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PROJECT MANAGEMENT PRACTICES IN A PORTUGUESE
FOOTWEAR COMPANY

Dissertação no âmbito do Mestrado em Engenharia e Gestão Industrial orientada pela Professora Doutora Aldora Gabriela Gomes Fernandes e apresentada ao Departamento de Engenharia Mecânica da Faculdade de Ciências e Tecnologia da Universidade de Coimbra.

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Project Management Practices in a Portuguese footwear company

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ECCO
Shoes for Life

ECCOlet Portugal

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Resumo

O presente trabalho surge da necessidade de melhorar o modo como a ECCO'let Portugal, onde decorreu o estágio curricular do investigador, realiza a gestão de projetos, nomeadamente, nos projetos do departamento de Investigação e Desenvolvimento (I&D). Este departamento é responsável pelo desenvolvimento de novos produtos para cada estação, estando também responsável pela produção de pequenas coleções. Os projetos de desenvolvimento de produto estão intrinsecamente associados a instabilidade, que depende de variáveis internas e externas às organizações. De forma a responder corretamente aos requisitos dos clientes, cada vez mais exigentes e informados, e garantir que as decisões tomadas vão de encontro ao alinhamento estratégico, as organizações apostam na utilização adequada de ferramentas e técnicas de gestão de projetos.

Deste modo, o presente trabalho de investigação tem como principal objetivo a melhoria das práticas de gestão de projetos com o propósito de suprir as adversidades sentidas no decorrer dos mesmos.

De acordo com a revisão da literatura, é possível verificar que a utilização de práticas de gestão de projetos se traduz em inúmeras vantagens no desempenho dos projetos e, conseqüentemente, da organização. Uma vez que o estágio teve uma duração relativamente pequena, e a empresa colocou algumas limitações à implementação, pelo que não foi possível quantificar os benefícios resultantes da utilização das sugestões de melhoria propostas ao nível das práticas de gestão de projetos.

Assim, este trabalho de investigação, apenas sugere algumas práticas na gestão de projetos, auxiliando a unidade de I&D através da criação de processos standardizados de gestão de projetos. A standardização de processos é uma abordagem que permite às organizações a criação de respostas padronizadas, que deverão ser reajustadas à realidade de cada contexto organizacional.

Palavras-chave: Gestão de Projetos, Práticas de Gestão de Projetos, Standardização, Gestão de Portefólio

Abstract

The present report arises from the need to improve project management practices in ECCO'let Portugal, where the internship of the researcher took place, namely in the Research and Development department (R&D). This department is responsible for developing new shoes for each season and is also responsible for producing small collections. New product development projects are mainly related to instability, depending on internal and external factors. However, organizations are committed to properly using project management tools and techniques to respond to clients' requirements, be more demanding and informed, and guarantee that the decisions taken meet the strategic alignment. Therefore, the present research intends to improve project management practices to help overcome the adversities felt during the project's lifecycle.

According to the literature review, the proper use of project management tools and techniques reveals numerous advantages in the projects' performance and, consequently, in the organization. However, since the internship had a relatively short duration and the company placed some limitations on the practice's implementation, it was impossible to quantify the benefits of using the proposed improvement suggestions.

Thus, this research work only suggests some project management practices, helping the R&D unit through the creation of standardized project management processes. The standardization of processes is an adopted approach that allows organizations to create standardized responses, which must be readjusted to the reality of the organizational context.

Keywords: Project Management, Project Management Practices, Standardized Project Management, Portfolio Management

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ACRONYMS

APPICAPS- Associação Portuguesa dos Industriais de Calçado, Componentes, Artigos de Pele e seus Sucedâneos

BCG- Boston Consulting Group

CSF- Critical Success Factors

EMCS- ECCO Master Color System

EPMO- Enterprise Project Management Office

GDM- Graphic and Design Management

MBOM- Manual Bill of Materials

MRS- Master Reference Shoe

PMBOK- Project Management Body of Knowledge

PMC- Project Management Capability

PMI- Project Management Institute

PMO- Project Management Office

R&D- Research and Development

1. INTRODUCTION

The present dissertation was written within the scope of a curricular internship at ECCO'let Portugal to obtain a master's degree in Industrial Engineering and Management from the Faculty of Sciences and Technologies of the University of Coimbra.

1.1. Context and Motivation

During the 19th century, Portugal became a specialist in the art of making shoes, being able to produce about 100 pairs of shoes per day. However, the artisanal work had a strong presence for a long time, and Portugal acted as an intermediate supplier, not having direct contact with clients (Coelho, 2020). Even though Portugal knew how to make qualified shoes, not many customers knew about this.

Portuguese footwear is known worldwide, and its industry gained recognition as "The sexiest Industry in Europe" (Coelho, 2020), turning this industry into one of the most relevant ones, allowing a significant financial flow with internal and external markets. On the other hand, customers are increasingly concerned with balancing quality, fashion, and price. Therefore, it is crucial to find suitable mechanisms to face the competitive environment in this industry, focusing on delivering high-quality products and ensuring the brands' presence in variable markets.

The shoe industry in Portugal has been in permanent growth. It aligns tradition with knowledge and technologies, increasing exported pairs and related invoicing, and has gained even more international recognition (Fact_numbers_Appicaps, 2019).

The business environment is more complex, clients are more demanding and informed, and the strong presence of competition characterizes it. Therefore, organizations must seek to adapt to constant change. One of the strategies that organizations undertake is improving project management practices (Alias et al., 2014; Cooper, 2013). Project management practices operate in different areas of knowledge such as cost management, risk management, and human resources management, acknowledging that projects' success depends on motivated and interested teams, that consumption must be estimated, and that risks must be considered (Oliveira, n.d.).

On the other hand, organizations tend to focus on new product development to attain different publics and ensure a competitive position in their sector of activity (Cooper & Kleinschmidt, 2010). Choosing which new products to develop is a trying strategic decision. Leaders must consider the new products' ability to succeed, the client's needs, and expectations that the new product will suffice. *New product development* is a challenging decision representing strategic value to the organization. Therefore, it needs to be focused, and it is imperative to prioritize new products that improve the organization's strategic position (Trott, 2008).

The internship takes place in ECCO's Portugal, in the R&D department, where the production process of new products begins. It is worth of mentioning that is R&D's responsibility to produce prototypes, manage the corrections pointed out by internal and/or external costumers, and develop material trials and tests, among others.

R&D also takes responsibility for the pre-series of various projects, including collaborations and partnerships. *Collaborations* are projects in which ECCO works with brands in the development process. On the other hand, partnerships are projects in which ECCO only helps part of the process. Both strategies allow the company to increase its business reach. This means that R&D has numerous projects simultaneously, and it is crucial to correctly plan all projects' activities, guaranteeing a balanced flow regarding resources, deadlines, and priorities. For this, R&D needs to focus on the correct use of project management practices, ensuring that the information about each project is available to all stakeholders, making projects progress easier to evaluate. In addition, multiple teams are involved in the new product development, making the information flow between teams significant.

As mentioned before, R&D has multiple projects, making it crucial to have a sound project planning system and prioritization of the projects in the portfolio.

1.2. Objectives

After daily observation, it was possible to identify some challenges in project management in the R&D department. Therefore, it is essential to acknowledge the importance of this department once it is responsible for new product development for ECCO Group.

Therefore, this research must address the volatility, uncertainty, complexity, and ambiguity (VUCA) environment in new product development and understand the impact of good project management practices in this case.

Thus, for this research, the investigation question is "What are the most useful project management practices for the R&D department under study?". For this, the primary goals to be addressed are:

- O1: Understand the role of project management in the new product development process;
- O2: Identify the problems regarding the management of projects at ECCO;
- O3: Identify and develop key project management practices to mitigate the problems of the management of projects.

1.3. Methodology

Planning the research methodology allows the alignment of a clear line of thought, outlining each phase for the project realization and ensuring scientific rigor. According to Saunders et al. (2019), the outlined investigation plan must answer the investigation question in this project: "What are the most useful project management practices for the R&D department under study?". The research methodology is based on Research Onion framework, published by Saunders et al. (2019). It consists of six layers, philosophy, approach to theory development, investigation strategy, time horizon, techniques and procedures, and data collection and analysis, that provide a detailed description of each stage of the project.

Figure 1.1 shows an adaptation of the Research Onion according to this project.

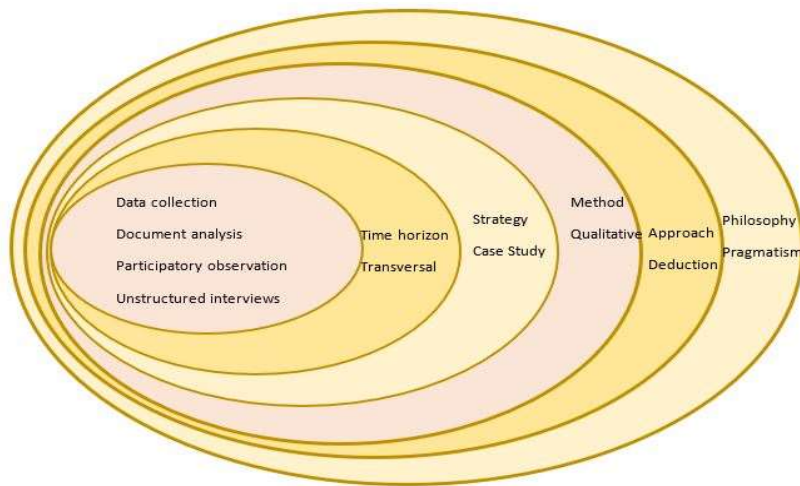


Figure 1.1 - Research Onion – Research Methodology

Adapted from (Saunders et al., 2019)

For this project, the philosophy embraced is pragmatism. For a pragmatist, the research seeks to find practical solutions to problems and acknowledges the existence of various solutions for the problem in the study (Saunders et al., 2019).

The project adopted a deductive approach. This means that during the first phase, there is a search in the literature to identify the project management practices more suitable for the case under study. Then, a detailed study was conducted on the ECCO 's processes and the flow between all departments. This type of methodology does not produce new results or new knowledge. Instead, it brings practical contributions by showing that the knowledge in literature can be used in practice in a different context ECCO company. Considering the context of this project, the strategy adopted was a case study, which allows detailed and intensive knowledge about the case.

Projects are commonly divided into different phases to achieve success. For example, in an early stage, the research is focused on observing the various stages of shoe production and the interactions between departments. For that, the researcher performed unstructured interviews better to understand the difficulties in the information flows between all stakeholders. Several internal documents were reviewed to understand ECCO's organizational culture and determine the project's starting point, such as ECCO's Handbook, ECCO's Annual Report and ECCO People, and an internal quarterly magazine available to all collaborators.

The second phase focused on a literature review, looking for documents with important information on the research topic, like project management, new product development, project management concepts and practices, project management office, project success, and project management tools and techniques.

In a third phase, unstructured interviews were carried out, as well as observation, essentially in the Pilot area, where the conception of new products occurs.

The combination of various phases allowed the realization of proposals for project management improvement practice at the ECCO's R&D department.

The researcher used also document analysis, such as ECCO's annual reports from different years, the magazines available to all collaborators, and information on several projects, for instance, projects' importance, stakeholders, resources availability, and prioritization, observation and unstructured interviews.

Great importance was given to participant observation in the various areas of activity to understand how the flow of information occurs. With the same goal, some collaborators were questioned about the information flow. Table 1 shows the objectives and the research methods that supported each of the objectives outlined.

