AGILE TRANSFORMATION IN BANKING & ALLIED SERVICES

by

Marilyn Sharon Miranda

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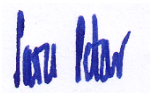

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Admissions Director

Declaration

I, hereby declare that the thesis entitled “Agile Transformation In Banking & Allied Services’ submitted to SSBM, Geneva for the award of degree of Doctor of Business Administration is my original research work.

This thesis, or any part thereof, has not been submitted partially or fully for the fulfillment of any degree in any other University / Institution

Dedication

I dedicate the dissertation to everyone in the academic and professional community who will benefit from its content.

Would also like to dedicate it to all the wonderful people who have helped me on my journey, especially my parents, George and Violet, husband Kevin and my children Keagan and Keira.

Acknowledgements

Special thanks to my mentor Dr. Luka Lesko, Ph.D. whose expertise and experience contributed to the quality of this dissertation. His guidance and advice through the research helped me shape and accomplish this research through his valuable timely help with critical observations helping present it in its current form.

I would like to also express gratitude to the members of the Evaluating Committee for their time invested in the review of this dissertation

Would also like to thank my peers and colleagues in my erstwhile organization for helping me by graciously participating in my interviews and focus group surveys.

ABSTRACT

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Marilyn Sharon Miranda
2024

Dissertation Chair: Dr. Luka Lesko, Ph. D.

The Agile methodology is a project management approach that involves breaking the project into phases and emphasizes continuous collaboration and improvement. This set of techniques, values and principles are designed to guide and improve how software development teams work together to deliver new applications and updates. The aim of the study is to elaborate on areas that help maximize the benefits of improving advocacy and acceptance of Agile methods creating the desired amount of impact on people and products. Flexibility to change and adapt during the development cycle is the core selling point allowing teams to create higher quality products keeping in mind customer needs. This is in comparison to earlier methods used like Waterfall where progression has gradually happened keeping in mind advancements in various fields of work, which not only has improved the agility and speed required for project related changes but also accelerated the pace in a data driven environment. Methodology used for this dissertation was through case studies, focus group surveys and semi-structured interviews. Qualitative study on the concepts of Agile in day to day management of organizations using tools and methodologies available and thrives on metrics like burndown charts and control graphs to help the team predict their delivery cadence.

Main results achieved were that using the Agile approach of continuous review and short design time-frame, the project team is better adapted to mobilize projects in tune with rapidly evolving environments in which the system will be used. Each initiative in the roadmap breaks down into a set of requirements which remain lean where everyone on the team develops a shared understanding via ongoing conversation and collaboration which is fleshed out into full details during implementation. We learn and improve performances to become Lean through experiments and breakdowns. Process

improvements are achieved by reducing variation through these experiments and through acting on the root causes of breakdowns.

In conclusion, Agile is not a destination – it's a path towards changing how your organization defines roles, plans accountability and mechanisms for responding to market changes This paper fills the gap in the digital library management literature by providing an overview of Agile Project Management versus and the pressing need for this being a core requirement due to the ever changing dynamic scenario driven by technology upgrade and competition.

In this paper we discussed how Agile empowers teams, builds accountability, encourages innovation while promoting continuous improvement in banking and allied services. More work is needed to understand

a) How can projects be described across domains in a consistent manner ?

b) How projects across domains can leverage the stored intellect and insights interchangeably?

c) What guidance can be provided to create and sustain better agile behavior to ensure successful outcomes ?

The hope is that as researchers start to address these questions in their research designs so that others easily leverage and apply the research results.

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LIST OF ABBREVIATIONS & JARGON

- MVP Minimum Viable Product
- PMBOK Project Management Body of Knowledge
- CMM Capability Maturity Model
- RPA Robotic Process Automation
- ROI Return On Investment
- CMMI Capability Maturity Model Integration
- TPM Total Production Maintenance
- VSM Value Stream Mapping
- KAIZEN Japanese Philosophy Of Continuous Improvement
- KANBAN Scheduling System To Manage & Track work
- JIDOKA Production Automation Of Defect Detection Mechanism
- ANDON Visual Management Tool To Production Issue Resolution
- TPS Toyota Production System
- SAFe Scaled Agile Framework
- LeSS Large Scale Scrum
- TRA Theory Of Reasoned Action
- KPI Key Performance Indicators
- GCP Google Cloud Platform
- AWS Amazon Web Services
- JIT Just In Time

CHAPTER I:
INTRODUCTION

1.1 Project Management : An Introduction

The banking industry is currently undergoing a significant transformation driven by digitization efforts across all aspects of business operations. When the banking industry and allied businesses make employees and customers paramount, a radical shift occurs in the way they manage and measure success. The new economics of service then requires innovative measurement techniques. These techniques calibrate the impact of employee satisfaction, loyalty, and productivity on the value of products and services delivered so that managers can build customer satisfaction and loyalty and assess the corresponding impact on profitability and growth. Leaders naturally have individual traits and styles. CEOs of companies that are successfully using the service-profit chain possess all or most of a set of traits that separate them from their merely good competitors. Of course, different styles of leadership are appropriate for various stages in an organization's development. But the messages sent by the successful leaders we have observed stress the importance of careful attention to the needs of customers and employees. These leaders create a culture capable of adapting to the needs of both.(James Heskett et al, 2008). This revolution isn't merely about enhancing efficiency and reducing costs; it fundamentally alters the traditional paradigms of banking operations and service delivery. Moreover, it leads to shifts in consumer financial behaviors, marking a profound change in the industry landscape. However, as the world grows more complex, this view gives rise to more matrix-like structure, more rules, and more control in an attempt to cope. Many organizations are now reaching the limits of this approach, with their people feeling that they are drowning in complexity. The penalty for ignoring this issue can be severe. Nokia, Eastman Kodak, and Motorola, once feted icons of management and innovation, lost their way—not because they weren't smart, but because their organizations were designed for a world that was rapidly disappearing. Changing our mind-set—or adjusting it to the new context—is no easy task, but developing an 'inner agility' is essential in releasing our potential to lead an agile

transformation. Reactive, or socialized, mind-sets are an outside-in way of experiencing the world based on reacting to circumstances and other people. Creative, or self-authoring, mind-sets are an inside-out way of experiencing the world based on creating our reality through tapping into our authentic selves, our core passion and purpose.

Organizations must therefore begin by both extending and transcending capabilities that made their leaders successful in the past. Leaders need three new sets of capabilities for agile transformations. First, they must transform themselves to evolve new personal mind-sets and behaviors. Second, they need to transform their teams to work in new ways. Third, it's essential to build the capabilities to transform the organization by building agility into the design and culture of the whole enterprise. (Aaron De Smet - Mckinsey, 2018).

This paper addresses a critical gap in project management literature by delving into two prominent methodologies: Agile and Waterfall. Both methodologies are widely used in software development and are best suited for different types of projects within the banking sector and allied services to be in line with the times and not fall behind. While Waterfall follows a linear approach, completing each project phase before progressing to the next, Agile operates on a more dynamic and iterative model. Agile methodology allows for simultaneous work on different phases of the project and emphasizes adaptability to changing customer preferences and evolving solution options. This necessitates close collaboration among stakeholders and rapid feedback loops during the development process (Rigby, 2018).

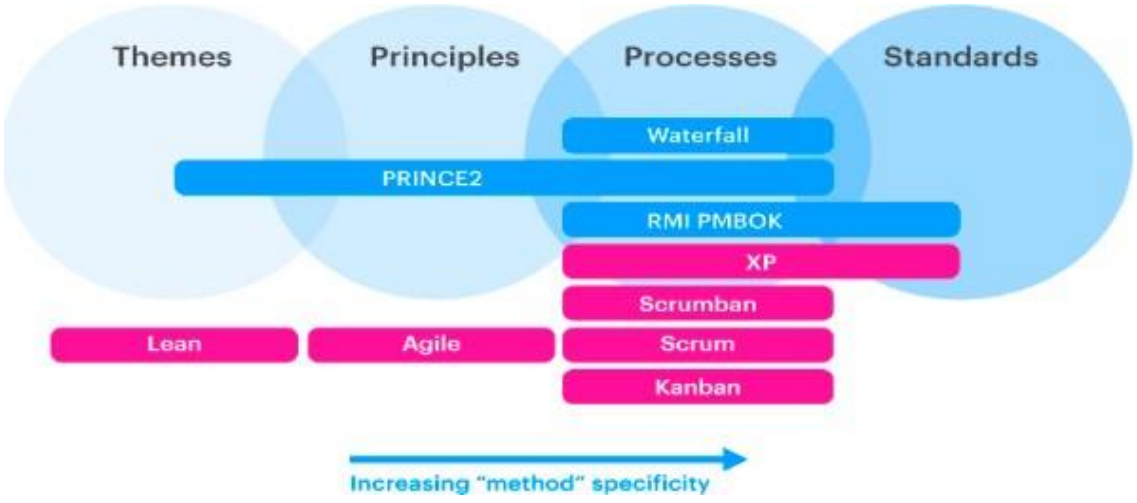

Figure 1.1 - Project Management methodologies and frameworks

https://kissflow.com/project/project-management-methodologies-and-frameworks/

The juxtaposition of Agile and Waterfall methodologies highlights the need for flexibility and adaptability in project management practices within the businesses. As technology advancements and customer requirements continue to evolve, banks are compelled to embrace a hybrid approach that combines the strengths of both methodologies. By incorporating the best practices from each methodology, banking institutions can effectively navigate the complexities of modern project environments and deliver innovative solutions that meet the evolving needs of customers.

Agile methodology, with its emphasis on iterative development and customer-centricity, enables banks to respond quickly to changing market dynamics and deliver value-added services that resonate with customers. By breaking down projects into smaller, manageable increments, Agile allows banks to prioritize features based on customer feedback and deliver incremental value throughout the project lifecycle.

On the other hand, Waterfall methodology provides a structured framework for project execution, ensuring that project requirements are clearly defined and documented upfront. While Waterfall may be less adaptable to changing requirements compared to Agile, it offers predictability and control, which are essential for certain banking projects with stringent regulatory requirements and compliance standards.

In conclusion, the adoption of Agile and Waterfall methodologies in the banking industry and its allied service industries reflects the need for a flexible and adaptive approach to project management. By leveraging the strengths of both methodologies and tailoring them to suit the specific needs of banking projects, institutions can effectively drive digital transformation initiatives and deliver superior customer experiences. As the industry continues to evolve, it is essential for banks to embrace a hybrid approach that embraces innovation while maintaining the rigor and discipline of traditional project management practices.

The Waterfall methodology adheres to a linear project progression format, where each phase of the project is completed before moving on to the next. This sequential approach ensures that deliverables for each phase are clearly defined and need to be completed / achieved before proceeding further. Waterfall is particularly advantageous in situations where projects must meet strict regulations or compliance standards, as it provides a structured framework for meeting predetermined milestones and objectives.

On the other hand, Agile methodology offers a more flexible and adaptive approach to project management. Agile teams embrace change and are empowered to adapt and pivot as the project evolves. Unlike Waterfall, which follows a predetermined plan, Agile allows for experimentation and iteration throughout the development process. This makes Agile particularly well-suited for projects where requirements are uncertain or likely to change, as it enables teams to respond quickly to new information and emerging priorities.

Agile methodology is characterized by its emphasis on collaboration, self-organization, and frequent communication. Agile teams work closely with business owners and stakeholders,

seeking feedback and validation at regular intervals. This continuous engagement ensures that the project remains aligned with stakeholder expectations and evolving business needs. Additionally, Agile promotes transparency and visibility, with progress tracked through regular check-ins and demonstrations of working software.

The choice between Waterfall and Agile methodologies depends on various factors, including the nature of the project, the level of uncertainty, and the regulatory requirements. Waterfall is well-suited for projects with clearly defined objectives and stable requirements, where adherence to strict timelines and deliverables is paramount. In contrast, Agile is better suited for projects that require flexibility, adaptability, and rapid response to change.

Ultimately, both Waterfall and Agile methodologies have their strengths and weaknesses, and the decision to use one over the other should be based on a careful assessment of the project requirements and constraints. While Waterfall provides a structured approach that is well-suited for projects with stable requirements and strict regulations, Agile offers flexibility and responsiveness, making it ideal for dynamic and uncertain environments. By understanding the strengths and limitations of each methodology, project managers can make informed decisions that best align with the needs of their projects and stakeholders.

A hybrid approach blending waterfall and agile methodologies integrates structured planning from waterfall with iterative development cycles of agile. Initially, project requirements are gathered and defined in a sequential manner, akin to waterfall. However, implementation occurs incrementally, allowing for flexibility and adaptation to evolving needs, characteristic of agile. This model fosters a balance between predictability and adaptability, leveraging the strengths of both methodologies. Stakeholder engagement remains consistent throughout, ensuring alignment with project goals while accommodating changes efficiently. By combining structured planning with iterative execution, the hybrid approach enhances project control, transparency, and responsiveness, optimizing outcomes in dynamic environments.

The key to navigating this landscape lies in hybrid project management methodologies that combine the planning rigor of Waterfall with the flexibility of Agile. Indeed, the Project Management Institute's 2020 report indicated that 11.4% of investment is wasted due to poor project performance. The Standish Group's CHAOS report 2020 showed a 42% project success rate, with 11% of projects failing outright. This indicates an estimated annual global financial loss not to mention wasted resources, missed opportunities, and negative societal impacts (Antonio Nieto-Rodriguez, 2023). Embracing hybrid methods can help organizations begin to remedy some of these outcomes. Using a blended approach, organizations can achieve an optimal balance, allowing them to nimbly adapt to unforeseen challenges without losing sight of their ultimate objectives. First, let's briefly review the core components of Waterfall and Agile, which both contain the building blocks of hybrid methodologies.

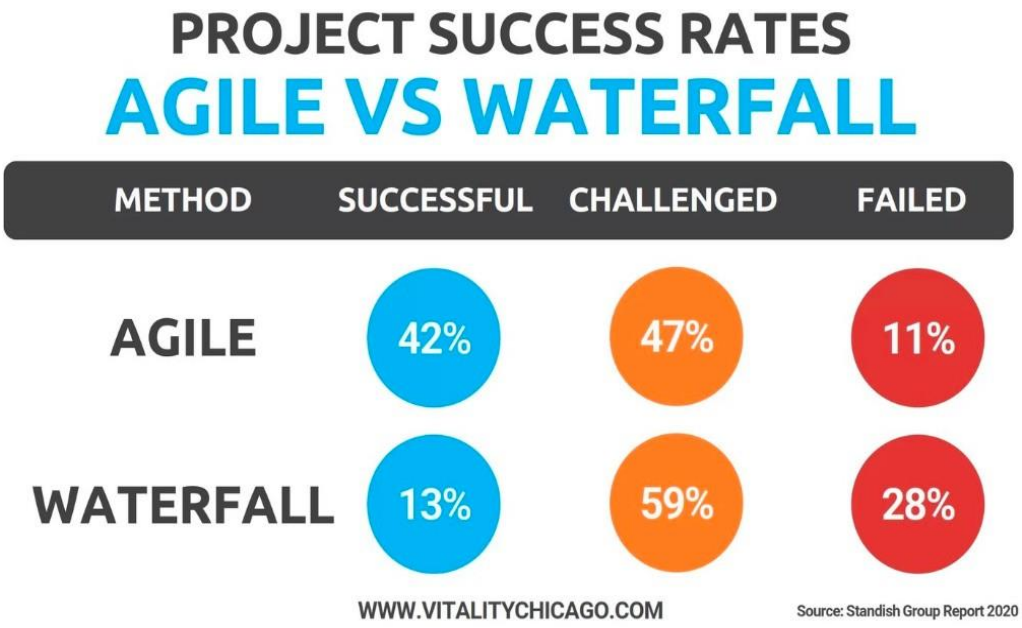

Fig 1.1a - Analysis of Project Success Rates

Source - Standish Group Report 2020

1.2 Waterfall Project Management : Theoretical Background

Waterfall methodology got more popular in the 1970s and 1980s, as it was a necessity for large and complex projects requiring a great amount of reliability and had stringent quality requirements. Construction and manufacturing firms traditionally used similar management methods however it was not a recognised approach until Dr Winston Royce developed the same to manage development of large software.

Involve the customer - the involvement should be formal, in-depth and continuing - Dr Winston Royce, 1970.

A few examples of service industries using the same would be Defense, Aerospace and teams in the Government sector. Through the Waterfall methodology there is a clear structured way of managing software development with structured deliverables, detailed milestones and well-defined documentation. Analogous to a waterfall, the process flows sequentially through five stages: requirements, design, development, testing, and deployment. Each phase concludes before the next one commences, ensuring a methodical progression and comprehensive completion of tasks.

