Universidade do Porto

Faculdade de Engenharia

FEUP

Sales Force Automation
Deliverable 3: Final Document

Information Systems

4th year of the Master in Informatics and Computing Engineering

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Project ID: P4 - Sales Force Automation

Group ID: S

Class: 3

December 17, 2017

Overview

This report is intended to describe the development of an information system for use in teams of vendors in order to consult data on sales, customers, and invoicing/billing through an electronic device.The name of our project is Sales Force Automation or the acronym SFA.This consists on the technique of using software to automate the business tasks of sales. Elements that we found essential:
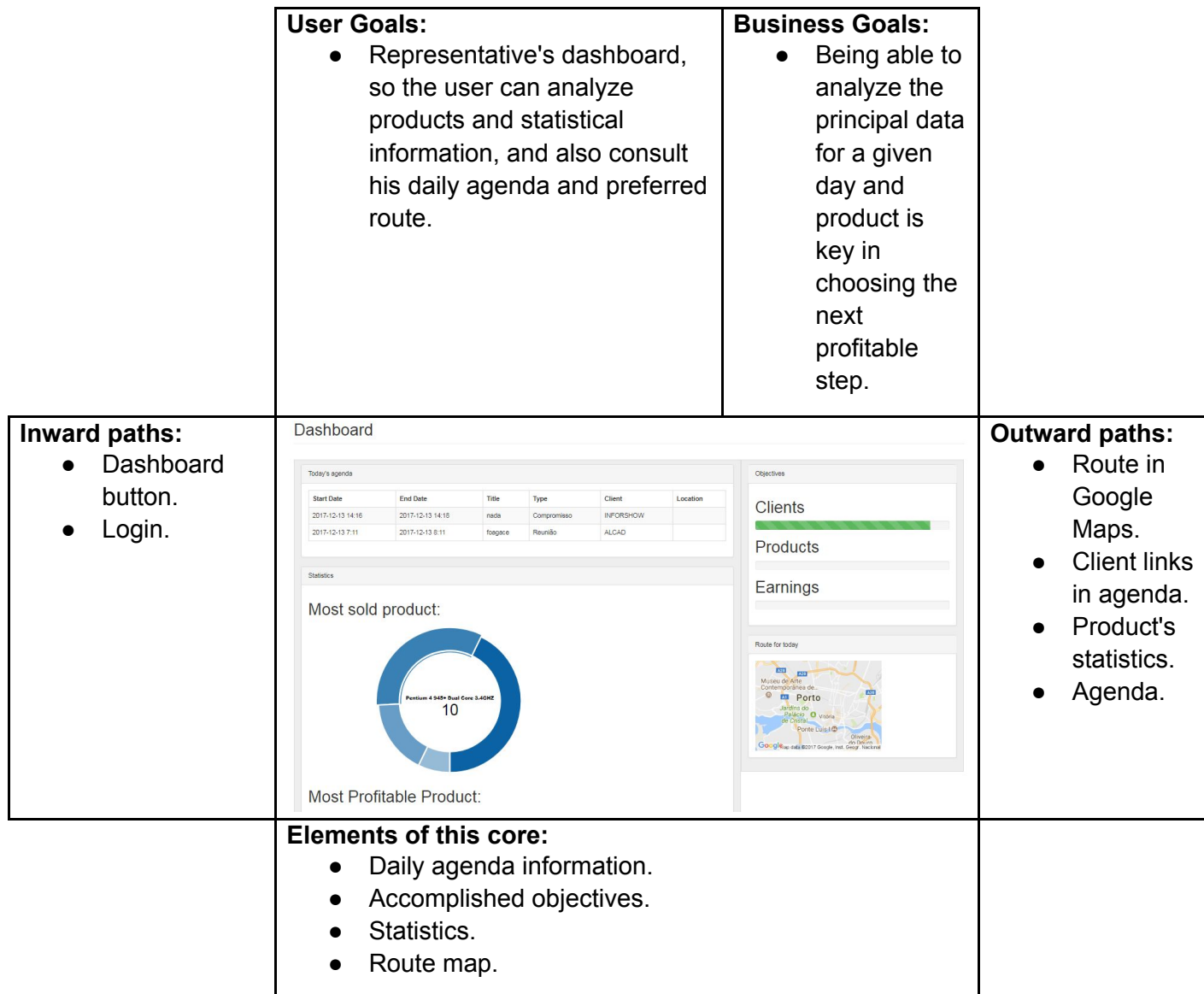
- Activities management.
- Opportunities management.
- Customers.
- Contacts.
- Information about stocks/clientes.
- Create sales orders.

The objective of the project is the development of a web application with the

intent of making the management of a sales representative's agenda easier. It

should automate parts of the processes used to make deals with customers. This not

only includes finding potential customers, but also recording past and future

commitments and the statuses of negotiations with current ones. Viewing the general

situation of the business is also an important trait that must be taken into account to

analyze current trends and make correct decisions to who the product should be sold

to. While sales force automation systems might be costly and hard to adopt, sales

representative can make better and more meaningful use of their time by having

access to aggregated and summarized data, which is also an advantage for the

business's management.

