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TRABAJO FIN DE MÁSTER

OPTIMIZATION AND SIMPLIFICATION OF LOGISTIC PENALTIES MANAGEMENT

Autor: Andrea Domínguez Bargueño

Director: Lucie Lapp

París

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Optimización y simplificación de la gestión de penalizaciones logísticas

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Fdo. Andrea Domínguez Bargueño

MÁSTER UNIVERSITARIO EN

INGENIERÍA INDUTRIAL

OPTIMIZATION AND SIMPLIFICATION OF LOGISTIC PENALTIES MANAGEMENT

Autor: Andrea Domínguez Bargueño

Director: Lucie Lapp

París

Acknowledgements

This project marks a very important stage in my life, it is the closing of my studies in Industrial Engineering. It is not just an university project, it is the summary of six years of effort and constant improvement

If I am here today, it is not only thanks to the effort and hours dedicated to study, this would not have been possible without the support of my family who have been there since day one, giving me encouragement when midterms exams got stuck or when June was full of exams.

However, even though I would never have imagined it before, I have been able to carry out a large part of my studies in France and get to know a different system from which I take many good things. For this reason I also thank my French university l'École Centrale de Nantes, both the students and the teachers.

My last six months were also spent in France, in Paris where I developed this project working for the company Procter & Gamble. I would also like to thank all the people I have worked with during these months for their constant help and their daily good humor at work. Of course, a special thanks to my internship tutor and director of this project Lucie Lapp who has taught me a lot of things and has always supported and helped me throughout these last months.

Finally, thanks to Universidad Pontificia Comillas - ICAI for having taught me so much and for being a university that above all brings values to its students. Thanks to Susana Ortiz for being available to answer all the questions and support my project from Spain.

OPTIMIZACIÓN Y SIMPLIFICACIÓN DE LA GESTIÓN DE PENALIZACIONES LOGÍSTICAS

Autor: Domínguez Bargueño, Andrea

Director: Lapp, Lucie

Entidad Colaboradora: Procter & Gamble France

RESUMEN DEL PROYECTO

El objetivo del proyecto es el desarrollo de un cuadro de mando que permita llevar a cabo el seguimiento detallado de las penalizaciones logísticas. Dichas penalizaciones se aplican cuando la entrega de productos no cumple en tiempo o forma con los estándares contractuales establecidos.

Palabras clave: Logística, Penalizaciones, Cuadro de Mandos, Power BI

1. Introducción

La cantidad de penalizaciones logísticas recibidas por la empresa Procter & Gamble en Francia ha sufrido un crecimiento exponencial en los últimos años y cada vez suponen un coste más elevado. En el año fiscal 2019-2020, por ejemplo, se pagaron alrededor de 8 millones de euros en penalizaciones logísticas a los diferentes distribuidores.

Optimizar la gestión de las penalizaciones con objeto de disminuirlas y gestionarlas de forma más eficaz es una meta que está en el objetivo de la compañía. Este proyecto pretende facilitar la toma de decisiones relacionadas con las penalizaciones logísticas para poder responder en tiempo y forma, limitando al máximo su importe. De esta manera contribuir a su disminución. También pretende facilitar el trabajo a las personas encargadas de la verificación, respuesta y negociación de las penalizaciones.

Este documento sintetiza los seis meses de trabajo en la multinacional Procter & Gamble en Francia y detalla el proyecto principal realizado durante las prácticas a tiempo completo en las oficinas de París.

2. Definición del proyecto

La fase inicial del proyecto , ha supuesto el estudio, aprendizaje y análisis de funcionamiento del área de la empresa de la gestión de pedidos, el estudio de las condiciones de los distintos distribuidores, el sistemas de penalizaciones, etc para adquirir el know-how necesario sobre como se producen y se gestionan las mismas, así como el análisis de los recursos y herramientas que se han venido utilizando durante todo el proyecto.

Las penalizaciones son acordadas entre el cliente y el proveedor al negociar el contrato de las condiciones logísticas. Es el cliente el encargado de enviar al proveedor cualquier incumplimiento de las condiciones establecidas ya sea por un retraso en la recepción de la entrega o productos que no han sido recepcionados. En las condiciones logísticas se negocia igualmente el valor de las penalizaciones. Siendo normalmente un porcentaje del valor de la entrega en caso de retraso o un porcentaje del valor de los productos no recibidos.

Una vez el proveedor ha recibido la penalización enviada por el cliente, debe ser comprobada para verificar que realmente se corresponde con las condiciones negociadas. Este estudio lleva mucho tiempo ya que existen multitud de clausulas diferentes donde apoyarse par rechazar la penalización. Por ejemplo, si la fecha de entrega del pedido cuando hay una promoción no se corresponde con la acordada, pero es entregado 10 días antes del comienzo de la misma, para algunos clientes se negocia que no se aplicarán las penalizaciones logísticas al considerar que no supone ningún perjuicio para el distribuidor.

Cuando la penalización ha sido verificada pueden producirse dos situaciones :

La penalización es justificada y por lo tanto se acepta y el servicio financiero se encarga de pagar el importe al distribuidor.

La penalización no es justificada, en este caso es necesario responder al distribuidor adjuntando los argumentos por los que se rechaza la misma. Cuando hablamos de una penalización de este tipo en muchos casos es necesario negociar posteriormente con el cliente para o bien anularla o bien llegar a un acuerdo. Por ejemplo, acordar un pago parcial de la penalización.

Para la ejecución del proyecto se han utilizado diferentes recursos para la recogida de datos, el diseño del cuadro de mandos y la automatización de todos los datos.

Power BI ha sido la herramienta principal utilizada durante todo el proyecto así como SAP, KNIME, Simplement y Python entre otras. Para la consecución del proyecto, ha sido necesario aprender desde cero y de manera autónoma cada una de estas herramientas.

Al mismo tiempo que se diseñaba y se desarrollaba los cuadros de mando, se han mantenido reuniones semanales con los diferentes managers implicados para mostrar el avance y poder obtener feedback constante y así introducir las mejoras sugeridas en la herramienta a medida que se iba construyendo.

Una vez finalizado el diseño y el desarrollo de la herramienta, y tras las pruebas iniciales se ha pasado a su implementación. Una vez realizada la carga inicial y la comprobación de los datos para verificar que eran correctos, se ha procedido a implementar un proceso automático y sincronizado de actualización de la información en todas las bases de datos.

Por último, se han lanzado acciones para la formación tanto individual como colectiva de los futuros usuarios del cuadro de mando así como las resolución de las dudas y la entrega de la documentación correspondiente (manuales de usuario).

Igualmente, se realizaron estás acciones más detalladas para los responsables de la herramienta con el objeto de resolver posibles incidencias y asegurar su optimo funcionamiento. Por último, se ha documentado también el manual de explotación del sistema.
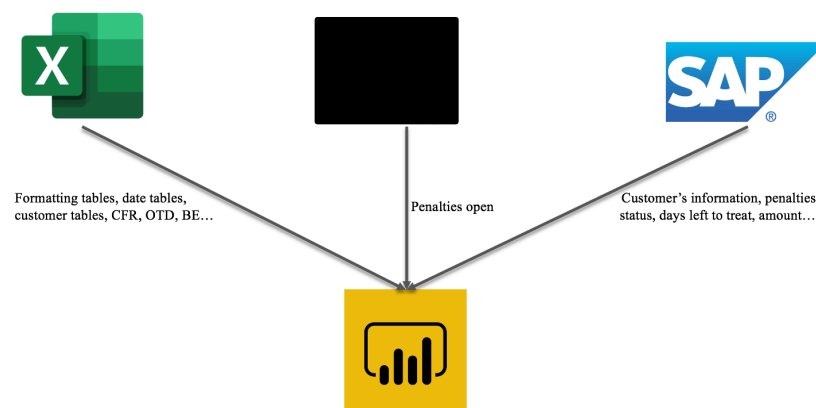
3. Descripción de la herramienta

El objetivo final es disminuir las penalizaciones logísticas y facilitar su tratamiento. Para ello, se han desarrollado dos cuadros de mando diferentes.

El primero ofrece una visión global sobre el estado de las penalizaciones facilitando diferentes puntos de vista, permitiendo filtrar por fecha, cliente, alertando sobre la finalización de los plazos, mostrando el importe pagado, etc. Este cuadro de mando facilita la toma de decisiones a corto y medio plazo y de este modo distribuir los recursos de manera más eficiente y alcanzar los plazos establecidos sin superar el importe máximo anual establecido para las penalizaciones.

El segundo cuadro de mando es específico para un solo cliente. Permite a las personas responsables conocer el estado de las penalizaciones a las que deben responder o negociar, facilita el trabajo de preparación de las negociaciones y permite priorizar las acciones necesarias o reubicar los recursos para responder mejor a las necesidades.

Los cuadros de mando se sustentan con la información actualizada de tres bases de datos diferentes como se puede comprobar en la siguiente figura:

Formatting tables, date tables, customer tables, CFR, OTD, BE…

Penalties open

Customer's information, penalties status, days left to treat, amount…

Figure 1: Arquitectura lógica

Excel, contiene todas las tablas de configuración de clientes y fechas, así como algunos datos relevantes que deber actualizarse manualmente todos los meses. la segunda base de datos, (no se proporciona la información por confidencialidad) contiene la información del cliente la cual se obtiene accediendo a través de Python a su página web y con ello podemos comprobar si la penalización aún está abierta en su sistema y por lo tanto se puede responder.

La base de datos SAP es la principal base de datos de la compañía donde se encuentra toda la información del proveedor tal como el importe de las penalizaciones, las fechas, los números de cliente, el nombre de los responsables, etc. Para poder acceder a ella se utiliza un programa llamado Simplement que junto con KNIME permite transformar las diferentes tablas SAP y obtener un código Microsoft SQL para nutrir los cuadros de mando.

4. Resultados

El objetivo principal del proyecto es obtener una herramienta que permita tener una visión actualizada del estado de las penalizaciones logísticas divididas por causas y clientes para tomar las decisiones correctas y ayudar a priorizar y dividir la carga de trabajo. Además, otro objetivo es ayudar y facilitar el trabajo de verificación y negociación de las penalizaciones.

En primer lugar, el acceso a la información mediante la visualización de gráficos y tablas agiliza la toma de decisiones y ha resultado un herramienta muy útil. Los gráficos son una parte importante de la aplicación, mostrando la información de forma rápida e intuitiva. También es importante mencionar que toda la aplicación tiene una interfaz muy amigable e intuitiva.

En segundo lugar, los datos obtenidos en el cuadro de mando ofrecen una alta fiabilidad, habiéndose comprobado su veracidad y corrección, algo muy importante para la toma de decisiones y estrategias correctas.

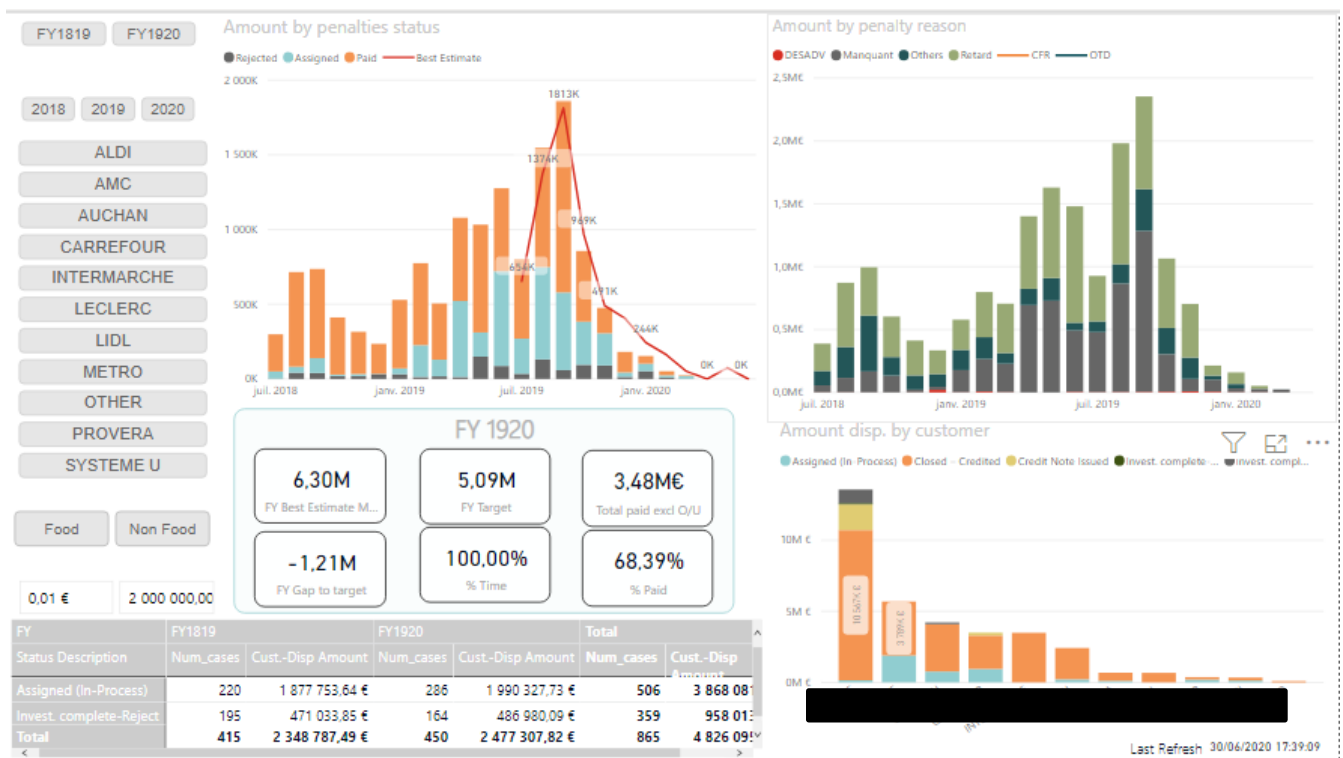El resultado final del primer cuadro de mando se adjunta a continuación :

Figure 2: Cuadro de mandos Macro

En esta imagen se pueden observar diferentes gráficos donde se muestra el importe estimado a pagar durante el año fiscal en curso además de otras informaciones útiles de los últimos dos años fiscales para poder tomar las decisiones acertadas.