In the 21st century, banks have employed the waterfall method for large-scale IT projects such as core banking system upgrades or new product development. For instance, when implementing a new online banking platform, the waterfall approach involves distinct phases: requirements gathering, system design, coding, testing, deployment, and maintenance. This method provides a structured framework, ensuring thorough documentation and clear project milestones. However, its sequential nature can lead to challenges in adapting to rapidly changing technology or market demands. Despite these limitations, banks continue to utilize the waterfall method for its reliability in managing complex projects with defined objectives.

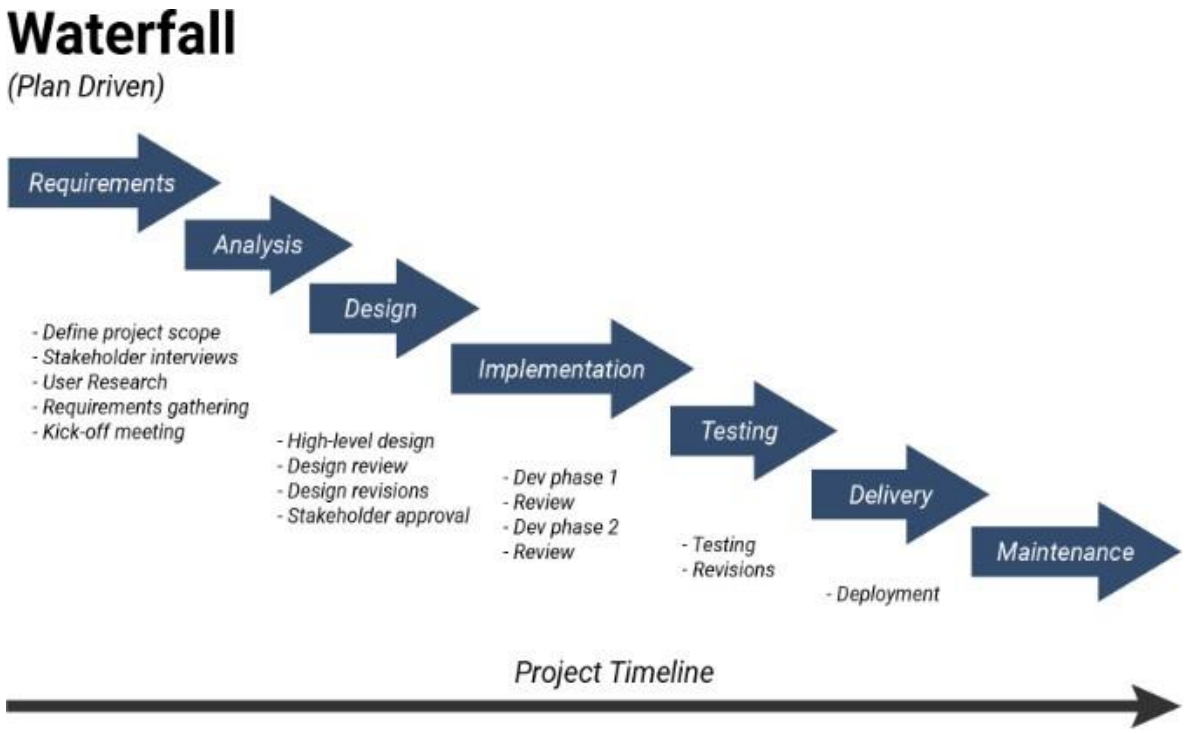

Fig 1.2. Waterfall Model- Stages of Approach

Source - https://www.actitime.com/project-management/what-is-waterfall-model

This methodology aligns well with traditional project management practices and standards such as Project Management Body of Knowledge (PMBOK) and Capability Maturity Model (CMM). The client base this appeals to are clients and stakeholders who get to see progress and results at every stage and have greater control over the scope and budget of a project. This approach faced criticism as we got into 1990's and 2000s due to its inability to keep pace with emergence of evolving technologies, aggressive markets and changing customer expectations. The looming risk at all times was of delivering a product that was not in line with the customer needs, out-dated and irrelevant. Minimal flexibility hindered its adaptation to changing customer needs as well. Changes in technology, market trends necessitated changed client preferences requiring costly revisions under the Waterfall model. To add to the same, lack of continuous feedback and collaboration stifled innovation resulted in compromised product quality. These shortcomings

underscored the need for methods that prioritized flexibility, enhanced collaboration and iterative development keeping the customer preferences in mind . The pace and agility that was missing through Waterfall necessitated the need for alternatives like Agile.

The Waterfall methodology initially appealed to clients and stakeholders seeking visibility and control throughout the project lifecycle. Its structured approach allowed them to track progress at every stage, enabling better management of scope and budget. However, as the software landscape evolved in the 1990s and 2000s with the rapid emergence of new technologies, dynamic markets, and evolving customer expectations, Waterfall faced criticism for its inability to adapt.

One of its primary drawbacks was its rigid, sequential nature, which hindered flexibility and responsiveness to changing requirements. The linear progression through stages meant that once a phase was complete, revisiting earlier decisions became cumbersome and costly. This lack of adaptability posed a significant risk of delivering products that were outdated or no longer aligned with customer needs.

Moreover, in fast-paced industries where time-to-market was crucial, Waterfall's sequential approach often resulted in delayed delivery, putting projects at a competitive disadvantage. As a result, alternative methodologies like Agile gained popularity for their iterative and collaborative nature, better suited to the fluidity of modern software development environments. Despite its initial appeal, Waterfall's inability to keep pace with technological advancements and shifting market demands led to its decline in favor of more adaptable methodologies.

Critical problem with traditional approaches to planning is that they focus on the completion of activities rather than the delivery of features , another reason why traditional planning fails to lead consistently to producing high value products. Since the plan is more data driven than customer centric, its value is probably not as much as it is expected to be. The work described by the plan is not prioritized by its value to the user (Mike Cohn, 2006)

1.3 Agile Project Management : Theoretical Background

The Agile methodology is a project management approach which breaks the project into faces and emphasizes continuous collaboration and improvement. Teams follow a cycle of planning, executing and evaluating. In early 2000 a group of software developers got together to discuss methodologies in speeding the development process helping bring software to the market at the first pace. Ken Schwaber and Jeff Sutherland, who were part of this group, were referred to as the founding fathers of the Agile methodology. Within a year , in 2001, the Agile Manifesto was created as a deterrent to issues with the traditional waterfall method.

The 17 Technologists that drafted the Agile manifesto documented 4 major principles for Agile project management to serve as a guide for teams on developing better software

- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

At its core, the manifesto emphasizes individuals and interactions over processes and tools, working software over comprehensive documentation, customer collaboration over contract negotiation, and responding to change over following a plan.

This paradigm shift prioritizes flexibility, adaptability, and continuous improvement. By valuing individuals and their interactions, Agile fosters collaboration and communication within cross-functional teams, promoting creativity and innovation. Emphasizing working software over documentation ensures that tangible results are delivered promptly, allowing for rapid feedback and iteration.

Customer collaboration is paramount in Agile, involving stakeholders throughout the development process to ensure that the product meets their evolving needs and expectations. Moreover, Agile embraces change as a natural part of the development process, enabling teams

to respond swiftly to new requirements and market dynamics. Overall, the Agile Manifesto advocates for a mindset focused on delivering value to customers efficiently, embracing change, and fostering collaboration and teamwork, setting the foundation for modern software development practices.

The main reason Agile was found to be more flexible and adaptable was that you broke the problem into digestible components that you then develop and test with the users .As you travel down the traditional organization chart, motivation and contextual awareness becomes more limited and specific, and more remote from the organization's overall strategic aims as quoted by (Stanley McChrystal, 2015) in ‘Team Of Teams’. It's more about adaptation over taylorism If you come across something that isn't working as expected or you realize that items that you hadn't considered you can adapt the effort and make changes at a rapid pace. Agile typically prioritizes creative development and feedback to improve applications and the development process.This is well suited in today's world where we need to be working smarter and faster. We didn't need every member of the task force no everyone he just needed everyone to know someone on everything so that they envisioned a friendly face rather than a competitive rival (p.129)

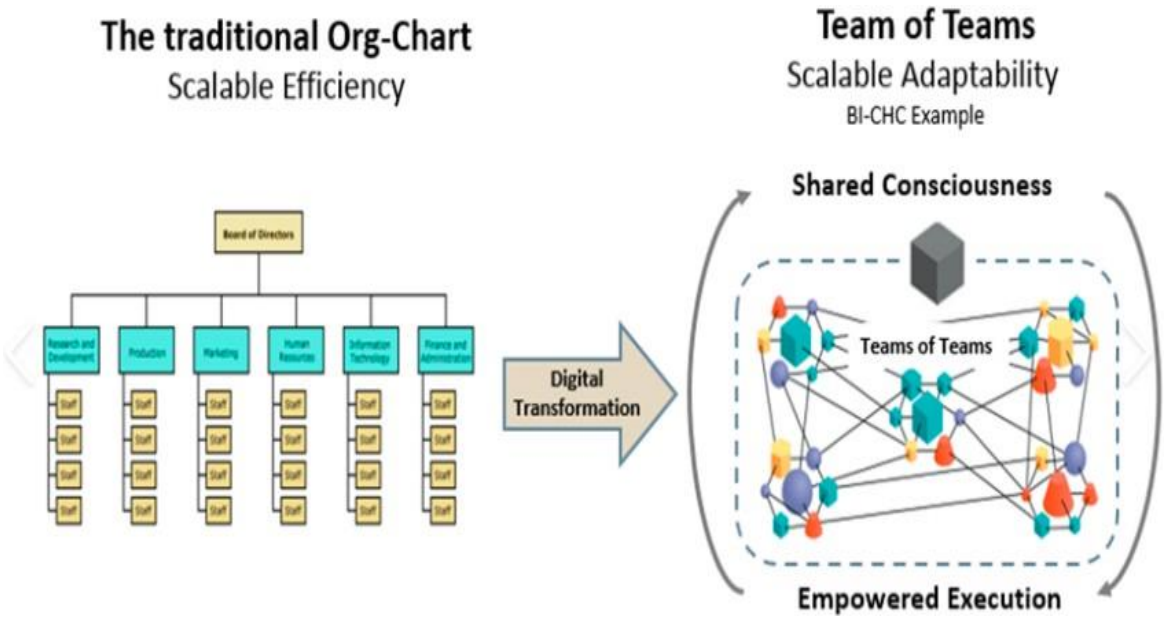

Fig 1.3 - Scaleable Adaptability in Agile Project Management
Source : Team of Teams (Stanley McChrystal, 2015)

Agile does come with certain pitfalls though. There are instances where teams run into challenges along the Agile journey. The key is to learn from the challenges and overcome the issues through stand ups and retrospectives .

With the publication of the Agile Manifesto in 2001, many Agile frameworks have emerged. Scrom, Kanban , Lean and Extreme programming to quote a few, embody the core principle of frequent iteration, continuous learning and superior quality. Software development teams favor Scrum and XP while Kanban is preferred among survey oriented teams, like IT and Human Resources.

Quantifying wastage of effort (Jeff Sutherland, 2014) Analysis reveals that only a 6th of any work done actually produces something of value. This is the inherent insanity and wastefulness of life in a modern corporationI scored by Jeff Sutherland.

Just like every approach, Agile also comes with certain pitfalls. According to Danile Vacanti (2020), “If we truly want to be Agile, we are going to have to adopt the language of the customers. To that end, we must choose words and concepts they are comfortable with - not force them to learn a new, arbitrary and unhelpful vocabulary”.
Product team culture is perhaps best described by John Doerr’s ‘missionaries and mercenaries’ metaphor. Mercenaries are driven by paranoia; Missionaries are driven by passion. Mercenaries focus on the competitors and financial statements; Missionaries focus on their customers and value statements, obsessed with making a contribution and AF fundamentary driven by the desire to make meaning (John Doerr, 2000)

This paper presents a comparative analysis of two prominent project management methodologies, Waterfall and Agile, within the context of software development. The aim is to assist organizations in selecting a methodology that aligns with their goals and objectives within a fixed timeframe. The research highlights the evolving trends in Agile methods and the coexistence of various approaches, such as Waterfall, Agile, and more recent additions like Lean, to address the ever-changing customer requirements driven by the rapid pace of technological advancement.

A noteworthy example cited in the research is Toyota, where the principles of Lean development have been successfully applied. These principles, which include adding value, eliminating waste, focusing on people who add value, and optimizing across the organization, underscore the importance of efficiency and continuous improvement in project management practices (Morien, 2005).

The research seeks to investigate the market viability of Agile compared to other methods and assess whether Agile can be used as a standalone approach. Furthermore, it explores how constraint management can be effectively addressed through the alignment of cross-team Key Performance Indicators (KPIs).

Waterfall and Agile methodologies are outlined as two distinct approaches to project management in software development. Waterfall follows a traditional, linear path where projects progress through sequential phases, including requirements gathering, design, implementation, testing, deployment, and maintenance. Each phase must be completed before advancing to the next, and changes are challenging to implement once a phase is finalized. Waterfall is characterized by its structured nature, meticulous documentation, and emphasis on upfront planning. It is most suitable for projects with well-defined requirements and minimal anticipated changes, where predictability and stability are paramount.

Conversely, Agile methodology adopts an iterative and flexible approach, emphasizing adaptability, collaboration, and customer involvement throughout the development lifecycle. Agile divides projects into smaller, manageable iterations known as sprints, typically lasting 1-4 weeks, allowing for continuous feedback and improvement. The Agile approach prioritizes the delivery of working software early and frequently, enabling rapid responses to changing requirements and priorities. Unlike Waterfall, Agile does not necessitate extensive upfront planning and documentation. Instead, it focuses on delivering tangible value to customers and responding effectively to evolving needs.

In conclusion, this comparative analysis sheds light on the strengths, weaknesses, and suitability of Waterfall and Agile methodologies in software development projects. By understanding the distinctive characteristics of each approach and considering factors such as project requirements, constraints, and organizational objectives, stakeholders can make informed decisions when selecting the most appropriate project management methodology for their specific context.

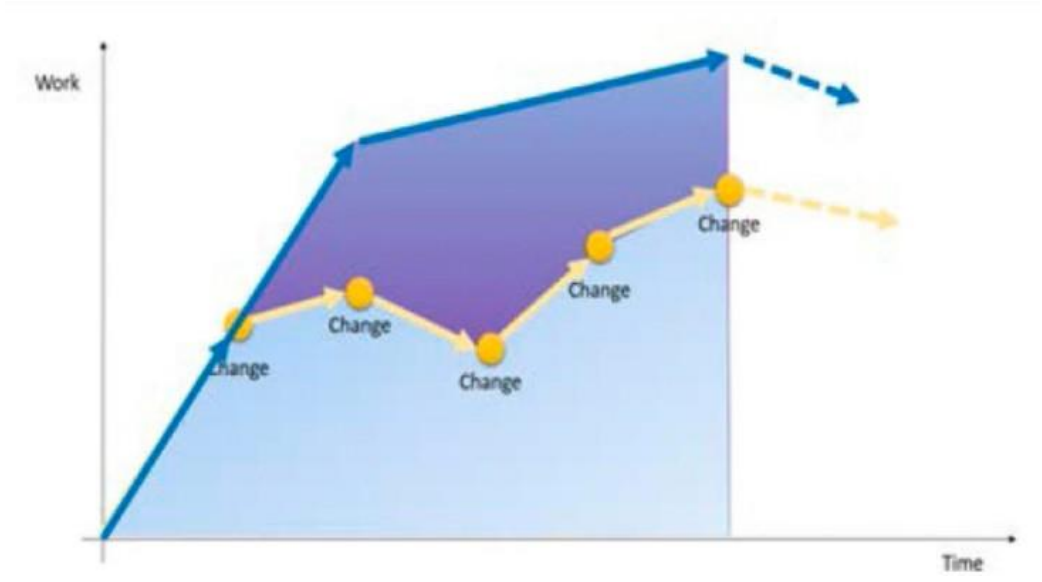

Fig 1.3a : Waterfall versus Agile incremental planning

(Source: Conference Paper presented at PMI Global Congress 2016)

One of the fundamental distinctions between Waterfall and Agile methodologies lies in their approach to change management. In Waterfall, accommodating changes to project requirements or scope becomes challenging once the project progresses beyond the initial requirements phase. This rigid structure of the Waterfall model restricts flexibility and makes it difficult to incorporate alterations to the project plan as it moves through its sequential phases.

Conversely, Agile methodology embraces change and fosters a culture of flexibility and adaptability. Agile teams welcome changes to project requirements at any stage of development, recognizing that evolving needs and priorities are inherent to the dynamic nature of software development. Agile achieves this through iterative cycles, where feedback loops are established to continually assess and adjust project objectives based on stakeholder input and evolving market dynamics.

The choice between Waterfall and Agile methodologies hinges on various factors, including the nature of the project, its requirements, and the preferences of the development team and stakeholders. Waterfall methodology offers a structured and predictable approach, characterized by comprehensive documentation and a sequential progression through predefined project phases. This method is particularly suitable for projects with well-defined requirements and minimal expected changes, where stability and predictability are paramount.

