HIGHER SCHOOL OF MANAGEMENT AND DIGITAL ECONOMY

HSMDE

Dissertation Submitted in Partial Fulfillment of the Requirements for a Master's Start-up Degree

Specialty: E-Business

THEME:

> # The Impact of Agile Project Management on Team Performance
>
> # CAS Study: Palmary

Project:

> # Taskily

Submitted by:

Mme. Reghda Rahma.

Mme. Amara Malak.

Mr. Bennili Mohamed Elamine

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3rd Promotion

Juin /2024

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Dedication Rahma

"My happiness is to see the pride in your eyes my lovely parents"
 I dedicate this work:

To my father ***Reghda Abdelmalek***, who promised to be my shoulder anytime and everywhere. Thank you for your constant support in my life. Thank you for always being there, no matter the distance or circumstance.

To my mother ***Kherraf Sonia***, my guiding light and my everything. Your endless love, wisdom, and support have been the foundation of all my successes.

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To the one who has shared the entire journey with me, adding vibrant colors to every moment, I extend my deepest gratitude and admiration, to ***Malak.***

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A special dedication to my father **Zebda Messaoud**: Your wisdom, resilience, and firm support have been a beacon of strength for me. Your belief in my abilities has given me the confidence to pursue my dreams with determination and courage. Thank you for being my rock and my inspiration. Your dedication to our family and tireless work ethic have taught me the value of perseverance and hard work. I strive to embody the strength, integrity, and kindness that you demonstrate every day.

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List of Abbreviations

CEO: Chief Executive Officer

CFD: Cumulative Flow Diagram

CPI: Cost Performance Index

DoD: Definition of Done

DSDM: Dynamic Systems Development Method

FDD: Feature-Driven Development

GRPI : Goals ,Roles, Procedures ,Interpersonal Relations

HACCP : Hazard Analysis Critical Control Points

IEEE : Institute of Electrical and Electronics Engineers

IPO : Input-Process-Output

ISO : International Organization for Standardization

IT: Information Technology

KPI : Key Performance Indicators

PO: Product Owner

SARL: Société à responsabilité limitée

SPI : Schedule Performance Index

T7: Trust, Thrust, Talent, Teaming Skills, Task Skills, Team-Leader Fit, Team Support from the Organization

TCPI: To Complete Performance Index

WIP: Work in Progress

XP: Extreme Programming

Abstract

In the fast-paced and competitive world of modern business, mastering project management is essential for organizations aiming to thrive and sustain their success. The methodology chosen for managing projects plays a critical role in determining the efficiency and effectiveness of project execution, which in turn influences the overall performance and growth of the organization.

This study examines the impact of Agile project management methodologies and practices on team performance within a company. The primary objective was to demonstrate that Agile methodologies influence the performance of team members and to explore the nature of this impact. Both qualitative and quantitative research methods were used, including interviews and the calculation of key performance indicators (KPIs). The study focused on the Agile approach deployed by teams at Palmary, the host company. The research methodology incorporated descriptive and analytical techniques.

The findings confirmed that Agile practices provide a robust framework for teams to adapt swiftly to changing requirements and consistently deliver high-quality results. By prioritizing flexibility, collaboration, and customer value, Agile methodologies significantly enhance team performance. The study highlights how these practices foster an environment conducive to continuous improvement and effective team dynamics, ultimately contributing to the overall success and sustainability of the organization.

Keywords: Project Management, Agile Project Management, Team Performance, Key Performance indicators, Agile practices.

Résumé

Dans le monde moderne des affaires, rapide et compétitif, la maîtrise de la gestion de projet est essentielle pour les organisations visant à prospérer et à maintenir leur succès. La méthodologie choisie pour gérer les projets joue un rôle crucial dans la détermination de l'efficacité et de l'efficience de l'exécution des projets, ce qui influence à son tour la performance globale et la croissance de l'organisation.

Cette étude examine l'impact des méthodologies et pratiques de gestion de projet Agile sur la performance des équipes au sein d'une entreprise. L'objectif principal était de démontrer que les méthodologies Agile influencent la performance des membres de l'équipe et d'explorer la nature de cet impact. Des méthodes de recherche qualitatives et quantitatives ont été utilisées, y compris des entretiens et le calcul des indicateurs clés de performance (KPIs). L'étude s'est concentrée sur l'approche Agile déployée par les équipes de Palmary, l'entreprise d'accueil. La méthodologie de recherche a intégré des techniques descriptives et analytiques.

Les résultats ont confirmé que les pratiques Agile fournissent un cadre robuste permettant aux équipes de s'adapter rapidement aux exigences changeantes et de livrer des résultats de haute qualité de manière cohérente. En priorisant la flexibilité, la collaboration et la valeur client, les méthodologies Agile améliorent significativement la performance des équipes. L'étude met en évidence comment ces pratiques favorisent un environnement favorable à l'amélioration continue et à des dynamiques d'équipe efficaces, contribuant finalement au succès et à la durabilité globale de l'organisation.

Mots-clés : Gestion de Projet, Gestion de Project Agile, Performance d'équipe, Indicateurs de Performance, pratiques Agile

ملخص

في عالم الأعمال اليوم الذي يتسم بالسرعة والتنافسية، يعد إتقان إدارة المشاريع أمرًا ضروريًا للمؤسسات التي تهدف إلى تحقيق النجاح والحفاظ عليه. تلعب المنهجية المختارة لإدارة المشاريع دورًا حاسمًا في تحديد مدى فعالية وكفاءة تنفيذ المشروع، والذي يؤثر بدوره على الأداء العام ونمو المؤسسة.

تتناول هذه الدراسة تأثير منهجيات وممارسات إدارة المشاريع الرشيقة على أداء الفرق داخل المؤسسة. كان الهدف الرئيسي هو إثبات أن المنهجيات الرشيقة تؤثر على أداء أعضاء الفريق واستكشاف طبيعة هذا التأثير. وتم استخدام أساليب البحث النوعية والكمية، بما في ذلك المقابلات وحساب مؤشرات الأداء الرئيسية.

ركزت الدراسة على النهج الرشيق الذي طبقته الفرق في شركة بالماري، الشركة المضيفة. وقد دمجت منهجية البحث بين الأساليب الوصفية والتحليلية.

وأكدت النتائج أن الممارسات الرشيقة توفر إطارًا قويًا للفرق للتكيف بسرعة مع المتطلبات المتغيرة وتقديم نتائج عالية الجودة باستمرار. ومن خلال إعطاء الأولوية للمرونة والتعاون وقيمة العملاء، تعمل المنهجيات الرشيقة على تحسين أداء الفريق بشكل كبير. وتسلط الدراسة الضوء على كيفية تعزيز هذه الممارسات لبيئة مواتية للتحسين المستمر وديناميكيات الفريق الفعالة، مما يساهم في نهاية المطاف في النجاح الشامل واستدامة المنظمة.

الكلمات المفتاحية: إدارة المشاريع , إدارة المشاريع الرشيقة ,أداء الفرق , مؤشرات الأداء الرئيسية , ممارسات المنهجية الرشيقة.

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General introduction

General Introduction

In today's dynamic and highly competitive business environment, the effective management of projects is paramount for the success and sustainability of organizations. Project management serves as a crucial framework that enables companies to systematically plan, execute, and oversee projects, ensuring that objectives are met within the constraints of time, budget, and resources. The choice of project management methodology can significantly influence the efficiency and effectiveness of project execution, thereby impacting overall organizational performance.

Project management methodologies provide structured approaches to manage projects and guiding teams towards achieving project goals.

The adoption of a particular project management approach can shape the way teams collaborate, communicate, and deliver outcomes. Consequently, selecting the right methodology is critical to enhancing team performance, optimizing resource utilization, and achieving strategic objectives.

In the field of organizational management, measuring team performance has proven to be an important practice that provides valuable insight into a team's effectiveness and contribution to larger goals.
Among the various project management methodologies, Agile has emerged as a popular and impactful approach, particularly in fast-paced and innovative sectors.

The primary goal of this research is to investigate the impact and effect of Agile project management practices on the performance of teams that adopt the Agile approach. As organizations increasingly turn to Agile methodologies to enhance their project management processes, it becomes essential to understand how these practices influence team dynamics, productivity, and overall performance. This study aims to provide a comprehensive analysis of the specific ways in which Agile methodologies contribute to team effectiveness, offering valuable insights for companies seeking to optimize their project management strategies.

We intentionally chose this topic, inspired by our start-up project that offers an agile project management solution aimed at enhancing project team performance. Our project motivated us to explore the various Agile methods and practices in use, with the goal of analysing the impact

of different project management approaches on team dynamics, productivity, and overall performance within a company.

The main research problematic can be summarized as follows:

"How can the implementation of Agile Project Management impact team performance?"

To address this problem comprehensively, several sub-questions will guide the research:

Sub-question 01: How do Agile Project Management practices enhance team flexibility and adaptability when confronted with project changes?

Sub-question 02: How do Agile Project Management practices affect intra-team collaboration and communication?

Sub-question 03: How do Agile Project Management practices affect the quality of deliverables and compliance with deadlines?

Sub-question 04: Which Key Performance Indicators (KPIs) are utilized to assess team performance?

The elements of response to the formulated problem will be provided by verifying the following hypotheses:

Hypothesis 01: Teams using Agile Project Management practices are able to adapt to project changes more quickly than teams using traditional project management methodologies.

Hypothesis 02: Agile Project Management practices lead to more frequent and effective communication within teams compared to traditional project management practices.

Hypothesis 03: Agile Project Management practices lead to higher quality deliverables and adherence to deadlines compared to traditional project management methods.

Hypothesis 04: Teams exclusively rely on Key Performance Indicators (KPIs) like Objective Achievement Rate and Frequency of Communication rate to evaluate team performance.

The research employs a descriptive and analytical methodology to thoroughly investigate the research problem. To gather relevant data, both qualitative and quantitative approaches are utilized. The qualitative aspect involves conducting in-depth interviews with project managers within the host company while the quantitative aspect involves the calculation and analysis of Key Performance Indicators (KPIs) to objectively measure team performance and project outcomes. This mixed-methods approach will provide a robust framework for understanding the impact of Agile methodologies on team performance.

In line with this logic, we will attempt to address these questions by subdividing our research work into two chapters:

The first chapter covers the theoretical foundation by introducing Agile project management, methods and practices.

Concurrently, we expound upon the concept of team performance, clarifying how it is defined and measured. Additionally, we explore how the principles and methodologies associated with agility contribute to enhancing team excellence.

In the second chapter, we provide an overview of the host organization. Subsequently, we delineate the research methodology and approach employed in this study.

The final sections of our research focus on the examination of gathered data and the presentation of results.

Chapter 01: Project Management and Team Performance

Chapter 01

Introduction

Project management and team performance are intricately linked aspects of any organization. Effective project management involves the coordination of resources, timelines, tasks, and communication to achieve specific goals within constraints like budget. Team performance, on the other hand, relates to how well a group of individuals works together to accomplish those goals.

In this chapter, we will provide a comprehensive overview of various project management approaches and their impact on team performance. The chapter is structured into four sections.

In the first section, we focus on the Fundamental Concepts of Project Management, the second section will delve into Agile Methods. The third section will focus on the Fundamental Concepts of Team Dynamics. Finally, the fourth section will discuss Team Performance Measurement, exploring the metrics and methods used to evaluate the performance of project teams.

Chapter 01

Section 01: Fundamental Concepts of Project Management

Within the landscape of project management methodologies, the strategic selection between the Waterfall and Agile approaches significantly influences the course and success of initiatives. This section undertakes a comprehensive examination of these methodologies, commencing with a thorough examination of the Waterfall model, rooted in Winston Royce's seminal work dating back to 1970. The subsequent focus shifts to the Agile methodology, a dynamic and adaptive approach formalized through the Agile Manifesto in 2001, marking a paradigm shift in project management.

As we navigate the intricacies of both methodologies, this exploration extends to Agile project Management, emphasizing iterative progress and customer-centricity. A nuanced comparative analysis spanning timeline, client involvement, flexibility, and budget considerations seeks to provide a scholarly foundation for decision-makers grappling with the strategic direction of their projects.

1.1 Classic methodology

The following sets out to comprehensively explore the Waterfall project management approach, encompassing its core phases.

1.1.1 Definition of the waterfall management

Waterfall management, as a project management methodology, follows a sequential and linear approach where the project progresses through distinct phases in a cascading manner. The completion of each phase is a prerequisite for advancing to the next, resembling the step-by-step descent of a waterfall. The concept of pure waterfall management entails concluding all tasks within a phase before transitioning to the subsequent one. Formerly the predominant approach in software development until around 2008, waterfall management was eventually surpassed by more adaptive methodologies rooted in agile techniques[1].

1.1.2 The phases of the waterfall methodology

In 1970, Winston Royce, a computer scientist, authored "Managing the Development of Large Software Systems," an article for the IEEE (Institute of Electrical and Electronics Engineers) outlining the phases in the waterfall methodology. While the term "waterfall" was coined later,

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[1] LAYTON Mark and al (2020), *Agile Project Management*, 3rd edition, For Dummies, 3rd edition, Canada, P .09.

the phases, albeit occasionally titled differently, fundamentally remain consistent with Royce's original definition.

The waterfall methodology consists of the following phases[1]:

a. Requirements
In this initial phase, project requirements are systematically gathered and comprehensively documented. This necessitates a profound understanding of customer needs, user expectations, and stakeholder requirements.

b. Design
Building upon the requirements delineated in the first phase, the development team formulates a detailed design of the system. This encompasses architectural design, software design, hardware design, and other relevant components.

c. Implementation
Subsequent to design approval, the actual development of the product or software commences. Programmers translate the design into source code, create modular components, and integrate them to construct a fully functional version of the product.

d. Testing
In this critical phase, the product undergoes a rigorous series of tests to ascertain its adherence to the specifications defined in the requirements phase. Testing procedures may include unit testing, integration testing, system testing, and validation testing.

e. Deployment
The product is deployed and made available to end users in this phase. This may involve installation on servers, software distribution, or other processes associated with the formal launch of the product.

f. Maintenance
Post-deployment, the maintenance phase ensues. During this period, adjustments, fixes, and enhancements are implemented in response to customer feedback or emerging issues, ensuring ongoing optimization.

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[1] LAYTON Mark, Op.Cit, P .08.

Chapter 01

1.2   The agility concept

Here we will explore the concept of agility, focusing on the genesis of the Agile Manifesto, as well as its underlying values and principles.

1.2.1   Origin of Agility

The mindset of the fervent changes in the mid-1990s, spurred by the advent of the Internet that profoundly reshaped the landscape of information technologies, the adoption of traditional methodologies, especially the waterfall method, hindered developers' responsiveness to the dynamic market and emerging approaches in the business domain. In response, development teams initiated the exploration of alternative solutions to these outdated models, highlighting recurring themes conducive to more rewarding outcomes.

In February 2001, seventeen pioneers of these new methodologies gathered in Snowbird, Utah, to share their experiences, ideas, and practices, engage in discussions on the best way to formalize them, and suggest avenues for improvement in the software development domain. It was at this time that the Agile Manifesto came into existence, marking a significant turning point in the evolution of development practices and paving the way for a more flexible and responsive approach[1].

1.2.2   The Agile Manifesto

The Agile Manifesto is a powerful statement, carefully crafted using fewer than 75 words[2] :

« Manifesto for Agile Software Development
We are uncovering better ways of developing
software by doing it and helping others do it.
Through this work we have come to value:
Individuals and interactions over processes and tools.
Working software over comprehensive documentation.
Customer collaboration over contract negotiation.
Responding to change over following a plan.
That is, while there is value in the items on
the right, we value the items on the left more »

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[1] LAYTON Mark, Op.Cit, P .21.
[2] SUDIPTA Malakar(2021), *Agile Methodologies In-Depth* ,BPB Publications, 1st edition, India ,P.29.

Chapter 01

1.2.3 Agile Manifesto values

The values of the Agile Manifesto, are as follows[1]:

a. Value 1: **Prioritizing Individuals and Interactions over Processes and Tools**

Emphasizing the value of individual contributions in the context of product development can yield powerful outcomes. When human interactions center around collaborative problem-solving, a cohesive and unified purpose can emerge. Furthermore, the agreements reached through these interactions often involve processes and tools that are simpler than conventional alternatives.

b. Value 2: **Working software over comprehensive documentation**

In the past, software developers invested significant time in generating elaborate documentation before initiating the coding process. While documentation serves a purpose, this value underscores the need for a balanced approach. There reaches a juncture where prioritizing the delivery of functional software to clients takes precedence over excessive dedication to initial documentation efforts.

c. Value 3: Customer collaboration over contract negotiation

Aligned with this value, the application of an agile approach manifests as a symbiotic partnership between the customer and the development team. Within this collaborative framework, the routine, accepted, and systematic processes of discovery, questioning, learning, and adjustments characterize the journey through product development

d. value 4: Prioritizing Responsiveness to Change over Adherence to a Predetermined Plan

This tenet underscores the recognition of change as a pivotal instrument in the creation of exemplary products. Teams adept at nimble responses to the evolving needs of customers, user feedback, and dynamic market conditions are poised to develop products that not only remain relevant but also prove genuinely beneficial. Such adaptability ensures the production of products that resonate with users and align with their evolving preferences.

1.2.4 Agile Manifesto principles

In the aftermath of the Agile Manifesto's publication, the original signatories sustained a continued dialogue. In a concerted effort to assist teams navigating the transition to agile

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[1] PORTNY Stanley and al (2020), *Project management all in one for dummies*,1st edition, Canada, P .209.

methodologies, they enriched the foundational four values of the Agile Manifesto by incorporating an additional set of 12 guiding principles[1]:

a. Customer Satisfaction

The foremost priority is to satisfy the customer by continually delivering valuable software early and consistently.

b. Adaptability to Change

Embrace changing requirements, even late in development, as agile processes leverage change for the customer's competitive advantage.

c. Frequent Software Delivery

Deliver working software frequently, with a preference for shorter timescales ranging from a couple of weeks to a couple of months.

d. Collaboration Between Business and Developers

Foster daily collaboration between business representatives and developers throughout the project.

e. Empower and Trust Motivated Individuals

Construct projects around motivated individuals, providing the necessary environment and support while trusting them to accomplish the task.

f. Face-to-Face Communication

Recognize face-to-face conversation as the most efficient method of conveying information to and within a development team.

g. Working Software as Progress Indicator

Regard working software as the primary measure of progress.

h. Sustainable Development

Promote sustainable development, enabling sponsors, developers, and users to maintain a consistent pace indefinitely.

i. Focus on Technical Excellence and Design

Ensure continuous attention to technical excellence and good design to enhance agility.

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[1] PORTNY Stanley and al, Op.Cit, P .215.

Chapter 01

j. Embrace Simplicity

Prioritize simplicity, maximizing the amount of work not done is —a fundamental aspect of the agile philosophy.

k. Self-Organizing Teams for Optimal Solutions

Acknowledge that the best architectures, requirements, and designs emerge from self-organizing teams.

l. Regular Reflection and Adjustment

At regular intervals, encourage the team to reflect on its effectiveness, tuning and adjusting behavior accordingly for continuous improvement.

