative and a number, retrieves the same amount of products that the he most sold
5	CreateSalesRepresentative	Given a JSON, create a new entity as a sales representative of the system.
6	DeactivateSalesRepresentative	Given an ID, disable the corresponding sales representative, making him unable to create more sales

Customer Visit

The customer visits are part of the functionalities planned for the project and partially implemented. For this purpose, we used de table TAREFAS that were able to target a client, an address, associate a sales representative or even create a summary of the visit.

	Function	Description
1	ListVisits	Lists all the visits in the system
2	GetVisit	Given and ID, retrieves the corresponding visit
3	CreateVisit	Given a JSON, create a new visit to be executed, in the system
4	GetVisitsToClient	Given a customer's ID, retrieve all the visits oriented to him.

Cart

One other functionality implemented is the cart. The set of tables that the ERP provides us (CABECOPORTUNIDADESVENDA, PROPOSTASOPV,

LINHASPROPOSTASOPV) are capable of managing this service important to determine the leads of the business.

	Function	Description
1	GetCartByCustomer	Given a customer ID, retrieves all the items that he revealed interest in
2	GetCart	Given and ID, retrieves the corresponding cart (CABECOPORTUNIDADESVENDA)
3	CreateCart	Given a JSON, create a new entry on the system to represent a new cart.
4	DeleteCartLine	Given a proposal, delete it from the ERP database.
5	DeleteProductFromCart	Given a custumerID and a productID, delete all the proposal in the database related to this client with the same productID

Sales Order

Relatively to the sales orders, we user the CABECDOC and the respective lines to generate the ECL (Encomendas de Cliente), the main objective of the software.

	Function	Description
1	CreateSalesOrder	Given a JSON, create a new sale order with the respective details
2	ListSalesOrder	Lists all the sales orders of the system
3	Encomenda_Get	Given a certain id, retrieve the corresponding sales order information
4	GetSalesOrderByRep	Given a sales representative ID and number, return the respective amount of the best sales orders related to him
5	GetSalesOrderByCustomer	Given a customer ID and number, return the respective amount of the best sales orders related to him
6	GetSalesOrderByProductForHistory	Given a product ID and a number, return the same amount of the most recent sales order containing that product reference

Route Calendar

In order to plan the routes of the sales force, there is also the option to consult the destination and path to each of the customer visits to be done.

	Function	Description
1	ListRoutes	Given a sales representative ID, return all the visits assigned to him
2	ListRoutesAfterDate	Given a sales representative ID and a certain date, return all the visits assigned to the salesman after the specified time

Labels

To separate and better approach the different customers, there is the possibility to assign labels to each client, creating a set of groups that allows to subdivide them strategically into different targets. For this, we use the CDU_CampoVar1, CDU_CampoVar2 and CDU_CampoVar3 to assign a maximum of 3 labels per client.

	Function	Description
1	ListCustomersByLabes	Given a label, return all the customers assigned with it
2	AddLabelToCustomer	Given a customer ID and a label, assign this label to the customer (max of 3 labels per client)
3	DeleteLabelFromCustomer	Given a customer ID and a label, delete this label from the customer
4	ListLabels	Retrieve all the labels assigned amongst the customers

Countries

The countries in this context are mainly used to scroll through the diffent options when assigning a nationality to the client. The table Paises from the ERP is able to provide us all the information required.

	Function	Description
1	GetCountries	Retrieve all countries in the ERP database

Stats

The main concern of the salesforce is to be successful in the adopted strategies, creating as many sales as possible and fulfilling the customers needs, maintaining a healthy and continuous relationship in order to register as better result as possible. The stats are a set of queries to the database that are able to retrieve and filter the most important information to represent on the dashboard, in a graphical format.