Table 1 - Research Objectives and Methods

Research Objectives	Research Methods
O1: Understand the role of project management in the new product development process	Document analysis Observation
O2: Identify the problems regarding the management of projects at ECCO	Observation Unstructured interviews
O3: Identify and develop key project management practices to mitigate the problems of the management of projects	Unstructured interviews

1.4. Dissertation Structure

The present report is divided into five chapters. The first chapter, Introduction, presents the contextualization of the topic to be addressed, the research question and objectives to be answered, and the methodology adopted throughout the project. In the second chapter, all the theoretical concepts that will support the project are presented, namely Project Management and its practices, New Product Development, among others.

In the third chapter, Case Study, the researcher introduces the company under study. In this phase, the researcher is focused on understanding the department responsible for new product development and finding problems within project management in new product development.

The fourth chapter presents the proposal for essential project management practices considered the most appropriate for the company under study. Finally, the last chapter, Conclusions, presents the main findings emerging from the study, followed by limitations and future work.

2. THEORETICAL FRAMEWORK

This chapter presents a literature review, which will present concepts that will support the realization of this project. First, therefore, project management concepts and product development will be presented.

To guarantee the external recognition of a company, as well as to achieve the goals defined by it, such as sales, exports, and numbers of customers, among others, it is necessary to create a portfolio of products that meets the demand of the target audience, but also to carry out efficient project management, to ensure good priority management, meeting the needs of each client, without compromising the other clients or the company's main goals.

2.1. New Product Development

A **product** is an article produced that can be quantified and can be the final item or a component of a more extensive final product. To produce articles. Companies need to combine people with specific skills and knowledge, the right tools for each task, and business standards such as quality and safety, to produce each article required **and product management** (PMI, 2021).

The product life cycle represents all phases of the product, from concept, delivery, growth, maturity, and retirement (Patanakul et al., 2010).

Client's demand dictates products' life cycle. With a broader set of organizations offering similar products and with information closer to customers, clients have the power to negotiate according to their needs and expectations. Organizations strive to captivate customers and prove trustworthy choices, aiming to keep customers engaged. For this, products should be designed to match trends and customer needs, coordinated with the company's goals (Patanakul et al., 2010).

New product development is vital to survive, grow, and prosper in business. The product life cycle is getting shorter; clients are more demanding. They want to participate in product development activities, and companies must find mechanisms to respond to the ever-changing environment (Cooper & Kleinschmidt, 2010).

The teams responsible for the development of new products need to consider several factors (Trott, 2008), such as:

- The potential of the new product;
- The product is entirely new or is going to substitute others;
- The need for new technology for the products development;
- What benefits can provide this new product offer to potential clients, among others.

Product development needs to prioritize products that improve the organization's position aligned with the strategic decisions and might represent strategic partnerships or collaborations (Trott,2008).

In Figure 2.1, it is possible to observe Ansoff's matrix, representing all the possible strategies behind new product development that might differ between organizations. The same organization might have different strategies behind each new product released (Trott,2008).

	Current Products	New Products
Current Markets	1. Market Penetration strategy	3. Product Development strategy
New Markets	2. Market Development strategy	4. Diversification strategy

Figure 2.1 - Ansoff Matrix
Adapted from (Trott, 2008)

Ansoff's matrix discusses developing new opportunities for an organization, considering an internal assessment of the organization and the external constraints (Pessoa, 2019).

Market penetration strategy consists of increasing the market in which an organization operates by attracting customers to consume its products instead of the competitors. To this end, organizations invest in marketing and advertising campaigns, making their product is known to as many potential customers as possible (Pessoa, 2019).

Market development strategies translate into reaching new markets through existing products. The expansion should look at factors such as location and age (Toledo, 2014).

Product development is an ongoing activity in all organizations to ensure their products, allowing a higher position against the competition by improving existing products or developing new products.

Companies will move into products and/or markets where they do not operate. This represents **diversification** strategies, allowing companies to increase the markets in which they operate.

2.2. Project Management

The concept of **project management** has undergone significant growth, and more and more companies are adopting it. Embracing project management concepts helps organizations achieve business results (Patanakul et al., 2010).

Recognition and application of knowledge, skills, techniques, and tools for each of the activities that are part of a project to meet its requirements. Project management mainly aims to guide a project to have the intended outcome (Patanakul et al., 2010).

There are three project management approaches, predictive, adaptive, and hybrid. The predictive approach concentrates on making strategies and analyzing the project for better development, predicting risks, and carrying out action plans if needed. An adaptive approach is set when the business environment, such as customer needs, competitive offerings, or industry structure, is hard to predict. On the other hand, **the hybrid approach** sets a combination of predictive and adaptive approaches (PMI, 2021).

2.2.1. Project Management Concepts

2.2.1.1. Project, Program, Portfolio

A **project** is carried out when there is a need to create a product, service, and/or result. The nature of the project depends on its purpose and is usually temporary. A project can be handled individually or be part of a **program** or a **portfolio**. Projects should be coordinated as a **program** when they are related. They should also be treated when their activities can be coordinated simultaneously, obtaining more benefits for the company (Shalal et al., 2019).

On the other hand, **portfolio** management aims to manage projects and programs aligned with the same strategic objectives (Shalal et al., 2019).

In Figure 2.2, it is possible to observe a visual explanation of the three concepts.

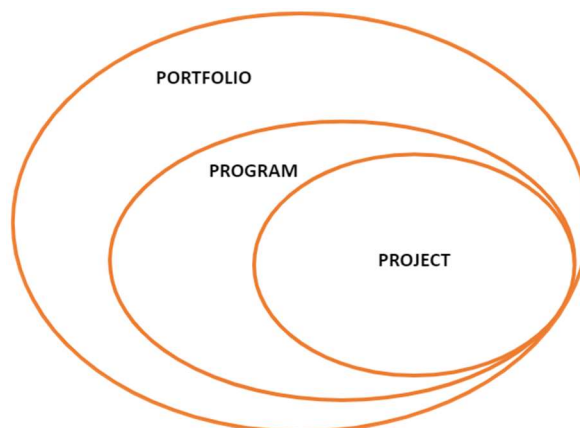


Figure 2.2 - Project, Program, Portfolio

Adapted from (Shalal et al., 2019)

Projects depend on internal and external forces that influence the value delivered. Internal forces include the combination of different projects simultaneously, some practices of the organization, or the combination of both factors. This might be confronted with the creation of some artifacts as process assets, governance documentation that will include the organizations' policies and processes, quality manuals, measuring procedures, and practices to facilitate access to all collaborators, among others. It is also essential to understand the organizational culture, structure, and governance, including its vision, mission, values, leadership style, authority relationships, and code of conduct. Resource availability and

employee capability are two internal factors of immense importance. The project is impaired without guaranteeing that both people and materials exist in sufficient numbers to conclude projects and that the employees designated for each task know what is required (Morris, 2017).

Some of the external factors that may have a positive or negative effect on the success of projects are **market conditions** such as sector actions, trends, brand recognition before the target audience and the strength of competitors, **social and cultural influences**, and issues with climate change, animal support, among others. On the other hand, factors such as **regulations** stipulated for each area of activity should also be considered, as well as **financial statements** such as possible economic crises or price inflation (PMI, 2021).

Project Management can be defined as the application of knowledge, skills, tools, and techniques to project activities to meet project requirements (PMI, 2021).

Program Management has its basis in project management but reflects on long-term strategic management rather than the short-term tactical view of project management (Morris, 2017).

On the other hand, **Portfolio Management** is the centralized management of one or more portfolios to achieve strategic objectives (PMI, 2021). Active portfolio management is a dynamic problem once concepts such as return, risk, and information flow are essential and must be framed with the strategic goals (Sigamani et al., 1999).

2.2.1.2. Project Management Processes

According to PMI (2021) all project activities require different inputs, tools, and techniques. To facilitate the overall organization, there is a tendency the various processes into five groups, initiation, planning, executing monitoring and controlling, and closing.

In the **initiation group**, processes performed to define new project or new phases of existing projects. The second group, **planning**, establishes scope, goals, and defines strategies to achieve them. In **executing**, sets the processes defined in planning are put in action, performing the complete work to satisfy project requirements.

Monitoring and Controlling is responsible for tracking and reviewing the progress of the project, with the purpose of identifying areas in which may be required changes. In the second phase of this group, controlling, the areas identified previously are submitted to change, evaluating the status before and after implementation.

The last group, **closing**, aims to formally define the complete closure of a project or a contract.

2.2.1.3. Project leader

All projects have a project team, defined when the project is opened, working for that specific project, and achieving its goals. Teams may change with time and may be charged with various projects. Still, each project has a project leader, the person assigned to organize the project's activities. Project leaders must oversee teams towards the goals, manage the processes, and deliver the intended outcome.

Team leaders need to evaluate the skills and abilities of their team members, to select correctly who should be involved in each of the projects' activities. On the other hand, the leader must encourage the team, trust their decisions, and allow them to take on new responsibilities (Schwalbe, 2015).

According to Schwalbe (2015), different circumstances require different leaders, who must be capable of leading the team to achieve the goals set for each project. Leadership is a combination of personal characteristics and areas of expertise. Leaders must bring together emotional intelligence, communication skills, and resilience in the face of change with technical and administrative skills and a problem-solving mindset.

2.2.1.4. Project Management Office

Companies should seek to implement Project Management Offices (**PMOs**), to improve project management, regarding schedules, costs and expenses, quality, and risks, associated with all projects, aligning them with their strategic goals.

PMOs are internal or external groups that must define and maintain projects in the organization. The group should be responsible for maintaining practices that combine strategic goals, and internal and external policies. One of the main objectives is, acknowledging the potential influence, positive or negative of the associated risks, to enable the repetition of results on similar projects, always with a view to the success of the project (Kendall & Rollins, 2003).

PMOs are usually related with the growing number of projects and their complexity, and summarize project management know-how of the organization, develop standardized methods, and guarantee its implementation (Shalal et al., 2019).

According to PMI (2021), PMOs have several responsibilities, among them, supporting project management or take responsibility for projects, which entails some challenges such as recognition and focus on the crucial activities, simplification of processes, promoting talent and capabilities and encouraging the culture of change, guaranteeing the teams are motivated, and that each member has full knowledge of its task.

The characteristics of a PMOs may differ, depending on the organizational environment and culture and are divided into three groups (Gerald I. Kendall, 2003):

- **Supportive** PMO, which provides support such as best practices, access to information and expertise on other projects;
- **Controlling** PMO, that controls all project activities, processes, procedures, and documentation;
- **Directive** PMO, directly manage projects, providing experience and resources.

When organizations have well-established project management capabilities, a strategic decision to be made is the introduction to EPMO, which links the implementation of organization strategy with portfolio investments in programs, with the main goal of achieving specific results.

2.2.1.5. Project Success

Project success is evaluated through the quality of the final product and/or service, punctuality on the delivery dates, the realization of internal and external requirements, budget fulfillment, and clients' satisfaction (Ershadi et al., 2020).

According to Serrador (2013), project success can be evaluated on four different levels, such as:

- Project efficiency, that can be defined as the production of an output in a qualified way, this means, in agreement with projects' scope, cost, time and quality;
- Impact on the customer, considering if the final product meets customers' needs and expectations;
- Business success is an overall success in the various dimensions of a business, such as financial, customer, employees, among others;

- Preparing for the future. Projects need to focus on the short-term strategic decisions, guaranteeing companies' survival in the future.

