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Sistemas de Informação

Grupo E

P2 - Sales Order Picking

Final Report

Turma 5

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Overview

This team’s project consists of a web application that provides our fictional coffee company Grão the ability to make a picking process of clients/suppliers orders, generate a delivery note and manage their inventory.

Functionalities/Features

- Authenticate the user
- Show client/supplier orders
- Sort orders by any parameter
- Choose orders to pick/store
- Create a picking/storing wave
- Move items between warehouses
- Transform orders documents in shipping guides

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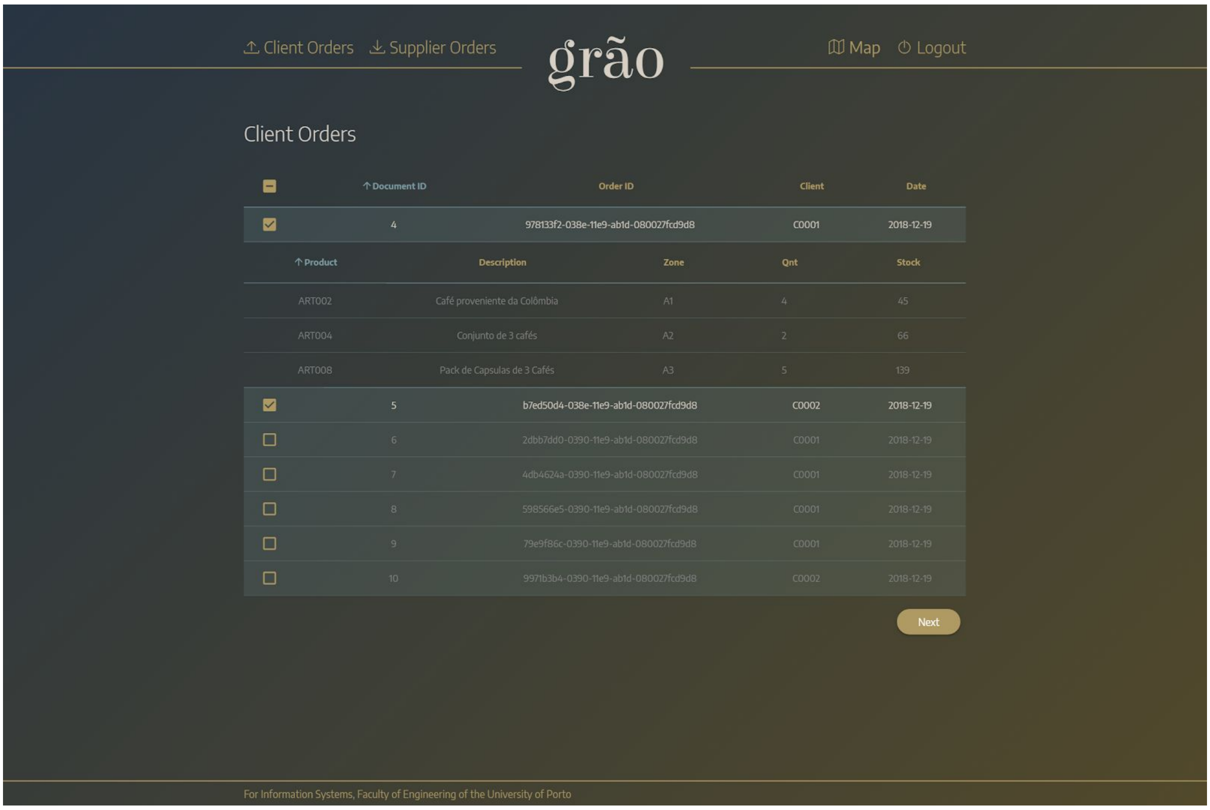
Core Views

ID Core View : GRAO_CLI_ORD



Client Orders

▬	↑ Document ID	Order ID	Client	Date
☑	4	978133f2-038e-11e9-ab1d-080027fcd9d8	C0001	2018-12-19
↑ Product	Description	Zone	Qnt	Stock
ART002	Café proveniente da Colômbia	A1	4	45
ART004	Conjunto de 3 cafés	A2	2	66
ART008	Pack de Capsulas de 3 Cafés	A3	5	139
☑	5	b7ed50d4-038e-11e9-ab1d-080027fcd9d8	C0002	2018-12-19
□	6	2dbb7dd0-0390-11e9-ab1d-080027fcd9d8	C0001	2018-12-19
□	7	4db4624a-0390-11e9-ab1d-080027fcd9d8	C0001	2018-12-19
□	8	598566e5-0390-11e9-ab1d-080027fcd9d8	C0001	2018-12-19
□	9	79e9f86c-0390-11e9-ab1d-080027fcd9d8	C0001	2018-12-19
□	10	9971b3b4-0390-11e9-ab1d-080027fcd9d8	C0002	2018-12-19