The Agile Manifesto constitutes the seminal point of origin for the Agile movement, a paradigm that has subsequently disseminated and evolved across multifarious domains beyond the confines of software development. Its successful integration into diverse sectors, encompassing project management, marketing, and human resources, attests to its versatile applicability. Fundamentally, agility is distinguished by its unwavering emphasis on flexibility, collaboration, and perpetual adaptation to dynamic changes. This ethos is strategically aligned with the overarching objective of expeditiously delivering outcomes of unparalleled quality. Subsequent to this overview, a closer examination of its application within the domain of management follows

1.3 Agile management

Here we delve into Agile project management and provide a comparison with the Waterfall method.

1.3.1 Definition

Agile Management embodies an iterative and time-constrained methodology in project management, distinguished by its steadfast commitment to continuous improvement, rapid delivery, and the prioritization of customer value. This approach is characterized by frequent, incremental deliverables, with a paramount focus on customer-centric decision-making. In stark contrast to traditional project management and product development paradigms, Agile Management offers a distinctive framework aimed at expediting goal attainment, ensuring both timeliness and cost-effectiveness. Noteworthy in Agile Management implementations is the

consistent achievement of projects completed not only within the allocated budget but frequently ahead of the initially planned schedule, reflecting the efficacy of this methodology in enhancing project outcomes[1].

1.3.2   Agile management VS waterfall management

The following table illustrates the difference between the Waterfall method and the Agile method, based on criteria such as Timeline, Client involvement, and the degree of flexibility:

Table 01: Comparison Table between Agile Project Management and Waterfall Project Management

	Waterfall Project Management	Agile Project Management
Timeline	The Waterfall model adheres to a predetermined timeline where both the commencement and conclusion of the project are meticulously planned from the project's inception	The Agile methodology is flexible, allowing for experimentation and adaptation as the project progresses. Agile projects evolve organically, adjusting the schedule as needed.
Client envolement	In the Waterfall model, client involvement is minimal after defining the ultimate objective, with interactions limited to specific check-ins or milestone deliverables.	Agile methodology emphasizes client involvement at every stage, encouraging active participation and feedback throughout the project. This iterative approach ensures continuous alignment with client expectations.
flexibility	The Waterfall model lacks flexibility, as each phase must be completed before the next begins. This meticulously planned approach suits teams with a clear, predefined vision from start to finish.	Flexibility is central to Agile, with short sprints allowing for adaptation and new information incorporation throughout the project. This iterative approach enables teams to respond to changing requirements

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[1] RUBIO Mauricio (2022), *The mini book of agile*, Packt Publishing, P .02.

	In Waterfall methodology, the budget is typically fixed, as the project is comprehensively planned from initiation to completion, allowing minimal scope for adjustments.	Agile methodology prioritizes adaptability throughout project phases. Consequently, budgets tend to be more flexible, allowing adjustments as projects progress dynamically.
Budget		

Source: Carried out by ourselves

1.4 Approaches that can be employed in conjunction with agile management

Here are the primary approaches that can be executed in parallel with agile management:

1.4.1 Le management 3.0

After the initial phase of management, often referred to as "management 1.0" and rooted in Taylorism, characterized by a directive approach where employee autonomy is limited, emerged a notable evolution in the form of "management 2.0". This phase is marked by the establishment of a vertical and pyramidal hierarchical structure, while paying increased attention to the human aspect.

However, a true revolution in management occurred with the advent of "management 3.0", introduced by Jurgen Appelo in 2010 through his book "Managing for Happiness". This new approach to leadership and management emphasizes team empowerment, individual autonomy promotion, and prioritization of the system over excessive individual control Moreover, it aligns well with agile principles by encouraging a culture of transparency, accountability, and continuous improvement[1].

1.4.2. Design Thinking

According to Tim Brown, CEO of IDEO and author of "Change by Design, design thinking is a human-centered approach to problem-solving that emphasizes empathy, observation, and experimentation to create innovative solutions that meet users' needs. This method involves multidisciplinary collaboration, rapid iteration, and prototyping to test and refine ideas. It enables organizations to innovate creatively and develop solutions that address the real needs of customers and users, while providing a memorable user experience[2]. Furthermore, design

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[1] *https://management30.com/learn/* *(16/04/2024 at 13:04)*

[2] Tim Brown (2009), *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation*, HarperBusiness, P .10.

thinking can be used in tandem with agility to ensure that the products developed meet the actual needs of users.

1.4.3. Lean startup

Initially developed by American entrepreneur Eric Ries, the Lean Startup methodology, as detailed in his book of the same name, is a well-recognized approach for iteratively validating a product, service, or offer with the target customer base[1].

Lean Startup provides a scientific approach to creating and managing startups. This means we work smarter, not harder. We want to learn from our customers as quickly as possible[2].

In summary, Agile and Waterfall represent distinct management methodologies, each ideally suited for particular project types. The Waterfall methodology is a fitting choice when project outcomes are well-defined from the outset, making it particularly advantageous for projects subject to stringent regulations, given its structured approach of delivering outcomes for each phase before progressing to the next.

Conversely, Agile proves more suitable for teams aiming for rapid progression, embracing experimentation, and initiating projects without a preconceived final vision. Agile's flexibility is paramount, requiring a collaborative and self-motivated team, along with regular check-ins with business owners and stakeholders to ensure alignment and track progress. The choice between Agile and Waterfall hinges on the project's nature, objectives, and the degree of predictability desired throughout its lifecycle.

In this section, we explored the concept of project management and delved into its two methodologies: The Classic methodology and the Agile methodology.

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[1] https://bpifrance-creation.fr/moment-de-vie/lean-startup (18/05/2024 at 03:51)
[2] RIES Eric (2011), *Le Modèle Startup : Devenir une entreprise moderne en adoptant le management entrepreneurial*, Pearson, France, P .28.

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Section 2: Agile methods

In the field of software development, agile methodologies have fundamentally revolutionized team project management. Scrum and Kanban are two of the most popular agile methodologies and are known for their effectiveness and adaptability. These provide structured framework conditions to foster customer collaboration, flexibility, and continuous value creation. Other agile methodologies, such as Extreme Programming (XP) and Feature-Driven Development (FDD), further enrich agile environments by providing unique perspectives on an iterative, incremental approach to project management. This section covers the basic principles of Scrum and Kanban, as well as other agile methodologies.

2.1 Scrum method

The following endeavors to explore the Scrum methodology comprehensively, covering its definition, distinct roles, artifacts, and various events.

2.1.1. Definition

Scrum is a one-step process framework for managing product development. This framework consists of Scrum roles, artifacts, and rules and uses an iterative approach to deliver a working product. Scrum is performed in time frames of one month or less in consistent periods called sprints, which can produce releasable product increments[1].

2.1.2 Roles of scrum method

The Scrum methodology defines three key roles:

a. Product Owner

The Product Owner (PO) is a key role in agile project management, responsible for ensuring that a product meets the needs of its customers and stakeholders. They serve as the primary contact between the development team, customers, and other stakeholders, and they are accountable for maximizing the value of the product resulting from the work of the Scrum Team[2].

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[1] ROWE Sandra (2020), Project *Management for Small Projects*, Berrett-Koehler Publishers,3rd edition, Oakland, P .260.

[2] *https://www.scrum.org/resources/what-is-a-product-own* (01/02/2024 at 6:33)

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> ## Missions

The roles of the Product Owner, a pivotal figure in the Scrum methodology, encompass a set of crucial responsibilities that shape the project's success and direction[1]:

- **Definition and Coherence:** The Product Owner (PO) delineates the product and maintains its coherence through the Scrum framework's central artifact, the "product backlog." This catalog of features is meticulously managed by the PO to consistently deliver value to the product, adhering to the principles of Inspection and Adaptation.

- **Validation:** As the sole custodian of the product backlog, the Product Owner (PO) assumes a pivotal validation role. Decision-making constitutes a central aspect of their responsibilities, with careful regard for team contributions and proposals. The overarching objective is to maintain coherence and amplify the value of each new product feature.

- **Needs Translator:** Although the product backlog content is managed by the Product Owner, this document serves as a central resource for all team members. Therefore, it is crucial that the backlog is accessible and understandable to everyone. Clear translation and presentation of all features are essential, aligning with the foundational principles of the Transparency pillar.

> ## Skills

In the dynamic realm of Scrum, the Product Owner's proficiency hinges on a multifaceted skill set. Here are the most important skills that a product owner must have[2]:

- **Rigor:** The Product Owner must uphold rigorous standards in keeping product definition elements current. Given the enduring nature of the product backlog, persisting as long as the product exists, a meticulous approach is indispensable for seamless functionality within the Scrum framework.

- **Immersion Capacity:** Optimal understanding of the product's context is imperative. Whether the product aligns directly with the PO's professional expertise or necessitates thorough immersion, comprehensive knowledge of processes, actors, and organizational aspects is essential for informed decision-making.

- **Listening and Openness:** Despite being responsible for the product, the PO should avoid assuming an "all-powerful" stance. Active engagement from all team members is a

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[1] OGER Julien ,EL HADDAD Bassem (2017) ,*Scrum de la théorie à la pratique*,Eyrolles,2nd edition,Paris,P.51.
[2] *Ibid, P. 52.*

prerequisite, requiring the PO to strike a delicate balance, remain open to change, and demonstrate a capacity for self-reflection.

- **Synthesis Skills:** Functioning as the central repository of product-related information, the Product Owner must ensure consistent and clear communication of product details to all stakeholders. Synthesis skills play a pivotal role in maintaining a uniform level of understanding among diverse actors involved in the product development process.

b.   Scrum master

The Scrum Master is a professional who ensures that Scrum processes are correctly applied and that the team adheres to Agile principles. They are responsible for establishing and facilitating the Scrum methodological framework, working with team members and external stakeholders. The Scrum Master's objective is to promote developments that bring added value to the product[1].

➤ Missions

The role of the Scrum Master, a cornerstone of the Scrum methodology, entails a range of critical responsibilities that significantly influence the project's progress and efficiency[2]:

- **Methodology Responsible:** The Scrum Master's role is distinctly characterized by his responsibility for ensuring the proper application of Scrum and promoting agility within the organizational context.
- **Organizer:** The Scrum Master guides the team in organizing various elements such as Daily Scrum and sprint planning. He meticulously monitors the proper execution and flow of processes, promptly addressing any deviations that may arise. Additionally, he supervises continuous improvement efforts, thereby overseeing the Inspection and Adaptation pillars at the organizational level.
- **Facilitator:** A key responsibility of the Scrum Master is to facilitate seamless communication among all stakeholders. This involves breaking down barriers, initiating discussions in the face of problems or conflicts, and ensuring the adherence to the Transparency pillar of Scrum.

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[1] *https://www.atlassian.com/fr/agile/scrum/scrum-master* (02/02/2024 at 20h)
[2] OGER Julien ,EL HADDAD Bassem , Op.Cit, P. 48.

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➢ **Skills**

Within the dynamic landscape of Scrum, the Scrum Master's effectiveness is predicated on a versatile skill set. Here are the primary skills critical for a Scrum Master[1]:

- **A Base of Scrum and Agile Knowledge:** A profound knowledge of Scrum and broader agile concepts is imperative for the Scrum Master. This forms the bedrock for effective implementation and guidance within the Scrum framework.

- **Capacity to Transmit and Evaluate Acquired Skills:** The Scrum Master's didactic capabilities come to the fore as he transmits knowledge throughout projects. Beyond mere transmission, the Scrum Master must possess the ability to evaluate teams' skill acquisition levels. This evaluation informs adaptive interventions and method reorientation according to evolving needs.

- **Relational Intelligence:** The Scrum Master's interventions are intrinsically tied to relational intelligence. This involves not only fostering positive relationships with diverse project stakeholders but also resolving conflicts, cultivating collaboration within the Scrum framework, and generating synergy. The emphasis is on facilitating mutual understanding, instigating effective communication, and promoting a culture of sharing within the Scrum ecosystem.

c.   The development team

The development team plays a crucial role in translating the Product Owner's requirements into tangible features within the application. Its responsibilities and skills are outlined as follows:

➢ **Missions**

The responsibilities of the Development Team, fundamental within the Scrum framework, comprise a critical set of duties that significantly influence the project's success and trajectory[2]:

- **Increment Responsible:** Similar to the product backlog, the development team takes ownership of the "increment" (Product Increment), a pivotal artefact in Scrum. This increment can be viewed as a compilation of product backlog items slated for completion, and the development team is accountable for its realization.

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[1]OGER Julien ,EL HADDAD Bassem , Op.Cit,*P. 49.*
[2]Ibid P. 54.

- **Estimation:** The development team undertakes the estimation of various items in the product backlog. Scrum underscores the importance of delegating the responsibility for determining the time required for completion to the primary stakeholders.

- **Implementer:** As the custodians of the increment, the development team assumes the role of implementers for the technical solution. Their responsibility extends to the meticulous implementation of new features, ensuring alignment with the functional criteria articulated by the Product Owner. Simultaneously, they uphold standards of technical excellence, fostering a level of quality that ensures the overall application's maintainability and scalability—essential considerations in the iterative and incremental development of an application.

➢ **Skills**

The skills expected from the development team are inherently diverse and adaptable based on the project's specific needs. These skills encompass the entire spectrum of application development, including functional and technical design, architecture, development, and system administration. Scrum mandates the formation of a unified yet multidisciplinary development team, amalgamating all requisite technical skills to successfully achieve the desired increment. Notably, Scrum does not impose specific requirements at this level, allowing flexibility in tailoring the team's expertise to suit the unique demands of the project[1].

2.1.3 Scrum artifacts

The artifacts of Scrum are information that represents the work or value produced by the team and stakeholders. They are designed to maximize key information transparency and enable future adaptation. The three main artifacts of Scrum are the Product Backlog, the Sprint Backlog, and the Increment[2]:

a. Product Backlog

The Product Owner oversees a dynamic list comprising essential features, enhancements, and fixes vital for the product's development. This list is in a state of perpetual evolution, reflecting the ever-changing needs and priorities of the project. Throughout the iterative process, the Product Owner meticulously maintains and updates this list between sprints, ensuring

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[1] OGER Julien ,EL HADDAD Bassem *, Op.Cit, P. 55.*
[2] JAIBEER Malik (2013), *Agile Project Management with Green Hopper 6 Blueprints*, Packt Publishing, Birmingham, P.10.

alignment with emerging ideas and information to drive continuous improvement and product excellence.

b. Sprint Backlog

It is a comprehensive catalog of tasks meticulously devised by the Development Team for execution within the current sprint. Solely crafted by the Development Team, its composition remains immutable by external parties, ensuring autonomy and ownership over sprint objectives and deliverables.

c. Increment

The Increment represents a collection of product features that are potentially shippable and usable at the culmination of each sprint. These features must adhere to the Definition of Done (DoD), a comprehensive checklist of tasks that the team must satisfactorily fulfill before deeming the feature ready for potential shipment.

These artifacts are essential for transparency, inspection, and adaptation within the Scrum framework.

2.1.4 Scrum events

Here are the central events of Scrum, which serve as crucial milestones fostering coordination and efficient task completion:

a. Sprints

A sprint is a specific time frame during which a team focuses on and finishes the tasks listed in the Sprint backlog. The team decides on the duration of the sprint, typically ranging from one to four weeks. Initially, many teams opt for two-week sprints and may adjust the duration based on their specific needs and circumstances[1].

b. The Daily Scrum

The Daily Scrum constitutes a pivotal event in the Scrum framework, serving as a mechanism for facilitating daily coordination and planning among the development team. It is a time-boxed meeting lasting 15 minutes, typically scheduled in the morning. During this session, team members engage in discussions regarding their progress, strategize their tasks for the day, and pinpoint any potential obstacles[2]. (View APPENDIX NO. 1)

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[1]EWEL Jim (2020), *The six disciplines of agile marketing*,1st edition, Canada, P .73.
[2] OGER Julien ,EL HADDAD Bassem *, Op.Cit, P.64.*

➢ **Objectifs**

The objectives of the daily scrum are as follows[1]:

- Organize and manage daily project tasks and keep everyone informed of progress.

- Promote open communication and teamwork through regular collaboration. Team members know they can support each other.

- Stay informed and resolve any problems immediately to avoid long-term problems. Everyone has a clear view of the project and can quickly address small issues.

- Proactively identify and resolve potential roadblocks to ensure smooth project progress.

2.1 Kanban method

The following endeavors to comprehensively explore the Kanban method, covering its definition, principles, practices, and tools.

2.2.1 History and Definition

The Kanban method, originating from the manufacturing industry by Taiichi Ohno for Toyota in the 1940s and later adapted to knowledge work by david j anderson, is a project management system that emphasizes visualizing tasks to enhance team efficiency and agility. By using labels to represent each task and its progression within the workflow, Kanban facilitates the alignment of efforts toward common goals and enables a culture of continuous improvement. This flexible and effective approach provides visibility into project status for all stakeholders, allowing team members to easily track the progress of ongoing tasks and empowering them to identify and address issues promptly. The method's history reflects its evolution from its application in manufacturing to its widespread adoption in various industries, offering benefits such as improved collaboration, information sharing, and the ability to manage work in a just-in-time manner[2].

2.2.2 Kanban method principles

The foundational principles of the Kanban Method are outlined below [3]:

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[1]OGER Julien ,EL HADDAD Bassem , Op.Cit, P.65.

[2] *https://kanbantool.com/kanban-guide/kanban-history* (07/02/2024 at 22h)

[3] MORISSEAU Laurent, PERNOT Pablo (2019) ,*Kanban L'approche en flux pour l'entreprise agile*,Dunod,Paris,P .46.

a. Understand current processes « Start with what you do now »

In the adoption of the Kanban methodology, the initial step involves closely examining current work methodologies. This entails understanding how things are currently done, identifying key steps, and evaluating day-to-day operations. This thorough analysis aims to fully grasp the operational reality. Acknowledging the current roles facilitates a smooth transition to Kanban, considering the specific attributes of each team member.

b. Secure unanimous approval for an evolutionary change « Agree to pursue improvement through evolutionary change »

The second step is to obtain unanimous approval from all team members for transitioning to the Kanban methodology. This requires clearly explaining the potential benefits and addressing any concerns. The goal is to create consensus by illustrating how Kanban can enhance daily work.

This approval should be sought at all levels of the organization, from frontline staff to leadership. Everyone's participation is crucial to foster a culture conducive to innovation and continuous improvement.

c. Encourage leadership actions at all levels « Encourage acts of leadership at all levels»

The third step involves encouraging leadership actions at all levels. Leaders across the organization must set an example by actively supporting the change. This entails adopting a shared vision, promoting continuous learning, and empowering teams to take initiatives.

Leaders should also provide necessary support, allocate appropriate resources, and create an environment that fosters innovation. They need to act as facilitators to ensure the success and sustainability of the Kanban implementation.