It is relevant to understand that several factors influence projects' success and are divided into five different groups: project management actions that refer to the communication system, planning efforts, and quality and safety programs; project procedures, such as changes in strategy and methods applied; human-related factors, recognizing client's experience, its nature and organizational size and contribution to decision-making; project-related factors, knowing that the type of project and its dimension and complexity determine how the project should be monitored; external environment factors, such as economic, social or political issues, and possible advances in technology (Alias et al., 2014).

Identifying these variables makes it easier to detect which of these are CSFs that, when adequately sustained, can significantly impact the project's success (Alias et al., 2014).

In Figure 2.3, there is an interpretation between success variables, CSF, and project success.

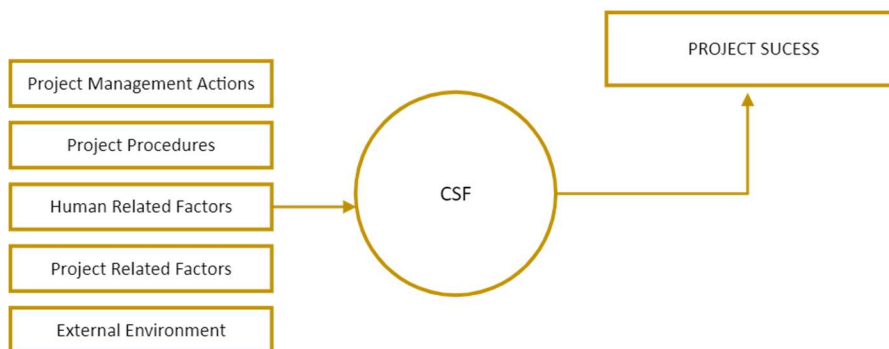


Figure 2.3 - Project Variables, CSF, and Project Success

Adapted from Shalal et al., 2019)

Success or failure of projects, depend on its dimension and complexity, but also on the success of tools and techniques, when applied correctly (Brian Hobbs, 2010). In Table 2, some tools, and techniques, of each area of knowledge are presented.

Table 2- Tools and Techniques

Area of Knowledge	Tools and Techniques
Integration Management	Project selection Investment Payback Period Project Charter
Scope Management	Scope Statement Product Review Lessons Learned
Cost Management	Cost Estimating Cost Change System
Quality Management	Benefit/Cost Analysis Control Charts Quality Audits
Risk Management	SWOT analysis Project risk audit Value earned management
Human Resources Management	Stakeholder analysis Team Building Activities Project team directory

Integration Management aims to define the follow-up to each project, depending on its size and complexity, and stipulate the type of investment. At this stage, a payback period must be stipulated to track the financial success of the project better. A project charter should be outlined, defining the project name, its designated team, and other important information such as the project's scope and strategic goals (Joslin & Müller, 2016).

Scope Management intends to define the project's scope statement, which will appear on the project charter, controlling possible changes. Projects reveal to be volatile

environments, so being, at the end of each project, it is crucial to recognize what happened as a plan and what did not and point solutions for possible projects and lessons learned (Joslin & Müller, 2016).

Cost Management is responsible for estimating the project's costs and evaluating possible changes during the project (Rory Burke, 2013).

Quality Management has as its primary objective to analyze the price benefit of each project and carry out control charts to verify that the processes and/or products are within the quality parameters established by the organization, the customer, and the policies established by the sector of activity. In addition, quality management must guarantee internal and/or external audits to ensure the quality of processes and/or products (Rory Burke, 2013).

Risk Management uses various analyses such as SWOT, project risk audits, and similar analyses to recognize, evaluate and define action plans for potential project investment risks (Brindley, 2017). It recognizes stakeholders' importance and is present in different project phases. It analyses the importance of each of them, guarantees the proper project team directory, and enables team-building activities to keep the teams motivated (Renn & Klinke, 2002).

The correct and simultaneous use of the tools and techniques discussed above represents a more significant possibility for project success.

2.2.2. Project Management Practices

Project management practices can be described as standards to maximize project execution efficiency. According to Highsmith (2010), fundamental project management practices have evolved, and many are helpful in fast-moving projects. Just because one project management practice is good does not mean it should be used for all projects. Therefore, one of the main challenges is which project management practices to adopt according to project needs and strategic decisions.

The industrial environment is complex and ever-changing; clients are more demanding and want to actively participate in the decision-making process; thus, project management practices are achieving growing visibility and importance. The use of acceptable

project management practices leads to projects' success (Tereso et al., 2019). These might include procedure lists, checklists, templates and programs or data basis, among others.

Table 3 presents a list of Project Management Tools and Techniques ranked by usage in descending order (Fernandes et al., 2013).

Table 3 - Project Management Tools and Techniques

1. Kick-off Meeting	21. Communication Plan	41. Feasibility Study
2. Activity List	22. Responsibility Assignment Matrix	42. Re-baselining
3. Progress Meetings	23. Handover	43. Risk Reassessment
4. Gantt Chart	24. PM Software for Task Schedule	44. Financial Measurement Tools
5. Baseline Plan	25. Bottom-up Estimating	45. Quantitative Risk Analysis
6. Progress Report	26. Project Statement of Work	46. PM Software for Cost Estimating
7. Client Acceptance Structure	27. Contingency Plans/Risk Response Plan	47. Configuration Review
8. Milestone Planning	28. Stakeholders Analysis	48. Database of Historical Data
9. Work Breakdown Structure	29. Cost-Benefit Analysis	49. Top-down Estimating
10. Project Closure Documentation	30. PM Software for Resource Scheduling	50. Bid Documents
11. Requirements Analysis	31. Team Member Performance Appraisal	51. PM Software for Resource Leveling
12. Change Request	32. Quality Plan	52. Ranking of Risks
13. Project Scope Statement	33. Product Breakdown Structure	53. Project Website
14. Customer Satisfaction Surveys	34. Quality Inspection	54. Earned Value Management
15. Project Issue Log	35. Critical Path Method	55. Project Communication Room
16. Project Charter	36. Bid/Seller Evaluation	56. Database for Cost Estimating
17. Close Contracts	37. Control Charts	57. Database of Lessons Learned
18. Lessons Learned	38. Requirements Traceability Matrix	58. Network Diagram
19. Risk Identification	39. Qualitative Risk Analysis	59. Work Authorization
20. PM Software for Monitoring Schedule	40. PM Software for Monitoring Cost	60. Critical Chain Method

Project management **practices** can be defined as tangible means applied by project managers, to perform projects and guarantee effectiveness and refer to specific areas of knowledge, being (Zaman et al., 2020):

- Defined lifecycle and milestones;

- Project scope, a detailed outline of all aspects of a project, such as activities, resources, and timelines;
- Human Resources management, that is focused in managing people within the employer-employee relationship, to achieve the organizations' strategic business objectives (Stone et al., 2021);
- Quality assurance, focused in assuring the project meets all quality aspects and requirements (Fakhravar & Ouabira, 2021);
- Time management, organizing and planning all projects' activities ;
- Cost management, that not only facilitates select profitable projects, but also evaluates projects' costings during its completion;
- Risk management, acknowledging the presence of internal and external factors that influence projects' success;
- Project communication, understanding the importance of communication's effect in project management (Beatriz Peña-Acunã, 2018);
- Procurement management.

It is clear project management practices are considered strategic tools and valuable assets in organizations (Fernandes & O'Sullivan, 2022).

2.2.3. Project Management Standardization

Delivering projects, carrying them through all phases from conception to deployment, and accomplishing determined schedules, costs, and internal and external quality standards, are crucially important in the ever-changing environment (Milosevic & Patanakul, 2002). So, organizations must adopt adequate methods to improve their Project Management Capability, representing the company's ability to define, plan, implement and adapt projects so that strategy becomes a strength of the business.

Standardized Project Management can be identified as a methodology and implies adopting standard practices for project management, ensuring a low level of variation in implementing the defined practice (Fernandes et al., 2014). Adopting standardized practices allows for creating a predictable methodology, with regular practices aligned with the

organization's strategy, improving the Project Management Capability, and similar results are expected from similar projects.

According to Patanakul et al.(2010), standardized project management practices can be categorized into Standardized Project Management components that when correctly driven, improves organizations' Project Management Capability, being:

- **Project Management Process**, organizing a sequence of activities that creates added value for project customers;
- **Project Organization**, all projects should be organized and coordinated as a portfolio, which means, aligning strategic goals with specific projects;
- **Information Technology**, which reveals the ability to improve information technology to create advantages for projects;
- **Project Management Methods**, which must be chosen correctly according to each project's needs, ensuring a good support to accomplish the projects' goals;
- Using adequate **metrics**, to measure and monitor performance, taking in consideration all the strategic decisions, reveals fewer problems;
- **Project Culture**, acknowledging the importance of motivated, satisfied, and supportive teams;
- Strong **leadership** skills tend to oversee more motivated and successful teams and, consequently, more successful, and effective projects.

On one hand, it is acknowledged that standardization in project leads to projects' success (Fernandes et al., 2015). On the other hand, each project is unique and has its specific characteristics, associated risks, and different external factors to be considered. For this reason, some authors argue that flexibility and adaptability are skills that provide resilience and guarantee organizations' survival.

2.2.4. Uncertainty, Risk and Risk Management

VUCA is an acronym with origins in the U.S. Army, to describe the challenges of military leadership in a battlefield environment (Shaffer & Zalewski, 2011).

Volatility, Uncertainty, Complexity, and Ambiguity (VUCA) defines the competitive environment in which organizations must adopt strategies to match rapid knowledge acquisition (Cousins, 2018).

Volatility sets the meaning of turbulence that occurs in organizations. It characterizes the dynamic reality of the context for decision-making. Sources of volatility in decision-making are, among others, the rapid development of new technologies and their applications and the rapidly changing information (Cousins, 2018).

Uncertainty is the absence of information and reflects the ambiguity surrounding decision-making. This absence may be regarding the probable causes of a determinate subject, possible solutions for a specific problem or the stakeholders' reaction to the solution implemented (Brindley, 2017). Decision makers need to predict the probable consequences of their actions despite knowing their projections are less than confident.

As cited in Lawrence (2013), **complexity** notes the existence of numerous factors whose understanding can be complex. These factors can be internal or external to the organization. Decision makers must make informed guesses about which forces will influence the outcome of critical events.

On the other hand, **ambiguity** represents the lack of clarity about events. It might be reflected in the inability to identify and act on threats and opportunities correctly.

Organizations' success is now linked with developing several skills, agility, and adaptability. So, it is crucial to understand the concepts of uncertainty, risk, and risk management.

Risk is the possibility that human actions and/or events lead to consequences that harm aspects that human beings value. This definition implies that harm depends on the relationships between human activity and the consequences (Renn & Klinke, 2002).

So, in project management, the risk is characterized as an adverse effect, and the most common types of risks impact wealth, performance, or schedule (Renn & Klinke, 2002).

Risk management intends to identify, evaluate, and prevent or mitigate risks of projects to achieve the desired outcomes (O'Connor, 2020).

Project managers must have a deep understanding of the strategic goals and the projects' objectives, so it is possible to identify barriers that could impact the ability to produce the intended results.

Evaluating the risks is of extreme importance. It is crucial to decide what is or is not an adverse effect, depending on the business and its characteristics. There are several elements to be considered when evaluating risks. Given the model outlined by Brindley (2017), the key variables that determine risk are:

- **Environmental variables**, that include possible developments in technology, politics, and culture;
- **Industry variables**, changes within a particular industry context, that may result in the development of new products and/or services, changes in competitive strategy, or structural arrangements;
- **Organizational variables**, structural, cultural, or operational changes, that may represent risk for the organization;
- **Problem specific variable**, which vary between projects, and can be the strategic decisions;
- **Decision-maker related variables**, acknowledging that the individuals or groups' characteristics.