Por ejemplo, en el primer gráfico a la izquierda, se muestra la estimación más conservadora del importe a pagar por mes para el total de los clientes. En naranja se muestra la cantidad ya pagada, en azul la cantidad pendiente de analizar y en gris la cantidad pendiente de negociar. En la tabla inferior izquierda, puede verse igualmente el número de penalizaciones y su valor dividido entre su estado (*assigned* = pendiente de analizar, *reject* = pendiente de negociar o anular). La información se amplía con mayor detalle en la memoria final a continuación de este resumen.

El otro cuadro de mando es específico de un cliente, en concreto el cliente que más penalizaciones envía anualmente y cuyo nombre no se facilita. Esta herramienta es única para este cliente y muestra el estado de cada uno de sus centros de distribución. Permite a las personas encargadas del tratamiento de las penalizaciones conocer su estado, poder seleccionarlas y buscarlas más rápidamente. Además, permite identificar aquellas penalizaciones que se encuentran en el servidor del cliente pero que por algún error no han llegado al sistema del proveedor y por lo tanto deberán ser reclamadas.

También cuenta con un apartado para facilitar las estadísticas y los datos necesarios que se exportan en un fichero Excel y que dan soporte a los responsables en las reuniones que se mantienen para negociar los acuerdos o anulaciones de las penalizaciones pendientes así como otras informaciones relevantes.

Por último, la parte inferior muestra un seguimiento por centro de distribución y también por trabajador y permite observar el trabajo realizado por los empleados, su rendimiento y también saber si es necesario reforzar el tratamiento de uno de los centros de distribución en caso que fuese necesario porque uno de ellos tuviese una carga de trabajo elevada.

Figure 3: Cuadro de mandos cliente

Con el desarrollo de este sistema se podrán controlar 1,5 millones de euros que se encuentran en riesgo debido a las respuestas fuera de plazo de las penalizaciones, así como reducir alrededor de un 30% el tiempo de gestión de las penalizaciones de cada uno de los usuarios de la nueva herramienta.

5. Conclusiones

Como resultado del proyecto y del trabajo realizado en la empresa Procter & Gamble Francia anteriormente mencionado se abren dos conclusiones de ámbito muy diferente.

Por un lado en el ámbito profesional, el resultado final es la obtención de los cuadros de mando que facilitarán el seguimiento y mejora de las penalizaciones de la empresa, lo cual redundara en un ahorro monetario y de control de tiempos así como permitir mayor agilidad en la respuesta y negociación de las penalizaciones pendientes, alertando en su caso de la proximidad de su vencimiento, etc. Esto facilitará el trabajo de las personas responsables ya que se ha automatizado la extracción de numerosos datos y con este proyecto todas las bases de datos se actualizarán automáticamente y de forma sincronizada.

Además, he tenido la oportunidad de conocer lo que significa trabajar en una multinacional y aprender sus sistemas de trabajo, la organización de la empresa e implicarme en las actividades de la misma. También he aprendido los valores de la empresa y su know-how. He aprendido como funciona el sistema de logística y sus particularidades.

Por otro lado, en lo que respecta al ámbito personal, he puesto en práctica los conocimientos adquiridos durante el grado y el máster, desarrollando mis habilidades personales de trabajo en equipo, compañerismo, comprensión y escucha, habilidades de comunicación y gestión del tiempo. He sido capaz de integrarme en un entorno profesional y llevar a cabo todas las tareas que me han sido asignadas con éxito. También he desarrollado autonomía , mejora en mi capacidad para tomar decisiones y resolución de problemas. Además, dada la situación vivida en los últimos meses a causa de la pandemia que ha supuesto un reto tanto para la organización como para mi, he sabido adaptarme a los cambios trabajando con total independencia y asumiendo los retos tecnológicos. Me ha gustado mucho trabajar en la empresa y constatar que con el trabajo se pueden implementar cambios que ayuden a la consecución de los objetivos de la empresa.

OPTIMIZATION AND SIMPLIFICATION OF LOGISTIC PENALTIES MANAGEMENT

Author: Domínguez Andrea.

Supervisor: Lapp, Lucie

Collaborating Entity: Procter & Gamble France

ABSTRACT

The aim of the project is to develop a dashboard that will allow detailed monitoring of logistical penalties. These penalties are applied when the delivery of products does not comply in time or form with the established contractual standards.

Keywords: Logistics, Penalties, Dashboard, Power BI

1. Introduction

The number of logistical penalties received by the company Procter & Gamble in France has grown exponentially in recent years and they are increasingly costly. In fiscal year 2019-2020, for example, around 8 million euros were paid in logistical penalties to the various distributors.

Optimizing the management of penalties in order to reduce them and manage them more efficiently is a goal that is in the company's objective. This project aims to facilitate decision-making related to logistics penalties in order to respond in a timely manner, limiting their amount as much as possible. In this way, it contributes to their reduction. It also aims to facilitate the work of the people in charge of verifying, answering and negotiating the penalties.

This document summarizes the six months of work full time at the multinational Procter & Gamble in France and details the main project carried out during the internship in the Paris offices.

2. Project's definition

The initial phase of the project has involved the study, learning and analysis of the operation of the company's order management area, the study of the conditions of the various distributors, the penalty systems, etc. to acquire the necessary know-how on how they are produced and managed, as well as the analysis of the resources and tools that have been used throughout the project.

The penalties are agreed between the customer and the supplier when negotiating the contract of the logistic conditions. It is the client who is responsible for sending the supplier any failure to comply with the conditions established either by a delay in receiving the delivery or products that have not been received. The value of the penalties is also negotiated in the logistics conditions. These are normally a percentage of the value of the delivery in case of delay or a percentage of the value of the products not received.

Once the supplier has received the penalty sent by the customer, it must be checked to verify that it really corresponds to the negotiated conditions. This study is very time consuming as there are many different clauses to rely on in order to reject the penalty. For example, if the delivery date of the order when there is a promotion does not correspond to the agreed one, but it is delivered 10 days before the beginning of the promotion, for some customers it is negotiated that the logistic penalties will not be applied because they consider that it does not mean any damage for the distributor.

When the penalty has been verified, two situations can happen:

The penalty is justified and therefore accepted and the financial service is in charge of paying the amount to the distributor.

The penalty is not justified, in this case it is necessary to respond to the distributor by attaching the arguments for which the penalty is rejected. When we talk about a penalty of this type in many cases it is necessary to negotiate later with the client to either cancel it or reach an agreement. For example, to agree on a partial payment of the penalty.

For the execution of the project, different resources have been used for the collection of data, the design of the control panel and the automation of all the data.

Power BI has been the main tool used throughout the project as well as SAP, KNIME, Simplement and Python among others. To achieve the project, it has been necessary to learn from scratch and in an autonomous way each of these tools.

At the same time that the dashboards were being designed and developed, weekly meetings were held with the different managers involved to show the progress and to be able to obtain constant feedback in order to introduce the suggested improvements to the tool as it was being built.

Once the design and development of the tool had been completed, and after the initial tests, it was implemented. Once the initial loading and checking of the data to verify that they were correct, an automatic and synchronized process of updating the information in all the databases has been implemented.

Finally, actions have been launched for both individual and collective training of future users of the dashboard, as well as the resolution of doubts and the delivery of the corresponding documentation (user manuals).

Likewise, these more detailed actions were carried out for those responsible for the tool in order to resolve possible incidents and ensure its optimum operation. Finally, the system's operating manual was also documented.

3. Dashboard description

The ultimate goal is to reduce logistical penalties and facilitate their treatment. To this end, two different dashboards have been developed.

The first one offers a global vision on the state of the penalties facilitating different points of view, allowing to filter by date, client, alerting on the end of the terms, showing the amount paid, etc. This dashboard facilitates short and medium-term decision making and thus more efficient distribution of resources and meeting deadlines without exceeding the maximum annual amount established for penalties.

The second dashboard is specific to a single client. It allows the people responsible to know the status of the penalties to which they must respond or negotiate, facilitates the work of preparing the negotiations and allows the necessary actions to be prioritized or resources to be relocated in order to respond better to needs.

The dashboard are supported by updated information from three different databases as shown in the figure below:

Formatting tables, date tables, customer tables, CFR, OTD, BE…

Penalties open

Customer's information, penalties status, days left to treat, amount…
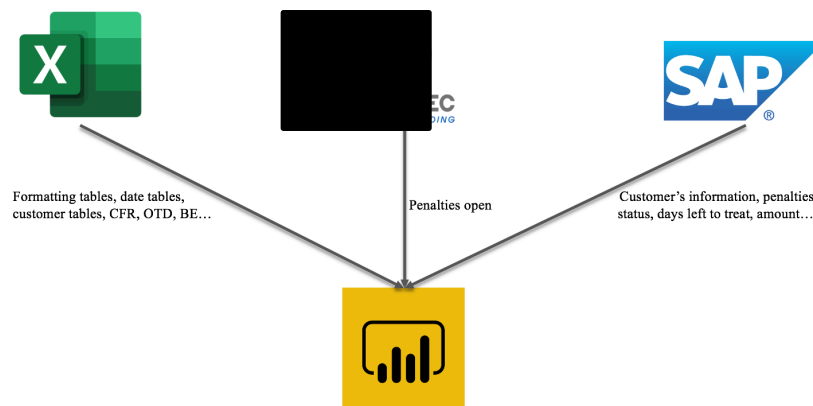
Figure 4: Logical architecture

Excel, contains all the configuration tables of clients and dates, as well as some relevant data that must be manually updated every month. The second database, (the information is not provided due to confidentiality) contains the client's information which is obtained by accessing your website through Python and with this we can check if the penalty is still open in your system and therefore can be answered.

The SAP database is the company's main database where you can find all the supplier's information such as the amount of the penalties, dates, customer numbers,

name of the responsible people, etc. In order to access it, a program called Simplement is used, which together with KNIME allows to transform the different SAP tables and obtain a Microsoft SQL code to feed the dashboards.

4. Results

The main objective of the project is to obtain a tool that allows an updated view of the status of logistic penalties divided by causes and clients in order to make the right decisions and help prioritize and divide the workload. In addition, another objective is to help and facilitate the work of verification and negotiation of the penalties.

Firstly, access to information through the display of graphs and tables speeds up decision making and has proved to be a very useful tool. The graphics are an important part of the application, showing the information in a fast and intuitive way. It is also important to mention that the whole application has a very friendly and intuitive interface.

Secondly, the data obtained in the dashboard offer a high reliability, having been checked for their veracity and correctness, something very important for making decisions and correct strategies.