On the other hand, Agile methodology prioritizes adaptability, collaboration, and the rapid delivery of value to the customer. Agile teams work in iterative cycles, delivering incremental updates and improvements in response to changing requirements and stakeholder feedback. This iterative approach allows Agile teams to remain responsive to evolving customer needs and market conditions, enabling them to deliver high-quality software products that meet customer expectations.

Ultimately, the selection of the most appropriate methodology depends on a careful assessment of the project's unique characteristics and goals. While Waterfall provides a structured framework that may be well-suited for certain projects, Agile offers the flexibility and responsiveness needed to thrive in dynamic and uncertain environments. By considering the strengths and weaknesses of each approach and aligning them with the project's requirements, development teams can make informed decisions that maximize the likelihood of project success.

A hybrid approach using the advantages of both waterfall in a time can get a successful project to collaboration which is very much needed regardless of whether you prefer Agile or waterfall, or both (Rodov Alexander, 2016)

The Agile Model

The purpose of this research is to advocate the use of the Agile Model breaking away from the traditional segmented approach moving to more flexible development styles. Agile, though more recent has developed across the years, formally defined in a research paper by Edmonds (1974). This evolved in 'Scrum' (1995), 'Crystal Clear' (1996) etc. In 2001, Agile software development pioneers declared the 'Agile Manifesto' having a set of rules for agile software development methods.

There are dependencies to make this successful though. In order to run a good scrum it is vital to have a good product backlog, where through CMMI practices it could be broken down into manageable pieces that can be analyzed for dependencies , planning stakeholder involvement and total project risk assessment (Jakobsen,2008)

Scrum Teams are cross-functional, meaning the members have all the skills necessary to create value each Sprint. They are also self-managing, meaning they internally decide who does what, when, and how. The Scrum Team is small enough to remain nimble and large enough to complete significant work within a Sprint, typically 10 or fewer people. In general, we have found that smaller teams communicate better and are more productive. If Scrum Teams become too large, they should consider reorganizing into multiple cohesive Scrum Teams, each focused on the same product. Therefore, they should share the same Product Goal, Product Backlog, and Product Owner (Sutherland, 2020)

Through this paper we would be discussing the model which combines the accountability and predictability of a waterfall model along with the agility and adaptability of Agile (Paul Dragos 2021). Thus an effective balance between these two ideologies can create a more efficient software development tool

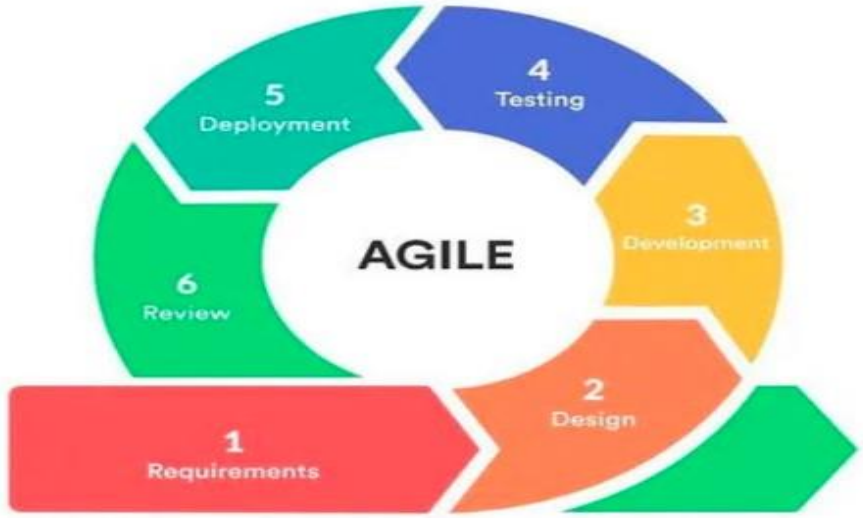

Fig.1.3b. Agile framework

Source: The Importance of Different Agile Methodologies Included in Agile Manifesto

https://www.360logica.com/blog/the-importance-of-different-agile-methodologies-included-in-agile-manifesto/

The purpose of research comparing Agile and Waterfall project management methodologies is multifaceted, aiming to provide insights into their respective effectiveness, suitability, and impact on project outcomes.

Below are key aspects of research purpose in this context:

- Performance Comparison: One primary objective is to evaluate and compare the performance of Agile and Waterfall methodologies in real-world project scenarios taking a few case studies into account. This involves assessing various metrics such as project duration, cost, quality, and stakeholder satisfaction. By analyzing empirical data and case studies, we identify which methodology tends to deliver better results in different project contexts.

- Adaptability and Flexibility: Another purpose is to examine how Agile and Waterfall methodologies handle changes and uncertainties throughout the project lifecycle. Agile's iterative and adaptive nature allows for more flexibility in accommodating evolving

requirements, whereas Waterfall's sequential structure may struggle to adapt to changes. Our research aims to investigate how these methodologies respond to changes in project scope, timeline, and stakeholder priorities.

- Risk Management: The research also focuses on assessing the risk management approaches of Agile and Waterfall methodologies. This involves examining how each methodology identifies, mitigates, and manages project risks. Agile's incremental approach may facilitate early risk detection and mitigation, while Waterfall's upfront planning may provide a more structured framework for risk management.

- Team Dynamics and Collaboration: Understanding the impact of Agile and Waterfall methodologies on team dynamics and collaboration is another important research objective. Agile's emphasis on self-organizing teams and continuous communication fosters collaboration and innovation, whereas Waterfall's hierarchical structure may lead to more siloed and rigid team interactions. Research seeks to explore how these different dynamics affect team morale, productivity, and overall project success.Also the benefits of informal conversation versus formal conversation.

- Customer Satisfaction and Value Delivery: Finally, research aims to assess how Agile and Waterfall methodologies contribute to customer satisfaction and value delivery. Agile's customer-centric approach, with its focus on delivering working software early and frequently, may lead to higher levels of customer satisfaction and value realization. Conversely, Waterfall's emphasis on comprehensive documentation and upfront planning may result in slower value delivery and potentially lower customer satisfaction.

In conclusion, the purpose of research comparing Agile and Waterfall project management methodologies is to provide valuable insights into their comparative effectiveness, adaptability, risk management practices, team dynamics, and impact on customer satisfaction and value

delivery. Such research aids organizations in making informed decisions about selecting the most suitable methodology for their specific project requirements and organizational context.The research seeks to investigate the market viability

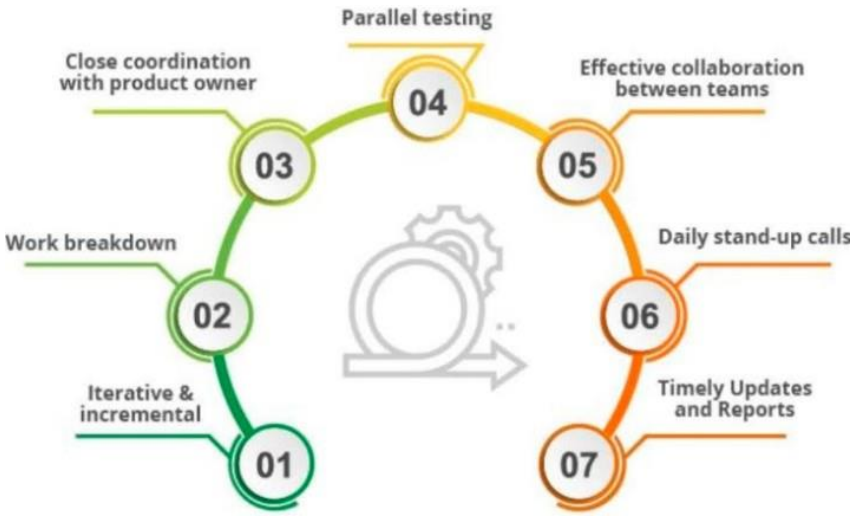

Fig 1.3c - TestingXperts (2021) –Agile methodology

1.4 Significance of scrutinizing methodologies

Changing requirements of a project needs to take into consideration the efforts put in by the development team ensuring there is optimal use of time and money. How we integrate the changes asked for due to regular and consistent feedback ,face to face communication between the client and the development team helping deliver high quality software to the client in the shortest period of time increasing customer satisfaction – that is the ultimate significance of this study. Also the relevance of informal conversations an out they should be adopted by Project

teams to established comfortable communication ecosystem that is accessible and can be shared (Rodov, Alexander, 2006)

Fig 1.4 : Formal versus informal communication
Source: Conference Paper presented at PMI Global Congress 2016

Agile culture if disseminated needs to be tangible for employees . This then translates into tangible results for clients. Delivering frequent, tangible, working results that are ‘useful in the eyes of the client’ helps give clarity and confidence in the project vision , i.e. the big picture (Maurer, 2004). It needs to follow and protect the values and merit benefit to the organization. The ideal would be to give customers both internal and external what they need to accomplish their purpose with no waste as quoted by Glen Ballard (2008) where scheduling and constraint analysis are critical to prepare a look-ahead scheduling.

The significance of studying project management methods such as Waterfall and Agile lies in their critical role in the success and efficiency of software development projects. Understanding the nuances, strengths, and limitations of these methodologies is essential for project managers, teams, and organizations to effectively plan, execute, and deliver projects. Debating between Waterfall and Agile project management methodologies is crucial for organizations to make informed decisions about how they approach and execute projects. This debate enables teams to

critically evaluate the strengths and weaknesses of each methodology in the context of their specific project requirements, organizational culture, and industry dynamics.

Choice between Waterfall and Agile allows organizations to assess their project characteristics and determine which methodology aligns best with their needs. Waterfall, with its sequential phases and emphasis on comprehensive documentation, may be more suitable for projects with well-defined requirements and low uncertainty. Conversely, Agile, with its iterative and collaborative approach, thrives in environments where requirements are subject to change and rapid adaptation is necessary.

Availability of choices prompts organizations to consider their organizational culture and readiness for change. Waterfall often requires strict adherence to predefined processes and may be favored in hierarchical or regulated industries where stability and predictability are paramount. On the other hand, Agile values flexibility, continuous improvement, and empowered teams, which may require a cultural shift and a willingness to embrace uncertainty and experimentation.

Moreover, debating between Waterfall and Agile encourages organizations to evaluate the level of customer involvement and feedback required throughout the project lifecycle. Agile's customer-centric approach emphasizes collaboration and frequent iterations based on user feedback, making it ideal for projects where customer satisfaction and responsiveness are critical. Waterfall, with its structured phases and limited customer involvement until the later stages, may be more suitable for projects with well-defined requirements and less need for ongoing customer input.It fosters a deeper understanding of project management methodologies and their impact on project success. By weighing the pros and cons of each approach, organizations can make informed decisions that maximize the likelihood of achieving their project goals within the constraints of time, budget, and scope.

In essence, debating between Waterfall and Agile project management methodologies enables organizations to tailor their approach to project execution, taking into account project characteristics, organizational culture, customer needs, and industry dynamics, ultimately leading to more successful outcomes.

Below are key aspects highlighting the significance of studying these methodologies:

- Enhanced Project Success Rates:

Researching and understanding both Waterfall and Agile methodologies contribute to higher project success rates. By selecting the most appropriate methodology based on project requirements, complexity, and stakeholder expectations, it will not only help organizations mitigate risks, but also improve project planning. This will increase the likelihood of delivering projects on time, within budget, and to the satisfaction of stakeholders.

- Improved Adaptability and Flexibility:

In today's dynamic and rapidly evolving business environment, adaptability and flexibility are crucial. Agile methodologies, with their iterative and incremental approach, offer greater adaptability to changing requirements and market dynamics compared to the rigid sequential structure of Waterfall. Understanding the principles and practices of both methodologies allows project managers to choose the most suitable approach for different project contexts, thereby improving the project's responsiveness to change.

- Optimized Resource Utilization:

Effective project management methodologies help optimize resource utilization, including human resources, time, and budget. Waterfall's upfront planning and comprehensive documentation may be more suitable for projects with well-defined requirements and stable environments, whereas Agile's iterative approach enables continuous prioritization and adjustment of resources based on changing project needs. Studying these methodologies equips

project managers with the knowledge to allocate resources efficiently, minimize waste, and maximize project productivity.

- Enhanced Stakeholder Collaboration and Satisfaction:

Both Waterfall and Agile methodologies emphasize stakeholder collaboration, albeit in different ways. Waterfall's structured phases facilitate clear communication and expectations setting, while Agile's customer-centric approach promotes regular feedback and collaboration throughout the development process. Understanding the significance of effective stakeholder engagement within each methodology helps build stronger relationships, increase stakeholder satisfaction, and ensure project outcomes align with business objectives.

- Innovation and Continuous Improvement:

Studying project management methodologies fosters a culture of innovation and continuous improvement within organizations. By analyzing the principles, practices, and experiences associated with Waterfall and Agile, teams can identify areas for optimization, experiment with new approaches, and implement best practices to drive innovation and enhance project delivery processes.

In conclusion, the study of project management methods such as Waterfall and Agile is significant as it equips organizations with the knowledge and tools needed to improve project success rates, adaptability, resource utilization, stakeholder collaboration, and innovation. By understanding the strengths and limitations of each methodology, organizations can tailor their project management approach to meet the unique needs of their projects and drive sustainable business growth.

Ofcourse , this also can be a double edged sword , on organizations getting ahead of themselves . Amazon as an example has an approach wherein rather than jumping into developing a plausible product , the agile mindset encourages going slow to going fast. CEO Jeff Bezos, often calls himself the ‘Chief Slowdown Officer’ where he intervenes when teams move quickly into coding without clearly defining the customer problem and elicit a solution (Bryar, 2021)

1.5 Relativity of Methodologies

The purpose of this research is to dwell into the relativity of methodologies

1. How relevant is Agile versus primitive methodologies in addressing constraints in day to day banking ?
2. How to classify these constraints for easier identification and modeling ?
3. How can alignment of cross team KPI help in addressing issues and resolving conflict while solutioning constraints ?
4. What is the role of centralized governance in meeting the planned objectives?

Classifying constraints in waterfall and agile methodologies can be helpful for easier identification and modeling. The scale, duration and final output determination is also important while considering the constraints

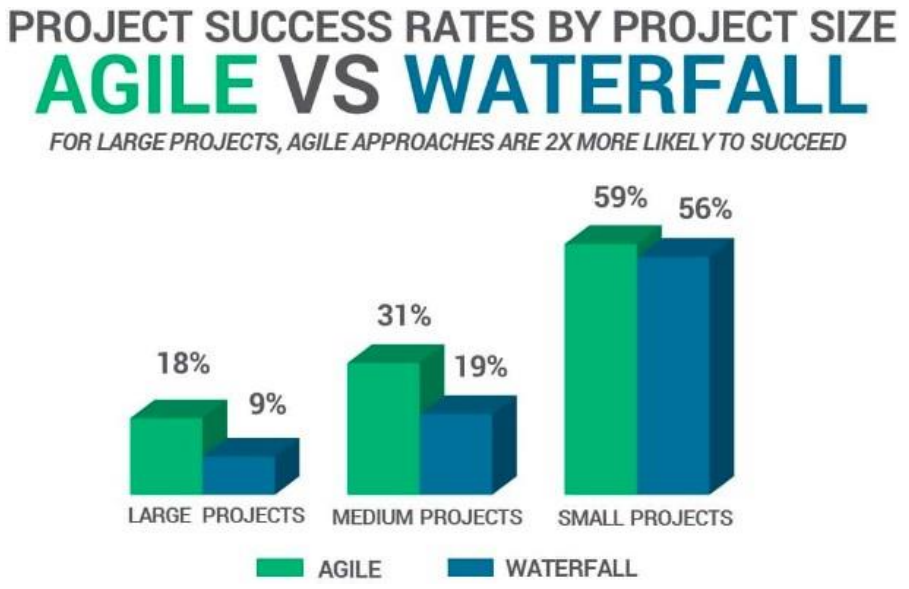

Fig.1.5 - Relativity of Methodologies

Source:Standish Group, Chaos Studies 2013-2017

https://medium.com/leadership-and-agility/agile-project-success-rates-are-2x-higher-than-traditional-projects-376a05e590d4

Waterfall Methodology Constraints:

Sequential nature:

In waterfall, tasks are completed sequentially, one after the other and this can become a constraint when changes are required later in the project lifecycle. Any change may require going back to the beginning of the cycle, impacting time and resources.

Limited Flexibility:
Waterfall has limited room for changes once a phase is completed. This lack of flexibility can be a constraint when requirements evolve or when there are unexpected challenges.

Long Delivery Cycles:
Since waterfall involves completing each phase before moving on to the next, projects can have long delivery cycles. This can be a constraint when rapid adaptation or response to market changes is necessary.

Heavy Documentation:
Waterfall typically requires extensive documentation at each phase. While documentation is important, excessive paperwork can become a constraint, consuming time and resources that could be used for actual development.