The project will have interoperability with the ERP Primavera which will be

used to obtain, store and manage relevant information such as sales orders history,

inventory status, customers profiles and scheduled commitments.

Core Views

CV01 – Dashboard

	User Goals: ● Representative's dashboard, so the user can analyze products and statistical information, and also consult his daily agenda and preferred route.	**Business Goals:** ● Being able to analyze the principal data for a given day and product is key in choosing the next profitable step.
Inward paths: ● Dashboard button. ● Login.	Dashboard Today's agenda | Start Date	End Date	Title	Type	Client	Location
---	---	---	---	---	---
2017-12-13 14:16	2017-12-13 14:18	nada	Compromisso	INFORSHOW	
2017-12-13 7:11	2017-12-13 8:11	foegace	Reunião	ALCAD	| Statistics Most sold product: Pentium 4 945+ Dual Core 3.4GHZ 10 Most Profitable Product: Objectives Clients Products Earnings Route for today Porto	**Outward paths:** ● Route in Google Maps. ● Client links in agenda. ● Product's statistics. ● Agenda.
	Elements of this core: ● Daily agenda information. ● Accomplished objectives. ● Statistics. ● Route map.	

CV02 – Agenda

<table>
<tr>
<td></td>
<td>User Goals:
Representative's agenda which displays detailed information about the chosen day's work order.</td>
<td>Business Goals:
Being able to plan ahead, setup meetings and organize long-term commitments is fundamental in every business management.</td>
</tr>
<tr>
<td>Inward paths:
Agenda button.</td>
<td></td>
<td>Outward paths:
Add a commitment to a chosen day.
Activities agenda.
Meetings links and notes.
Calendar interactivity.</td>
</tr>
<tr>
<td></td>
<td colspan="2">Elements of this core:
Monthly agenda.
Daily task list.</td>
</tr>
</table>

CV03 - Sales orders

User Goals:	Business Goals:
● Table with sales overall information about the products, such as its id, quantity and buyer's name.	● Being able to identify the key buyers and the most sold products.

Inward paths:		Outward paths:
● Sales orders button.		● Sales orders links and information on the table. ● Add sales orders.

Elements of this core:
● Table with information regarding sales.

CV04 – Opportunities

	User Goals: ● Identify opportunities to expand business throughout a dedicated process.	**Business Goals:** ● Putting opportunities into perspective and analyzing them step-by-step is of major importance in every business daily agenda.
Inward paths: ● Opportunities button.	**Create** **Qualification** Inforshow, Informática Comunicação Profitability: 200 Soluciones Cad de Madrid, SA Profitability: 9 **Needs analysis** José Maria Fernandes & Filhos, Lda. Profitability: -19 Soluciones Cad de Madrid, SA Profitability: 9 Empreendimentos do Lima Profitability: 9 Sofrio, Lda Profitability: 200 **Proposal** Soluciones de Software de Espanã Profitability: 0 **Negotiations** Soluciones Cad de Madrid, SA Profitability: 0 Sofrio, Lda Profitability: 0 **Ready to close** Soluciones Cad de Madrid, SA Profitability: 9 Inforshow, Informática Comunicação Profitability: 1	**Outward paths:** ● Opportunities' information in each of the steps' notes. ● Change the state of the opportunities. ● Add new opportunities.
	Elements of this core: ● Step-by-step opportunity analysis. ● Note cards.	

CV05 - Client Profile

	User Goals: ● Client's profile page, where the representative can track the latest bought items and contact information.	**Business Goals:** ● Client's management, such as needs, preferred products and contacts, is important in order to deliver a more personalized service.

Inward paths: ● Customer name.	Profile Entidade: TEST Nome Cliente: Test Numero Contribuinte: 588909456 Moeda: EUR Morada: Test street Telefone: 918564231 Recent Orders 	Date	Entity	Serie(NumDoc)	Product (QTY) (PPU)(€) (TP)(€)	TotalMerc(€)
2017-12-13T00:00:00	TEST	A (14)	Pentium D925 Dual Core (2) (1000) (2000) Processador INTEL CORE 2 DUO E6300 1.86GHZ (3) (1198) (3594)	5594		**Outward paths:** ● Last orders made by the client.
	Elements of this core: ● Profile information (name, email, phone). ● Last orders made by the client.	

CV06 - Product information

User Goals:	Business Goals:
● Products' profile, where it's possible to look up product information regarding quantities/sales.	● Statistic studying about a product's profit can contribute to estimate its growth in value overtime, and if it still remains profitable.

Inward paths:		Outward paths:
● Product id.		● Last orders table.