The final result of the first dashboard is attached below:
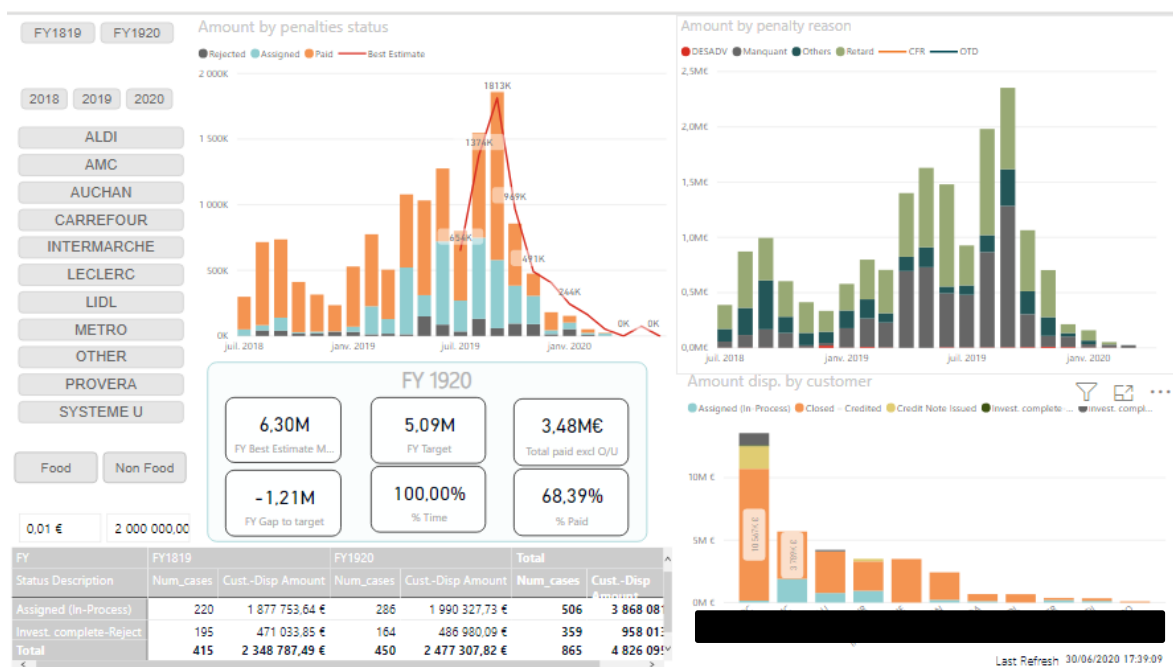
Figure 5: Macro dashboard

In this image you can see different graphs showing the estimated amount to be paid during the current fiscal year as well as other useful information from the last two fiscal years in order to make the right decisions.

For example, the first graph on the left shows the most conservative estimate of the amount to be paid per month for the total of the clients. In orange it shows the amount already paid, in blue the amount to be analyzed and in grey the amount to be negotiated. In the lower left table, you can also see the number of penalties and their value divided by their status (assigned = pending analysis, reject = pending negotiation or annulment). The information is expanded in more detail in the final report following this summary.

The other dashboard is specific to a customer, specifically the customer that sends the most penalties annually and whose name is not provided. This tool is unique for this customer and shows the status of each of its distribution centers. It allows the people in charge of processing the penalties to know their status, to select them and to search for them more quickly. In addition, it allows the identification of those penalties that are on the client's server but that due to some error have not reached the supplier's system and therefore must be claimed.

It also has a section to provide the necessary statistics and data that are exported in an Excel file and that give support to those responsible in the meetings that are held to negotiate agreements or cancellations of pending penalties as well as other relevant information.

Finally, the lower part shows a monitoring by distribution center and also by worker and allows to observe the work done by the employees, their performance and also to know if it is necessary to reinforce the treatment of one of the distribution centers in case it is necessary because one of them has a high workload.
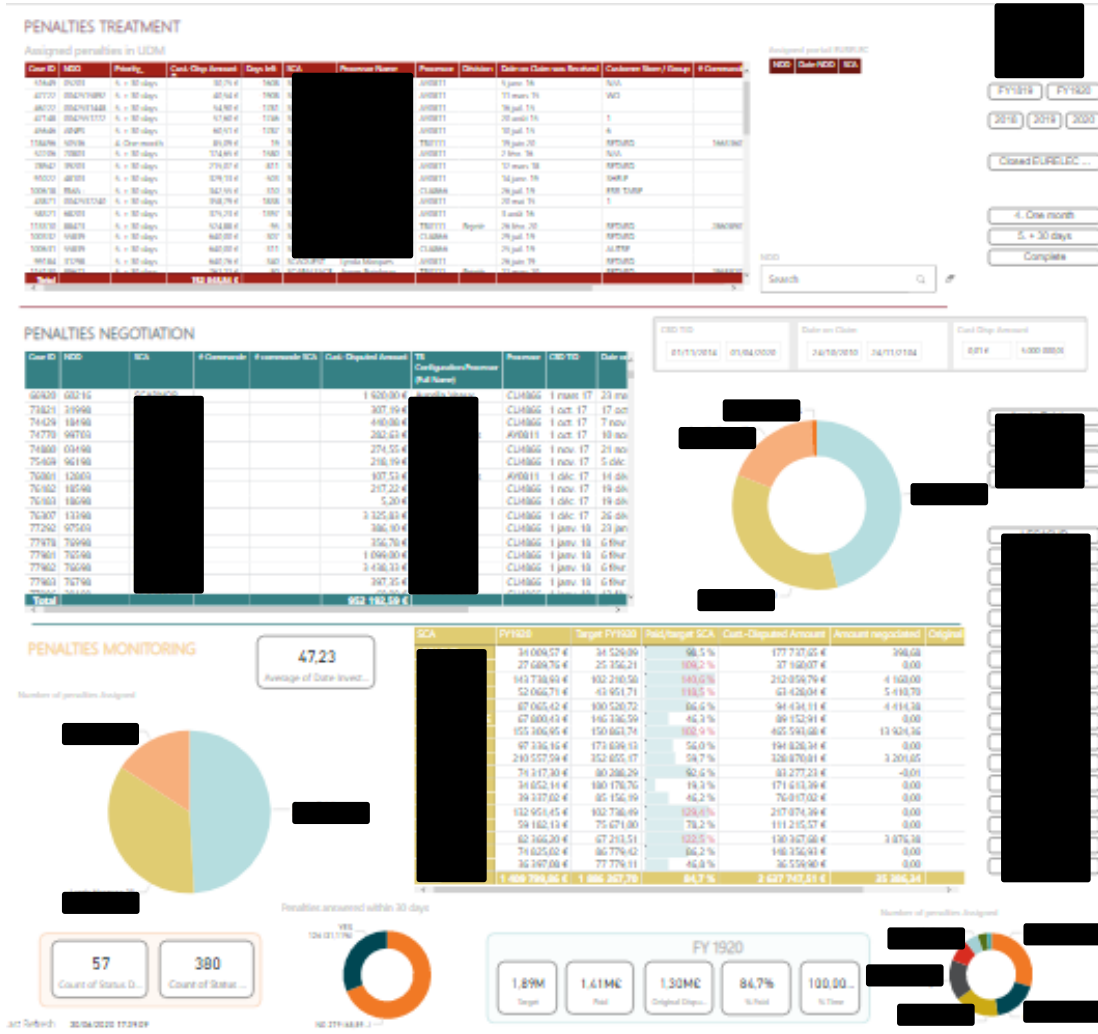
Figure 6: Customers dashboard

With the development of this system, it will be possible to control 1.5 million euros that are at risk due to late responses to penalties, as well as to reduce by around 30% the time needed to manage the penalties of each of the users of the new tool.

5. Conclusions

As a result of the project and the work carried out in the company Procter & Gamble France mentioned above, two conclusions of a very different scope are opened.

On the one hand, in the professional field, the final result is the obtaining of the dashboards that will facilitate the follow-up and improvement of the company's penalties, which will result in monetary savings and time control as well as allow for greater agility in the response and negotiation of pending penalties, alerting them to the proximity of their expiration, etc. This will facilitate the work of the people responsible since the extraction of numerous data has been automated and with this project all the databases will be updated automatically and in a synchronized way.

In addition, I have had the opportunity to get to know what it means to work in a multinational company and to learn its working systems, the organization of the company and to get involved in the activities of the company. I have also learned the values of the company and its know-how. I have learned how the logistics system works and its particularities.

On the other hand, in the personal area, I have put into practice the knowledge acquired during the degree and the master, developing my personal skills of teamwork, companionship, understanding and listening, communication skills and time management. I have been able to integrate into a professional environment and carry out all the tasks assigned to me successfully. I have also developed autonomy, improved my decision making and problem solving skills. Moreover, given the situation experienced in recent months due to the pandemic that has been a challenge for both the organization and myself, I have been able to adapt to the changes by working with total independence and taking on the technological challenges. I have enjoyed working in the company and I have seen that with work you can implement changes that help to achieve the objectives of the company.

REPORT

UNIVERSIDAD PONTIFICIA COMILLAS
ESCUELA TÉCNICA SUPERIOR DE INGENIERÍA (ICAI)
GRADO EN INGENIERÍA EN TECNOLOGÍAS DE TELECOMUNICACIÓN

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Chapter I.   INTRODUCTION

1.1. BACKGROUND

Most of the shops in which consumers go shopping are owned by big chains, which often have many stores in a national or international scale. Belonging to a brand enables a business to benefit from numerous synergies, facilitating the development of its business and improving its customer service. In addition to joint communication and purchasing operations, the brands, or even companies, very often have the particularity of having common logistics networks for the distribution of products. These logistics organizations manage the flow of goods for all businesses, from the place of production or storage to the stores. Nowadays, the increasing complexity of distribution operations, due to the growth in the number of product references and the reduction in stock levels throughout the chain, has placed logistics at the heart of the business and strategy of many brands.

France is one of the only countries where logistical penalties are applied to large-scale distribution companies. These penalties are applied to delivery delays, when the quality of the service is not the one agreed or when the quality of the information is not right, for example the absence of documents. The amount of the penalties varies greatly depending on the type and the agreements between the customer and the supplier. However, not all customers decide to apply them as they can negotiate other logistic conditions where they are not included.

The conditions of the penalties are agreed between the customer and the supplier during the negotiations of the logistics contract once a year.

This study is carried out at the company Procter & Gamble France. However, the clients of this supplier will not be shown to avoid any kind of violation of the company's confidentiality.

1.2. MOTIVATION

As part of the second year of industrial engineering master's program in Universidad Pontificia Comillas, I have done an internship abroad in Procter & Gamble France in Paris. I have worked in the Customer Logistics Operations team as a junior manager and an important part of my work is dedicated to dealing with penalties and answering them.

After several weeks working with penalties I realized that it is very difficult to set real objectives and know the status of current penalties without a tool capable of analyzing and representing that data. Therefore, the creation of a tool that allows simplifying and optimizing this process could help enormously in its treatment. This tool should help the Customer Service Representatives (CSR) be more efficient and spend as less time as possible treating the penalties but also it should help managers to take wisher strategic decisions regarding the past and present data.

Besides the individual motivation of this project, there is an important motivation from the company to achieve better management of these penalties. Given the important economic impact that these represent, a tool that allows the observation and analysis of the data, would allow to take more effective decisions to reduce this expense. As well as allowing to see the past data, it could allow to identify trends and create strategies to better manage them.

The economic impact of logistical penalties on a company such as the one where this work is done exceeds several million euros. Specifically, during the 2019-2020 fiscal year, this amount reaches up to 7.8 million euros only for this company taking into account the penalties paid in this fiscal year, including penalties that occurred last year and were paid this year and excluding those that occurred during this year and have not yet been invoiced.

1.3. OBJECTIVES

The main objective of the project is to create a tool to simplify the understanding and treatment of the penalties received by the company. To achieve this main objective several intermediate objectives have been scheduled.

1. Understand the process of order and penalties management. In order to understand the current process of how the reception and response of the penalties is managed, the first part of the project consisted of knowing and learning how it is currently done and what are the needs to be taken into account. To do this, in a first instance it has been learned how the company's order system works, how the arrival of orders is managed and how they are organized in the Customer Service Operations department. After the comprehension of the order's management, it was necessary to treat the penalties in order to detect the points to be improved in the process.

2. Understand the user's needs. For this several interviews with managers and Customer Service Representatives have taken place to be able to better adapt the solution to their needs.

3. Get the data. It was necessary to find out which are the current sources of information and to clean the data in order to standardize them and make them reliable.

4. Learn how to use the software and design the first draft to validate with the users. This part will take up most of the time allocated to the project.