2.2.3 Kanban method practices

The defining practices of the Kanban method are as follows[1]:

a. Visualisation

Effective visualization is key to efficient collaboration and enables the identification of improvement opportunities. Often, within organizations, work remains concealed. Visualizing

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[1] MORISSEAU Laurent, PERNOT Pablo , *Op.Cit* , P.47.

this work and its progression significantly enhances transparency. From an evolutionary standpoint, human visual perception has been acquired for an extensive period, enabling the rapid capture and processing of substantial amounts of information. Furthermore, visualization encourages cooperation, as all involved individuals literally have access to the same image. A more detailed exploration of visualization will be undertaken in the section dedicated to Kanban boards.

b. Limiting Work in Progress (WIP)

The concept of Work in Progress (WIP) indicates the number of work items in the process of completion at a specific moment. Through Kanban, it has been discovered that the most effective systems focus more on workflow and less on the exhaustive utilization of workers. When resources are fully utilized, there is no "slack" in the system, resulting in a very low flow, similar to peak hours on a highway. In knowledge work, a change in context can significantly reduce worker efficiency. In Kanban, WIP are limited to balance resource utilization and ensure smooth workflow.

c. Workflow Management

The aim of workflow management is to ensure the smooth and predictable progression of work while sustaining an optimal pace. As mentioned earlier, the limitation of work in progress is recognized as a crucial mechanism in achieving this objective.

Monitoring or evaluating the workflow provides invaluable insights for managing customer expectations, forecasting delivery schedules, and fostering a continuous improvement ethos.

d. Making Policies Explicit: A Facet of Team Advancement

Teams garner advantages through the articulation of initial policies, thereby establishing clear criteria for decision-making regarding work items and the evolving process. This explicit definition of policies lays the groundwork for the team's ongoing evolution. Explicitly outlining these criteria facilitates a shared understanding among team members, fostering a cohesive and informed decision-making environment. This practice not only initiates a structured approach to handling work items but also allows for adaptability and continuous improvement as the team navigates its operational landscape. In academic terms, this proactive policy-making serves as a foundational element for the team's dynamic development within the evolving context of its work environment.

e. Implement Feedback Loops

This practice involves establishing reliable feedback loops at different stages of a project to gather input and make necessary adjustments. By continuously seeking feedback from customers, stakeholders, and team members, the Kanban method enables teams to identify and address issues promptly, leading to improved efficiency and better outcomes. The feedback loops can take various forms, such as daily stand-up meetings, retrospectives, and customer feedback sessions. The Kanban method emphasizes the importance of continuous improvement, and feedback loops are a critical component of this approach.

f. Improve collaboratively, evolve experimentally

This practice is rooted in the change management principles of Kanban, which advocate starting with the current state and agreeing to pursue improvement through evolutionary change. Kanban is a method for continuous improvement, and this practice involves making changes collaboratively using designed experiments based on models and the scientific method. Feedback and metrics play a crucial role in guiding the evolutionary path, and safe-to-fail experiments are designed to test hypotheses. If the experiment yields positive results, the change is retained; if not, it can be easily rolled back. This approach fosters a culture of collaborative improvement, empowers team members to take the lead, and encourages small, continuous, incremental, and evolutionary changes. By embracing this practice, organizations can optimize their workflow, increase delivery speed, and continuously improve their processes.

2.2 Agile metrics KPI's

Contained below are essential tools within the Kanban methodology, instrumental in optimizing workflow and enhancing operational efficiency.

a. The Cumulative Flow Diagram

It is an advanced analytical tool that provides a visualization of workflow and overall project progress. The CFD allows teams to monitor the stability of their workflow, anticipate bottlenecks, and adjust their workflow accordingly. It also helps to make processes more predictable by graphing how tasks accumulate over time and their overall distribution across

process stages. In summary, the CFD is a Kanban method tool that provides valuable insights to improve workflow management and process predictability[1].

b. Kanban boards

Kanban boards are visualization tools used to map and manage the flow of work. They are designed to help visualize work, limit work in progress, and maximize workflow efficiency. Cards are moved from one column to another to reflect the progress of work, from the "waiting" phase to "in progress" and then to "done". Kanban boards offer instant visibility into ongoing activities and those that require attention, thus promoting appropriate focus, increased productivity, and better workflow management. Kanban boards can be physical or digital, and their use extends to various domains such as software development, project management, customer service, and other business and operational functions. These tools allow teams to better prioritize tasks, limit work in progress, and promote continuous improvement of the workflow process[2].

c. Burn down chart

A burn down chart visually represents the remaining work against time, commonly used in agile methodologies like Scrum. However, it's adaptable to any project with measurable progress over time.

Typically, the vertical axis of a burn down chart depicts outstanding work, while time spans horizontally. This chart aids in predicting project completion. During the Daily Scrum, the Development Team updates the Sprint Burn Down, plotting the remaining work for the day. A burn down chart is considered essential for a Scrum team due to its ability to: Monitor project scope creep, keep the team on schedule, compare planned work with team progress[3]. (APPENDIX NO. 2)[4]

d. Epic Burn down chart

The Epic Burndown chart provides insights into your team's progress on the work for an epic. An epic refers to a sizable user story that can be subdivided into smaller stories. This chart displays data based on the chosen estimation statistic.

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[1]https://excellenceagile.com/2015/09/23/lecture-dun-cumulative-flow-diagram/(07/02/2024 at11:15)

[2] MORISSEAU Laurent, PERNOT Pablo,Op.Cit, P.44.

[3] JAIBEER Malik ,*Op.Cit*,P.74.

[4] https://www.visual-paradigm.com/scrum/scrum-burndown-chart/ (04/04/2024 at 15h)

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Here are some of the purposes for using an Epic Burndown chart: Assess the pace at which your team is advancing through the epic, understand how the addition and removal also known as Scope creep, of work during the sprint have impacted your team's overall progress, forecast the number of sprints needed to complete the work for an epic, drawing from past sprint data and changes made during the sprints[1]. (APPENDIX NO. 3) [2]

e. Velocity

Velocity refers to the average amount of work completed by a Scrum team during a sprint, typically measured in story points or hours. It serves as a valuable tool for forecasting. By tracking forecasted and completed work over multiple iterations, the product owner can utilize velocity to anticipate how swiftly the team can progress through the backlog. The more iterations recorded, the more precise the forecast becomes.

Monitoring velocity over time is crucial. Newly-formed teams often experience a gradual increase in velocity as they refine relationships and streamline workflows. Established teams can track their velocity to ensure consistent performance and assess the impact of process changes. A decrease in average velocity may indicate inefficiencies within the team's development process, warranting discussion during the next retrospective meeting[3].

(APPENDIX NO. 4)[4]

f. Control chart

A control chart—sometimes referred to as a Shewhart chart, statistical process control chart, is one of the graphical tools commonly used in quality control analysis to understand how a process   involves   over   time. The control chart focus on the cycle time of individual issues, which refers to the total time from "in progress" to "done". Teams with shorter cycle times tend to have higher throughput, while teams with consistent cycle times across multiple issues are more predictable in delivering work. Although cycle time is a primary metric for Kanban teams, Scrum teams can also benefit from optimizing cycle time.

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[1] https://support.atlassian.com/jira-software-cloud/docs/view-and-understand-the-epic-burndown-report/ (04/04/2024 at 10:23)
[2] https://www.atlassian.com/agile/project-management/metrics 06/04/2024 at 8h)
[3] JAIBEER Malik ,*Op.Cit,*P .96.
[4] https://www.atlassian.com/agile/project-management/metrics (13/04/2024 at 17:19)

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The main elements of a control chart include: a time-series graph illustrating data points collected at specific time intervals, a horizontal control line to facilitate the visualization of variations and trends, horizontal lines representing upper and lower control limits, placed equidistantly above and below the control line. These values are calculated based on the data recorded on the time-series graph over a given period[1]. (APPENDIX NO. 5)[2]

2.3 Other Methods

In emphasizing the versatility of agile methodologies, it becomes apparent that they extend beyond the established frameworks of Kanban and Scrum, offering a multitude of practices designed to cater to the nuanced needs of teams and projects. Among these alternatives[3]:

2.3.1 Extreme Programming (XP)

Stands out with its focus on code quality, continuous communication, and rapid feedback. This model aims to enhance the flexibility of the development process by favoring short and iterative development cycles.

2.3.2 Feature-Driven Development (FDD)

Represents a predominant agile methodology that concentrates on creating clear and well-defined features, thereby facilitating the effective management of functional elements within a project.

2.3.3 Dynamic Systems Development Method (DSDM)

provides a flexible approach that focuses on continuous collaboration between development teams and stakeholders, facilitating rapid adaptation in development.

It is crucial to underscore that the choice of a specific agile methodology depends on the essential characteristics of the project, the capabilities of the team, and the requirements of the client. By considering these diverse methodologies, teams can select the one that best aligns with their needs and facilitates the implementation of an agile and efficient development process.

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[1] https://www.lucidchart.com/blog/fr/comment-faire-une-carte-de-controle (14/04/2024 at 15h)
[2] https://www.atlassian.com/agile/project-management/metrics (14/04/2024 at 18h)
[3] SUDIPTA Malakar ,*Op.Cit*,P .103.

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In this section, we delved into Agile methodologies, such as Scrum and Kanban, along with other approaches. We analyzed their frameworks, practices, and benefits for project management.

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Section 03: Fundamental concepts of a team

Teams are the basic structure of how a company or an organization organizes and manages project activities and tasks. Therefore, the success or failure of a project is highly dependent on the overall performance of the team assigned to the project.

The increased focus on teams has forced many organizations to work on improving overall performance due to the global nature of companies and projects.

3.1   Defining a team

A team can be defined as a group of people who interact and influence each other to achieve a common goal.

Although in management literature, team and group are used interchangeably, many authors, such as IVANCEVICH (2008), DUHÀ (2007), BIEHL (2004), MARRAS (2000), and KATZENBACH and SMITH (1994) cited in LANGEVIN (2004), establish numerous conceptual differences[1] as shown in the following table:

Table 02: Differences between a team and a group

Criteria	Group	Team
Leadership	Group has a strong, clearly focused leader	The team has shared leadership goals.
Accountability	Individual accountability.	Individual and mutual accountability.
Purpose	The group's purpose is the same as the broader organizational mission.	Specific team purposes that the team itself delivers.

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[1] BLERIOT Hugues and al (2016), *La performance des équipes de travail : quel rôle de la fonction RH?*,Mémoire d'expertise,University ,Paris Dauphine, France,P.12.

Meetings	Runs efficient meetings.	Encourages open-ended discussion and active problem-solving meetings.
Work product	Individual work products.	Collective work products.
Synergy	Neutral synergy (sometimes negative).	Positive synergy.
Skills	Random and varied skills.	Complementary skills.

source: https://tyonote.com/team/#comment-15376 (30/12/2023 at 14h05)

The concept of a team is diverse and has multiple definitions from different perspectives. These definitions will vary depending on factors such as team size, goals set by members, and other nuanced considerations.

The following table presents a comprehensive understanding of the nuanced perspectives on teams within different context[1]:

Table 03: Teams definitions

Author	definition	elements			
		Limited group of people	Common purpose/ set of performance goals	Mutually accountable / responsible	Interdependence

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[1] BULJAC-SAMARDžIć Martina (2012) ,*Healthy Teams: Analyzing and Improving Team Performance in Long-Term Care,*Doctoral Thesis,Erasmus Universiteit Rotterdam,Netherlands,P.12.

Cohen & Bailey (1997)	A team is a collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more large social systems, and who manage their relationships across organizational boundaries	✔			✔	✔
Katzenbach & Smith (1993)	A team is a small number of people with complementary skills who are committed to a common purpose, set of performance goals, and approach for which they hold themselves mutually accountable.	✔	✔		✔	✔
King (2002)	A team is a diverse group of people with different backgrounds, abilities, and knowledge levels to accomplish a specific task. Second, members of a team work to achieve agreed upon goals.	✔	✔			✔
Manion et al. (1996)	A small number of consistent people committed to a relevant shared purpose, with common performance goals, complementary and overlapping skills, and a common approach to their work. Team members hold themselves mutually	✔	✔		✔	

	accountable for the team's results or outcomes.				
Mickan & Rodger (2000; 2005)	A small number of members with the appropriate mix of expertise to complete a specific task, who are committed to a meaningful purpose and have achievable performance goals for which they are held collectively responsible	✔	✔	✔	
WHO (2007)	Two or more people working interdependently towards a common goal. Getting a group of people together does not make a 'team'. A team develops products that are the result of the team's collective effort and involves synergy. Synergy is the property where the whole is greater than the sum of its parts.	✔	✔		✔

Source: BULJAC-SAMARDžIć Martina(2012),*Healthy Teams: Analysing and Improving Team Performance in Long-Term Care*, Doctoral Thesis, Erasmus Universiteit Rotterdam,Netherlands,P.12.

In summary, we will retain the following definition: A team is defined as a group of people who perform interdependent tasks to work toward accomplishing a common mission or specific objective.

3.2 Types of team

Every business team type is defined by three common attributes which are: location, function, and role[1]:

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[1] https://www.predictiveindex.com/blog/business-team-types/ (30/12/2023 at 15h19)

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a. Team types by location

➢ In-person teams: People who work in the same room, office, or building are called a personal team.

➢ Virtual teams: Also known as remote or geographically distributed teams, these are teams whose members work remotely and are not physically present.

➢ Hybrid teams: mixes virtual and in-person teams; these employees typically spend several days of the week at home, and several in the office.

b. Team types by function

➢ Functional teams: consists of people who have similar professional expertise. The roles and responsibilities in functional teams are assigned by a leader to whom team members report.

➢ Cross-functional teams: is composed of representatives from different departments, each with different expertise and skills, but all working toward the same goal.

➢ Self-managed teams: is a group of employees who work collaboratively and take full responsibility for both work processes and the final result. The decision-making power is distributed horizontally among team members.[1]

c. Team types by role

➢ Project teams: Formed for a finite period to accomplish a specific project or goal.

➢ Operational teams: are groups within an organization focused on executing routine tasks and daily functions.

➢ Leadership teams: consist of top executives and senior managers responsible for making high-level strategic decisions and guiding the overall direction of the organization.

d. Special business team types

➢ Contract teams: group of temporary employees to help with a specific problem, they may be consultants on the payroll of a completely different organization, or independent contractors such as freelancers.

➢ Problem-solving teams: when an emergency occurs, companies set up a temporary problem-solving task force to resolve the issue. Problem-solving teams often disband once the immediate problem is resolved.

➢ Matrix teams: teams with more than one supervisor are referred to as matrix teams. In most matrix teams, the first supervisor is the head of a department, while the second supervisor is a project manager from a different department.

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[1] https://www.runn.io/blog/types-of-teams (30/12/2023 at 15h30)

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3.3 The stages of team development

The psychologist Bruce Tuckman invented the memorable phrase "forming, storming, norming, performing " in his 1965 paper "The Sequence of Development in Small Groups". He then added a fifth phase, his adjourning, to mark the end of the team's journey.

The stages of team development are[1] :

a. Forming: The team comes together, and members get to know each other. This stage is characterized by politeness, orientation, and a focus on defining the team's purpose, goals, and roles.

b. Storming: Conflict and differences in opinions emerge as team members start to express their individuality. This stage is marked by debates, challenges to authority, and the establishment of hierarchies. Clear communication becomes crucial to resolving conflicts and moving forward.

c. Norming: Team members establish norms, clarify roles, and develop a sense of cohesion. There is a growing acceptance of the team's goals,where collaboration improves, and the team begins to operate more smoothly.

d. Performing: The team reaches a high level of performance, where members work together effectively to achieve common goals. Trust and collaboration are strong, and the team is capable of making decisions independently. Innovation and creativity thrive in this stage.

e. Adjourning: Some models include a fifth stage, adjourning or mourning, which acknowledges the temporary nature of teams. This stage involves concluding tasks, celebrating achievements, and dealing with the emotions of disbandment, especially for temporary teams. The following figure shows the five phases explained above:

Figure 01 : Team development curve

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[1] OZIGBO Ada-Mac and al (2020), *Team Building and Performance in Organizations: An Exploration Of Issues,* International Journal of Management and Entrepreneurship (IJME) Vol. 2, No. 1, P.190-191.
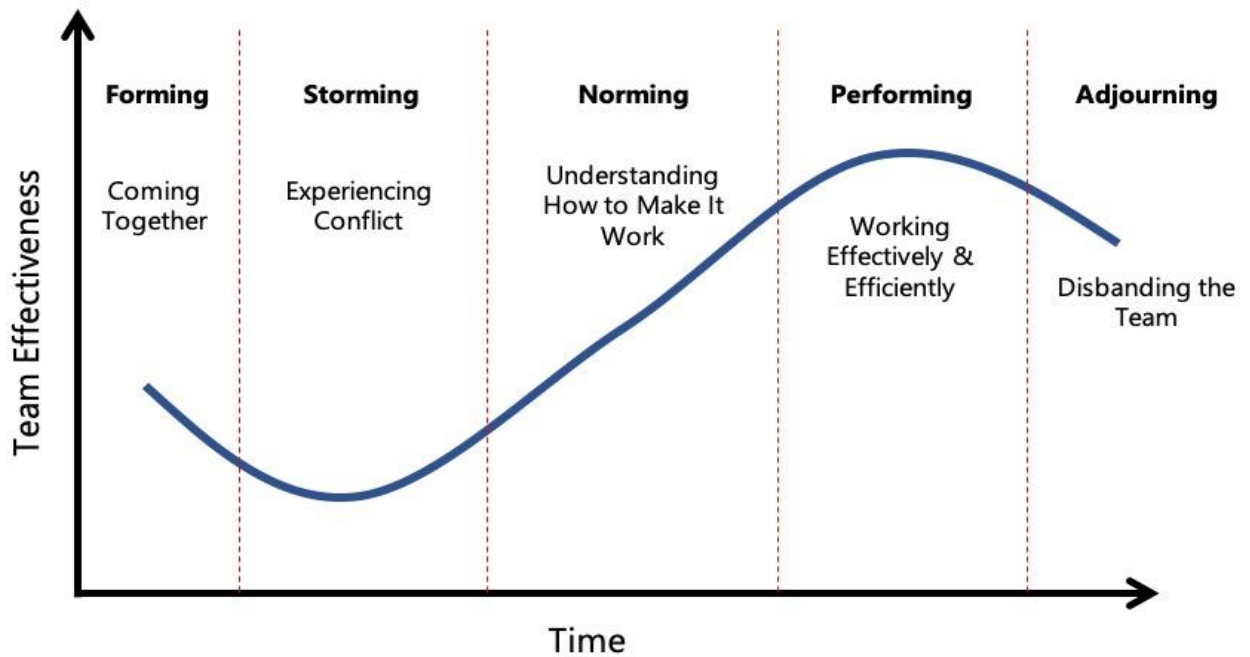
Source : https://www.thoughtfulleader.com/5-stages-of-team-development/ (30/12/2023 at 17h27)

3.4   Agile Team

This following aim to explore the concept of agile team, encompassing its characteristics and its various practices.

3.4.1   Define agile team

An Agile team is a cross-functional group that adheres to agile principles and methodologies, is typically 10 people or fewer, and has all the skills necessary to define, build, test, and deliver value to customers.[1]

3.4.2   Characteristics of Agile Team

Here are key characteristics of agile teams[2]:

a.   Cross-Functional

Agile teams consist of members with diverse skills necessary to complete all aspects of a project.