Risk of Requirements Changes:

Due to the sequential nature, the time span is large which always opens us to the risk that requirements might change during the project lifecycle, leading to rework and potential delays.

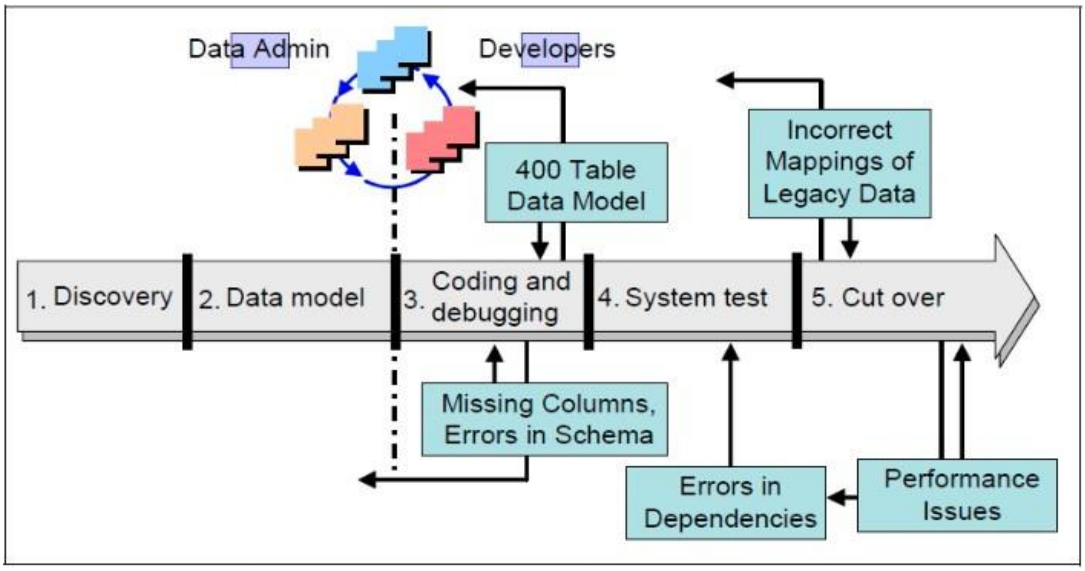

Fig 1.5a - Constraints in Waterfall Methodology

Source-https://forsharingknowledge.blogspot.com/2012/05/example-of-waterfall-method-sdlc.html

Agile Methodology Constraints:

Uncertainty in Requirements:

Agile often deals with evolving requirements, which can be a constraint if stakeholders are unsure or not decisive about what they want, leading to ambiguity and changes during development.

Resource Availability:

Agile teams require trained and dedicated resources, including skilled personnel and time commitment which might not always be possible due to the evolving availability and other commitments. Limited availability of resources can constrain project progress.

Dependency on Customer Feedback:

Agile heavily relies on continuous feedback from customers or stakeholders. Customers availability and ability to articulate actual requirements or changes is key. If this feedback loop is slow or inconsistent, it can constrain the team's ability to make informed decisions and adapt quickly.

Team Collaboration:

Agile emphasizes collaboration within cross-functional teams. Constraints can arise if there are communication barriers, lack of clarity in SLA's, conflicting priorities, or lack of alignment among team members.

Scope Creeps :

Agile allows for flexibility, but this can lead to scope creeps if not managed properly. Without clarity and clear boundaries, the project might expand beyond its original scope, impacting timelines and resources.

Modeling Constraints:

According to the theory of constraints in the book, 'The Goal',(Eliyahu Goldratt, 1984) writes about impediments for organizations in achieving their goals is due to one or more types of constraints. It could be a team or individuals That produce remediated features (production of value) or it could be related to product quality which has a direct effect on Sales. This theory of

constraints has been applied to a wide array of industries like Operations, the Supply chain, Finance, Project marketing.Project management and even Sales.

Identification:

To elicit responses from sections of individuals Semi-structured interviews and focus group surveys was a secondary method used along with Case studies being the primary method used. Open-ended responses to clearly identify and document constraints specific to the project and methodology were used alongwith analysis of past projects to identify potential constraints.

Prioritization:

Asked respondents to prioritize constraints and potential impact on project success. Some constraints may have higher priority due to their criticality or likelihood of occurrence and help build on the analysis needed based on collation of results. Respondents were asked to consider constraints due to their direct impact on project success. Time constraints, such as deadlines or market windows that drive project scheduling and resource allocation. Budget constraints determining the financial feasibility and scope of the project. Resource constraints, including skilled labor or technology availability, influence project execution. Additionally, regulatory or compliance constraints dictating project parameters to ensure legal adherence were also in scope of focus. Views on addressing constraints early in planning, mitigating risks and enabling effective decision-making came up as a priority in project management.

Mitigation Strategies:

Solicited details of developed strategies to mitigate/ manage identified constraints. This could involve proactive risk management, stakeholder communication, or process improvements.

Integration with Project Plan:

Discussed the integration of constraints into the project plan and schedule. Attempt was to understand if all the project stakeholders are aware of constraints and their implications on project delivery.

Continuous Monitoring:
Governance mechanism monitoring constraints throughout the project lifecycle was discussed to help adapt and adjust approaches as new constraints emerge or existing ones evolve.

By classifying constraints and incorporating them into the project management approach, you can better identify, model, and mitigate potential risks, thereby increasing the chances of project success.

Alignment of cross-team Key Performance Indicators (KPIs) can be beneficial in addressing issues and resolving conflicts while managing constraints in both waterfall and agile project management methodologies through the below:

Basis the discussions , analysis of the same helped reached conclusions as below:

Waterfall Project Management:

Improved Communication:
Aligning Key Performance Indicators (KPIs) across different teams encourages better communication and collaboration. When everyone is working towards common goals and metrics, it fosters a shared understanding of project objectives and priorities.

Early Detection of Issues:
By tracking KPIs consistently across teams, any deviations or issues can be identified early in the project lifecycle. This allows for prompt intervention and resolution before they escalate into major problems.

Efficient Resource Allocation:

With aligned KPIs, resource allocation can be optimized based on the overall project goals rather than individual team objectives. This ensures that resources are utilized effectively to address constraints and bottlenecks as they arise.

Facilitates Problem-Solving:

When teams share common KPIs, they are more likely to collaborate in problem-solving efforts. This can lead to innovative solutions and a more holistic approach to addressing constraints within the waterfall project framework.

Agile Project Management:

Continuous Improvement:

Agile methodologies emphasize continuous improvement, and aligning KPIs across teams supports this by providing a common framework for evaluating performance and identifying areas for enhancement.

Cross-Functional Collaboration:

Agile teams are inherently cross-functional, and aligned KPIs foster collaboration by encouraging teams to work together towards shared objectives. This collaboration helps in resolving conflicts and addressing constraints more effectively.

Transparency and Accountability:

Aligned KPIs promote transparency and accountability within agile teams. When everyone is accountable for the same metrics, it fosters a culture of ownership and responsibility, reducing conflicts and finger-pointing.

Adaptive Decision-Making:
Agile teams make decisions based on real-time data and feedback. Aligned KPIs provide the necessary data points to make informed decisions quickly, enabling teams to adapt their approach to address constraints and optimize project outcomes.

In both waterfall and agile project management, the alignment of cross-team Key Performance Indicators (KPIs) fosters a culture of collaboration, transparency, and accountability, which are essential for effectively addressing issues, resolving conflicts, and solutioning constraints. It enables teams to work towards common goals, optimize resource utilization, and make data-driven decisions to overcome challenges and deliver successful outcomes.
In waterfall project management, centralized governance plays a crucial role in ensuring that projects are executed efficiently and effectively according to predefined plans and standards.

1.6 Methods by which Centralized Governance functions within a waterfall project management framework:

Establishing Standards and Processes:
Centralized governance defines and establishes standardized processes, methodologies, and best practices to be followed throughout the project lifecycle. This includes defining project phases, deliverables, and approval gates.

Enforcing Compliance:

Centralized governance ensures that project teams adhere to established standards and processes. This involves monitoring project progress, reviewing deliverables at key milestones, and ensuring that projects meet predefined quality criteria.

Resource Allocation:
Centralized governance oversees the allocation of resources, including personnel, budget, and equipment, to ensure that projects have the necessary resources to be successful. It helps in prioritizing projects and allocating resources based on organizational priorities and strategic objectives.

Risk Management:
Centralized governance oversees risk management activities within projects. It identifies potential risks, assesses their impact and likelihood, and defines mitigation strategies to minimize project disruptions and ensure successful delivery.

Decision Making:
Centralized governance facilitates decision-making processes within projects by providing a framework for escalation and resolution of issues. It ensures that decisions are made in a timely manner and are aligned with organizational objectives and priorities.

Communication and Reporting:
Centralized governance establishes communication channels and reporting mechanisms to ensure that project stakeholders are informed about project progress, issues, and decisions. It facilitates transparent communication and enables effective stakeholder engagement throughout the project lifecycle.

Quality Assurance:

Centralized governance oversees quality assurance activities to ensure that project deliverables meet predefined quality standards. It defines quality metrics, conducts reviews and audits, and provides guidance and support to project teams to ensure the delivery of high-quality outcomes.

Overall, centralized governance in waterfall project management provides a structured framework for planning, executing, and controlling projects, ensuring that they are delivered on time, within budget, and to the required quality standards. It helps in managing project risks, facilitating decision-making, and promoting collaboration and alignment across project teams and stakeholders.

In agile project management, centralized governance takes on a different role compared to traditional waterfall approaches. While agile methodologies emphasize decentralized decision-making and self-organizing teams, centralized governance still plays a critical role in providing oversight, support, and alignment across multiple agile teams and projects.

Methods by which Centralized Governance functions within an Agile project management framework:

Establishing Agile Frameworks and Standards:

Centralized governance defines and establishes agile frameworks, methodologies, and best practices to be followed across the organization. This includes defining common agile practices, such as Scrum or Kanban, and providing guidelines for their implementation.

Providing Agile Training and Support:

Centralized governance offers training and support to agile teams to ensure that they understand and can effectively implement agile principles and practices. This may include providing training sessions, coaching, and access to resources and tools.

Ensuring Alignment with Organizational Objectives:

Centralized governance ensures that agile initiatives and projects are aligned with organizational objectives and priorities. It provides guidance and support to agile teams to ensure that their work contributes to the overall strategic goals of the organization.

Facilitating Collaboration and Coordination:

Centralized governance facilitates collaboration and coordination among agile teams by providing platforms, tools, and communication channels for sharing information, coordinating efforts, and resolving dependencies.

Managing Resources and Budgets:

Centralized governance oversees resource allocation and budget management for agile projects. It ensures that resources are allocated effectively across projects and that budgets are managed in accordance with organizational policies and guidelines.

Monitoring and Reporting:

Centralized governance monitors the progress of agile projects and provides regular reporting to stakeholders. It tracks key metrics, such as velocity, cycle time, and burndown charts, to assess project health and identify areas for improvement.

Risk Management:

Centralized governance oversees risk management activities within agile projects. It identifies potential risks, assesses their impact and likelihood, and works with agile teams to develop mitigation strategies.

Continuous Improvement:

Centralized governance promotes a culture of continuous improvement within agile teams and across the organization. It facilitates retrospectives and lessons learned sessions to identify areas for improvement and implement changes to enhance agility and performance.

Overall, centralized governance in agile project management provides support, guidance, and oversight to agile teams while allowing them the autonomy to self-organize and make decisions. It ensures alignment with organizational objectives, promotes collaboration and coordination, and facilitates continuous improvement to drive successful outcomes in an agile environment.
The centralized governance model differs significantly between waterfall and agile project management methodologies due to their distinct approaches to project execution and decision-making.

Summary of the Centralized Governance Model comparison in both methodologies:

Waterfall Project Management:

Top-Down Decision Making:
In waterfall project management, centralized governance typically involves a top-down decision-making structure. Decisions regarding project planning, resource allocation, and risk management are made centrally by project managers or higher-level management.

Emphasis on Compliance and Control:
Centralized governance in waterfall emphasizes compliance with predefined processes, standards, and documentation requirements. There's a focus on control and adherence to a sequential project lifecycle with distinct phases and deliverables.

Rigid Framework:

The governance model in waterfall is based on a rigid framework with clearly defined roles, responsibilities, and reporting structures. There's limited flexibility to adapt to changing requirements or circumstances once the project plan is established.

Long-Term Planning:
Centralized governance in waterfall involves long-term planning and detailed upfront documentation. Project scope, requirements, and schedules are typically defined at the beginning of the project, and changes are discouraged once the project is underway.

Centralized Monitoring and Reporting:
Monitoring and reporting in waterfall projects are centrally managed, with project progress tracked against predefined milestones and deliverables. Reports are generated periodically to provide stakeholders with updates on project status.

Agile Project Management:

Decentralized Decision Making:
In agile project management, centralized governance involves a more decentralized decision-making structure. While centralized governance provides oversight and support, agile teams have greater autonomy to make decisions and self-organize.

Focus on Empowerment and Collaboration:
Centralized governance in agile emphasizes empowerment and collaboration within self-organizing teams. Agile teams are encouraged to collaborate closely with stakeholders and make decisions collectively to achieve project goals.

Adaptive Framework:

The governance model in agile is based on an adaptive framework that allows for flexibility and responsiveness to change. Agile teams embrace iterative development cycles, allowing for continuous refinement of requirements and adaptation to evolving circumstances.

Short-Term Planning:
Centralized governance in agile involves short-term planning with a focus on delivering value incrementally. While high-level objectives are established, detailed planning occurs iteratively throughout the project lifecycle, allowing for continuous refinement and adaptation.

Transparent Monitoring and Reporting:
Monitoring and reporting in agile projects are transparent and collaborative. Agile teams track progress using visible tools like burndown charts and task boards, enabling real-time monitoring of project status. Reporting is frequent and focuses on delivering tangible value to stakeholders.

Overall, the centralized governance model in waterfall project management is characterized by top-down decision-making, rigid processes, and long-term planning, while in agile project management, it emphasizes decentralized decision-making, empowerment of self-organizing teams, and adaptive planning and execution.

CHAPTER II:
REVIEW OF LITERATURE

2.1 Project Management Framework :

Building a balance between the traditional project management methods like Waterfall, a well-established project management framework with clear, defined, restricted, and sequential phases which offers a comprehensive step by step guide to the users in project management across the corporate arena and Agile , another effective project management framework that ensure collaboration, effectiveness, iterative delivery, data-driven decision making along with value to customers is key.

Simplicity in rules helps advance the agile manifesto and can help achieve broad statutory mandates such as increased competition and capital formation in the marketplace .

The project management framework you use for an organization can significantly impact project outcomes and team performance. Below are critical factors to consider in the best project management framework diagram:

- Find Key Variables – Each project has its own unique requirements and challenges. Hence It is important to have basic knowledge of the scope and key variables of the project to select the apt project management framework.Key variables in project management include scope, time, cost, quality, risk, resources, and stakeholder expectations. Scope defines the project's objectives and deliverables. Time encompasses project duration and deadlines. Cost involves budget allocation and expenditure. Quality refers to meeting project requirements and standards. Risk entails identifying and mitigating potential obstacles or uncertainties. Resources encompass human, financial, and material resources required for project execution. Stakeholder expectations involve managing communication and ensuring alignment with stakeholders' needs

and preferences. Balancing these variables is essential for successful project completion while meeting organizational goals and stakeholder satisfaction.

- Design a Comparison Chart - Listing out the different types of project management frameworks and their features will help you analyze whether they fit your resources and needs. This chart will succinctly outline key differences between Waterfall and Agile methodologies in approach, flexibility, documentation, customer involvement, and risk management.

- Weigh the Pros and Cons - Besides the charting, gain clear projects on the risks and rewards of each framework to get the best chances of success by buying- in the choice of your team, assuring their decision to embrace the one.

In the fast-paced and evolving landscape of the banking sector, the relevance of Agile methodologies compared to primitive methodologies (like Waterfall) is paramount in addressing constraints and meeting the dynamic demands of day-to-day operations.

Here's how Agile stands out:

Adaptability to Regulatory Changes:
Banking operations are heavily regulated, with frequent updates and changes in regulations. Agile's iterative approach allows banks to swiftly respond to regulatory changes by prioritizing and implementing compliance requirements in shorter cycles. This agility ensures that banks can maintain compliance while minimizing disruption to ongoing operations, a challenge that primitive methodologies may struggle to address due to their rigid and sequential nature.

Customer-Centric Solutions:
Today's banking customers expect personalized and innovative services delivered promptly. Agile methodologies prioritize customer feedback and collaboration, enabling banks to quickly develop and deploy new features or products based on customer needs and market trends. This

customer-centric approach fosters greater satisfaction and loyalty, driving competitive advantage in a crowded market where customer experience is a key differentiator.