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Inward Paths/ Trigger Words :

- Homepage
- Client Orders Navigation Bar Button

Elements of the core :

LST_001 (LST) | Orders
LST_002 (LST) | Products

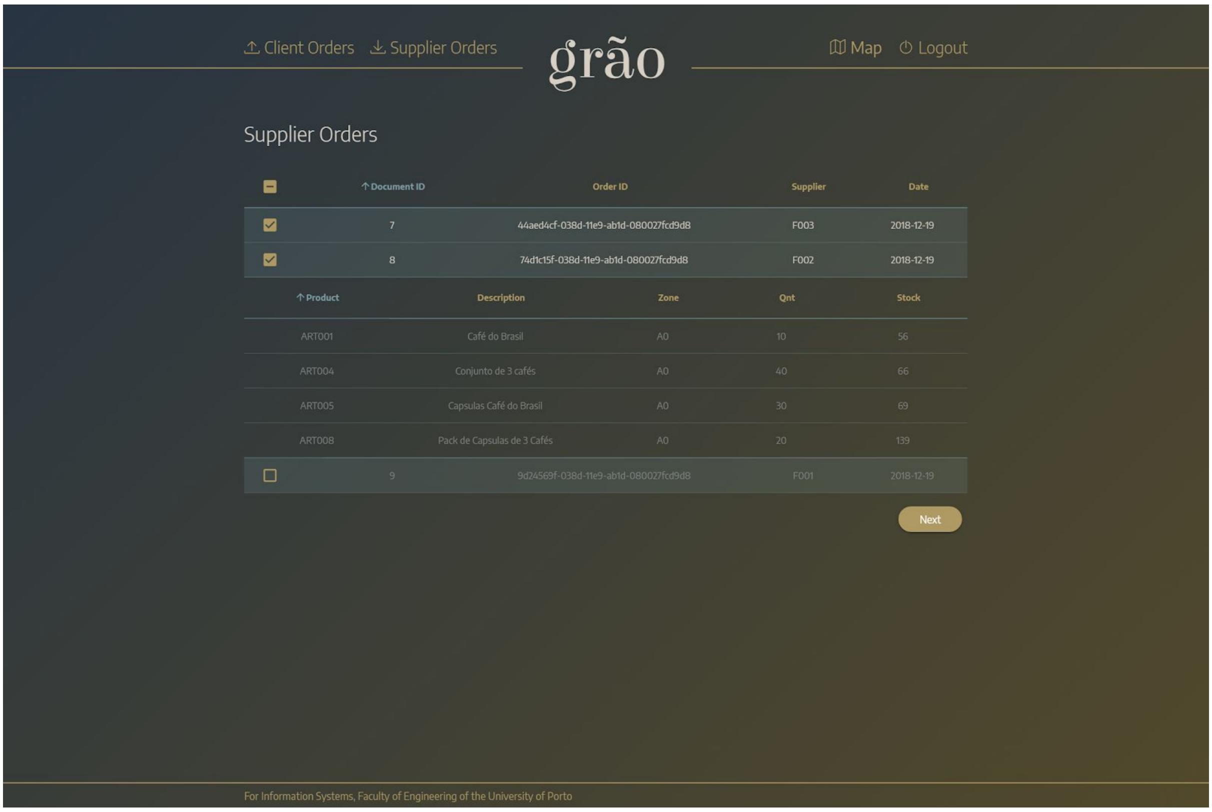
User & Business Goals :

- Client orders overview (Document ID, Order ID, Date, Client) and product id, description, quantity, stock and warehouse zone.
- Intuitively check the desired picking orders.
- View to be used as a management tool of the client orders.

Outward Paths/ Call to Action :

- Provide to the user aggregate information about *grão*'s client orders like each order's ID, dates.
- Mark each client order to generate the picking route.
- See order's products and quantity.