	Function	Description
1	GetIncomeStatBySalesRep	Given a sales representative ID, retrieve the yearly income he generated since 2015
2	GetIncomeStatByMonth (2)	Given a month, retrieve the income generated in that period of time
3	GetIncomeStatByYear (2)	Given a year, retrieve the income generated in that period of time
4	GetSalesStatBySalesRep	Given a sales representative ID, retrieve all the sales orders he is responsible of, sorted by year
5	GetSalesStatByMonth (2)	Given a month, retrieve the sales orders generated in that period of time
6	GetSalesStatByYear (2)	Given a year, retrieve the sales orders generated in that period of time
7	GetIncomePerYearBySalesRep	Given a sales representative ID, retrieve the yearly income he generated since 2015
8	GetIncomePerYear (2)	Given a year, retrieve the income generated in that period of time
9	GetIncomePerMonth (2)	Given a month, retrieve the income generated in that period of time
10	GetTotalSalesNumByCategories (2)	Given a category, return the number of sales related to them.
11	GetSalesTopCategories (2)	Return the categories ordered by the number of sales of products related to them
12	GetTopSalesRep	Given a number, retrieve the same quantity of the best sales representatives of the company

(2) - This function has a duplicate, assigning a sales representative ID as extra argument and specifying the queries to search for results related to him