Projects carry several risks, including **customer risk**, once the client may, at any time, terminate the contract and cancel the project, **financial risks** since there is usually a significant initial investment, **purchasing risk** because the company depends directly on the suppliers to achieve the goals determined for each project, and **process risks** associated with all phases to conclude the project.

2.3. Portfolio Management

Portfolio management aims to align different projects and/or programs with the same strategic goal and is responsible of evaluating which projects must be prioritized and which projects must be de-prioritized (Cooper et al., 2002). Portfolio Management is set to three main goals, being:

- Allocating the correct resources as to maximize the value of portfolios;
- Balance between projects integrated in the portfolio, managing long and short-term projects, high and low risk projects, and balance between project types (new product development, research, cost reductions, among others), ensuring the right number of projects according to the companies needs and strategic decisions;
- Regardless all considerations, portfolios must reflect the organizations' strategy.

Projects in portfolios are in different stages of completion, and for this, projects compete for resources' availability, considering the ever-changing information, opportunities, and strategic considerations. For this, portfolio management is highly dependent on the decision environment (Cooper, 2013).

The adequate management of portfolios is a challenge that can translate into financial and competitive advantages. On the one hand, maximizing return and R&D productivity are possible. On the other hand, it allows for maintaining a competitive position of the business while efficiently allocating scarce resources. To choose the correct projects to allocate, organizations need to consider possible costs, the probability of commercial success, and whether there is an in-house technical capacity or a need for subcontracting services. Other than these acknowledgments, organizations must evaluate if the projects on hold are linked to the business strategy (Cooper et al., 2002).

Portfolio management for new products is a challenging task and a strategic initiative and could be translated into the motto "Fewer Projects, Better Projects" (Cooper, 2021). To guarantee R&D productivity, portfolio management intends to undertake fewer projects but better align with strategy and existing projects, guaranteeing the correct resource for each project, and completing all tasks by the due dates. Sometimes, some projects are canceled, and

the project team must decide which projects to abandon. For this, all projects must be monitored and tracked.

2.4. Embedding Project and Portfolio Management Practices

Portfolio and Project management practices improve project performance (Kock et al., 2020). Therefore, organizations must focus on project management and, more than applying practices in an initial phase, ensuring that these practices are embedded, meaning the use of practices must be standardized to all involved.

Embedment suggests concepts such as (Fernandes & Araújo, 2019):

- Diffusion – acknowledges the importance of social influence in phenomena;
- Dissemination – refers to active planned efforts to convince stakeholders on the importance of adopting Project management practices;
- Implementation – active planned efforts to incorporate project management practices in the organization;
- Routinization – implies that the project management practices are in-sink with other organization management practices and that all staff is involved. Therefore, project management practices must be related to the organization's context.

There are several factors that might accelerate the embedment process in organizations, such as (Fernandes et al., 2015):

- Motivation – where teams must be convinced that the adoption of project management practices will be useful;
- Compatibility – ensure the practices adopted are linked to the values and strategic decisions of the organization;
- Communication – guaranteeing that all involved understand the importance of adopting project management practices;
- Opinion leaders, champions – the existence of people that can encourage all different collaborators to adopt project management practices;
- Build trusting relationships between the researcher and stakeholders;
- When adopted, understand the impacts of the practices, among others.

2.5. Summary

Through the literature review, it was possible to understand the main concepts in Project Management that will be used in the department under study, the R&D department of ECCO'let Portugal. It is known that the concept of project management is constantly evolving and is of great importance for the success of projects in organizations when the suitable tools and techniques for each project are chosen.

One of the essential pillars for the study of this topic was PMBOK, from PMI, in which it was possible to apprehend concepts on project management and the tools and techniques most applied in projects.

Since the internship took place in a new product development environment, articles such as Cooper and Kleinschmidt (2010) were analyzed to grasp the importance of project management in new product development.

The literature allowed the researcher to understand better project management applied to new product development and apply the tools and techniques in these cases in the department under study.

The implementation of project management practices will reflect into overall projects' effectiveness and efficiency and organizations must consider its application (Tereso et al., 2019).

The researcher must also reflect on the importance of the embedding process, this means, the factors that influence the institutionalization of project management practice in organizations (Fernandes et al., 2015).

3. CASE STUDY

3.1. ECCO

ECCO is a worldwide shoe manufacturer and one of the most recognized companies in the footwear sector. It was founded in 1963 in Bredebro, Denmark, and its primary concern is delivering high-quality, comfortable shoes.

This company is set to high standard values such as Heritage, honoring and respecting its history and roots; Innovation, with the continuous search for better results; Excellence, by keeping the commitment to setting and delivering the highest quality achievable in everything ECCO is involved; Care, strengthening relationships between employees, partners and clients, and Passion which is a part of their attitude (DO COLABORADOR, 2019). ECCO is one of the few major shoe manufacturers in the world that owns and manages with complete control its entire value chain, from “Cow to Shoe” (Annex B), which means it is responsible for tanneries¹, and shoe manufacturing to wholesale and retail activities, including e-commerce.

So, ECCO's business is based on creating footwear that combines style and comfort. Along with footwear, ECCO also develops small leather goods and shoe accessories that complement and strengthen ECCO's presence in retail.

According to ECCO's Annual Report 2021, the industry is present in 89 different markets, such as China, EUA, Netherland, Japan, United Kingdom. Among six shoe and four leather factories, ECCO employs more than 21 000 people. With 2 200 stores around the globe, the sales from 2021 topped 1218 million euros.

In 1984, a strategic decision was made to open the first factory outside Denmark. Alongside the shoe-making industry recognition and ease of finding qualified professionals, Portugal became a strategic choice. ECCO' let Portugal become a Research and Development Center for ECCO.

In 2020, ECCO's financial review was much affected by Covid 19, being forced to close some stores, increasing support for the online shopping (CONTENTS, 2020) and reinventing marketing and selling processes.

¹ Place where animal skin and hide are treated and processed for human use

3.2. R&D Department

The R&D department is the connection between Designers' sketches and a reference prototype since R&D collaborates closely with designers, focused on realizing the new conceptual product idea. From the first technical dialogue until the final prototypes are presented development process begins in the Technical Area, where the collection is put together to be presented to the market. The team is responsible for releasing the documentation required to build the shoes.

After the technical team releases the documentation, the planning team is set to organize the production process according to deadlines and resources' capacity to start the development of the physical shoe.

The pilot area from R&D oversees elaborating several prototypes of the shoe. Once a shoe is wholly validated, a Master Reference Shoe (MRS) is developed, a shoe that will be sent to all production areas to serve as a quality reference.

R&D works differently from production. While production is stable, making it possible to plan, R&D constantly changes. Since this is where the prototypes of each new article are developed, it is expected that expenditure on the material will be variable and difficult to estimate. This reinforces the importance of project management in this department.

Figures 3.1 and 3.2 show the central departments where the internship took place and where the conception of new products happens.

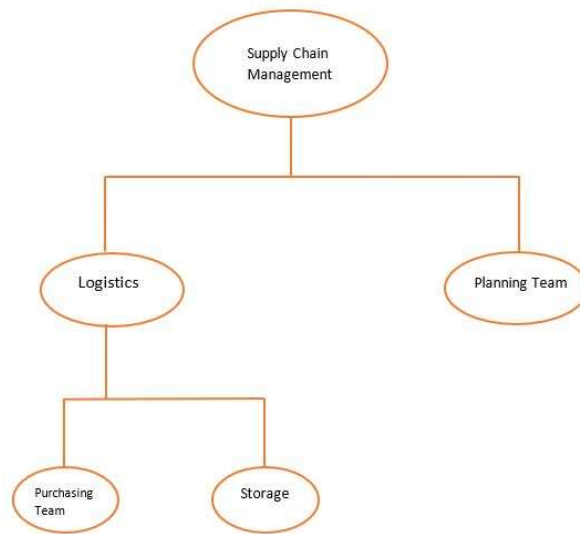


Figure 3.1 - Supply Chain Management

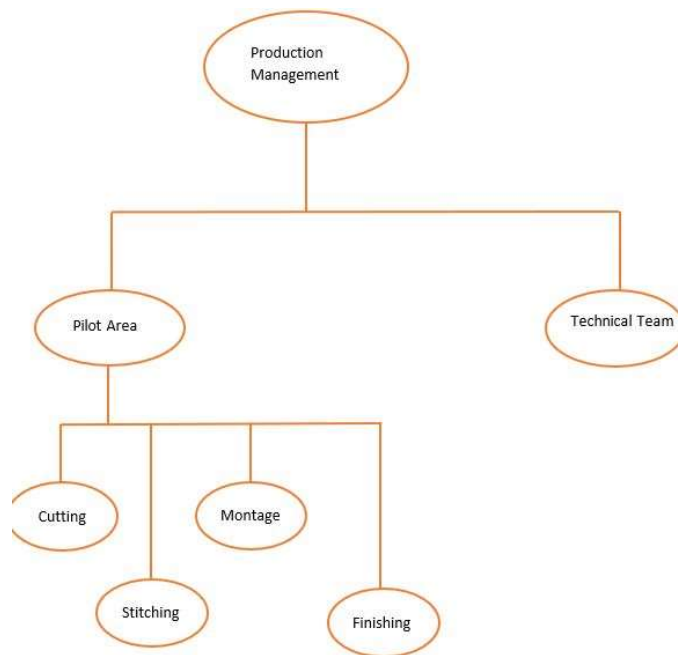


Figure 3.2 - Production Management

3.3. ECCO's New Product Development Process

This section aims to present the ECCO's new product development process to understand the role of project management in this process, answering the research project's first objective.

For ECCO, shoes can be described as assembling two main parts, the uppers, and the soles. The uppers are generally made of leather, while the soles are mostly made of polyurethane.

Since Portugal is the Product Development Center for ECCO Group, developing prototypes is extremely important and is in the pilot area, managed by R&D.

R&D is also responsible for some projects and sale samples.

The diagrams in Figures 3.3 to 3.5 show the interactions between all areas of expertise, so the final product is delivered to the client. The diagrams were developed through participant observation in the pilot area of the R&D department and unstructured interviews with several stakeholders in the process. These interviews were directed to eight workers of the Pilot Area, such as the chef of each station (Stitching and Cutting, Assembling, and Finishing) and their substitutes, and lasted approximately fifteen minutes each. Once these workers are directly linked to the production process, understanding how the suggestions later presented influence their work was of great importance. Most interviewees found that the information flow should be different, even though some revealed resistance to possible changes.