ID Core View : GRAO_SUPP_ORD



Supplier Orders

▬	↑ Document ID	Order ID	Supplier	Date
☑	7	44aed4cf-038d-11e9-ab1d-080027fcd9d8	F003	2018-12-19
☑	8	74d1c15f-038d-11e9-ab1d-080027fcd9d8	F002	2018-12-19
□	9	9d24569f-038d-11e9-ab1d-080027fcd9d8	F001	2018-12-19

↑ Product	Description	Zone	Qnt	Stock
ART001	Café do Brasil	A0	10	56
ART004	Conjunto de 3 cafés	A0	40	66
ART005	Capsulas Café do Brasil	A0	30	69
ART008	Pack de Capsulas de 3 Cafés	A0	20	139

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Inward Paths/ Trigger Words :

- Homepage
- Suppliers Orders Navigation Bar Button

Elements of the core :

LST_001 (LST) | Orders
LST_002 (LST) | Products

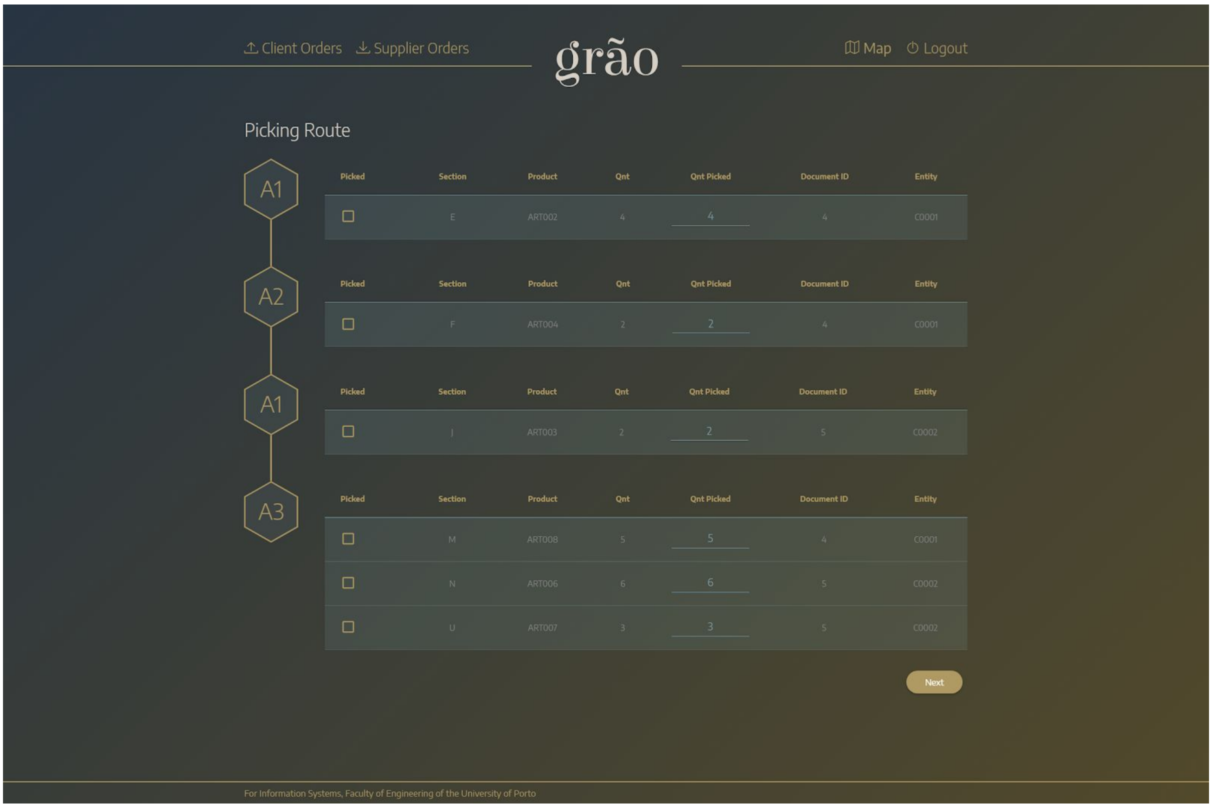
User & Business Goals :

- Supplier orders overview (Document ID, Order ID, Date, Supplier) and product id, description, quantity, stock and warehouse zone.
- Intuitively check the desired storing orders.
- View to be used as a management tool of the supplier orders.

Outward Paths/ Call to Action :

- Provide to the user aggregate information about *grão*'s supplier orders like each order's ID and dates.
- Mark each supplier order to generate the storing route.
- See order's products and quantity.