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[1] https://scaledagileframework.com/agile-teams/ (01/01/2024 at 14h 21)
[2] DEBARSHI Mukherjee (2015), Characteristics *of Agile Teams– A Discussion on Technology and Culture,* IMS Manthan ,The Journal of Innovations , P.78-79.

b. Self-Organizing

Team members have the autonomy to make decisions regarding how they will accomplish their tasks. The team sets its own schedule based on priorities from the product owner and the available capacity of the team.

c. Adaptive to Change

Agile teams are adaptable and embrace changes in requirements, priorities, or technology.

d. Empowered to Make Decisions

Team members are empowered to make decisions related to their work (leadership through participation).

e. Effective conflict management

It means identifying and addressing conflicts proactively, seeking resolution through open communication and collaboration.

f. Transparent Communication

Team members openly share information, updates, and challenges to ensure everyone is well-informed and aligned.

g. Customer Collaboration

Agile teams prioritize customer collaboration throughout the development process. Regular interactions with customers and stakeholders ensure that the product aligns with their needs and expectations.

h. Continuous Improvement

Team members engage in regular reflection and improvement activities.

Agile team performance will be affected if the team lacks the basic characteristics listed above. If this happens, the team may become dysfunctional. The absence of traits such as effective communication, collaboration, adaptability, and shared goals can create obstacles in achieving project objectives. This deficiency may hinder the team's ability to respond to changing requirements, innovate collaboratively, and maintain a cohesive workflow.

3.4.3   Agile team roles

An Agile team structure is designed to promote flexibility, collaboration, and rapid response to change. In Agile methodology, teams work in iterations or sprints, delivering incremental value to the product.

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An agile project management team consists of three roles in the Scrum team: Product Owner, Scrum Master and Development Team (Team members in the project) as outlined below[1]:

a. **The product owner**: is primarily responsible for the product backlog, product requirements, and features. The Product Owner adds tasks to the Product Backlog according to the business vision (Business Owner) and customer requirements (End Users). It is important for product owners to collect this information in order to prioritize product backlog tasks and maximize the value of the product. The Product Owner communicates with the team what needs to be prioritized in each sprint.

b. **The Scrum Master**: is part of the Scrum Team and acts as an Agile Coach. The Scrum Master's main responsibilities are to support collaboration within the team, support the team when challenges arise, and help the development team work more efficiently. It is important to mention that the Scrum Master is not responsible for the plan or the results delivered in the sprint. All members of the development team are responsible for this part.

c. **The development team:** in an agile context is a cross-functional and self-organizing group of individuals with diverse skills necessary for product development.

3.4.4 Agile Team Practices

Agile teams follow a set of practices to promote collaboration, flexibility, and adaptability, and overall team performance. Here are some key Agile team practices[2]:

a. **Stand-Up Meetings:** Specific type of team meeting where team members report on three straight-forward questions on current work status, namely on:
   - Work accomplished on the previous day.
   - Work planned for the current day.
   - Impediments encountered.

  This meeting has a time limit (a rule of thumb is that participants are allowed to "stand up" for approximately 15 minutes).

b. **Customer access:** Level of informal communication with customers (e.g., telephone, email, face-to-face) and ease of contacting customers to clarify technical questions from team members regarding customer requirements.

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[1] SCHWABER Ken ,JEFF Sutherland (2017), Le *Guide de Référence de Scrum: Les Règles de Jeu ,P. 6-7.*

[2] GREN Lucas and al (2019), Agile *ways of working: A team maturity perspective*, Wiley Journal of Software: Evolution and Process ,32:e2244, P.2-3.

c. **Retrospectives:** A type of team meeting in the form of a lessons learned workshop aimed at providing constructive feedback among team members and identifying and improving critical issues that occurred during previous iterations.

d. **Customer acceptance tests :** allows customers to review and test the latest working version of the product with high-priority features, providing continuous feedback as well as the opportunity to change product requirements.

e. **Time-Boxing:** is about setting a fixed time frame for specific activities or events. The best illustration is the sprint. Sprints are time-boxed iterations, and meetings like Sprint Planning, Daily Stand-up, and Sprint Review have predefined durations.

f. **Iteration planning:** it's for defining the scope of work for the upcoming sprint. It ensures that the team has a clear understanding of what needs to be accomplished during the iteration.

g. **Iterative development:** where a project is broken down into smaller cycles or iterations. Each iteration involves planning, design, implementation, testing, and review.

h. **Continuous integration and testing:** Involve customers and stakeholders regularly for feedback, validation and showcasing the product increments.

In this section, we delved into defining a team, examining its various types, and analysing the stages of team development. We presented the definition of an agile team and looked at its main practices, then we explored the agile performance management concept. This comprehensive understanding sets the stage for our next section, where we will delve deeper into team performance and explore methodologies for effective measurement.

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Section 04: Team performance measurement

Performance evaluation systems are important measurement tools used as mechanisms to support various areas of an organization.

It is argued that what gets measured in a performance management system is what is easy to measure, and that what gets measured gets managed. However, team performance measurement is not a perfect science yet, simply because one of the main challenges that arise in conducting performance review is to identify the measure and the criteria for evaluating performance[1].

4.1   Defining team performance

While the terms "team performance" and "team effectiveness" are related and often used interchangeably because performance is also used as a synonym for team effectiveness in literature[2].

The concept of performance serves as a valuable descriptor for evaluating both a team's abilities and the processes it engages in. Effectiveness is distinctly tied to the successful attainment of goals, milestones, and objectives as dictated by contextual requirements or stakeholder expectations. Conversely, performance is more directly related to the proficiency and effectiveness of task execution and collaborative efforts.

So, Team performance refers to the extent to which a team accomplishes its goals or mission as well as the quality and quantity of its outputs and outcomes[3].

Team performance refers to the evaluation of the results of teamwork. Such results as the ability of the team to meet project goals and objectives, product creation quality, operations performance and the ability of members to function as a unit.

Regarding KATZENBACH & SMITH, they highlight the strong correlation between the type of the team and their effectiveness and performance. They model it as follows[4]:

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[1] WHATEL Susan (2004), *Performance Management - Key to organization success*, A dissertation submitted in partial fulfilment for an MA in Human Resource Management, National College of Ireland, P.21.
[2] ARORA Rachna and al (2024), Team *Effectiveness: A Key to Success in 'IT Organizations*, Australasian Accounting, Business and Finance Journal AABFJ | Vol. 17, No.1, P.100.
[3] MARTIN James and al (2018), Shared *Leadership and Team Performance: An Analysis of Moderating Factors*, "Procedia Computer Science" journal, V 138 , P.674.
[4] BLERIOT Hugues and al ,Op.Cit, P.37.

Figure 02 : Team performance curve
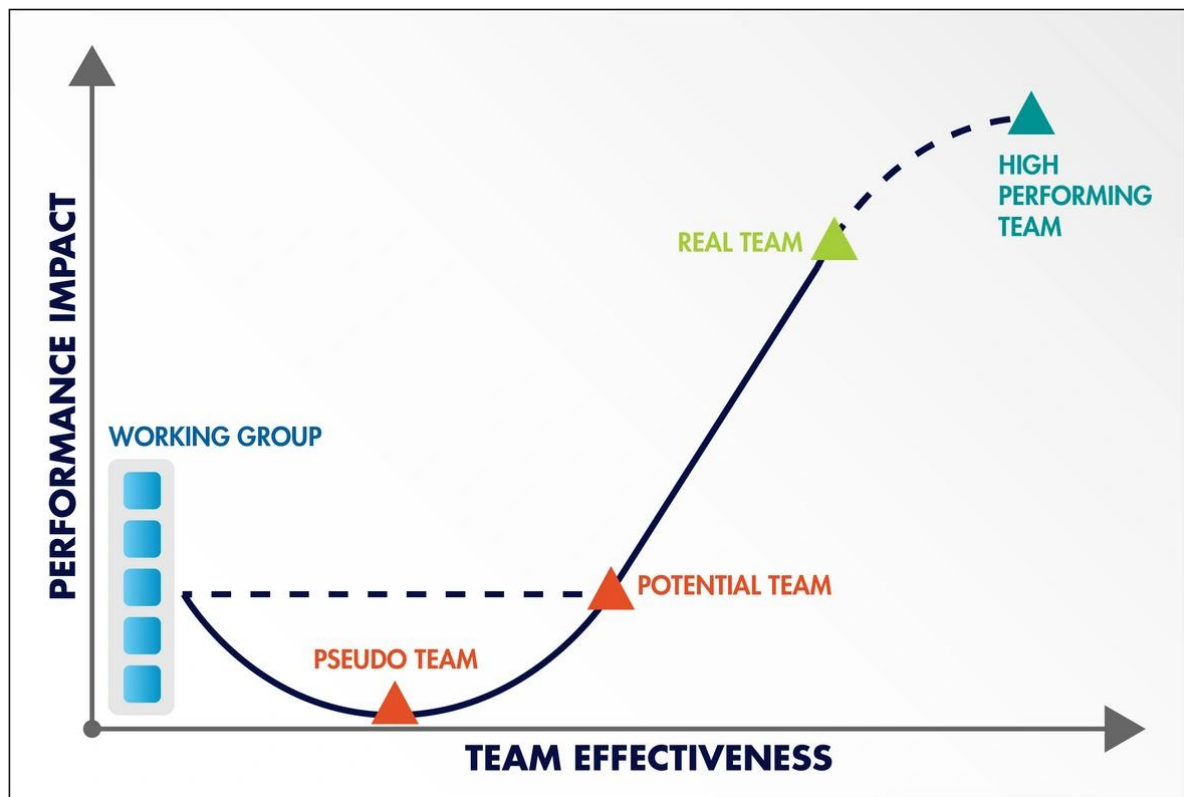
Source: BLERIOT Hugues and al (2016), La performance des équipes de travail: quel rôle de la fonction RH?,Mémoire d'expertise,University Paris Dauphine, France,P.37.

The graph shows that certain types of teams perform less effective than others:

➢ In workgroups, members interact in a limited manner, exchange information, share practices, and make decisions on an empowered basis. This also represents the formation stage.

➢ At the second point on the curve, the pseudo-team attempts to form a team but doesn't genuinely seek collective performance or the establishment of common objectives. This marks the lowest level of effectiveness.

➢ The potential team comes together at the third point on the curve. Members aim to enhance incremental performance and strive to clarify objectives, develop a common work plan. They are learning to work together, but collective responsibility does not yet exist, and the skills of each member are not fully utilized.

➢ The next point is characterized by the "real team." It involves individuals with complementary abilities and knowledge who are committed to serving a common purpose and achieving collective goals through collaborative work. Each member feels mutually responsible.

➢ Finally, at the highest point on the curve, there is the highly effective team. Beyond meeting the conditions of a "real team," its members are highly committed to personal development and the success of their colleagues. They perceive themselves as a priority unit within the system and actively contribute to its development. Such a team is consistently engaged in defining, analysing, and solving problems, reflecting on its practices. It is equally focused on individual development as well as long-term collective learning for all team members.

4.2 Team performance Models

Several models have been developed to understand and improve team performance. Some of these models highlight structure, interpersonal dynamics, talent and motivation of individual team members.

4.2.1 GRPI Model

It was introduced by Richard Beckhard in 1972 and later popularized by Irwin Rubin, Mark Plovnick, and Ronald Fry ; it is an acronym that comprises the four pillars of the model — goals, roles, processes and interpersonal relationships[1]:

- **Goals :** for teams to be effective, they need clear goals and direction.
- **Role**s **:** each team member must understand their responsibilities.
- **Procedures:** for a team to function properly, processes must be in place.
- **Interpersonal Relations:** it is important that each team member can relate to each other, communicate effectively, and trust each other.

4.2.2 The T7 Model of Team Effectiveness

Michael Lombardo and Robert Elchinger(1995) developed the T7 Model of Team Effectiveness to represent the key facets that influence performance of work teams. And these key facets are[2]:

- **Trust:** All team members share a common goal and are committed to reaching it.
- **Thrust:** The team is fully supportive and committed to the member's success.

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[1] https://www.aihr.com/blog/team-effectiveness-models/#GRPI (30/12/2023 at 21h30)

[2] DE MEUSE Ken (2009) , *Driving Team Effectiveness* ,The Korn/Ferry Institute, USA, P.4.

- **Talent:** The effective completion of tasks is facilitated through the collective skills and expertise possessed by each member of the team.

- **Teaming Skills:** The team operates in a synchronized manner and works cohesively to achieve its objectives seamlessly.

- **Task Skills**: Team members perform their tasks consistently and on time.

- **Team-Leader Fit:** The degree to which the team leader satisfies the needs of the team members.

- **Team Support from the Organization**: The extent to which the leadership of the organization enables the team to perform.

4.2.3   The Lencioni Model

Patrick Lencioni conducted a study on factors that can hinder a team's effectiveness and efficiency. He formulated the 'Lencioni Model - Understanding Team Dysfunction,' identifying five dysfunctions that pose threats to optimal team performance. These dysfunctions are[1]:

a. **Absence of Trust:** The absence of trust creates an environment where team members are hesitant to be vulnerable, share their weaknesses, or admit mistakes.

b. **Fear of Conflict:** Healthy teams engage in constructive conflict to address differing opinions and perspectives. A fear of conflict results in artificial harmony, where team members avoid necessary debates and fail to explore alternative solutions.

c. **Lack of Commitment:** A team that doesn't commit to decisions may suffer from ambiguity and lack of direction.

d. **Avoidance of Accountability**: When there's an avoidance of accountability, team members may not feel responsible for their actions, leading to a decline in overall team performance.

e. **Inattention to Results**: as a result, the team have lost sight of their collective goal, performance declines.

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[1] LENCIONI Patrick (2003), *Overcoming the Five Dysfunctions of a Team: A Field Guide For Leaders, managers and facilitators* ,Jossey-Bass, USA, ,P. 7.

4.2.4 Input-Process-Output (IPO) Model

The Input-Process-Output (IPO) Model is a conceptual framework that helps in understanding and analysing the functioning of systems, including teams. This model breaks down a system into three main components[1]:

a. Inputs for a team may include individual skills, knowledge, experience, team composition, resources, and the organizational context in which the team operates.

b. Team processes involve communication, collaboration, decision-making, and the execution of tasks. It encompasses how team members work together to achieve common goals.

c. Output can be tangible, such as completed projects or deliverables, and intangible, such as improved team cohesion or enhanced problem-solving capabilities and team member well-being.

The IPO model suggests that the quality of inputs, the effectiveness of the process, and the nature of the outputs are interrelated. Successful teams focus on both optimizing internal processes and leveraging available resources to achieve desired results. A feedback loop exists where the output of one cycle becomes the input of the next cycle, allowing continuous improvement.

4.2.5 Performance management process

Performance management is a strategic and integrated approach to improve employee performance and create a sustainable organizational success through team and individual skill development.

The performance management process is composed of four main stages[2]:

4.2.6 Planning

organizations strategically establish performance objectives that are closely aligned with overarching organizational goals where a clear communication of these expectations is imperative, to ensure that employees are aware of their roles and responsibilities in achieving the defined objectives. On the other hand team performance plans are developed, the steps, actions, and milestones are outlined   to meet the established performance targets.

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[1] https://business.adobe.com/blog/basics/learn-about-the-input-output-model (05/01/2024 at 23h14)
[2]https://www.workhuman.com/blog/performance-management-process/(29/05/2024 at 16 :33)

4.2.7 Managing

organizations ensure the implementation of devised plans and the generation of desired outcomes. In particular terms that is likely to mean:

a. The organization should provide necessary practical support and provide appropriate resources.
b. The organization should ensure that the information is clear about the results and provide any necessary advice or clarification.
c. The organization should provide the necessary training and development to enable employees to carry out their responsibilities.
d. The organization should adjust goals and priorities on a regular basis.

4.2.8 Reviewing

the organizations evaluate and assess performance outcomes through the conduct of formal performance reviews.

4.2.9 Rewarding

The organizations provide some form of reward if employees achieve goals. This goes beyond mere financial rewards and includes greater opportunities for praise, training, development, and advancement.

4.3 Factors influencing team performance

Each team has the potential to rise or fall based on the group of people who share the same passion and goals and are working together to achieve success.

Team performance can be influenced by a variety of interrelated factors that collectively shape the dynamics within a collaborative unit.

To identify team performance factors, many authors rely on the "input-process-output" model. This model posits that team performance (output) is achieved through an effective internal functioning and social interaction process within the team (process), which, in turn, depends on pre-existing and external conditions characterizing the team and its task (input). Other authors deviate from the model while maintaining a similar logic. Lastly, some present team

performance factors without integrating them into this specific. We will follow this latter approach to present the main performance factors identified in the literature.[1]

Team performance is influenced by a variety of factors that can impact how well a group of individuals works together to achieve common goals. These factors can be complex and interconnected, and they include:[2]

4.3.1 Team dynamics and composition

It involves understanding how team members interact and contribute to achieve common goals.

a. **Team composition:** the diversity of skills, knowledge, and backgrounds within a team can enhance problem-solving and creativity. However, team composition must also consider effective role allocation and compatibility among members.

b. **Role clarity:** clearly defined roles and responsibilities help prevent confusion and conflicts within the team. Each team member should understand their contribution to the overall goals.

c. **The work structure:** the distribution of tasks within the team primarily involves the degree of autonomy granted to the team and the level of interdependence among its members.

d. **Organizational culture**: the set of support mechanisms provided by the organization to enable the team to function effectively. This encompasses all resources that enhance the team's environment and working conditions, including information systems, communication technologies, training programs, budget, equipment, and facilities.

e. **Recognition and rewards:** acknowledging team achievements and rewarding individuals contributes to motivation and a positive team culture.

4.3.2 Leadership and relationships

It involves examining the connections and interactions between leaders and their team members.

a. **leadership:** indeed, it is the leader who selects the members, clarifies responsibilities, and, through managerial skills and leadership style, creates the group dynamics that allow team spirit to develop.

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[1] LANGEVIN Pascal (2011), Quels *facteurs de performance pour quels types d'équipe ? L'avis des managers*, The "Standards and Globalization" conference, France, P.3.

[2] LANGEVIN Pascal , Op.Cit, P.3-4.

b. **Team Relationships:** healthy and supportive relationships among team members maintain effective teams.

c. **Communication:** open and transparent communication is crucial for team collaboration. Clear communication fosters understanding, prevents misunderstandings, and promotes a positive team culture.

d. **Conflict resolution skills:** conflicts are inevitable, but how they are addressed can impact team dynamics. Effective conflict resolution skills within the team help maintain a positive working atmosphere.

4.3.3   The feedback and performance monitoring system

The feedback and performance monitoring system are a structured approach implemented by organizations to assess and enhance the performance of individuals, and teams. It contributes to a culture of continuous improvement, employee development, and organizational success.

4.4   Measuring Team Performance

The context in which all aspects of measurement are created; who will conduct the evaluation, how and what will be used? Team size, task complexity, the physical environment of the task, task interdependencies, and the amount of communication and interaction required to complete the task; should also be considered [1].

There are a number of ways in which data can be collected. One can use self-report, peer assessments, observations, and objective outcomes. It is best to use a combination of both qualitative and quantitative data.