Product

Product code: A0001
Description: Pentium D925 Dual Core
Stock atual: 569
PVP1: 1000
PVP2: 698
PVP3: 748
Total earnings(€): 1429779.94

Recent Orders

Date	Entity	Serie(NumDoc)	QTY	PPU	Total Price
2017-12-13T00:00:00	TEST	A (14)	2	1000	2000
2016-10-07T00:00:00	MICROAVI	2016 (1128)	1	1000	1000
2016-10-07T00:00:00	J.M.F.	2016 (1127)	1	1000	1000
2016-09-21T00:00:00	SILVA	2016 (1102)	2	1000	2000
2016-09-20T00:00:00	SOFRIO	2016 (1100)	1	833.33	750
2016-09-19T00:00:00	SILVA	2016 (1092)	5	1000	5000
2016-09-18T00:00:00	SOFRIO	2016 (1090)	4	833.33	2999.99
2016-09-18T00:00:00	SOFRIO	2016 (1090)	3	833.33	2249.99
2016-09-15T00:00:00	SILVA	2016 (1072)	3	1000	3000
2016-09-15T00:00:00	SILVA	2016 (1072)	5	1000	5000

Elements of this core:
- ● Product's information.
- ● Orders' table.

Other Features

Automatic generation of sales orders:

Our product is able to create a new sales order, when an opportunity is marked as winned, using the opportunity information.

Update by drag:

Our product updates the opportunity state when the user changes its position in the opportunities table.

Addition of clients:

Our website allows an user to create add clients to the database.

Easily differentiate activities types:

Our website shows a circle with a specific colour for each type of activity in the agenda.

Interoperability with Primavera

In this section, we will define what webservices were implemented.

Dashboard

Protocol to get the data that will be presented on the dashboard:

Webservice ID	DASHBOARD
Webservice Description	Provide some metrics related with how well the sales of the sales representative are performing and part of his agenda.
Related Core View(s)	CV01
HTTP Verb	GET
Route	/dashboard/?representative_id=<representative_id>
Input Example	/dashboard/?representative_id=1

Expected Output	```
	{
	  "today_agenda": [
	    {
	      "id": "{A7E3A72E-CBB9-11E7-806B-080027A3C35D}",
	      "start_date": "2017-11-17 17:10",
	      "end_date": "2017-11-17 17:10",
	      "title": "Apresentação",
	      "type": "Reunião",
	      "client": "SOFRIO",
	      "contact_id": "",
	      "representative_id": "1",
	      "location": "FEUP",
	      "opportunity_id": "OPV001",
	      "notes": "Be ready."
	    }
	  ],
	  "objectives": [
	    {
	      "clients": "56",
	      "products": "80",
	      "earnings": "30"
	    }
	  ],
	   "statistics": {
	     "most_sold_products": [
	       {
	         "product_id": "A0003",
	         "product_name": "Processador INTEL CORE 2 DUO E6300 1.86GHZ",
	         "product_units_sold": "2"
	``

```
            }
        ],
        "most_profit_products": [
            {
                "product_id": "A0005",
                "product_name": "Mesa p/ PC",
                "product_profit": "3000"
            }
        ]
    }
}
```

Agenda

Protocols to get and set the appointments that a sales representative attended and will attend:

Webservice ID	APPOINTMENTS
Webservice Description	Provide the detailed information of the appointments of a sales representative.
Related Core View(s)	CV02
HTTP Verb	GET
Route	/agenda/?representative_id=<representative_id>
Input Example	/agenda/?representative_id=1

Expected Output	```[
	    {
	        "id": "{A7E3A72E-CBB9-11E7-806B-080027A3C35D}",
	        "start_date": "2017-11-17 17:10",
	        "end_date": "2017-11-17 17:10",
	        "title": "Apresentação",
	        "type": "Reunião",
	        "client": "SOFRIO",
	        "contact_id": "",
	        "representative_id": "1",
	        "location": "FEUP",
	        "opportunity_id": "OPV001",
	        "notes": "Be ready."
	    }
	]```

Webservice ID	APPOINTMENT_CREATE
Webservice Description	Create an appointment that the sales representative should attend.
Related Core View(s)	CV02
HTTP Verb	POST
Route	/agenda

Input Example	```/agenda
	{
	    "start_date": "2017-11-17 23:00",
	    "end_date": "2017-11-17 23:56",
	    "title": "Present product",
	    "type": "Reunião",
	    "client": "SOFRIO",```

	"contact_id": "", "representative_id": "1", "location": "Home", "opportunity_id": "OPV001", "notes": "Do not be late." }

Expected Output	Success:
	{
	   "id": "{35998DB3-CD18-11E7-8BA4-080027A3C35D}",
	   "start_date": "2017-11-17 23:00",
	   "end_date": "2017-11-17 23:56",
	   "title": "Present product",
	   "type": "Reunião",
	   "client": "SOFRIO",
	   "contact_id": "",
	   "representative_id": "1",
	   "location": "Home",
	   "opportunity_id": "OPV001",
	   "notes": "Do not be late."
	}
	Failure: "It was not possible to create the appointment."

Webservice ID	APPOINTMENT_UPDATE
Webservice Description	Update the information of an appointment that the sales representative should attend.
Related Core View(s)	CV02
HTTP Verb	PUT
Route	/agenda/?id=<id>

Input Example	/agenda/?id={35998DB3-CD18-11E7-8BA4-080027A3C35D}
	{
	   "start_date": "2017-11-17 23:00",
	   "end_date": "2017-11-17 23:56",
	   "title": "Present product",
	   "type": "Reunião",
	   "client": "SOFRIO",
	   "contact_id": "",
	   "representative_id": "1",
	   "location": "Home",
	   "opportunity_id": "OPV001",
	   "notes": "Do not be late."
	}

Expected Output	Success: "Sucesso" Failure: message with error description.

