UNIVERSIDAD CARLOS III DE MADRID
ESCUELA POLITÉCNICA SUPERIOR

TRABAJO FIN DE GRADO

GRADO EN INGENIERÍA INFORMÁTICA: SISTEMAS DE LA INFORMACIÓN

ANÁLISIS, DISEÑO E IMPLEMENTACIÓN DE UN SISTEMA GESTOR DE ALMACÉN ADAPTADO A LA LOGÍSTICA FMS (FOREIGN MILITARY SALES)

Resumen En Inglés

AUTOR: ADRIÁN CEJUDO RUIZ
TUTORA: BELÉN RUÍZ MEZCUA

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A continuación se muestra el resumen en inglés de dicho proyecto (también incluido en el archivo .PDF del mismo.

This Project consisted to study, develop and test a store manager completely new, whose operation is collected under the American estándar FMS (Foreign Military Sales) .

The Project has been developed in the company Sli Uti [http://www.go2uti.es/] under the supervision of Raúl Díaz Gutierrez by the company and Belén Ruiz Mecua by the University Carlos III of Madrid.

First has been developed a Project time management with all it´s task, developing a Gantt chart to track and avoid delays.

Tasks has been originated to develop the milestones of this Project with a good control of time and develop.

We have developed a "State of Art" or "State of the Question", evaluating three store manager tools that are in the market today. This has been possible to develop a descriptive tables watching their strengths and weaknesses related to the Software that we will implement the project.

The tasks has been:

- Easy WMS [Mecalux,Esmena. "Solucione De Almacenaje" [en línea]. December 2011, www.mecalux.es/wms.
- GoldenSoft. "Gestión Comercial Y Contable" [en línea]. December 2011, http://www.goldensoft.com
- Infor Enterprise Software Solutions [en línea]. December 2011, www.infor.com

The three tools offers an optimal store manager system with it´s integrated database.

The weaknesses regarding this project id that none of them is associated with a standard identification traceability of orders, so it is not possible to use globally.

Besides, all of them are desktop applications, so it´s use will be mandatory via installer on the machine itself.

This project does not contemplate such weaknesses as well as a Web application with full access via the Internet, be associated with FMS standard for commercial use with the Government and Ministry of Defense.

Before to start the design tasks we have carried out a catalog of requirements which will consider the application.

The requirements has been divided in:

- User Requirements
  - Capacity
  - Restriction

- System Requirements
  - Functional
  - No functional

- Technical Requirements

This task is an important part ,of this stage depends largely on achieving the ultimate goals as a bad definition can cause that the system doesn´t meet all the functionality requested, required and necessary.

Once you have obtained the list of requirements along with their dependency counterfoils ensuring that the requirements are related and there is no ambiguity in its definition or description is passed to the tasks of analysis and system design.

We have developed a comprehensive analysis of the FMS standard operating procedures and all its documentation both at the level of applications.

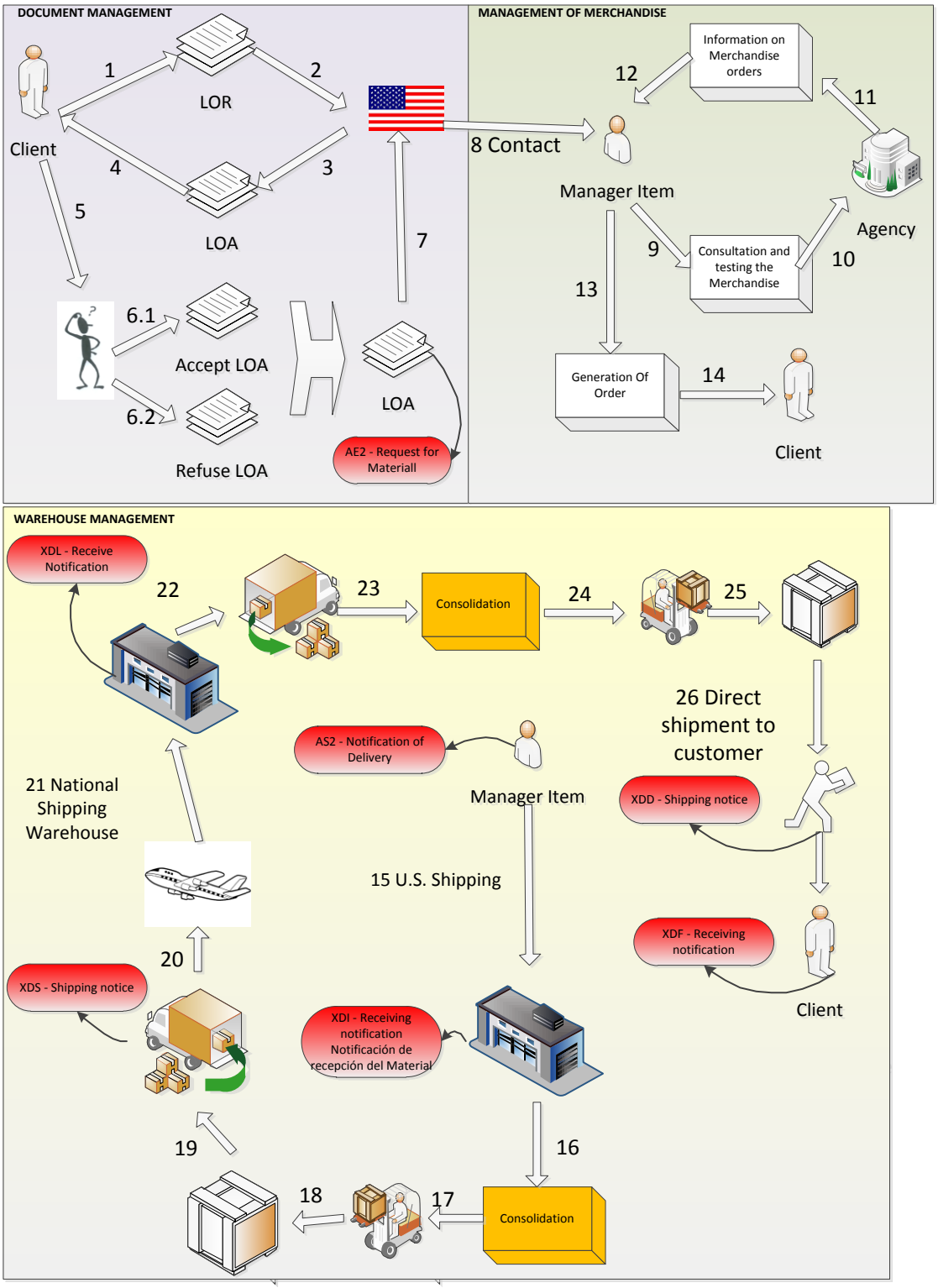
In this task has been carried out a very precise preparation process model that said host system.

