Product Substitution in the Fast Moving Consumer Goods Sector - Process Mapping and Analysis

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To my parents, brother and sister,
To my grandmother,

"Behind every great leader there was an even greater logistician."
James M. Cox

Abstract

In order to stay competitive in the Fast Moving Consumer Goods (FMCG) industry, companies strive under the pressure from the market by constantly adapting themselves to the consumers' needs.

New products are regularly being developed and introduced in the market and, thus, the supply chain needs to be adapted in order to successfully launch products on time and simultaneously keep the right inventory levels. To this extent, it is essential to optimize the processes which are responsible for detecting consumer needs, developing products and actually launching them.

In today's global marketplace, most of the FMCG companies use the Manufacturing Resource Planning (MRP II) system to integrate all the disciplines of the supply chain and optimize the planning activities. Nevertheless, the synchronization required whenever the company is introducing a new version of a product by discontinuing an old one is still an area that most of the FMCG companies struggle with.

It is in this context, that this project was raised and led to the purpose of this dissertation: Product Substitution in the Fast Moving Consumer Goods Industry - Process Mapping and Analysis.

Taking into consideration the complexity of the process and the fact that it greatly relies on human performance, it was noticeable that the performance of the team was depending on additional factors not exclusively associated with the process design.

Therefore, an analysis on a managerial level was made and five focus areas were defined: communication, ownership, synchronization, knowledge management and performance measurement.

For each area, different measures were taken or recommended with the ultimate goal of improving the overall performance of the focal company regarding product substitution. This is expected to affect the output measures by reducing the non-productive inventory of old raw, pack, intermediate and finished products, generating cash savings and by increasing the efficiency of the process, enabling the new products to arrive to the market on time.

It is noteworthy that the creation of a common understanding of the process across the teams is a critical step towards the process improvement, although it is still too early to quantify the impact of most of the actions taken throughout the project execution.

Furthermore, the introduction of a developed monitoring system will create the foundation for discussions and improvement, allowing the team to track their performance on a continuous basis, perform analysis and adapt the process whenever it is needed.

Resumo

Na indústria de *Fast Moving Consumer Goods* (FMCG), as empresas, constantemente submetidas à pressão do mercado, esforçam-se por se adaptar às necessidades dos consumidores, a fim de manterem a competitividade pretendida.

Novos produtos são regularmente desenvolvidos e introduzidos no mercado, daí a necessidade de adaptar a cadeia de abastecimento, de modo a, atempadamente, lançar com sucesso produtos, mantendo, em simultâneo, os níveis de inventário corretos. Nessa medida, é essencial otimizar os processos responsáveis pela deteção das necessidades dos consumidores, o desenvolvimento de produtos e o seu lançamento no mercado.

No mercado global de hoje, a maioria das empresas de FMCG usa o sistema *Manufacturing Resource Planning* (MRP II), com o objetivo de integrar todas as disciplinas da cadeia de abastecimento e otimizar as atividades de planeamento. No entanto, a sincronização necessária, sempre que a empresa está a introduzir uma nova versão de um produto e a interromper a venda de um antigo produto, é, ainda, uma área que a maioria das empresas de FMCG tem dificuldade em lidar.

É neste contexto que surge o projeto que serviu de base à presente dissertação: Substituição de Produto na Indústria de *Fast Moving Consumer Goods* - Mapeamento e Análise do Processo.

Tendo em consideração a complexidade do processo e o facto de este depender muito da ação humana, ficou evidente que o desempenho das equipas dependessem de fatores adicionais não necessariamente associados com o mapeamento do processo.

Assim sendo, foi feita uma análise a nível gerencial e foram definidas cinco áreas de foco: comunicação, propriedade, sincronização, gestão do conhecimento e medição do desempenho.

Para cada área, foram tomadas ou recomendadas diferentes medidas, com o objetivo final de melhorar o desempenho global da empresa em foco, em relação à substituição de produtos, reduzindo o inventário não produtivo de matérias primas, produtos intermédios e acabados, gerando, assim, oportunidades de redução de custo e aumentando a eficiência do processo, o que permite que os novos produtos cheguem ao mercado atempadamente.

É de salientar que a criação de um entendimento comum do processo entre as equipas foi um passo crítico para a melhoria do processo, embora seja ainda cedo para se quantificar o impacto da maioria das ações tomadas ao longo da execução do projeto.

Além disso, a introdução do sistema de monitorização desenvolvido criará a base para discussões e melhorias, permitindo que a equipa acompanhe o seu desempenho de forma contínua, faça análises e implemente adaptações no processo sempre que necessário.

Acknowledgments

Writing a dissertation in a country I did not know before, far away from my family and most of my friends, during one of the coldest winters ever, was definitely not as easy as I thought it would be.

Luckily, I had extraordinary people around me and good energy coming from different sources that kept my heart and soul warm even when it was -20 °C outside.

To Ildiko and Artem, thank you for supervising my work in the company, guiding me when the path was not so clear and to Christopher, Emanuela and Andrzej, I would like to thank for the trust and for always finding a space in their extremely busy agendas to talk with me.

I would also like to thank to my coordinator from FEUP, Prof. Pedro Amorim, who was able to keep me on track even with the long distance and guided me through this journey by sharing his wisdom.

To my family, thank you for transmitting to me the correct values, for supporting me in all my decisions and for teaching me I should never give up.

To all the people from the company, especially from the Feminine Care Category, with whom I had the opportunity to work with – from Raw Materials to Distribution Planners – thank you for the time you spent answering to my questions.

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Finally, I would like to mention the Erasmus+ programme that financially supported me during my stay in Poland.

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Acronyms

AW- Artwork

BOM- Bill of Material

CFR- Case Fill Rate

CSP- Category Supply Planning

DDS – Daily Direction Setting

DP- Demand Planning

DRP – Distribution Requirements Planning

FMCG- Fast Moving Consumer Goods

FP – Finished Product

FPC- Finished Product Code

IDE- Inventory Disposition Expense

IL – Initiative Leader

INC- Interchangeability

IOL- Initiative Operations Leader

IOP-t- Initiative Operations Planning Tracker

IWS- Integrated Work Systems

MD – Master Data

MIL – Market Initiative Leader

MRP II – Manufacturing Resource Planning

MSM – Material Supply Management

NPI – Non Performing Inventory

OPL – One-Point Lesson

PI- Phase-in

PIPO- Phase-in, Phase-Out

PO- Phase-Out

PSC – Planning Service Center

PS – Product Supply

RPM – Raw and Pack Materials

SIP – Site Integrated Planning

SKU- Stock Keeping Unit

SMO – Selling & Market Operations

SNO – Supply Network Operations

SOS- Start of Shipment

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1 Introduction

This chapter starts by presenting the purpose of this study followed by the focal company where the work for this dissertation was developed. It is important to mention that due to confidentiality reasons, the company where the study took place will be referred to as Polonex throughout the rest of this paper. Later the introduction to the case study as well as the structure of this dissertation are given.

1.1 Purpose

In the fast moving consumer goods industry, multi-site production planning has emerged as one of the most challenging problems during the recent years. In reality, the focus in production planning and scheduling is shifting from the management of plant-specific operations to a holistic view of the entire supply chain comprising value adding functions like purchasing, manufacturing and distribution (Bilgen, B. & Günther, H., 2009).

In order to increase the performance of the entire logistic chain, most of the companies are now operating with ERP systems that allow them to integrate different disciplines from the supply chain network. Some companies go even further, by centralizing multiple planning activities in a single location.

By shifting the operational and strategical planning from a specific market to a centralized planning centre, although there are several synergy opportunities, there are also many issues that can emerge especially in the adaptation period. In fact, by changing the structure of the company, even if the business processes may stay practically the same, the way they are managed can dramatically change.

In order to evaluate which factors are influencing the performance of a process in an organization that is going through a major structural change, a case study was held at Polonex, taking into consideration one of their main business processes: the product substitution process.

The process analysis goes beyond the way the system is structured since this process highly depends on human performance and it is believed that there are another factors impacting the performance of the process.

With this in mind, the main goals that were set-up for this research are:

- Mapping of the Product Substitution process.
- Get a clear understanding of the impact of the process in the daily activity of the employees.
- Identify the main lines of action by analysing the process as-is.
- For each focus area, gather a set of actions to be implemented in a short and long-term in order to improve the performance of the process.

1.2 The Company

Polonex is a multinational fast moving consumer goods company founded in 1837 in the United States of America. Nowadays, its portfolio include more than sixty-five brands being them divided into different product categories: Fabric Care (laundry detergents, fabric enhancers), Home Care (dish care, air care, surface care), Baby Care (diapers, wipes), Feminine Care (tampons, pads, adult incontinence), Family Care (paper towels, tissues, toilet paper), Hair Care (shampoos, conditioners, styling aids), Grooming (blades, razors, shaving products), Oral Care (toothbrushes, toothpaste), Skin and Personal Care (lotions, antiperspirants, deodorants) as well as Personal Health Care (gastrointestinal, respiratory, supplements).

In order to make these brands reach the consumers, Polonex is divided into six regional Selling & Market Operations (SMOs) focused on selling and distributing products. (Figure 1) These regional and local SMOs reach consumers in over 180 countries and are responsible for developing and executing local plans that serve consumers wherever, whenever and however they want.

Figure 1- Polonex' Net Sales distribution by geographic region, 2016

When it comes to the functional distribution, Polonex is divided into seven areas: Brand, Finance & Accounting, Human Resources, Product Supply, Legal, R&D and Information Technology. The work of all these disciplines is led in a global, regional and local level.

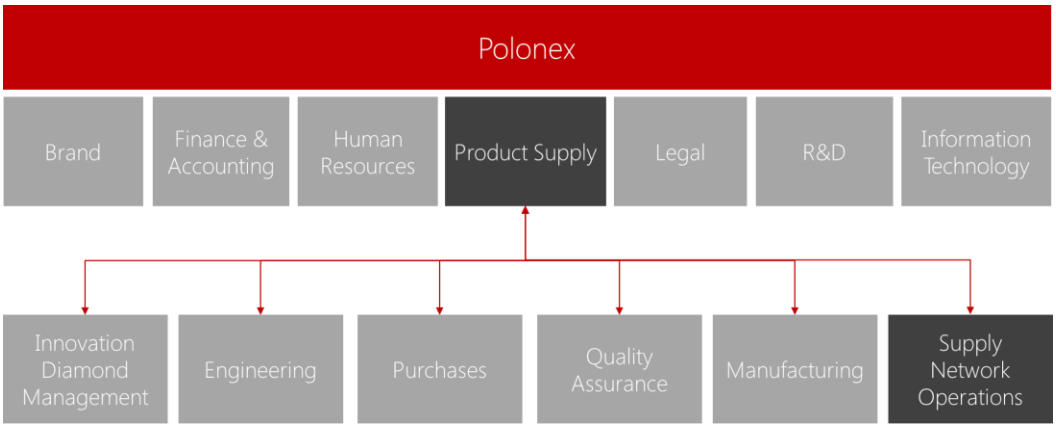


Figure 2- Functional structure of Polonex

The European Planning Service Center (PSC) is responsible for all the Supply Network Operations Planning and this project was executed under this segment that is highlighted in dark grey in the Figure 2.

1.2.1 The European Planning Service Center (PSC)

Polonex centralizes all the planning efforts for supply network operations into one location per region – a Planning Service Center. With this centralization, all the planning activities required to coordinate the supply chain - suppliers, production plants, warehouses, distribution centers and transportation- are brought together, increasing synergies and communication between the different teams.

The Planning Service Center for Europe was only inaugurated in 2013 and it is located in Warsaw, Poland. From this center, more than 850 people are supporting major Polonex' businesses across Europe, being responsible for the supply network operations planning.

Inside the Planning Service Center, there are vertical teams that manage specific categories (Fabric Care, Home Care, Feminine Care, etc.) but there are also horizontal teams that manage across all categories – Customization Planning and Execution, Demand Planning, Artwork Planning, External Supply Solutions and Capability Team. A representation of the structure of the PSC is depicted in the Figure 3.

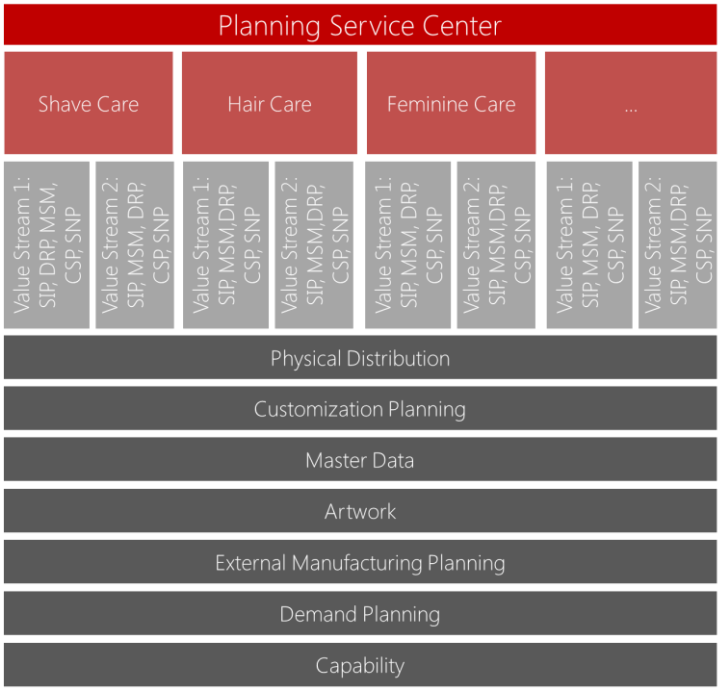


Figure 3- Structure of the Planning Service Center

Supply Chain Management is a very delicate process, especially in the Fast Moving Consumer Goods sector as changes in the product portfolio are happening all the time and at an extremely fast pace.

Therefore, it is crucial that all these vertical and horizontal teams are synchronized and work together in order to perform successfully in a set of output measures which in the PSC case are: Service, Inventory and Cost Savings.

Vision of the European PSC

"We are the best supply chain leaders on Earth and Polonex's business competitive advantage in Europe. We are ALL IN to Win and we love it here!"

Equity of the European PSC

"The heart of Product Supply"

1.2.2 The Feminine Care Category

As mentioned before, Polonex is divided into different categories being the focus of this project in one of them - Feminine Care. Under this segment, we can find different value streams namely Adult Incontinence, Pads (Ultra and Thick), Tampons and Liners. Whenever the final product is a mix of other finished products, it is called customization and in this case it is handled as a separate value stream.

In order to produce these products, Polonex has six plants spread all over Europe being them in Budapest in Hungary, Montornes and Jijona in Spain, Borispol in Ukraine, Crailsheim in Germany and Gebze in Turkey (Figure 3).

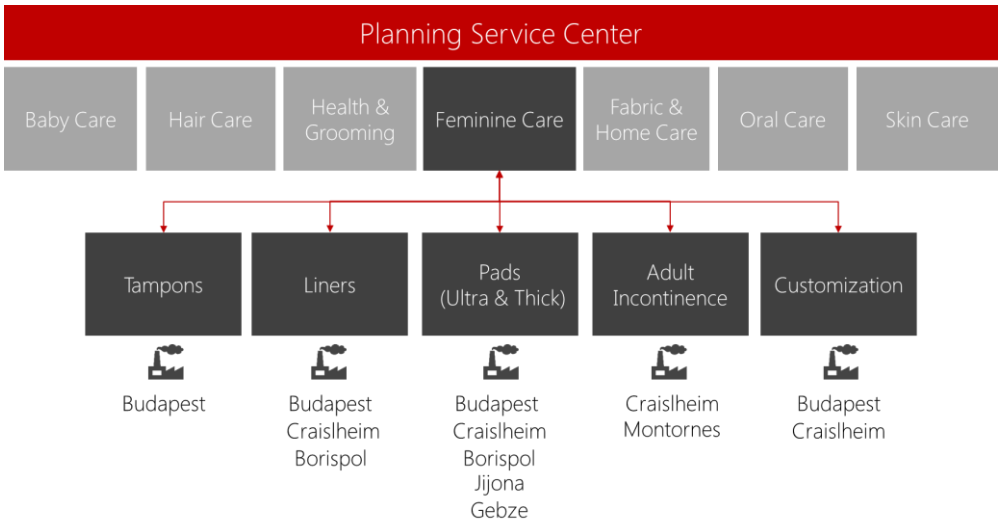


Figure 3- Distribution of plants per value stream of the Feminine Care Category

Besides these plants, fourteen distribution centers of Polonex in Europe are being used by the Feminine Care Category in order to make these products arrive to the customers. In these distribution centres multiple products of Polonex from different categories are combined in order to minimize the costs of transportation and at the same time ensure a high quality service.

1.3 Scope and Methodology

Alike all the fast moving consumer goods companies that want to stay competitive in the market, Polonex is constantly looking for unmet needs from the consumer side which results in an increased or updated products' portfolio.

Most of the times Polonex introduces a new product (Phased-in), an old product is discontinued (Phased–out) and it is crucial that the substitution of products in the supply chain is cautiously made as it is directly affecting the output performance measures – Service, Inventory and Cost Savings.

From the Supply Network Operations perspective, this requires several changes in terms of set-up of systems, but also in terms of inventory management.

Implementing these changes throughout the whole supply chain is quite challenging as all the functions need to be perfectly aligned: if they execute their tasks too late, the new products will arrive too late to the market, decreasing the service level. However, if the tasks are performed too early, there will be significant amount of stock of old-products unutilized, contributing to the increase of non-performing inventory. This will end up in high quantities of raw, pack and finished products being scrapped and high costs for the company.

1.3.1 Project Scope

Regarding the scope of the project, as it was mentioned before, this study is going to take place under the Feminine Care Category of Polonex, focusing on the tasks that need to be executed at the Planning Service Center.

Also, besides what was already described, the product substitution initiatives can have different origins depending on who is actually introducing this substitution in the supply chain. Some of these changes are initiated by the Initiatives team, some by the Global Material Development and Supply Organization and sometimes even from other bodies. As only the initiatives started by the Initiatives team are completely managed at the Planning Service Center, only these ones will be included in the project's scope.

Thus, for the execution of this project, only the Product Substitution projects from the Feminine Care Category managed by the Initiatives Team will be considered.

1.3.2 Methodology

In order to get a holistic view of the process, how the sub processes were linked as well as getting an understanding of the problems the organization was facing, the shadowing method was used for the first part of the project execution.

Shadowing is a "research technique which involves a researcher closely following a member of an organization over an extended period of time." (McDonald, 2005).

The difference between shadowing and most of all the other organizational research methods, is that this method does not only focus on gathering data, but also collecting opinions and behaviors.

While shadowing all the people involved in the process, the What, When, Why and How (3W1H) method was used in order to get the general overview of the process. This information was important to map the process, but also to serve as a basis for the training material that was later created. Several meetings with different organizational leadership levels also took place during this stage.

Besides that, as Polonex has different categories (Baby Care, Hair Care, Fabric Care, Home Care, etc.) and all of them have different approaches to product substitution according to their needs, the benchmarking method was used in order to get to know the current best practices.

After gathering all this information and analyzing the process based on the state-of-the-art regarding business process management, five lines of action were identified.

For each focus area, a set of actions was suggested in order to improve the overall performance of the process. Small changes were being implemented throughout the time this case-study was being held, but due to time restrictions, it was not possible to test everything that was proposed.

However, a meeting with the top management team took place where the analysis made as well as all the recommendations were presented and most of the recommendations will be included in the action plan for this fiscal year.

1.4 Structure of the Dissertation

This dissertation is divided in five chapters followed by an appendix section where some of the mapping documentation as well as extra information can be found.

In the first chapter an introduction to the place where the case study was held as well as an introduction to the project itself is made. The motivation and goals for this project can also be read in this section.

Secondly, the theoretical foundation for this project is presented. Not only the state-of-art regarding business processes, continuous improvement, performance measurement and integrated planning can be found in the second chapter, but also the way these concepts are interpreted by the company where this project took place.

In the third chapter, the process-in-scope is presented with some more detail including the most important actors, sub-processes, milestones as well as the communication tools that are currently being used during the process execution. After introducing the as-is process, a general analysis is made, enlisting the main issues encountered by the company that influence the process performance.

Taking into consideration this analysis, in the fourth chapter, the five lines of action that were designed are listed. For each focus area, the current status is introduced and later the changes that occurred during the time-span of this project as well as future recommendations are presented.

Finally, in the last chapter, the conclusions regarding the subject of this study can be read as well as the perspectives for a future work on the topic of this dissertation.

2 Theoretical and Business Framing

In this chapter, the state-of-art regarding the topics that served as basis for this study can be found. Furthermore, in the end of each subtopic, there will be an explanation of how these concepts are approached by the company or how they affect the daily work of the employees.

2.1 Business Processes

There are several definitions about what a business process or simply process is, depending on the context. According to Alec Sharp and Patrick McDermott (2001) a process is "a collection of interrelated work tasks, initiated in response to an event, achieving a specific result for the customer and other stakeholders of the process". In a more simplified way, Paul Harmon (2010) says that a process is "a bounded set of activities that are undertaken, in response to some event, in order to generate an output." (Figure 4).

In fact, the most important factors regarding a process are the actors involved and the activities they are executing, but also very important are the inputs and the outputs of the process after the actions being taken. Without these two events, there is no need for a process. Every business process must have a specific result, and we should also be able to trace it back to the event that triggers it (Sharp & McDermott, 2001).

Figure 4 - Representation of a simple process

2.1.1 Process Management

There are different areas related with Process Management and also different approaches can be followed when the desired outcome is to improve a process.

According to Sharp, A., and McDermott, P. (2001) a process is supported by six enablers being them workflow design, information technology, motivation and measurement, human resources, policies and rules and facilities design.

In a similar way, Brocke, J. (2015) considers that the five critical enablers for a high-performance process are the design, metrics, performers, infrastructures and the process owner.
In both approaches, it can be seen that the design of the process is just a part of the set of key points that influence the performance of a process and that there are other factors to take into consideration when analyzing a process as "having some but not all of these enablers for a process is of little or no value" (Brocke, J., 2015).