ID Core View : GRAO_ROUTE_VW



Picking Route

A1

Picked	Section	Product	Qnt	Qnt Picked	Document ID	Entity
□	E	ART002	4	4	4	C0001

A2

Picked	Section	Product	Qnt	Qnt Picked	Document ID	Entity
□	F	ART004	2	2	4	C0001

A1

Picked	Section	Product	Qnt	Qnt Picked	Document ID	Entity
□	J	ART003	2	2	5	C0002

A3

Picked	Section	Product	Qnt	Qnt Picked	Document ID	Entity
□	M	ART008	5	5	4	C0001
□	N	ART006	6	6	5	C0002
□	U	ART007	3	3	5	C0002

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Inward Paths/ Trigger Words :

- Supplier Orders' *Next* button
- Client Orders' *Next* button

Elements of the core :

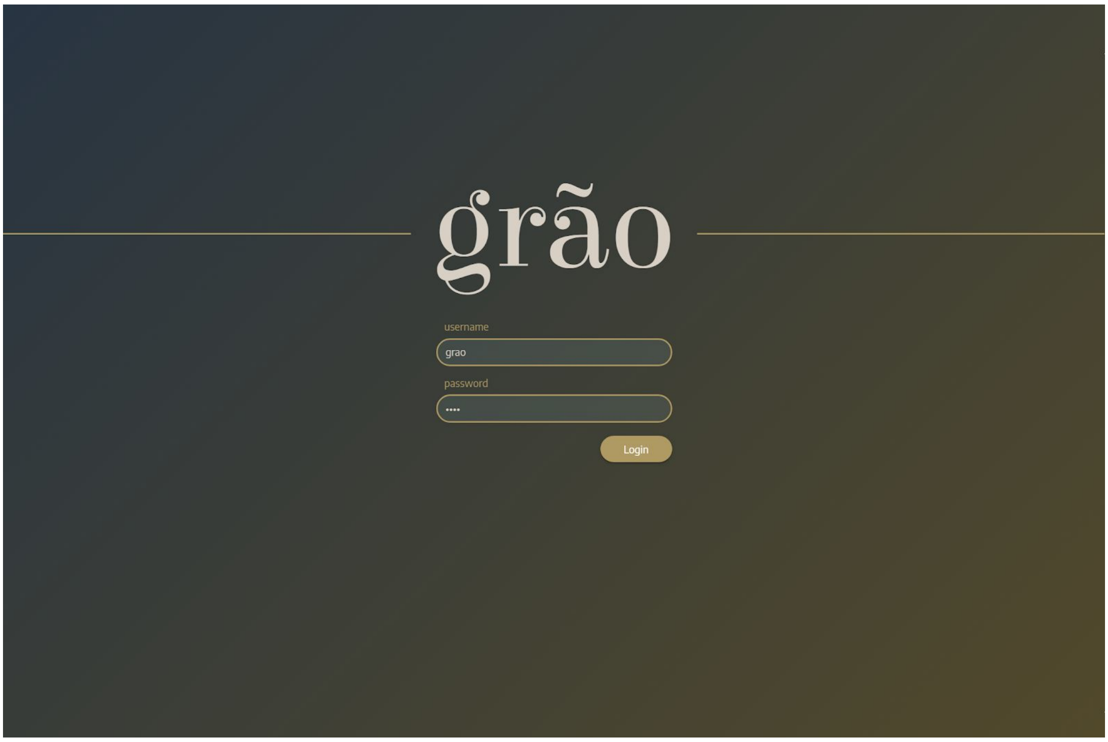
LST_001 (LST) | Route
LST_002 (LST) | Products

User & Business Goals :
- Picking or Storing route overview.
- Intuitively confirm product picking or storing.
- View to be used as a management tool for product picking or storing.
- The route is ordered by section and divided by warehouses to be more perceptible to the user and make his task faster and more effective.

Outward Paths/ Call to Action :
- Provide to the user aggregate information about products to store/pick and to/from which part of the warehouse.
- Each order document is transformed in a shipping guide document.
- In the supplier orders case, each product is moved to the respective ERP suggested location.