Webservice ID	APPOINTMENT_DELETE
Webservice Description	Delete an appointment that the sales representative should attend.
Related Core View(s)	CV02
HTTP Verb	DELETE
Route	/agenda/?id=<id>
Input Example	/agenda/?id={35998DB3-CD18-11E7-8BA4-080027A3C35D}
Expected Output	Success: "Sucesso" Failure: message with error description.

Sales Orders

Protocols to get, create, update and delete information about sales orders:

Webservice ID	SALES_ORDERS
Webservice Description	Get the sales orders.
Related Core View(s)	CV03
HTTP Verb	GET
Route	/DocVenda
Input Example	/DocVenda

Expected Output	[
	  {
	    "id": "{308AB32A-CB4C-11E7-B836-080027640604}",
	    "Entidade": "SOFRIO",
	    "NumDoc": 24,
	    "Data": "2017-11-17T00:00:00",
	    "Desconto": 10,
	    "TotalMerc": 2504.03,
	    "TotalIva": 3079.95,
	    "Serie": "A",
	    "Anulado": true,
	    "LinhasDoc": [
	      {
	        "CodArtigo": "A0003",
	        "DescArtigo": "Computador Pentium III 1GHz",
	        "IdCabecDoc": "{308AB32A-CB4C-11E7-B836-080027640604}",
	        "Quantidade": 1,
	        "Unidade": "UN",
	        "Desconto": 0,
	        "PrecoUnitario": 998.33,
	        "TotalILiquido": 998.33,
	        "TotalLiquido": 898.5
	      }
	    ],
	    "IdOportunidadeDB":""
	  },
	  {
	    "id": "{DCBBF1F6-7A5A-11E6-A55F-080027184ECD}",
	    "Entidade": "LIMA",
	    "NumDoc": 1108,
	    "Data": "2016-09-22T00:00:00",
	    "Desconto": 0,
	    "TotalMerc": 534,
	    "TotalIva": 656.82,

```
      "Serie": "2016",
      "Anulado": false,
      "LinhasDoc": [
       {
         "CodArtigo": "B0006",
         "DescArtigo": "TFT 17" 1702 1280x1024",
         "IdCabecDoc":
"{DCBBF1F6-7A5A-11E6-A55F-080027184ECD}",
         "Quantidade": 1,
         "Unidade": "UN",
         "Desconto": 0,
         "PrecoUnitario": 276,
         "TotalILiquido": 276,
         "TotalLiquido": 276
       },
       {
         "CodArtigo": "B0004",
         "DescArtigo": "Ddram2 1024Mb 533Mhz PC2 4200",
         "IdCabecDoc":
"{DCBBF1F6-7A5A-11E6-A55F-080027184ECD}",
         "Quantidade": 1,
         "Unidade": "UN",
         "Desconto": 2,
         "PrecoUnitario": 129,
         "TotalILiquido": 129,
         "TotalLiquido": 126.42
       }
      ],
      "IdOportunidadeDB":""
    }
]
```

Webservice ID	SALES_ORDERS_ORDER
Webservice Description	Get a specific sale order.
Related Core View(s)	CV03
HTTP Verb	GET
Route	/DocVenda/?id=<id>&serie=<serie>
Input Example	/DocVenda/?id=15&serie=A

Expected Output	{
	    "id": "{A940A533-C7DF-11E7-B090-080027640604}",
	    "Entidade": "SOFRIO",
	    "NumDoc": 15,
	    "Data": "2017-11-12T00:00:00",
	    "Desconto": 0,

```
          "TotalMerc": 465.84,
          "TotalIva": 572.98,
          "Serie": "A",
          "Anulado": false,
          "LinhasDoc": [
           {
             "CodArtigo": "B0001",
             "DescArtigo": "Monitor 7JT-1024*1024",
             "IdCabecDoc":
          "{A940A533-C7DF-11E7-B090-080027640604}",
             "Quantidade": 2,
             "Unidade": "UN",
             "Desconto": 0,
             "PrecoUnitario": 166.67,
             "TotalILiquido": 333.34,
             "TotalLiquido": 300.01
           },
           {
             "CodArtigo": "B0003",
             "DescArtigo": "Monitor 747D 14'",
             "IdCabecDoc":
          "{A940A533-C7DF-11E7-B090-080027640604}",
             "Quantidade": 1,
             "Unidade": "UN",
             "Desconto": 10,
             "PrecoUnitario": 132.5,
             "TotalILiquido": 132.5,
             "TotalLiquido": 107.32
           }
          ],
          "IdOportunidadeDB":""
        }
```

Webservice ID	CREATE_SALES_ORDERS
Webservice Description	Creates a new sale order.
Related Core View(s)	CV03
HTTP Verb	POST
Route	/DocVenda

Input Example	/DocVenda/
	
	{
	 "Entidade":"SOFRIO",
	 "Serie":"A",
	 "LinhasDoc":[{"CodArtigo":"A0004","Quantidade":1,"Desconto":0}]
	}

Expected Output	Success:"Sucesso"
	Failure: message with error description.