One of the most common ways of improving a process is the process reengineering but before that, a major analysis of the existing process needs to be made. Once the gaps are identified, there should be a "redesign effort that should significantly improve the process". Some of these changes can be made by for example, removing non-value added steps or automating part of the process. Regarding the management component of process improvement, the company should "focus on changing the way managers plan, organize, measure and control their process." (Harmon, P., 2010).

It is also known that in order to improve a process, it is important that the process is defined and it is measurable (Figure 5).

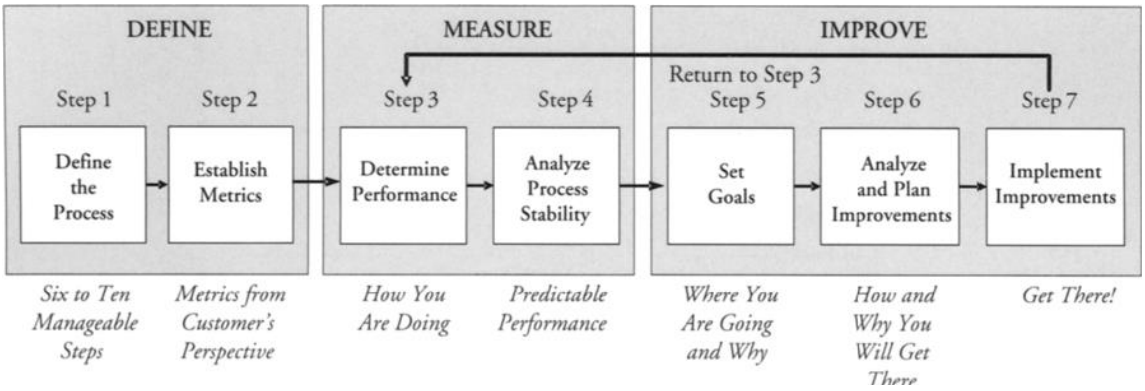


Figure 5- Steps of the process management process (Harmon, P., 2010)

2.1.2 Process Modelling

While modelling a process, the main question that will arise is with how much detail we need to describe it. And to answer to that question, many others will appear regarding the goal, target group and what is actually relevant or not for these parties to know.

Thus, the level of detail is something that should be defined from the very beginning. It is practically impossible to describe the entire process with all the details correctly. However, there are some guidelines a model should follow in order to be useful.

It is very common that people start mapping a process and including everything into one big model. However, "it is usually far better to break up a given domain problem into a number of discrete chunks that working together solve the problem" (White, S. & Miers, D., 2008).

Also, as above mentioned, the modeler should take into consideration the fact that someone else will read this model and should understand exactly the message and what are the actions that need to be implemented.

While mapping a process, there are different tools that can be used depending on the goal of the representation and level of detail. Some examples are swim lanes, flowcharts (Figure 6), responsibility matrix and activity worksheets.

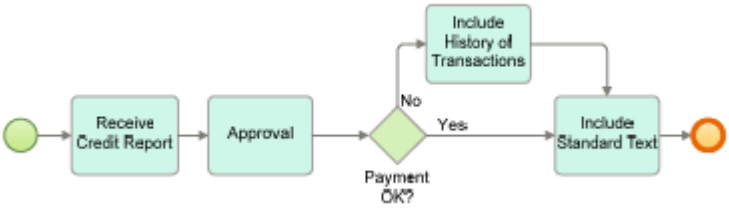


Figure 6- Sample of a flowchart (White,S. & Miers, D. 2008)

2.1.3 Process Modelling Notation at Polonex

Although there are some Process Modelling Notation principles, this notation can differ from company to company. It is important though, that consistency is maintained in order to make it easy for every employee to understand the documents.

Below, the process modelling notation used in the company and, thus, applied while mapping the process is going to be displaced.

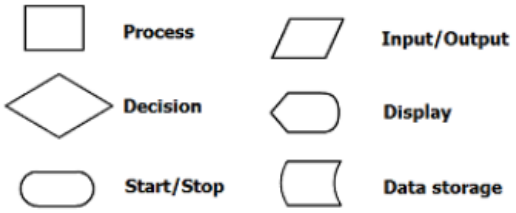


Figure 7- Process Modelling Notation used by Polonex

In order to simplify the design of the flowcharts, Polonex also has a Flowchart Wizard tool that was used in this project (Figure 8).

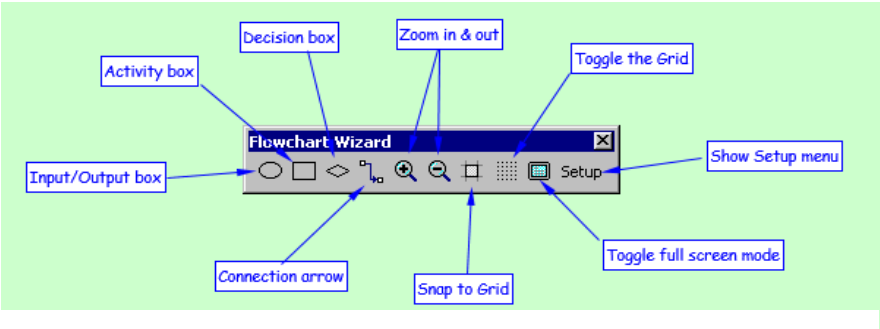


Figure 8- The Flowchart Wizzard Tool of Polonex

2.2 Continuous Improvement

Continuous Improvement is nowadays present in most of the companies and it can be applied in multiple areas of a business. In this section an introduction to the Lean Philosophy can be read as well as the way this philosophy is incorporated in Polonex- The IWS Philosophy.

2.2.1 Lean Philosophy

There are several methodologies that are linked with the lean philosophy but all of them lay on the principle that all forms of waste should be identified and eliminated. According to this philosophy, before results can be improved, processes must be improved (Berger, A., 1997). Loss elimination can be done focusing on the different types of wastes that can be related to inventory, motion, over-processing, overproduction, defects and transport.

Although this philosophy was initially present in manufacturing, according to Morgan, J. (2005) it can also be applied to other business processes in the enterprise, for example product development or services.

Sharp, A., and McDermott, P., (2001) consider that Lean Philosophy and Process Reengineering are extremely linked and can be both be brought together under the term “process management.” If reengineering a process is done once (or periodically), then improving it goes on forever.

2.2.2 IWS Philosophy

Besides being an integrated management model, Integrated Work Systems (IWS) is a philosophy that is present at Polonex and the two main cultural elements where it lies on are the zero defect mentality as well as the total employee involvement.

The IWS system is divided into different pillars and each of them is connected with methodologies and tools that are used on a daily basis at Polonex to develop the required capability to achieve zero losses and defects (Figure 9).

A brief description for each pillar can be found below, being the most relevant pillars for the development of this project explained into more detail later.

Leadership

The execution of Leadership Pillar work is aimed at achieving the Business Objectives (Compelling Business Needs and Performance Targets) and the Cultural Objectives (Vision). The Leadership Pillar synchronizes the whole IWS implementation and focuses on elimination of losses associated with leadership capability, systems and behaviors.

Organization

The purpose of this pillar is to provide methods to integrate all IWS Pillars and provide a set of behaviors, systems and structures that improve the organization's capability to deliver breakthrough business results with 100% Employee Involvement.

Focused Improvement

The focused improvement aims at reducing losses and defects by analyzing and increasing the efficiency of equipment, processes and organizations.

Autonomous Maintenance

The purpose of this pillar is to ensure that the teams operate at zero defects without outside intervention by teaching people new ways of thinking and working, increase the skills of the team and establishing basic conditions to keep equipment well-maintained.

Progressive Maintenance

Polonex aims at having Progressive Maintenance by achieving optimal equipment and process conditions in a manner that is efficient and cost effective.

Education & Training

Lack of skills or knowledge are often identified as root causes of losses. Therefore, training is assigned to employees in order to create the capability to identify and eliminate losses.

Initiative Management

The initiative management pillar provides tools and frameworks to define, design and introduce projects at minimum cost, eliminating defects, losses or extra work. Initiatives include product, materials and equipment projects affecting production and logistics systems.

Quality

This pillar aims at developing required capability to ensure zero product defects, zero quality incidents, and that all regulatory requirements and Polonex's quality expectations are met.

Work Process Improvement

Optimizing and standardizing the processes in order to improve the productivity and reduce costs is another pillar of the IWS philosophy.

Health/Safety/Environment

The Health, Safety and Environment pillar ensures the safety of people, equipment and environment aiming at zero accidents and incidents.

Supply Network

The supply network pillar assures the capacity to eliminate losses as defined by the business needs and CBN of the PSC and the creation of standards to manage, integrate, and optimize the entire supply network interaction, from suppliers to customers and, ideally, to the shelf.

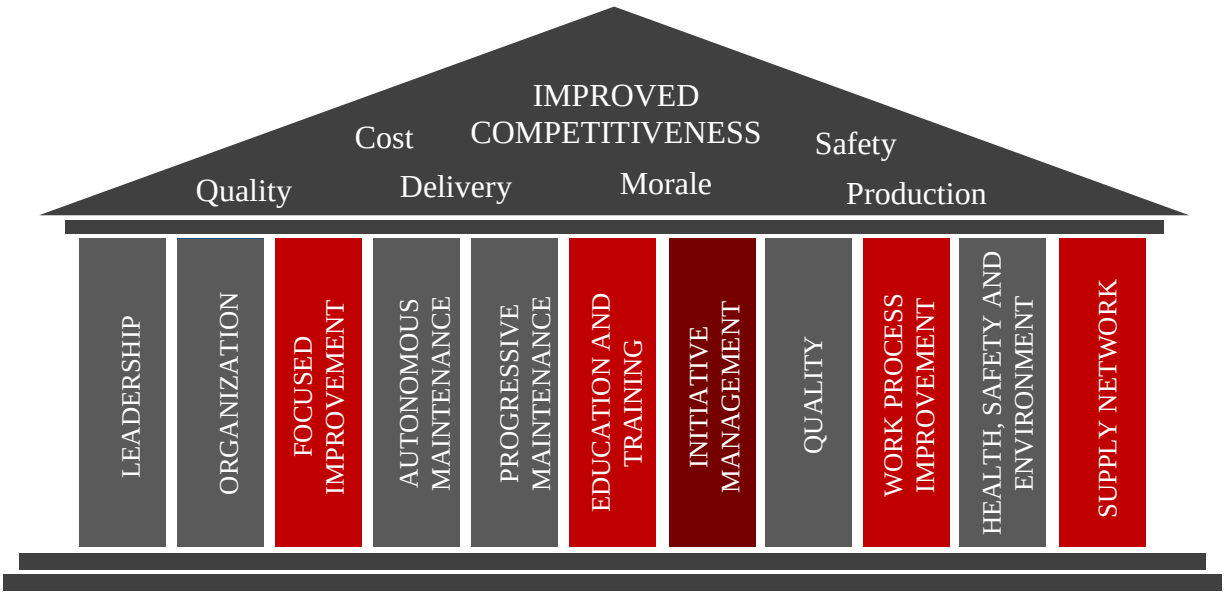


Figure 9- Pillars of the Integrated Work Systems Philosophy
(in red the pillars related with this project and in dark red the most relevant to it).

The IWS pillars above mentioned are several times connected between each other and this project is not an exception.

Being the project about the substitution of products in the market, it is automatically under the Initiative Management Pillar as each change is considered a different project, creating disruptiveness in the logistic processes. Although this is the most important pillar, the project is also touching other IWS areas.

Taking into consideration the transversal component of this project across the whole supply network, aiming at the synchronization of all the different disciplines from suppliers until the end consumers, the Supply Network Pillar of the IWS philosophy is also involved.

The Work Process Improvement and Focused Improvement pillars are also present as this project aims at improving the product substitution process.

Lastly, as it was explained before, Polonex has a very new team of employees at the Planning Service Center and the expertise was still not developed to the maximum extent. Therefore, it is also one of the focus of the project to build capability across the team.

2.3 Performance Measurement

Quoting James Harrington (1999), a pioneer in performance improvement and quality management, measurement is essential if you want to control and improve because "If you can't measure something, you can't understand it. If you can't understand it, you can't control it. If you can't control it, you can't improve it."

In an enterprise, performance can be measured in several ways taking into consideration different perspectives. For example, from the operations point of view, performance can be perceived as good results in terms of quality, speed, cost and flexibility whilst from a marketing perspective, performance is measured in terms of user satisfaction, or strategy execution effectiveness (Neely A., 2002).

Even when looking from an operational point of view, there can be different areas of performance measurement, however, it is important that a team has a common performance objective creating value to all stakeholders as this is a key concern within the performance management (Sari, R., 2014).

When it comes to the Planning Service Center of Polonex, although different areas have different Key Performance Indicators, all the areas have the common goal of increasing the Operational Total Shareholder Return, being this the end outcome measure.

2.3.1 Key Performance Indicators

Key Performance Indicators are a set of measures that focus on the aspects of organizational performance that are most critical for the current and future success. Besides being informative, they are also used to coordinate. In fact, these indicators should be the base for all the instruments used by managers and leaders in order to understand whether the teams are on track to success or not (Neely, A., 2002) (Parmenter, D., 2015).

Furthermore, KPIs should be defined according to the needs of the company as these indicators will help monitoring important aspects of their processes and later improve them. (Dombrowski *et al*., 2013).

According to Parmenter, D. (2015), although different teams can have different KPIs in their area, these KPIs should only be added if they are significant to the overall organization as KPIs should be organizational based. These KPIs can also be translated in intermediate internal indicators that are set in order to help the teams reach the final objective.

2.3.2 Measuring Process Performance

The performance of a certain process can be measured internally and externally as it can be seen in Figure 10.

When setting up a measurement system for a process, it is important to first think of how the process will affect the exterior of the company and once these performance indicators are chosen, the alignment of internal measures with the drivers of the company's performance can be achieved (Harmon, P., 2010).

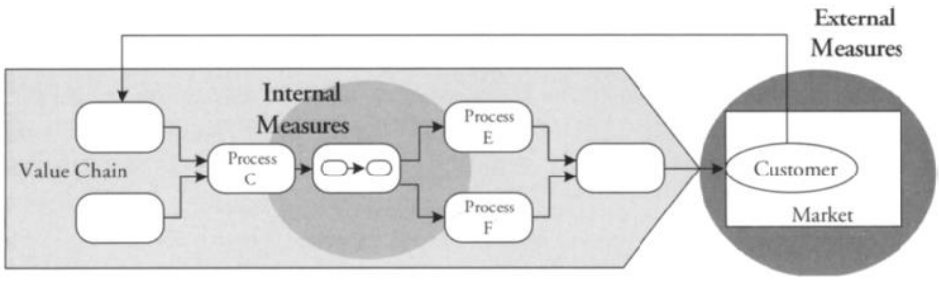


Figure 10 – External and internal measures of a process (Harmon, P., 2010).

These internal measures focus on the coordination between process activities and the communication between process actors. With the help of these indicators it is easier to identify the gaps and improvement opportunities as they give useful information regarding activity-related costs, queuing time of process instances, workload of process participants, etc. (Kueng, P. & Krahn, A., 1999).

According to Kueng, P. (2000) a process performance measurement system can be characterized as an information system which:

1) Gathers – through a set of indicators – performance-relevant data of one or several business processes.
2) Compares the current values against historical and target values.
3) Disseminates the results to the process actors.

The workflow of this Process Management System is depicted below.

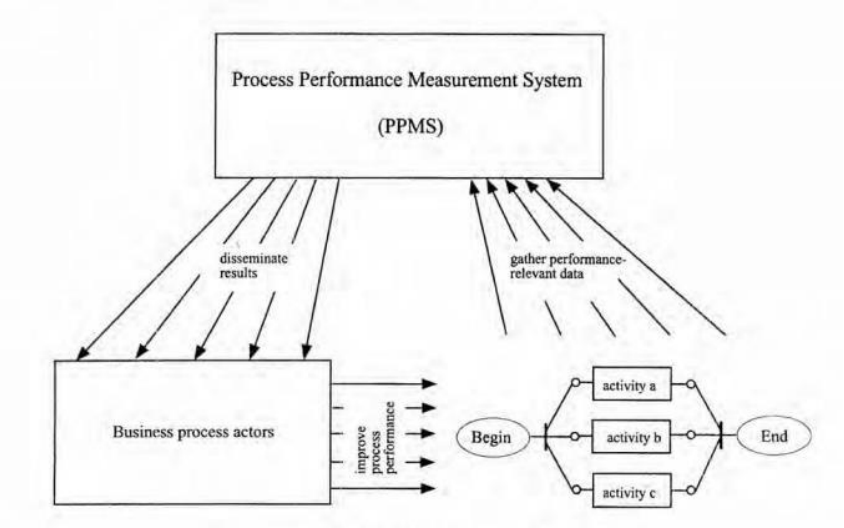


Figure 11- Process Performance Measurement System from a conceptual view
(Kueng, P.,2000)

2.3.3 O-TSR and CBN

Operational Total Shareholder Return (O-TSR) and Compelling Business Needs (CBN) are the main drivers of performance at Polonex.

Total Shareholder Return (TSR) is the cash return over a period of time after an investment is made. People invest in a company based on expected financial return and riskiness. Thus, if expectations of TSR increase, stock price increases and vice-versa.

In a similar way, each Polonex' business unit measures Operational TSR focusing on increasing its value through higher earnings and generating cash flow.

When it comes to the Compelling Business Needs, they describe specific organization's role in delivering the Category Business objectives, quantifying how much and how fast the results need to be proven.

CBN are specific, precise and measurable focus points that are within the control of the organization and that are simple and easy to understand, using just a few words or paragraphs as description.

O-TSR PSC

The Supply Network Operations team impacts O-TSR by reducing cost and cash to serve, building organization capability to design innovative and synchronized supply chains and by creating a sustainable cost structure.

The O-TSR drivers are Sales Growth, Margin Improvement, and Asset Efficiency and all the Key Performance Indicators at PSC are connected with this main performance drivers (Figure 12).

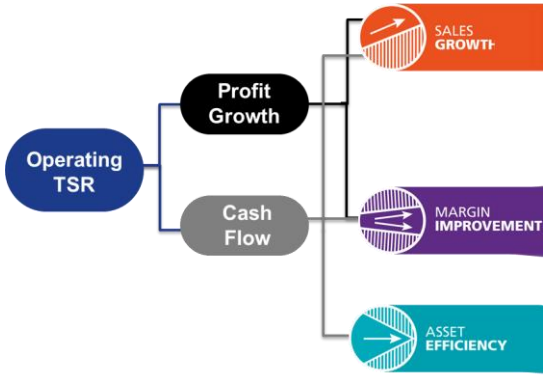


Figure 12- Operational Total Shareholder Return
of the Planning Service Center

CBN PSC

The Compelling Business Needs of the European Planning Service Center for 2016 are:

- We are number 1 Supplier to our Customers.
- Our objective is to deliver 10% Days On Hand Reduction.
- We will deliver 100 $MM PSC Led/Enabled Savings.
- 100% of the Organization is engaged and we are ALL IN to Win.

2.4 Integrated Planning

Most of the fast moving consumer goods companies run their core business processes on Enterprise Resource Planning applications enabling them to create an integrated, consumer-driven supply chain. In this section the basic concepts of these systems will be explained.

2.4.1 Enterprise Resource Planning and MRP II

Enterprise Resource Planning (ERP) systems were created in the 1990s and resulted in dramatic changes of many intra-company information architectures (Knolmayer, G. *et al*, 2002).

Within ERP, there are different business applications and modules that can be used in order to integrate all the functions across the whole enterprise.

An example of these applications is the Manufacturing Resource Planning (MRP II) which is a very complex planning and control methodology to build internal work processes and information system capability, integrating manufacturing and materials planning.

It was created as an evolution of the MRP (Material Resources Planning) adding financial, distribution and simulation capabilities. However, the logic of MRP II is still the same and in order to make an MRP system operate effectively, there are some pre-requisites that need to be maintained such as inventory record accuracy, data-base integrity, employee understanding and realistic master plans (Toomey, J.,1996).
The MRP II logic extends from the strategic to the operational level and these levels represent different planning horizons. The strategic planning horizon may cover 1 to 5 years whilst the execution planning real time to 1 week (Higgins, P. *et al*, 1996).

2.4.2 ERP at Polonex

There are several existing ERP systems and the one currently being used by Polonex is SAP.

SAP (Systems, Applications and Products, in Data Processing) was created in Germany and as in all the other ERP systems, the flow of business processes across the company can be integrated and optimized as they provide different ways to collect, store, manage and interpret data allowing Polonex to control their business processes.

In the Table 1, the main SAP applications used by Polonex are mentioned.

Table 1- SAP business applications existing at Polonex

SAP Business Applications at Polonex	
Procurement Service Line	Purchasing, Scheduling Agreements, Source List
Financial Services and Solutions	Accounting, Costing
Site Integrated Planning	MRP views, BOM, Quota, Production Version, Resource, Recipe/Routing, Work Scheduling
Physical Distribution	Sales Organizations, Warehouses, Storage

3 Product Substitution in the Fast Moving Consumer Goods Industry

In a Fast Moving Consumer Goods environment, as the companies are striving to have the latest technologies in the market as well as answering to all the consumer needs, innovation plays a very important role in the competiveness of a company.

In this chapter important elements of the Product Substitution Process will be presented and in the end an analysis of the whole process can be found.

3.1 Process Framing

As it was mentioned before, every time an update to the product portfolio is made by creating a new product (New Launch), by substituting an old product with a new one (Substitution) or by delisting an old product without replacing it (Discontinuation), Polonex starts a new initiative project (Figure 13).

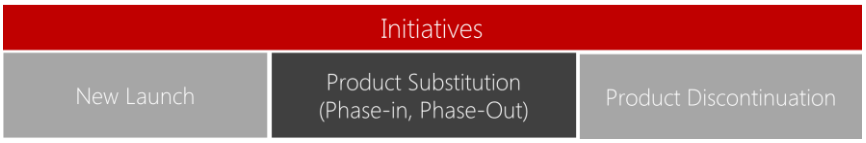


Figure 13- Different types of initiatives existing at Polonex.