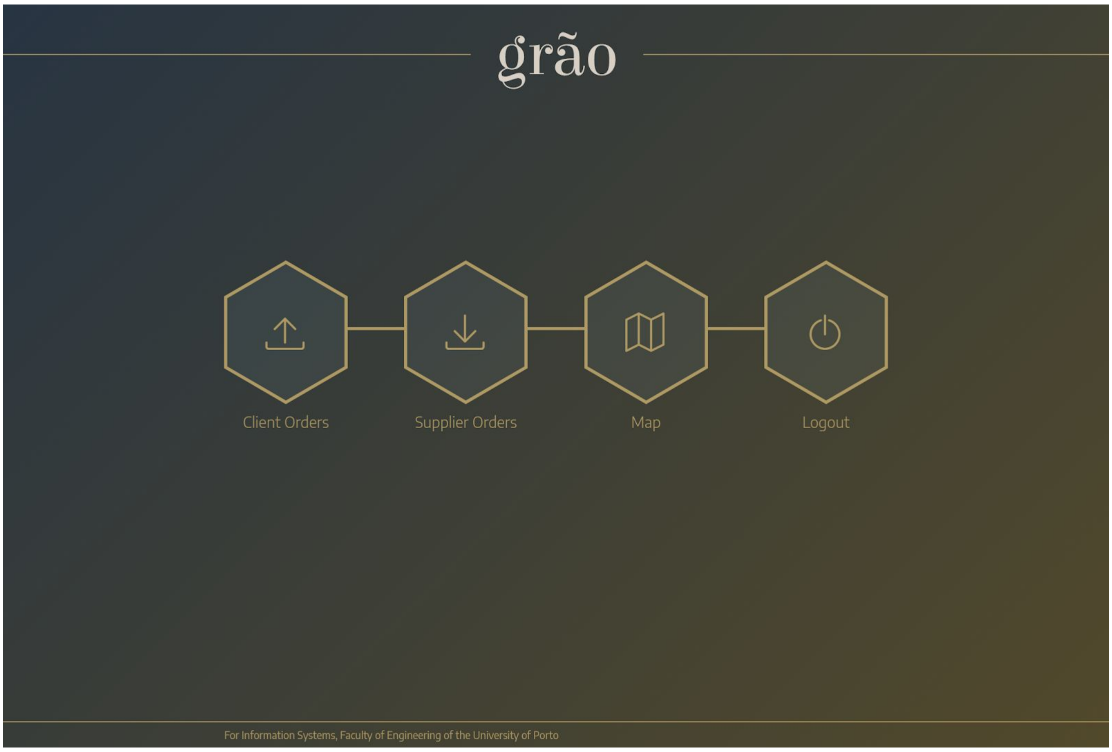
Other Features

Login : Login Page for authentication of the User.



username
grao
password
••••

Homepage : Homepage for rapid access to every page.



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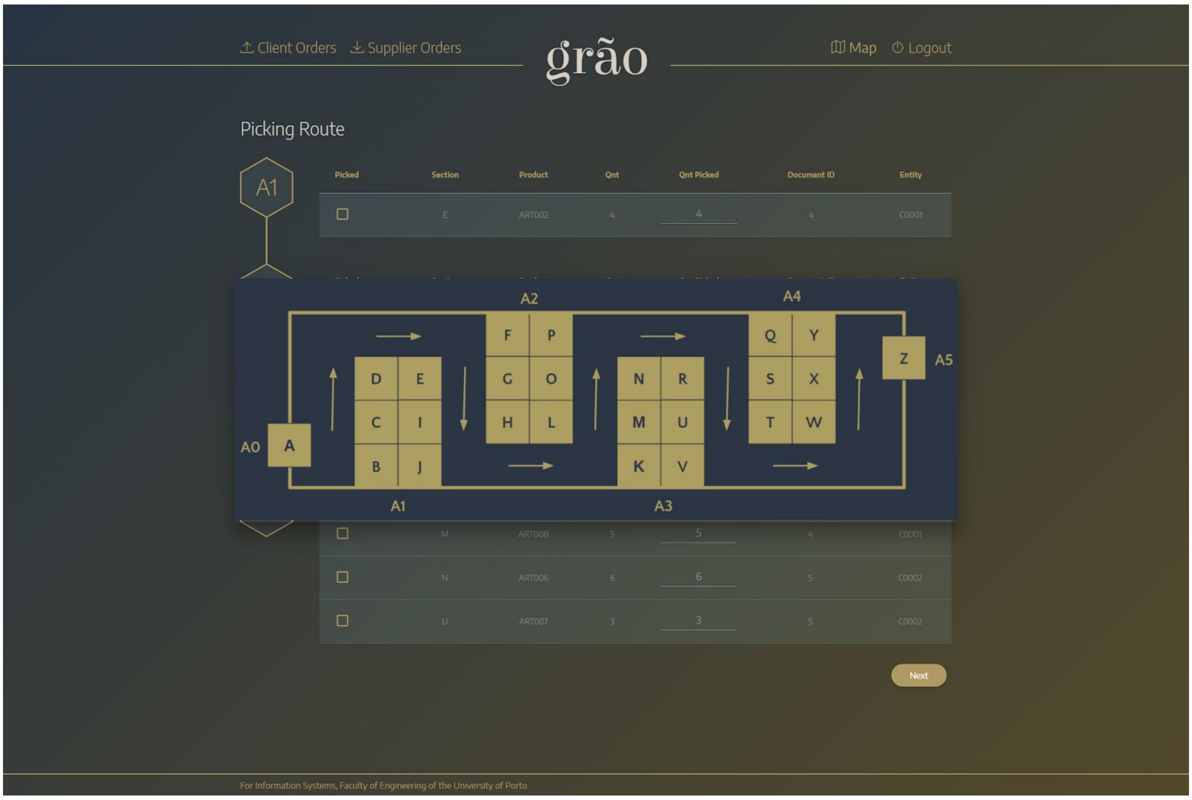
Warehouse Map : Warehouse Map for a layout of the map available in every page.