5. Create of the final tool and verify the data.

6. Automatize the updates

7. Train the future users.

8. Document the work done.

1.4. METHODOLOGY

The following Gantt chart shows the distribution of tasks during the period of the internship and the development of the project. The first part is a period of training and learning, and finally with the execution and implementation of the designed tool.
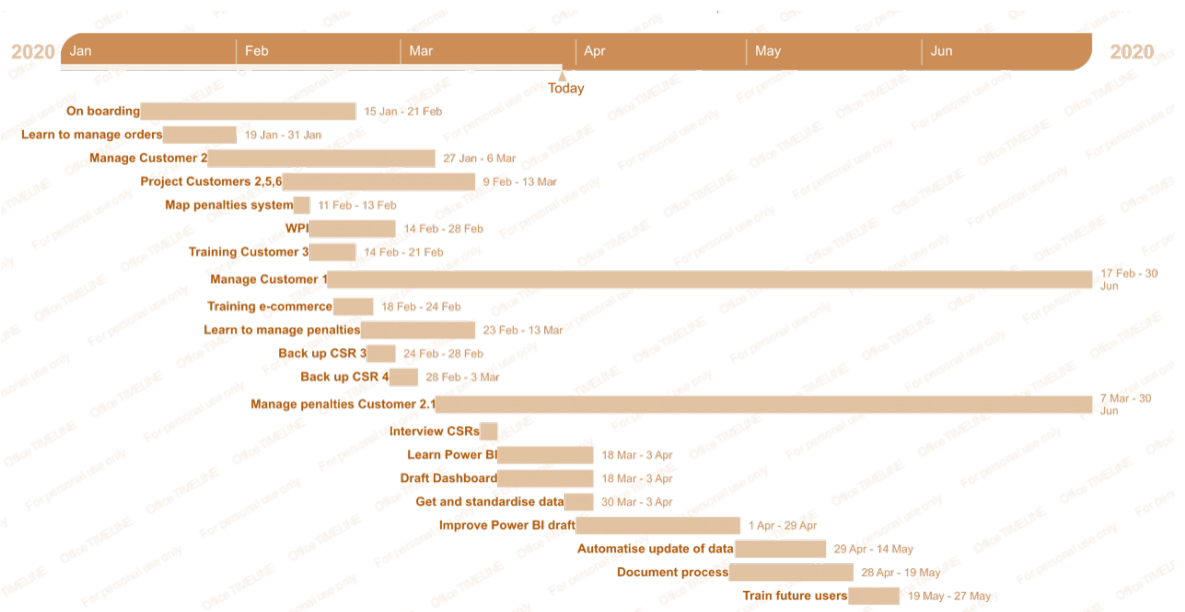

Figure 7: Project's Gantt Chart

Weekly meetings with the project director have been planned during the implementation of the project. Weekly meetings were also hold with the heads of the company's supply chain department to show progress and receive feedback on the project's progress. These meetings have also provided a view from a more business point of view.

1.5. RESOURCES

1.5.1. SAP

Figure 8: Systems, Applications, Products in Data Processing logo

Systems, Applications, Products in Data Processing (SAP) is a computer program capable of managing data for different needs such as: human resources, production, logistics, sales, finance, accounting. It can be used to manage all phases of companies, whether large or small.

SAP is the enterprise resource planning software used by the company to manage orders and other transactions. In particular, this software will enable to manage orders, respond to outstanding penalties, and obtain all the information needed to perform analyses. In this project, most of the information used comes from SAP and thanks to a third party important data as amount of penalties, dates, customers, etc have been extracted.

1.5.2. MICROSOFT POWER BI

Figure 9: Power BI logo

Power BI is a tool that allows you to join different databases to model and analyze data and then present it in an intuitive way through tables and graphs. In addition, it allows you to share the representations with many users and thus have a single source of data.

Power BI is a business analytics service by Microsoft. It aims to provide interactive visualizations and business intelligence capabilities with an interface simple enough for end users to create their own reports and dashboards.   [5]

1.5.3. SIMPLEMENT

Figure 10: Simplement logo

Simplement is a Microsoft Gold partner who specializes in helping SAP customers improve their reporting capabilities through Azure, SQL Server and Power BI. The core

solutions make SAP data easy to use and easy to secure in a variety of front-end business intelligence applications.   [6]

Simplement is an Independent Software Vendor (ISV). Simplement was founded to simplify implementation of SAP systems. From the technical and functional SAP backgrounds and the experiences in Microsoft Business Intelligence, it is the better way to report on the vast store of data inside of SAP offering products and services to make business more efficient. The most important characteristics are: Rapid implementation, Ability to scale deep and wide, Support for a wide array of third party analysis tools.   [7]

1.5.4. KNIME

Figure 11: KNIME logo

KNIME Analytics Platform is open source software for creating data science applications and services. Intuitive, open, and continuously integrating new developments, KNIME makes understanding data and designing data science workflows and reusable components accessible to everyone. With KNIME Analytics Platform, it is very easy to create visual workflows with an intuitive, drag and drop style graphical interface, without the need for coding.   [8]

1.5.5. PYTHON

Figure 12: Python logo

Python is a programming language that allows working quickly and integrate systems more effectively. Python is an interpreted programming language whose philosophy emphasizes the readability of its code. It is a multi-paradigm programming language, since

it supports object orientation, imperative programming and, to a lesser extent, functional programming. It is an interpreted language, dynamic and multiplatform.   [9]

1.5.6. COMPANY

This work is carried out in collaboration with the company Procter & Gamble France who has contributed the issue of this project as well as all the necessary data for its realization.

Figure 13: Procter & Gamble logo

The Procter & Gamble Company (P&G) is an international consumer goods company headquartered in Cincinnati, Ohio, founded in 1837 by William Procter and James Gamble. It specializes in a wide range of personal health, hygiene and personal care products divided in various segments, including beauty, care, fabric and home care, healthcare, , women, baby and families.

Chapter II. ANALYSIS OF THE ISSUE

In this section some of the points of vital necessity for the realization of the project in question will be explained.

2.1. LOGISTIC'S ANALYSIS

The players in the mass distribution sector

Large retailers are global players who do not only own shops. They may own central purchasing units, logistics service providers, logistics platforms, and sometimes even producers too. Similarly, they often have multiple commercial shops (from convenience stores to hypermarkets and specialized stores). Most of these companies have become international and are developing strongly.

One of the particularities is that the brand networks are distinguished by their legal form, with on the one hand groups (ex: Auchan, Carrefour, Casino, etc.) and on the other hand independent groups (ex: E.Leclerc, Intermarché, Système U, etc.). This distinction leads to differences, particularly in purchasing policies. Logistics costs currently account for around 8% of the selling price of products. This average hides strong disparities between products: about 3% for cosmetics, 15% for mineral waters.

Large retailers have focused their development on making products available to consumers at lower prices than traditional stores. This was made possible thanks to a strategy of massive purchases from suppliers. Large retailers have established two complementary purchasing systems: most purchases are made by central purchasing, which group orders from stores of the same brand on a regional or national scale, while purchases of local products are managed at the level of each store. The policy of centralizing purchases tends to reduce the proportion of direct relationships between suppliers and shops. [3].

Suppliers

The business of a major suppliers is based on two essential functions: the purchase of raw materials to transform into products and sale them to the stores. Between the process, the role of the logistics function is to optimize the management of physical and information flows to ensure the availability of products at the right time. In this case, the project is focus in the last mile of this logistics, from the factories to the warehouse of the mass distribution players.

In this respect, the main performance indicator used by companies is the Case Fill Rate (CFR) which measures the capacity of trucks used versus the capacity available. The On Time Delivery (OTD) is also a key indicator as it provides the percentage of orders delivered on time.

The logistics function involves all the links that enable the distribution of the product from the supplier to the consumer, i.e. transport, logistics services (packaging, storage, etc.), customer service, customization, business planning, demand management, availability and information flow management.

Cooperation between retailers and suppliers

The logistics between the suppliers and the retailers involves several challenges concerning the organization of relationships between different partners along the value chain. This means that it is vital to an appropriate mix of contracts and relational norms to avoid risk and prevent conflict between partners.

Negotiations of sales contracts between suppliers and retailers concern the price and quantities purchased, but also the reference of products in stores, future promotions, the distribution of logistics services (packaging, storage) and transport conditions, marketing activities, penalties etc. The characteristics of purchasing contracts therefore determine the logistical organization set up to distribute the products and in France, it must be agreed as of 1st of March to avoid any fines by the government. The purpose of this contract is to enter into long-term agreements (one year or more) between the supplier and its customer for the

products at pre-fixed prices. The operations are carried out with periodic purchase orders (monthly, quarterly, etc.). The maximum and minimum quantities to be supplied as well as the different choices are established in the contract in order to adjust the price at the end of each contract year.

In recent years, supply chain management has become a strategic corporate function. There have been many changes in production strategies: a shift from a push-flow to a pull-flow logic, specialization of production units, relocation of supplies and production, delayed differentiation, etc. These evolutions, coupled with the development of marketing strategies (increase in the number of references, promotions...), have thus complicated the management of the flow of goods and the associated IT flows. There has been a shift from simple distribution models, directly linking the producer and the point of sale, to more complex schemes in which a number of intermediate points of passage are interposed.
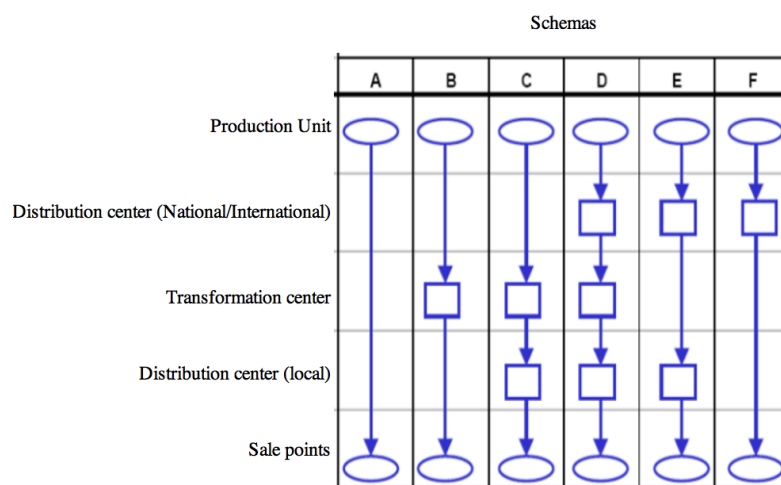

Figure 14: Logistic organization schemes [4]

In the past, stores were supplied by producers who sent products directly from their factories or warehouses to the stores. Each store had a storage area necessary to cover the safety stock. The delivery service to the stores was included in the sales contracts. The frequency of delivery was therefore quite low, since storage space in the stores was available and the producer had to be allowed to maximize the filling of the truck in order to reduce

transport costs. This distribution channel, where the store is the only "intermediary" between the producer and the consumer, is called the "short circuit".

One of the peculiarities of the logistics chains in the mass retail sector compared to other sectors is the plurality of customer-supplier cooperation approaches. These approaches emerged after the disappearance of many taboos regarding the sharing of commercial information. They have gradually given rise to various forms of more or less complex collaborations. The approach is an industry-retail partnership strategy in which manufacturers and retailers work together to increase consumer satisfaction and reduce costs.

Electronic data interchange (EDI) is seen as the keystone of industry-trade relations making the partnership technically feasible and economically profitable for all participants. It guarantees the interconnection and responsiveness of the supply chain. It ensures, in complete security thanks to the authentication certificate, the exchange of information from various processes such as shared supply management, exchange of forecasts, traceability, synchronization of product information between partners and the exchange of commercial messages directly integrated into companies' IT applications.

Vendor Managed Inventory (VMI), which involves logistics cooperation between manufacturers and distributors, is part of a demand-led flow approach. The VMI is defined as a reactive system of supply calculation piloted by the supplier on behalf of his customer at the warehouse level. It is based on the supplier taking charge of the distributor's supplies, in exchange for daily information on stocks, warehouse withdrawals, upcoming promotions, etc. transmitted by EDI. The flows are driven by consumer demand (warehouse issues) and no longer pushed by suppliers. It has proven to be effective in terms of reducing stocks (up to 50% at distributors), improving the service rate (over 99.5%), optimizing loads and reducing uncertainty.

2.2. LOGISTIC PENALTIES

The actors of the large distribution (supermarkets, hypermarkets, shops...) and their suppliers sign annually the contracts of purchase and sale of the products that have been previously negotiated. These contracts also include a logistics contract where they must agree on the products, quantities and discounts among many other things. Likewise, within this contract, logistical penalties are negotiated. The issue of penalties is discussed with respect to the principles applicable to the conclusion of the logistics contract, its execution and the settlement of the penalties.