A Product Substitution Initiative is defined as the introduction of a new Finished Product and/or Raw/Pack Material as a replacement of existing ones. The changes implemented can have only commercial purposes, only technical purposes (e.g., reducing costs by changing a raw material) or both.

In terms of supply chain readiness and inventory management, the most delicate situation is indeed when a product is replaced by a new one as it is extremely important to make sure that the new product is ready on time and at the same time the old product is ready to be discontinued.

The complexity of the process comes not only with the amount of tasks to be executed, but also the amount of people involved, SKUs that need to be changed as well as the amount of different markets where these changes are going to take place.

Besides that, although the product substitution occurs very often, it is not always easy to synchronize all the actors in one direction as there are many different Product Substitution scenarios and for each of them, a different set-up of the system needs to be made.

In this section, some important elements regarding the process-in-scope will be introduced, giving an overview of the framework where this process is positioned.

Finally, it is also worth mentioning that the product substitution can be also referred to as PIPO (Phase-in, Phase Out) and throughout this dissertation, this name will also be used.

3.1.1 Important Transition Moments

In terms of Product Supply, there are two very important moments in the product substitution process: Production and Shipment. Although the moment when the product arrives to the shelf is very important for marketing purposes as it is when all the advertisement campaigns start, from the operational point of view, this date is not as important as the others.

From the moment a new product starts being produced, it still takes some time until it can be shipped and only afterwards it will be available on the shelves. Regarding the old products, the opposite occurs. An old product can still be on the shelves and shipped although it is not produced anymore.

Below the most important dates are listed:

Start of Production (SOP)

Moment when all the necessary elements to produce the new product are gathered.

End of Production (EOP)

Date when the last production of the Phase-Out product is done. After this date the markets are still selling the old products but only using the existent stock.

Start of Shipment (SOS)

Estimated date for start of shipment for a given product in a given country.

Taking into consideration the type of transition, it can be worth mentioning the earliest and latest SOS dates.

End of Shipment (EOS)

This is the last date when a product can be shipped. After this date, if there are remnants of old products, they are going to be scrapped.

3.1.2 Types of Product Substitution

There are several scenarios of product substitution taking into consideration the different dimensions described below. For more information, a table can be found in the appendix of this paper.

Dimension 1: Type of Product

- Every Day Available (EDA): Regular product which is shipped on a permanent basis.
- In-Out: temporary/promotional product. Length of promotion can be limited by time or volume.

Dimension 2: Dimension of the change

- Soft- – type of product substitution when Finished Product Code (FPC) on all levels (Item, Case, Stretch Wrap, and Pallet) stay the same.
- Hard- type of product substitution when FPC on at least one level is changing.

Dimension 3: Type of transition

- Fixed date all – all customers in a given country start selling the new product at the same date.
- Fixed date staggered – customers/groups of customers in a given country start selling the new product on different fixed dates.
- Floating with start/end – conversion should happen within predefined window. After end of the window only the new product can be shipped (regardless of the remnants on the old product).
- Full floating – conversion date is dependent on the old product stock availability only.

The Figure 14 helps understanding the different types of transitions.

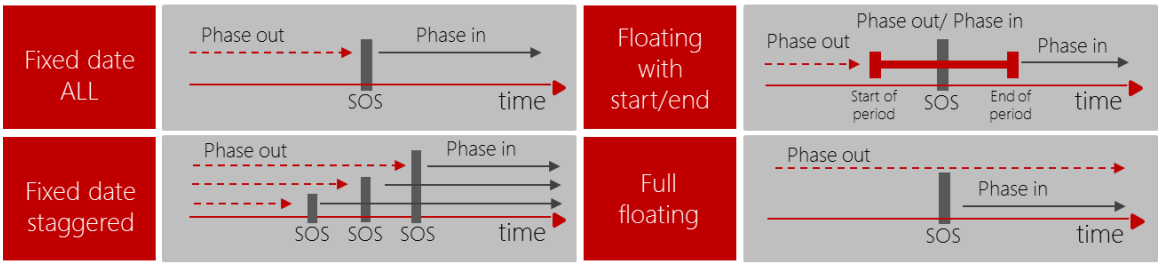


Figure 14- Representation of different transition scenarios.

The most difficult scenario to handle is when all the dates are fixed as even if there is stock of the old products, it cannot be shipped anymore. A full floating situation is ideal as even though the company is not producing the old codes anymore, they can still ship and sell the old products in the market, making sure there is a low level of remnants.

Since January 2016, 209 substitution projects are still on-going in the Feminine Care Category, involving 3495 different SKUs as it can be seen in Table 2.

Table 2- Number of Feminine Care SKUs that were substituted in 2016

Type of transition	EDA	In-Out	Total
Hard	1175	37	1212
Soft	2057	226	2283
Total	3232	263	3495

3.1.3 Impact of Product Substitution in the Performance of the Company

The substitution of products in the market is by default causing disruptiveness and needs to be handled very carefully in order to reduce as much as possible the negative impact in the business results.

Polonex measures the performance in 3 different perspectives - Service, Cash and Cost Savings - being the final measure the O-TSR as it was explained in the sub-section 2.3.3.

Inventory management is one of the fundamental drivers of these business results because if there is not enough stock, the service aspect will be hurt but if there is too much stock, the

cash indicators will be affected. Also, if there is excessive stock, it might be eliminated with disposal orders which will then impact the performance in terms of cost.

Service, Cost and Cash are, therefore, extremely linked and almost all the decisions that need to be taken will touch one of these points negatively.

Below, a more detailed explanation about each of these perspectives as well as the performance indicators for each of them can be found.

Furthermore, another aspect that is very important for Polonex is Quality so it will also be introduced in this section.

Service

As it can be seen in the PSC CBN, customers are the focus of Polonex' attention as PSC wants to be the number 1 supplier. Therefore, it is important that the company has always enough stock to satisfy the customer's demand and that releases the new products according to what was agreed before.

Case Fill Rate (CFR)

Case Fill Rate is the key internal service measure to increase the company's total customer service level. It measures the amount of cases shipped versus the amount of cases ordered.

When it comes to product substitution, the initiatives team is responsible for the CFR results for the first 13 weeks after the SOS date.

SOS on time

This indicator compares the actual start of shipment date with what was aligned in the base plan. It is important that the company launches the new products on time not only because of customers' expectations but also because in the Fast Moving Consumer Goods sector, new products are constantly being introduced and being the first introducing a new technology in the market can result in a big competitive advantage.

Cost

There can be a lot of cost saving opportunities but in terms of the substitution of products, the most important one is the cost of remnants disposals. There are also targets for other segments of the projects such as artwork execution, transportation and warehousing but those are not tracked on a regular basis.

Inventory Disposal Expense (IDE)

When the substitution project is over, the remnants of old products (raw, pack, intermediate and finished products) are collected and scrapped according to what is aligned. When planning a new initiative, a target for these costs is set taking into consideration the dimension of the project. The performance is measured by comparing the actual cost with the target that was set.

Cash

Cash is measured by the inventory on ground as inventory is seen as frozen cash that could be used in another useful way. There are different types of inventory and the one that is mostly affected by the products' substitution is the non-productive inventory.

Non- Productive Inventory (NPI)

There are 3 different types of non-productive inventory – red, orange and yellow (Table 3).

For the product substitution it is important that stock of old products is depleted on time before being considered red or orange NPI as this stock will probably be later scrapped or offered at a discount price.

Table 3- Different types of non- productive inventory.

Idle	Red	Blocked	Non-shippable for quality reasons.
		Discontinued	No longer available for sale.
	Orange	No mover	Inventory that has no forward demand and is not remnant/anticipation.
		Remnant	Inventory offered at a discount (status of remnant)
Excess	Yellow	135% of the maximum inventory	

Quality

Quality is the priority number one for the company as it can greatly affect the trust the consumers put in Polonex' brands thus, affecting the way they perceive the company.

Whenever introducing a new product, the likelihood of making mistakes is higher so a lot of attention needs to be put into the details, making sure nothing goes wrong.

Quality Incidents (QI)

A quality incident occurs every time the quality and integrity of the company's products are compromised. The target for quality incidents is zero and whenever a QI happens, it needs to be reported within 48 hours, the product involved must be controlled immediately and a deep analysis is made resulting in corrective and preventative actions.

Significant Quality Incidents (SQI)

Significant Quality Incidents occurs if there is risk in terms of health or safety, regulatory or legal, public relations, product performance or customer relationship.

The target for this indicator is also zero and whenever it is different than zero, a similar corrective and prevention process to the QI is started.

3.2 Introduction to the Process

The Product Substitution process has multiple phases and milestones from the moment a new business idea is built or a new consumer unmet need is identified until the actual substitution (Figure 15).

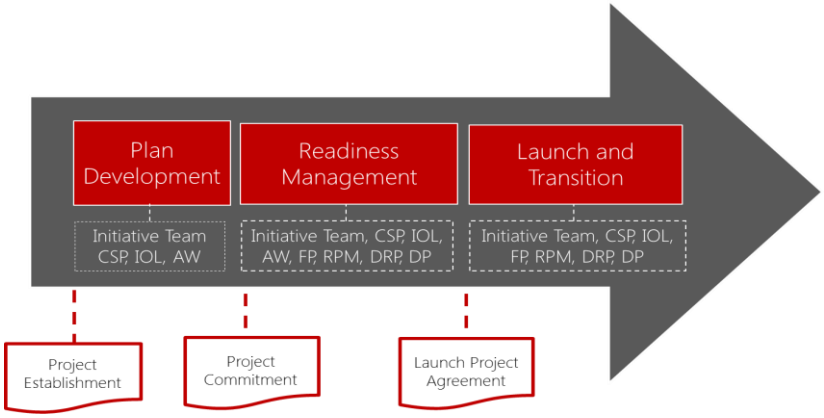


Figure 15- High level overview of the Products Substitution process (Product Supply perspective)

The Supply Network Operations (SNO) are mostly involved in the last stages of the initiative delivery process, making sure the supply chain is ready to embrace the disruptiveness caused by these changes. As it was already mentioned before, the focus of this project is the synchronization of the different disciplines and actors within the Planning Service Center, therefore, there will be a bigger emphasis on the Readiness Management and Launch and Transition Stages.

However, the SNO team starts being involved once the Project Establishment document is signed by all the parties involved in the Initiative Delivery Process.

In the next sections the process will be presented into more detail starting by the description of the actors involved, milestones, sub processes and communication tools.

After presenting the process itself, an extensive analysis to the process can be found.

3.3 Actors Involved

In order to successfully substitute a product in the market, it is necessary that the SNO delivery team is working very closely ensuring every initiative is done at the right time, with the right service, the right inventory, the right cost, the right quality and the right effort. In this section all the important actors involved will be presented.

3.3.1 Initiative Development Team

Before an initiative gets to the implementation part, there is a lot of work that needs to be completed in order to have specific plans for the different markets as well as making sure that the supply chain and markets are able to implement these changes.

The initiative development team (Figure 16) is the one responsible for the development of the initiative plan and it is composed by different functions in different locations. Some of the members of this team are: Technical Readiness Leader (TRL), Project Manager (PM), Market Initiative Leader (MIL), Site Initiative Execution Leader (SIEL), Initiative Operations Leader (IOL), etc.

Figure 16 - Representation of the responsibilities split in the initiative development team.

From this team, only the IOL is working at the Planning Service Center being the bridge between the conceptual part and the operational side of the product substitution project.

In the analysis of this process, the focus will be on the work that is executed at the Planning Service Center and, therefore, the only actor from this team that will be mentioned in specific is the IOL. The other members will be hereafter mentioned as “Initiative Development Team”.

3.3.2 The Initiative Operations Leader

The Initiative Operations Leader (IOL) leads the Product Substitution process from the operational point of view as he is the one responsible for the supply network readiness. IOLs need to communicate with all the other functions from PSC, giving important information got from the Initiatives Development Team and making sure everything happens on time (Figure 17).

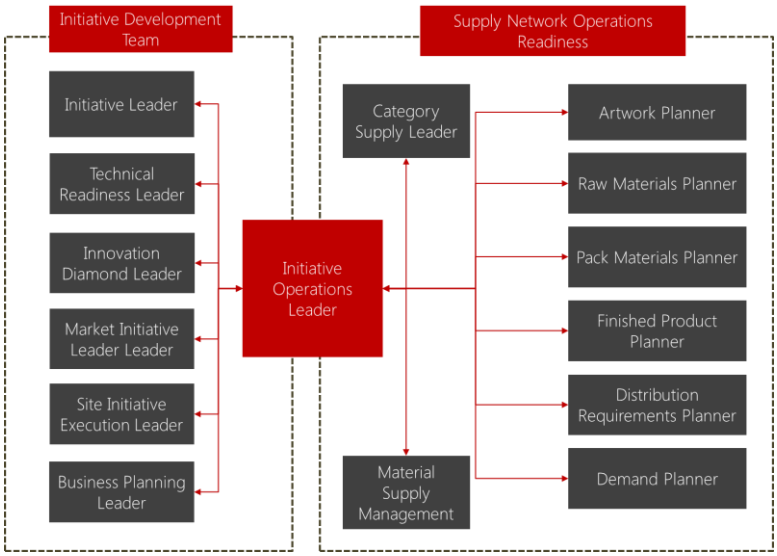


Figure 17- Scheme of the initiative delivery team.

The IOL is the only function from the PSC that is specifically focused on the initiatives management and are divided by value stream. All the other actors have specific responsibilities for a specific market and the tasks regarding the substitution of products are just additional ones.

3.3.3 Supply Network Operations Delivery Team

Besides the IOL, there are many other actors involved in the product substitution process as it can be seen in the Figure 18.

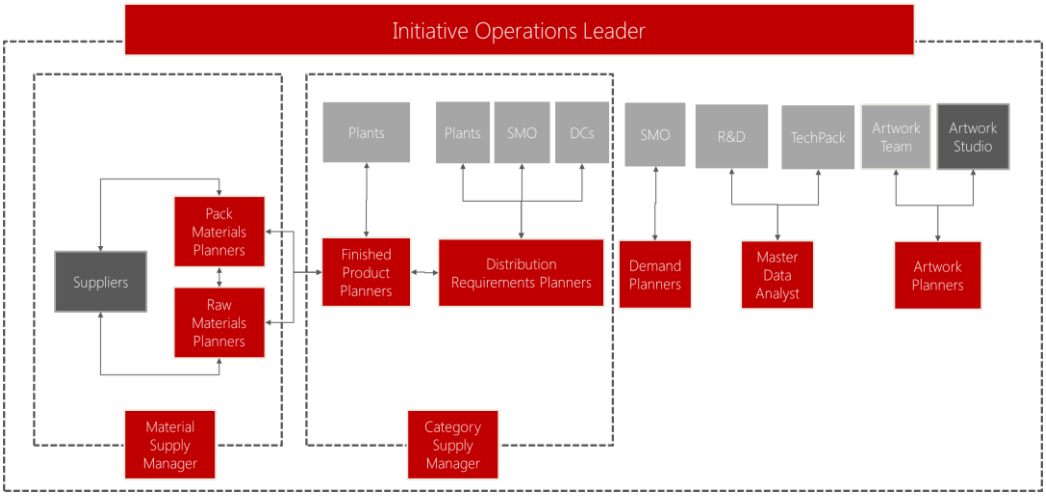


Figure 18- Representation of the Supply Network Operations readiness management team

SIP Planners

The Site Integrated Planning (SIP) is divided in 2 areas: Materials (Raw and Pack) planning and Finished Product planning. The collaboration of these functions with the plants and suppliers is crucial and it impacts the whole supply chain responsiveness.

They integrate MPS/MRP work with Initiative Planning process via SAP material transition tools to plan and execute the needed changes.

Raw and Pack Materials (RPM) Planners are responsible for ordering materials from suppliers taking into consideration the demand on Finished Product and the forecast in the system. The orders need to be enough in order to avoid material runouts, impacting service, but not more than what is necessary otherwise it will generate non-productive materials inventory. Furthermore, RPM Planners are expected to work hand in hand with the suppliers in order to generate saving ideas. Together with the Materials Supply Managers they are responsible for the Operational Readiness of new suppliers or new materials, and negotiate smaller minimum order quantities to help reduce projected remnants of old materials.

Finished Product (FP) Planners are responsible for creating Finished Product production plans to be executed by the manufacturing plants. These plans take into consideration the demand seen but also the capabilities, capacity and reliability of the production lines. Finished product runouts should be avoided but at the same time, the performance is also hurt if FP Planners are producing when it is not necessary, generating non-productive FP inventory. FP Planners should also work together with the plants in order to optimize the schedule of changeovers, reduce plants reaction time, improve labor utilization, etc.

Demand Planner

Demand Planners (DP) are the most linked with the Selling & Market Operations units, getting input regarding customer dynamics, marketing plans, financial investments, etc. They are the ones responsible for inserting the forecast into the system and since all the other functions will base their work on the requirements seen, the forecast accuracy is crucial for the business results.

Distribution Requirements Planner

Distribution Requirements Planners (DRP) are the front line to customer service as they are working together with each market, ensuring appropriate priority setting – from the supply chain reaction to customer orders and Inventory Management in the markets. They need to react very quickly on a daily basis to customers' requests ensuring high quality service. DRP are also responsible for minimizing the non-productive FP inventory at the distribution centers and for optimizing trade lanes, exploring cost savings opportunities.

Master Data Analyst (MDA)

Responsible for creating the SAP Master Data parameters. They work closely with RPM and FP planners on creation of new master data and changes to existing master data to support Initiative execution.

Material Supply Manager

While Raw and Pack Materials look at the short horizon, Material Supply Managers (MSM) take into consideration 3 to 18 months of material supply. They are in continuous communication with suppliers aiming at the supply chain optimization, negotiating shorter lead times, smaller minimum order quantities, higher delivery frequency, saving opportunities, etc.

Category Supply Planner (CSP)

Category Supply Planners (CSP) are looking into a long term horizon of 3 to 18 months, making sure there is enough capacity to produce what is needed as well as ensuring there is enough space in warehouses. They are also responsible for inventory management, making plans for the future and tracking what was already produced.

Besides that, they are the ones making the Demand Flow verification which is very important in order to reflect the right picture in SAP.

Artwork Planner (AWP)

Artwork is what customers and consumers see printed in the packaging of Polonex' products (also outer cases). Every time the company changes an ingredient, countries of sales, bar code, plants, etc. of a product or simply wants to change the design of the packaging, even just for promotional campaigns, a new piece of artwork needs to be created and all these projects are managed by Artwork Planners.

If there is a product substitution, a new artwork needs to be created and artwork readiness is a very important step in the PIPO process.

However, Artwork Planners will be considered special actors as, although they are working at PSC, they are mainly communicating with people outside of the PSC, having less involvement in the PIPO implementation in the supply chain. Artwork Planning is a very complex process by itself so the details will be left out of the scope for the analysis.

3.4 Milestones Description

1st Milestone: Project Establishment

The Project Establishment (PE) formally communicates the agreed design scope boundaries and the decision to begin the development of a business proposition. Project Establishment does not imply that the initiative will proceed to launch.

2nd Milestone: Project Commitment

Project Commitment formally communicates the agreed scope for the initiative and the decision to begin the launch preparations. If this document is signed, it means that the initiative continues to represent an attractive business opportunity relative to others in the portfolio.

3rd Milestone: Launch Project Agreement

Launch Plan Agreement formally communicates the approval of the detailed expansion plans for all markets and the business unit's intention to proceed with the launch.

At this stage, the technical, commercial, and market plans are confirmed and a sequence of market launches across each region is established.

4th Milestone: Launch Authorization

This milestone is not always formally existing but at this stage the SMOs confirm the "go to market" readiness.

3.5 The Plan Development Phase

Although the Supply Network Operations Team is already involved in this phase by giving input in terms of feasibility of execution of the product substitution, only a few interactions are done with the Planning Service Center, being them mostly through the Initiative Operations Leader that is in contact with the rest of the Initiative Delivery Team.

Important inputs are given by the Category Supply and Material Supply Management that research the possibility of implementation of the new initiative by analyzing supplier Capacity:Demand ratio, supply chain lead times, manpower restrictions, etc.

Artwork Planners are also involved in this phase as an extensive artwork plan needs to be created.

An important document that will be updated throughout the whole initiative delivery process is created in this stage - the Base Plan. This document includes information such as timeline, conversion strategies, SKUs list, Countries affected, etc. and the quality and completeness of this document will highly influence the way the project is delivered.

3.6 Readiness Management Phase

The Readiness Management Phase, also called "Prepare for Launch" phase is the time when all the necessary elements are updated and fully ready to execute the Launch. Although most of the work needs to be completed by the Planning Service Center side, the global business unit and SMO must collaborate during this phase to maximize in-market success.

The supply network operations team should confirm that capacity and inventory build plans remain on track and can support the latest launch plans. It is also important to assess the risk level of any remaining supply issues and revisit launch timings if high risk items are identified.

3.6.1 Master Data

Master Data (MD) is the language used in different systems to set-up data that is highly shared across several applications and functions in SAP.

Maintaining data quality is necessary as different people access the same data (although with different views) and consistent interpretation is required across the whole company.

Whenever a new product is created, the master data related to that product needs to be set-up in SAP. A single finished product code has different stages from being plannable until it can be publishable and orderable (Figure 19).