This part is very important to understand what the FMS standard is to develop a software that works in that format.

It has been separations in terms of orders and order not repairable although the large difference in these orders is in shipping by the customer of the goods.

Here we will briefly describe the logic obtained in the buying process an order:

1 Proceso FMS Resumen



The 4 blocks of the analysis are:

1. **Document Management**: Describes the permit application process for submitting a request for a new purchase merchandise or request for repair.

2. **The Merchandise Management**: The process they have to make the armies around the world for the purchase of material, which can be considered as the preparation of the order.

3. **Warehouse Management orders**: The process is performed in the stores from the entrance to the notice of application for a commodity.

4. And finally **the integration of the processes** described above with the global information system FMS.

In the document management:

1. The customer gives the LOR document to USA. This document provides all the materials you want to buy.
2. USA study the LOR recived and check the goods that the customer wants to request. If everything is OK they contact with the control areas responsible for the material and generates the LOA. If USA needs an extra- information by the customer will be communicated to the client before generating the LOA, during, or in the same process or management of the goods.
3. Once it reaches the LOA, the customer can study it and:

   -Accept it sending the acceptance with the information neccesary for financing, transport and information.
   -Reject. If it´s reject the customer can contact again with USA sending a new LOR backing to step 1.

If the customer has accepted the LOA, once it´s recived in USA it proceed to consult the stock of each goods and the order generation, so that we enter at the next block.

In the Merchandise Management:

1. Once you have all the information of the goods applied for, contact the "Item Manager", which are responsible for managing the goods with stock number, location and even if they still made or is a good classified in their treatment.
2. The Item Manager is responsible for checking the goods ordered and if any discrepancy occurs generates the order of the goods.
   - If there is no discrepancy and that the good can be served, is the Item Manager is responsible for the generation of electronic document delivery notice thereof. (Generation of AS2)

In warehouse management, which is where the project manager directly:

1. Once the goods arrives to the store in USA (generation of XDI) is where our store management woks.
2. It takes place the process of consolidation for onward shipment to the store customer who requested the goods. In such consolidation is performed:

    - Shipment Management: The shipments are the biggest containers in which the boxes will consist of those orders. In this management is possible to create a new shipment in the own store, close a shipment to it´s send and open a shipment to get the boxes inside.

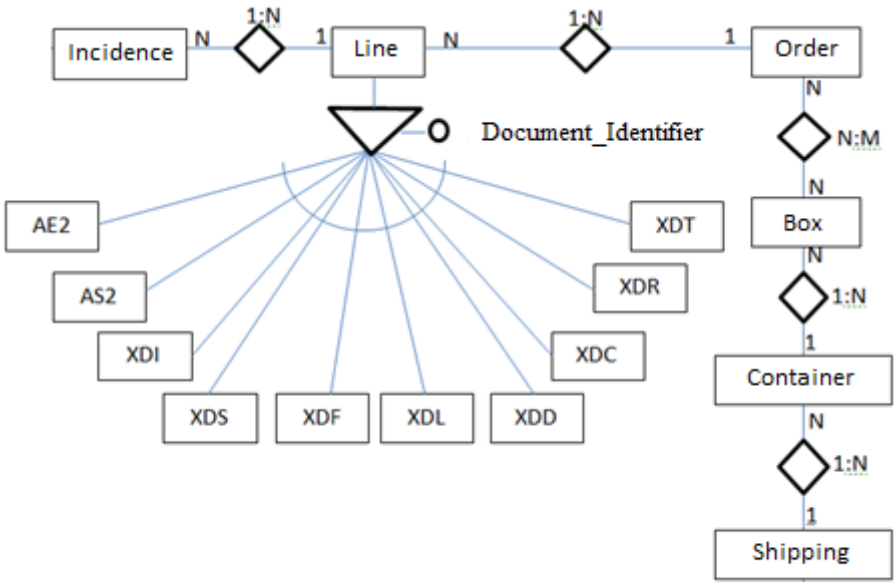
    - Boxes Management: The boxes are smallers than the containers in which goods will order. You can create new boxes from the store, open to enter new orders and close them to be introduced later in a container.