The logistical scheme must be formalized in a clear and concrete manner according to the type of logistics: cross-dock, cumulative flow, shared supply management, etc. In addition, there must be a clear classification of the missing products with the quality of service measured by rates adapted to each flow category. The service rate should vary according to the products, logistics and companies involved. As well as delivery delays should also depend on the point of departure and entry. Products that are not available on delivery may be penalized by a percentage of their price, all the conditions regarding penalties and their consequences must be made clear in the logistics contract.

The formalization of the hourly periods between the different parties and their delivery must be defined in accordance with the logistical scheme chosen for supply, together with a maximum duration for the customer to accept or reject an order if it arrives with a delay exceeding the stipulated duration. The customer must respect the agreed schedules and have the unloading platform as well as the materials and personnel necessary for the reception, unloading and verification of the delivery. Delays may also be penalized by a percentage of the price of the whole truck depending on the length of the delay.

The supervision and verification of the penalty verification process must also be present in the contract including the mutually agreed deadlines for the duration of the penalties and the time to be able to answer them always taking into account the type and size of the companies.

The procedures for the issuance, verification and challenge of logistical penalties should also be agreed upon, defining the type of media used for the communication of information, specifying the process in case of disagreement among others. Likewise, the client must be clear when issuing the penalties, adding all relevant information such as order number, date and time and place of delivery as well as the products and quantities affected, specifying the reason for the penalty.

2.3. DEFINITION OF NEEDS

In previous sections, it has already been mentioned that there is currently no application that monitors past and present data, although this is not the only reason why the company has decided to create this project.

The penalties management account for between 1 and 3 hours per week for each of those responsible for managing them. This is a very large amount of time for an activity that does not provide any kind of benefit. Besides being a long and boring treatment. This tool is intended to streamline this work to reduce the time spent on them and facilitate their management to make it a less tedious activity.

Furthermore, there is no insight into the current state of penalties and the penalties of recent years. To obtain this analysis it is necessary to do it by hand, something that takes time and is not updated so it must be done continuously. Thanks to this tool, it is possible to have an updated view of the number of penalties in the process of verification and negotiation as well as how much money they represent. This allows you to better prioritize the work as well as add reinforcements if necessary. In addition, trends can be identified in order to make strategic decisions as well as to have a clear vision per client in order to take the necessary measures in case of detecting unusual actions in any client.

With penalties amounting to around 8 million euros, it is very important to achieve the planned objectives. In the current situation it is very difficult to project in the coming months and know what actions are necessary to not exceed the maximum target spending

penalties set by the directors of the company. Having the value of penalties in real time allows to know how much money has already been spent and to define strategies to avoid the maximum amount paid. For example, if we have a target of 5 million euros and we have paid 4 million euros 5 months before the end of the fiscal year, we will have to take extreme measures and negotiate all the penalties received to avoid exceeding the target.

It is for all the above reasons that this tool can help enormously in the management of penalties and have a great impact within the company.

2.4. STATE OF THE ART

As it is a project of innovation and creation from scratch of a tool, no similar tools have been found for this purpose. Before this project, there was no other way to study the past data except by calculating it by hand extracting data from excel, something that took a long time and therefore was not done many times although is very useful.

The process for dealing with penalties is as follows:

1. The client sends a PDF file via email where he indicates, among other data, the cause of the penalty, the amount and the order and products impacted. This file is then transferred to a robot capable of extracting the necessary information from the PDF and entering the data into SAP. This part of the process will not change with the installation of the tool.

2. People in charge of processing the penalties, called CSR (Customer Service Representative) must access a transaction in SAP where they will see a list of the penalties in their name according to their status (Assigned or Rejected). They can also search for penalties with their corresponding number. From there they can access the penalties and do the necessary.

3. In the case of an assigned penalty, one that has yet to be processed, they will have to access and read the PDF and then make an investigation as to whether the penalty is

justified or not. To do this, they must check the orders and documents such as delivery notes and decide whether there has been any damage.

4. If justified, they must respond both in SAP, as in the customer's platform. If it is not, they must inform the customer of the justification and respond equally on both platforms. Later, a meeting will be held with the customer to negotiate those penalties rejected until an agreement is reached.

To better understand the actual process, a WPI (Work Process Improvement) has been carried out. WPI's Process Improvement Workshops teaches proven techniques to help address systemic process issues that may be holding back the organization from reaching maximum efficiency. [10]

The objective analysis of those steps and decisions for the purpose of implementing changes to ensure a higher, measurable level of efficiency, quality, and customer satisfaction by reducing variation, removing activities that contribute no value to the product or service produced and alleviating wasteful frustration among others.

2.5. PLANNING AND ECONOMIC ESTIMATION

The cost of implementing this tool is not a large expense since the only thing that is an expenditure is the power bi pro license. Moreover, most of the future users already have this license, so it is not a relevant expense since it is only 8,40€ per new user.

Chapter III. DEVELOPING THE DASHBOARD

The development of the tool has been carried out in the following stages:

1. Databases
2. Design
3. Manual and automatic version
4. Automatization
5. Desktop and online version

3.1 DATABASES

The dashboard is powered from 3 different information sources. Firstly, the data will be updated manually until an automatic system is implemented. This will allow users to start using the tool as the update will be done daily and will not hinder their work.
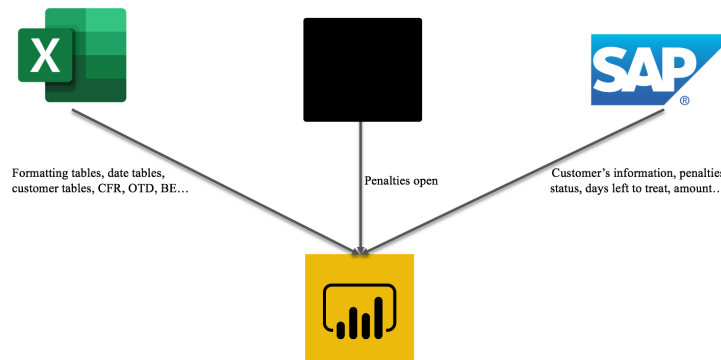

Figure 15: Logical architecture

The databases includes the following data:

Excel:

Microsoft Excel has been used as an advanced data analysis and visualization tool that has served as a database to configurate different sources of data. It contains also some of the data that must be introduced manually. The excel database includes for example:

- Job aid
- Date configuration
- Customer Configuration
- User Configuration
- System Status configuration
- Date format

- CFR: Case Fill Rate
- OTD: On Time Delivery
- BE: Best Estimate
- Projection
- Paid by customer
- Paid by

This data on the excel is all entered manually, the customer and date format will be only modified when a new customer is added or when the fiscal year changes. However, paid information, CFR, OTD, Best Estimate and projection will be updated at the beginning of the month by the person who will be in charge of maintaining the tool.

Customer base:

It is an excel file download from a website owned by the customer and it contains several information, for example: amount and reason of the penalty, warehouse impacted, date of impact and date of order among other information.

SAP:

Information from SAP is downloaded into an excel thanks to a third party and a software called KNIME, this process is explained later on the document. The SAP extract contains for example:

- Case ID

- Dates of claim, creation, investigation

- Amount disputed

- Warehouse impacted

- Owner of the penalty

- Reason of penalty

- Status of penalty

As shown in the figure bellow, all this information is linked through different connections on Power BI to be able to use related information from different tables
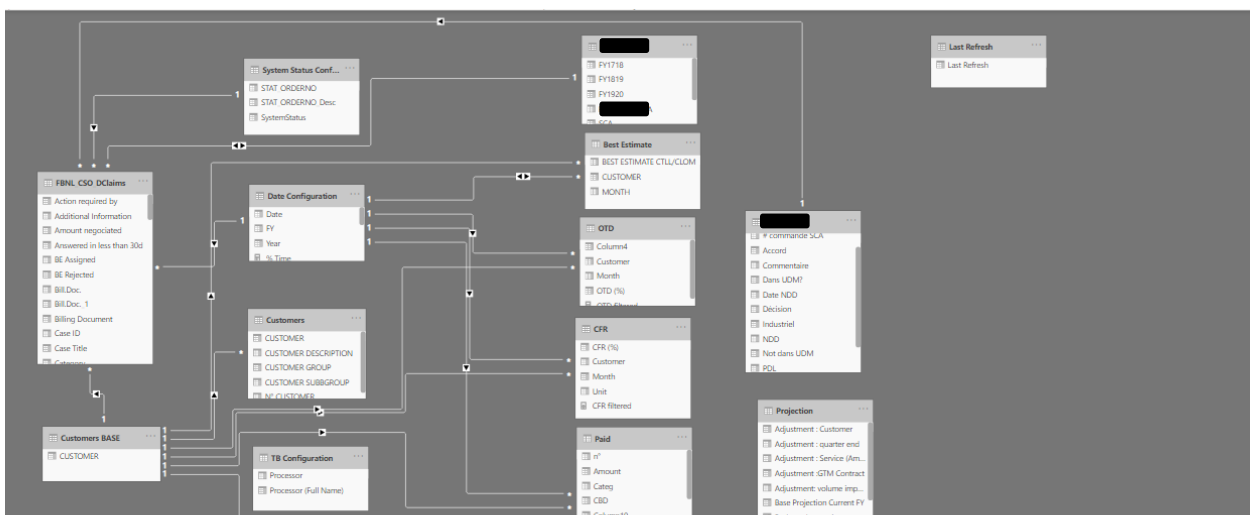
Figure 16: Power BI data links

3.2   DESIGN

Once all databases were clear and all the information was gathered then the design stage started. The design has been changed numerous times throughout the project, with the specifications obtained and the continuous feedback received. Some of the version done throughout the last months are shown below:
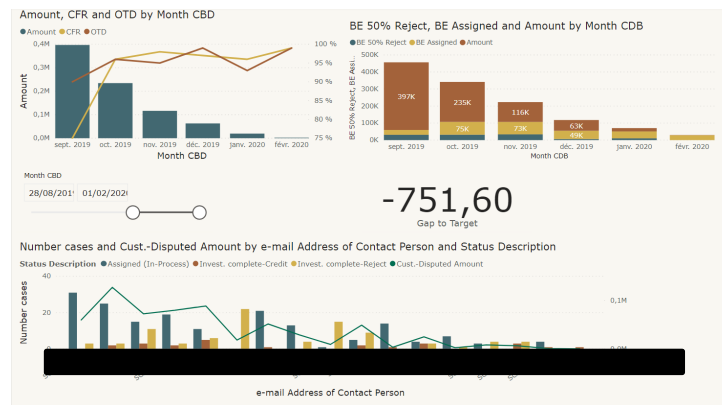
MACRO DASHBOARD

Version 1 (Mars 2020):

Figure 17: Macro Dashboard design version 1
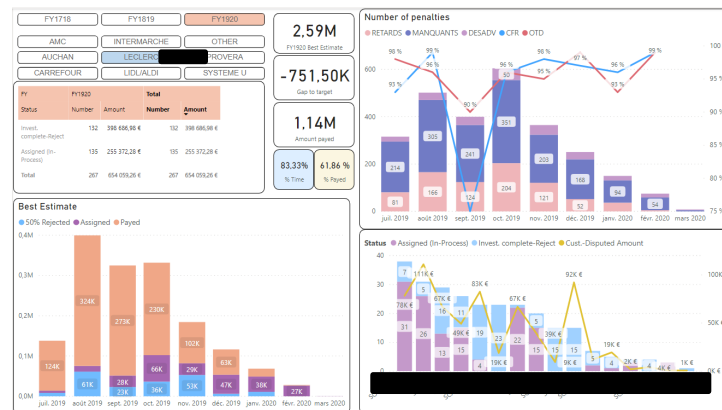
Version 2 (April 2020):

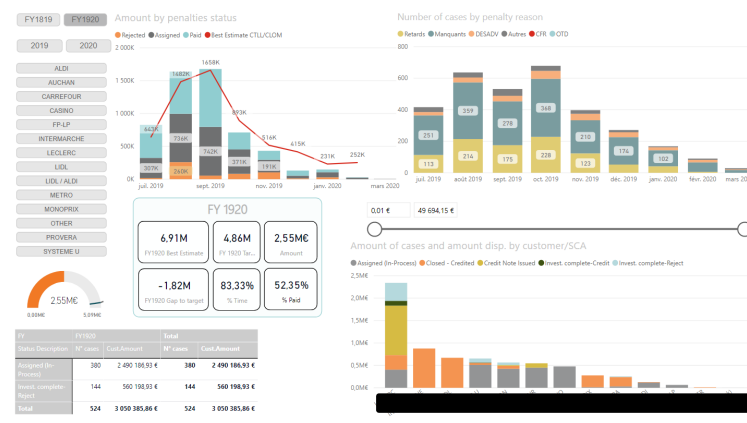*Figure 18: Macro Dashboard design version 2*