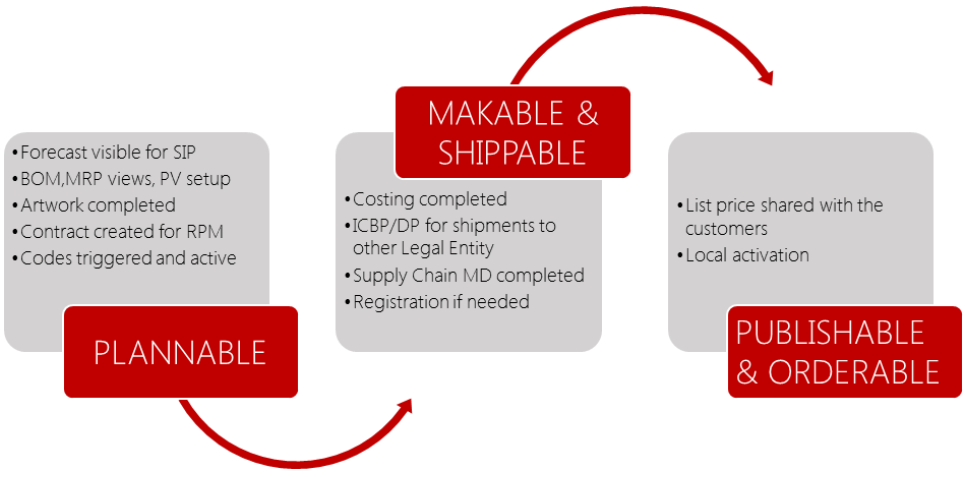


Figure 19- Stages of a Finished Product Code (FPC)

3.6.2 Costing (Bellringer)

Bellringer is the global standard work process in Polonex to set up purchased Raw, Pack and Semi Finished Products. It is also an important stage of Master Data completion as the outcomes of the process will also be documented in SAP and are essential for the launch of a new product – Scheduling Agreement and Costing.

Furthermore, final Artwork documentation approved and attached is a purchases' requirement in order to avoid wrong quotations from the supplier.

It is important to mention that some of the Finished Product Master Data can only be completed after the costing is done.

3.7 Launch and Transition Phase

Launch and Transition is the endpoint of the Product Substitution Process as this is when the actual transition between the old and new product in the market is done.

3.7.1 PIPO Execution

The PIPO execution is done taking into consideration the exhaustion of phase-out materials and at the same time, making sure the Phase-In finished products are ready on time keeping the high level of service.

Most of the decisions to be taken during the transition period are discussed during meetings as there are several issues that can be encountered.

Therefore, the synchronization during the execution of this sub process is crucial especially between Raw Materials, Pack Materials and Finished Product Planners.

3.7.2 Inventory Management

Managing the inventory of old products and building anticipation inventory of the new products is a crucial part of the Launch and Transition phase.

It is important that there is enough stock to cover the demand on the old products until the SOS date but not excessively as later this will become non-productive inventory.

On the other hand, it is important that the new products are also ready on time and there is enough stock available.

The two management set parameters which determine the performance of a material requirements planning system are the lead time and the safety stock (Buzacott, J. & Shanthikumar, J., 1994).

Therefore, it is important that there is a robust inventory management strategy taking into consideration these two settings which is created by the Category Supply Manager.

Although Inventory Management is part of the Launch and Transition Phase, in fact, it starts in the Readiness Management stage when safety time for the Phase-in Materials and Finished Products is set-up in SAP.

Later this safety time will be changed to fixed safety stock once there is already enough data gathered in order to know what the exact quantity should be which usually happens one month after SOS date.

When it comes to the old products, the fixed safety stock is first changed to safety time and on the SOS date the safety time is deleted from the system.

Besides setting up the safety time or fixed safety stock that are used to provide a buffer for uncertainty, it is important that during the Launch and Transition phase the inventory picture is checked on a weekly or even daily basis in order to make sure the product substitution is successfully done.

3.8 Closure

At this stage, disposal orders are aligned with the plants and distribution centres, scrapping the materials and finished products that cannot be sold anymore. Besides that, all the master data in SAP regarding old products should now be deactivated.

Regarding the new products, 13 weeks after the SOS date these SKUs are handed-over to the SIP planners and they will be treated as the other on-going business products.

3.9 Communication Tools

Besides the communication through email, there are several communication tools that help driving efficiency and reduce the non-value added work across the Supply Network Operations Network teams.

The most relevant ones to this process will be presented in this section.

3.9.1 SAP-linked Tools

The Initiative Operations Tracker (IOP-t) is a SAP-linked tool that serves 3 purposes:

- It allows a status check of master data setup for a project.
- It serves as a single source of reference of product substitution master data (FPCs, countries, milestone dates and conversion types)
- It allows the team members of the initiative delivery team to see their action when it can be done, or when their data has to be updated.

The team members are driven to a specific action across the various initiatives they are involved in: Set up tasks (data creation) and Change Alerts (Updates).

Besides that, the IOP-tracker also provides a set of readiness reports that can be downloaded at any time.

The high level process of how the tool is used can be seen in the Figure 20 and in the appendix more details can be read.

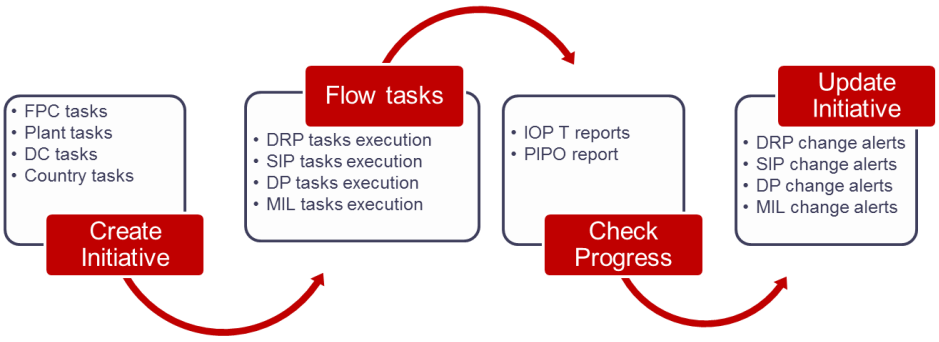


Figure 20 - Workflow of the IOP-t tracker

The Bellringer is another SAP-linked tool used by Product Supply and Finance & Accounting teams to gather the necessary master data to create Scheduling Agreements and Outline Agreements with suppliers.

3.9.2 The SharePoint

The SharePoint is a platform where everyone can share and collaborate on a single copy of documents. Documents are accessible globally from this central location although some can have access restrictions.

3.9.3 Meetings

At the Planning Service Center (PSC) there is an intensive drumbeat of meetings that occur on a daily, weekly or monthly basis, synchronizing all the different functions that work at PSC but also functions from other sites.

The Daily Direction Setting (DDS) meetings happen on a daily basis in order to plan the day-to-day business.

On a weekly basis, different topics are discussed on the Pit Stop meetings. These meetings are used to evaluate the previous week and prepare for the following one by looking at the main gaps and taking corrective and preventive measures.

When it comes to the product substitution process, besides the meetings that happen whenever a milestone of the delivery process is reached, there are two very important meetings that happen on a weekly basis – the D10 and the D14 meetings.

The D10 Meetings

The objective of the D10 meeting is to review the supply chain readiness for the implementation of new projects. During this meeting the participants review the feasibility of the base plan and if something is not ok, they propose changes in the plan.

The master data readiness, possible outages, remnants projection as well as capacity constrains are discussed. If there is a need, a new Start of Production date is aligned. Any change need to be communicated with the rest of the team.

The D14 Meetings

The objective of this meeting is to review the initiative readiness in terms of market implementation. The changes in the base plan are shared and discussed and updates are given in terms of supply chain and market readiness. Possible outages are highlighted and together the IOL and the Market Initiative Leader come up with solutions focusing on service. The remnant projection is also compared with the elimination plan, focusing on inventory.

A more detailed explanation of the existing meetings can be found in the appendix.

3.10 Process Analysis

After mapping the process and getting a clear understanding of the work flow and information flow, let us now analyze the current status of the process to understand what the key improvement areas are and what can be done in order to tackle them.

On a first sight, it is clear that the process-in-scope is mostly not focused on material flow, which is common in manufacturing or logistic processes, but the focus lies on the flow of information.

Whilst in manufacturing through application of visual management or standardization of processes, it is possible to identify waste in production and improve processes, in product development, the process transparency is not easy to achieve and consequently the identification of waste is also difficult (Dombrowski, 2013).

According to Paul Harmon (2010), more complex processes that involve branches and exceptions, usually drawn on many rules and tend to be less well-defined. Therefore, these processes rely less on the automation and more on the human performance.

When it comes to people-based and collaborative processes, it may be necessary in some cases to reengineer the process flow, but it should not be the centerpiece of the improvement efforts. The most desirable forms of improvement in this case are participative, incremental and continuous. For example, by specifying and measuring outputs and fostering a sense of urgency to change can bring a higher impact in a short-term (Brocke, J., 2015).

Another characteristic of this type of processes is that they change often, evolving as time passes. Thus, it is important that when defining major process performance opportunities, a high-level overview of the processes is taken into consideration, keeping a certain level of abstraction.

Taking into consideration the process in cause, more oriented to the managerial and cultural context surrounding the process, it was then necessary to analyze the process taking into consideration the different types of process performance enablers presented in the section 2.1.1.

Workflow design

The documentation that was existing regarding the process was out-of-date as it was still taking into consideration the old structure of the company. Also, these documents were hard to read and understand and not available to people whenever they needed it.

Information Technology (IT)

At the moment, IT applications and tools support normal processing but do not adequately support when an exception needs to be handled. Also, a lot of the tasks that are currently being performed manually, could be more efficiently performed by a software application.

Lastly, some of the data need to be input more than once because the software applications being used do not share relevant data.

Motivation and Measurement

Most of the employees working on the process-in-scope do not feel responsible for achieving the tasks of the process. Another problem encountered is that they often are not given adequate information about the process and important data that they could use to anticipate work, plans or schedule is not shared.

But the most relevant issues regarding the motivation are that the employees are not rewarded for achieving key process goals and there is no proper way of monitoring the performance of the process.

Performers

The employees have never been told who is responsible for various tasks that are part of the process-in-scope and in general need training regarding the different steps of the process. Besides that, as it was already mentioned, the existing documentation does not offer complete and adequate guidance.

Another issue the employees are facing on a daily basis is the lack the time that is required for the performance of some of the tasks involved in the process.

Finally, the employees do not feel responsible for the execution of the process and even believe that some of the tasks are unnecessary.

Process owner

The current process owner, which is the leader of the IOLs team, does not have time to actually manage the process as he has to manage another projects as well.

As there is almost no data that the Process Manager can easily get from the systems and use to assess the performance of the process, the monitoring of the process is currently not being done.

4 Lines of Action

After getting the general overview of the current status, five lines of action were identified in order to improve the overall performance of the team regarding the products substitution process (Table 4).

Table 4 - Goals of each line of action

Lines of Action	Goals
Communication	Reduce Over-Processing; Increase Process Accuracy
Ownership	Total Employee Involvement; Create the Sense of Urgency
Synchronization	Reduce the Non-Performing Inventory; SOS date on target
Knowledge Management	Standardize processes; Build capability across the team
Performance Measurement	Create the Run-to-Target mind-set. Increase Motivation

In the next sections, a more detailed explanation about each of these lines of action can be found as well as the action plan created in order to tackle each of them.

4.1 Communication

4.1.1 Initial Stage

The lack of communication between all the actors involved in the process was identified as the cause of most of the mistakes, late actions or even the fact that some actions were forgotten. The process is complex and involves a lot of SKUs from different markets and different markets mean, most of the times, different people. This complexity is not always easy to deal with, therefore, the communication improvement should be the number one priority for the site.

Furthermore, it was observed that the planners were not always aware of the right timing when certain tasks should be executed which led to late action from the planners side and more work from the Initiative Operations Leaders as they needed to check manually what was done and send reminders – contributing to the not so efficient communication flow.

The main issues encountered are enlisted in the Table 5.

Table 5 – Summary of the Why-Why analysis made regarding the communication flow

PROBLEMS	WHY?	WHY?	WHY?
Planners ignore some of the emails with important information	They do not know when their action is required or not	They receive a lot of emails so the important ones are just mixed with these.	No clear communication flow
IOLs get overloaded with questions.	Planners miss important information for their actions	The only place with information about the project is the IOP-t which is not always complete and updated.	
	Planners do not know if the information they see in IOP-t is reliable		
Planners do not always get informed about the decisions taken	They are not attending the meetings	There are too many meetings to attend and it is not clear when their attendance/input/follow-up is required.	
	The follow up is not properly done.		

Meetings

Although the D10 and D14 meetings are intended to allow better communication between all the functions and better synchronization, a lot of times the planners are not attending them.

As a result, some of the decisions cannot be made during the meetings and email chains are created in order to reach a conclusion. In some cases, it also happens that some decisions are made without consulting some of the planners because they were not present.

When asking the planners why they were not attending the meetings, their answers were divided into two major causes: lack of availability and lack of interest.

The lack of availability is happening because the meetings are organized by Value Stream (VS) as the IOLs are divided by VS but for each value stream, there are planners organized per markets and planners organized by materials spending pools, for example. This way, on top of all their responsibilities, each planner should join a D10 meeting for each value stream – around five meetings regarding product substitution per week.

Regarding the lack of interest, this is mostly associated with the fact that the other planners do not feel the ownership of the substitution of products and another worth mentioning point is that the meetings are not always efficient which raises some frustration within the team.

The Single Point of Contact (SPOC)

In order to make it easier for the IOLs to reach all the planners of a certain area, the Raw and Pack Materials Planners have a single person which is responsible for attending the meeting and transmitting important information to all the planners of their function (Figure 21).

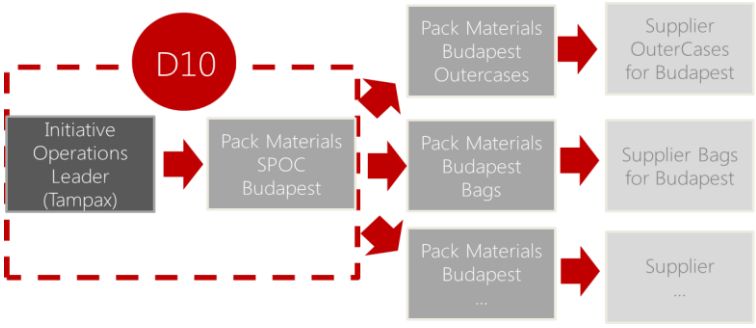


Figure 21- Information flow with a Single Point of Contact (SPOC)

However, the SPOCs most of the times do not know what the status of the codes of the other planners is which leads to delaying decisions and again, make some of the meetings less productive.

The IOP-tracker

The IOP-tracker is a very useful tool for IOLs as it allows them to track the overall Product Substitution Readiness.

However, not all the tasks are included in IOP-t and some of the planners (SIP RPM and some of the SIP FP) do not have access to it.

Another disadvantage of the IOP-tracker is that it cannot be used for communication purposes as it is impossible to write comments on it.

As a result, some of the actions are sent manually through email to the planners that do not have access to it and several different tracking files are being used. Also, not all the actions are actually tracked which leads to late actions putting the whole initiative plan in risk.

Finally, the IOP-tracker is not always updated which makes it a tool not 100% reliable so the planners usually double check the information with the IOLs.

Emails overload

As it is not clear when a certain task should be executed and the planners are not always attending the meetings, a high amount of emails is created in order to track the status of the initiative.

Another issue is that it is not very clear where the planners should get the information and where they need to give input so most of the times they are sending emails to IOLs whenever they have any doubt, even though this information is available in IOP-t or in another document.

The weekly cycle

Most of the planners have daily tasks related to the on-going business and their schedules are made on a weekly or even daily basis.

However, the Initiatives Operations Leaders, do not have a standard schedule as their tasks are mostly related with Project Management. Whenever the IOLs request an action from the other members of the delivery team, they have 7 days to execute their tasks and IOLs are sending emails whenever they see there is a need. Most of the times there is no weekly logic behind these actions.

From the planners' side, they are also not very aware of the tasks they need to execute related to PIPO and when they need to execute them.

SharePoint

The SharePoint is being used to store reports and working files but currently the distribution of the folders is not clear. There are several folders even for the same teams so it is difficult to know where to look for information. Also, different folders have different access restrictions which makes the initiatives management process more complicated – horizontal team. There is no place where all the information regarding the initiatives is stored.

4.1.2 Actions and Recommendations

Tasks Clarification

Besides the general mapping of the process, specific training documents were created for the most involved actors in the process. This action will be more specified in the Knowledge Management section.

What is worth mentioning is that a weekly cycle for each function was created, including which meetings the planners need to attend, which reports they need to open and which actions need to be executed according to the information they got (Figure 22).

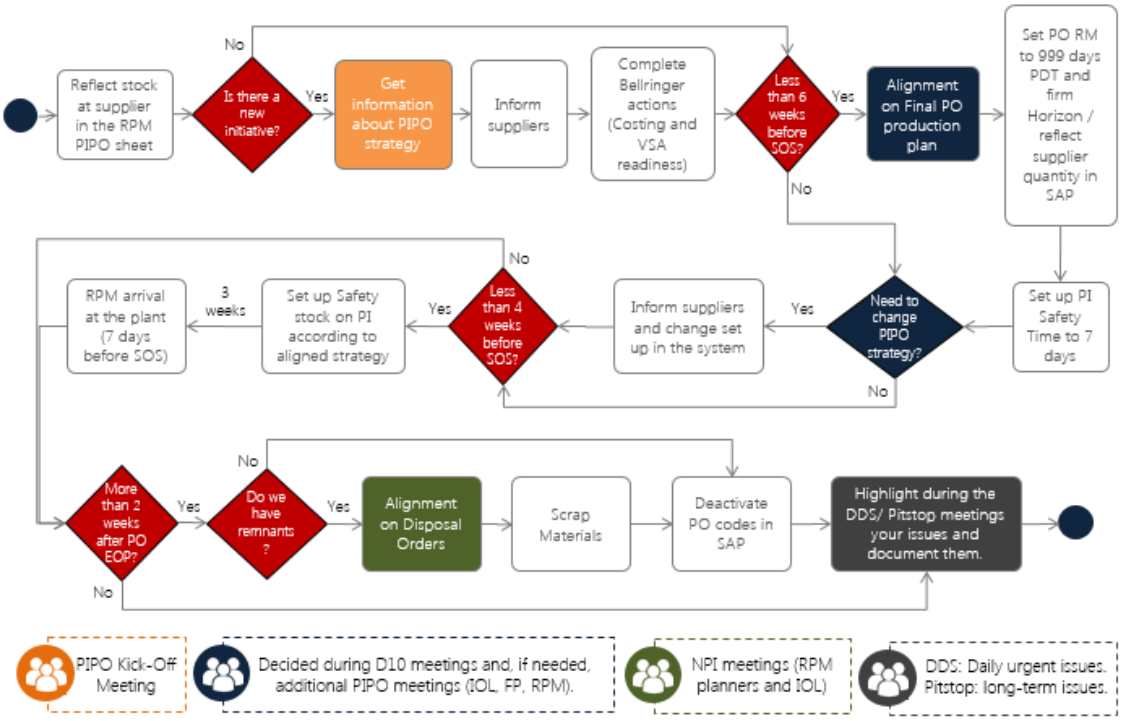


Figure 22- Weekly PIPO cycle of the raw and pack materials planners

Right action, right time

As the IOP-t is at the moment not tracking all the tasks, provisory tracking files were created in order to track the most crucial tasks that were not included there.

For DRP planners, a tracking file was created including, for example, the Interchangeability Set-up as well as safeties management.

The status of these actions is discussed during the DRP PitStop on a weekly basis and action plans are created taking into consideration the information gathered.

Ariane 2.0		Phase OUT													
Owner	Prod plant	PO Finish Product Code	CT	CT	PO carton	Stock at supplier	Plant stock	per 1 tray/ CS remnant to use up for production	PO tray/ case	Stock at supplier	Plant Stock	per 1 tray/ CS remnant to use up for production	remnants pack mats available for productio	PO hood	FILM/ Tbox
Angowski, Lukasz	4853	83729647	10	30	97397910	0	4,940	494	97398089	0	0	-	0	97398083	0
Hofman, Iga; Rasput	4853	83729429	10	30	97343776	0	44,340	4,434	97346087	4,400	2,343	6,743	4,434	98999478	0
Hofman, Iga; Rasput	4853	83729429	10	30	97343776	0	44,340	4,434	97346087	4,400	2,343	6,743	4,434	98999478	0
Hofman, Iga; Rasput	4853	83729430	10	30	97343776	0	44,340	4,434	97346087	4,400	2,343	6,743	4,434	98999478	0
Hofman, Iga; Rasput	4853	83723651	18	20	96803085	0	13,160	731	96251544	0	0	-	0	95779380	0

Phase IN									PIPO						calc	
PI Finish Product Code	CT	CT	SOP pack mats available on site	PI carton	Confirmed delivery Date	PI case / tray	Confirmed delivery Date	New Hood/ Sticker/ Wrap	PO carton	SOS	Prod plant	PO Finish Product Code	remnant on Pack mats [EUR]	PI production pl	PI Finish Product Code	New SOS date: (to move forecast)	comment action/ additi
83733334	10	30	#########	90805666	#########	90805654	IN PLANT	n/a	97397910	########	4853	83729647	192	5053	83733334	#########	-24
83733454	10	30	#########	90805684	#########	90805654	IN PLANT	n/a	97343776	########	4853	83729429	0	5053	83733454	#########	26
83733077	10	30	#########	90805684	#########	90805654	IN PLANT	n/a	97343776	########	4853	83729429	2,258	5053	83733077	#########	-255
83733077	10	30	#########	90805684	#########	90805654	IN PLANT	n/a	97343776	########	4853	83729430	1,447	5053	83733077	#########	-106
83733077	10	30	#########	90805684	#########	90805654	IN PLANT	n/a	96803085	########	4853	83723651	0	5053	83733077	#########	35
83733077	10	30	#########	90805684	#########	90805654	IN PLANT	n/a	96919566	########	4853	83729364	0	5053	83733077	#########	78
83733454	10	30	#########	90805684	#########	90805654	IN PLANT	n/a	96919566	########	4853	83729364	0	5053	83733454	#########	78
83733335	4	60	#########	90805668	#########	90805655	IN PLANT	n/a	90757765	########	4853	83732092	0	5053	83733335	#########	5
83733079	4	60	#########	90805685	#########	90805655	IN PLANT	n/a	97343771	########	4853	83729423	10,476	5053	83733079	#########	-478
83733079	4	60	#########	90805685	#########	90805655	IN PLANT	n/a	97343771	########	4853	83730344	7,961	5053	83733079	#########	-548
83733457	4	60	#########	90805685	#########	90805655	IN PLANT	n/a	97343771	########	4853	83729423	2,431	5053	83733457	#########	-21

Figure 23- Two captions of the monitoring file for the raw and pack material planners

For RPM planners, as they currently have no access to IOP-tracker, a very complete tracking file was implemented and it is tracking the communication with suppliers, safeties management as well as remnants projections, per initiative (Figure 23).