Webservice ID	UPDATE_SALES_ORDERS
Webservice Description	Updates an existing order.
Related Core View(s)	CV03
HTTP Verb	PUT
Route	/DocVenda/?id=<id>

Input Example	/DocVenda/?id={9DD49CEB-CBAF-11E7-8D5E-080027640604}/
	 {
	 "Entidade":"LIMA",
	 "Serie":"A",
	 "LinhasDoc":[{"CodArtigo":"A0002","Quantidade":1,"Desconto":0}]
	 }

Expected Output	Success:"Sucesso"
	Failure: message with error description.

Webservice ID	CANCEL_SALES_ORDER
Webservice Description	Cancels a sales order.
Related Core View(s)	CV03
HTTP Verb	DELETE
Route	/DocVenda/?id=<id>
Input Example	/DocVenda/?id={DCBBF1D6-7A5A-11E6-A55F-080027184 ECD}
Expected Output	Success: Sucesso"
	Failure: message with error description.

Webservice ID	SERIES
Webservice Description	Get available document series.
Related Core View(s)	CV03

HTTP Verb	GET
Route	/Series/
Input Example	/Series/

Expected Output	`[`
	  `{`
	    `"CodSerie": "2016",`
	    `"Data_UltDoc": "2016-12-30T00:00:00",`
	  `},`
	  `{`
	    `"CodSerie": "A",`
	    `"Data_UltDoc": "2017-12-13T00:00:00",`
	  `},`
	`]`

Webservice ID	PRODUCTS
Webservice Description	Retrieves the details of all products.
Related Core View(s)	CV03
HTTP Verb	GET
Route	/artigos/
Input Example	/artigos/

Expected Output	`{`
	    `"CodArtigo": "A0001",`
	    `"DescArtigo": "Pentium D925 Dual Core",`
	    `"STKAtual": 569,`
	    `"PVP1": 1000,`
	    `"PVP2": 698,`
	    `"PVP3": 748,`
	    `"IVA": "20",`
	    `"TotalEarnings": 1431430.76`
	`},`
	`{`
	    `"CodArtigo": "A0002",`
	    `"DescArtigo": "Pentium 4 945+ Dual Core 3.4 GHz",`
	    `"STKAtual": 569,`
	    `"PVP1": 1198,`
	    `"PVP2": 878,`
	    `"PVP3": 643,`
	    `"IVA": "23",`
	    `"TotalEarnings": 189430.26`
	`}`
	`]`

Webservice ID	CLIENTS
Webservice Description	Retrieves the details of all clients.
Related Core View(s)	CV03
HTTP Verb	GET

Route	/clientes/
Input Example	/clientes/

Expected Output	[
	{
	    "Morada": "Test street",
	    "CodCliente": "TEST",
	    "NomeCliente":"Test",
	    "NumContribuinte": "588978564",
	    "Moeda": "EUR",
	    "Email": "test@gmail.com",
	    "Telefone": "912345678",
	    "PVP": 1
	},
	{
	    "Morada": "AV. DO ETERNO GELO, 83333",
	    "CodCliente": "SOFRIO",
	    "NomeCliente":"Sofrio Lda",
	    "NumContribuinte": "123456789",
	    "Moeda": "EUR",
	    "Email": "",
	    "Telefone": "",
	    "PVP": 1
	}
	]

Webservice ID	CREATE_CLIENTS
Webservice Description	Creates a new client.
Related Core View(s)	CV03
HTTP Verb	POST
Route	/Clientes

Input Example	/Clientes/
	{
	 "CodCliente":"TEST",
	 "NomeCliente":"Teste1",
	 "Moeda ":"EUR",
	 "NumContribuinte ":"588978564",
	 "Morada ":"Test street",
	 "Email ":"test@gmail.com",
	 "Telefone ":"912345678"
	}

Expected Output	Success:"Sucesso" Failure: message with error description.

Client Profile

Protocol to get the information related to a client:

Webservice ID	CLIENT_PROFILE
Webservice Description	Obtain information about a client.
Related Core View(s)	CV05
HTTP Verb	GET
Route	/clientes/<client_id>
Input Example	/clientes/SOFRIO

Expected Output	Success:
	
	{
	    "Morada": "AV. DO ETERNO GELO, 88888",
	    "CodCliente": "SOFRIO",
	    "NomeCliente": "Sofrio, Lda",
	    "NumContribuinte": "123456789",
	    "Moeda": "EUR",
	    "Email": "",
	    "Telefone": "200267890",
	    "PVP": 0
	}
	Failure: error indicating "not found"..