Version 3: (May 2020)

Figure 19: Macro Dashboard design version 3

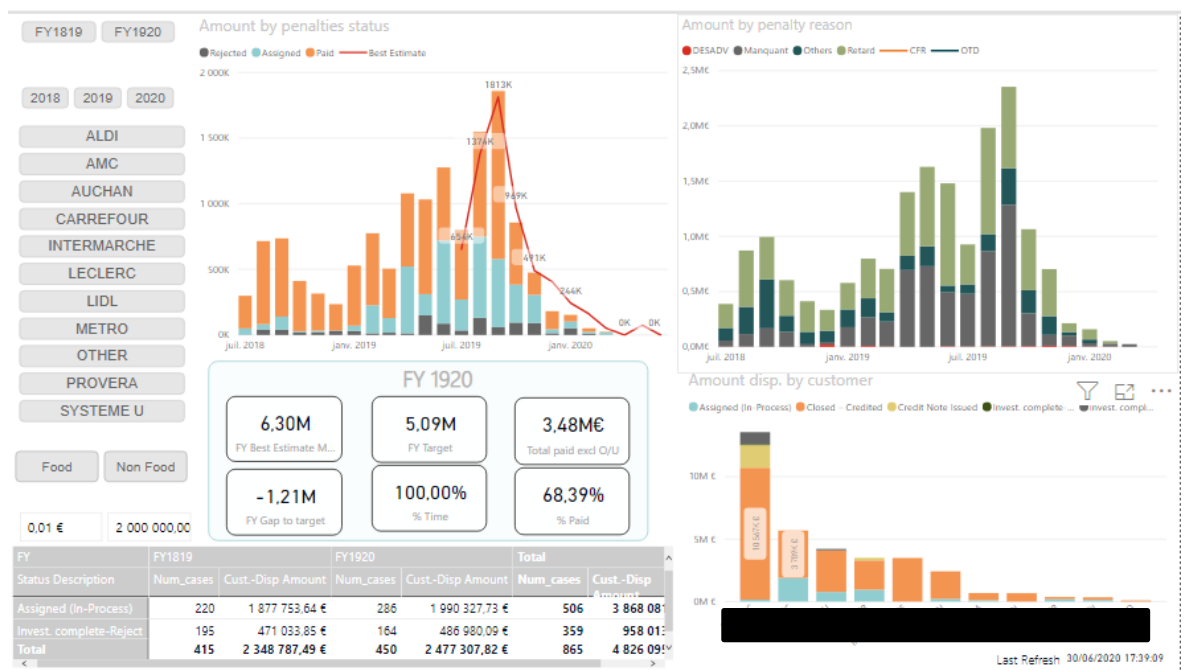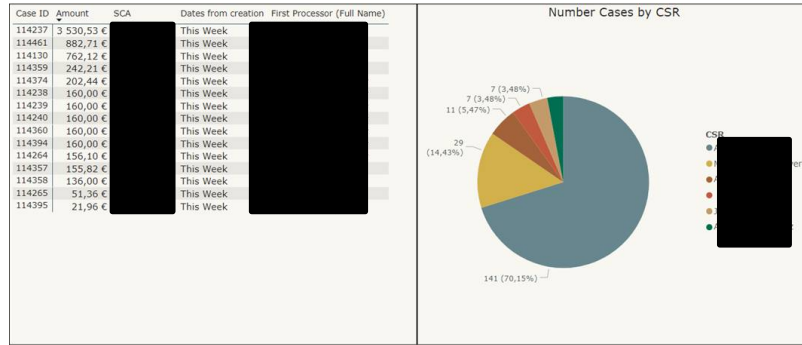## Final versión (June 2020):

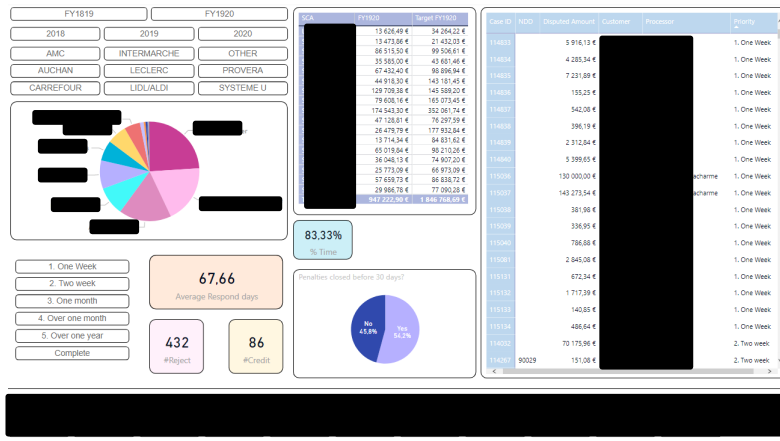

Figure 20: Macro Dashboard design final version

CUSTOMER'S DASHBOARD

Version 1 (Mars 2020):

Figure 21: Customer Dashboard design version 1

Version 2 (April 2020):

Figure 22: Customer Dashboard design version 2

Version 3 (May 2020):

Figure 23: Customer Dashboard design version 3

Final version (June 2020):

Figure 24: Customer Dashboard design final version

3.3   DESIGN II

Below is the information detailed for each of the different dashboard graphics.
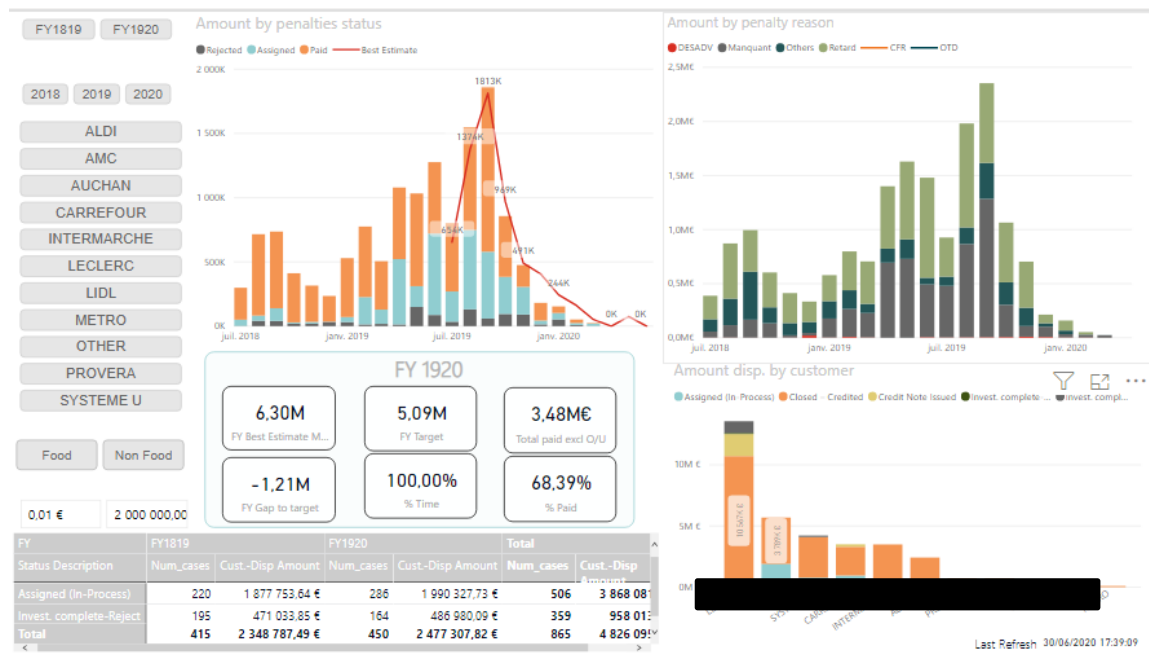
MACRO DASHBOARD

Figure 25: Macro Dashboard

a. Filters

There are four different filters in the macro dashboard, this allows user to choose between fiscal year or calendar year, also choose to have a detailed view of one or more customers and also show penalties from food or non-food.

Figure 26: Filters

b. Fiscal Year view

On the following card we can see the status of the year in the blink of an eye. It updates when a customer is filtered.
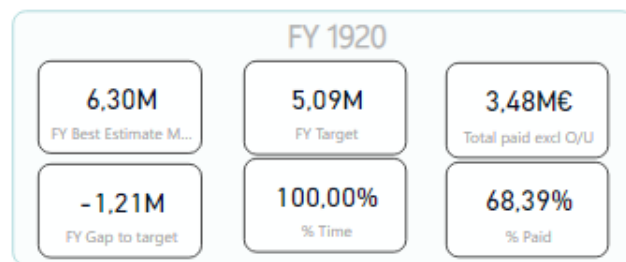

Figure 27: Fiscal Year View

1. Best estimate: how much the company thinks they will pay at the end of the year in the best scenario.
2. Target for this fiscal year.
3. Amount paid during fiscal year up to date
4. Gap to target: Difference between the Best Estimate and the target

5. Percentage of time of fiscal year that has passed already
6. Percentage of money of the target paid already

c. Number of cases assigned and rejected fiscal year

This table shows the number of cases still Assigned (need to be treated) and the number of penalties that have been Rejected (so they need to be negotiated). It also shows the amount that they represent.

FY	FY1819		FY1920		Total	
Status Description	Num_cases	Cust.-Disp Amount	Num_cases	Cust.-Disp Amount	Num_cases	Cust.-Disp Amount
Assigned (In-Process)	220	1 877 753,64 €	286	1 990 327,73 €	506	3 868 081
Invest. complete-Reject	195	471 033,85 €	164	486 980,09 €	359	958 013
Total	415	2 348 787,49 €	450	2 477 307,82 €	865	4 826 09!

Figure 28: Number of cases by status

d. Amount by penalties status
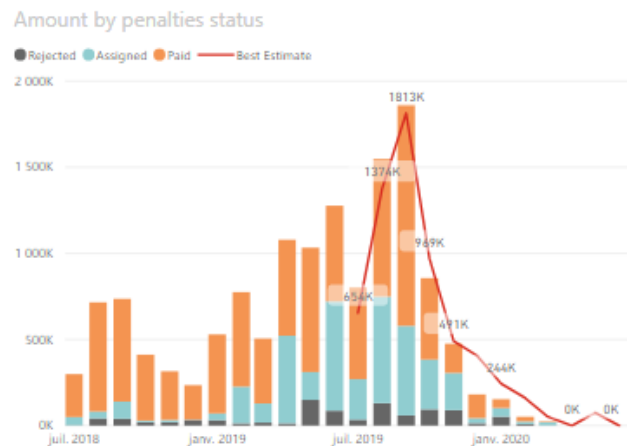
Figure 29: Amount of penalties by status

Amount of rejected penalties are shown in grey, in blue the penalties assigned and the orange represents the penalties already paid. This graphs allows to see how much money is at risk (penalties assigned) and how much are still to be negotiated. The objective is to have only orange bars for the months of the previous fiscal year.

The red line shows the best estimate for each month. This graphs is updated when filters are chosen.

e. Amount of cases by reason
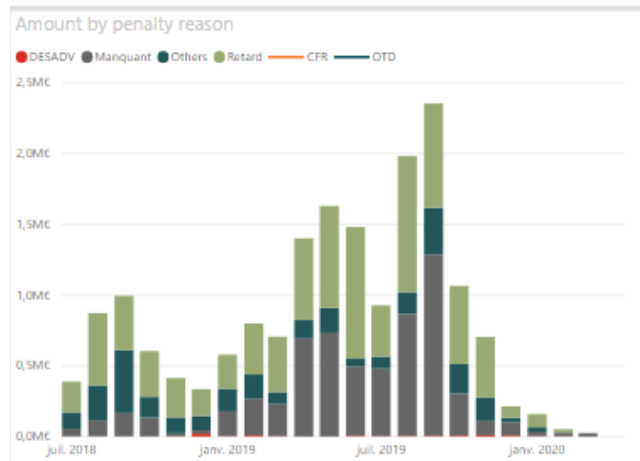
Figure 30: Amount of cases by reason

This graphs shows the amount of money divided by the penalty reason. Penalties can be given because of a missing product (grey), DESADV missing (red) or late deliveries (green). Bars in dark blue show the penalties that do not have a clear reason on the system. Whenever a customer is chosen in the filters, it shows two lines that represent the CFR (Case Fill Rate) and OTD (On Time Delivery).

f. Amount by customer
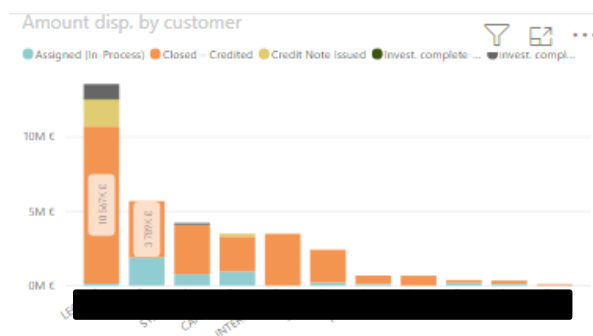
Figure 31: Amount by customer

As seen in the figure above, this graphs represents the amount by customer. It allows to compare between customers and also now which are the customer where most attention should be given.