Risk Management and Security:
Security threats and cyberattacks are constant concerns for banks. Agile methodologies promote continuous integration and testing, allowing for early detection and mitigation of security vulnerabilities. By integrating security measures into each iteration, banks can proactively address risks and enhance the resilience of their systems and processes, a crucial aspect that primitive methodologies may overlook until later stages of development.

Operational Efficiency:
Agile methodologies promote collaboration, transparency, and cross-functional teamwork, leading to improved operational efficiency within banking organizations. By breaking down silos and fostering a culture of collaboration, banks can streamline processes, reduce bottlenecks, and accelerate decision-making, ultimately enhancing productivity and reducing time-to-market for new products and services.
Innovation and Competitive Advantage: In today's digital age, innovation is key to staying ahead in the banking industry. Agile methodologies encourage experimentation, continuous learning, and adaptation to changing market conditions, enabling banks to innovate rapidly and seize opportunities for growth. By embracing Agile, banks can foster a culture of innovation that drives competitive advantage and positions them as leaders in the market.

In summary, Agile methodologies offer significant advantages over primitive methodologies in addressing the constraints of day-to-day banking operations. From regulatory compliance and customer satisfaction to risk management and innovation, Agile's adaptive and customer-centric approach equips banks with the agility and flexibility needed to thrive in an ever-changing environment. As banks continue to navigate technological advancements, regulatory pressures, and evolving customer expectations, Agile methodologies will remain relevant and essential in driving sustainable growth and success in the banking sector.

2.2 Consumer Behaviour in Waterfall and Agile Models

Consumer behavior is a direct action to obtain, consume and use the product or service including the decision process preceding and following the action. Toyota is a classic example of the Japanese philosophy of continuous improvement (Kaizen). The success of 'lean manufacturing system' or 'Just-in-Time (JIT) has been studied worldwide and imbibed in business models to have an integrative strategy, i.e. cross-functional strategy that appoints gradual improvement to be competitive in the ever-changing market

Our basis for data analysis worked on the principles as below (Fontana, 2014)

1. An agile software development team is a complex adaptive system that evolves in a discontinuous way
2. Improvement in work is done through experimentation helping develop new solutions
3. High performance is achieved through ambidexterity and
4. To accomplish the above, teams develop dynamic capabilities pursuing outcomes and not following codified routines

The Theory of Reasoned Action (TRA) is a psychological model that explains and predicts human behavior based on an individual's attitudes, subjective norms, and perceived behavioral control. While TRA is traditionally applied in various fields such as social psychology and health behavior, it can also be adapted for understanding and influencing behavior within agile project management contexts.

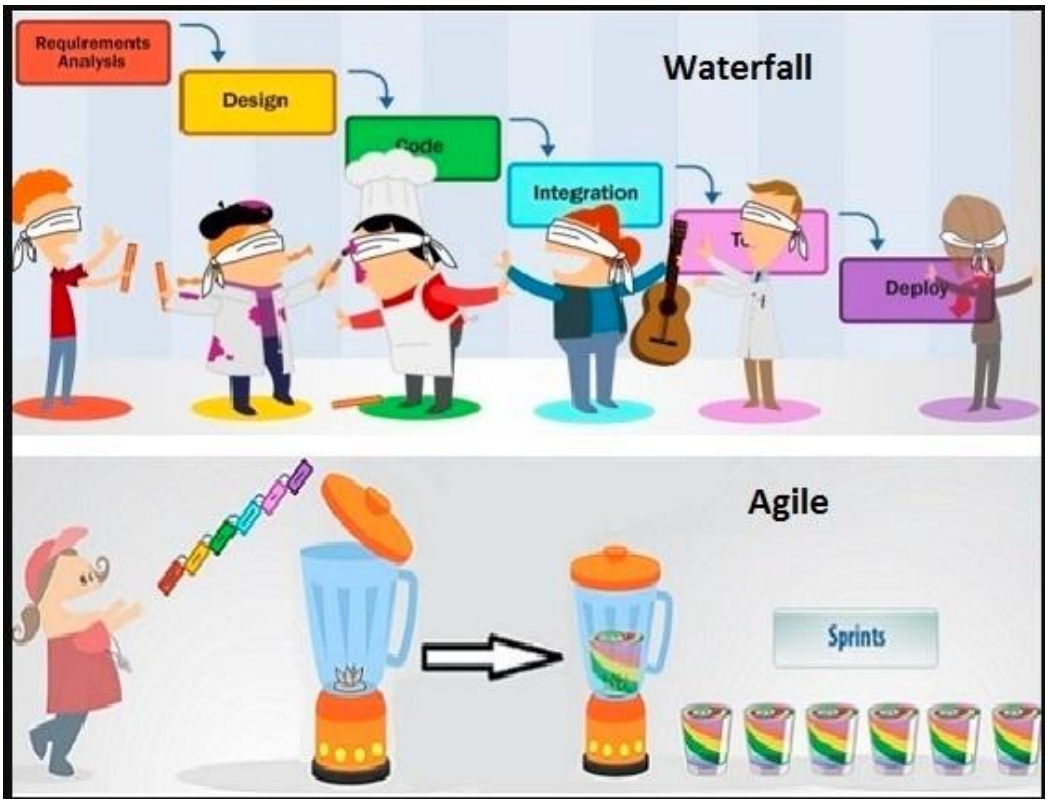

Fig 2.2 - Consumer Behaviour in Waterfall and Agile Models

Source - https://www.slideshare.net/IderaSoftware/

In the context of agile project management, the Theory of Reasoned Action can be applied as follows:

Attitudes Towards Agile Practices:

- Attitudes refer to an individual's positive or negative evaluations of performing a behavior. In agile project management, attitudes may relate to perceptions of the effectiveness, efficiency, and desirability of agile practices such as iterative development, continuous feedback, and collaboration.

- Project managers and team members may have different attitudes towards agile practices based on their experiences, beliefs, and perceptions of the benefits or drawbacks of agile methodologies.

Subjective Norms in Agile Teams:

- Subjective norms refer to an individual's perception of social pressures or expectations to perform or not perform a behavior. In agile teams, subjective norms may influence behavior based on the perceived expectations of team members, stakeholders, or organizational culture.
- For example, team members may feel pressure to adopt agile practices if they perceive that their peers or leadership value agile principles and expect adherence to agile methodologies.

Perceived Behavioral Control in Agile Environments:

- Perceived behavioral control reflects an individual's belief in their ability to perform a behavior and the extent to which they perceive internal and external factors to facilitate or inhibit their ability to enact the behavior. In agile project management, perceived behavioral control may relate to factors such as technical skills, resources, support, and autonomy.
- Agile team members' perceptions of their ability to implement agile practices effectively, overcome obstacles, and exert influence within the team or organization can impact their willingness to embrace agile methodologies.

Behavioral Intentions and Actual Behavior:

- According to TRA, behavioral intentions are the proximal predictors of behavior, representing an individual's readiness and willingness to perform a behavior. Behavioral intentions are influenced by attitudes, subjective norms, and perceived behavioral control.
- In agile project management, team members' intentions to adopt and adhere to agile practices are influenced by their attitudes towards agile, subjective norms within their team or organization, and their perceived ability to implement agile methodologies effectively.
- Behavioral intentions may ultimately translate into actual behavior, such as actively participating in agile ceremonies, embracing iterative development, collaborating with team members, and adapting to changing requirements.

By applying the Theory of Reasoned Action within agile project management contexts, project managers and agile coaches can gain insights into the factors influencing team behavior and

tailor strategies to promote the adoption and successful implementation of agile practices. This may involve addressing attitudes towards agile, fostering supportive social norms, and empowering team members to overcome barriers to agile adoption.

Several factors influence team behavior and the successful implementation of agile practices. Understanding these factors and tailoring strategies accordingly is crucial for effective adoption:

Organizational Culture:
The existing organizational culture significantly impacts how teams embrace agile practices. A culture that values transparency, collaboration, and innovation fosters agile adoption. Strategies should focus on aligning agile principles with the organization's values and promoting cultural shifts towards agility.

Leadership Support:
Leadership plays a critical role in championing agile transformation. Leaders must demonstrate commitment to agile methodologies, provide resources, and remove barriers to adoption. Strategies include educating and involving leaders in agile processes, fostering their understanding of the benefits, and empowering them to lead by example.

Team Dynamics:
Team dynamics, including communication patterns, trust levels, and collaboration, influence agile adoption. Strategies should focus on building cohesive teams through team-building activities, fostering open communication channels, and establishing clear roles and responsibilities.

Individual Attitudes and Skills:
Individual attitudes towards change and agile practices impact adoption. Strategies should involve assessing individual readiness for agile, providing training and coaching to enhance skills, and addressing resistance through change management techniques.

Communication and Feedback:
Effective communication and feedback mechanisms are essential for agile success. Strategies include promoting open and transparent communication channels, encouraging feedback loops, and facilitating regular retrospectives to identify areas for improvement.

Experimentation and Adaptation:
Agile values experimentation and continuous improvement. Strategies involve encouraging teams to experiment with agile practices, providing support for learning from failures, and fostering a culture of adaptability and resilience.

Recognition and Celebration:
Recognizing and celebrating successes, no matter how small, reinforces positive behavior and motivates teams. Strategies include acknowledging achievements, highlighting team contributions, and creating a supportive environment that values learning and growth.

By considering these factors and tailoring strategies to address them, organizations can promote the successful adoption and implementation of agile practices. It requires a holistic approach that encompasses cultural, leadership, team, and individual aspects, fostering an environment conducive to agile values and principles.

2.3 Agile Manifesto - Human Society Theory

The ‘Agile Manifesto’ as alluded earlier in the paper was a structured attempt and moving away from traditional methods and moving to an ‘agile way of work’. This is long and arduous and requires tasks to be people centric which makes it more difficult and unpredictable. There is also a cultural significance to be taken into account which if not handled correctly could have a negative effect on the transformation
People being accustomed to the status quo which could act as a barrier to change. Leaders advocating Agile need to work on aspects such as team’s buy-in, morale boosting, management agreement of change, systemic handling of perceptions of people to change. To achieve effective

teamwork in an agile world, the notion of a leader needs to be transformed through facilitation and coaching rather than command and control (Kevin Johnston, 2017)

Applying theories from the field of human society to agile project management can provide valuable insights into team dynamics, communication patterns, and organizational behavior. One such theory that can be relevant is Social Identity Theory. Team dynamics are vital in Agile projects. Strong team dynamics are influenced by effective communication, conflict resolution, empowerment, trust, and ongoing learning. By encouraging teamwork and problem-solving abilities, these dynamics substantially impact project outcomes and complete projects in Agile contexts.

The adoption of Agile project management technologies is crucial, along with team dynamics. Teams can effectively organize tasks, communicate, and collaborate using Jira, Trello, Asana, Slack, Microsoft Teams, and QR codes. These technologies make it easier to share information, coordinate tasks, and monitor progress, increasing the overall effectiveness of Agile project management.

Organizations must incorporate both team dynamics and efficient tool use if they want to get the best results. Teams can increase their productivity and success in today's changing business climate by fostering a collaborative and creative team atmosphere and utilizing suitable Agile project management technologies. With this all-encompassing strategy, projects are delivered successfully and efficiently, meeting the changing needs of stakeholders and producing the intended results.(Elen Mesropyan, 2023)

Fig 2.3 - Agile Manifesto

Source : https://mungfali.com/explore/Agile-Manifesto-Infographic

Social Identity Theory:

Group Identity in Agile Teams:

Group identity in agile teams refers to the collective sense of belonging, cohesion, and shared purpose among team members. It emerges from the alignment of individual values, goals, and behaviors with those of the team. Several factors contribute to the development of group identity in agile teams:

- Social Identity Theory posits that individuals derive a sense of identity and self-esteem from the groups they belong to. In agile teams, team members develop a shared identity based on their common goals, values, and practices.
- Understanding this group identity can help project managers foster a sense of belonging and cohesion within agile teams. Emphasizing the team's shared purpose and values can strengthen team bonds and promote collaboration.

Overall, group identity in agile teams is essential for driving collaboration, innovation, and high performance. By nurturing a strong sense of identity and belonging among team members, agile teams can effectively navigate challenges, adapt to change, and deliver value to stakeholders.

In-Group Favoritism:

In-group favoritism, also known as in-group bias, refers to the tendency of individuals to favor members of their own group over those outside the group. In the context of agile project teams, in-group favoritism can manifest in various ways.

- Social Identity Theory suggests that individuals often exhibit in-group favoritism, showing preference for members of their own group over outsiders. In agile teams, this can manifest as strong collaboration and support among team members while potentially leading to conflicts with individuals or groups outside the team.
- Project managers can leverage in-group favoritism by fostering a sense of camaraderie and unity within agile teams. Encouraging team members to support and advocate for each other can enhance team cohesion and productivity.

To mitigate the negative effects of in-group favoritism in agile project teams, it's essential for project managers and team leaders to:

- Foster a culture of inclusion and diversity within the team.
- Encourage open communication and collaboration with individuals outside the team.
- Implement fair and transparent decision-making processes.
- Provide equal opportunities for recognition and rewards based on merit rather than group affiliation.
- Address conflicts and biases through conflict resolution techniques and team interventions.
- Promote cross-functional collaboration and knowledge-sharing across different teams and departments.

Inter-Group Dynamics:

Inter-group dynamics in agile project management refer to the interactions, relationships, and collaborations between different agile teams or groups within an organization. These dynamics can significantly impact project outcomes and organizational effectiveness. Here's a closer look at inter-group dynamics in agile project management:

- Collaboration vs. Competition: Inter-group dynamics may involve both collaboration and competition between agile teams. While collaboration fosters knowledge sharing, synergy, and collective problem-solving, competition can arise due to resource constraints, conflicting priorities, or differences in team objectives. Balancing collaboration and competition is essential for maximizing overall organizational performance.

- Dependencies and Handoffs: Agile projects often involve dependencies between different teams or groups. Inter-group dynamics influence how effectively these dependencies are managed, including communication, coordination, and alignment of priorities. Clear

communication channels, regular sync-ups, and shared understanding of dependencies are essential for minimizing delays and bottlenecks.

- Resource Allocation and Prioritization: Inter-group dynamics impact resource allocation and prioritization decisions within organizations. Competing demands for resources, such as skilled personnel, budget, or technology, can create tensions between different agile teams. Effective governance mechanisms, transparent decision-making processes, and alignment with organizational goals are necessary for fair and equitable resource allocation.

- Knowledge Sharing and Learning: Inter-group dynamics provide opportunities for knowledge sharing and learning across different agile teams. Collaboration between teams enables the exchange of best practices, lessons learned, and innovative ideas. Establishing communities of practice, cross-functional training sessions, and shared repositories can facilitate knowledge sharing and promote continuous improvement.

- Conflict Resolution: Conflicts may arise between different agile teams due to differing priorities, communication breakdowns, or resource constraints. Effective conflict resolution mechanisms, such as mediation, negotiation, or escalation procedures, are essential for resolving inter-group conflicts constructively and minimizing disruptions to project progress.

- Leadership and Governance: Leadership and governance structures influence inter-group dynamics within organizations. Strong leadership that promotes collaboration, facilitates communication, and resolves conflicts fosters positive inter-group relationships. Agile governance frameworks, such as scaled agile frameworks (SAFe) or Large-Scale Scrum (LeSS), provide guidelines for managing inter-group dynamics in large-scale agile environments.

- Organizational Culture: Organizational culture shapes inter-group dynamics by influencing norms, values, and behaviors related to collaboration and competition. A culture that values teamwork, trust, and transparency fosters positive inter-group relationships. Building a

culture of psychological safety, where team members feel comfortable expressing ideas and concerns, is essential for effective collaboration across different agile teams.

Overall, managing inter-group dynamics in agile project management requires a combination of effective communication, collaboration, conflict resolution, and leadership to promote synergy, alignment, and collective success within organizations

- Social Identity Theory also highlights inter-group dynamics, including competition and cooperation between different groups. In agile project management, inter-group dynamics may arise between agile teams, departments, or external stakeholders.

- Project managers can mitigate potential conflicts between groups by promoting a sense of shared identity and common goals across the organization. Emphasizing collaborative efforts and aligning incentives can foster positive inter-group relationships and facilitate effective cross-team collaboration.

Communication and Trust:

- Social Identity Theory underscores the importance of communication and trust within groups. Effective communication and trust are essential for maintaining group cohesion and achieving collective goals.
- Project managers can enhance communication and trust within agile teams by fostering an open and transparent communication culture. Encouraging active listening, providing constructive feedback, and promoting psychological safety can strengthen interpersonal relationships and build trust among team members.

By applying Social Identity Theory to agile project management, project managers can gain insights into team dynamics, communication patterns, and inter-group relationships. Understanding the role of group identity, in-group favoritism, and inter-group dynamics can

inform strategies to foster collaboration, build trust, and enhance overall team performance in agile environments.