4.4.1   4.5.1. Purpose of team performance measurement

The purpose behind measuring team performance in companies is multifaceted[2]:

a. **Goal Alignment:** ensure that team efforts align with the company's overarching goals and objectives.

b. **Resource Optimization:** evaluate how efficiently teams utilize resources, including time, budget, and manpower.

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[1]ALINAA.VON Davier and al (2017),*Innovative Assessment of Collaboration, Methodology of Educational Measurement and Assessment*, Springer International Publishing Switzerland ,Switzerland, P.25.

[2] https://www.cultureamp.com/blog/reasons-measure-employee-performance (31/12/2023 at 20h53)

c. Continuous Improvement Culture: foster a culture of continuous improvement by regularly assessing and adapting team processes.

d. Talent Management: facilitate talent management by identifying high-performing individuals and teams.

e. Strategic Decision-Making: provide data-driven insights for strategic decision-making at both the team and organizational levels.

4.4.2 KPIs for team performance measurement

We define KPIs (key performance indicators) as the quantitative measures that provide insight into a company's internal processes and structures [1] .Performance indicators enable organizations to gain accurate knowledge about business activities and monitor and manage results. Metrics are benchmarks that allow to compare actual performance with desired performance[2].

The KPIs should be linked to a strategic goal and specific outcome for the company.

Below, we present a list of frequently encountered Team Key Performance Indicators (KPIs)[3]:

a. Productivity KPIs

 Productivity is related to the team's production capacity of goods and services.

➢ **Objective Achievement Rate**
- KPI: Percentage of team objectives achieved within a specified time frame.
- Measurement: Number of completed objectives divided by the total number of set objectives.

➢ **Task Completion Rate**
- KPI: Percentage of planned tasks completed.
- Measurement: Number of completed tasks divided by the total planned tasks.

➢ **Adherence to Schedule**
- KPI: Percentage of tasks completed on schedule.
- Measurement: Number of tasks completed on time divided by the total number of tasks.

➢ **Individual Productivity**

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[1] BADAWY Mohammed and al (2016), *A survey on exploring key performance indicators*, Future Computing and Informatics Journal, P.47–52.
[2] SILVA Luiz and al (2021) , *A MANAGEMENT INSTRUMENT FOR TEAM PERFORMANCE EVALUATION*, Revista Produção e Desenvolvimento, V7, P.5.
[3] Ibid,P.6.

- KPI: Individual contribution to team projects.
- Measurement: Number of tasks completed or output generated by each team member.

b. Commitment KPIs

Commitment is the link generated between the organization and its employees and it can be measured through the following aspects:

➢ **Employee Engagement**
- KPI: Employee engagement survey results.
- Measurement: Scores from surveys assessing team member satisfaction, motivation, and commitment.

➢ **Team Morale KPIs**
- KPI: Team morale and satisfaction survey results.
- Measurement: Scores reflecting team members' overall satisfaction and morale.

➢ **Employee Retention KPIs**
- KPI: Employee turnover rate within the team.
- Measurement: Percentage of team members retained over a specific period.

c. Organization KPIs

In the context of a company, the concept of "organization" refers to the structured arrangement of people, resources, and processes to achieve specific goals and objectives.

➢ **Decision-Making Effectiveness**
- KPI: Success rate of decisions made by the team.
- Measurement: Percentage of decisions resulting in positive outcomes.

➢ **Resource Utilization**
- KPI: Efficient use of resources (time, budget, manpower).
- Measurement: Percentage of allocated resources used effectively.

➢ **Alignment with Organizational Values**
- KPI: Adherence to organizational values and culture.
- Measurement: By an observation of team actions against organizational values.

d. Communication KPIs

Communication is the process of exchanging information in the team that aims to equalize the information.

➢ **Team Participation in Meetings**
- KPI: Participation rate in team meetings.

- Measurement: Percentage of team members actively participating in scheduled meetings.

➢ **Frequency of Communication**

- KPI: Number of interactions or communications within the team.
- Measurement: By counting the number of meetings, emails, chats, or other communication channels used by the team over a specific period.

➢ **Peer Collaboration Feedback**

- KPI: Feedback on collaborative behaviour from peers.
- Measurement: By gathering input from team members about the quality and effectiveness of collaboration within the team.

e. Interpersonal relationship KPIs

Interpersonal relationship refers to the dynamic and complex connections and interactions between individuals in the workplace.

➢ **Feedback Integration**

- Indicator: Integration of feedback into interpersonal interactions.
- Measurement: Through observing how feedback received is integrated into team dynamics and individual behaviour.

f. Knowledge KPIs

Knowledge is a combination of experiences, values, and information that team members have gained in different situations and in their ability to reinvent and improve themselves.

➢ **Training Participation Rate**

- KPI: Percentage of team members participating in training programs.
- Measurement: Number of participants in training sessions divided by the total number of team members.

➢ **Adaptability to Industry Changes**

- KPI: Team's ability to adapt to industry changes.
- Measurement: By assessing how quickly and effectively the team incorporates new industry trends and best practices.

➢ **innovation Index**

- KPI: Number of innovative ideas generated post-learning initiatives.
- Measurement: By assessing the team's ability to apply new knowledge in generating creative solutions.

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4.5 Team performance improvements with agile project management practices

Implementing agile practices can lead to significant improvements in team performance[1] :

4.5.1 Productivity

Agile practices such as timed iterations and continuous feedback contribute to increased productivity. Teams focus on delivering high-priority features in short cycles, resulting in faster and more frequent releases.

By fostering cross-functional collaboration, agile teams can work together to identify and respond to emerging trends and customer needs. This makes product development cycles more efficient, reduces time to market, and ultimately increases productivity and competitiveness.

Agile principles can also lead to increased productivity by empowering employees to take ownership of their work.

Agile principles can promote productivity by emphasizing continuous improvement. By regularly evaluating and optimizing processes, agile teams can identify areas for improvement and implement changes to optimize workflows and eliminate inefficiencies.

4.5.2 Collaboration between team members

Including daily stand-up meetings, sprint planning, and periodic retrospectives, agile management practices improve communication and shared responsibility which will emphasize teamwork, collaboration, and can create a more positive work environment.

4.5.3 Job Satisfaction

The autonomy and flexibility afforded by agile methods increases employee motivation. A sense of ownership and the iterative nature of development lead to more visible success. A positive work environment helps to improve employee satisfaction and retention.

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[1] TEEBI Ibrahim(2023) ,*Effects of Agile Methodologies on an Organization Workforce*, Thesis of Business Administration Degree , Metropolia University of Applied Sciences,Finland, P.9-12.

4.5.4   Quality of Deliverables

A focus on frequent testing and feedback helps to identify errors and issues early in the development process. Also, highlighting customer needs ensures the final product meets customer expectations.

4.5.5   Time-to-Market

The iterative development approach inherent in Agile project management contributes significantly to reducing the time-to-market for products or services. By breaking down projects into smaller, manageable increments known as iterations or sprints, Agile facilitates more frequent and faster releases of deliverables. This iterative cycle allows teams to swiftly respond to changes, incorporate feedback, and prioritize essential features, ultimately expediting the overall development process. This rapid and incremental release mechanism enhances the agility of the organization, ensuring that valuable and functional components reach the market sooner, meeting customer demands and staying competitive in dynamic industries.

4.5.6   Adaptability

Iterative development allows teams to respond quickly to changing conditions and reduces the impact of unforeseen challenges on project timelines.

When unexpected challenges arise, the iterative nature of Agile empowers teams to address issues within the confines of a smaller iteration, limiting the potential cascading effect on the entire project timeline. Teams can incorporate new information, adjust their course, and make improvements more frequently, ensuring that the project remains adaptable and resilient in the face of uncertainties.

4.5.7   Customer Satisfaction

Agile's customer-centric approach involves the customer throughout the development process. Regular feedback and incremental delivery ensure that the final product accurately meets customer expectations, resulting in higher satisfaction.

4.5.8   Innovation and Creativity

Agile practices promote an environment that fosters innovation and creativity. By encouraging experimentation and risk-taking, agile methods can create a culture that values continuous improvement and the pursuit of new ideas. This can lead to the development of new products, services, or processes that can contribute to the long-term success of the organization.

4.5.9   Alignment with Business Objectives

The consistent practice of reassessing and reprioritizing tasks within agile project management is instrumental in maintaining a focused approach on the highest-priority features and goals. By regularly evaluating project priorities during iterations or sprints, teams can ensure that their efforts align closely with the most critical objectives.

The literature suggests that the adoption of agile methodologies can have both positive and negative effects on an organization's workforce, which create potential challenges associated with the adoption of agile methodologies.

In this section, we defined team performance, explored its models, and discussed practical methods to measure it. We have also highlighted how the implementation of the agile project management practices can lead to significant improvements in team performance.

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Conclusion

In conclusion, effective project management is pivotal for optimizing team performance and achieving successful outcomes. By employing methodologies like Agile, including Scrum and Kanban, alongside traditional approaches, teams can adapt to diverse project needs while fostering collaboration, innovation, and adaptability.

Our exploration of project management methodologies has revealed two distinct approaches: the traditional/classical method and the agile methodology. The traditional approach, characterized by its sequential and linear processes, has long been the standard for managing projects.

On the other hand, the agile methodology offers a more flexible and iterative approach to project management. It prioritizes collaboration, adaptability, and continuous improvement.

The choice between traditional and agile project management methodologies depends on various factors, including project complexity, stakeholder requirements, and organizational culture. Regardless of the approach chosen, prioritizing team performance and fostering a collaborative and supportive environment are key ingredients for project success in today's dynamic and competitive market.

Chapter 02: Case Study

Introduction

After covering the theoretical aspects, understanding them and in order to accomplish our research objective that is studying the impact of Agile Project Management Practices on team performance, we chose Palmary Group as a case of study.

In this chapter, we undertake a comprehensive exploration of the impact of agile project management practices on the teams of Palmary company. Our investigation is divided into four distinct sections, each shedding light on key aspects of our research.

The first section provides an insightful presentation of the host company of our internship, Palmary.

Following the company presentation, the second section delves into the explanation of our research methodology. Employing a hybrid approach, we combined qualitative interviews with quantitative KPI calculations. This methodological framework was carefully crafted to capture both the nuanced insights from qualitative data and the quantitative metrics indicative of agile project management's impact.

Finally, the last two sections of this chapter focuses on the analysis of data and results.

Section 01: Palmary case study

In this section, we will introduce the hosting organization, beginning with the company's background. We will then explore its activities, missions, and objectives. Finally, we will provide an overview of the company's sector.

1.1 The Company's background

The company PALMARY FOOD, with its industrial division SARL SOBCO, was founded in 2007 in the Harouba industrial area , in the Wilaya of Boumerdes, near the capital Algiers. PALMARY FOOD currently has six production locations and is one of the industry leaders in the local market with significant growth and expansion dynamics[1].

With more than 15 years of expertise, Palmary stands out as a key player in the confectionery and biscuit factory in Algeria.

Palmary has an industrial platform with cutting-edge technology and great design expertise and recipes to deliver quality products for every budget, every age, men and women, every need and market segment.

Palmary operates across four dedicated factories, each contributing uniquely to its product line: AFA Conserve in Khemis Khechna, Kamelo in Blida, SOCOBE in Boumerdes, and Bibila in Blida.Palmary also partners with Agrofilm, a packaging company, to make sure its products are well-packaged and top-quality. Together, they make sure Pamary's products are both delicious and presented beautifully.

With over 2,200 employees driven by Pamary's values of generosity and excellence, the Algerian group continues to develop its various products.

With its flagship brand MAXON launched in 2013, PALMARY FOOD has a wide range of products in the tablets, spreads and biscuits categories. Second, his brand KOOL is the leader in mosaic cookies, and the brand still has a lot of development potential. Other products and brands are also very available, such as DREAM/MEGADREAM, KREMALI, MON GOÛTER.

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[1] https://palmaryfood.com/?page_id=212 (02/05/2024 at 12:27)

The following figure illustrates the historical development of the Palmary company:

Figure 03: A trajectory of growth for Palmary
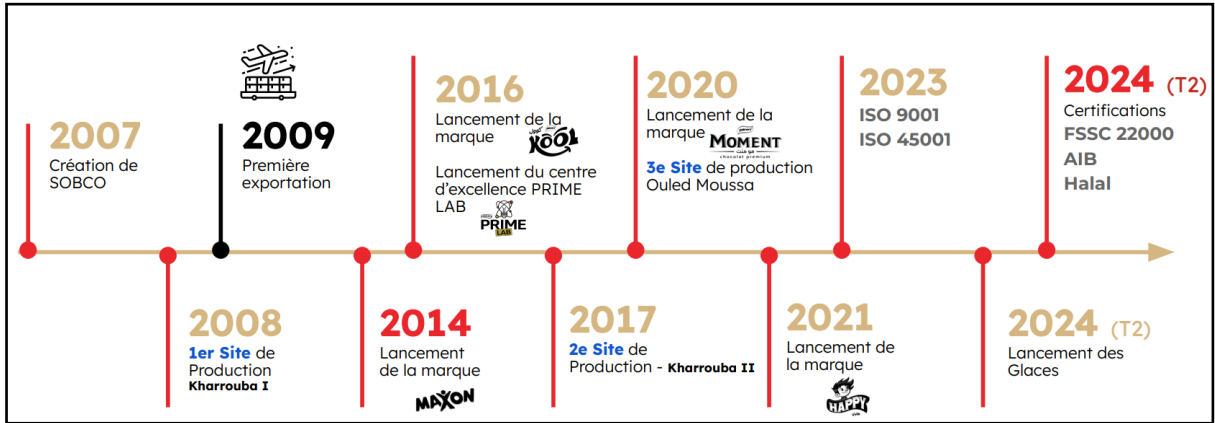
In the next figure, we present key statistics on Palmary's business activities. It demonstrates the company's performance and its impact within its industry:

Figure 04: key statistics of Palmary's business
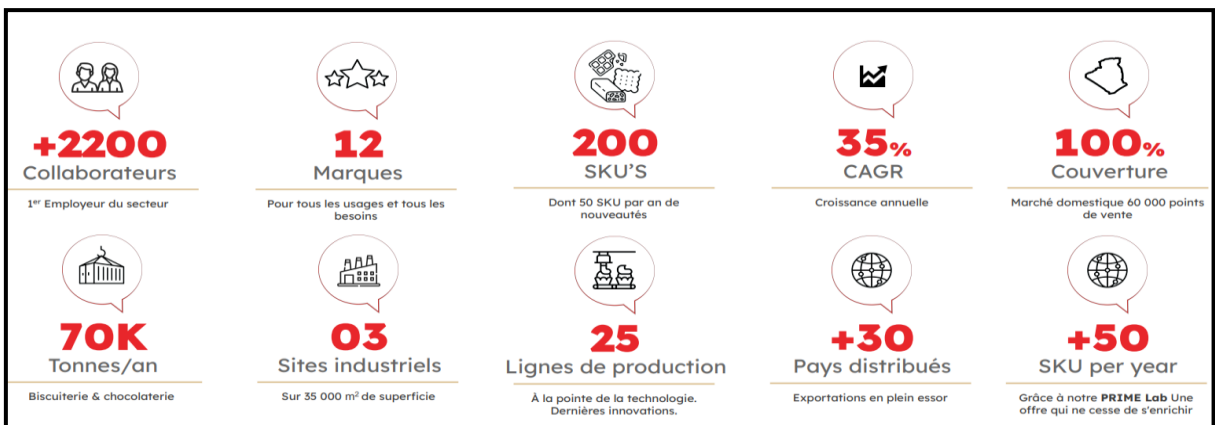
1.2 Missions and objectives

At Palmary, the core missions drive every aspect of the operations, ensuring that they continually excel in delivering quality products and services.

Plamary's missions include :

- Increase customer satisfaction.
- Improve the quality of our products.
- Enhance the skills and capacity of our employees.
- Preserve the health and safety of our employees.
- Optimize the production equipment of our products.
- Improve relations with our suppliers.
- Ensure the effectiveness of our quality management system.
- Enhance the effectiveness of internal and external communication.

At Palmary, excellence is a priority, so under the slogan: **Crafting delicious moments of joy**, the company aims to:

a. **Increase customer satisfaction:** by ensuring that customers' needs and expectations are not only met but exceeded, resulting in higher levels of satisfaction and loyalty.

b. **Strengthening skills in quality and food safety:** by improving the employees' knowledge and practices regarding quality and food safety.

c. **Reinforce supplier management:** by enhancing the work with the company's suppliers to ensure better quality and efficiency.

d. **Increase market share:** by growing Palmary presence in existing and new markets.

e. **optimize operational efficiency:** by streamlining the company internal processes and workflows to maximize productivity, minimize waste, and reduce costs

f. **Improve product quality:** by focusing on continuous improvement initiatives where PRIME Lab embodies the group's commitment to excellence and forward-thinking vision in the chocolate and biscuit industry in Africa. Through its expertise, PRIME Lab enables Palmary to craft products with a unique taste and anticipate consumer trends and expectations for innovative flavours and textures.

g. **Continuously improve quality and food safety management:** Committed to a continuous improvement approach to the quality and safety of its products, the Palmary group meets the highest international standards, as evidenced by the ISO 9001, HACCP, and Halal certifications already obtained.

1.3 The company products

Palmary produces a wide range of brands and products for its customers, always striving to anticipate and meet their needs and preferences. Whether it's with the iconic brands Maxon and

Moment or its latest innovations Happy, Kool, and Regalo, Palmary continually creates new culinary experiences and promotes a culture of excellence.

In the image, the seven product categories for Palmary's brands are presented:

Figure 05 : Palmary Product Categories

Source : internal documents of Palmary

1.4   Overview of the organizational hierarchy

The organizational chart provides a visual representation of Palmary's hierarchical setup, illustrating the relationships and roles within the company.In the following figure , we illustrate the Palmary's organizational structure[1] :

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[1] Internal company document

Figure 06 : Palmary's organizational chart

As shown in Palmary's organization chart, the company is made up of:

1.4.1 The administration board

led by the CEO, oversees the overall strategic direction and operations of Palmary. Responsible for setting goals, making high-level decisions, and ensuring alignment with the company's mission and vision.

1.4.2 Functional directions

We quote the following:

a. **Operating Direction:** is responsible for overseeing the manufacturing processes and operations within the company's production.

b. **Supply-chain Management:** is tasked with ensuring the smooth flow of materials, products and information along the company's entire supply chain through strategic planning, coordination and collaboration with suppliers and distributors.

c. **Commercial Direction :** is committed to driving sales growth and maintaining strong customer relationships. The division identifies business expansion and revenue generation opportunities through strategic planning, market analysis and effective communication.

d. **Research and Development Direction:** focuses on driving innovation and creating new products or improving existing ones through scientific and technological advancements.

e. **Control Management Direction :** focuses on ensuring operational efficiency and leveraging technology to support Palmary objectives.

f. **Information Systems Direction :** is responsible for managing the Palmary's technology infrastructure and software systems.

g. **Finance and Accounting Direction :** is tasked with managing the company's financial resources and ensuring compliance with accounting standards.It oversees budgeting, financial reporting, and taxation, providing valuable insights to support strategic decision-making.

h. **Human Resources Direction :** responsible for conducting employee processes, including hiring, training, and reviewing.

i. **Purchasing Direction :** is responsible for sourcing and procuring materials, goods, and services essential for the company's operations.

j. **Export Operations Department:** Manages all aspects of the company's international trade activities. This department coordinates the export of products to various countries and ensures compliance with regulatory requirements and international trade law.