CUSTOMER'S DASHBOARD

a. Filters
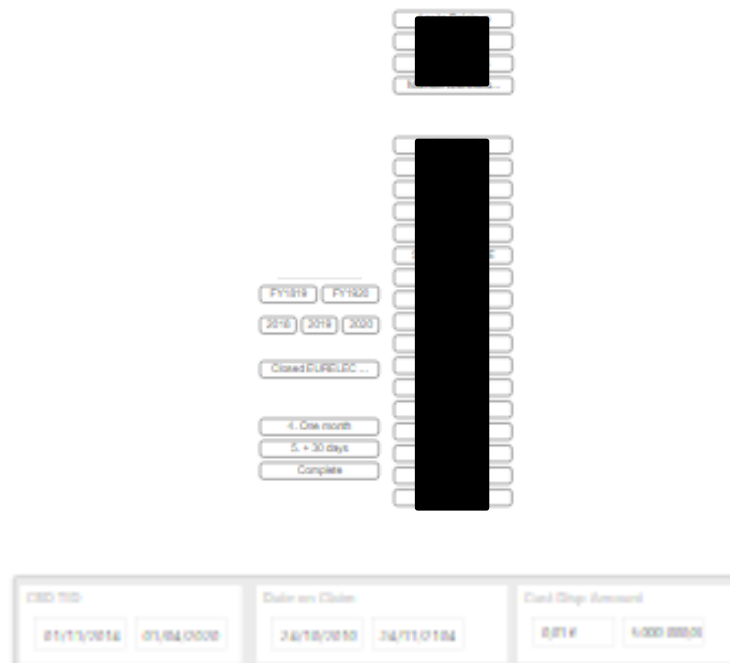
Figure 32: Filters Customer's dashboard

In customer's dashboard there are several filters:

- Fiscal Year filter
- Calendar Year filter
- Open or closed in customer's web
- Days left to treat
- Owner (Customer Service Representative)
- Customer's warehouse

b. Penalties treatment

Penalties treatment part is found on the top of the dashboard. It allows to identify penalties that have not been added to the SAP system, to find penalties by the NDD number and to have a quick view of penalties still left to treat.

Figure 33: Penalties treatment

c. Penalties negotiation

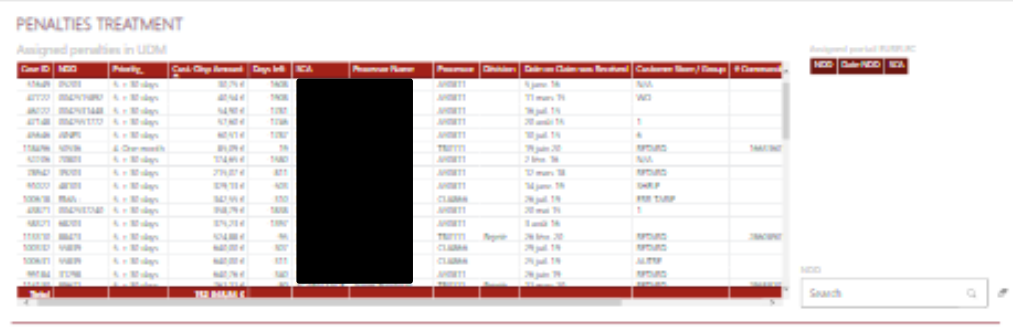The negotiation part of the dashboard allows owner to download an excel very quick to prepare the negotiation with customers. On the right site, the graph represents the penalties divided by CSR (Customer Service Representative).
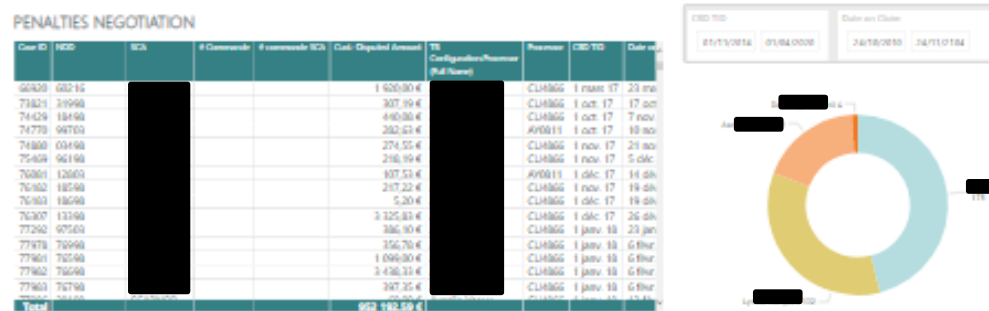

Figure 34: Penalties negotiation

d. Penalties monitoring

The last part of the dashboard allows to follow up the status of each customer's warehouse as well as monitor the Customer Service Representative (CSR) work. It shows the average time spent to answer penalties (it should always be under 30 days) as well as how much penalties are still open and how much money has been paid so far during this fiscal year.
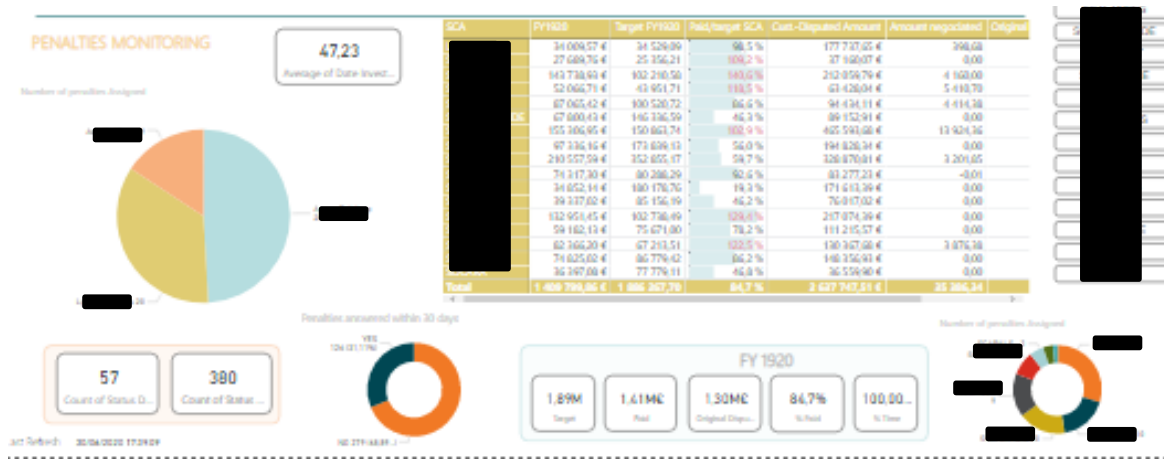
Figure 35: Penalties monitoring

3.4 Manual and automatic version

To ensure the proper functioning of the tool in the future, it has been decided to build two dashboards that are the same in terms of design but different in terms of updating data.

On the one hand, the first dashboard developed is updated manually, i.e. one of the users will be responsible for collecting all the data and entering it into the tool. This mechanism has been especially useful at the beginning of the development of the tool since it has allowed to start training the users and they have been able to use it even though it was not finished and the automatic update was still missing.

To obtain the necessary data for the manual version, it is necessary:

1. Manually download the information from the customer's internet page about their view of the penalty status.

2. Make a manual extract from SAP with all the necessary information. This step has been facilitated by the creation of variants in SAP that allow you to download the necessary document in a few clicks.

This update needs to be done every day in the morning so that the data used by users is accurate. It takes no more than 20 minutes and can be done by any of the so-called SPOC (Single Point of Contact) that have been trained for.

This version, besides having been used at the beginning of the creation of the tool, will serve in the case that the automatic version has any error for some unknown reason. In that case, it will be necessary for the person in charge to make the relevant modifications and publish the tool again in the online version.

On the other hand, the automatic version is the one that currently works and ideally, it will no longer be necessary to use the manual version. This version allows data to be updated without the need for a person to intervene. For this purpose, different automation techniques have been used, which are detailed in the following section. This version is updated in the online version automatically every day at 9.00 am. However, the data is updated at 1.00 a.m., i.e. the 9.00 a.m. update reflects the status of the data at 1.00 a.m. It has been decided to do this because there are different automatic batches during the day to automate other tools and the automation at 1.00 a.m. allows to not disturb any of the other updates.

3.5 DESKTOP AND ONLINE VERSION

Power BI has two different interfaces to work on, the desktop version and the online version. The desktop version in mainly used to design the dashboard and clean the data and then publish the online version. This desktop version is only accessible by the SPOC people to make any modifications or solve any possible problems.

The online version has more limited features, modifications can also be done but in this case it has only been used to share it with the users and set up the automatic refresh. It

is very important to republish any new versions from the desktop online in order to view the modifications on the online version. To be able to go to the online version, an account premium is necessary.

3.6 AUTOMATIZATION

3.6.1 PYTHON

In order to access and obtain the customer's information it is necessary to automatically access the customer's website. To do so, several options were taken into account. First, an RPA was set up. Robotic process automation (RPA) is a technology that allows anyone to configure computer software and makes it possible for a robot to emulate and integrate the actions of a human interaction into digital systems to execute a business process. Robots use the user interface to capture data and manipulate existing applications in the same way as humans. These robots perform interpretations, activate responses and communicate with other systems to operate in a wide range of repetitive tasks. And they do it considerably better, as software robots never sleep, make no mistakes and are much less expensive than employees. [11]

However, once the RPA was developed, it could not be transferred to the central computer as other RPAs in the computer increased the price of the installation.

So it was decided to opt for a python code capable of accessing the website, logging in with a username and password and downloading the document. Once the document was in downloads folder, the code was changed to the corresponding folder. Below is the python code used, hiding the sensitive information.

```
from selenium import webdriver
import os
import shutil
import time
from selenium.webdriver.support.ui import WebDriverWait
from selenium.webdriver.common.by import By
```

```
from selenium.webdriver.support import expected_conditions
as EC

driver                                                    =
webdriver.Chrome(executable_path='C:\\Windows\\chromedriver.exe
')

driver.get("████████████████████████████████████
████████████████████████████/")

ownpgid = █████████████████████████

ownpgpassw = ████████████████████████

pgid = driver.find_element_by_xpath("//*[@id='user']")

pgpass= driver.find_element_by_xpath("//*[@id='pass']")

signbutt    =    driver.find_element_by_xpath("//*[@id='wp-
submit']")

pgid.clear()

pgid.send_keys(ownpgid)

pgpass.clear()

pgpass.send_keys(ownpgpassw)

signbutt.click()

pgid2                                                     =
driver.find_element_by_xpath("//*[@id='table_1_wrapper']/div[1]
/a/span")

pgid2.click()

time.sleep(5)

driver.quit()

qb_import=███████████████████████████████████████
█████████████████████

qb_histo=████████████████████████████████████████
██████████████████████████████████████████████████████
██████████████████████████████████████

shutil.move(qb_import,qb_histo)
```

3.6.2 SIMPLEMENT AND KNIME

SAP is one of the most widely used business applications in big companies. However, in order to extract information from SAP you need to use an application called SAP Business Warehouse (BW) which allows to download reports of SAP data. This BW license is free if

user already has SAP license. Nevertheless, this reports are very slow and complicated to obtain. That is why, in order to be able to access and extract all the necessary information from SAP, it was necessary to use a third party that could perform this extract. The company already has a partner company that produces these extractors for other tools.

The third party is a company called Simplement, a solution to export SAP tables via a common SQL interface. The Simplement solution takes SAP tables, de-clusters SAP cluster tables and other SAP tables and transforms them into regular tables in Microsoft SQL.

Once all the data is transform into Microsoft SQL it has been decided to convert it into an excel in order been able to use it on different platforms and tools. KNIME software has been used to convert all data.