Webservice ID	SALES_ORDERS_CLIENT
Webservice Description	Get the sales orders associated to a client.
Related Core View(s)	CV05
HTTP Verb	GET
Route	/DocVenda/?id=<id>
Input Example	/DocVenda/?id=SOFRIO

Expected Output	[
	  {
	    "id": "{308AB32A-CB4C-11E7-B836-080027640604}",
	    "Entidade": "SOFRIO",
	    "NumDoc": 24,
	    "Data": "2017-11-17T00:00:00",
	    "Desconto": 0,
	    "TotalMerc": 2504.03,
	    "TotalIva": 0,

          "Serie": "A",
          "Anulado": false,
          "LinhasDoc": [
           {
             "CodArtigo": "A0003",
             "DescArtigo": "Computador Pentium III 1GHz",
             "IdCabecDoc":
          "{308AB32A-CB4C-11E7-B836-080027640604}",
             "Quantidade": 1,
             "Unidade": "UN",
             "Desconto": 0,
             "PrecoUnitario": 998.33,
             "TotalILiquido": 998.33,
             "TotalLiquido": 898.5
           }
          ],
          "IdOportunidadeDB": ""
        },
        {
          "id": "{A940A533-C7DF-11E7-B090-080027640604}",
          "Entidade": "SOFRIO",
          "NumDoc": 15,
          "Data": "2017-11-12T00:00:00",
          "Desconto": 0,
          "TotalMerc": 465.84,
          "TotalIva": 0,
          "Serie": "A",
          "Anulado": false,
          "LinhasDoc": [
           {
             "CodArtigo": "B0001",
             "DescArtigo": "Monitor 7JT-1024*1024",
             "IdCabecDoc":
          "{A940A533-C7DF-11E7-B090-080027640604}",
             "Quantidade": 2,
             "Unidade": "UN",
             "Desconto": 0,
             "PrecoUnitario": 166.67,
             "TotalILiquido": 333.34,
             "TotalLiquido": 300.01
           }
          ],
          "IdOportunidadeDB": ""
        }
      ]

Opportunities

Protocol to get, create and edit the state of negotiations:

Webservice ID	OPPORTUNITIES
Webservice Description	Retrieves the opportunities.
Related Core View(s)	CV04
HTTP Verb	GET
Route	/opportunities/?representative_id=<representative_id>
Input Example	/opportunities/?representative_id=1

Expected Output	```[
	  {
	    "opportunity_id": "OPV016",
	    "customer_id": "SOFRIO",
	    "customer_name": "Sofrio, Lda",
	    "products": [
	      {
	        "product_id": "B0001",
	        "product_name": "Monitor 7JT-1024*1024",
	        "product_quantity": "2",
	        "cost": "95,9",
	        "selling_price": "176",
	        "profitability": "76,58",
	        "margin": "0,443993506493506"
	      }
	    ],
	    "opportunity_type": "Ready to close",
	    "opportunity_state": "Open",
	    "representative_id": "1",
	    "associated_activities": [
	      {
	        "id":
	"{0549AC21-98FC-11DC-A3E8-8000600FE800}",
	        "start_date": "2016-2-20 13:30",
	        "end_date": "2016-2-20 14:00",
	        "title": "Apresentação da Proposta",
	        "type": "Apresentação de proposta",
	        "client": "SOFRIO",
	        "contact_id": "",
	        "representative_id": "1",
	        "location": "FEUP",
	        "opportunity_id": "OPV001",
	        "notes": "They want detailed information."
	      }
	    ]
	  }
	]```

Webservice ID	CREATE_OPPORTUNITY
Webservice Description	Create a new opportunity.

Related Core View(s)	CV04
HTTP Verb	POST
Route	/opportunities

Input Example	/opportunities
	
	{
	   "customer_id": "SOFRIO",
	   "products": [
	      {
	         "product_id": "B0001",
	         "product_quantity": "2",
	         "cost": "95,9",
	         "selling_price": "176"
	      }
	   ],
	   "opportunity_type": "Ready to close",
	   "opportunity_state": "Open",
	   "representative_id": "1"
	}

Expected Output	Success:
	
	{
	   "opportunity_id": "OPV016",
	   "customer_id": "SOFRIO",
	   "customer_name": "Sofrio, Lda",
	   "products": [
	      {
	         "product_id": "B0001",
	         "product_name": "Monitor 7JT-1024*1024",
	         "product_quantity": "2",
	         "cost": "95,9",
	         "selling_price": "176",
	         "profitability": "76,58",
	         "margin": "0,443993506493506"
	      }
	   ],
	   "opportunity_type": "Ready to close",
	   "opportunity_state": "Open",
	   "representative_id": "1",
	   "associated_activities": []
	}
	Failure: "It was not possible to create the opportunity."

Webservice ID	UPDATE_OPPORTUNITY
Webservice Description	Change the information related to an opportunity.
Related Core View(s)	CV04
HTTP Verb	PUT
Route	/opportunities/?opportunity_id=<opportunity_id>

Input Example	/opportunities/?opportunity_id=OPV016
	{
	   "customer_id": "SOFRIO",
	   "products": [
	     {
	       "product_id": "B0001",
	       "product_quantity": "2",
	       "cost": "95,9",
	       "selling_price": "176"
	     }
	   ],
	   "opportunity_type": "Ready to close",
	   "opportunity_state": "Open",
	   "representative_id": "1"
	}

Expected Output	Success: "Sucesso" Failure: message with error description.