D10 and D14 Meetings

In order to increase the efficiency of the D14 meetings, an IOP-t linked tool that was already being used by the other categories was adapted for the Feminine Care category. This tool gathers all the actions to discuss in one file and in the end of the meeting, it is possible to send emails with the minutes and action points to all the planners. This tool is also tracking the attendance of people which was not always happening before.

The template for the D10 meetings is not ready for implementation yet but since the D10 meetings are the most important meetings for the Supply Network Operations initiatives delivery team, it is now high priority to adapt this tool for the D10 meetings as it is expected to improve significantly the communication and efficiency of these meetings.

Another point that the planners were not so happy about was that they were attending a 30 minutes meeting with no clear agenda and their input was only needed for 2 or 3 minutes. Good to keep in mind that the D10 meetings are organized by Value Stream and some of the planners (like DRP) are organized by market. This way, one planner should attend five D10 meetings per week which very difficult to happen at the moment due to time restrictions.

RPM planners solved this issue with the creation of SPOC for each market and this solution is recommended to be expanded to the functions that didn't have them before (DRP and FP).

However, with the creation of SPOCs, some important information is not shared in these meetings because the planners are the ones that know the problems they are facing and they will not be present in the meetings.

The preparation for this meetings is, therefore, crucial and the IOL should share the agenda and required attendance at least one day before the meeting. The Planners see the agenda and prepare the right information to send to the SPOC. During the meetings this information is discussed and the action plan is shared with the planners later (Figure 24).

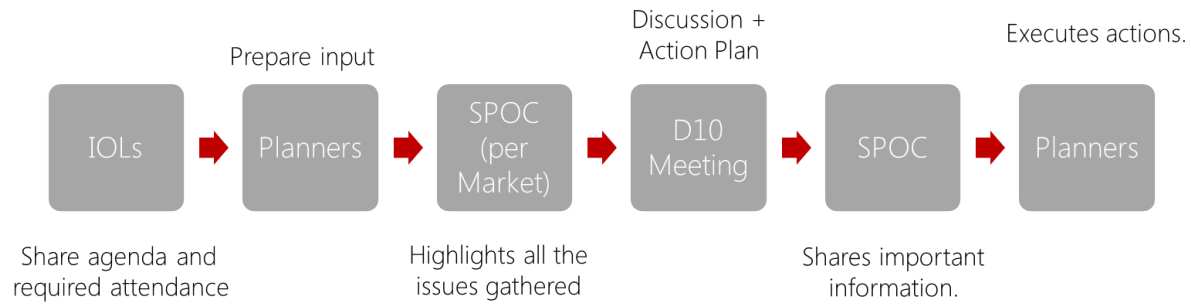


Figure 24- New information flow of the D10 meetings

It is also worth mentioning that if in the agenda there is a crucial point for a specific market, the planner of that market should join the meeting even though he is not the SPOC.

Weekly agenda for IOL

Even if some parts of the weekly cycle were already existing before, a more complete agenda for the IOL team was recommended (Figure 25). This is expected to greatly improve the communication between all the functions. It will be easier to know what needs to be ready at which stage of the week and for IOLs it is easier to organize their time.

The Pit Stops are a recent addition that is still in development stage but this way the planners are gathered by Value Stream to discuss the latest issues encountered as well as tracking some of the essential tasks for the planning execution.

Time	MON	TUE	WED	THR	FR
Morning	RPM team - obtain stock list from suppliers	RPM team - PIPO file up to date with stock overview - file update shared with IOL & SIP Leader	Touch Point with Markets	SIP leader with FP planners - check PIPO codes and align with IOL forecast changes	IOL send latest copy of PIPO file to PM for stock update for next week circle
	DRP checks available stock and highlights potential risks	SIP Leader - run reports with stock /forecast to enable PIPO calculations for FP team			SIP Planners adjust systems according to new SOS date
14h30-15h30	Pit Stop MD	Pit Stop DRP IP@100	Pit Stop FP IWL Loss Elimination	Pit Stop:Service Loss Elimination	Coaching Vitamin
Afternoon	IDE/NPI revision - Disposal Orders (monthly)	SIP leader share updated PIPO file and attached new copy for the week	FP planners - Fix Last Production Run	IOL request all new SOS dates	DRP: Adjust PIPO Window INC
					Demand: Update Forecast
	D10 Meetings		D14 Meetings		

Figure 25- Recommended weekly agenda for the initiative related tasks

Readiness Management cycle:

-IOLs set up new initiatives in IOP-tracker as soon as possible (daily basis).

-MDA creates the BOMs (daily basis).

-On Tuesday the DRP Planners get to know which codes need to have different safeties and which ones are ready to set-up interchangeability- DRP Pit Stop.

-On Wednesday the Finished Product Planners get to know which codes need to set up the Last Production Run – FP Pit Stop.

- On Thursday the major issues regarding CFR are discussed during the Service Loss Elimination Pit stops and on Friday the teams are trained in necessary matters during the Coaching Vitamin session.

- On Thursday and Friday, all the functions should set up new codes and update the on-going ones as on Monday the Master Data completion is revised – Master Data Pit Stop.

Launch and Transition cycle:

-All the D10 meetings should take place on Monday or Tuesday. During these meetings all the functions highlight the issues or possible risks and PIPO plans are revised.

-If there is a need to change the plans, this is communicated on the D14 to the Market Initiative Leaders. The situation is accessed and the MIL approves or not the changes.

- If the market approves the changes, the systems need to be updated with the new PIPO dates. (Thursday and Friday)

- One day before the D10 and D14 meetings, the IOLs are sharing the agenda with the team and the inputs are gathered in the meetings' file.

IOP-tracker as the only one tracking file

Although some of the actions are temporarily being tracked using another tracking documents, it is advised that in the future there is only one place with information and that place should be the IOP-t.

The implementation is currently being analyzed and it is expected that by February 2017, all the functions will have access to the IOP-tracker and the missing tasks will also be included there.

Furthermore, in order to increase the reliability of the tool, it is important that in the future some key working principles are taking into consideration:

- The IOL is a project Manager (not checker)
- IOLs must ensure all initiatives are loaded into IOP-t
- IOLs must ensure IOPT is regularly updated with changes (Finished Product Codes or Life Cycle Scope cancellations, SOS or EOS dates, etc.)
- Planners must check the IOP-t at least once per week.

SharePoint

First of all, a clean up to all the folders is needed in order to make the SharePoint a platform where it is easy to find the information needed. Some of the folders can be merged and clear names should be given to them.

Besides that, the creation of an initiatives management folder was recommended in order to store all the training documentation but also important communication files and reports.

In the future, the planners should look for information directly in this folder instead of sending emails that are not necessary. A single communication sheet should be created on the Finished Product Level and one for Materials.

As this requires quite some time and effort, it was still not possible to implement. However, it was highlighted to the management team.

4.1.3 Future Stage

With the implementation of all the actions above mentioned and by applying the communication principles presented in the Table 6, the communication in the future is expected to be less disorganised and more efficient.

The process is also expected to be more transparent making people aware of which files or tools they need to use in order to get the right information, reducing the number of evitable mistakes.

Table 6- Communication principles for the product substitution process

Communication Principles	
Monitoring Files	Use the IOP-t as much as possible. Other tracking files should be shared on SharePoint.
Meetings	Prepare the meetings beforehand. Use SPOCs for different Markets. Standardize meetings by using template.
Storage of information	Use SharePoint as a way of communication where it is clear where to find information.
Right action, Right time	Use the weekly cycle to track the readiness of the process. Automate monitoring files.
Emails	Should be avoided. Only used in case there is information missing or urgent issues need to be highlighted.

4.2 Ownership

4.2.1 Initial Stage

Most of the work that is done at the Planning Service Center is done on a daily basis and each function has their own responsibilities in order to produce and distribute the right amount of products to satisfy the customers' demand.

There are only a few horizontal areas that bring all the planners together and products substitution is one of them. In order to successfully substitute a product in the market, it is crucial that all the planners work as a team, execute their tasks on time and solve the unpredictable situations together.

However, since none of them is the actual owner of the process, a lot of times other tasks that are directly affecting the performance of the planners are prioritized over these actions.

The Initiative Operations Leader is seen as the only person responsible for the process and the only one that is actually affected by the performance of the substitution projects performance.

In order to bring all these functions together, the D10 and D14 meetings take place and the overall status of the projects is discussed. However, since the planners have already a high number of mandatory meetings to attend and they do not feel responsible for successfully deliver these projects, most of the times they do not feel the need to join these meetings.

According to Beaglehole (1932) and Furby (1978) possessions and ownership feelings trigger a sense of responsibility. Also in the same line, Parker (1997) defined ownership in terms of a "concern for" and "felt responsibility". That is exactly what is pretended. Planners should execute their tasks on time and be accountable for the results of their actions.

The main issues encountered are enlisted in the Table 7.

Table 7- Summary of the Why-Why analysis made regarding the ownership

PROBLEMS	WHY?	WHY?
Important input is not taken into consideration when taking decisions.	Low attendance to D10 and D14 meetings	No Ownership Feeling
	Low interest in decision making regarding a project.	
Late open actions.	Planners prioritize other actions over product substitution actions.	

4.2.2 Actions and Recommendations

Awareness Presentation

A PowerPoint presentation was created and presented in front of the whole Feminine Care Category. The goal of this presentation was to raise the awareness regarding the importance of the process itself but also the importance of working together as a team in order to achieve better results.

Trainings delivered

Thanks to the creation of training documentation and the workshops already delivered, the planners are now more aware of the impact of their actions in the overall process and in the work of the other employees, increasing the responsibility feeling.

Meetings Attendance

It was recommended that the IOLs start tracking which functions are joining the meetings or not and if not, why they were not attending it. Sharing the agenda before the meetings and asking directly for input would also increase the ownership feeling as the planners would feel that their time is valued.

Kick-Off Meeting Refreshment

Currently the kick-off meetings are used to inform the team about an upcoming initiative and the IOL informs the team about the scope of it: type of initiative, SOS date, countries/markets affected, etc.

However, in order to involve the planners and increase the level of commitment, a document with intermediate deadlines should be presented and the planners should agree (or not) with it. In case they think the timings are too stretched and they will not be able to fulfill the tasks requested on time, the team should come up with a solution together.

The main outcome of this meeting would be a timeline with which all the planners are comfortable with and therefore, would be more willing to follow in the future.

Involvement in strategic decisions

While shadowing some of the roles, it was noticeable that the most experienced planners were not following the strategy created by the leadership team as they thought it was not in line with the daily business needs they are responsible for. The managerial team is sometimes not aware of all the issues the planners are facing as they are not running the day-to-day business.

It is extremely important to involve everybody when a strategical decision needs to be made because when people are part of the decision-making process, they are more willing to commit to it. This issue was highlighted to the managerial team.

4.2.3 Future Stage

Summarizing all the actions that were taken, some principles were written and are to be taken in consideration while executing the product substitution process (Table 8).

In the future all the planners involved in the product substitution process should be accountable for their actions and feel the process as part of their responsibilities.

All in all, product substitution is a vital process for a FMCG company and in order to be executed successfully, it requires 100% employee involvement.

Table 8- Ownership principles for the product substitution process

Ownership Principles	
Open actions	Be accountable for your own tasks and execute them on time.
Meetings	IOLs share agenda before the meeting including the reason why someone should attend it. Planners attend the meetings, if required. If not, share the important information with your SPOC.
Commitment	Planners should be involved in strategic decisions. IOLs should involve planners from the very beginning of the delivery process.

4.3 Synchronization

4.3.1 Initial Stage

The most problematic part of the process in terms of synchronization is the PIPO Execution part because if the planners are not involved in decision making or do not take into consideration what others are facing, in the end the performance of the team will not be as good as it was expected to be.

If the right materials are not ready on time, the production cannot start. On the other hand, if the raw and pack material planners do not know on time what is the transition plan, there is a high possibility that when they are checking the stock at the suppliers, the PI materials are not ready on time or, as it happens most of the times, there are more PO materials produced than what is needed but because this was produced inside the commitment zone of the supplier, the company is still responsible for these remnants.

Whenever one of the above mentioned situations happen, the team discusses what the possibilities are in order to lower the damage either in terms of service or cost: delaying the PI production or switching back to PO production.

Also to keep in mind is that when the PI materials are not ready on time and the team decides to switch back to PO production, sometimes the suppliers are not always ready to sell PO materials which then can lead to a cut in the market (both PO and PI).

The main issues encountered are enlisted in the Table 9.

Table 9- Summary of the Why-Why analysis made regarding the synchronization of the team

PROBLEMS	WHY?	WHY?
Unable to produce the new products on time	PI Materials not ready on time.	No synchronization
High expenses in disposal orders	PO Materials ordered without taking into consideration transition date.	
No clear process	Too many changes in the plans happening all the time	
Demand not reflected properly and requirements not flowing.	DRP and DP not changing the set-up of the systems according to the new PIPO plans.	

4.3.2 Actions and Recommendations

Process Reengineering

The first step that was done was the reengineering of the process turning it more simple and easy to follow than the old one (Figure 26). Instead of fixing the last production and then adjust the transition plans taking into consideration the information got from the suppliers, in the new process the first step is to check which suppliers have the longest commitment zone and which suppliers have the longest lead time.

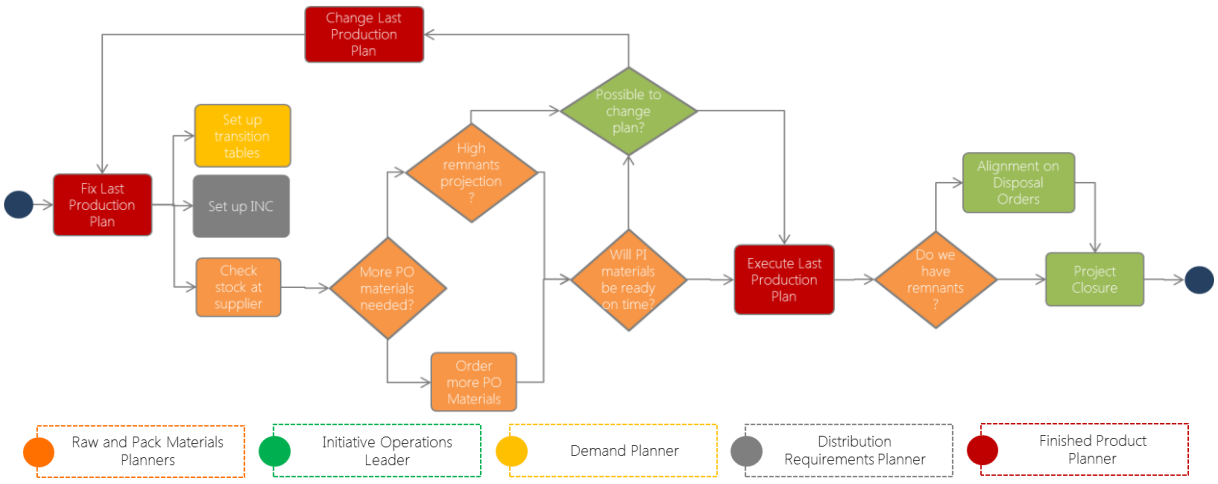


Figure 26- High level overview, PIPO execution (as is)

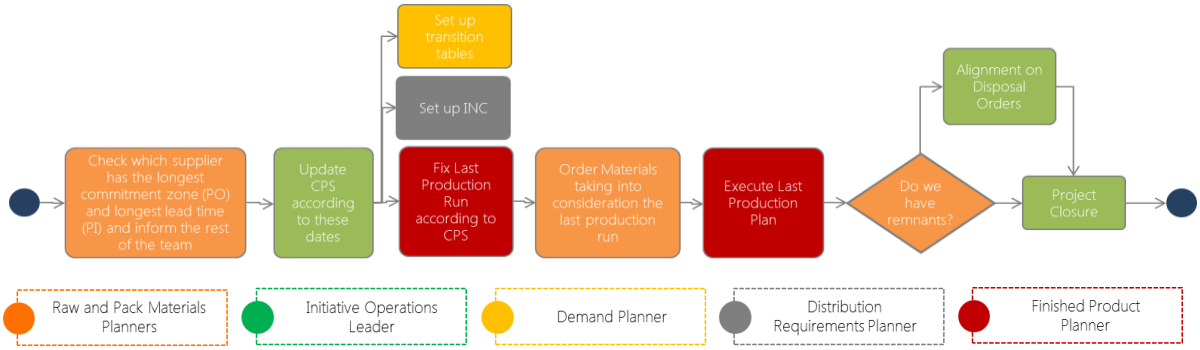


Figure 27- High level overview, PIPO execution (to be)

By including this information in the IOL base plan, the planners can avoid the responsibility for PO Materials produced because it was within the commitment zone and the team can be prepared for ordering PI materials on time taking into consideration the longest lead time (Figure 27).

Also, if this information is taken into consideration when fixing the last production plan, the likelihood of having to re-plan due to runout of materials or due high remnants is lower.

New Strategy written

As it was not very clear with how many months, weeks or days before the start of shipment date a certain task should be executed, some of the numbers were discussed within the management team and deployed to all the planners. This new strategy is already included in the training material created.

Re-planning periodicity

It is known that replanning more frequently in multilevel MRP systems, worsens the MRP performance (Zhao, 1993) and that less frequent re-planning improves system performance in terms of total costs, schedule instability and service levels across forecasting error levels.

Changing plans is natural because the demand is uncertain and there is always a forecast error. Therefore, the old plan has to be modified to adapt to new information to keep the production cost low and maintain the service level (Tang, 2002).

However, this should be avoided as much as possible and whenever it is done due to no demand related issues, it should be documented properly. During the Initiatives Pit Stops meetings, the issues encountered are to be discussed, finding the root cause and together the team should come up with solutions in order to avoid this in the future.

Responsibility Split

The major task that Initiative Operations Leaders have is to ensure that the supply chain is ready to substitute the products on time, coordinating all the functions to execute their tasks.

Currently, after the supply chain readiness completion, they are still coordinating the actual PIPO execution until the new in-market product is not considered new anymore – usually 13 weeks after the start of shipment date.

However, the PIPO execution is mostly about the synchronization of raw and pack materials with Finished Product Planners and therefore, it is believed that it should be led by Site Integrated Planning Leaders instead of IOLs. This would not only increase the ownership feeling of SIP planners but would also increase the synchronization of these actions regarding PIPO (Figure 27).

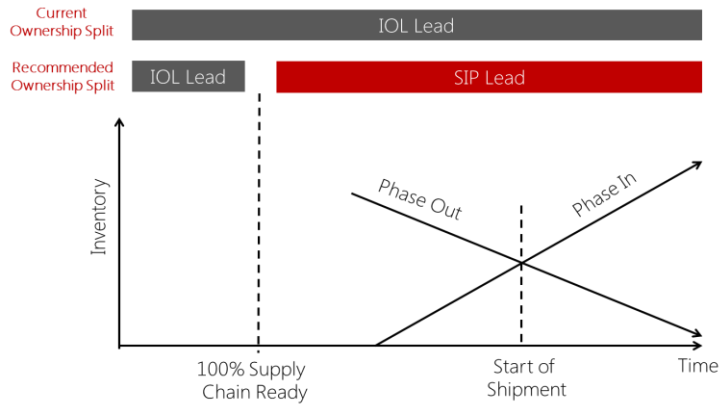


Figure 27- Current and recommended ownership split of the Product Substitution process

SIP Pit Stops

Currently, besides the daily direction settings meetings, there are meetings for Raw and Pack Materials and another meetings for Finished Product Planners. However, since these functions considerable affect each other's performance, in the future it is advised to have also these Pitstops meetings together and come up with solutions in order to solve the common encountered issues.

4.3.3 Future Stage

When it comes to the synchronization, the most difficult step of the process is the transition of production from the old to the new products as it is difficult to take into consideration all the different factors that may influence the success of the transition. If the principles presented in Table 10 are followed in the future, the overall performance of the process is expected to increase by reducing the non-productive inventory of old materials but also by allowing the new products to arrive on time to the market.

However, the creation of a decision support system to help the team with the transition period was recommended to the management team as it is believed it will increase substantially the efficiency of the process but also the accuracy of the decisions to be taken.

Table 10- Synchronization principles for the product substitution process

Synchronization Principles	
Last Production Run	The stock on ground, lead times and commitment zones of the different suppliers should be considered when fixing the last production run.
INC set-up	The interchangeability should be set-up only after fixing the last production run. If the plans change later, the transition date also needs to change.
Re-planning Periodicity	Whenever it is needed to re-plan the PIPO execution, the reason behind should be documented and the risks need to be mitigated.
Responsibility	The IOL is the responsible for the supply chain readiness. However, the PIPO transition is led by the SIP planners.

4.4 Knowledge Management

4.4.1 Initial Stage

As it was mentioned before, the European Planning Service Center was created only three years ago and since then that all the planning activities have been moved one by one from other sites to this center.
Some of the experienced people were relocated to Warsaw, working now as expats but most of the employees are quite recent. Also, the fact that now all the planning activities are centralized in one location change dramatically the way the company operates and therefore, the company is still adapting to the new way of planning.
With all these changes in terms of workforce but also processes, a substantial knowledge gap can be noticed as not all the employees know exactly what they need to do and what was the latest strategy deployed and thus, should be followed.
Additionally, since the substitution of products is not the main responsibility of the other functions, only the Initiative Operations Leader has training in executing successfully these projects. Even not all the IOLs attended these training sessions so not all of them know what

exactly needs to be done and learn by experience which makes the team working in a heterogenic way.

The main issues encountered are enlisted in the Table 11.

Table 11- Summary of the Why-Why analysis made regarding knowledge management

PROBLEMS	WHY?	WHY?
Planners do not know which tasks they are responsible for.	Responsibility split is not always clear.	Poor Knowledge Management
Planners think some of the tasks are useless.	Planners do not know the impact their actions have in the process.	
IOLs are responsible for driving the process but they don't always know the whole process.	On-boarding sessions are not standard.	