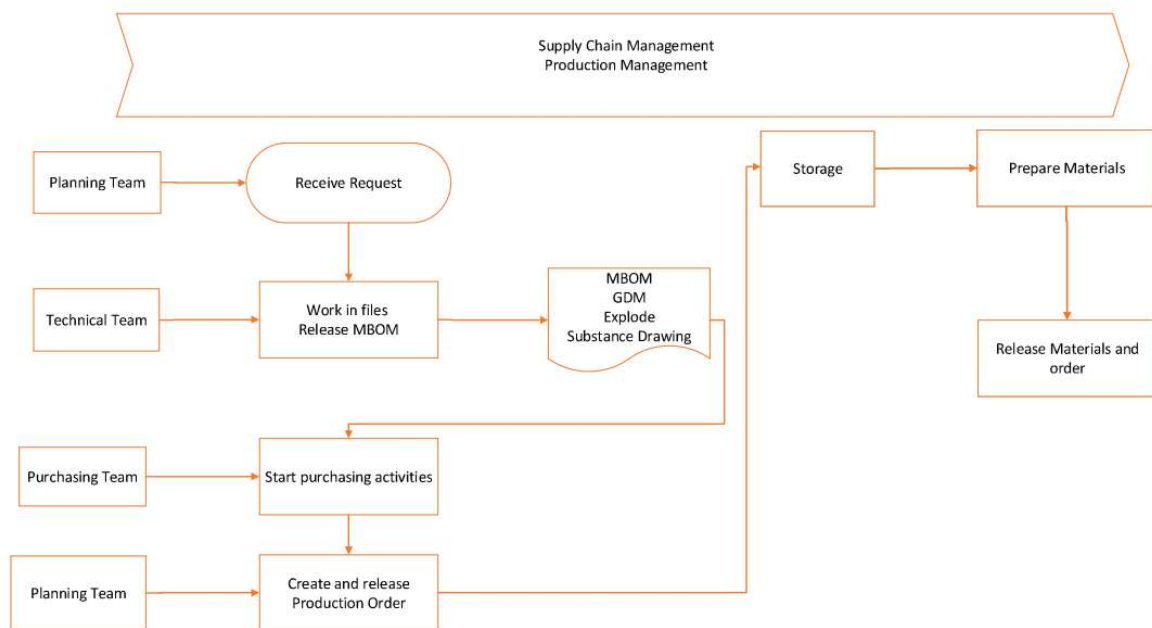


Figure 3.3 - New Product Development Process_Supply Chain

New product development in ECCO begins when the Planning Team receives the request. Then, the specifications are transmitted to the technical team that works on the documents (MBOM, GDM, Explode, and Substance Drawing). Each document is crucial once it represents the functional specifications for cutting, stitching, assembling, and finishing.

After these documents are released, the purchasing team is responsible for buying the materials indicated in the MBOM and communicating delivery deadlines to the planning team that, with this information, creates and releases the Production Order (set of all the documents above and information such as the client and the number of shoes to produce and deadlines). Finally, the order is to be sent to the Warehouse, where this team collects and prepares all materials referred to in the MBOM and takes it to the Pilot Area, more specifically, to the cutting area.

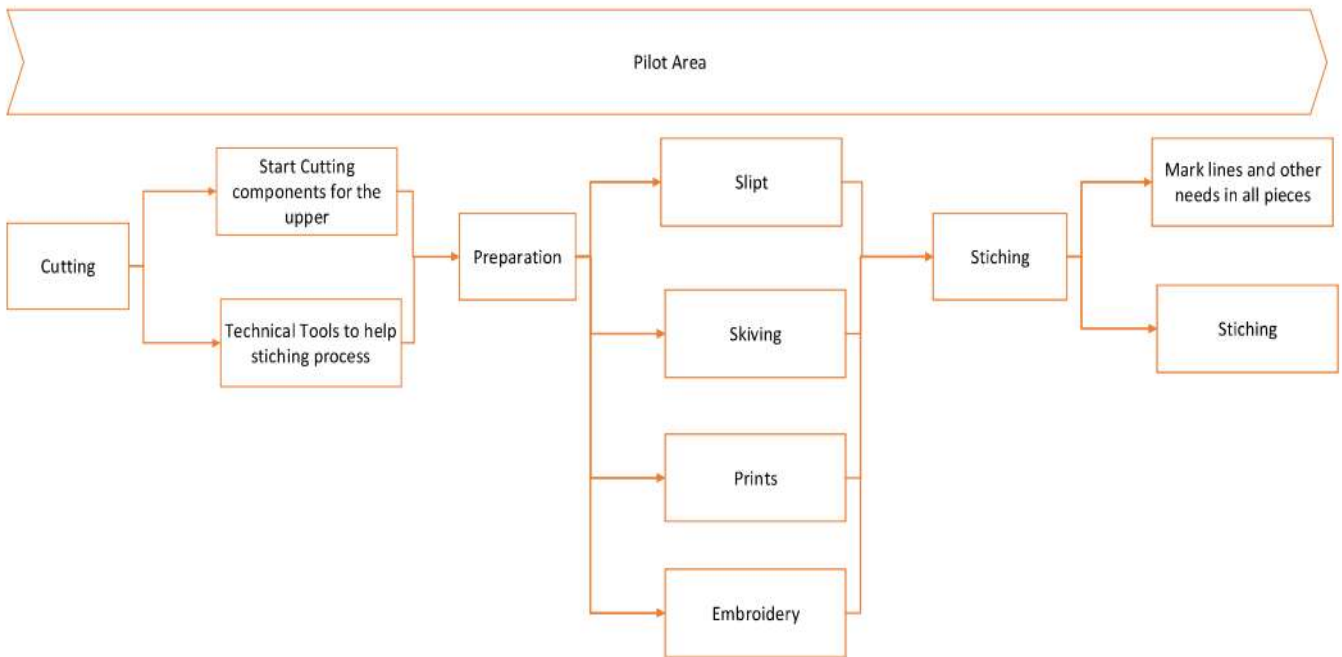


Figure 3.4 - New Product Development Process_Cut

When the Production Order is released in the area, Cutting is responsible for cutting several elements in leather or other materials and cutting technical tools that might be needed. Upon completion of this phase, the preparation team carries out a series of processes on the materials: Split, Skiving, Prints, and Embroidery. Not all components go through all these phases but only pass to the stitching area once all the required processes are complete.

The stitching area is responsible for marking lines to help stitchers and the upcoming tasks and stitching components.

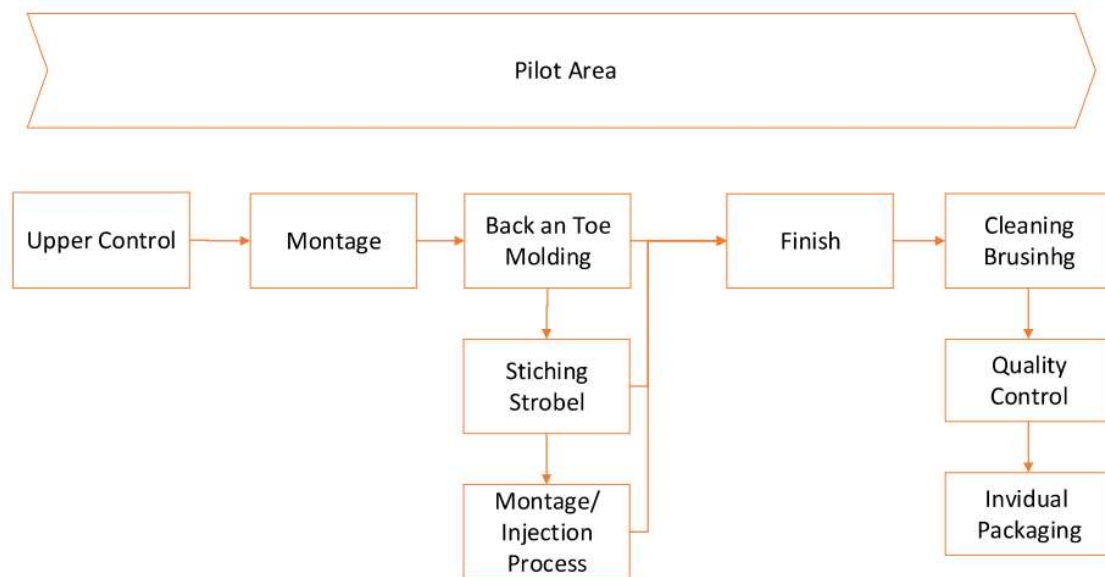


Figure 3.5 - New Product Development Process_Finish

After sewing the elements, those responsible for the stitching area must supervise the quality of the product. Thus, failures that may arise at this stage can be controlled promptly and prevent the final product form being destroyed. Products that have the desired quality are transferred to assembling area. This area is responsible for molding the sole, sewing the Strobel, and the injection process.

The finish area is set to clean and brush the final product, control its quality, and prepare the individual package of each shoe.

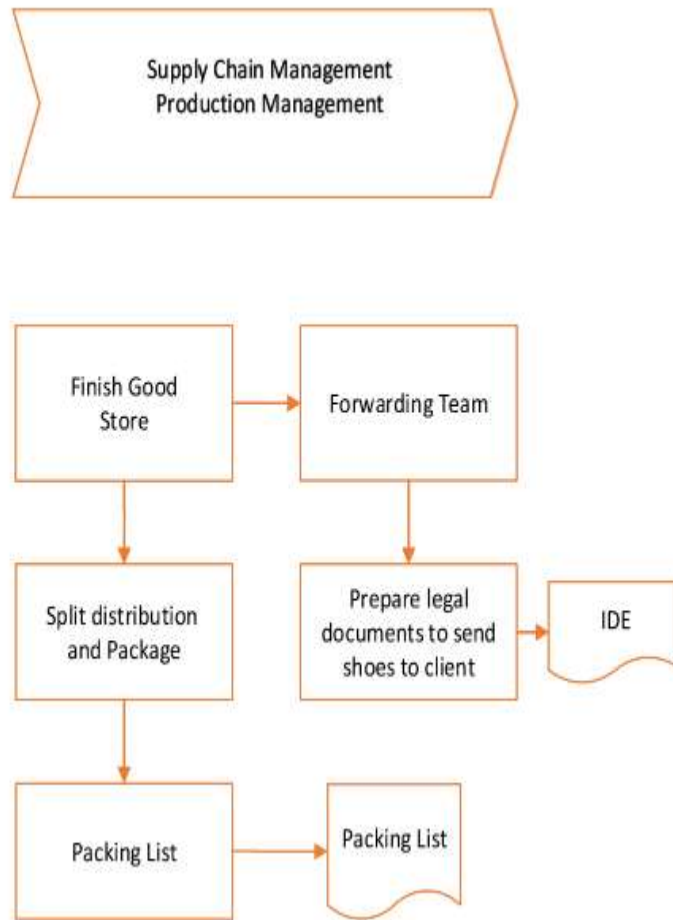


Figure 3.6 - New Product Development Process_Pack

The same product can be sent to multiple customers. Therefore, the Finish Good Store team will be responsible for separating and packaging orders by customer. After packaging, the Forwarding team is set to prepare all the legal documents required and fill the IDE- Internal Document of Export- that indicates information such as client and shipping address, packaging list and deliver special information.

3.3.1. Tecnical Team

The technical team aims to develop the shoe design and describe the materials needed and the indications for their use through the documents Manual BOM, Explode, Substance Drawing, and GDM for each new shoe. **MBOM** is a document that sets all the materials required to build the shoe. **Explode** represents all the pieces that form the shoe designs. On the other hand, **GDM** represents the instructions for each of the teams in the pilot, which means the instruction for cutting, stitching, and all the remaining teams. Finally, **substance drawing** indicates thickness and tolerance for each shoe component.

From Figures 3.7 to 3.11, observe an example of the African Run shoe article (Figure 3.7) of each document listed above.