Paths

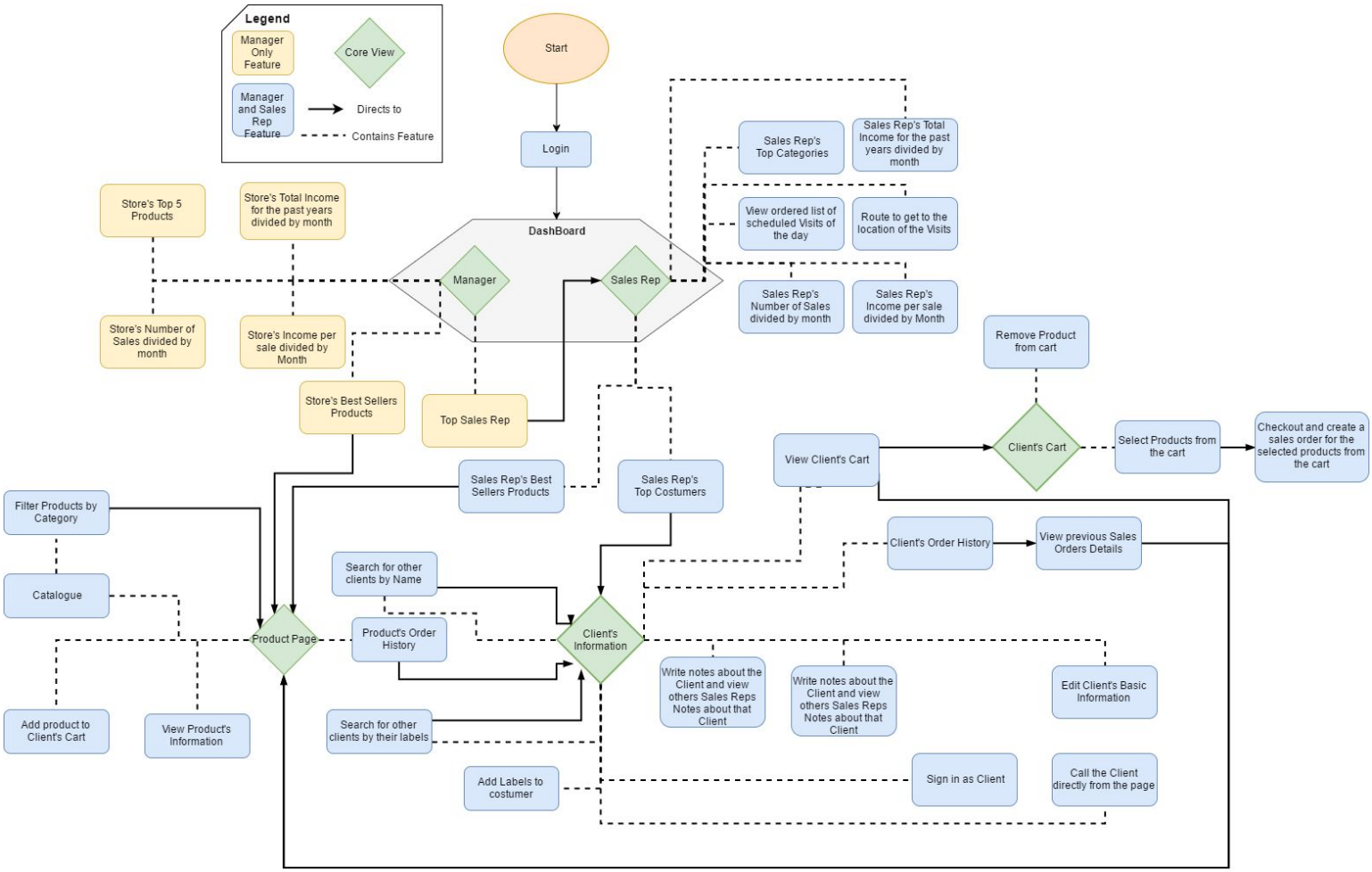
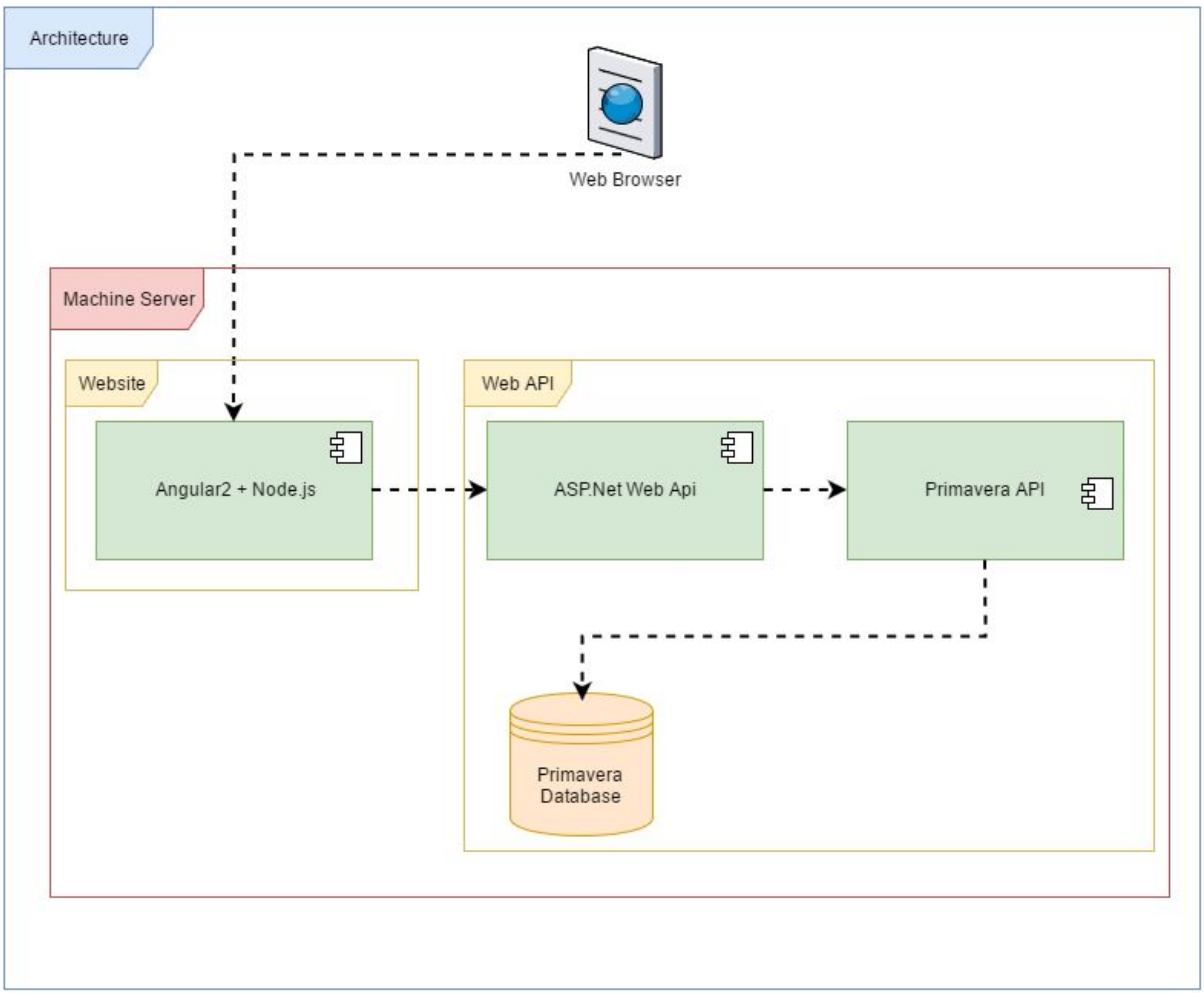