4.4.2 Actions and Recommendations

Creation of Training Material

As there was nearly no documentation and training material existing, in order to decrease the knowledge gap, training material was created with the knowledge gathered.

Besides the process mapping, a list with the main tasks for each function was created (one pagers) and a database with One Point Lessons was also created.

This database can be used for on-boarding purposes but all the other planners can also check it whenever they are in doubt.

Examples of this training material as well as some of the mapping documentation can be found in the appendix.

Lastly, due to the constant evolution of the process, it is advised that these training materials are revised every year.

Creation of a Training Plan

After identifying existing knowledge gaps, a training plan was created including the responsible for delivering the training sessions, who needs to attend it and the goal of each of the sessions. The table with the training plan can be found in the appendix and it is worth mentioning that some of these trainings already took place

Although this plan can be applied to the current employees, the new generations will miss these training sessions as currently there are no on-boarding sessions regarding the product substitution for all the other functions besides the IOL.

Therefore, a general training for new hires should be include in the on-boarding session and this training plan should be repeated at least every year with all the employees in order to refresh the knowledge.

4.4.3 Future Stage

During the execution of this project, a lot of effort was put into the creation of training material regarding the process and giving presentations to the different teams which was essential to create a common understanding across the team.

However, as the process is constantly changing and the people in the team as well, it is recommended that some principles are followed in the future (Table 12).

Table 12- Knowledge Management principles for the product substitution process

Knowledge Management Principles	
Creation & Storage	Whenever a new situation is faced, a one point lesson should be created explaining the procedure to follow. All the training materials should be stored in a single location on SharePoint.
Distribution	Training sessions should be held in order to spread the information regarding a specific topic. Awareness presentations should also be made at least 2 times per year. Function related documentation should be distributed during the on-boarding sessions of new hires.
Maintenance	The Process Owner should revise the training materials at least once every year.

4.5 Performance Measurement

4.5.1 Initial Stage

Performance Measurement is a key factor in terms of motivation of teams as they give a clear purpose and the performance of the teams can be reflected on them.

Although there were several reports tracking the overall performance of the Feminine Care Category, it was very difficult to measure the performance of this process and the impact it has in the business results.

When this project started, the KPIs for initiatives were not being calculated and discussed on a regular basis and there were no monitoring indicators for the products substitution process.

The main issue was that due to having information in different places, it is difficult to get an overview of the process and because there is lack of workforce on the IOLs Team, there is no one at the moment taking care of the process monitoring and the KPIs.

The main issues encountered are enlisted in the Table 13.

Table 13- Summary of the Why-Why analysis made regarding performance measurement

PROBLEMS	WHY?	WHY?
Lack of motivation from the planners and IOLs side	Planners are not awarded when they achieve good results regarding their tasks.	Poor Performance Management
Difficult to find relevant data regarding the process	There is no way of monitoring the process at the moment.	
Employees are not aware of the impact initiatives have in the business.	KPIs are not measured and discussed on a regular basis.	

4.5.2 Actions and Recommendations

Creation of monitoring indicators

Besides changing the frequency of the KPIs tracking and discussion, it was also necessary to create internal measures to allow the process monitoring.

At the moment, most of the data is collected in separate files which make an analysis of the process difficult. Also, the fact that there is no standard file for IOLs make it difficult to automate the data creation.

However, with the new version of IOP-t that will be launched in February, it will be possible to get most of this information from there, so the monitoring indicators that were recommended and can be found in the appendix, will already take into consideration the implementation of this updated version of the IOP-t.

These indicators are to be tracked on a weekly basis and discussed during the weekly Pit Stops.

Process Owner

Although the KPIs and monitoring indicators are existing, it is still not possible to make it work as there is no one responsible for tracking performance of this process. The IOLs as well as their leader (Initiative Operations Planning Leader) have currently no time to handle extra work so three possible solutions were given to the managerial team and they are currently being assessed.

It is important to mention that before coming up with these three proposals, several meetings took place in order to benchmark how the process is being managed in other categories of Polonex. These were the ones that would fit the category needs the best.

Scenario 1: The Initiative Operations Planning leader, stops managing projects of Product Substitution and gives these responsibilities to an extra IOL. The IOP Leader is now responsible for tracking the performance and based on the results, look for opportunities to improve and implement changes in the process. Besides that, this person should ensure all the initiative team members are trained with the needed skills but also that the other planners know their role in the process and what they are accountable for (Figure 28).

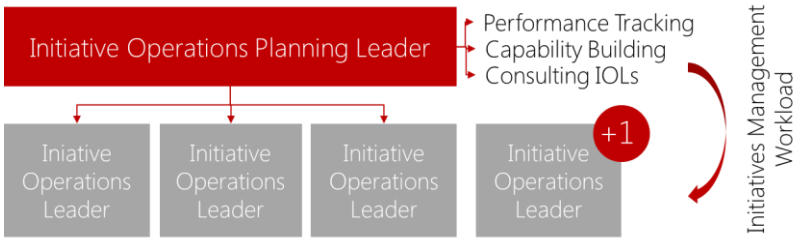


Figure 28 - Workforce expansion - scenario 1

Scenario 2: In this scenario, instead of adding another Initiative Operations Leader, a new role would be added. The difference is that instead of adding a managerial role, a specialist would be added as “Initiative Operations Analyst”. This person would take care of some of the operational work the IOLs have to do. For example IOP-t set-up, codes requests, filling in spreadsheets, etc. (Figure 29).

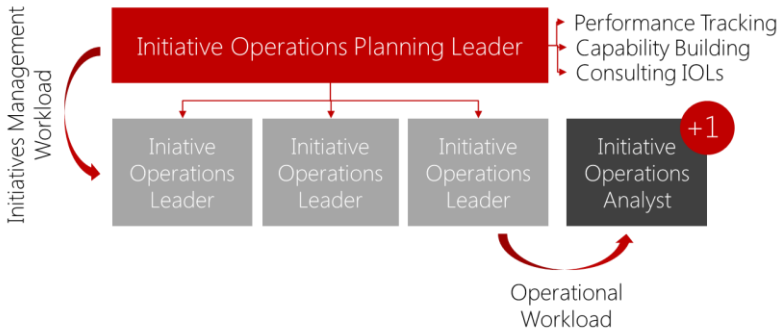


Figure 29- Workforce expansion - scenario 2

This way, the Initiative Operations Planning Leader would not need to take care of initiatives management and would play the same role as in the scenario 1.

Scenario 3: Another option would be to keep the team as it is working at the moment but add another person to be responsible for performance measurement and capability building (Figure 30).

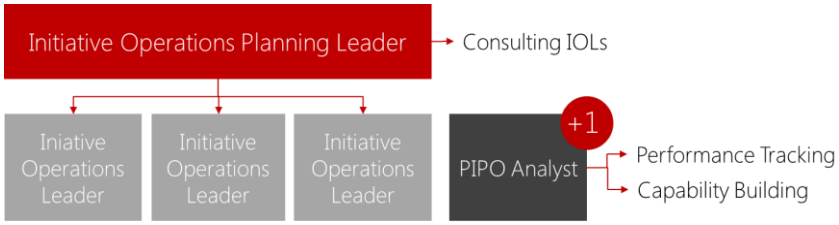


Figure 30 - Workforce expansion - scenario 3

Although the third scenario would also be feasible, from all the scenarios that were presented the first two seem to be more likely to be successful as a PIPO Analyst would still get to know the whole process before actually building the capability across the team. As the process is quite complex, it would be difficult for the PIPO Analyst to improve the process without having experience on the field.

4.5.3 Future Stage

The implementation of the monitoring system that was created and the expansion of the team will be a crucial step towards the process improvement.

If this happens and the principles from Table 14 are followed, it will be possible to easily access data, allowing the team to analyze it and based on what is observed, together come up with solutions in order to eliminate losses and continuously improve the product process.

Table 14- Performance Measurement principles for the product substitution process

Performance Measurement Principles	
KPIs	KPIs should be tracked on a weekly and monthly basis.
Process Monitoring	Based on the data gathered, improvement areas should be identified and tackled on a weekly basis.
Discussion	KPIs and internal indicators are to be discussed on a weekly basis during the Pit Stop meetings. Process Owner provides important data to be used during the discussions.

5 Conclusions and Future Work

This dissertation aims at understanding which factors influence the performance of a business process in an organization by mapping and analyzing the product substitution process in a fast moving consumer goods company.

In fact, it was clear from the beginning that mapping this process was not sufficient in order to make the process work successfully. There were a lot of rules and exceptions to take into consideration on a daily basis making the process-in-scope relying a lot on human performance. Besides being people-oriented, the process is highly exposed to external factors such as the demand volatility.

A comprehensive analysis on a managerial level was made and several actions were taken towards the elimination of the obstacles the team was facing once this project started.

The IWS Philosophy was present throughout the whole project execution as the two main cultural elements where it lies on - the zero defect mentality and the total employee involvement – were the base of many outcomes of the project (Table 15).

Table 15- The IWS Philosophy in the project.

IWS Pillar	Outcomes of the Project
Initiative Management	Reduction of the negative impact of the initiatives in the overall performance of the company
Supply Network	Synchronization of the different disciplines of the Supply Chain
Work Process Improvement	Mapping and Analysis of the standard Process
Focused Improvement	Creation of indicators to measure the performance of the process
Education and Training	Raising awareness about the process and train people about what are the tasks to be executed in their role

A major contribution of this project is the integration of production and distribution planning which is specifically important in the fast moving consumer goods industry (Bilgen, B. & Günther, H, 2010). The fact that some changes were being implemented during the time this project was taking place, is reflected in the results of the remnants projection that have been decreasing substantially over the time. These projections reached in the end of December the lowest value since these numbers are being monitored in all the plants.

These numbers are expected to continue to decrease in the future, especially with the implementation of some of the recommended actions. For example, by shifting the process ownership from the Initiative Operations Leaders to the Site Integration Planning Operations

Leaders during the transition moment. This will greatly improve the synchronization of the production planning rows and will also increase the ownership feeling of these actors making the product substitution part of their responsibilities.

Furthermore, it was concluded that it is very difficult to improve a process if the current situation is not monitored. Having the possibility to gather information in one place was identified as one of the most important actions to follow. Therefore, the implementation of the monitoring system created is crucial in order to have a stable source of information allowing the teams to discuss the results and together find ways to improve the current process.

Although it was easy to recognize this need, since there were no people available in the team to actually do it, another problem was raised in terms of lack of human resources. It is believed that the introduction of one more member in the team would allow the performance tracking but also would give the possibility to build capability across the team, which was spotted as another improvement area.

All in all, the main conclusion taken was that besides mapping a process, when dealing with a process with this magnitude, that is human-based, it is important that all the actors involved feel part of the process and are well-informed about their responsibilities and the impact of their actions.

What was observed during the time spent at the focal company was that even though some parts of the process were already standardized, most of the employees were not knowledgeable about them or they were not following them because they did not know what their role in the process was. Besides that, it was also not clear what would be the impact of a late action from their side in the performance of the whole product substitution process.

Therefore, the creation of a common understanding of the process across the teams by creating documents and giving presentations to different teams was a very important step towards the process improvement.

Another important outcome of this project was the creation of this sense of urgency that people need to change the way they perceive the product substitution and start embracing it as a vital process of an organization that strives to be competitive in the market. In the end, that is a core aspect of the fast moving consumer goods industry.

Although the impact of some of the actions cannot be measurable in a short-term or cannot be measure at all because of their nature, it can be predicted that in a near future, once the performance of the process is done more frequently, the results of all of these implementations will be reflected in a better performance of the process. All these actions are expected to affect the output performance measures mostly by reducing the non-performing inventory, increasing the case fill rate and by allowing the product substitution in the market to happen on time.

When it comes to future work, it would be interesting to develop a decision support system that would help the team with the most critical point of the whole product substitution process – the actual transition. Fixing the last production run of the old product and the first production of the new product is a decision that needs to take into consideration several factors like: commitment zones and lead times of suppliers, demand volatility, earliest and latest start of shipment date, cost of remnants, cost of delaying the introduction of the product in the market, existent stock of old materials, in which other products the old materials are being used, etc.

This topic is currently being discussed during meetings, taking a lot of time and requiring a lot of manual work as the planners need to check the current situation of the SKUs sometimes one by one. Besides not being efficient, the decision taken is most of the times not accurate

which causes frustration within the team. The need for the creation of a decision support system as well as the benefits this tool would bring in terms of business competitive advantage was highlighted to the management team and is currently being discussed.

When it comes to the topic of the study itself, besides measuring if these changes in the process are improving the performance in a long-term, it would be interesting to analyze a different process in the same context and understand if the problems encountered are due to the complexity of the process or if they are happening due to the change of the way the company operates, causing disruptiveness in the internal processes as well.

Finally, this work gives an overview of different problems that can appear while managing a process, presenting solutions to tackle them. Hopefully, this case study provided some insights in process management and will motivate others to further explore the problem of managing product substitution in the fast moving consumer goods industry.

References[1]

Buzacott, J. & Shanthikumar, J. 1994. “Safety Stock versus Safety Time in MRP Controlled Production Systems”. *Management Science,* 40 (12), 1678-1689

Berger, A. 1997. "Continuous improvement and kaizen: standardization and organizational designs", *Integrated Manufacturing Systems*, 8 (2), 110 – 117

Bilgen, B. & Günther, H. 2010. "Integrated production and distribution planning in the fast moving consumer goods industry: a block planning application", *OR Spectrum*, 32(4), 927-955

Brocke, J. 2015. "*Handbook on Business Process Management 1: Introduction, Methods, and Information Systems*", Springer, Heidelberg

Buzacottt, J. & Shanthikumar, J. 1994. “Safety Stock versus Safety Time in MRP Controlled Production Systems”, *Management Science*, 40(12), 1678-1689

Christopher, M. 1998. "*Logistics and Supply Chain Management: Strategies for Reducing Cost and Improving Service*", Financial Times, London

Damelia, R. 2011. "*The Basics of Process Mapping*", CRC Press, Boca Raton

Dombrowski, U.et al 2013. “Balanced Key Performance Indicators in Product Development”. *International Journal of Materials*, Mechanics and Manufacturing, 1(1)

Dyne, L. & Pierce, J. 2004. “Psychological ownership and feelings of possession: three field studies predicting employee attitudes and organizational citizenship behavior”. *Journal of Organizational Behavior*, 25, 439-459

Fowler, M. (2005 to 2017) *The New Methodology*, retrieved from https://www.martinfowler.com/articles/newMethodology.html

Harmon, P. 2010. "*Business process change: A guide for business managers and BPM and Six Sigma professionals*", Morgan Kaufmann, Waltham

Higgins, P. et al, 1996 "*Manufacturing Planning and Control: Beyond MRP II*", Saxon Graphics Ltd, Derby

Knolmayer, G. et al, 2002. "*Supply Chain Management Based on SAP Systems: Order Management in Manufacturing Companies*", Springer, Heidelberg

Kueng, P. & Krahn, A. 1999. "Building a Process Performance Measurement System: Some Early Experiences", *Journal of Scientific & Industrial Research*, 58, 149-159

[1] Disclaimer: Some parts of this dissertation were written based on information from the internal and external pages of the company but due to confidential reasons, the websites cannot be mentioned.

Kueng, P. 2000. “Process performance measurement system: tool to support process-based organizations”, *Total Quality Management*, 11(1), 67-85

Madison, D. 2005. "*Process mapping, process improvement, and process management: a practical guide for enhancing work and information flow*", Paton Professional, California

McDonald, S. 2005. “Studying actions in context: a qualitative shadowing method for organizational research”. *Qualitative Research*, 5 (4), 455-473

McIntyre, W. 2009. "*Lean and Mean Process Improvement*", Library of Congress, United States of America

Morgan, J. 2005 "*Creating Lean Corporations: Reengineering from the Bottom Up to Eliminate Waste*", Productivity Press, New York

Neely, A. 2002 "*Business Performance Measurement: Theory and Practice*", Cambridge University Press, Cambridge

Niu, J. & Dartnall, J. 2008. “Application of fuzzy-MRP-II in Fast Moving Consumer Goods Manufacturing Industry”, *Winter Simulation Conference*, 1939-1945

Parmenter, D. 2015 "*Key Performance Indicators: developing, implementing and using winning KPIs*", John Wiley & Sons Inc., New Jersey

Ptak, C. 1991. "MRP, MRP II, OPT, JIT, and CIM- Succession, Evolution, or necessary combination", *Production and Inventory Management Journal*, 7

Sari, R. 2015. “Integration of Key Performance Indicator into the Corporate Strategic Planning: Case Study at PT. Inti Luhur Fuja Abadi, Pasuruan, East Java, Indonesia”, *Agriculture and Agricultural Science Procedia*, 3,121-126

Sharp, A., & McDermott, P. 2001. "*Workflow Modeling: Tools for Process Improvement and Application Development*", Artech House, London

Soliman, F. & Youssef, M. 1998. "The role of SAP software in business process re-engineering", *International Journal of Operations & Production Management*, 18 (9/10), 886 - 895

Tang, O. & Grubbström, R. 2002. “Planning and replanning the master production schedule under demand uncertainty”. *International Journal of Production Economics*, 78(3), 323-334

Toomey, J. 1999. "*MRP II: Planning for Manufacturing Excellence*", Kluwer Academic Publishers, London

White,S. & Miers, D. 2008 "*BPMN Modeling and Reference Guide: Understanding and Using BPMN*", Future Strategies Inc., Lighthouse Point

Zhao, X. & Lee. T. 1993. “Freezing the master production schedule for material requirements planning systems under demand uncertainty”. *Journal of Operations Management*, 11(2), 185- 205

APPENDIX A: Product Substitution Scenarios

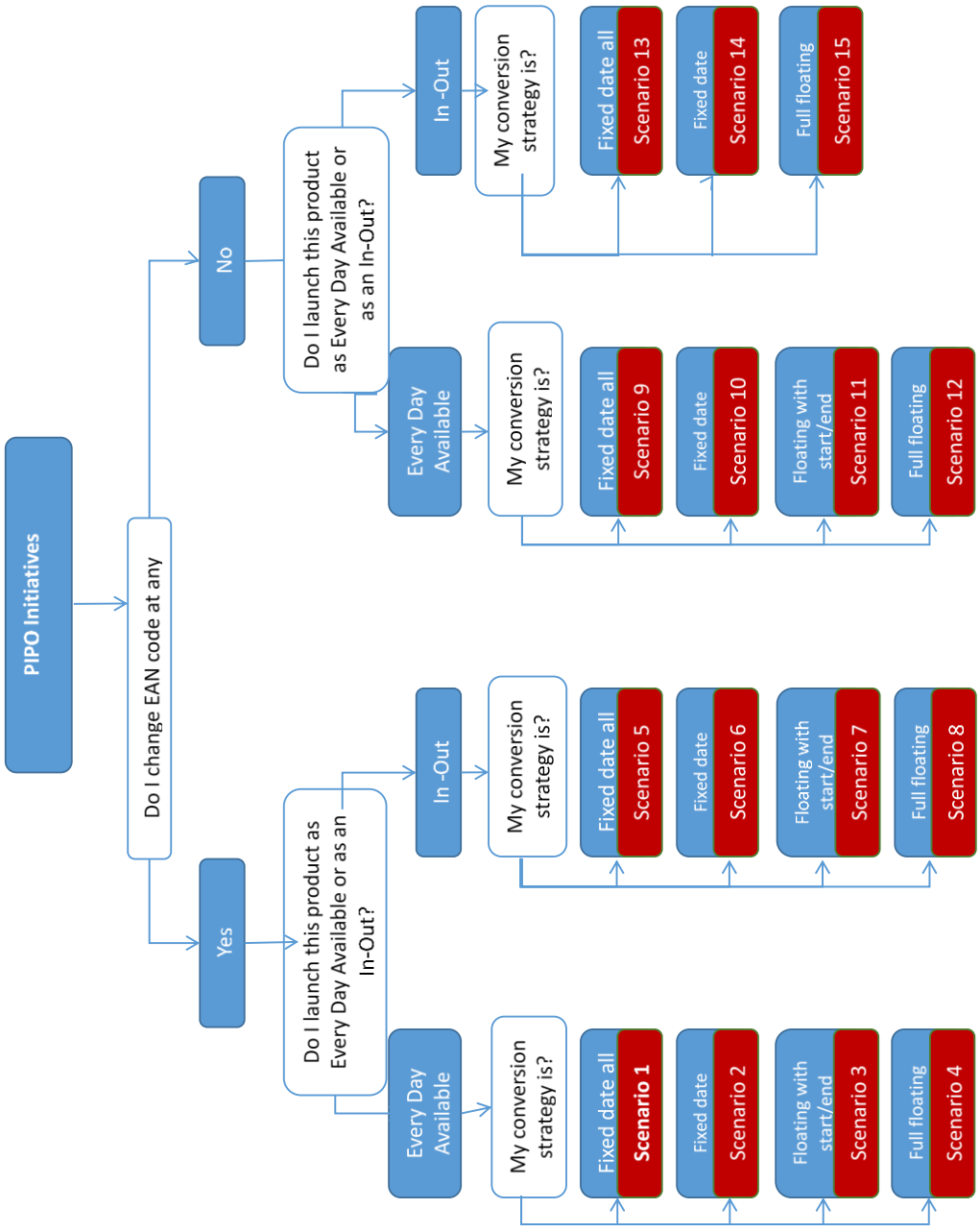


Figure 31 - Diagram with Product Substitution scenarios

Table 16 – Explanation of the different Product Substitution scenarios

Scenarios			Business Scenario's				Country Level				
	Customer Conversion (EAN change at any level?)	P&G Conversion (How to execute SOS)	Business Scenario's	Example/Remark	PI code	PO code	Dates relevant to PI code				Date relevant to PO code
							SOS	Earliest SOS date	Latest SOS date	End of promo	EOS
sc1	EDA HARD	Fixed Date All	All trade at once	regulatory/legal or fast shelf conversion needed	PI code	PO code	Base Plan SOS	N/A	N/A	N/A	N/A
sc2		Fixed Date Staggered	diff dates by customer/ customer group.		PI code	PO code	Base Plan SOS = 1st Customer SOS = ESoSD	N/A	Last Cutomer SOS	N/A	N/A
sc3		Floating with Start/End	delisting of PO in few weeks after conversion		PI code	PO code	calculated SOS	Base Plan and CPS ESoSD	Base Plan LSoSD	N/A	N/A
sc4		Full floating	delisting of PO after depletion		PI code	PO code	calculated SOS	CPS ESoSD	N/A	N/A	N/A
sc5	INOUT HARD	Fixed Date All			promotional code	original code	ARD SOS/ Base Plan	N/A	N/A	ARD end of promo	N/A
sc6		Fixed Date Staggered			promotional code	original code	ARD SOS / Base Plan= 1st Customer SOS = ESoSD	N/A	N/A	ARD end of promo	N/A
sc7		Floating with Start/End			promotional code	original code	ARD SOS/ Base Plan	N/A	Base Plan LSoSD	ARD end of promo	N/A
sc8		Full floating			promotional code	original code	ARD SOS/ Base Plan	N/A	N/A	ARD end of promo	N/A
sc9	EDA SOFT	Fixed Date All	Soft executed as hard, all trade at once		PI code	PO code	Base Plan SOS	N/A	N/A	N/A	N/A
sc10		Fixed Date Staggered	diff dates by customer/ customer group.		PI code	PO code	Base Plan SOS = 1st Customer SOS = ESoSD	N/A	Last Cutomer SOS	N/A	N/A
sc11		Floating with Start/End	Soft within window		PI code	PO code	calculated SOS	Base Plan and CPS ESoSD	Base Plan LSoSD	N/A	N/A
sc12		Full floating	soft until PO depleted		PI code	PO code	calculated SOS	CPS ESoSD	N/A	N/A	N/A
sc13	INOUT SOFT	Fixed Date Staggered			promotional code	original code	ARD SOS / Base Plan= 1st Customer SOS = ESoSD	N/A	N/A	ARD end of promo	N/A
sc14		Floating with Start/End		To be used for Fixed Date All	promotional code	original code	ARD SOS/ Base Plan	N/A	Base Plan LSoSD	ARD end of promo	N/A
sc15		Full floating			promotional code	original code	ARD SOS/ Base Plan	N/A	N/A	ARD end of promo	N/A