2.4 Summary

An agile mindset, as articulated by prominent agile authors, encompasses attitudes fostering a productive working culture. This includes respect, collaboration, iteration, improvement, and learning cycles. Agile minds prioritize adaptability over rigid adherence to plans and hold themselves accountable for outcomes, emphasizing the delivery of value. Pride in ownership and a continuous focus on learning and improvement are central tenets. Authors such as Jeff Sutherland and Kent Beck emphasize these principles as fundamental to agile methodologies.Fundamental principles of Agile methodologies include customer satisfaction through continuous delivery of valuable software, embracing changing requirements for competitive advantage, delivering working software frequently, collaborating closely with customers and stakeholders, building projects around motivated individuals and supporting them, fostering face-to-face communication, measuring progress through working software, maintaining a sustainable pace to promote agility, ensuring attention to technical excellence and good design to enhance agility, and fostering simplicity by maximizing the amount of work not done. These principles prioritize adaptability, customer collaboration, iterative development, and continuous improvement to drive project success and deliver value efficiently.

An agile mindset is the combination of attitudes supporting a productive working culture. These include respect,collaboration, iteration, improvement and learning cycles,pride in ownership, focus on delivering value, and the ability to adapt to change. Agile minds prioritize adoption to change over sticking to a plan and hold themselves accountable for outcomes such as growth, profitability, and customer loyalty, not outputs such as the number of new products,etc.

An Agile mindset is the combinations of actions and behaviors that result in an agile culture. Encompasses values, principles, *and* a disciplined focused approach to using the agile framework as part of the contemporary way of working. It is a shift from linear plan driven ways of working towards an adaptive, value driven, customer centric approach.This mindset is the environment within which agile teams flourish. It isn't a prerequisite for an agile adoption, nor is it required for a functional agile team. But if this mindset is cultivated and nourished, the teams (and therefore the company) will experience amazing results – happy employees delivering great value and making customers elated with the results.

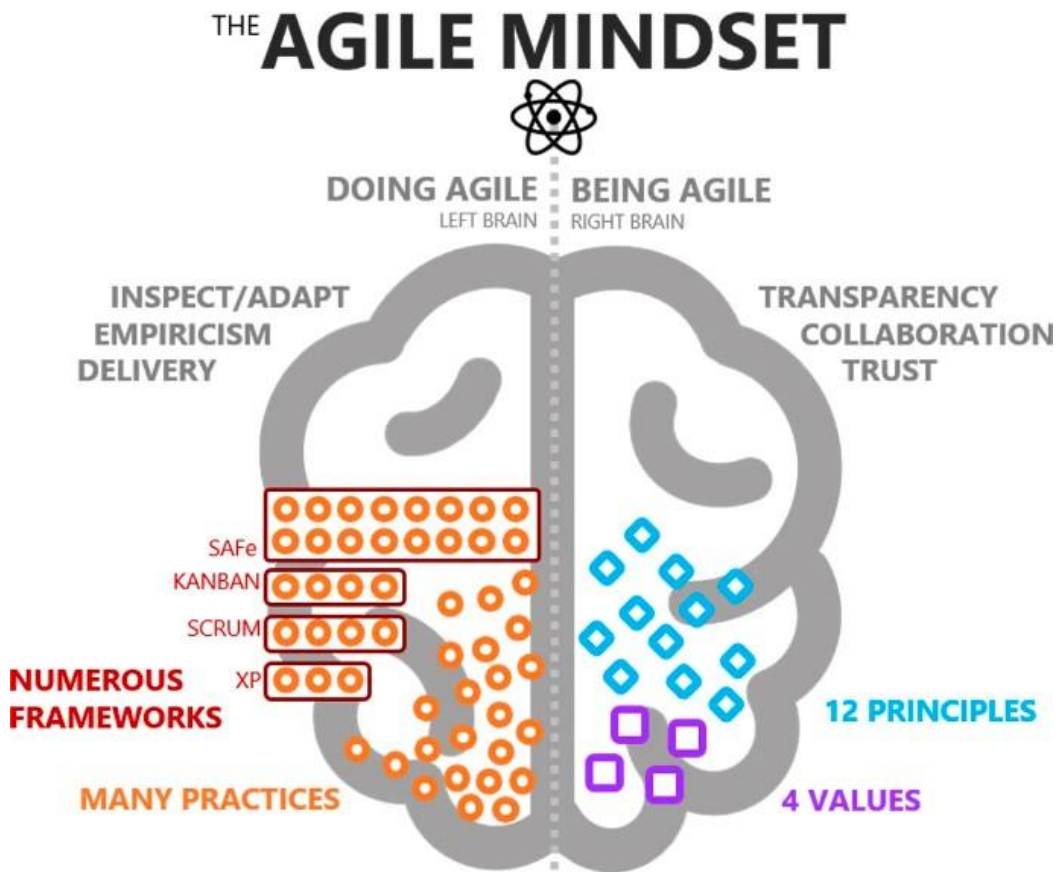

Fig 2.4 Agile is a mindset and a behavior

Source : https://zenexmachina.com/agile-as-a-mindset-agile-as-behaviour/

CHAPTER III:
METHODOLOGY

3.1 Overview of the Research Problem

The primary research method for this study is a multifaceted approach combining case study reviews, focus group surveys, and semi-structured interviews. This methodological triangulation enhances the depth and breadth of understanding of the research topic by synthesizing existing knowledge from scholarly sources with first-hand insights and perspectives from participants.

Literature Review of Case Studies:

The literature review serves as the foundational component of the research methodology. It involves systematically identifying, reviewing, and synthesizing existing scholarly literature relevant to the research topic. By examining theoretical frameworks, empirical studies, and practical applications, the literature review provides a comprehensive understanding of the subject matter, identifies gaps in knowledge, and informs the development of research questions and hypotheses.

The literature review serves as the cornerstone of research methodology, meticulously analyzing and amalgamating scholarly works pertinent to the research subject. Through scrutinizing theoretical frameworks, empirical studies, and real-world applications, it furnishes an exhaustive comprehension of the topic, discerns areas lacking in understanding, and guides the formulation of research inquiries and hypotheses. This systematic process not only establishes the research's foundation but also facilitates the identification of relevant methodologies and informs subsequent data collection and analysis strategies, thereby enhancing the rigor and validity of the study's findings.

Focus Group Surveys:

Focus group surveys are conducted to gather qualitative data from a diverse group of participants with shared characteristics or experiences related to the research topic. These surveys involve structured discussions facilitated by a moderator, allowing participants to express their perspectives, opinions, and insights in a collaborative setting. Focus group surveys enable the

exploration of complex issues, the identification of common themes and patterns, and the generation of rich qualitative data that complements and contextualizes findings from the literature review.

Focus group surveys gather qualitative data from a diverse cohort sharing characteristics or experiences pertinent to the research topic. Facilitated structured discussions elicit participant perspectives, opinions, and insights collaboratively. This method delves into intricate issues, identifies recurring themes, and generates qualitative data enriching literature review findings. It provides a platform for nuanced exploration, supplementing and contextualizing research outcomes.

Semi-Structured Interviews:

Semi-structured interviews provide an opportunity for in-depth exploration of specific themes or topics identified during the literature review and focus group surveys. Interviews were conducted with individual participants selected based on their relevance to the research objectives, expertise, or unique perspectives.Intent was that through the Semi-structured interviews, it offers a chance for thorough examination of themes from literature reviews and focus group surveys. These interviews engaged individual participants chosen for their alignment with research goals, expertise, or distinct viewpoints. Providing flexibility while maintaining focus, this approach enabled probing into nuanced aspects and gathering rich insights. By targeting key contributors, it ensured depth and relevance in data collection, facilitating a comprehensive understanding of the subject matter. The semi-structured nature of the interviews allowed for flexibility in questioning, enabling probing deeper into participants' responses helping clarify ambiguities, and uncovering new insights. Through semi-structured interviews, gained a nuanced understanding of participants' experiences, motivations, attitudes, and behaviors, thereby enriching the overall findings of the study.

By integrating case studies, focus group surveys, and semi-structured interviews, this research methodology adopts a holistic approach to inquiry, combining theoretical insights with empirical

evidence and stakeholder perspectives. This methodological triangulation enhances the validity, reliability, and rigor of the study, ensuring that the research findings are comprehensive, nuanced, and actionable.

The approach used to collect the data through this approach was based on guidelines proposed by Halcomb and Davidson (2006) through an iterative process.

Reflective documentation was done immediately post interviews, revising details to triangulate on data for analysis.

After conducting semi-structured interviews, the research methodology involved immediate reflective documentation to capture key insights, observations, and impressions while they are fresh. This reflective documentation served as a preliminary record of the interview process, including notable themes, emerging patterns, and unexpected findings helping to document their thoughts, reactions, and interpretations of the interview data, providing valuable context for subsequent analysis.

Following the interviews, revisited the reflective documentation and the interview transcripts to refine and revise details, ensuring accuracy and completeness. This process of revising details involves triangulating on the data by cross-referencing information from multiple sources, such as the reflective notes, interview transcripts, and supplementary materials. By triangulating the data, the researcher verifies consistency, identifies discrepancies, and validates interpretations, enhancing the reliability and trustworthiness of the findings.

Ultimately, the combination of immediate reflective documentation and subsequent revision of details facilitates a comprehensive analysis of the interview data. It enables us to uncover nuanced insights, detect underlying patterns, and derive meaningful conclusions that accurately reflect participants' perspectives and experiences. This iterative process of reflection and revision enhances the rigor and depth of the research, contributing to the validity and credibility of the study's findings.

This study first reviewed various types of constraints in banking and their characteristics, through Classification method will be developed to categorize constraint factors . Finally, once

the constraint classification and modeling techniques are identified, a conceptual framework for total constraint management will be outlined.

This study embarked on a comprehensive exploration of constraints prevalent in the banking sector, aiming to discern their multifaceted characteristics and implications. The initial phase involves an exhaustive review encompassing diverse types of constraints encountered in banking operations. Constraints may span regulatory compliance, technological limitations, resource constraints, market dynamics, operational inefficiencies, and customer demands, among others. Each type exhibits distinct attributes, such as specificity, impact severity, and temporal variability.

Subsequently, a robust classification method is proposed to systematize the categorization of constraint factors identified during the review process. This methodological framework is devised to effectively organize constraint factors into coherent groups or categories based on common attributes, causal relationships, or operational contexts. Utilizing classification techniques such as hierarchical clustering, factor analysis, or decision tree algorithms, the study seeks to discern underlying patterns and interdependencies among constraint factors.

The development of a classification method holds several pivotal objectives. Firstly, it aims to provide a structured taxonomy that delineates the landscape of constraint factors within the banking domain, facilitating a comprehensive understanding of the challenges faced by financial institutions. Secondly, it enables the identification of key dimensions or clusters of constraints, offering insights into high-impact areas requiring strategic attention and resource allocation. Thirdly, the classification method serves as a valuable tool for stakeholders in formulating targeted interventions, devising mitigation strategies, and optimizing resource allocation to address constraint factors effectively.

By leveraging the classification method, this study endeavors to furnish the banking industry with actionable insights and decision-support tools to navigate complex operational challenges. Through a nuanced understanding of constraint factors and their classification, banks can enhance agility, resilience, and competitiveness in an evolving regulatory and technological

landscape. Ultimately, the study aspires to contribute to the advancement of banking practices and foster sustainable growth and innovation within the financial sector.

AGILE MANIFESTO – **http://agilemanifesto.org/**

▫ Individuals and interactions	**over processes and tools**
▫ Working software	**over comprehensive documentation**
▫ Customer collaboration	**over contract negotiation**
▭ Responding to change	**over following a plan**
.....^.....	.....^.....
While there is value on the right	**we value the items on the left more**

The Agile Manifesto, a foundational document for agile methodologies, emphasizes four key values and twelve principles that prioritize individuals and interactions, working software, customer collaboration, and responding to change over following rigid processes and documentation. The benefits of adhering to the Agile Manifesto include:

Customer Satisfaction: Agile approaches prioritize customer collaboration and responsiveness to their evolving needs, resulting in higher levels of customer satisfaction and product relevance.
Adaptability: Agile methodologies promote flexibility and adaptability, allowing teams to quickly respond to changing requirements, market conditions, and customer feedback, enabling faster time-to-market and competitive advantage.
Quality Improvement: By emphasizing continuous integration, testing, and feedback loops, Agile methodologies facilitate early identification and resolution of issues, leading to higher-quality deliverables and reduced rework.

Team Collaboration and Empowerment: Agile fosters a culture of collaboration, empowerment, and self-organization among team members, leading to increased morale, productivity, and innovation.

Transparency and Visibility: Agile practices promote transparency and visibility into project progress, impediments, and risks through frequent communication, feedback, and shared understanding, enabling better decision-making and risk management.

Predictability: Agile methodologies provide greater predictability in project delivery by breaking work into smaller, manageable increments, allowing for more accurate estimation and forecasting of project timelines and deliverables.

Continuous Improvement: Agile encourages a mindset of continuous improvement through regular reflection, adaptation, and learning, enabling teams to iteratively enhance processes, products, and practices over time. In their 2017 paper, "Method for Adaptation and Implementation of Agile Project Management Methodology," Andris Rasnacis and Sergejs Berzisa present a structured approach for adapting and implementing Agile project management methodologies within organizations. Overall, the paper offers a valuable framework for organizations seeking to transition to Agile project management, emphasizing the importance of customization and continuous improvement in the adaptation process.

In summary, embracing the Agile Manifesto and its principles fosters customer-centricity, adaptability, quality improvement, collaboration, transparency, predictability, and continuous improvement, ultimately leading to greater project success and value delivery.

3.2 Operationalization of Theoretical Constructs

Main variables and their measures:

- Resource planning : Since Agile works on incremental cycles , delivery of the end product or prediction of cost, time and resourcing becomes more critical as the project gets bigger and more complex. Measuring the same needs to be done through Skill-fit management,Supply and demand resourcing and sequenced delivery

- Measurement of output – since incremental delivery is the key component to get the end result the measurement of output of being fragmented or cohesive needs to be done. This can be measured through a Project Charter, Resource Management plans and Project document updates
- Documentation and tracking : Since documentation happens throughout, especially around ‘build time’ and not at the beginning, level of detailing to include variable KPI’s . Burn up and Burn down charts help as visualization prediction tools

3.3 Research Purpose and Questions

The purpose of this research is to advocate and dwell into the relativity of Agile versus earlier used methodologies

1. How relevant is Agile versus primitive methodologies in addressing constraints in day to day banking ?
2. How to classify these constraints for easier identification and modeling ?
3. How can alignment of cross team KPI help in addressing issues and resolving conflict while solutioning constraints ?
4. What is the role of centralized governance in meeting the planned objectives?

3.4 Research Design

The keys to successful agile surveys are a careful new balance of frequency and brevity.
Designing a research study for agile project management involves careful consideration of the research objectives, methodology, data collection techniques, and analysis approaches. Here's a proposed research design for studying agile project management:

Research Objectives:

- Clearly defined the research objectives, such as understanding the effectiveness of agile methodologies, identifying best practices, or exploring challenges in agile adoption.

Methodology:

- Adopted an approach combining qualitative and quantitative methods to provide a comprehensive understanding of agile project management.
- Qualitative methods such as interviews and case studies can capture rich insights into experiences, perceptions, and behaviors related to agile practices.
- Quantitative methods such as focus group surveys provided statistical validation and generalizability of findings.

Data Collection Techniques:

- Empirical study through inspiring real world case studies of agile methodologies
- Conducted semi-structured interviews with project managers, team members, and stakeholders to explore their experiences, challenges, and perceptions of agile project management.
- Facilitated focus group discussions to delve deeper into specific topics or themes related to agile practices, such as teamwork, communication, or decision-making.

Sampling Strategy:

- Employed purposive sampling to select participants who have experience with agile methodologies and diverse perspectives relevant to the research objectives.
- Ensured representation from different organizational levels, project types, and industries to capture a comprehensive range of experiences and viewpoints.

Data Analysis:

- Utilized thematic analysis for qualitative data to identify patterns, themes, and insights emerging from interviews and focus groups.
- Employed statistical analysis techniques for quantitative data to identify correlations, trends, or associations between variables related to agile project management.

Ethical Considerations:

- Ensure ethical principles such as informed consent, confidentiality, and participant anonymity are upheld throughout the research process.
- Obtain necessary approvals from individuals to conduct and share their research

Validity and Reliability:

- Implement strategies to enhance the validity and reliability of research findings, such as triangulation of data sources, member checking, and peer debriefing.

By following this research design, gained valuable insights into agile project management, best practices to contribute to the advancement of knowledge in this field.