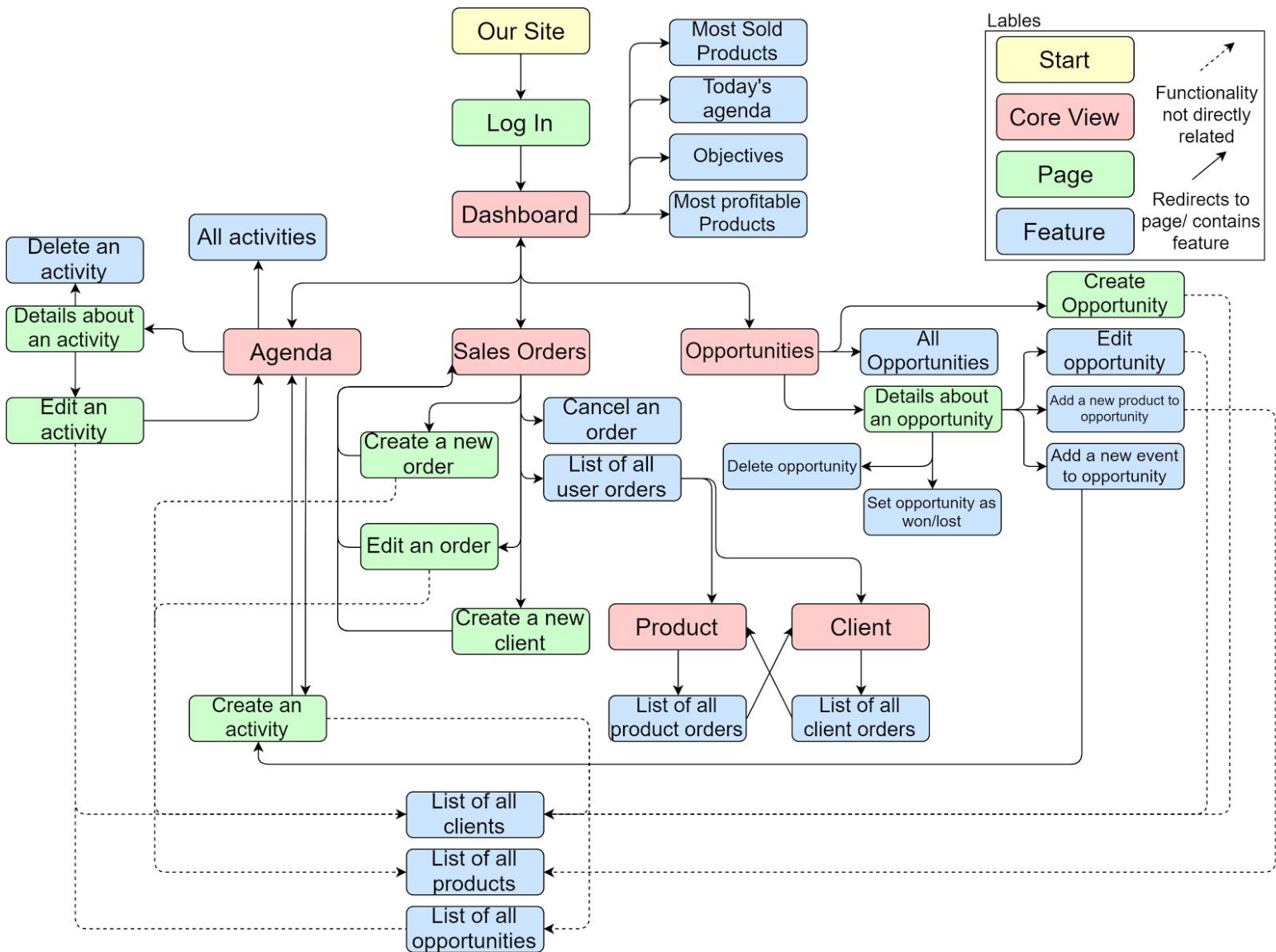| Webservice ID	DELETE_OPPORTUNITY
Webservice Description	Delete an opportunity and its associated activities.
Related Core View(s)	CV04
HTTP Verb	DELETE
Route	/opportunities/?opportunity_id=<opportunity_id>
Input Example	/opportunities/?opportunity_id=OPV016
Expected Output	Success: "Sucesso" Failure: message with error description.

Product Information

Protocol to get the details of a product.