Picking Route

Picked	Section	Product	Qnt	Qnt Picked	Document ID	Entity
□	E	ART002	4	4	4	C0001

□	M	ART008	5	5	4	C0001
□	N	ART006	6	6	5	C0002
□	U	ART007	3	3	5	C0002

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Multiple Order Selection : The user can select multiple orders to process and there’s an option to select all at once to facilitate his experience.

Sorting Orders and Products : Sorting can be done by any parameter of the table containing either the orders or the products.

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Interoperability with Primavera

Client Order Listing

Webservice ID
CLI_ORD_LST

Webservice Description
This API access allows us to populate the *Client Orders* tab. Therefore, it is necessary to extract from Primavera all clients orders' unique identification code, the client and the date that aren't still processed.

Related Core View(s)
This webservice is related to core view GRAO_CLI_ORD.

Input Example
API URL
POST {{apiUrl}}Administrador/Consulta

Body

```
"SELECT CD.Id, CD.Data, CD.Entidade, CD.NumDoc, CDS.Estado FROM CabecDoc CD, CabecDocStatus CDS WHERE CDS.IdCabecDoc = CD.Id AND CDS.Estado='P' AND CD.TipoDoc ='ECL'"
```

Expected Output

```
{
  “Data”: “2018-12-19T00:00:00”,
  “Entidade”: “C0001”,
  “Estado”: “P”,
  “Id”: “c6532d62-03ca11e9-99e7-080027fcd9d8”,
  “NumDoc”: 6
}
```

Supplier Order Listing

Webservice ID
SUP_ORD_LST

Webservice Description
This API access allows us to populate the *Supplier Orders* tab. Therefore, it is necessary to extract from Primavera all suppliers orders’ unique identification code, the date and the supplier that aren’t still processed.

Related Core View(s)
This webservice is related to core views GRAO_SUPP_ORD.

Input Example
API URL
POST {{apiUrl}}Administrador/Consulta

Body

```
"SELECT CC.Id, CC.NumDoc, CC.DataDoc, CC.Entidade FROM CabecCompras
CC, CabecComprasStatus CCS WHERE CC.Id = CCS.IdCabecCompras AND
CCS.Estado='P' AND CC.TipoDoc ='ECF'"
```

Expected Output

```
{
  “Id”: “b2830291-e987-11dd-9538-000c29f83a13”,
  “DataDoc”: “2018-01-23T00:00:00”,
  “NumDoc”: 8,
  “Entidade”: “F0002”
}
```

List Client Order Products

Webservice ID
CLI_ORD_PRD_LST

Webservice Description
Whilst expanding each client order, the user must be able to check out which products belong to it and their respective quantities as well as warehouse location. The current stock parameter is extracted for comparison with the quantity attribute to check if the order may be fulfilled at the time.
Additionally, product specifications and location are also used in the routing picking page.

Related Core View(s)
This webservice is related to core view GRAO_CLI_ORD.