APPENDIX B: Process Mapping

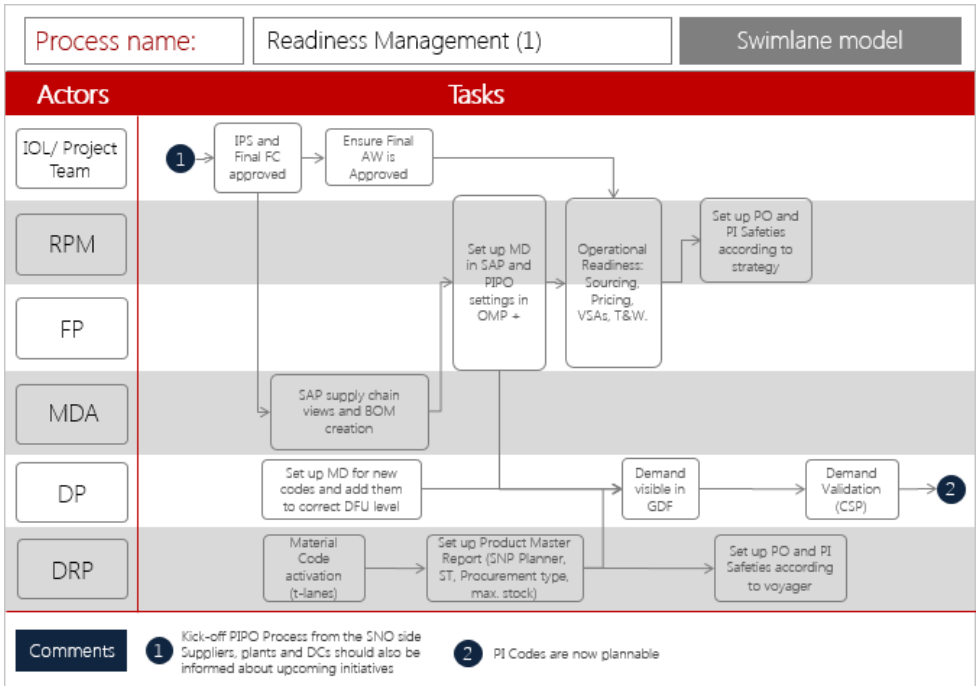


Figure 32 – Example of the swimlanes created – readiness management phase

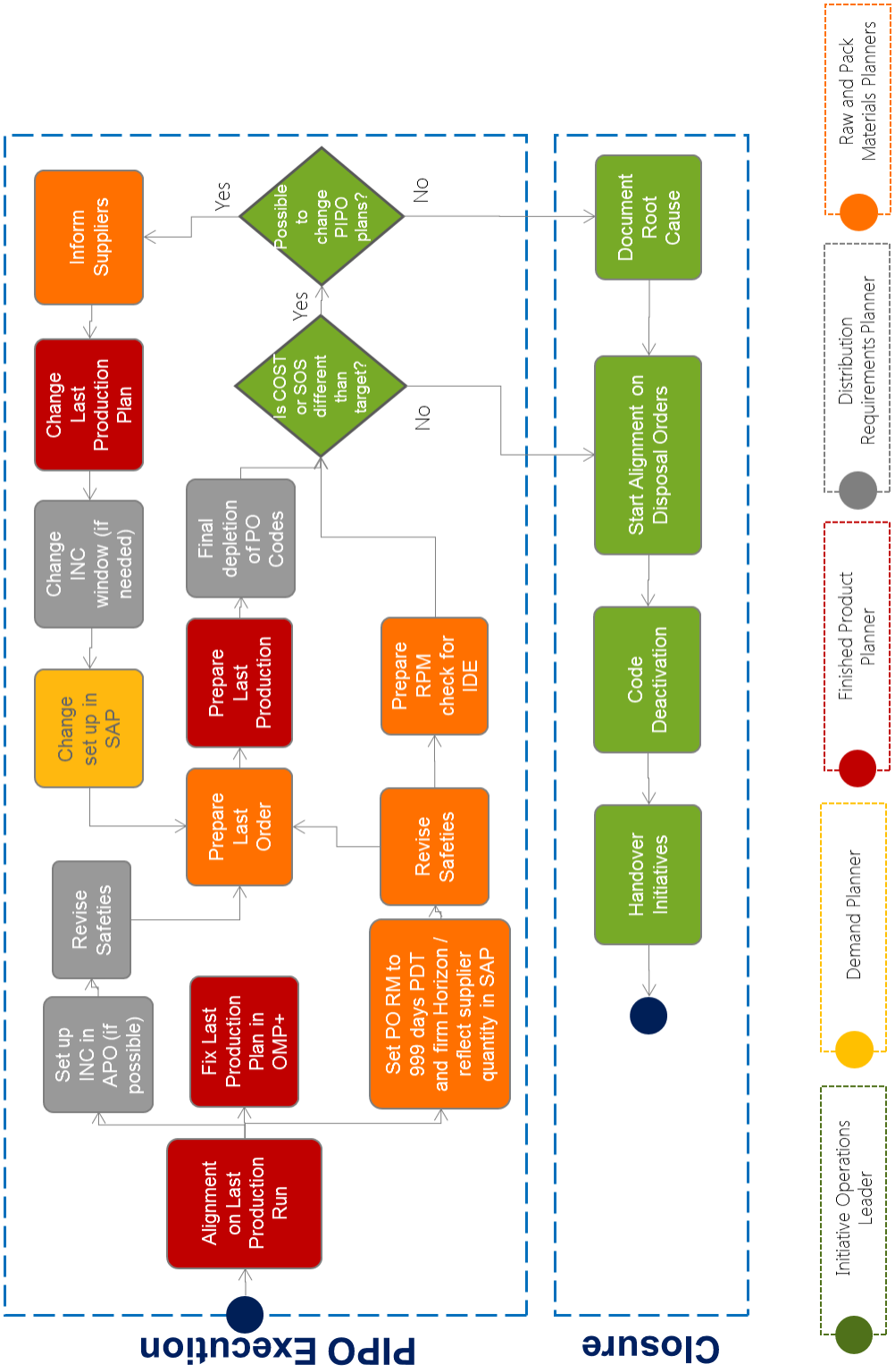


Figure 33 – Example of the flowcharts created – PIPO execution and closure

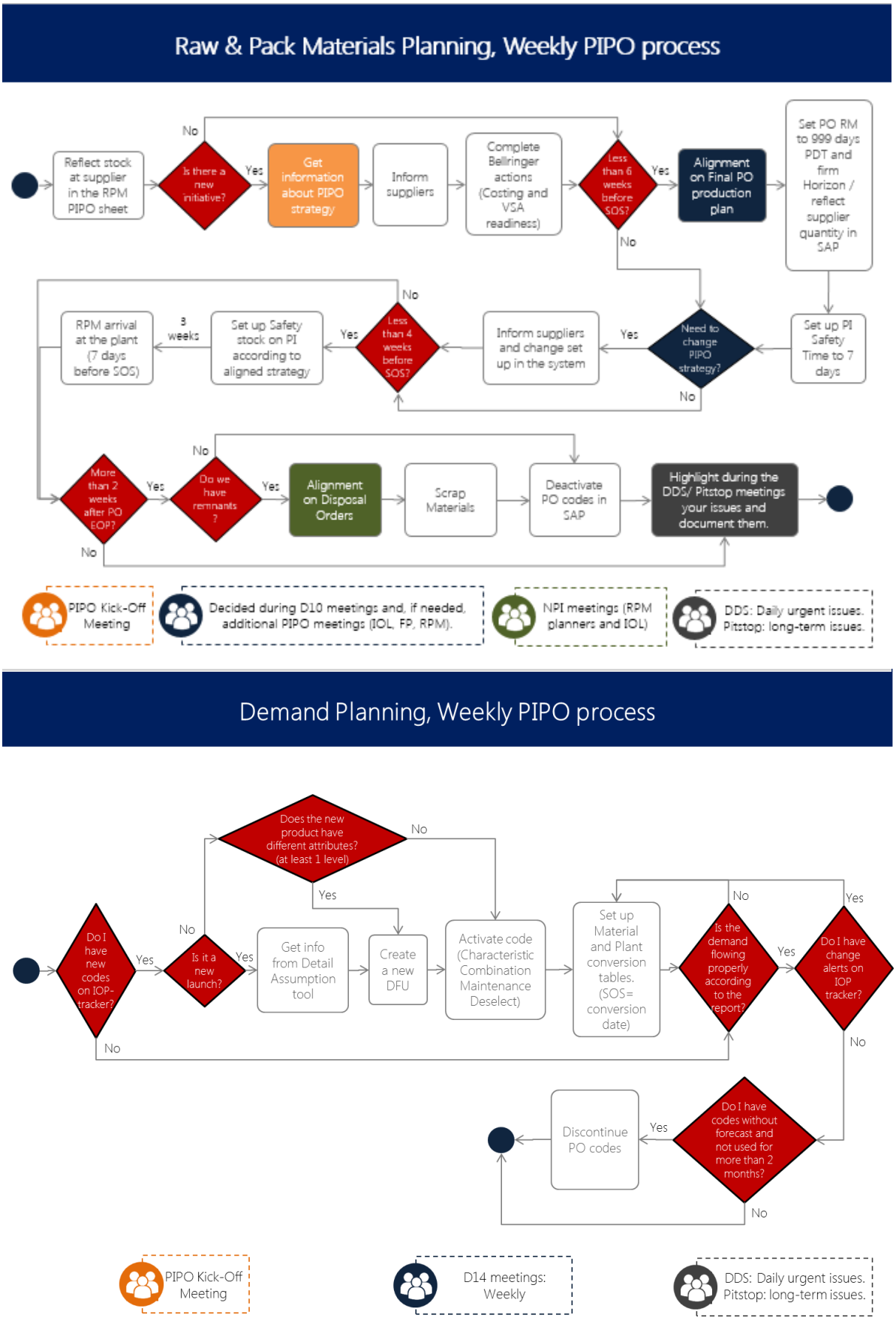


Figure 34- Example of the weekly charts created - raw and pack materials planning and demand planning

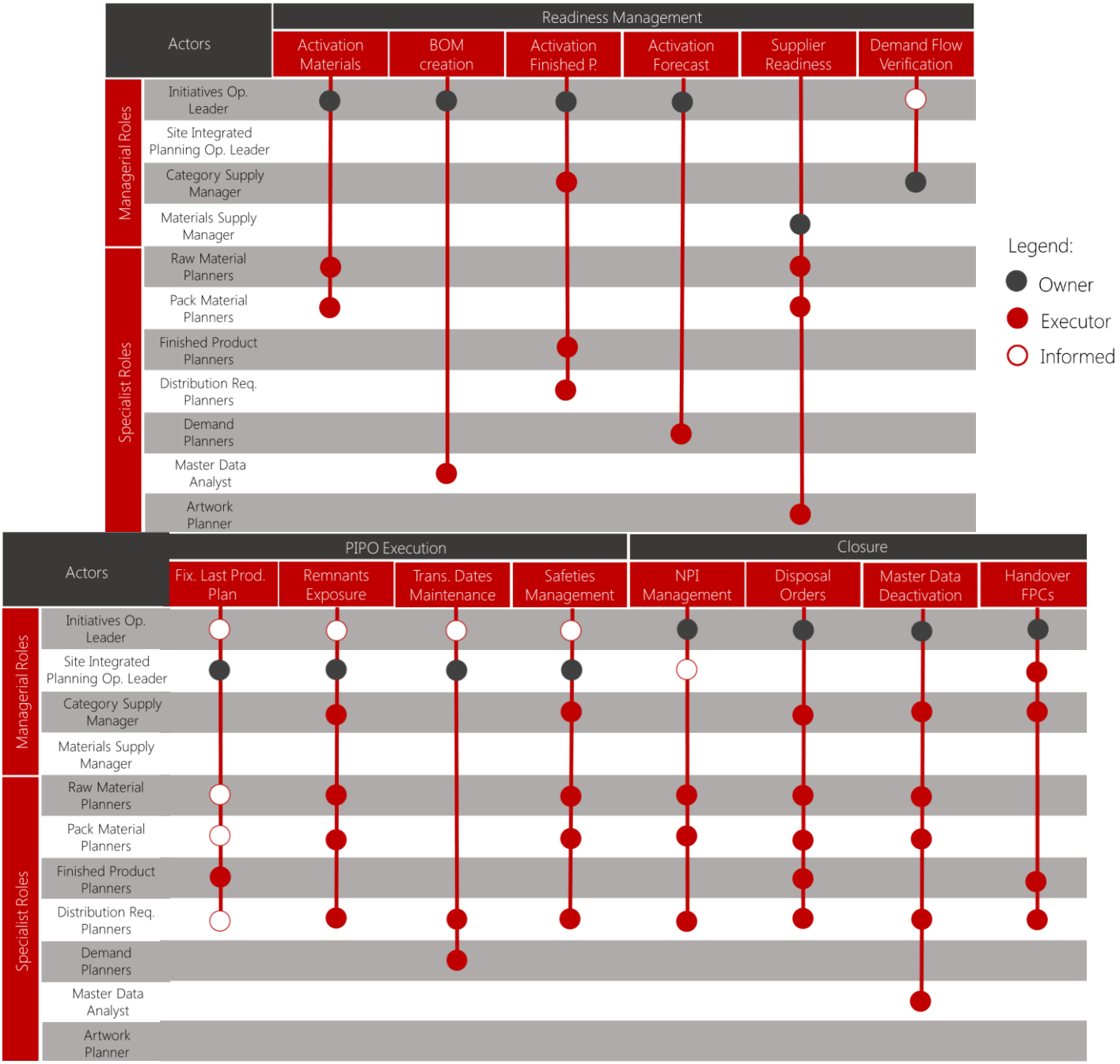
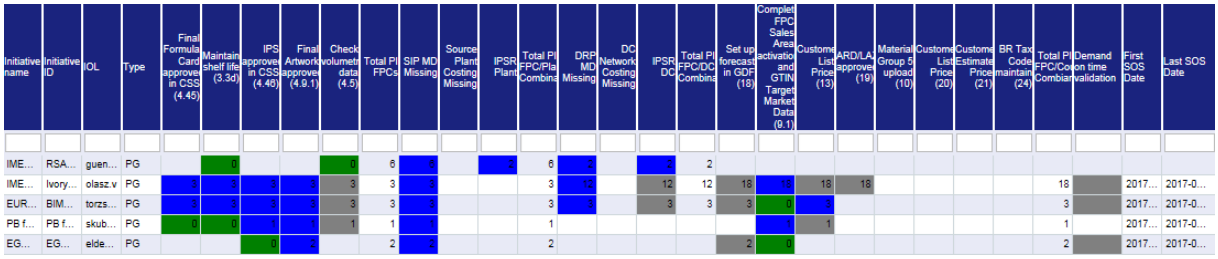


Figure 35 - Responsibility matrix of the Product Substitution process

APPENDIX C: The IOP-Tracker



Initiative name	Initiative ID	IOL	Type	Final Formula Card approved in CSS (4.45)	Maintain shelf life (3.3d)	IPS approved in CSS (4.46)	Final Artwork approved (4.9.1)	Check volume/t data (4.5)	Total PI FPCs	SIP MD Missing	Source Plant Costing Missing	IPSR Plant	Total PI FPC/Pla Combina	DRP MD Missing	DC Network Costing Missing	IPSR DC	Total PI FPC/DC Combina	Set up forecast in GDF (18)	Complet FPC Sales Area activatio and GTIN Target Market Data (9.1)	Custome List Price (13)	ARD/LA approve (19)	Material Group S upload (10)	Custome List Price (20)	Custome Estimate Price (21)	BR Tax Code maintain (24)	Total PI FPC/Con Combian	Demand con time validation	First SOS Date	Last SOS Date
IME...	RSA...	guen...	PG		0			0	6	6		2	6	1		2	2												
IME...	Ivory...	olasz.v	PG	3	3	3	3	3	3	3			3	12		12	12	18	18	18	18					18		2017...	2017-0...
EUR...	BIM...	torzs...	PG	3	3	3	3	3	3	3			3	3		3	3	3	0	3						3		2017...	2017-0...
PB f...	PB f...	skub...	PG	0	0	1	1	1	1	1			1						1	1						1		2017...	2017-0...
EG...	EG...	elde...	PG			0	1		2	2			2					2	0							2		2017...	2017-0...

Figure 36- Screenshot of one of the views of the IOP'-tracker

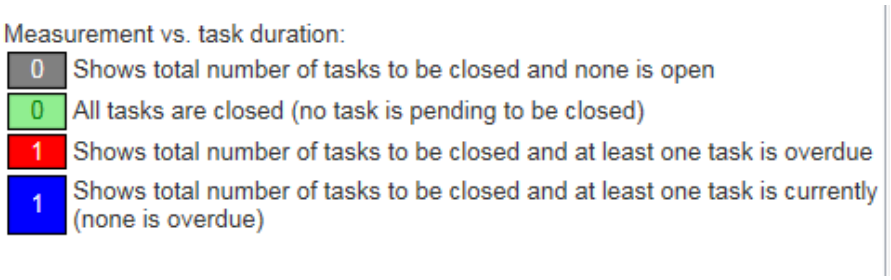


Figure 37- Tracking the open actions in IOP-tracker

The IOP-Tracker

Users: DP, DRP, MIL, SIP FP, F&A, SIEL

The high level process of how the tool is used:

1) The IOL enters scope of the initiative in IOPT.
2) This automatically generates a set of tasks which have a set sequence between them and only open up when their predecessors are done. The tasks become visible to initiative team members on ‘executor views’.
3) The status of task completion is visible on reports targeted mainly at IOL.
4) Any changes to scope details (dates, conversion types, etc.) done by the IOL, after a particular team member has executed his task, become available to this person as ‘change alerts’, so master data can be updated if needed.

APPENDIX D: Meetings

The DDS Meetings

Frequency: Daily

Participants: Manufactuting sites, PSC Demand and Supply teams, SMO

Duration: 30 min

The Daily Direction Settings meetings are daily checkpoint meetings that take place every morning in order to make timely and effective decisions of what, how and when the products should flow.

Before the meeting the planners check all their codes and highlight the most problematic cases explaining the situation and suggesting an action.

During the meetings there is an alignment on immediate priorities based on the most updated information and continuously action on them.

The DDS-i

DDS-insights is a tool that supports the daily direction setting meetings. All the planners need to give input with the most problematic cases to be discussed during the meetings. Action plans are created and DDS-i sends automatic emails to the people involved with minutes and tasks. Different functions have access to different DDS-i areas.

The D14 meetings

Frequency: Weekly

Scope: 1 Market – 1 Category (or more than 1 Markets with Time Slot distribution)

Participants: IOL, MIL, DP, (CSP), (DRP), (Customization)

The objective of this meeting is to review the initiative readiness in terms of market implementation. The changes in the base plan are shared and discussed and updates are given in terms of supply chain and market readiness. Possible outages are highlighted and together the IOL and MIL come up with solutions focusing on service. The remnant projection is also compared with the elimination plan, focusing on inventory.

The D10 meetings

Frequency: Weekly

Scope: 1 Value Stream- Several Initiatives and Several Markets

Participants: IOL, DRP, SIP FP, SIP RPM, (MDA), (MSM), (SCL)

The objective of this meeting is to review the supply chain readiness for the implementation of new projects. During this meeting the participants review the feasibility of the base plan and if something is not ok, they propose changes in the plan.

The master data readiness, possible outages, remnants projection as well as capacity constrains are discussed. If there is a need, a new Start of Production date is aligned. Any change need to be communicated with the rest of the team.

The R10 meetings

Frequency: Depends on the project.

Kickoff: 2 months before LPA sign off

LPA: 6-9 months before SOS

Close-out: 3 months after SOS

Participants: Project Manager, IOL, MIL, (DRP), (CSP), (SIP FP), (SIP RPM), (DP)

The objective of these meetings is to gather input on the initiative base plan and share information with the project manager of the initiative.