The design and structure used to get a view on the preferred approach in methodologies was as below:

- Survey with a set number of pre-screened participants for collecting information through responses to inquiries , i.e. 8 concise questions
- This ‘Focus group survey’ included staff across levels managing projects who have worked in both waterfall as well as agile methods of working.
- Respondent base was across Management, Operations and technology teams This was done to clearly help distinguish views and understanding of benefits and disadvantages of both the approaches

- Mobile friendly – To help get contextual, in the moment feedback keeping in mind that there is a good user experience , mobile survey was conducted

3.5 Population and Sample

Determining the sample size for focus group surveys depends on various factors, including the research objectives, the diversity of participants, the complexity of the topic, and the desired level of data saturation. While there's no fixed rule for sample size in focus group surveys, here are some considerations to help guide your decision:

Diversity of Participants:
Aim was for a diverse range of participants who represent different perspectives, experiences, and demographics relevant to the research objectives. A diverse sample can provide richer insights and a broader understanding of the topic was used as the rationale to conduct the same.

Data Saturation:
Focus group surveys aimed to achieve data saturation, where new information or themes stopped emerging, indicating that sufficient data has been collected based on the complexity of the subject matter.

Practical Constraints:
Considered practical constraints such as time, budget, and resources available for conducting focus group surveys. Balanced the desire for a larger sample size with the improved qualitative

content of sample due to subject matter expertise within the constraint of participants within the available resources.

Research Goals:

Clarified during the semi-structured interviews , the specific research goals and the depth of insight required to achieve those goals. The research aimed to explore a broad range of perspectives and experiences however a larger sample size would be necessary for that which was not possible. Since the focus is on in-depth exploration of specific themes, a smaller sample size sufficed.

Contextual Factors:

Considered contextual factors such as the homogeneity or heterogeneity of the participant population, the complexity of the research topic, and the level of variation in participant responses. These factors influenced the optimal sample size for focus group surveys.

To summarize, the Focus Group Survey typically involved 25 participants to facilitate meaningful diverse perspectives. It was essential to prioritize quality over quantity and ensure that the sample size is sufficient to meet the research objectives and generate insightful findings. Keeping in mind having the demographics across ethnic, diversity and profile background , the population chosen was

- Respondents were across teams based in Mumbai , India
- Sample population respondent base were chosen across Management, Operations and technology teams
- The questionnaire was sent to a group of 25 project managers in the period 2023
- The questionnaires contained 10 questions with suggested answers.
- Respondents were asked to base their answers on a project they had been involved in the last one plus years that was either completed or near completion.

3.6 Participants Selection

When selecting participants for focus group surveys and semi-structured interviews, it was essential to consider several factors to ensure the research gathered diverse perspectives and relevant insights. Here are some guidelines used for participant selection:

Relevance to Research Objectives:

- Participants should have direct experience, knowledge, or expertise related to the research topic or objectives. Considered individuals who are actively involved in agile project management, such as project managers, team members, stakeholders, or agile coaches.In order to enhance validity, only informants that had relevant experience of the problem of the research were selected. The information provided by informants, therefore, is not based on opinion, but on actual experience.

Diversity of Perspectives:

- Aimed for diversity in participant backgrounds, roles, experiences, and viewpoints to capture a comprehensive range of perspectives. Include participants from different organizational levels, project types, and agile maturity levels to ensure varied insights.

Inclusion Criteria:

- Defined specific inclusion criteria based on the research objectives. Considered factors such as years of experience in agile project management, familiarity with specific agile methodologies (e.g., Scrum, Kanban), or involvement in agile transformation initiatives.

Purposive Sampling:

- Use purposive sampling techniques to select participants who meet the defined inclusion criteria and can contribute meaningful insights to the research. Purposefully selected individuals who can provide diverse perspectives and enrich the data collected.

Recruitment Channels:

- Identified appropriate recruitment channels to reach potential participants, such as professional networks, industry associations, agile communities, or organizational contacts. Utilized multiple channels to maximize participant diversity and reach.

Participant Consent:

- Obtain informed consent from participants before their involvement in focus group surveys or semi-structured interviews. Clearly communicated the purpose of the research, the voluntary nature of participation, and the confidentiality of responses.

Sample Size:

- Decided on appropriate sample size based on the research methodology, objectives, and desired level of data saturation. Balanced the need for a sufficient sample size with practical considerations such as resource constraints and data quality.

Participant Engagement:

- Ensured participants felt valued and engaged throughout the research process. Clearly communicated the importance of their contributions, actively listen to their perspectives, and create a supportive environment for open dialogue and discussion.

By carefully selecting participants for focus group surveys and semi-structured interviews, the research helped gather valuable insights, diverse viewpoints, and rich qualitative data to inform the research findings effectively.

Pre-screening was done to check on the following :

- Tenure in role specific to projects
- Demographics in the organization
- Role of respondent in the overall project

- Selection was done across various groups of people in hierarchy

3.7 Instrumentation Approach

In the Focus Group Survey and Semi structured interviews , single and multiple choice questions were used in which the respondents were asked to select either one option or multiple applicable options from a predetermined list.

Instrumentation refers to the tools, techniques, and procedures used to collect data during interventions. Effective instrumentation is essential for guiding discussions, eliciting meaningful responses from participants, and capturing relevant insights. Here are key components of instrumentation in focus group surveys and semi structured interviews :

Discussion Guide:

- Developed a comprehensive discussion guide outlining the topics, questions, and prompts to be covered during the focus group session. The discussion guide should be structured yet flexible, allowing guiding the conversation while also encouraging spontaneous sharing by participants.

Open-Ended Questions:

Framed open-ended questions that encourage participants to share their experiences, opinions, and perspectives freely. Avoid leading or biased questions and instead focus on exploring key themes and eliciting diverse viewpoints - this was done during interviews.

Probes and Follow-Up Questions

- Prepared probes and follow-up questions to delve deeper into specific topics, clarify responses, or encourage further discussion. Probes helped uncover underlying motivations, perceptions, or experiences that may not surface initially.

Moderator Skills:

- Prepared self with effective facilitation skills to guide the discussion, manage group dynamics, and ensure balanced participation maintaining a neutral stance, actively listen to participants, and encouraging respectful interaction.

Recording responses:

- Took notes to document key points, observations, and insights during the focus group session. Note-taking supplements additional context for data analysis.

Participant Materials:

- Provide participants with relevant materials or handouts, such as consent forms, background information, to enhance their understanding of the topics and facilitate discussion.

Pre-Testing:

- Conduct pre-testing or pilot sessions to refine the discussion guide, assess the clarity of questions, and identify potential challenges or ambiguities before the actual focus group surveys.

By carefully designing and implementing instrumentation in focus group surveys, attempts were made to facilitate productive discussions, capture rich qualitative data, and generate meaningful insights into the research topic.

In the semi structured interview , the same respondents were asked to elaborate on their thoughts and rationale , experiences supporting the same

3.8 Data Collection Procedures

In focus group surveys, data collection begins with participant recruitment based on inclusion criteria. Sessions typically involve a facilitator guiding discussions using a structured discussion guide, with open-ended questions and probes encouraging participant interaction. through note-taking for additional context. Participant confidentiality and informed consent are ensured

throughout. After the session, recordings were transcribed, and notes were analyzed to identify themes and insights. The data collected from multiple sessions were synthesized to provide a comprehensive understanding of the research topic.

In semi-structured interviews, data collection commences with participant selection based on research objectives.

Choice of participant :

- The participants were chosen from a Multinational corporation
- Office is located in the Mumbai suburban district in Maharashtra, India.
- The eligibility criteria chosen was graduates having experience in banking
- Minimum work experience was ranging from one year to twenty plus years
- Experience was across cadres within the organization
- Diversity candidates were taken in the mix
- Candidates had experience across operations, technology , reference data , risk and controls

Interviews are conducted in an informal environment using a flexible interview guide, allowing for in-depth exploration of topics. Open-ended questions and probes elicit rich responses from participants. Concurrent note-taking captures non-verbal cues and contextual details. Ethical considerations, such as informed consent and confidentiality were upheld throughout the process. After interviews, recordings were transcribed, and notes analyzed to identify patterns and themes. The collected data provided valuable insights into participants' perspectives and experiences related to the research topic.

Methodology used to collate the data as below:

- Period of 8 weeks given to respondent to get back on the survey and interviews happened in 2 weeks post the same

- Response received from 15 of the 18 respondents chosen, limited response from the management cadre – rationale shared was that inability to respond due to limited technical expertise

3.9 Data Analysis

Data analysis of focus group surveys and semi-structured interviews involved systematically examining the collected data to identify patterns, themes, and insights relevant to the research objectives.

Here's a comprehensive approach to actions taken in analyzing data from these qualitative research methods:

Transcription: Started by transcribing discussions of semi-structured interviews verbatim. Transcription ensured accurate representation of participants' responses and facilitated subsequent analysis.

Pattern Recognition: Looked for patterns, trends, and relationships within and across categories. Identified similarities and differences in participants' responses, viewpoints, and experiences. Paid attention to variations based on participant demographics, roles, or other contextual factors.

Triangulation: Triangulated data sources by comparing and contrasting findings from focus group surveys and semi-structured interviews. Look for convergence or divergence in themes and insights across different data collection methods.

Interpretation: Interpreted the findings in relation to the research objectives, theoretical frameworks, and existing literature. Drew connections between the identified themes and broader implications for theory, practice, or policy.

Conclusion: Concluded the data analysis process by summarizing the main findings, highlighting their significance, and discussing implications for future research or practice.

3.10 Research Design Limitations

In the Focus group surveys for waterfall and agile project management, several limitations arose due to the nature of the research respondent sample size and the complexities of the subject matter. Here are some key limitations:

Sampling Bias:

- Focus group surveys had a minute sampling bias since the participants chosen included management however due to lack of responses it did not represent the target population. Also since the dependency was high on participants interest or/and availability, it could be a biased sample that does not accurately reflect the diversity of project management contexts.

Generalizability:

- Findings from focus group surveys may lack generalizability due to the small sample size and specific context of the participants. The insights obtained may be applicable only to the particular projects the respondents handled and could be limited to the organizations involved in the study, limiting the broader applicability of the findings.

Group Dynamics:

- Though confidentiality was maintained , Focus group dynamics, such as dominant personalities, or social desirability bias, could be one of the areas influencing participant responses and interactions. Certain individuals were reluctant to express their opinions freely, leading to some anomalies in the data

Depth of Exploration:

- Due to time constraints and the need to cover multiple topics within a limited timeframe, focus group surveys may have not allowed for in-depth exploration of complex issues related to waterfall and agile project management. Certain topics or nuances may be overlooked or only superficially addressed during the discussions.

Influence of Organizational Culture:

- Organizational culture and norms may influence participant responses in the focus group surveys, particularly in the context of agile project management. Participants' hesitance to openly discuss challenges or failures due to fear of repercussions or cultural norms that prioritize positivity and success cannot be ruled out as Organizational goals were the predominant factor of influence

Data Analysis Challenges:

- Analyzing qualitative data from focus group surveys was quite time-consuming and labor-intensive. Ensuring reliability and validity in coding and thematic analysis required careful attention to detail which was challenging to achieve consistently especially in small sample size.

Despite these limitations, focus group surveys remained a valuable method for exploring perspectives, experiences, and attitudes related to waterfall and agile project management. Attempts were made to acknowledge and address these limitations when interpreting the findings and consider triangulating data with other research methods to enhance the validity and reliability of the results.

Research design limitations in semi-structured interviews for waterfall and agile project management can affect the validity, reliability, and generalizability of the findings. Here are some key limitations analyzed :

Sampling Bias:

- Semi-structured interviews suffered minutely from sampling bias as participants were not representative of the broader population of project managers or team members. Recruitment methods, such as convenience sampling or reliance on personal networks, was the primary method of choosing the participants and could be responsible for tilting a bit to a non-representative sample, limiting the generalizability of the findings.

Social Desirability Bias:

- Participants could have provided socially desirable responses, particularly in organizational settings, assuming there was pressure to present oneself or one's team in a favorable light. This bias could affect the accuracy and honesty of participant responses, leading to a distortion of the data.

Interviewer Bias:

- Though tried to be impartial there could be some Interviewer bias basis the comfort with participants selection and may have influenced the data collected during semi-structured interviews. Personal biases, assumptions, or preconceptions about waterfall or agile methodologies may inadvertently have shaped the direction of the interview or influenced participant responses.

Limited Depth of Exploration:

- Semi-structured interviews may not allow for deep exploration of complex topics or nuances related to waterfall and agile project management. Time constraints and the need to cover multiple topics within a single interview session may have also resulted in surface-level discussions that failed to capture the full complexity of the subject matter.

Response Variability:

- Participant responses in semi-structured interviews may have varied in depth, detail, and clarity, depending on factors such as communication skills, experience level, or willingness to share. Variability in responses could have complicated data analysis and interpretation, making it challenging to identify consistent themes or patterns.

Limited Contextual Understanding:

- Limited contextual understanding could also be prevalent due to time constraints in probing deeply into participants' responses or overlooking critical contextual factors shaping project management practices. Due to a limited understanding of the organizational context as well as keeping in mind the final objective involving cost and effort, the findings may lack depth and relevance.

Time and Resource Constraints:

Conducting semi-structured interviews requires significant time and resources, including recruiting participants, scheduling interviews, transcribing recordings, and analyzing data. Time and resource constraints due to availability limited the number of interviews conducted or the depth of analysis, potentially compromising the comprehensiveness of the study.

To mitigate these limitations, attempts were made to carefully plan and execute semi-structured interviews, triangulating data from multiple sources and methods to provide a more comprehensive understanding of waterfall and agile project management practices.

Though there was a 83% response rate on the Focus survey conducted, the limitations were a few that could skew the understanding of the results

- Limited participation across certain segments
- Qualitative output however findings cannot be generalized

3.11 Conclusion

Choosing between agile and waterfall approaches isn't about choosing one over the other; it's about choosing the right approach for the situation at hand. Agile works well for projects with high uncertainty and changing requirements, while waterfall is better suited for projects with well-defined requirements and clear end goals. Quoting Scott Ambler,”The key is to understand the unique characteristics of your project and select the methodology that aligns best with your needs."

Findings through discussions revealed that choosing a project management methodology is a critical decision that significantly impacts the success of a project. Factors such as the nature of the project, stakeholder requirements, budget constraints, and project timelines must be carefully considered to determine the most suitable approach on a project to project basis. Agile and Waterfall methodologies represent two contrasting approaches to project management, each offering distinct advantages and drawbacks.

Agile methodology, known for its adaptive and flexible approach, is particularly well-suited for projects characterized by high risk or uncertainty, as well as those with unknown or frequently changing requirements. In Agile, project requirements are continuously refined and adjusted through iterative cycles of planning, execution, and review. This iterative process allows teams to adapt quickly to changing circumstances, incorporate stakeholder feedback, and prioritize deliverables based on evolving priorities. Agile methodologies promote collaboration, transparency, and responsiveness, enabling teams to deliver value incrementally while mitigating risks associated with uncertainty.

Conversely, the Waterfall methodology follows a structured, linear approach to project management, with distinct phases such as initiation, planning, execution, monitoring, and closure. Waterfall works well for projects with well-defined requirements and clear end goals, where the scope, timeline, and budget can be accurately determined upfront. The sequential

nature of Waterfall ensures a systematic progression from one phase to the next, with clear milestones and deliverables established at each stage. While Waterfall provides a sense of predictability and control, its rigid structure may limit flexibility in responding to changes or unexpected challenges that may arise during the project lifecycle.

Ultimately, the choice between Agile and Waterfall methodologies depends on the unique characteristics and requirements of the project. Projects with high uncertainty, dynamic requirements, or evolving stakeholder needs may benefit from Agile's adaptive approach. Conversely, projects with well-defined requirements, stable scope, and predictable outcomes may be better served by the structured approach of Waterfall. In some cases, a hybrid approach that combines elements of both methodologies may be appropriate, allowing organizations to leverage the strengths of each approach to maximize project success. Regardless of the chosen methodology, careful consideration of project-specific factors is essential to ensure alignment with stakeholder expectations and project objectives.

Spundak, M (2014)- "Mixed Agile/Traditional Project Management Methodology – Reality or Illusion?", examines the concept of integrating Agile and traditional project management methodologies to address the challenges and complexities of modern project management. Published in the journal *Social and Behavioral Sciences*, the paper delves into whether a hybrid approach of Agile and traditional methods is a feasible and effective strategy for managing projects. Merits and demerits of combining Agile methodologies, known for their flexibility and iterative approach, with traditional project management methodologies, which are typically characterized by their structured and sequential processes, such as improved adaptability and flexibility in project execution while maintaining some of the structured oversight and planning associated with traditional methods. Conversely, it also highlights potential disadvantages, including the risk of conflicting practices and the complexity of managing a hybrid approach effectively. Spundak concludes that while the idea of a mixed Agile/traditional methodology is intriguing and has potential benefits, its practical implementation often reveals significant challenges. The paper suggests that while hybrid approaches can offer some advantages, they

require careful planning and management to avoid the pitfalls of conflicting practices and to ensure a cohesive project management strategy.