Input Example
API URL
POST {{apiUrl}}Administrador/Consulta

Body

```
"SELECT CD.Id, CD.Entidade, CD.Serie, CD.NumDoc, CD.TipoDoc,
A.Artigo, A.ArmazemSugestao, A.Descricao, LD.Localizacao,
LD.Quantidade, A.STKActual FROM CabecDoc CD, LinhasDoc LD, Artigo A
WHERE A.Artigo = LD.Artigo AND LD.IdCabecDoc = CD.Id AND
CD.Id=orderId"
```

Expected Output

```
{
        {
                "ArmazemSugestao": "A1.C",
                "Artigo": "ART001",
                "Descricao": "Café do Brazil",
                "Entidade": "C0001",
                "Id": "c6532d62-03ca11e9-99e7-080027fcd9d8",
                "Localizacao": "A1.C",
                "NumDoc": 6,
                "Quantidade": 5,
                "STKActual": 12,
                "Serie": "A",
                "TipoDoc": "ECL",

        },
        {
                "ArmazemSugestao": "A1.J",
                "Artigo": "ART002",
                "Descricao": "Café da Colombia",
                "Entidade": "C0001",
                "Id": "c6532d62-03ca11e9-99e7-080027fcd9d8",
                "Localizacao": "A1.J",
                "NumDoc": 6,
                "Quantidade": 2,
                "STKActual": 15,
                "Serie": "A",
        "TipoDoc": "ECL",

    }
}
```

List Supplier Order Products

Webservice ID
SUP_ORD_PRD_LST

Webservice Description
Whilst expanding each supplier order, the user must be able to check out which products belong to it and their respective quantities as well as expected warehouse location. The current stock parameter is extracted to manage future inventory updates. Additionally, product specifications and location is also used in the picking route page.

Related Core View(s)
This webservice is related to core view GRAO_SUPP_ORD.

Input Example
API URL
POST {{apiUrl}}Administrador/Consulta

Body
"SELECT CC.Id, CC.Entidade, A.Artigo, A.Descricao, A.ArmazemSugestao, CC.Serie, CC.NumDoc, CC.TipoDoc, LC.Localizacao, LC.Quantidade, A.STKActual FROM CabecCompras CC, LinhasCompras LC, Artigo A WHERE A.Artigo = LC.Artigo AND LC.IdCabecCompras = CC.Id AND CC.Id=orderId"

Expected Output

```
{
    {
        "Id": "b2830295-e987-11dd-9538-000c29f83a13",
        "Entidade": "F0002",
        "Artigo": "ART002",
        "Descricao": "Cafe do Brazil",
        "ArmazemSugestao": "A1.B",
        “Serie”: “A”,
        “NumDoc”: 1
```

```
            “TipoDoc”: “ECF”,
            “Localizacao”: “A0.A”,
            "Quantidade": 34,
            "STKActual": 103
      },
      {
            "Id": "b2830295-e987-11dd-9538-000c29f83a14",
            "Entidade": "F0003",
            "Artigo": "ART003",
            "Descricao": "Café da Venezuela",
            "ArmazemSugestao": "A3.U",
            “Serie”: “A”,
            “NumDoc”: 1
            “TipoDoc”: “ECF”,
            “Localizacao”: “A0.A”,
            "Quantidade": 22,
            "STKActual": 53
      }
}
```

Transform Document

Webservice ID
TRANSF_DOC

Webservice Description
This API access allows us to create a shipping guide in Primavera when all the items linked to a certain order are picked up.

Related Core View(s)
This webservice is related to core view GRAO_ROUTE_VW.

Input Example
API URL
POST {{apiUrl}}Vendas/Docs/TransformDocument/ECL/A/6/000/true

Body

```
{
          "Tipodoc": "GR",
          "Serie":  "A",
          "Entidade": "C0001",
          "TipoEntidade": "C",
          "DataDoc": "11/29/2018",
          "typeData": "11/29/2018"
}
```

Expected Output
true

Warehouse Transfers

Webservice ID
WARE_TRANSF

Webservice Description
This API access allows us to transfer a specific quantity of a product from one location to the other within the company.

Related Core View(s)
This webservice is related to core view GRAO_ROUTE_VW.

Input Example
API URL
POST {{apiUrl}}Inventario/Transferencias/CreateTransfer

Body

```
{
     "TipoDoc": "TRA",
     "Serie": "A",
     "Data": "02/12/2018",
     "Moeda": "EUR",
     "LinhasOrigem":
     [{
           "Artigo":"A0002",
           "Armazem":"A1.B",
           "Localizacao":"A1.B",
           "Lote":"",
           "Quantidade":2,
           "QPicked":2,
           "INV_EstadoOrigem":"DISP",
           "ArmazemSugestao":"A1.B",
           "LinhasDestino":
                [{
                    "Artigo": "A0002",
                    "Armazem": "A1.B",
                    "Localizacao": "A1.B",
                    "Lote": "",
                    "Quantidade": 2,
                    "INV_EstadoDestino":"DISP"
                }]
          }]
}
```