Image link for better resolution: http://imgur.com/a/BPn5f

System Architecture



The architecture of our project contains 5 layers:

1. WebBrowser
2. Angular2 + Node.js
3. ASP.Net API
4. Primavera API
5. Primavera Database

To build our website we used a new technology becoming increasing popular due to its simplicity, powerful applications, lightweight implementation and great online support from programmers and companies like Google itself. Therefore, Angular2 was the obvious choice. This technology is incredibly fast and its MVC structure is a great choice for this project.

So that our website could retract information from the Primvera Database, we built a web API using ASP.Net . By using the Primavera API and expanding it, we managed to provide our website with all the information needed from the API.

Project Specification vs Delivered Project

The document created by the group stating the project specifications shows a lot of ambition powered by a lot of features aiming to provide the best experience for a company to create great customer service. This is the result of a great asset to manage the sales force automation.

However, the group does not have the exact result that was specified. For one, the group renamed customer groups to customer labels (for better integration with Primavera). Following this small tweak, the missing features are the update of the sales order, the creation and deactivation of sales representatives, the creation of customer labels and finally the creation of customer visits. The main reason for the lack of features is due to the not anticipated workload required to provide the perfect integration of separate features into a single seamless application. Therefore, a single web service as the get of all customers and their labels can be played together for even better results like a perfect mix of a search tool that allows the search by the customer name and its labels. The outcome is pretty straightforward, because one quickly realises the speed bump in the presence of the search of thousands of customers. Like this example there are a lot more that shows the group's concern in creating an application capable of handling big databases.

Despite the lack of some features, there were others tools created that enhance the user experience and create an even greater product value. As expected, the group is talking about the customer cart and the search of products, clients and sales representatives.

To conclude, the group is extremely happy with the end result. There were some unexpected bumps, but the features not present are outpaced by the ones stated before. The main obstacle was the due date, but that didn't compromise the delivery of a great product.

Lessons Learned

As said before, the group is extremely happy with the end result and now has more experience with the enterprise environment. Until this assignment, most of the projects developed were consumer focused, but with this one we had the opportunity to extend a successful portuguese software. It was also new to us the direct impact of the product in "real" life and there had to be some concerns about the legality of some operations. For example, it must not be possible to delete sales orders. Anyway, we're at the university to learn and that was what we successfully did. We now are experienced with C#, ASP.NET and Angular2.

About the ERP, Primavera was a software that we did not have any experience nor knowledge about its existence. We now proudly affirm we know our way around. To not repeat ourselves, in the other topics is shown our best effort to create the ultimate experience. So, we believed we used on every step the correct approach and every discussed integration was a lesson learned.