1.5   Palmary's Expansion Beyond Algeria

Since 2009, beyond the borders of its domestic market, the Palmary group has been firmly committed to an ambitious export strategy, now shining in over 30 countries worldwide. With a particularly strong presence in Africa and the MENA region, the Palmary group exports to a multitude of destinations, thereby contributing to the diversification of its revenue streams and the consolidation of its position on the international stage.

The group's market portfolio includes diverse destinations, ranging from Angola to the United Arab Emirates, as well as Canada and the Netherlands. This international presence reflects the ability to adapt to the specificities of each market and meet the quality requirements of consumers worldwide.

Palmary's reach extends far and wide, encompassing a diverse array of countries and regions as: Angola, Cameroon, Ivory Coast, Egypt, Gabon, Gambia, Guinea, Libya, Madagascar,

Mauritania, Nigeria, Senegal, Sudan, Togo, Tunisia, Saudi Arabia, UAE, Iraq, Jordan, Kuwait, Lebanon, Oman, Yemen, Netherlands, Bosnia, Kosovo, Malta, Canada, Philippines.

1.6   overview of the company sector

The agro-food industry is the industrial structure downstream from agriculture, whose function is to transform primarily agricultural products for food purposes[1].

As we explore Palmary's role in the agri-food industry, it's crucial to understand how important it is for countries like Algeria. This sector doesn't just help the economy by adding to the GDP; it also creates jobs and ensures there's enough food for everyone. In Algeria, food expenses absorb around 45% of household budgets[2].

However, it is crucial to recognize that there is fierce competition in this field. The agri-food industry faces intense competition due to evolving market dynamics and changing consumer preferences. The world's food system is currently dominated by about 40% , a very large multinational corporations that produce, process, and distribute food and have significant market power. Their profits range from US$40 billion to US$60 billion annually, significantly exceeding the value added of the entire agriculture and food sector in many countries[3].

Furthermore, Palmary's expansion into international markets exposes it to a wider range of external factors, such as changes in political conditions and conflicts.

Despite the challenging circumstances faced by the sector and various other factors, Palmary Company's current position can be attributed to its robust strategy and effective project management practices. We are committed to studying these aspects in the upcoming sections.

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[1] BOUKELLA Mourad (2008), *Politiques agricoles, dépendance et sécurité alimentaire*, série de réflexions "L'Algérie de demain, Relever les défis pour gagner l'avenir", Fondation Friedrich Ebert, p35.
[2] TEBANI Amel (2013) ,*L'industrie agroalimentaire en Algérie: Etat des lieux et stratégie d'avenir* ,Revue de droit et des sciences humaines - Études économiques - Vol 7, Num 1, P.456.
[3] Ibid, P.454.

Section 02: Methodology and Research Approach

In order to successfully conduct our research overall and specifically address our initial research question, as well as to confirm or refute the hypotheses formulated initially, we adhered to a rigorous methodology. Our aim was to collect the most reliable information possible to ensure the best possible outcomes.

2.1.Presentation of the research methodology

A research methodology is the systematic framework adopted by a researcher to empirically tackle their research problem. It entails a structured series of steps and components that form the basis of the researcher's scientific inquiry.

In our study, we embraced a qualitative approach centred on structured interviews. This method facilitated the collection of insights from individuals directly immersed in our research topic. These individuals, possessing substantial professional experience in project management, were engaged to ensure the generation of reliable and comprehensive results.

Concurrently, we integrated a quantitative aspect into our research, focusing on the calculation and evaluation of team performance KPIs.This analytical process relied on quantitative data extracted from the company, acquired during the monitoring of project execution.

2.1   The qualitative study

Qualitative research methods focus on providing a complete picture of the situation with the aim of increasing the understanding of social processes and interrelations. It is defined as a research to explore and understand the opinions and strive for in depth understanding of different kind of findings in library research[1].

2.1.1   Qualitative study Tools

a. Focus Group

A Focus Group is typically a semi-structured or highly structured interview involving multiple respondents simultaneously, facilitated by a moderator. These sessions typically include 8 to 12 participants to encourage interaction and ensure everyone has a chance to contribute. The duration of focus group interviews varies, typically lasting between 30 to 90 minutes for employees and 60 to 120 minutes for consumers. Moderators may conduct sessions on-site at a

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[1] RAGINE Charles and al (2004), *Workshop on Scientific Foundations of Qualitative research*, Workshop on Scientific Foundation, P .18.

company for employee focus groups, while consumer focus groups often take place at market research agencies or hotels[1].

b. Observation

Observation is a qualitative research method aimed at understanding social, cultural, and psychological phenomena by collecting non-numeric data. It assumes that there are multiple realities that can be understood through the perspectives and experiences of the individuals involved[2].

c. Interview

This involves a meeting between an interviewer and an interviewee. The interview is recorded in audio or video format after obtaining permission to record, to facilitate the analysis of the gathered information. The interviewee's responses can also be transcribed onto a computer for quantitative analysis using specialized software. For instance, this may include counting the frequency of word mentions or conducting a semantic analysis of sentences. There are 3 different types of interviews:

➤ **Directive Interview:** This method is characterized by the freedom given to the interviewee to express themselves on a given topic. The interviewer then asks open-ended questions to encourage the interviewee to speak. The objective is to allow the interviewee to guide the discussion, while enabling the interviewer to revisit the topic if necessary.

➤ **Semi-structured interview:** The semi-structured interview isn't completely open-ended, nor is it too rigid with specific questions. Usually, the researcher has some guiding questions that are pretty open, and they need to get meaningful answers from the interviewee. They try to let the interviewee talk freely as much as possible. If the conversation strays off topic, they gently steer it back to the main points. They also ask any extra questions that haven't been covered, at the right time and in a natural way[3].

➤ **Non-directive interview:** The interviewer introduces a broad topic to the interviewee and primarily acts as a facilitator, encouraging the interviewee to freely express their thoughts. The interviewer listens attentively without interrupting, allowing the interviewee to guide

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[1] SARSTEDT Marko and al , Op.Cit, P.79.
[2] https://ideascale.com/fr/blogues/quest-ce-que-lobservation-qualitative/ (05/05/2024 at 16:54)
[3] HALLIL Waffa (2019), *Les mutations du comportement du consommateur dans les sociétés numériques Contribution de la connectivité du consommateur à la qualité relationnelle*, A DOCTORAL THESIS IN COMMERCIAL SIENCE, EHEC Alger, Tipaza, P.163.

the conversation. The interviewer's role is to observe and learn from the interviewee's responses during the interaction.

2.1.2 Interview Guide Preparation

The interview guide is a document prepared by the interviewer that gathers all the topics they intend to address and serves as a framework for exploring these topics during the face-to-face interaction. This "roadmap" is structured in the form of questions to introduce and delve into the field of investigation. The guide revolves around discussion points aimed at facilitating conversation. The topics covered stem from the literature, the research problem, and the researcher's intuition[1].

2.2 Quantitative Study

Quantitative research methods typically entail utilizing large, randomized samples, employing statistical analyses extensively, and featuring fewer instances of case studies to illustrate findings. The primary aim of quantitative research is to ascertain the relationship between an independent variable and a dependent variable within a population. Moreover, quantitative methods are frequently applied in the natural sciences, with the overarching goal of providing explanations for causal relationships, facilitating generalizations, and predicting future outcomes[2].

2.3 The calculation and evaluation of KPIs

 key performance indicators are quantitative metrics that offer insight into a company's internal processes and structures. They play a crucial role in facilitating effective planning and control by providing supporting information, promoting transparency, and aiding decision-makers in management. By establishing measurable benchmarks, KPIs enable organizations to assess their performance and track progress toward their objectives. Ultimately, KPIs enhance business efficiency and effectiveness [3].

In our study, the calculation of Key Performance Indicators (KPIs) played a crucial role in establishing a comparative analysis between the Agile approach and the Waterfall approach,

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[1] HALLIL Waffa ,Op.Cit,P.164.

[2] Idem.

[3] BADAWY Mohammed and al (2016) , *A survey on exploring key performance indicators*, Future Computing and Informatics Journal, Volume 1, Issues 1–2, P.47–52.

both of which were implemented to manage the same project at Palmary company. By leveraging KPIs, we were able to objectively measure and compare the performance outcomes of each methodology, providing clear insights into their respective impacts on team efficiency

Section 03: Qualitative study

After we have presented a global overview of Palmary's business and the research methodology followed throughout our empirical work, we will present the results obtained after conducting interviews within the company.

3.1 The study objective

The literature review enabled us to comprehend agile management practices on one hand, and on the other hand, to identify theoretical concepts regarding team performance within companies.

In the context of our case study, Palmary company is selected as a practical case to study the application of agile practices in the project implementation. More importantly, the aim is to examine the effect of this managerial approach on the performance of Palmary's team members.

3.2 The methodology of the qualitative phase

We will outline the data collection procedure, data gathering, and the thematic analysis method. Interviews were conducted with directors and project managers at Palmary company to ensure a comprehensive understanding of project and team management practices using an interview guide. The semi-structured interviews conducted during the qualitative phase of our study allowed for a focused exploration of key topics while providing flexibility for respondents to elaborate on their perspectives. This method facilitated in-depth discussions with directors and employees at Palmary, enabling us to gather rich and detailed insights into the implementation of agile practices and their impact on team performance.

The interview guide proves to be an indispensable tool in our case study as it provides us with an opportunity to gather and address various information face-to-face with key decision-makers within the company.

3.3 The structure of the interview guide

To clearly define the objective of our qualitative study, we structured our interview guide as outlined in the table below (View APPENDIX NO. 6):

Table 04: Interview guide structure

Study axis	Question to Ask	Variables Sought
Project management process	-What was your role in the previous projects you participated in? Were you a team member or project manager? -Can you provide a concrete example of a project you worked on recently? Briefly describe the project and your involvement	-Project management methodology. -Stages of the completed project.
Communication between team	-How does your team communicate during the project? What tools do you use to facilitate communication and collaboration? -How often does your team hold meetings?	-Communication tools. -Frequency of meetings.
Agile project management practices	-What methodology do you use to manage your projects? Can you explain the different stages you go through when carrying out a project? -Are you following agile team practices such as daily stand-up meetings or sprint reviews?	-Agile team practices.

Contingency management	-How does your team react when you encounter unforeseen events or obstacles during the project? Can you provide an example of an unforeseen situation and how it was handled? -How does your team react when you encounter unforeseen events or obstacles during the project? Can you provide an example of an unforeseen situation and how it was handled? -In your past experiences, has your team generally met projects on time and on budget? How do you manage time and resource constraints?	-Reaction to unforeseen events. -Respect of deadlines and budget.

Source: Carried out by ourselves

3.4   Interview Procedure

The interviews took place between April 28th and April 30th, 2024. The interviews lasted between 30 and 45 minutes and took place at the interviewee's workplace. In the six interviews, each one was recorded and transcribed in full to collect maximum data and provide reliable and precise information for qualitative analysis.

The interviews began with an introductory phase where we introduced ourselves to the interlocutor and explained the object of our research as well as the objectives of the interviews. This introductory phase was followed by the presentation by the interlocutors of their organization as well as the answer to our questions.

The recommended rules for conducting a semi-structured interview were adhered to. During the interview, the interviewer maintained a positive attitude, listening with interest and attention to all statements made by the interviewee.

It is also important to mention that the individuals we conducted interviews with were carefully selected as executives, directors, and project managers within Palmary company. This selection enabled us to refine our findings effectively.

The following table illustrates the Profile of Interviewed Individuals:

Table 05: Interviewed Individuals

Name	Position	Department
Christoph RUTER	Marketing Director	Marketing Department
Abdelkarim MOKRANE	Director of Information Systems	Information Systems Direction
Mehdi BETTATECHE	Export Director	Export Operations Direction
Smail Belkhiri	Controller	Finance and Accounting Direction
Ramzi BOUMEZBER	Marketing Manager	Marketing Department
Mohamed El Amine BENAMARA	Project manager in Information Systems	Information Systems Direction

Source: Carried out by ourselves

3.5 The analysis of qualitative data: Thematic Analysis

Thematic analysis is a structured approach used to systematically identify, organize, and provide insight into patterns of meaning, known as themes, within a dataset.[1]

We opted for thematic analysis as the data analysis method in our study for several reasons:

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[1]VIRGINIA Braun (2012), Thematic *analysis*, APA handbook of research methods in psychology, American Psychological Association, Vol. 2, P.2.

- ➤ Thematic analysis provides a comprehensive exploration of interview data, facilitating the identification and analysis of trends, recurring themes, and prevalent concepts within participants' responses.
- ➤ It offers flexibility in capturing the viewpoints and experiences of participants.
- ➤ Thematic analysis enables a deep understanding of the gathered data or information

The analysis of all interview responses allowed us to identify the following themes:

a. Project management process

Based on the fact that Palmary's activity is industrial in the agri-food sector, the company's projects go through a life cycle that begins with the planning phase, which requires a solid study of available resources, especially for projects like the launch of a new product in the market by the marketing department. Additionally, there's a rigorous and clear task allocation, as mentioned by Mr. Christoph , with deadlines allowing for continuous monitoring of each project stage for timely adjustments. The export Director emphasizes that "...*the most important thing is not just to act, but to react…*" especially in a competitive market like Palmary's. Whether for internal projects like those in the IT and control management departments or external projects, project team members always set a goal of meeting the expectations of clients concerned with the project deliverable.

b. Communication and collaboration between team members

The Export Director Mr Bettateche , underscored the substantial daily flow of information among collaborators, facilitated by instant messaging or daily stand-ups to maintain consistent project information levels. It often happens that a single team works on multiple projects, so to coordinate and synchronize phases effectively, communication via emails that maintain traceability, as mentioned by Christoph, is crucial. Project managers are able to track the progress through this communication method. Additionally, bi-weekly meetings are organized within the exports department and as needed for other departments, accompanied by reporting that is transmitted either to project stakeholders or decision-making bodies.

Furthermore, different departments may collaborate on the same project, such as the collaboration between the IT department and the controller in developing dashboards. This collaboration entails integrating feedback changes and recommendations from internal clients regarding Key Performance Indicators (KPIs) and types of graphs used, as elaborated by Mr. Belkhiri, the controller.

c. Agile project management practices

The statement made by Mr. Christoph, "*At Palmary, our strength lies in being agile and flexible*" explains that being overly procedural would result in lengthy validation processes across project stakeholders, leading to crucial time loss as declared by the Marketing Director: "*...With the agility of common sense, a one-year project could be completed in just a semester..... "..* In the marketing team, during the conception of a new product, agility allows them to skip known steps based on established retro-planning in the project's initial phase, containing precise deadlines reflecting one of the agile practices, time boxing. In the export department, a single stage of a long-term project may last 2 or 3 years, such as obtaining international certifications, which justifies the inability to backtrack project stages, as highlighted by the Export Director. However, regular meetings help address daily uncertainties. Obtaining feedback from clients was a common practice across projects. For instance, in a new product project like el Tadj , testing phases were planned at the project's outset, with over 8 tests conducted among consumers, homemakers, and artisans to meet client requirements and gain their satisfaction.

Palmary teams also integrate retro-planning as a pivotal component in their project development approach. This involves not only a retrospective evaluation of past tasks but also the agility to modify and optimize their planned activities. Such strategic adaptability empowers them to proactively adjust their course in response to emerging project demands and market shifts, thereby sustaining their competitive advantage as MR Belkhiri the controlor states: « *...Making changes during the realization of the project is a normal outcome of the non-rigidity of our processes. This allows us to prevent damage before it is too late….*»

d. Contingency management

Unforeseen events are encountered by all projects to varying degrees depending on their nature. These challenges include major obstacles faced by the export team, such as wars and changes in international regulations, as highlighted by the export director's statement, "…*We find ourselves reacting more than acting….*" Additionally, challenges related to raw materials, like the recent price change of a vital ingredient in their projects, leading to a revision of the company's annual budget, as mentioned by the controller. Internally, unforeseen production issues also arise. Furthermore, the variation in consumer preferences presents challenges, necessitating continuous monitoring of market trends by the marketing team to meet expressed needs and remain competitive. As noted by the Marketing Director, *"...We sometimes exceed*

deadlines for various reasons, but to launch a competitive product that aligns with our brand, we must be adaptable..."

3.6 Insights and findings

Throughout the interviews, we were able to gain a comprehensive understanding of the practices of agile approach applied by team members within Palmary company and dissect the various phases of the company's project management process. This enabled us to establish the following findings:

➢ Agility as a project management approach within the company is not merely a procedural method but rather a mindset. Mr Christoph's statement, "…*Agility applies automatically…*" underscores the seamless integration and inherent nature of agility within the company's operations. It is translated into a discipline characterized by practices and techniques that are applied or followed by the majority of departments, albeit to varying degrees depending on several criteria.

➢ The organizational structure within the company allows for the involvement of multiple departments in executing a single project, such as the launch of a new product in the culinary segment. Initially, the process begins with product conception and progresses to the production phase in the factories, involving a long production chain with upstream and downstream activities. According to Mr. Mohamed El Amine BENAMARA, Project Manager in Information Systems, project management in this case requires a dual approach. An agile approach is employed during the initial phase to allow flexibility in task execution. Conversely, a sequential predictive approach is followed during the production phase, where adhering to the planned sequence of steps is crucial and reworking phases can be challenging, especially given the heavy investment of resources and time factors before and during the project. This enables us to understand that the project management approach adopted by Palmary teams may not necessarily be agile. Instead, it depends on the nature of the project and its requirements. The project manager and their team select the most suitable project management approach accordingly.

➢ Palmary recruits dynamic, adaptable, and skilled individuals capable of effectively navigating unforeseen circumstances. Transparency is a cornerstone value within the company, as emphasized by Mr. Mokrane: "…*Transparency is non-negotiable here...*" This value plays a pivotal role as it directly influences team performance and, consequently,

project outcomes. Additionally, Palmary fosters an inclusive environment where each team member is valued and respected, regardless of their background or identity. This approach serves to enhance the diversity of perspectives within the team, fostering innovation and creativity, and ultimately contributing to the overall success of projects.

➢ Interviews with project managers and department directors within the company revealed an interesting factor affecting team performance under the agile approach: the role of leadership. It was emphasized that the leader's role in any project is crucial. Initially, they assist team members in properly adopting agile practices, and subsequently, with their guidance and direction, team outcomes improve, and motivation increases. They also provide a clear vision and direction for their teams. They ensure that everyone understands the project goals, priorities, and how their individual contributions align with the overall objectives.

➢ From all the explanations and details of the project management process within the company obtained through the interviews, we can highlight that the organizational culture and the sharing of specific values such as transparency, collaboration, and innovation have boosted the creation of a favorable work environment for team members under the agile approach. This has strengthened their commitment and dedication to successfully completing their tasks and enhancing their performance while applying agile practices.