Figure 3.7 - African Run

2990000105-01
 P294807 African Run 01.06.2020 Size 40

Manual BOM 1/1

Group name:	Diam 2.1 African Run	Article no.:		Designer:	Cláudio	During:		BOM type:		OTHER:
Group no.:		Series:	AT21	Contacts:	Filipe-ELM	Shoring:		BOM version:		Control:
Prod. no.:	154	Garment:		CAD no.:		Making:		Partic.:		
Prod. no.:	748	PLA:		Substance:		Finish:		Construction:		
Production:	P294807	Date:	01.06.2020					Size:		41

ABANDONAR O CORTAR NA PRODUÇÃO

size 40

TPU ONLY OUTSIDE

CORTAR NA PROCU

DESCRIPTION	New Type	New Full Upper Color 1	New Full Upper Color 2	New Full Upper Color 3	New Full Upper Color 4	New Full Upper Color 5	New Full Upper Color 6	New Full Upper Color 7	New Full Upper Color 8	New Full Upper Color 9	COMMENTS
HEADERS											
1.1		001	000	000	000	001	000	000	000	000	100%
1.2		001	000	000	000	001	000	000	000	000	100%
1.3		10	002	000	10	10	002	000	000	000	100%

Figure 3.8 - MBOM

DIMENSIONS!

File Name : C:\Users\maog\AppData\Roaming\Procaml\Innovator\Connector\Basket\01E3BF397F9048F98DC8AA4C5C1A19FF\P244817.dsb
 Model Name : P244817 Rev 005 Gen 1

Engineer Parts List

Date : 17-06-2020 10:57:53

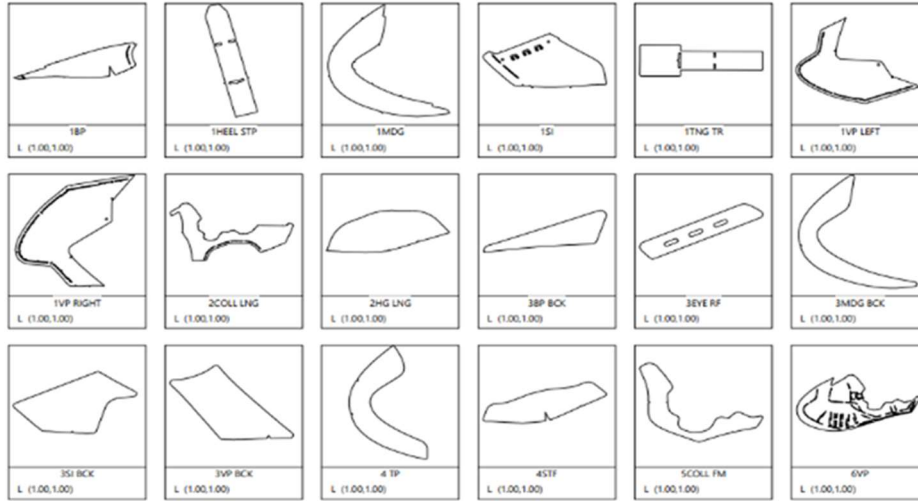


Figure 3.9 - Explode

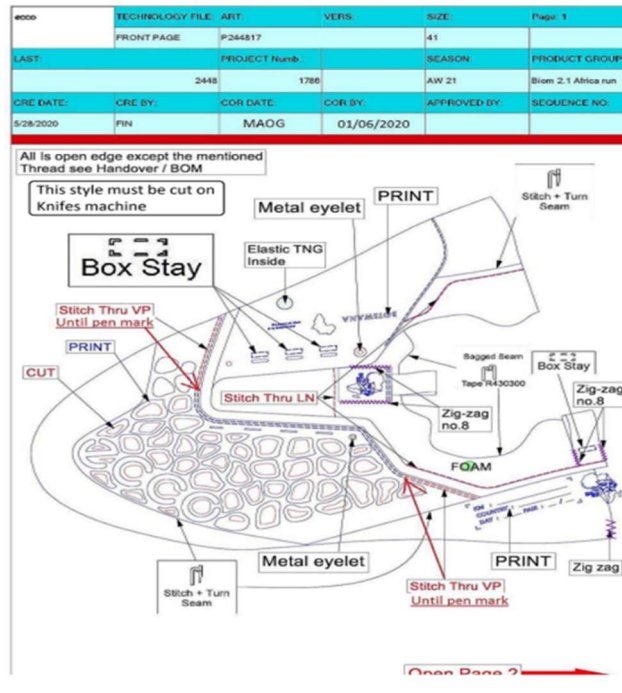


Figure 3.10 - GDM

eCCO [®] Substance drawing		Project	Draw. revision	Last	Mould	Date	
		OMI794	-1	90-2448	50-2448	16/Jan/20	
Group				Drawing for			
BIOM 2.1 MEN				A1			
Area	A	B	C	D	E	F	
Leather	0,90 (+) 0,10	0,90 (+) 0,10	0,90 (+) 0,10	0,90 (+) 0,10	(+)	(+)	
Lining	0,70 (+) 0,05	0,70 (+) 0,05	0,70 (+) 0,05	(+)	(+)	(+)	
Backer/Reinf	0,40 (+) 0,05	0,40 (+) 0,05	0,40 (+) 0,05	0,40 (+) 0,05	(+)	(+)	
Felt	(+)	(+)	0,40 (+) 0,05	0,40 (+) 0,05	(+)	(+)	
Toepuff / Stiffener	0,80 (+) 0,05	(+)	(+)	(+)	(+)	(+)	
Heelgrip	(+)	(+)	(+)	0,80 (+) 0,05	(+)	(+)	
+/- for average	(+)	(+)	(+)	-0,10 (+)	(+)	(+)	
Theoretical substance	2,80 (+) 0,25	2,00 (+) 0,20	2,40 (+) 0,25	2,40 (+) 0,25	(+)	(+)	
After stitching	2,60 (+)	1,90 (+)	2,20 (+)	2,20 (+)	(+)	(+)	
After moulding	2,60 (+)	1,90 (+)	2,20 (+)	2,20 (+)	(+)	(+)	
Pre press	0,5 ... 0,7	0,7	0,7	0,7 ... 0,5			
Last-mould distance	2,10	1,90	1,20	1,50	1,70		
Last-mould tolerance	Between mould and last :+ 0,05 / -0,19.						
Substances based on art.	P244801						
Areas based on art.							
NB: Below drawing is NOT 1:1. Areas might NOT match latest valid dxf file. It is ONLY to visualise blend-areas and the values above							

x	Instruction
	LIKE instr. No.
	from instr. No.
	DXF file: B2448-01.DXF

Approved by	ILAN
Date	16/Jan/20
Approved by	ILAN
Date	16/Jan/20

Figure 3.11 - Substance Drawing

3.3.2. Supply Chain Management

The Supply Chain Management team is divided into two primary teams, Planning and Logistics. The logistics team is organized in Purchasers and Warehouse. With information indicated in the MBOM of each product, the Purchasing team is set to buy the different materials needed in R&D, and the Warehouse team is responsible for materials storage.

The other team, Planning, is set to coordinate what happens in the Pilot area and the priorities according to estimated delivery dates for the different projects.

Daily, this team is responsible for printing the "Daily Plan," where it is possible to observe the most critical issues in the Pilot area, such as prototypes and, corrections, material trials, among others, that will serve as a basis for the Production Management team to organize daily tasks with each of those responsible for the Pilot area, this means, with the stitching and cutting responsible, the assembling responsible and the finishing responsible (Figure 3.12).

DAILY PLAN FROM:

PROTOTYPES

Request date	User	Colour specification	Work Order no	Article no	Shoe dev name / Group name	Slot	Division	Gender	Colour no	Handed to Purchaser [...]	Raw material Done [...]	Cutting done [...]	Preparation Done [...]
#N/D	#N/D	#0080FF	A02198	P2338118	ATH WOMEN	Solt 2	Athleisure	Ladies	163	29/06/2022	29/06/2022	30/06/2022	01/07/2022
#N/D	#N/D	#0080FF	A02200	P232240	BIOM 2,0 LADY	Solt 1	Athleisure	Ladies	007	27/06/2022	27/06/2022	01/07/2022	04/07/2022
#N/D	#N/D	#0080FF	A02201	P232363	BIOM 2,0 MEN	Solt 1	Athleisure	Mens	001	29/06/2022	29/06/2022	30/06/2022	04/07/2022
#N/D	#N/D	#0080FF	A02208	P2338121	ATH LADY	Solt 1	Athleisure	Ladies	459	05/07/2022	05/07/2022		
#N/D	#N/D	#0080FF	G56633	P268903	GOLF BIOM C4 LADY	Solt 2	Golf	Ladies	007	28/06/2022	28/06/2022	30/06/2022	01/07/2022
#N/D	#N/D	#0080FF	G56636	P266910	GOLF HYBRID MEN	Solt 2	Golf	Mens	178	01/07/2022	01/07/2022	04/07/2022	05/07/2022
#N/D	#N/D	#0080FF	M07528	P237349	ASTIR M	Solt 1	Men	Mens	543	04/07/2022	01/07/2022	04/07/2022	05/07/2022
#N/D	#N/D	#00FF55	M07539	P254619	HELSINKI M	Solt 1	Men	Mens	00667	05/07/2022	04/07/2022	05/07/2022	05/07/2022
#N/D	#N/D	#00FF55	M07544	P79497	FUSION	Solt 1	Men	Mens	053	05/07/2022	05/07/2022		
#N/D	#N/D	#00FF55	O07861	P237025	SOLICE LADY	Solt 1	Sport	Ladies	001	29/06/2022	29/06/2022	01/07/2022	04/07/2022
#N/D	#N/D	#00FF55	O07895	P271205	ULT TRN MEN	Solt 1	Sport	Mens	001	05/07/2022	05/07/2022		
#N/D	#N/D	#0080FF	POC03870	P154119	TRACE LITE	Solt 2	POCs	Ladies	386	28/06/2022	28/06/2022	29/06/2022	01/07/2022
#N/D	#N/D	#0080FF	POC03872	P178215	ESPINHO MEN	Solt 2	POCs	Mens	114	04/07/2022	04/07/2022	04/07/2022	05/07/2022
#N/D	#N/D	#0080FF	W08241	P179596	SARTORELLE 25	Solt 2	Women	Ladies	001	04/07/2022	01/07/2022	04/07/2022	05/07/2022
#N/D	#N/D	#00FF55	W08242	P262318	NOUVELLE W	Solt 2	Women	Ladies	021	04/07/2022	01/07/2022	Miss mat.	
#N/D	#N/D	#0080FF	W08243	P256420	SOFT 7 LADY	Solt 1	Women	Ladies	001	04/07/2022	01/07/2022	04/07/2022	05/07/2022

Figure 3.12 - Daily Plan

3.3.3. Storage Team, Forwarding Team

The Warehouse team has the responsibility of keeping raw materials organized. When a new order is released, the documents provided by the technical team will be delivered to the warehouse team, which will collect the needed materials and deliver them to Pilot. Once the shoes are fully developed and must be sent to clients, the Forwarding team will prepare the legal documents - Internal Document of Export (IDE). This document is based on identifying all the products shipped from this department to a customer, including information such as the shipping address, packing list, shipping mode, and the practiced' prices. Once this document is correctly filled, the warehouse is responsible for arranging the packing lists and, with external partners, proceeding to the expedition.