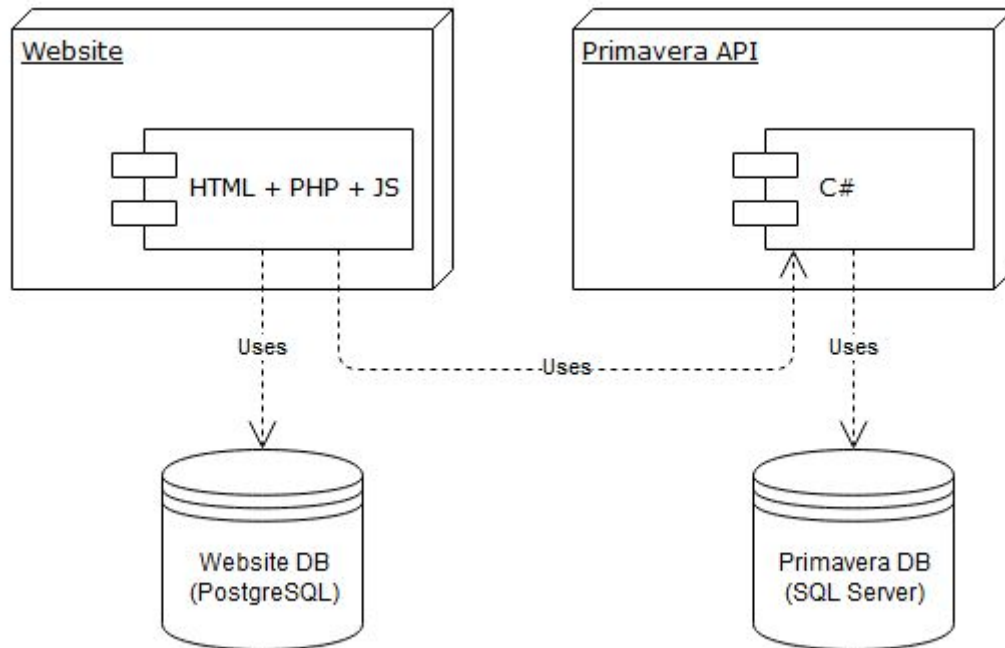| Webservice ID	PRODUCT_INFORMATION
Webservice Description	Retrieves the details of a product.
Related Core View(s)	CV06
HTTP Verb	GET
Route	/artigos/?id=<product_id>
Input Example	/artigos/?id=A0001

Expected Output	Success:
	
	{
	    "CodArtigo": "A0001",
	    "DescArtigo": "Pentium D925 Dual Core",
	    "STKAtual": 569,
	    "PVP1": 1000,
	    "PVP2": 698,
	    "PVP3": 748,
	    "IVA": 20,
	    "TotalEarnings": 1431430.76
	}
	Failure: error indicating "not found".

Webservice ID	SALES_ORDERS_PRODUCT
Webservice Description	Get the sales orders associated to a product.
Related Core View(s)	CV06
HTTP Verb	GET
Route	/DocVenda/?id=<id>
Input Example	/DocVenda/?id=A0001

Expected Output	[
	  {
	    "id": "{9DD49CEB-CBAF-11E7-8D5E-080027640604}",
	    "Entidade": "SOFRIO",
	    "NumDoc": 25,
	    "Data": "2017-11-17T00:00:00",
	    "Desconto": 0,
	    "TotalMerc": 0,
	    "TotalIva": 0,
	    "Serie": "A",
	    "Anulado": false,
	    "LinhasDoc": [

```
        {
          "CodArtigo": "A0001",
          "DescArtigo": "Pentium D925 Dual Core",
          "IdCabecDoc":
        "{9DD49CEB-CBAF-11E7-8D5E-080027640604}",
          "Quantidade": 1,
          "Unidade": "UN",
          "Desconto": 0,
          "PrecoUnitario": 833.33,
          "TotalILiquido": 833.33,
          "TotalLiquido": 750
        }
      ],
      "IdOportunidadeDB": ""
    },
    {
      "id": "{18561E5E-CB47-11E7-B836-080027640604}",
      "Entidade": "SILVA",
      "NumDoc": 23,
      "Data": "2017-11-17T00:00:00",
      "Desconto": 0,
      "TotalMerc": 0,
      "TotalIva": 0,
      "Serie": "A",
      "Anulado": false,
      "LinhasDoc": [
        {
          "CodArtigo": "A0001",
          "DescArtigo": "Pentium D925 Dual Core",
          "IdCabecDoc":
        "{18561E5E-CB47-11E7-B836-080027640604}",
          "Quantidade": 1,
          "Unidade": "UN",
          "Desconto": 0,
          "PrecoUnitario": 833.33,
          "TotalILiquido": 833.33,
          "TotalLiquido": 833.33
        }
      ],
      "IdOportunidadeDB": ""
    }
]
```

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Paths

System Architecture

Project Specifications vs Delivered Project

The specification originally generated showed the ambition of the group, but it was a little bit minimalist, because we didn't know enough about all we could do with Primavera ERP.

Along the development of the project, we changed the specification according to the functionalities provided by Primavera that we were not initially familiarized. We removed the "Target customers" module because we were going to show the clients that were associated to an opportunity and that was not of great value and could be seen analysing the activities in the agenda or the opportunities. We also added the ability to add clients and the ability to automatically generate sales orders based on opportunities, when they are winned.

The frontend of the project is not as good as expected due to some problems using PHP and due to some difficulty managing all the work necessary to do along with other assignments.

Lessons Learned

The group is happy with the integration of the ERP System Primavera with our website.

With this project we learned how this type of systems are designed and how difficult is to create and extend them. We learned C#, ASP.NET, SQL Server and how to interact with Primavera. Also, we practised HTML and PHP. In addition, we learned that is better to use an already existing ERP solution than creating one ourselves due to its complexity: rules that must be fulfilled, restrictions that can be difficult to implement, a very extent amount of code… It is better to buy a proven solution than creating one that needs to be updated a lot of times and that can be difficult to manage along the other resources of the company, specially because this system manages a lot, if not all, of the resources of the company.