➢ Palmary uses performance indicators such as the To-complete Performance Index (TCPI), Cost Performance Index (CPI) , and the Schedule Performance Index (SPI) to assess the future performance of the project. TCPI measures the ratio between remaining work and available funds, determining whether the project will be completed at a higher, lower, or equal cost to the current budget. CPI compares earned value with actual costs, evaluating the efficiency of resource utilization. SPI compares earned value with planned value to assess compliance with the schedule. These indicators help Palmary monitor project progress in real time, in line with the agile practice highlighted by Mr. Mokrane: *"…What's interesting about agility is that we check on an ongoing basis….*" This practice perfectly reflects the agile spirit of the manager, who prioritizes continuous monitoring and responsiveness to changes to ensure project success.

In the next section, we will aim to demonstrate our findings as we calculate the KPIs and examine specific projects of the Palmary company.

Section 04: Quantitative study

The purpose of this section is to conduct a comparative analysis of the performance of a project managed using a traditional project management methodology versus the same project managed using the Scrum Agile methodology. By examining these two distinct approaches, we aim to evaluate their effectiveness in delivering project outcomes and meeting stakeholder expectations.

This comparison will focus on a specific project undertaken by Palmary to implement a production and productivity tracking solution, named Palmalign. The first version of this project was executed using a traditional predictive methodology, while the second version employed the Agile Scrum framework.

Through this analysis, we will assess key performance indicators (KPIs) such as the Cost Performance Index (CPI), Schedule Performance Index (SPI), and To-Complete Performance Index (TCPI). Additionally, we will consider stakeholder satisfaction and the overall impact on project deliverables. The goal is to provide insights into how each methodology influences team performance and to draw conclusions that can inform future project management practices within the organization.

4.1 The Project PALMALIGN

The following is a description of the Palmalign project.

4.1.1 Project Overview

In its endeavor to digitize its processes, Palmary initiated a project to implement a production and productivity tracking solution named Palmalign. This project was a collaboration between Palmary's team and Naxxum, an international company specializing in mobile and web solutions development and digital transformation, operating in several countries, including Algeria.

4.1.2 Project Scope

The project involves developing an application to track and monitor production and productivity, replacing the current PALMALIGNES WEB application. The new application will enable operators to report real-time production data, including:

➢ Production declarations.
➢ Downtime declarations specifying the reason (preventive or corrective maintenance).

- Waste declarations.
- Declarations of present operators.

4.1.3 Project Deliverables

Upon completion of this project, PalmaryFood will have the following deliverables and solutions:

- Palmalignes Web (with a new user interface) along with the source code,
- Palmalignes Mob (allowing the reporting of production data via a mobile application), along with the source code.
- Technical documentation for the applications.

4.2 Description of Project Management Approaches

In the next part we will outline the project progression, detailing the phases of each methodology, along with stakeholder feedback and project outcomes.

4.2.1 Version 1 of the project: Traditional approach

It is important to address the following aspects:

a. The project phases

The project followed the stages of project management methodology and was executed as follows:

- **Requirements**
- The first version of the project was launched in 2021 with the aim of developing an application following a traditional methodology.
- A comprehensive specifications document was drafted by a management controller to provide clear guidance to the developers.
- Two development engineers were engaged to work alternately on the project.

- **Design**
  - Detailed project planning, including timelines, required resources, and development steps.
  - Use of a few storyboards to visualize the application features to be developed.

➢ Implementation

The development engineers worked on the project following the specifications provided and adhering to established timelines.

➢ Testing

After eight months of development, thorough testing of the application was conducted. During this phase, it became evident that the application did not meet the expectations of internal clients, particularly in the areas of industry, quality control, and maintenance.

➢ Deployment

Following this realization, an additional six-month period of work was required to make the necessary adjustments. During this phase, the engineers intensely focused on resolving the identified issues during testing, reviewing every aspect of the application to ensure its compliance with the requirements and expectations of internal users. Unfortunately, even after this adjustment period, it became evident that the application still did not meet the specific needs of internal users. Despite all efforts, confidence in the application had significantly diminished.

b. Performance Analysis of Version 1

We will calculate the KPI's for this first version and interpret the results as follows:

➢ Cost Performance Index (CPI)

$$\text{CPI} = \frac{\text{Earned value(EV)}}{\text{Actual cost (AC)}}$$

Where:

-Earned Value (EV) is the value of work actually performed.

-Actual Cost (AC) is the actual cost incurred for the work performed.

After calculating the CPI, we found the following result

CPI = 0.6

A CPI of 0.6 indicates that the project is spending 40% more than initially planned for every unit of work completed. In other words, for every dollar spent, the project is only getting 60 cents worth of planned value.

This substantial cost overrun suggests major financial mismanagement within the project.

> **Schedule Performance Index (SPI)**

$$SPI = \frac{Earned\ value(EV)}{Planned\ value\ (PV)}$$

Where:

-Earned Value (EV) is the value of work actually performed.

-Planned Value (PV) is the value of work planned to be performed.

After calculating the SPI, we found the following result

$SPI = 0.4$

An SPI of 0.4 indicates that the project is significantly behind schedule. Specifically, it means that for every unit of time planned, the project is only achieving 40% of the expected progress.

This severe delay suggests that the project is taking more than twice the initially anticipated duration.

> **To-Complete Performance Index (TCPI)**

$$TCPI = \frac{Budget\ at\ Completion\ (BAC) - Earned\ Value\ (EV)}{Budget\ at\ Completion\ (BAC) - Actual\ Cost\ (AC)}$$

Where:

Budget at Completion (BAC) is the total budget allocated for the project.

Estimate at Completion (EAC) is the expected total cost of completing all project work.

After calculating the TCPI, we found the following result

$TCPI = 1.3$

The TCPI of 1.3 indicates that the remaining work must be completed with a performance index 30% higher than the current performance to meet the budget constraints.

This means the project team must significantly improve their efficiency and cost management compared to what they have achieved so far.

c. Stakeholder Satisfaction

The prolonged development time and significant budget overruns eroded the confidence of the internal stakeholders, including those from industry, quality control, and maintenance. Initially, the stakeholders' expectations were high, but as delays and additional costs accumulated, their trust in the project diminished. The need for extensive rework and the project's failure to meet initial timelines further contributed to stakeholder dissatisfaction. As a result, the stakeholders' engagement and support waned, impacting the overall morale and commitment to the project's success.

d. Project Outcomes

Despite the substantial efforts and resources invested, the first version of Palmalign failed to meet the specific needs of its users. The mismatch between the delivered functionalities and user requirements necessitated additional six months of adjustments, which strained the project team and extended the project timeline beyond acceptable limits. The traditional methodology's lack of flexibility to incorporate continuous feedback and iterative improvements meant that many issues were only discovered late in the project, leading to significant rework and inefficiencies.

4.2.2 Version 2 of the project: Agile approach

It is important to address the following aspects:

a. The project phases

Here's a detailed outline of the project stages according to the Scrum methodology:

➢ **Team Formation**

The team consists of five developers, a product owner, a scrum master, and three versatile developers (test, UX, and full stack).

➢ **Sprint Planning** :(Sprint 0)
- The product owner and the team meet to define the project goals and features to be developed.
- The product backlog is established, listing all features to be implemented, prioritized by business value.
- The team plans the tasks necessary for the first iteration.

➢ **Iterations (Sprints)**

- Iterations have a fixed duration of two weeks.

- The team focuses on implementing the most prioritized features from the product backlog.

- Every day, the team meets for a daily stand-up meeting to share progress, discuss encountered obstacles, and coordinate upcoming work.

➢ **Sprint Review**

- At the end of each iteration, the team holds a sprint review with stakeholders to present the developed features and gather feedback.

- Completed features are demonstrated and evaluated by stakeholders for validation.

➢ **Sprint Retrospective**

After the sprint review, the team holds a retrospective to reflect on what went well, what could be improved, and actions to take to enhance the development process.

➢ **Iteration Repetition**

The process repeats for each iteration, with sprint planning, development, sprint review, and retrospective.

The figure below illustrates the major events throughout the project phases:

Figure 07: Key events in Project Phases
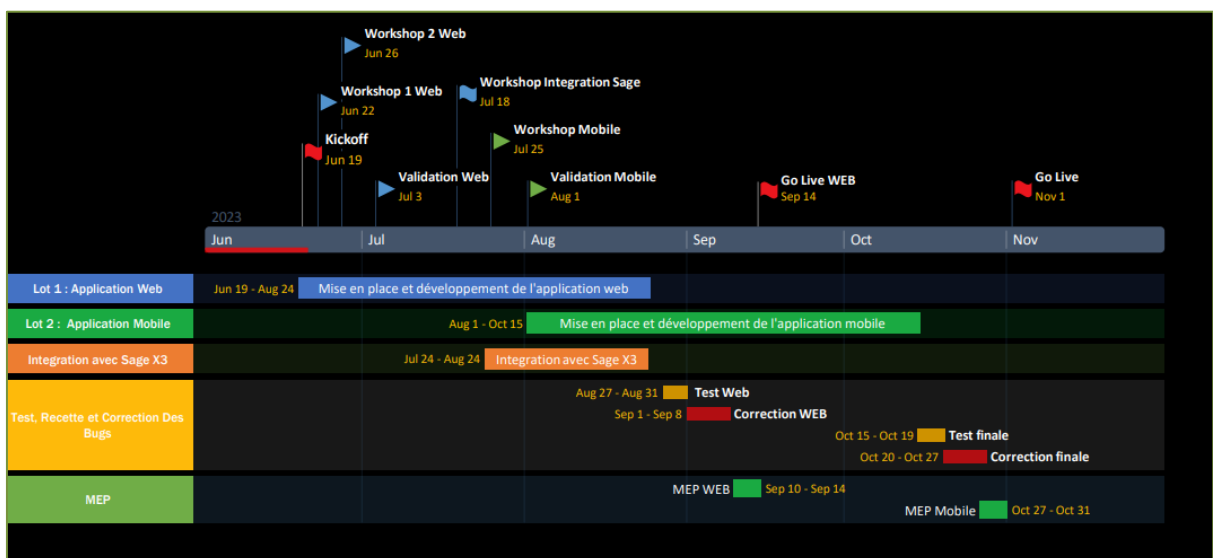
Source: Internal document

b. Performance Analysis of Version 2

We will calculate the KPI's for this second version and interpret the results as follows:

➤ **Cost Performance Index**

CPI = 0.9

A CPI of 0.9 implies that the project's expenditure is approximately 90% of the initially planned budget for each unit of work completed. In simpler terms, for every dollar spent, the project achieves about 90 cents worth of planned value.

This close adherence to the budget indicates effective financial management and control within the project. The project team has succeeded in keeping costs in line with expectations, reflecting prudent resource allocation and expenditure management.

➤ **Schedule Performance Index**

SPI = 0.87

- An SPI of 0.87 showcases strong schedule performance, indicating the project's proximity to its planned timeline.
- The relatively high SPI suggests that the project was delivered punctually, despite the challenges posed by changing requirements and stakeholder feedback. This achievement underscores the adaptability of Agile Scrum, allowing the team to navigate evolving circumstances while adhering to deadlines effectively.

➤ **To-Complete Performance Index**

TCPI = 0.98

- With a TCPI of 0.98, the project was steadily progressing towards completing the remaining work within the allocated budget. This value indicates that minor efficiency improvements were needed to achieve the final budget, showcasing effective cost and schedule management throughout the project's lifespan.
- The close alignment with budgetary constraints underscores the Agile methodology's capability to address project intricacies while upholding financial discipline.

c. Stakeholder Satisfaction

The iterative and incremental delivery model of Agile Scrum ensured continuous stakeholder engagement and feedback. By involving stakeholders at every stage and validating each

functionality incrementally, the team could align the project outcomes closely with stakeholder expectations. This frequent interaction and the visible progress boosted stakeholders' confidence in the project's direction and delivery.

d. Project Outcomes

The second version of Palmalign, managed through Agile Scrum, delivered a higher quality product that better met the users' needs. The flexibility to adapt to changing requirements and integrate feedback continuously allowed the team to refine the application in real-time, addressing issues promptly and effectively. The structured sprints and regular reviews ensured that the project remained focused on delivering value, resulting in a more robust and user-friendly application

4.3 Comparative Analysis

In this part, we will conduct a comparative analysis, examining the previously calculated KPIs, stakeholder feedback, and project outcomes for both versions of the project.

4.3.1 KPI's Comparison

This table presents a Side-by-Side Comparison of CPI, SPI, and TCPI for Both Versions:

Table06: Side-by-Side Comparison of CPI, SPI, and TCPI for Both Versions

KPI	Traditional Methodology (Version 1)	Agile Scrum Methodology (Version 2)
CPI	0.6	0.9
SPI	0.4	0.87
TCPI	1.3	0.98

Source: Carried out by ourselves

We will analyze the differences in performance metrics:

a. Cost Performance Index (CPI)

Traditional Methodology (Version 1): With a CPI of 0.6, the first version significantly exceeded its budget, indicating that the project was inefficient in terms of cost management.

Agile Scrum Methodology (Version 2): The second version achieved a CPI of 0.9, reflecting much better cost control and resource management. This improvement suggests that the Agile approach allowed for more effective monitoring and adjustment of costs throughout the project lifecycle.

b.   Schedule Performance Index (SPI)

Traditional Methodology (Version 1): An SPI of 0.4 reveals severe delays, with the project taking more than twice the planned time. This highlights the rigidity and inefficiency in adapting to changes and addressing issues promptly.

Agile Scrum Methodology (Version 2): With an SPI of 0.87, the second version showed significant improvement in adhering to the schedule. The iterative nature of Agile allowed for better time management and quicker resolution of delays.

c.   To-Complete Performance Index (TCPI)

Traditional Methodology (Version 1): A TCPI of 1.3 indicates that the project required much higher efficiency to complete within the remaining budget, suggesting ongoing financial strain.

Agile Scrum Methodology (Version 2): A TCPI of 0.98 reflects a balanced and realistic approach to completing the project within the remaining budget. The near-optimal TCPI shows that the Agile process maintained a steady trajectory towards financial and schedule targets.

4.3.2   Stakeholder Feedback comparison

In the Traditional Methodology (Version 1), stakeholders experienced significant frustration due to the project's inability to meet budget and timeline expectations, leading to extensive rework and adjustments that diminished their confidence and satisfaction. The prolonged development time and budget overruns resulted in decreased stakeholder engagement and support, eroding their trust in the project and the development team. Conversely, in the Agile Scrum Methodology (Version 2), stakeholders were more satisfied due to regular updates, visible progress, and the ability to provide continuous feedback, which better aligned the project with their needs and expectations. The iterative and collaborative nature of Agile Scrum fostered higher engagement levels, making stakeholders feel more involved and valued as their input was actively sought and incorporated throughout the project.

4.3.3 Project outcomes comparison

The comparison between the two versions of Palmalign reveals stark differences in project outcomes and methodologies. In the initial version, despite significant efforts and resource allocation, the project failed to meet user requirements, necessitating a prolonged adjustment phase that strained the project team and extended the timeline. This outcome can be attributed to the inflexibility of the traditional methodology in incorporating continuous feedback and iterative improvements, resulting in significant rework and inefficiencies. In contrast, the second version, managed through Agile Scrum, delivered a superior product that better aligned with user needs. The methodology's flexibility enabled real-time adaptation to changing requirements, efficient issue resolution, and sustained focus on value delivery, ultimately leading to the development of a more robust and user-friendly application.

4.4 The quantitative study summary

In conclusion, the Agile Scrum methodology (Version 2) has clearly outperformed the traditional methodology (Version 1) in several key aspects, including cost management, adherence to deadlines, and control over remaining costs. These significant improvements can be attributed to several factors inherent in the Agile approach:

- Team Engagement: The Agile approach fosters engagement and active involvement of all team members throughout the project. Each member is encouraged to contribute, creating a sense of collective responsibility and motivation to achieve project goals.
- Flexibility in Requirements Management: The iterative nature of the Agile approach allows for continuous adaptation to changes and new project requirements. Adjustments can be made quickly and efficiently, avoiding significant delays often associated with traditional methodologies.
- Effective Communication: Agile methods, such as daily stand-up meetings and regular reviews, promote open and transparent communication within the team. This enables the rapid identification of potential issues and their resolution before they become major obstacles.
- Collaboration: The Agile approach encourages close collaboration among team members, as well as with external stakeholders. This enhanced collaboration fosters mutual understanding of project objectives and enables more informed decision-making throughout the process.

Ultimately, the superior performance of Version 2 compared to Version 1 can be attributed to the team's increased efficiency in managing project challenges and opportunities. Adopting the Agile approach allowed the team to adapt more quickly to changes, proactively respond to stakeholder needs, and achieve project objectives more effectively. Thus, it is evident that team performance played a central role in the success of Version 2 of the project.

Conclusion

In summary, the Agile Scrum methodology has emerged as a superior approach to project management, surpassing traditional methodologies in critical areas such as cost management, meeting deadlines, and controlling remaining costs. Agile's strength lies in its adaptability and responsiveness to change, allowing teams to swiftly address evolving requirements and deliver value to stakeholders in a timely manner. This flexibility, coupled with a collaborative environment that promotes active engagement and transparency among team members and stakeholders, empowers teams to take ownership of their work and make informed decisions, ultimately driving project success.

General conclusion

General Conclusion

The primary objective of this research is to examine how Agile project management practices impact the performance of teams that adopt this approach.

In the initial section of the literature review, we introduced different project management approaches, namely the traditional approach and the Agile approach. Our focus was primarily on Agile methodologies, where we outlined some of the most well-known methods. Additionally, we delved into the concept of team performance and familiarized ourselves with the assessment metrics used by companies to evaluate team effectiveness, including various Key Performance Indicators (KPIs).

To effectively conduct our research, we adopted a mixed-methods approach. Initially, we employed a qualitative approach by conducting interviews with project managers and directors within our case study company, Palmary. This qualitative phase allowed us to gain insights into the perceptions and experiences of professionals regarding Agile project management practices.

Subsequently, we proceeded with a quantitative approach, aiming to quantify specific KPIs for projects managed using both traditional and Agile methodologies. By comparing the performance metrics of projects under each approach, we aimed to provide empirical evidence of the impact of Agile practices on team performance.

Declarations from professionals in the interviews provide valuable empirical evidence supporting the notion that Agile Project Management's emphasis on iterative development and continuous feedback loops indeed enables teams to respond promptly to changing project requirements. This iterative approach allows teams to adjust their plans and deliverables more swiftly compared to teams adhering to traditional, linear project management methodologies.

This leads to the confirmation of our first research hypothesis, which states that: **Hypothesis 01: Teams using Agile Project Management practices are able to adapt to project changes more quickly than teams using traditional project management methodologies.**

Through the comparative analysis conducted in the quantitative study, we were able to closely examine the practices of both traditional and Agile approaches. It became evident that Agile Project Management encourages regular communication through practices like daily stand-up meetings, sprint reviews, and retrospectives. These structured communication channels facilitate ongoing collaboration and information exchange among team members, resulting in

more frequent and effective communication compared to traditional project management approaches. This leads to the confirmation of our second research hypothesis, which states that: **Hypothesis 02: Agile Project Management practices lead to more frequent and effective communication within teams compared to traditional project management practices.**

Through the calculation of Key Performance Indicators (KPIs) for the same project managed using both traditional and Agile approaches, the comparison between these metrics provides clear evidence that Agile Project Management practices lead to superior quality deliverables and better adherence to deadlines compared to traditional project management methods.