DIE		Documento Interno de Exportação		Internal Document of Export		Packing List			
Pedido em PORTUGAL por: Order in PORTUGAL by:		vmp		Data Pedido: Order Date:	19/05/2022				
Endereço Destinatário/Consignee Address:		Requested by: / Pedido por:		Nº telefone/Phone Nº:		Categ.	Article	Color	Nº Pcs
		Contact Person: / Pessoa de contacto:							
		Tipo de documento/ Document Type:							
		Proforma: <input type="text"/>		STOCK: <input type="text"/>					
		Commercial Invoice: <input type="text"/>		Store location: <input type="text"/>					
Descrição Mercadoria/Description of Goods:		Quantidade/Quantity:		ASSINALAR OPÇÃO CORRECTA					
Components of shoe (small cut leather pieces, reinforcements, lining, foam)				MARK THE CORRECT OPTION					
Ribbon				Q009 GOLF					
metal pieces (eyelets)				Q018 GO-TO-MARKET					
rubber logo				Q032 SPORT MARKET					
upper - reference				Q054 APPLIED RESEARCH					
				Q055 DMS					
Quantidade embalagens/Total Packages:		Peso Bruto/Gross Weight:		Dimensões/Measures:					
Motivo de exportação/Reason of Export:		Data Recolha/Pick Up Date:		Serviço Pretendido/Desired Service:					
				AIR :					
				COURIER :					
				TRUCK :					
				SEA:					
Em caso de reclamação mencionar nº relatório: In case of claim state claim report number:									
Incoterms /Delivery Terms [SELECIONAR OPÇÃO CORRETA / MARK THE CORRECT OPTION] (pagamento e responsabilidades do vendedor/comprador payment and responsibilities of seller and buyer)									
EXW	FCA	CPT	CIP	DAP	DPU	DDP			
Ex works	Free carrier	Carriage paid to	Carriage and insurance paid to	Delivered at place	Delivered piece unloaded	Delivered duty paid			
Instruções especiais (Informar a class do produto perigoso de acordo com ADR): Special instruction (state the class of dangerous goods according ADR):									
A preencher EXPORT/IMPORT:									
To be Complet EXPORT/IMPORT:									
EXPORT/IMPORT preparado por: EXPORT/IMPORT prepared by:									

Figure 3.13 - Internal Document of Export

3.3.4. Pilot Area

The Pilot area is where the shoes are done. This area is divided in distinct sections, listed below:

- Cutting: where leather and/or other materials are cut according to the projects' needs. Each component has different characteristics and, as such, requires different care when cutting.
- Preparation: which is responsible for Split, Skiving, Prints and Embroidery. Split is a process in which the fibrous part is separated from the leather.

Skiving is an operation that reduces the thickness of uppers or lining materials. Prints and Embroidery are responsible for some details added to the leather.

- Stitching: responsible for the uppers.
- Montage: which is a very important area, since ECCO stands out for the injection of the soles. There are several types of soles, each of which requires a different treatment. This area is also responsible for the injections of the ECCO Master Color System (EMCS), that serve as a color basis to the ECCO Group, suppliers, and clients.
- Finishing: where there is a quality inspection and, if necessary, some final repairs. When there is a bigger defect, the opinion of the line managers is recommended, and the shoe might be partially or totally undone.

Portugal is the Development Center for ECCO Group, which means that the final prototype developed is sent to Production, that takes the responsibility of mass production. It may happen that projects are shared between different centers, and Portugal is responsible to produce the uppers or for the injection of the soles, instead of the entire shoes.

3.4. Role of Project Management in ECCO's New Product Development Process

At ECCO, the R&D department works differently than the Production department, mainly because Production is responsible for mass Production, where all materials are previously defined by R&D. This department is responsible for materials selection and, for this, opts from several similar options, tests materials according to the specifications and needs, which are processes that are longer when compared with Production.

For this reason, project management is essential in new product development.

It is worth of mentioning that R&D is responsible for new collections and small, limited editions. For this reason, the Supply Chain team must carefully choose projects aligned with the company's strategic goals and that do not interfere with the collections that require delivery. In a second phase, this team is responsible for evaluating projects' importance

according to details such as deadlines, clients' decision-making powers, clients' demands, and importance, and guaranteeing that materials (leather, tools, human resources) are available and that projects are completed giving their standing, and that one project does not interfere others. Project Management is also responsible for choosing the correct collaborators for each task, which means designating teams with specific skills for each project. Teams may vary depending on projects' specifications and level of difficulty. In this department, it is common to have daily meetings where the main issues regarding ongoing projects are discussed.

At ECCO, projects are evaluated on costings, before completion and during, to understand whether the project is going as planned in estimated costings and to comprehend if a project is profitable or not. Teams are set to contact suppliers, ensuring quality specifications and delivery.

As identified in chapter 1, the research method was based on document analysis and observation of some collaborators working directly with the documents reviewed.

Table 4 shows the main actions related to Project Management in new product development observed during the researcher's internship.

Table 4 - Project Management Practices in New Product Development Process

ID	New Product Development
R1	Selecting projects
R2	Evaluate Projects
R3	Purchasing Materials
R4	Allocating teams with specific skills
R5	Evaluate projects financial profits
R6	Ensure quality standards
R7	Daily meetings

3.5. Problems in Management of Projects at ECCO

After deepening analyzing the new product development process and understanding the role of project management in this process, the researcher identified several difficulties regarding the management of projects at ECCO, answering the second research objective of this dissertation project.

The researcher identified some problems through unstructured interviews and observation, as shown in Table 5.

Table 5 - Problems in management of projects

ID	Problems
P1	Lack of a general view of projects
P2	Lack of project planning
P3	Lack of details on the project tasks concluded
P4	Lack of knowledge of the potential project risks
P5	Lack of project performance evaluation

Lack of general view of projects

As mentioned in the previous chapter, the R&D department has daily meetings. However, after some participant observation, the researcher concluded that, apart from the designated project leaders, teams have little knowledge of general details on projects.

In addition to interfering with the team's motivation and, consequently, with their productivity, teams recognize the difficulty in managing resources according to the various projects, as changes in strategy are not communicated as frequently or as normally should. It is not unusual for new product development projects to change frequently for various reasons, such as changes in the selected suppliers, customer demanding, and balance between ongoing projects and newly selected ones, among others. For this reason, the researcher finds it extremely

important to ensure that all those directly involved in each project are alerted more frequently of possible changes.

Lack of project planning

The researcher noted that project planning is mainly an ongoing activity related to daily planning activities and team motivation, which means the planning team makes decisions for the subsequent phases accordingly to the previous ones.

Once new product development processes are diverse and ever-changing, it is customary to acknowledge this approach.

The lack of project planning makes guiding teams more complex, making the project leader's role challenging as teams become more dependent. (Kenley & Seppänen, 2010).

Lack of details on the project tasks concluded

Still related to the planning tasks, verifying that the designated teams had difficulty understanding each of the product development phases was possible.

R&D has a critical task for ECCO since collections are first designed and tested in this department. For this reason, ensuring that teams are in complete alignment with the objectives of each project is of great significance. New product development processes are complex and in constant change, so leaders need to motivate teams through difficulties (Codreanu, 2016).

Lack of knowledge of the potential project risks

The R&D team needs to acknowledge that all processes have potential risks. For this, teams must be comfortable with evaluating potential risks and outlining risk response plans, if needed.

After observing several daily meetings on project status, the researcher realized that teams did not question the possibility of some tasks not going as planned. According to Sigamani et al.(1999), more than outlining potential risks in projects, teams should focus on

portfolio risk management, realizing how risks are charred between projects and how to change project priorities, this is also not done in ECCO.

Lack of project performance evaluation

R&D has several projects, from developing new collections to small collections in partnerships or collaborations with numerous brands, to ensure the company's name is present in different markets.

When projects are concluded, information such as lessons learned throughout the project, risks, and related project issues should be included in a close report. This report must be available to all team members and be a basis to avoid similar mistakes in future projects.

4. KEY PROJECT MANAGEMENT PRACTICES

To face the main problems identified previously, this report suggests essential practices according to project management best practices in literature and the analysis of the ECCO context. It is expected that the appropriate use of the suggested practices will lead to positive impacts in future projects.

Thus, this chapter will answer the third objective of this case study: "Identify and develop key project management practices that mitigate the problems of management of projects at ECCO." In Table 5, it is possible to observe the main problems found throughout the internship discussed previously, and the suggested project management practices to overcome these problems.

Table 6 - Proposal of Key Project Management Practices

Problems	Project Management Practices
Lack of a general view of projects	Project Opening Kick-off Meeting
Lack of project planning	Kick-off Meeting Project Opening
Lack of details on the project tasks concluded	Progress Report
Lack of knowledge of the potential project risks	Risk Register
Lack of project performance evaluation and knowledge management	Close Report

Project Opening

Also known as Project Charter, this document intends to formalize the beginning of a project, giving the project leader permission for the justified use of tangible and intangible resources for the realization of the project (PMI, 2021). Furthermore, this document validates the sharing of information between designated team members, and the researcher considers

that, among others, this Project Opening document should include the following information:

- Client and the strategy behind the choice of the project in the study ;
- Project goals;
- Description of the project, focusing on its benefits, deadlines, required resources, and responsibilities assignment .

Kick-off Meeting

It consists of the first meeting, led by the project leader, with the key people involved. This meeting should discuss information such as project objectives and guidelines, team members, and respective responsibilities. In addition, the main challenges associated with the project must also be discussed as possible requirements imposed by the customer and/or other forces outside the organization.

That a motivated team is a team that is more likely to face the adversities of projects successfully. So, these kick-off meetings, in addition to sharing crucial information about the project's progress, will allow teams to grow closer, improving the work environment and, consequently, the predisposition of employees to face adversities during the projects.

The researcher suggests that the project leader follows the subsequent order in a meeting:

- Presenting the team members to one another;
- The meeting leader must provide a description of the project, including relevant information such as materials needed, legal or customer requirements, making available the Opening Project document;
- Remind team members of deadlines and individual obligations;
- Create a shared vision of the process and its outcomes.

Kick-off meetings should be relatively brief, and all key stakeholders must be present (Rosenzweig et al., 2014). To meet the needs represented by the problems "Lack of a general view of projects", and "Lack of project planning", the researcher created a template, "Project Opening", in Figure 4.1.

Project Name		Client	Project ID	Date	
XPTO		Novos Horizontes	15362	22/06/2022	
Project Driver		Contact	Email		
Beatriz		125436985	btn@ecco.com		
Team					
Name	Office	Name	Office	Name	Office
Maria Anabela	Quality	Cátia Raquel	Planning	Carlos	Technical
Description					
Produce small leather items for Novos Horizontes					
Goals					
Open ECCO for different markets Improving different technical skills					
Success Criteria					
Delivering high-quality items to client Delivering project on the defined deadline					
Main Activities		Predicted Start Date	Predicted Finish Date		
Produce EMCS for client to approve color system		w27	w28		
Contact suppliers		w29	w31		
Testing leather		w31	w33		
Produce items		w33	w34		
Wait for clients' approval		w35	w35		
Signature					

Figure 4.1 - Project Opening

Progress Report

A Progress Report is a document that must be conducted and shared during the project's life cycle. This document contains relevant information that will assist in evaluating project performance, and it is crucial to keep all stakeholders informed and aligned with its progress.

The main objective of a Progress Report is that if someone external to the project has access to this report, and can easily understand the project, obtain a brief description regarding:

- Brief description of the project
- Completed tasks
- Tasks in development
- Tasks to complete
- Risks associated with the completed tasks or related to subsequent decisions

This document should be periodically updated throughout the project and include lessons learned. It is crucial to assume that projects depend on external factors even when planned and developed with the good practices. Thus, it is crucial to acknowledge the ever-changing environment and evaluate the working methods and objective how the difficulties could have been avoided, which makes it possible to avoid the same error or, if it is unavoidable, how to proceed. Figure 4.2 presents the Progress Report is presented.