    - Consultation orders. Within the manager may consult or take orders for analyzing relevant data can consult them directly orders, orders modified or unassigned pending.

After studying the logic FMS, was carried out performing the functions of the warehouse operator, along with the use cases and the subsequent interaction of objects.

The data model elaboration finished with the data base design and it´s entity- relationship diagram.

2 Diagrama E/R Resumen



As reflected in the diagram have the following tables:

-Line: According to the ID it can be of different type.

-Order: The order is associated in one or several boxes.

-Box: is associated with a single cargo.

-Cargo: is associated with a single shipment.

-Shipment: contains one or several cargos.

-Incidence: possible incidences found in a order.

After studied the type of lines that may exist in the logic FMS to the type of properties or attributes contained therein.

In that way the standard is followed faithfully by the store manager system.

Below, we carry out the system design tasks.

We defined the system architecture to see how the store manager should be communicated to the subsequent monitoring of traceability of orders bound him.

The binding and release of FMS lines of the databases is done by Web services- stocking the own database client and systems U.S database to ensure that every order has been sent, received and also can be monitored by other applications that perform this function.

We have conducted classes designed to develop the software along with their methods, attributes and relationships with the physical design of data by creating the database in Sql Server 2008 management system.

In that way we get the class diagram of the application and build scripts for both the database hosted in the U.S. store as the database hosted in the country of origin of the Customer.

Then we carried out a study of possible design alternatives in terms of operating system, database manager, the application format and layout in terms of getting application interfaces why technology selected.

Once the design has defined the next step was to perform the battery of tests to perform on the application and in this way make sure it works properly.

The tests carried out are:

- Unit Tests

- White box.

- Black box.

-Integration Tests

- Data insertion tests.

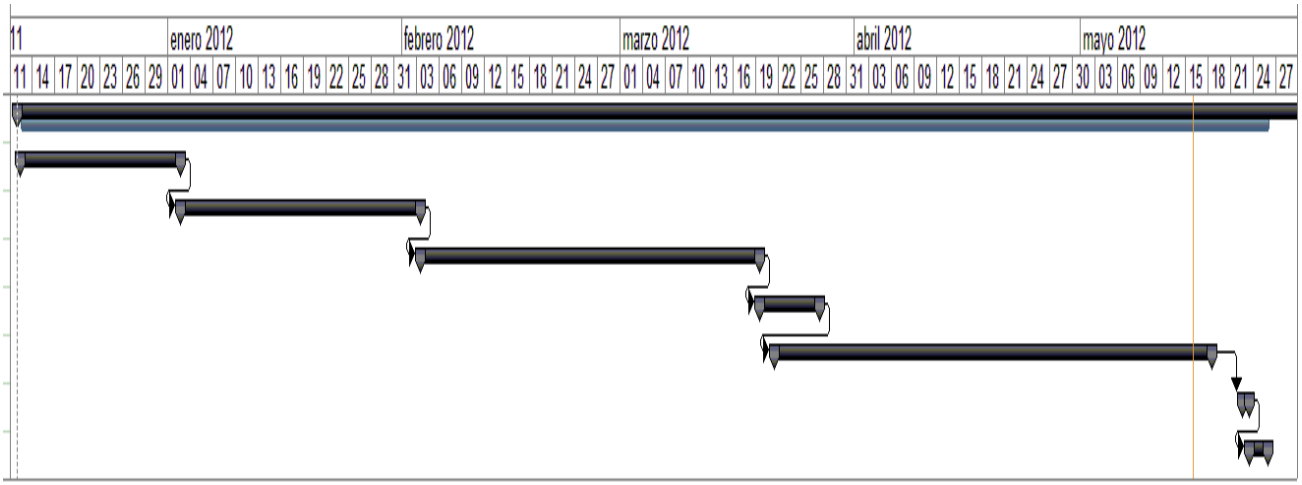
Having already defined tests and requirements linked to their corresponding application has been implemented quickly and that the design has been validated and verified with the requirements.

Interface sample insertion order in boxes:

Finally, we have carried out a development application including implementation of technologies that must be installed and how to do everything to work properly.

We have managed the Gant chart getting the costs were necessary along with the development time of all tasks, including data we obtain that the total project cost has been € 45,302 all together, VAT included.

As reflected in the following diagram, we see that the project has been conducted for six months, from December 2011 to late May 2012.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