As a result, we are able to confirm the third research hypothesis. **Hypothesis 03: Agile Project Management practices lead to higher quality deliverables and adherence to deadlines compared to traditional project management methods.**

During the interview phase, it was explicitly stated that the Key Performance Indicators (KPIs) utilized to assess the project management process in the company included the To Complete Performance Index (TCPI), Cost Performance Index (CPI), and Schedule Performance Index (SPI). Therefore, the fourth hypothesis, which limits the KPIs to only two, is contradicted by the collected data, leading to its rejection. **The Hypothesis 04: Teams exclusively rely on Key Performance Indicators (KPIs) like Objective Achievement Rate and Frequency of Communication rate to evaluate team performance.**

During our internship period, we conducted an in-depth analysis of how Agile methodologies enhance team effectiveness. We calculated key performance indicators (KPIs) focusing on a crucial phase of the project management process, evaluation phase . By demonstrating the impact of Agile project management practices on team performance, we aim to inspire professionals within the company to enhance various aspects of their teams' work.

Based on the findings and analysis conducted throughout this project, we propose the following recommendations for the host organization:

- Implement Comprehensive Agile Training Programs

It is essential to develop and schedule comprehensive training programs for all team members. These programs should be designed to thoroughly familiarize employees with agile practices and methodologies. Ensuring that all team members have a deep understanding of the principles and techniques of agile management will enable them to contribute more effectively to agile

projects. Such training will enhance their ability to collaborate, adapt to changes, and deliver high-quality results in a timely manner. Furthermore, this initiative will cultivate a common understanding and shared language around agile practices, promoting consistency and efficiency across the organization.

-   Introduce and Monitor Additional Key Performance Indicators (KPIs)

Project teams should implement a wider range of Key Performance Indicators (KPIs) to assess the effectiveness of agile practices. Important KPIs to consider include Task Completion Rate, which measures the percentage of tasks completed within a given timeframe, providing insights into productivity and workflow efficiency, and Frequency of Communication. To better visualize performance, teams should use charts such as control charts and epic burndown charts. By closely monitoring these metrics, Palmary can gain a clearer understanding of how agile methodologies are being implemented and their impact on project outcomes. This data-driven approach will facilitate continuous improvement and fine-tuning of agile practices, ultimately leading to more successful project completions and enhanced overall team performance.

Other perspectives of research emerge as significant. Two overarching themes include exploring the leadership dynamics within agile teams and investigating the correlation between agile methodologies and innovation. These areas offer valuable insights into how leadership influences team dynamics in agile contexts and how agile practices foster innovation within organizations.

 However, it's important to acknowledge that this research is not without limitations. In our view, its primary constraints are as follows: the limited timeframe, which prevented us from tracking multiple projects that extended beyond our internship period. Additionally, the confidentiality surrounding certain critical projects within the company, making it challenging to integrate with their team

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Appendices

APPENDIX NO. 1: Daily Scrum
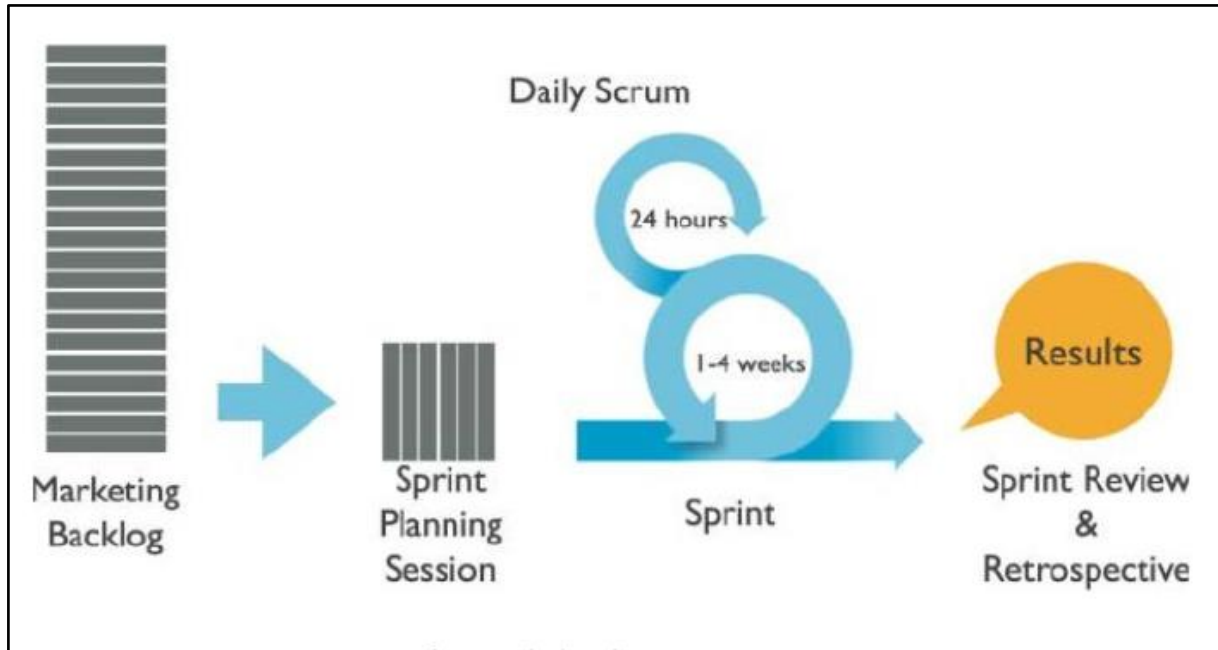
APPENDIX NO. 2: Burndawn Chart
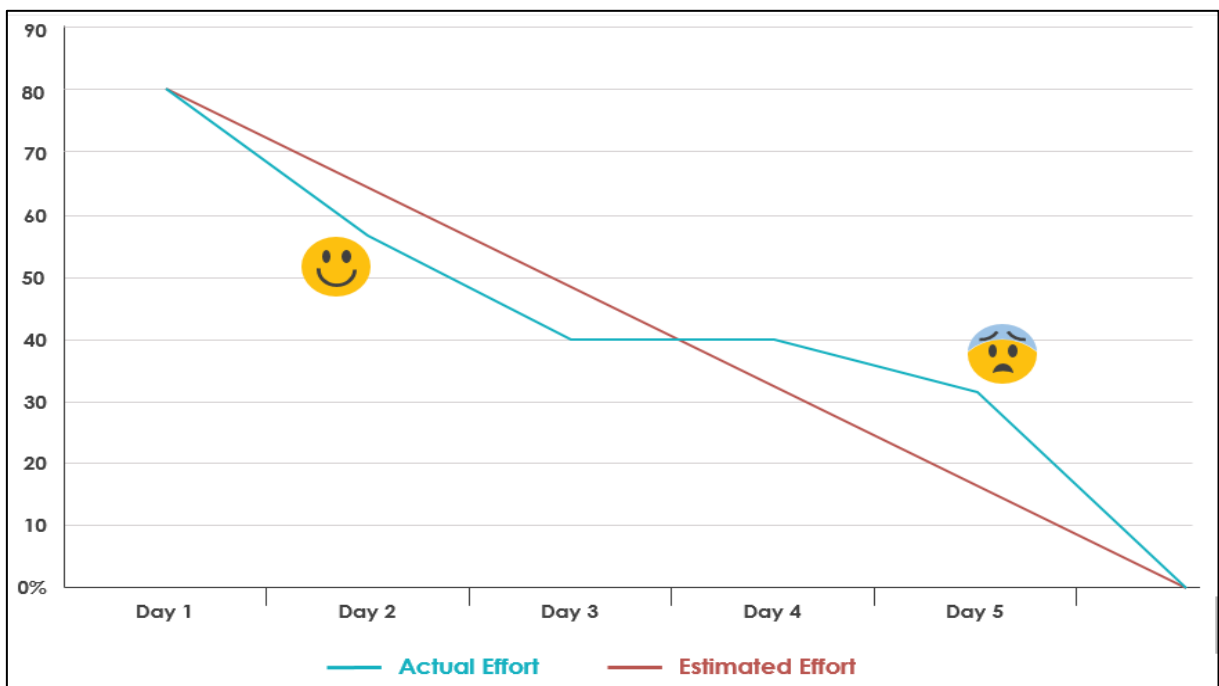
APPENDIX NO. 3: Epic Burndown Chart
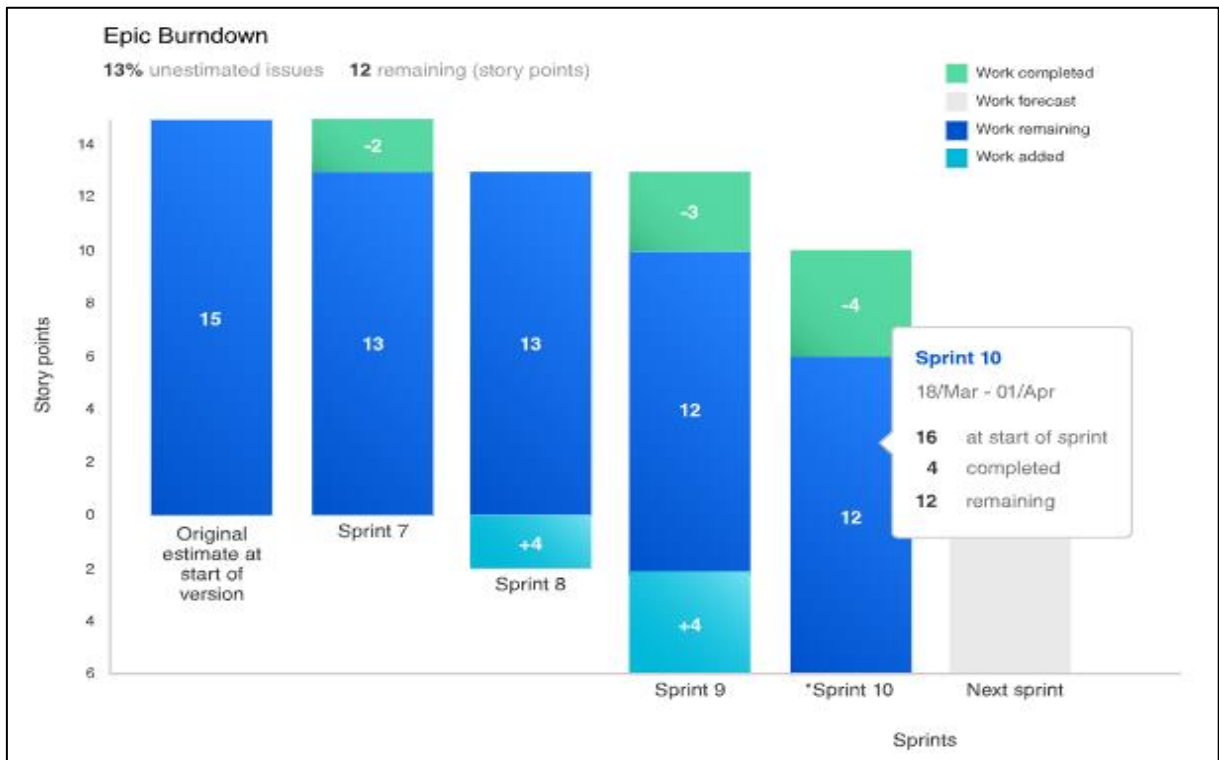
APPENDIX NO. 4: Velocity Chart
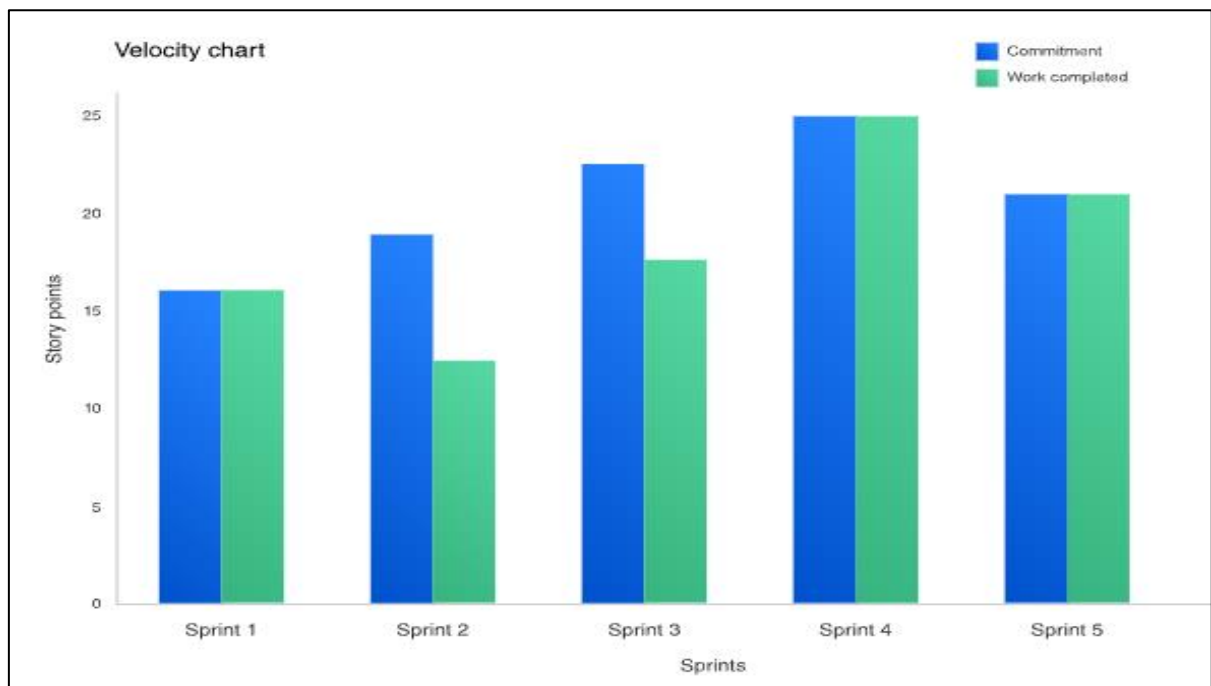
APPENDIX NO. 5: Control Chart
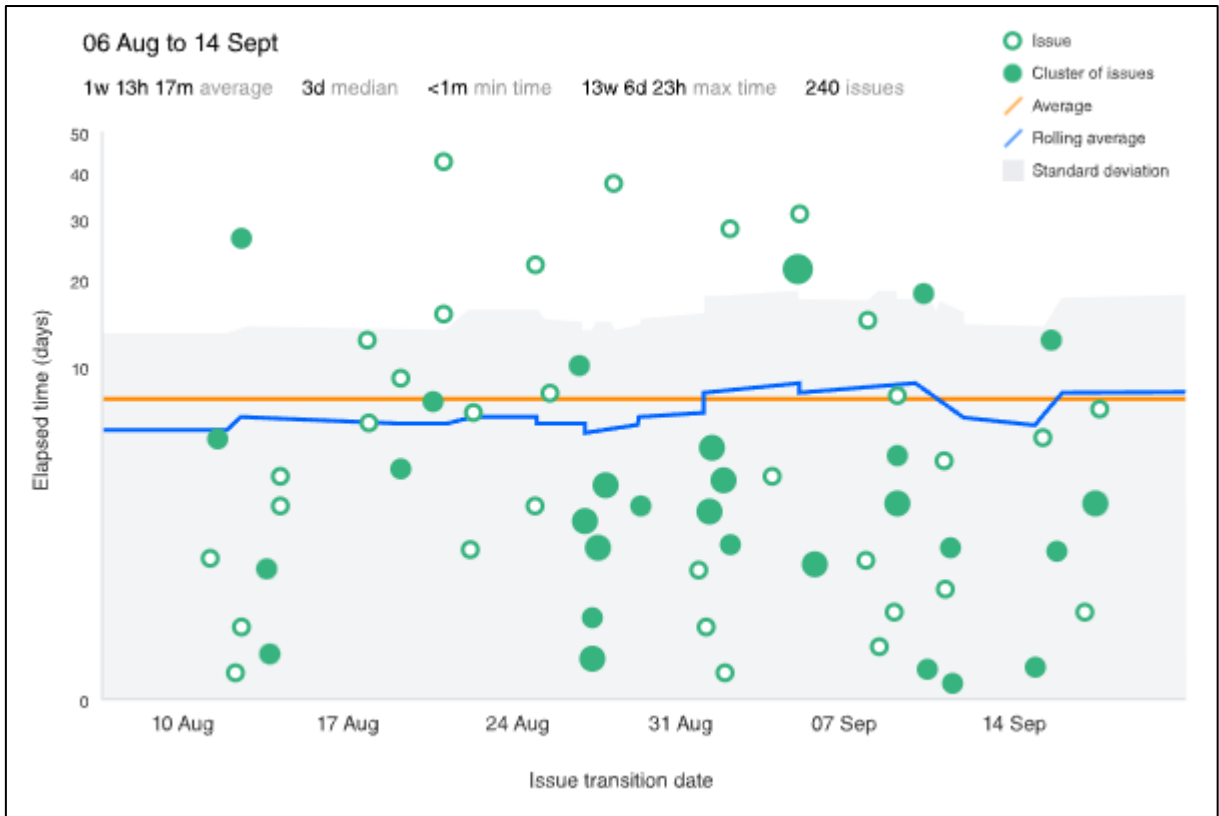
APPENDIX NO. 6:" Interview Guide"

- **Date:** From 23th to 30th April 2024

-**The duration of the interview**: Between 30 and 45 minutes

-**Objective of the interview:** Our aim is to examine the influence of agile project management and its practices on team performance within the Palmary .

-**Introduction:** Firstly, we would like to introduce ourselves as students from Higher School of Management and Digital Economy, specializing in e-business. We are currently engaged in our master's dissertation titled "The impact of Agile Project Management on Team Performance.

-**Topic to be discussed**

- **Topic 1: Project management process**

-What was your role in the previous projects you participated in? Were you a team member or project manager?

-Can you provide a concrete example of a project you worked on recently? Briefly describe the project and your involvement

- **Topic 2: Communication between team members**

-How does your team communicate during the project?

-What tools do you use to facilitate communication and collaboration?

-How often does your team hold meetings?

- **Topic 3: Agile project management practices**

-What methodology do you use to manage your projects?

- Can you explain the different stages you go through when carrying out a project?

-Are you following agile team practices such as daily stand-up meetings or sprint reviews?

- **Topic 4 : Contingency management**

-How does your team react when you encounter unforeseen events or obstacles during the project?

- Can you provide an example of an unforeseen situation and how it was handled?

- How does your team react when you encounter unforeseen events or obstacles during the project?

- Can you provide an example of an unforeseen situation and how it was handled?

- In your past experiences, has your team generally met projects on time and on budget? How do you manage time and resource constraints?

Content Table