Project Name		ID	Last Report Date	
XPTO		15362	29/07/2022	
Project Status			Date	
In Progress			30/08/2022	
Description				
Produce small leather items for Novos Horizontes				
Concluded Activities		Beginning Date	Finish Date	Duration
Produce EMCS for client to approve color system		w27	w29	2 weeks
Contact suppliers		w29	w31	2 weeks
Activities in Progress		Date Prediction	Date	Gap
Activities on Hold			Date Prediction	
Testing leather			w32	
Produce items			w34	
Wait for clients' approval			w36	
Observations				
Risks				
Delay in quality testing materials Injection machine breakdown Customer denies choice of material				
Signature				

Figure 4.2 - Progress Report

Risk Register

To reduce or control risks organizations are formed to evaluate and control risks.

For this, in the previously addressed documents, project management teams must identify potential risks associated with each project. Later, teams need to focus on understanding the risk perception and possible consequences, and not all risks require actions.

Risk evaluation attempts to translate the perceptive risk and how it affects projects' success. Therefore, it is essential to consider that the perception of risk may vary according to the organization's interests, the organizational culture, and the values for which the same is governed. Thus, identifying and assessing risk is sometimes hampered (Renn & Klinke, 2002).

Risk Register is a repository that should include, among others:

- Responsible for risk management
- Probability
- Impact
- Planned risk responses

Not all risks must be addressed in the same way. According to PMI (2021), there are several risks strategies:

- Risk acceptance, when the risk acknowledged has low impacts on the projects' success, the project team decides to not take any action.
- Risk avoidance, when the risk is considered a threat to the project, teams take action to eliminate it or to protect the project.
- Risk enhancement, which occurs when the risk might translate into an opportunity and so, the teams act to increase its probability of occurring.
- Risk escalation, when the risk is out of the project's team, the risk is escalated to its superiors, that have more capabilities of acting towards it.
- Risk might also represent threats and in those cases, risk mitigation acts to decrease its probability of occurring.

Figure 4.3 presents the first proposed Risk Register to be used by ECCO's R&D department. The plan responses suggested for each risk to be conducted, must be put to practice, evaluated, and adapted according to the gap between the expected results and the results obtained.

Projects' Name		Client	Projects' ID	
Projects' Driver		Contact	Email	
Risk Register				
Risk	Cause and Category	Date	Analysis	
Risk Register				
Risk	Planned Response			
Signature				

Figure 4.3 - Risk Register

As mentioned before, some authors defend the possibility of portfolio risk management (Renn & Klinke, 2002; O'Connor, 2020). As ECCO has multiple projects at the same time, after more reflection, the researcher found it necessary to update the Risk Register to a better suited with the portfolio management. The new Risk Register, in Figure 4.4, allows teams to point risks that are shared between project, identify the possible impacts, and probability of occurrence. Once the risk status is "Opened", teams must identify a risk response strategy to make face to the risk impacts.


<div style="display: flex; justify-content: space-between; align-items: center;"> Risk Register  </div>					
Risk Name	Status	Probability	Impact	Risk Assignment	Action Plan
Delay in quality testing materials	Opened	60%	Delay in final products' delivery	Project XPTO Project ML Project HT	Consider external contracts Buy the service to external partner Priorize quality testing according to
Injection machine breakdown	Opened	50%	Injection process jeopardized	Project XPTO Project ML Project HT	Consider external injection process Ask the production area for help
Customer denies choice of material	Opened	50%	Delay in final	Project XPTO Project ML Project HT	Consider multiple materials for client to choose from
Signature					

Figure 4.4 - Risk Register and Action Plan

Close Report

The researcher considered the use of a document that specifies the closure of a project, containing all the relevant information regarding its terminus, is essential to evaluate the project performance (Figure 4.5). More than formally closing projects, this report will serve as a tool for knowledge management as the lessons learned for using in future projects will be registered.

Since the R&D department is responsible for developing new products, it is frequent that several prototypes and versions of one product are developed until the final process. Therefore, this department needs to evaluate spending.

From a Portfolio Management perspective, all the reports and the research are considered beneficial to display information on similar projects, projects for the same client, and projects with the same final goal. With this information, project managers know which projects could be negotiated. Management of projects is more than managing each of the ongoing projects; it is balancing resources (financial, human resources, materials, machinery) to deliver all products and/or services at the right time, with the quality demanded by each client, without compromising the other projects' success (Martin et al., 2015).

<h2 style="margin: 0;">Close Project</h2>	
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Project Name	Client	ID				
XPTO	Novos Horizontes	15362				
Date						
Description						
Produce small leather items for Novos Horizontes						
Observations						
Despite the difficulties in quality management, the project was successful XPTO was pleased with the final result in specific skills		Improvement				
Related Projects						
Project ML Project HT						
Lessons Learned						
Choose to have more than one supplier Keep in close touch with suppliers and clients Previously choose more than one type of leather						
Project Evaluation						
	Baseline	Actual	Variance	% Variance		
Start Date	22/06/2022	22/06/2022	0	0		
Finish Date	05/09/2022	14/05/2022	6 days	11,1		
Budget	50000	70000	20000	40%		
	Total production	Defective Products	Variance	% Variance		
Quality	10 000	1000	9 000	90%		
	1	2	3	4	5	Notes
Stakeholders satisfaction						
Signature						

Figure 4.5 - Close Report

5. CONCLUSIONS

The present research work allowed the development of project management practices, which the researcher considered more appropriate considering the context of ECCO'let Portugal's R&D department.

Thus, to answer the research question posed as "What are the appropriate project management practices for the department under study?", three research objectives were defined:

- Understand the role of project management in the new product development process;
- Identify the problems regarding the management of projects at ECCO;
- Identify and develop key project management practices that mitigate the problems of management of projects.

The first objective of this project consisted in understanding the role of project management in new product development. For this, the researcher had to conduct an extensive literature review about project management and project management in new product development. It was possible to comprehend that project management practices must be chosen according to projects' needs and contribute for project success (Patanakul et al., 2010). Project management operates in several areas of knowledge, among them Human Resource management, Risk management, Quality management and Cost management. The areas of knowledge presented allow teams to understand the need for combined management of all factors, delivering quality products and/or services, on time, without compromising spending estimates for each project and acknowledging that factors, internal or external, might influence projects' success (Brian Hobbs, 2010).

Related to the second objective, through observation of daily basis project management practice in new product development and unstructured interviews, it was possible to identify the main problems the department faced when referring to project management practices, such as lack of documentation on potential risks, opening and closing projects' reports (see Table 4).

The researcher selected the previously learned concepts, tools, and techniques that best fit the reality of the company under study. The practices suggested were the

implementation of a Project Opening the document, a Kick-off Meeting for each project (designating teams and responsibilities, development of a risk register and action plan), and development of a Progress Report and a Close Report. In addition, all the mentioned documents should be available to all team members.

Despite completing the research objectives, the lack of access to documents and the company network limited the use of the research method document analysis. Moreover, the implementation of the suggested documents was not approved for reasons external to the researcher, therefore it was not possible to evaluate their impact in the organization.

Regarding the embedding process, the researcher highlights the difficulty in convincing those involved of the project management value and states that the result would be different if she had the support of a champion. A champion is someone who knows the organization's processes and has the power to persuade employees of the importance of the practices suggested.

Respecting future works, the researcher asserts the implementation of the project management practices proposed above and the evaluation of the results of its implementation. As referred before, R&D department is responsible for several projects of great importance and complexity, with collaboration among several teams. For this reason, the researcher suggests ECCO's company to implement project management practices gradually and start with these five key project management practices: Project Opening, Kick-off Meeting, Risk Register, Progress Report, and Close Report.

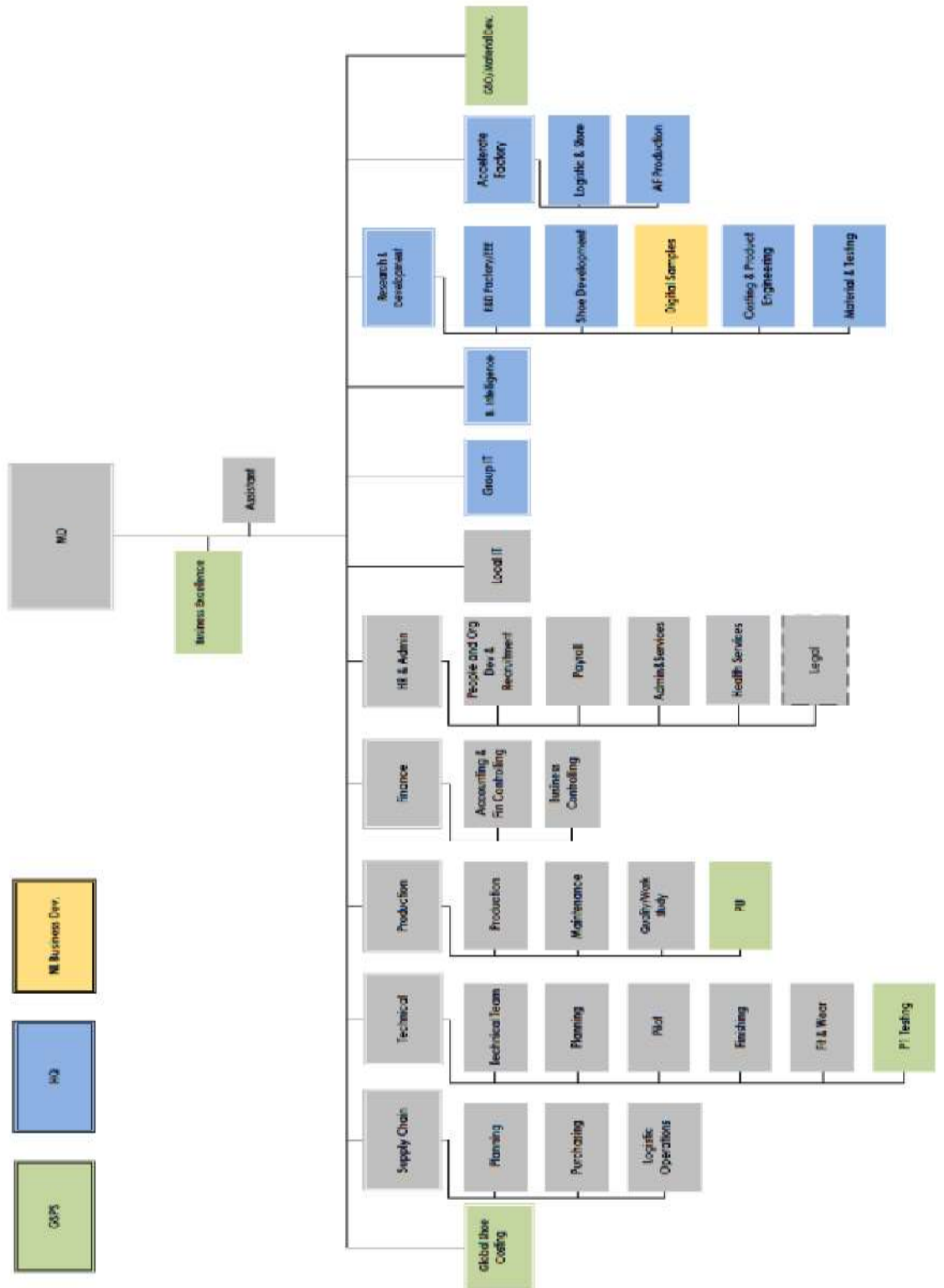
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ANNEX A – ORGANIZATIONAL STRUCTURE



ANNEX B – ECCO BUSINESS MODEL