Expected Output
true

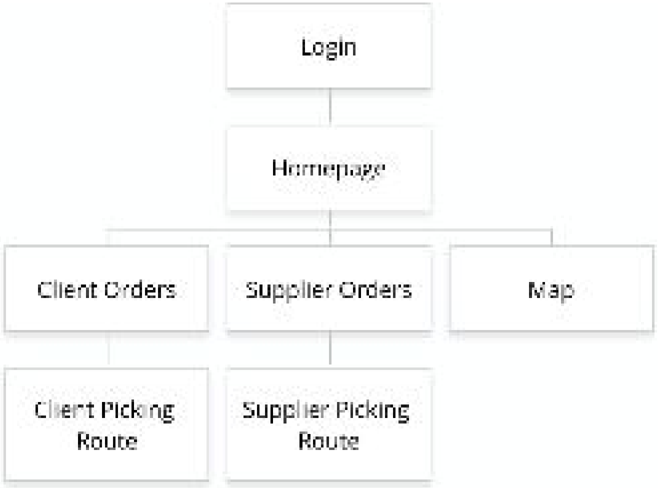
Paths

After logging to the website (*/login*), the user is sent to the homepage (*/home*), having access to a stylized hexagonal button menu selecting screen at the center which - according to user's choice - may redirect to the client orders (*/client/orders*), the supplier orders (*/supplier/orders*), display a map overlay and logout (which sends the client back to the login page).

In fact, these four buttons are made available on every page (except on the login screen for obvious reasons) by the form of a conveniently placed header.

On both the client orders and supplier orders screen, after the choosing process and pressing next, the user is redirected to the client picking route and supplier picking route (*/route*) screens respectively.

After the whole procedure is completed, the website returns to the homepage.



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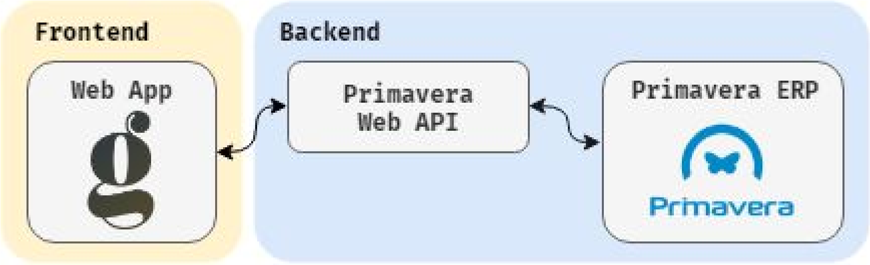
System Architecture

The website's system architecture relies on the typical client-server setup. In fact, Primavera could be categorized as some sort of database, as every information of our fictional company is stored in it.

Our web application communicates through the Primavera Web API in order to save to the ERP warehouse transfers, transform documents, update inventory, etc.

Obviously, for this project, we weren't able (nor were asked) to set up a real server, as we worked purely locally. This would make sense so we could store login credentials. The diagram presented below illustrates the architecture of this project and not a fully fledged picking wave service, where we'd likely include a REST API and a database.



Project Specifications vs Delivered Project

We consider every proposed specification was successfully implemented on the exception of two minor features:

- The partial document transformation wasn’t fully completed. A user may in fact pick selective client or supplier orders, yet picking specific products in the routing step is useless since every order document previously chosen is transformed to a shipping guide with every product that the order document contained.
  Although we were able to select a smaller portion of products and a particular API request (warehouse transfers) was accomplished, the modifications necessary to generate documents in this fashion were deemed too challenging for the time being and other development priorities got in the way.
- Exceptions on inventory weren’t registered. Every product always has a warehouse suggestion attribute on Primavera, even if it is a warehouse for products which don’t relate at all with other warehouses. This could be considered a workaround for this very issue and whether this is optimal could be open for interpretation.

Although it wasn’t in the specification, the creation of a database to collect the picking routes was considered. It would be helpful in case of the occurrence of a problem (e.g. power cut) or if the user wished to access all the routes at a later time. However, this wasn't possible due to the lack of time.

Lessons Learned

Overall, after heavy interaction with Primavera ERP, the team was able to grasp plenty more financing concepts and better understand the inner workings of companies’ order system and warehouse organization.

Additionally, although not directly related with this course, we took the opportunity to explore a different Javascript framework and we now feel relatively comfortable developing for Primavera ERP and building interfaces with Vue.js.