The final document is very large as it contains all information regarding claims and penalties of the last 5 years. In order to minimize the updating time of the excel it has been decided to use KNIME to also reduce the lines extracted. One complete extract has been done once to get all data from the past, after this big extract the next ones will only include the lines that have been modified. KNIME is capable of reading the last modification date and compare it with the last update, if they have changed then it will replace the old line with the line updated with the last changes.

Figure 36 shows the schema of the KNIME where it displays on the left side the connections needed to get the old excel document from the Sharepoint, then the comparation between old lines and new lines and last part on the right it rewrite the old document and replaces it.
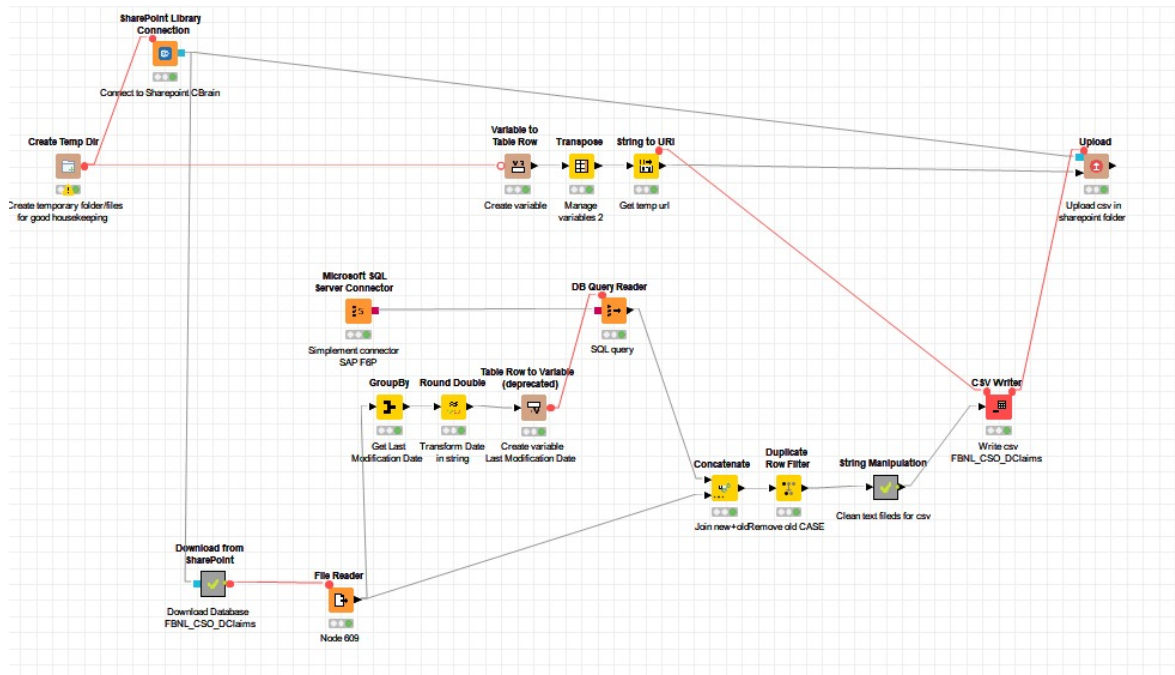
Figure 36: Knime schema

3.6.3 AUTOMATIC BATCHES

In order to launch all different automatizations several batches have been set up. Batches do jobs that can be done without any human interaction or that can be scheduled to run when needed. KNIME Batch allows the computer to open KNIME and launch the necessary actions in order to execute the KNIME code and update the document. The other batch that has been used to start the python code explained in page 37. Then these batches have been built in the central computer of the office which is never turned off (except weekends) and they have been set up on the Task Scheduler of the central computer. Task Scheduler is a Microsoft Windows tool that provides capacity to schedule the beginning of a program or code script at concrete times.

Batches have been configurate on the Task Scheduler as follow:

- KNIME Software update (SAP Extract) : Every day at 1.00 am and Mondays at 7:00.
- Python (Customer's information): Every day at 1:30 am.

However, as explained later on the document, this updates won't be visible in the Power BI until the Power BI is updated.

3.6.4 POWER BI AUTOMATIC REFRESH

As to achieve the online version to refresh automatically it is necessary to set it up on Power BI online. To give access to Power BI to enter the information on the computer, a gateway must be installed, this gateway allows to access the computer and upload the files.

All documents must be keep the same structure so that Power BI can recognized them. The refresh has been set up at 9.00 am and if any error occurs, the people responsible would be inform of the problem.

Chapter IV. IMPLEMENTATION AND CONFIGURATION

4.1. PRESENTATIONS AND TRAININGS

Once the dashboard was ready then the implementation in the team started. First of all, several meetings were set up to explain future users what was the dashboard for and show all the features. After presenting the tool, trainings with all future users were scheduled as seen in the table below:

Week	Position	Topic
19	Customer Representative	Presentation Customer dashboard
19	Managers	Presentation Macro and Customer dashboard
21	Managers	Question & Ask + inputs
21	Individually Customer Representatives	Training
25	SPOC 1– Single Point of Contact	Training
25	SPOC 2– Single Point of Contact	Training
26	SPOC 1– Single Point of Contact	Training

Table 1: Schedule trainings

Training Customer Representative:

During the different trainings with the final users, it was taught how to use the dashboard step by step, as well as an accompaniment to the users in a typical day to show them what they will have to do once connected in the tool. A question-and-answer session was also held, and later a follow-up session was held on the learning process and a session to receive feedback and possible improvements to the tool.

Training SPOCs:

The people responsible for the proper functioning of the dashboard were trained more thoroughly. In it, they were taught how to use it but also all the logic behind the creation of the dashboard, as well as its configuration and automation. In addition, possible errors that could arise and how to solve them were shown.

4.2. DOCUMENTATION

So as to ensure the proper functioning of the project once it has been completed, the entire process has been documented, as well as possible modifications to be made in the future, such as adding a new client. It has also been documented how the different data to be inserted manually every month must be updated.

Job aids:

❑ FR Penalties Dashboard Manual Update: Update data from ▮▮▮▮▮, UDM and paid

❑ Job Aid Update FR Penalties Dashboard: Update Best Estimate, Projection, CFR – Case Fill Rate & OTD – On Time Delivery

❑ Maintenance FR Penalties Dashboard

A. Updates: Yearly Updates, Update Customers List, Update TB List, Dashboard Online Refresh, Dashboard Desktop Refresh

B. Modifications on document name, column header or folder

All trainings have also been documented for both the macro dashboard and the customer dashboard.

Chapter V. RESULTS

In this section the most important and relevant results of the project are highlighted, among which are the proper functioning of the same and the cases of use for which it has been created.

The main objective of the project was to obtain a tool that will allow to have a updated vision of the status of the logistic penalties divided by causes and customers in order to take the right decisions and help prioritize and divide the workload. On top of that, another objective was to help and ease up the work done to verify the penalties.

Firstly, it has been possible to display very useful information quickly by means of the graphics and tables. Graphics are an important part of the application, showing information quickly and intuitively. It is also important to mention that the whole application has a very friendly interface.

Secondly, the data obtained in the dashboard has been checked to verify its reliability and all of them are correct and show the right numbers, something very important to be able to make the right decisions and strategies.

Also, having documented the whole process will allow the continuity of the tool in spite of finding problems and errors in the future. Furthermore, the documentation will allow to train future users following the different guides created. If there are any changes in the future, or something else needs to be created or deleted, it will be easy done thanks to the SPOCs knowledge and also the different documents available.

Furthermore, the implementation of this tool avoids to have millions of euros at risk because of the delay on its treatment. This risk was analyzed to measure the impact of the project and it accounts for around 1,5 million euros. Also it saves up several hours per week for the different users.

In addition, feedback received from the final users stands out, being very positive and all of them have been pleased to have at their disposal a tool to support them in dealing with the penalties.

In conclusion, the final result is very complete tool, user friendly but it still has some room for improvement at the same time. In this project, and all the objectives that have been achieved have been fulfilled but some improvements could be done as explained in the following page.

Chapter VI. FUTURE IMPROVEMENTS

This section briefly describes some future modifications that could improve the current version of the dashboard by adding new functionalities or features or to solve certain weaknesses, or to improve the operation of the tool itself.

Firstly, there is a part of the data that could not be automated and yet it would be very useful to have it automatically. This is the data of the penalties that have already been paid by the company's financial service. This would make it possible to have this information updated once a week, since currently a rather tedious job is done manually, which is only done one week a month.

Also, the insertion of data could be improved manually, since it is a repetitive and manual work that could be automated to be done once a month instead of a person having to be in charge of filling in this information by copying it from another database.

These improvements would make it a more efficient and automatic tool even though the current version works perfectly.

Chapter VII.   CONCLUSIONS

As a result of the project and the work carried out in the company Procter & Gamble France mentioned above, two conclusions of a very different scope are opened.

On the one hand, in the professional field, the final result is the obtaining of the dashboards that will facilitate the follow-up and improvement of the company's penalties, which will result in monetary savings and time control as well as allow for greater agility in the response and negotiation of pending penalties, alerting them to the proximity of their expiration, etc. This will facilitate the work of the people responsible since the extraction of numerous data has been automated and with this project all the databases will be updated automatically and in a synchronized way.

In addition, I have had the opportunity to get to know what it means to work in a multinational company and to learn its working systems, the organization of the company and to get involved in the activities of the company. I have also learned the values of the company and its know-how. I have learned how the logistics system works and its particularities.

On the other hand, in the personal area, I have put into practice the knowledge acquired during the degree and the master, developing my personal skills of teamwork, companionship, understanding and listening, communication skills and time management. I have been able to integrate into a professional environment and carry out all the tasks assigned to me successfully. I have also developed autonomy, improved my decision making and problem solving skills. Moreover, given the situation experienced in recent months due to the pandemic that has been a challenge for both the organization and myself, I have been able to adapt to the changes by working with total independence and taking on the technological challenges. I have enjoyed working in the company and I have seen that with work you can implement changes that help to achieve the objectives of the company.

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ANEX I: ACRONYMS AND ABBREVIATIONS

- CFR: Case Fill Rate
- CLOM: Customer Logistics Operations Manager
- CSR: Customer Service Representative
- FY: Fiscal Year
- OTD: On Time Delivery
- SAP: Systems Applications and Products
- SPOC: Single Point of Contact

ANNEX: SUSTAINABLE DEVELOPMENT GOALS (ODS)

The ODS were adopted by world leaders at the United Nations on September 25th 2015. Among the main goals are ending hunger, creating fair and equal conditions for all human beings, gender perspective, accessibility to water and the deterioration of the planet and resources.

In addition, the UN remarks that action is needed to reduce social inequality, corruption, racism, disease and xenophobia among other factors that prevent peace and generate conflict. Each of the challenges has specific goals that must be achieved in the next 15 years so that we can live in a world where there is peace and avoid conflicts and wars. To achieve these goals, the involvement of everyone is necessary, both individuals and companies, politicians and other groups, including universities.

From now on, our university will demand the inclusion of an appendix in the final degree and master's work that refers to the 2030 Agenda and the sustainable development goals. I believe that this is a very powerful initiative in terms of making students aware of these objectives, as well as creating a space for personal reflection on what one can contribute to the cause.

In my case, my project is not related to any of the objectives, which is why I have decided to include in my work a personal reflection on the individual responsibility of each person, especially the students, in the face of a problem for which many consider themselves not to be responsible.

During the last decades, society has prioritized its personal interests over those of the social whole, which has produced different conflicts and instability. We have become used to buying without asking where the products come from, what materials they are made of or who made these products. We have been blinded by the price of things and by the greed to accumulate wealth and expose it. All this is accompanied by a moment in history when we spend more time looking at screens than enjoying life.

A change of consciousness is urgently needed, to enable us to act in accordance with our values. Or perhaps the problem is that we must revise those values. Stop being guided by what others will think and fight to do what is really right because, at what point did it become acceptable to wear shoes made by people in subhuman conditions? Is it really necessary to take that fruit that has crossed the whole world instead of waiting for its season? There are many incongruities to which we no longer have an answer because we have become used to them being normal but they should not be.

This change of consciousness is already beginning to be noticed in the new generations, but when the time comes for them to take up the positions where decisions are made, it may already be too late to avoid the consequences. It is necessary that we all get involved and use our energy to build a citizenship that will rebuild pillars based on solidarity and that will allow us to achieve the Sustainable Development Goals.

There are many ways in which we can participate in building a better society and we must act as soon as possible. From the university we should manage to reach all the students who in turn will have the responsibility to make their families aware because it is a team effort and everyone must be involved. We have to relearn some of our customs to create habits that respect the environment and other living beings with whom we live. It is in our hands to see the world grow or see it perish.