Mostly these meetings occur whenever there is a milestone in the process: Kick-off, Project Establishment, Project Commitment, Launch Plan Agreement, Closure.

The Pit Stops Meetings

The Pit Stop meetings take place on a weekly basis and aim at bringing together the whole value stream to discuss the biggest issues encountered throughout the week, improving the current practices. The system planning parameters are also revised in order to ensure a maximum performance for the next week. There can be Pit Stops for different areas of improvement, for example Master Data or Inventory Management.

APPENDIX E: Training Plan

Table 17 - Training plan created for the Supply Network Operations initiatives delivery team

Training Session	Who is delivering it?	Who needs to attend?	Goal of the training
Introduction to PIPO	IOL	RPM, FP, DRP, DP, MDA	Raise awareness about importance of the process. Give general overview: Terminology, Scenarios, etc.
Master Data Set-up	IOP	RPM, FP, DRP, DP, MDA, IOL	Specific training regarding Master Data Set-up. What needs to be done and what is the order of the actions.
PIPO Execution (advanced)	IOP/SIP Leader	RPM, FP, IOL	How RPM and FP should be synchronized. Common mistakes, how to avoid them.
Inventory Management	SIP Leader	RPM, FP, DRP, CSP, IOL	When and how should the safeties be set-up. Where can they find information
IOP-Tracker	IOP	RPM, FP, DRP, DP, MDA, IOL	How to use IOP-tracker: actions completion, reports creation.
INC set-up	DRP PIPO Owner	DRP	When and how to set up interchangeability.
RPM PIPO Strategy	RPM PIPO Owner	RPM, IOL	Raise awareness regarding the existing strategy.
Demand Flow	IOL, CSP	DP, DRP, IOL	What happens when the demand is not flowing correctly. Corrective and preventive measures.

APPENDIX F: Training Material

PIPO Process in FemCare

Finished Product

When?	What?	How?	Why?
12-10 weeks before PI SOP	Create MRP Views, Production Version, Quota and MD	MMf1(SAP) and OMP+	Only after this the codes are plannable in SAP and OMP+
12-10 weeks before PI SOP	Set Up PIPO attributes and grouping in OMP+	Product attribute PIPO Grouping and PIPO Life Cycle attribute in OMP+ (also for PIPO-linked RPM)	Pyramid "PL10-PIPO Grouping-Life Cycle-Product" in Planning context will be created and both PI and PO will be visible while planning.
12-10 weeks before PI SOP	Check RPM stocks at Plant	Confirm with Plant what is available on the ground.	Kick-off alignment on remaining PO production quantities.
2 months before SOP date	Monitor RPM inventory picture weekly.	Attend the PIPO meeting	Adjust the moment when final PO codes production plan must be fixed
3-4 weeks before PI SOP	Finalize PO SKUs production plan and firm it in OMP+ and apply planning calendar	Apply "Closed" planning calendar to PO SKU (Data Manager => GDMProcessEvol)	This will ensure that PI SKU is not planned by OMP+ earlier than SOP date. As an alternative, you can change "Valid From" date for corresponding Production Version of PI SKU in SAP
After PO plan was firmed and Master Data changed	Give signal to DRP that this step is done	During D10 meetings or Email	Only after this step they are able to set up APO INC.
After having firmed PO plan	Deactivate PO codes	Set MRP Type for PO codes at Production Plant to X1 (mm02)	After this, the codes won't be plannable anymore and OMP+ won't propose production afterwards.

Meetings	When?	Why do you need to attend?
Initiative Kick-Off	As soon as IOL has info	Get to know what the initiative that is coming.
D10	Weekly (when IOL requests your attendance)	Alignment on new SOS dates, remnants strategy.

- Solver will respect RPM availability inside OMP+ horizon on demand.
- If you create the Master Data in SAP before the BOMs are created, then you need to manually update the master data later.
- Use Pyramid "PL10-PIPO Grouping-Life Cycle-Product" in Planning Context to minimize remnants, during manual PO SKU planning.
- Give signals to other planning functions when system setup changes are required.
- Plan the Last Production on time and taking into consideration the longest commitment zone of suppliers as well as the lead times for PI codes.

Document created in December 2016

Figure 38 – Example of the "One pagers" created – finished product planning

PIPO in FemCare	
Knowledge Management - One Point Lessons	
Function	Topic
Raw and Pack Materials Planning	Costing
	Schedule Agreement
	Master Data Set-up (MRP Views)
	Communication with supplier
	Preparation RPM for IDE
	Reflect stock at supplier in SAP
	PI Safeties Management
	PO Safeties Management
	D10 meetings preparation
	PO Codes Deactivation
Finished Product Planning	Master Data Set-up in SAP (MRP Views)
	Master Data Set-up in SAP (Production Version)
	Master Data Set-up in SAP (Quota)
	Master Data Set-up in OMP+
	Set up PIPO attributes/pyramid in OMP+
	Fix Production Plan
	PO Codes Deactivation
Distribution Requirements Planning	Master Data Set-up (Material Code Activation)
	Master Data Set-up (Product Master Report)
	INC Set-up
	PI Safeties Management
	PO Safeties Management
	D10 meetings preparation
	PO Codes Deactivation
Demand Planning	Master Data Set-up (Codes Activation)
	Create a new DFU Level
	D14 meetings preparation
	PO Codes Deactivation
	Demand Flow - Troubleshooting
Master Data Analyst	Check Codes activation (mostly RPM)
	Check MD completeness
	BOMs Creation
Initiatives Operations Planning	Set-up IOP-tracker
	Codes Request
	Kick Off Meetings preparation
	D10 meetings preparation
	D14 meetings preparation
	Master Data Tracking
	SIMPL Gates
	Change PIPO Plans
	IDE tracking
	NPI Tracking

Figure 39 – List of the “One Point Lessons” gathered.

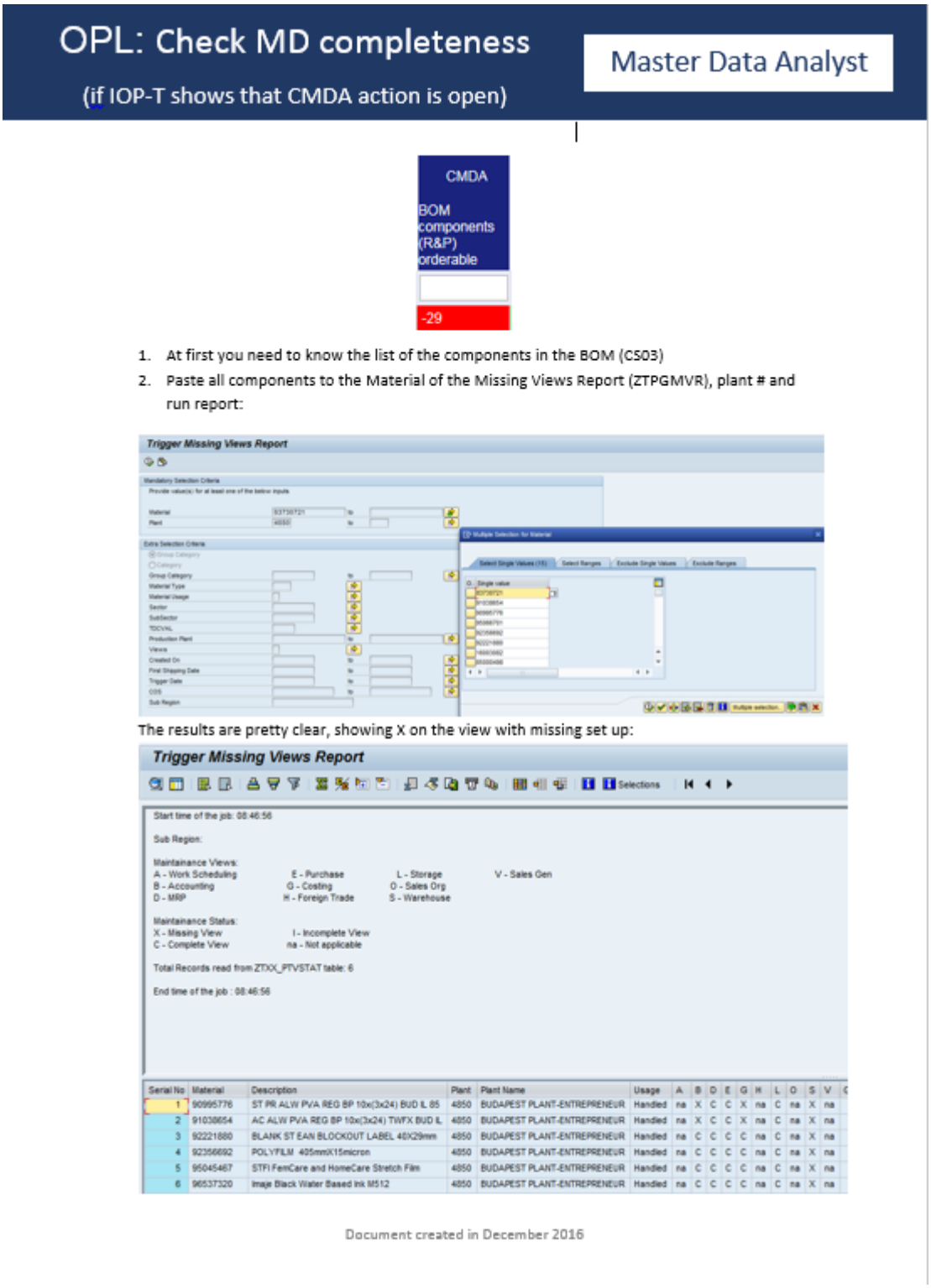
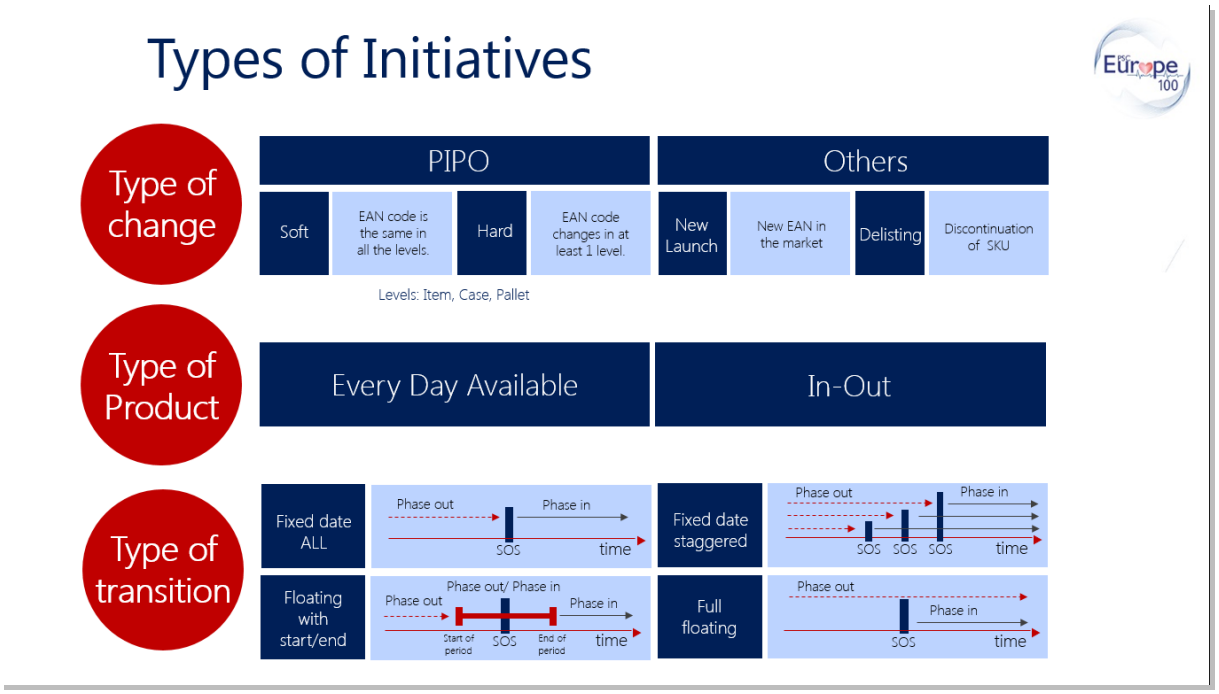


Figure 40 - Example of a "One Point Lesson" for master data analysts.



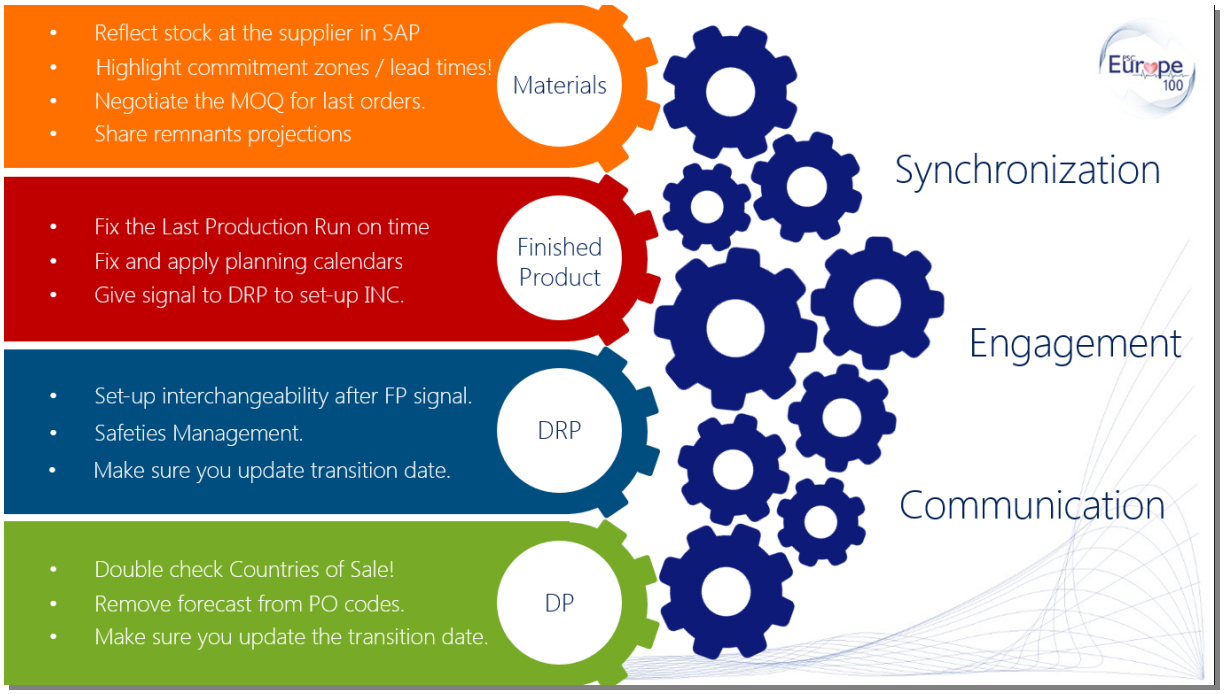


Figure 41 - Screenshots from the awareness presentation

APPENDIX G: Monitoring System

Process Indicators		Monitoring Process			
Name of In-Process Steps	In-Process Measures	Who Monitors	Monitoring Frequency	Action or Control Limits	Who Investigates
Baseplan is complete	yes/no	IOL	per project	no	IOL
PC Readiness	**Supply Network/ Master Data Requirements Defined**				
DELIVERY VIABILITY	yes/no	IOL	PC Gate	no	SC Ldr
Remnants Disposal Plan in approved Base Plan	yes/no	IOL	PC Gate	no	PM
FP Codes are created	Done	IOL	at PC approval	not avail at PC	IOL
LPA Readiness	**Phase-in (PI) FP Codes (FPCs) are PLANNABLE**				
DELIVERY VIABILITY	yes/no	IOL	LPA Gate	no	SC Ldr
IPS, IPMS, SPS in CSS	100%	IOL, SIP	before LPA approval	not done	SIP, IOL, TDL
Remnant Projection & Disposal Plan Approved	yes/no	IOL	LPA Gate	no	PM
FPCs with Final AW	%	IOL	weekly from PC approval	<100%	IOL
Countries of Sales correct?	%	IOL	weekly from PC approval	<100%	IOL
PI FPCs have Planning and Production BOMs	%	SIP	weekly from PC approval	<100%	SC Ldr
PIPO Rules set for DRP and GDF	%	DRP, IOL	weekly from PC approval	<100%	SC Ldr
PIPO SKUs Forecasted in GDF	%	DP	weekly from PC approval	<100%	SC Ldr
Demand Validation	%	DP-Planner	weekly from PC approval	<98%	SC Ldr
Demand Flow Verification	%	IOL	weekly from PC approval	<98%	SC Ldr
LAZ Readiness	**LAZ FPCs are MAKEABLE, SHIPPABLE, PUBLISHABLE**				
DELIVERY VIABILITY	yes/no	IOL	LAZ Gate	no	SC Ldr
Remnant Projection & Disposal Plan Approved	yes/no	IOL	LAZ Gate	no	PM
PI R/PM have SA's and Price maintained in *6P*	%	SIP	weekly from LPA approval	<100% PI R/PM	MSM
Stock at supplier reflected in SAP	%	RPM	weekly from LPA approval	<100%	SIP Ops Ldr
Safety Stock ->Safety Time (PO)	%	RPM, FP, CSP	weekly from LPA approval	<100%	SIP Ops Ldr
Safety time set-up (PI)	%	RPM, FP, CSP	weekly from LPA approval	<100%	SIP Ops Ldr
Remove Safety (PO)	%	RPM, FP, CSP	weekly from LPA approval	<100%	SIP Ops Ldr
Safety Time -> Safety Stock (PI)	%	RPM, FP, CSP	weekly from LPA approval	<100%	SIP Ops Ldr
Last Production Plan Fixed	%	FP	weekly from LPA approval	<100%	SIP Ops Ldr
Fix last production at supplier and last delivery reflected in SAP	%	RPM	weekly from LPA approval	<100% PO R/PM	SIP Ops Ldr
INC set-up	%	DRP	weekly from LPA approval	<100% of FPCs with Production Plan fixed	IOL
Demand Validation	%	DP-Planner	weekly from LPA approval	<98%	SC Ldr
Demand Flow Verification	%	IOL	weekly from LPA approval	<98%	SC Ldr
SOS Readiness	**PI FP Codes are ORDERABLE/BILLABLE**				
DELIVERY VIABILITY	yes/no	IOL	weekly from LAZ approval	no	SC Ldr
PIPO FPCs Substitution Rules Operational (CSO systems)	%	IOL	weekly from LAZ approval	<100%	IOL
SOS date Compliance (Demand)	%	DP	weekly from LAZ approval	<100%	IOL
SOS date Compliance (DRP)	%	DRP	weekly from LAZ approval	<100%	IOL
PI RPM on ground 7 days before SOS	%	RPM	weekly from LAZ approval	<100%	MSM
Printing Plates at supplier on time	%	AW	weekly from LAZ approval	<100%	IOL
IS Inventory pre-building on track?	Yes or No	FP	weekly from LAZ approval	<100%	SIP Ops Ldr
Demand Validation	%	DP-Planner	weekly from LAZ approval	<98%	SC Ldr
Demand Flow Verification	%	IOL	weekly from LAZ approval	<98%	SC Ldr
13 weeks after SOS	**Closure + Handover**				
Launched on time?	yes/no	IOL	At SOS date	no	PM
Changed from PI to PO?	yes/no	SIP	Weekly after SOS	yes	IOL
Master Data Deactivation FP	%	DRP, CSP, FP	Weekly after SOS	<100% of PO codes without requirements	MDA
Disposal Orders if there are remnants	yes/no	DRP, RPM, CSP	Weekly after SOS	no	IOL
Master Data Deactivation RPM	%	RPM, MDA	Weekly after SOS	<100% of PO codes without requirements	MDA
Handover FPCs to SIP	%	IOL, SIP	Weekly after SOS	<100% of PO codes (13 weeks after SOS)	SC Ldr
PIPO Issue sheet if PIPO cost > targets	yes/no	IOL	Weekly	no	IOL

Figure 42 - Monitoring system proposed to the management team.

Initiatives Dashboard	
Total Active Initiatives and Projects:	[Number 1]
Active Initiatives on Compressed Schedule:	[Number 2]
Percent on Compressed:	[Number 2]/ [Number 1]*100
Total number of active SKUs:	[Number3]
Total Remnants projection:	[Number 4]
% Initiatives LAz- 6 months	[Number 5]
Initiatives on Track	[Number 6]
Initiatives Off-Track but Recoverable	[Number 7]
Initiatives Off-Track and Need Intervention	[Number 8]

Figure 43 – Screenshot of the general indicators regarding initiatives

Initiative Name	Value Stream	Nr of SKUs	Status	Base Plan Hit Rate	Nr of Overdue Actions	CPS Compressed?	MD Activation Completeness	Costing Completeness	Last Production Plan	Remnants Projection	SOS Date	SOS Date (remnants exhaustion)
[Insert name]	[Insert VS]	[Number from IOP-t]	[Active, Closed]	[%]	[Number from IOP-t]	[Yes,No]	[%]	[%]	[Yes,No]	[from RPM and FP files]	[current SOS Date]	[Taking into consideration PO Demand/Forecast and Remnants]

Changed from PI to PO?	Nr of Codes with double safety	D10 Attendance Rate	D14 Attendance Rate	Actions	SA Overdue	AW Overdue	Kick Off vs SOS date	IOP-t/ SAP Compliance	Costs due to late actions (e.g. Airfreight costs)	Number of times the SOS date changed	Longest Lead Time PI	Longest Commitment Zone PO
[Yes,No]	[Number from SAP]	[% of attendants vs required]	[% of attendants vs required]	[Insert actions for next week]	[Number from IOP-t]	[Number from IOP-t]	[Number from IOP-t]	[Audit tool]	[Insert number]	[Insert number]	[Insert number]	[Insert number]

Figure 44 - Screenshots of the proposal for the Initiatives tracking file (besides IOP-t)