CHAPTER IV:
RESULTS

4.1 - Case Study : The Toyota Model

The Toyota Production System (TPS) serves as a pioneering example of agile methodology in manufacturing, embodying principles of efficiency, flexibility, and continuous improvement. Developed by Toyota in the 1950s, the TPS revolutionized automotive manufacturing and has since been adopted and adapted by organizations worldwide.

As a leading thought leader, in Lean and Agile that combine the fields of complexity, thinking, distributed leadership and team science (Nigel Thurlow,2019) helped develop and test many techniques to scale agile ways of working and successfully combined practices to get greater utility

Toyota is the world's first modern mobile manufacturer to produce more than 10 million vehicles per year. Toyota was running a £5,000,000 size Business Intelligence Program to capture feedback from dealers and end users. The key objective of this initiative was to get feedback, analyze them and feed them back to the manufacturing unit.These efforts were incorporated into product design to improve driving experience and efficiency of the car. Due to the sheer size of uncertainty and complexity of the program, the customers were keen on transparency of program progress and early visibility. In progress, hence there was a need for Agile adoption.This could only be possible if the teams were trained on Scrum methodology. The major challenge was to change the mindset of business and IT developers to work collaboratively and adopt Agile. Due to the scale of the program, the team grew quickly with varied experience, bringing the entire team to the same level of understanding.

Business and the IT teams successfully trained on the Agile program.The customers had better visibility of program progress and delivered the right product due to an iterative feedback cycle.It's a very well known story and at the time the concept was revolutionary and reduced the

time taken to build a car. Agile concentrates on recognizing the interaction and the interdependence between the technology and the people who work with it.Toyota went on to develop the Toyota Way. Taking a quote from the book “Toyota culture: The heart and soul of the Toyota Way” - ‘Mistakes are okay, as long as people learn from them.’ Nowadays you hear about lean product development, lean construction, lean government, However, as with any culture, Toyota culture was deeply rooted in its values. That meant that if you really wanted to get the benefit of the company's operating system it was just not sufficient to copy tools like lean and just in time. You have to start with the values and beliefs. That makes it much harder to replicate, even though the benefits are very clear.(Willy Shih, 2022). The objectives can be very different and hence the methodologies and the thinking had to be evolved to solve the problems for that specific area using Agile.

Iterative and incremental development can be seen as far back as the 1950s. In 1986 ,a Harvard Business Review article called ‘The New Product Development Game’ used the concept of Scrum from a rugby scrum. And it denoted a shift from the idea of relay races, with teams handing the baton to another team to another team to finish the race.To the idea of a single unit of people working together from start to finish to complete an endeavor. With these principles, it gained traction to become Agile as we know it today

Quoting Aristotle ,“We are what we repeatedly do. Excellence, then, is not an act, but a habit” It brings us to the famous quote by the Toyota way - “Toyota isn't just building cars but building people”. This encapsulates the core philosophy of Toyota as an organization.Toyota had 6 core rules within which Kanban are operated. Being the 9th largest company in the world by revenue, it is a pretty good example of how decent working practices lead to success.

Exploring their rules and how they applied to any business, team or individual.

1. Do not send defective products to the subsequent process :

In other words, we must make sure that the work in the earlier workflow steps is done and complete before moving to the next step.If we become slack in any step, we create inefficiency.

A problem with our server must be fully fixed before the QA engineer tests the fix or her time will be wasted.

2.The subsequent process comes to withdraw only what is needed :

Applied to the Kanban board, this means that the later step in the workflow takes only the task that was completed in the previous step.

3.Produce only the exact quantity withdrawn by the subsequent process:

The key here is that no more work is produced than what is necessary to complete the task in the previous workflow step. This is a vital rule in the efficiency plan.

4.Level the production:

This is concerned with finding the constant rate at which your team or organization can output their product or solve problems. This meets demand consistently whether it goes up or goes down.

5.Kanban is a means of fine tuning:

In other words, simply by using the system you will start to smooth out your processes as time goes on, again improving efficiency.

6 Stabilize and rationalize the process:

This means that whatever process you pick should eventually gain a consistent structure.

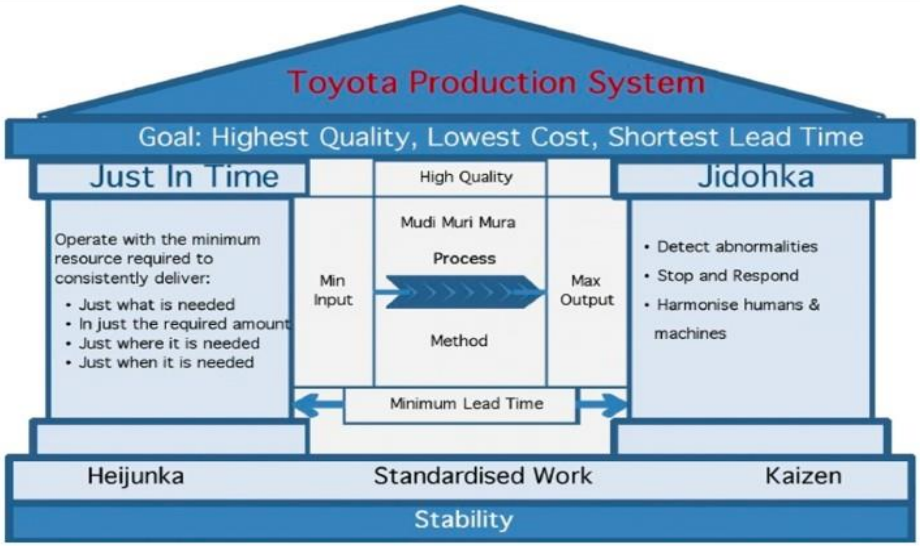

Fig 4.1: Toyota Production System

https://worldofagile.com/blog/toyota-production-system/

Just-in-Time (JIT) Production:

JIT is a central concept of the TPS, focusing on minimizing waste by producing goods only as they are needed. By synchronizing production with customer demand, Toyota reduces inventory levels, eliminates overproduction, and improves responsiveness to market fluctuations.

Mudi Muri Muda :

In Toyota's Agile methodology, "mudi" refers to waste reduction, "muri" to overburden, and "muda" to inefficiency. Mudi targets unnecessary processes, aiming for leaner workflows. Muri identifies the excessive strain on resources or personnel, seeking balance and sustainability. Muda addresses any activity that doesn't add value, promoting optimization and streamlining. In Toyota's Agile framework, these principles guide iterative development, fostering adaptability and continuous improvement. Teams strive to eliminate muda by focusing on customer value, minimize muri by managing workloads effectively, and eradicate mudi by refining processes iteratively. This holistic approach ensures efficiency, flexibility, and customer-centricity in product development.

Jidoka (Autonomation):

Jidoka refers to the principle of building quality into the production process by incorporating automatic mechanisms for detecting and preventing defects. By empowering machines to stop production when abnormalities occur, Toyota ensures that quality issues are addressed promptly, minimizing rework and waste.In Toyota's Agile methodology, "jidoka" emphasizes automation with human intelligence. Jidoka enables teams to build quality into their processes by detecting and addressing issues promptly. It empowers workers to stop production when abnormalities occur, preventing defects from propagating downstream. In Agile, jidoka fosters a culture of continuous improvement and accountability. Teams embrace automation to reduce manual errors and enhance efficiency. By integrating jidoka into Agile practices, Toyota promotes a proactive approach to quality assurance, ensuring that products meet customer expectations and defects are addressed early in the development cycle. This results in higher-quality deliverables and increased customer satisfaction.

Kaizen (Continuous Improvement):

Kaizen is the philosophy of continuous improvement, encouraging all employees to contribute ideas for incremental enhancements to processes, products, and systems. Through ongoing experimentation, problem-solving, and knowledge sharing, Toyota fosters a culture of continuous learning and innovation at all levels of the organization.In Toyota's Agile methodology, "kaizen" embodies the philosophy of continuous improvement. Kaizen encourages teams to make small, incremental changes to processes, products, and workflows to enhance efficiency, quality, and productivity. In Agile development, kaizen is integrated into every aspect of the process, promoting a culture of learning and adaptation. Teams regularly reflect on their practices, identify areas for improvement, and implement changes incrementally. By embracing kaizen, Toyota Agile teams continuously refine their work, striving for excellence and innovation. This iterative approach fosters a dynamic environment where improvement is not just a goal but a fundamental part of the organizational ethos, driving sustained success.

Andon System:

The Andon system is a visual management tool used to highlight production issues and facilitate quick resolution. When a problem arises on the production line, workers can pull an Andon cord to signal for assistance. This triggers a response from managers and team members, who collaborate to address the issue and prevent its recurrence.

Toyota leveraged "andon" which served as a visual and audible signal for problem detection and resolution. It empowers team members to stop production or escalate issues when abnormalities arise, ensuring prompt attention and resolution. In Agile development, andon boards or systems provide transparency and visibility into the status of work and potential bottlenecks. Teams use andon to communicate effectively, enabling quick response to challenges and maintaining flow. By integrating andon into Agile practices, Toyota promotes a culture of accountability, collaboration, and continuous improvement. Teams can address issues swiftly, minimizing disruptions and enhancing overall productivity and quality of deliverables.

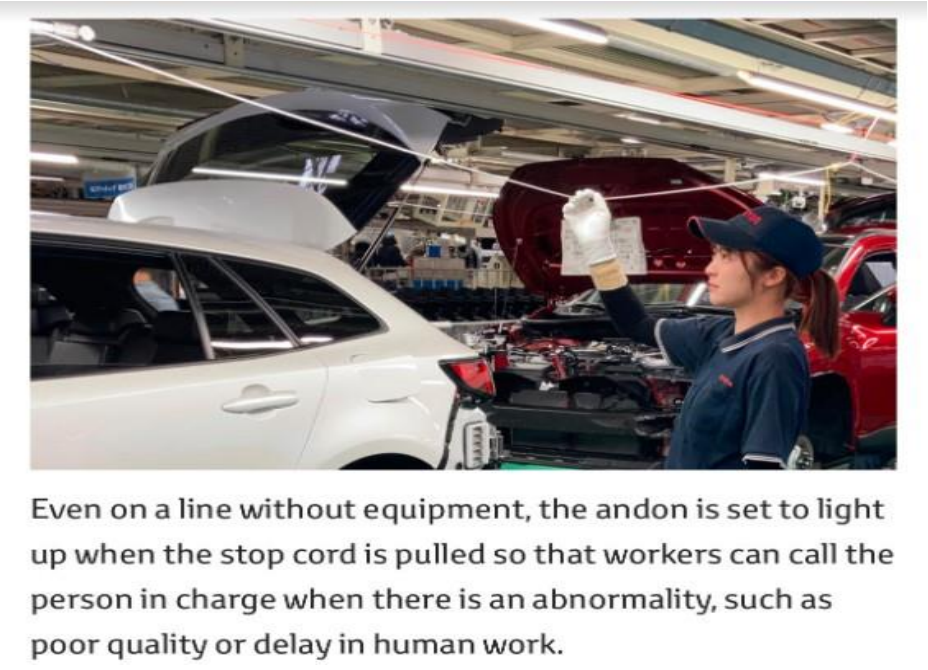

Fig 4.1a: Andon visual management tool used to highlight production issues and facilitate quick resolution

Source: Global Toyota > company - Toyota Production System | Vision & Philosophy

Heijunka (Production Leveling):

Heijunka aims to balance production flow and minimize fluctuations in demand by smoothing out production levels over time. By standardizing work processes and adopting flexible production scheduling techniques, Toyota reduces lead times, improves resource utilization, and enhances overall efficiency.

Respect for People:

Central to the TPS is a deep respect for the expertise, creativity, and contributions of all employees. Toyota recognizes that frontline workers possess valuable insights into process inefficiencies and actively engages them in problem-solving and decision-making. By empowering employees to take ownership of their work and participate in continuous improvement activities, Toyota fosters a culture of trust, collaboration, and shared responsibility. Taking a quote from the book “Toyota culture: The heart and soul of the Toyota Way” - ‘Focus on the problem, not the person.’

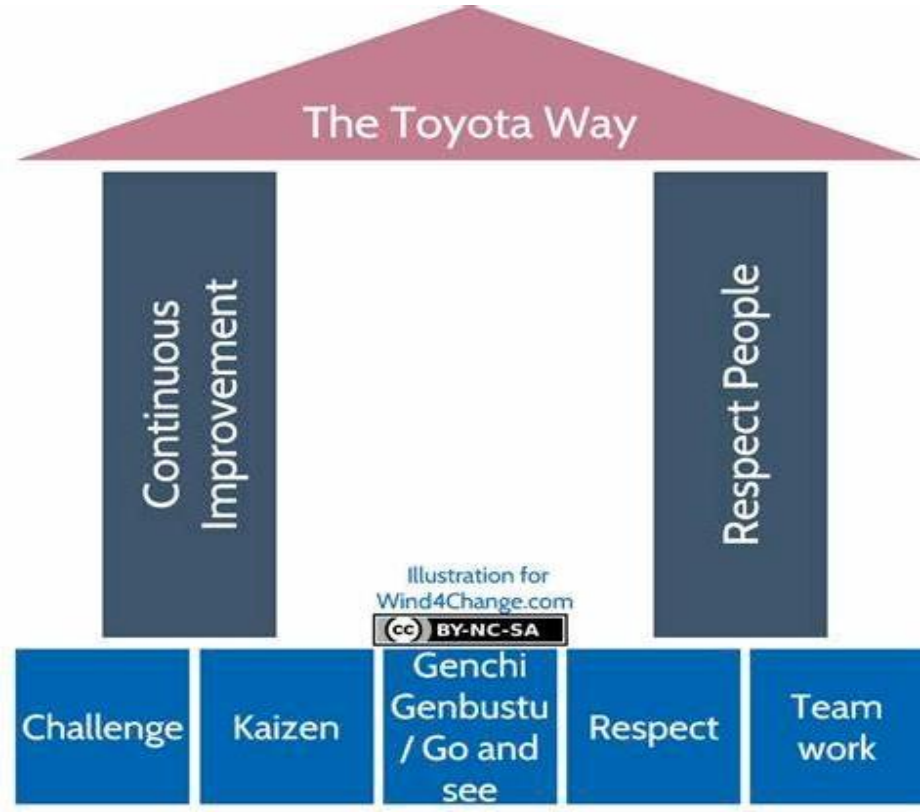

Fig 4.1b. People Management in Toyota

https://wind4change.com/lean-manufacturing-tps-toyota-production-system-way-what/

Kanban System:

The Kanban system is a visual scheduling method used to manage workflow and inventory levels in a production environment. By visualizing work-in-progress and establishing clear limits on inventory, Toyota enhances transparency, identifies bottlenecks, and maintains a smooth, steady flow of materials and information throughout the production process.

In summary, the Toyota agile methodology model is characterized by its commitment to efficiency, quality, and continuous improvement. By integrating principles such as JIT production, Jidoka, Kaizen, and respect for people, Toyota has been able to achieve remarkable levels of productivity, quality, and customer satisfaction. As organizations across industries seek to emulate Toyota's success, they can draw inspiration from the TPS's core principles and adapt them to their unique contexts, driving sustainable improvements and competitive advantage.

4.2 - Case Study : The ING Bank Model

Digital innovators such as Spotify and Netflix are at the forefront of developments when it comes to tailoring their service to client needs. They have a clear concept of corporate culture and they're defined approach to collaboration processes. They believe firmly in the methodology called Agile.

For ING bank, they are important sources of inspiration in establishing a new way of working together, a new level of servicing clients.The new way of working calls for quicker reactions to changing client needs, less interdepartmental passing of the batton, fewer coordination meetings, more room for initiative, and higher levels of responsibilities for teams and individuals.

ING Bank employs an Agile model that emphasizes adaptability, collaboration, and customer-centricity in its operations. At the core of its Agile framework are principles borrowed from methodologies like Scrum and Kanban, tailored to suit the bank's specific needs.

In ING's Agile model, cross-functional teams work in short iterations, or sprints, to deliver value incrementally. These teams are empowered to make decisions autonomously, fostering a culture of ownership and accountability. Continuous feedback loops ensure that customer needs remain central to the development process, enabling rapid adjustments based on market demands.ING Bank emphasizes collaboration among business stakeholders, developers, and operations teams, promoting transparency and alignment of objectives. This collaborative approach enhances communication and reduces silos, allowing for faster decision-making and problem-solving.The bank also emphasizes the importance of continuous improvement, encouraging teams to reflect on their processes and outcomes regularly. This commitment to learning and adaptation enables ING to stay responsive to changing market conditions and customer preferences.Overall, ING Bank's Agile model enables it to deliver innovative products and services more efficiently while maintaining a focus on customer satisfaction and market competitiveness. By embracing Agile principles, ING remains agile in a rapidly evolving financial landscape.

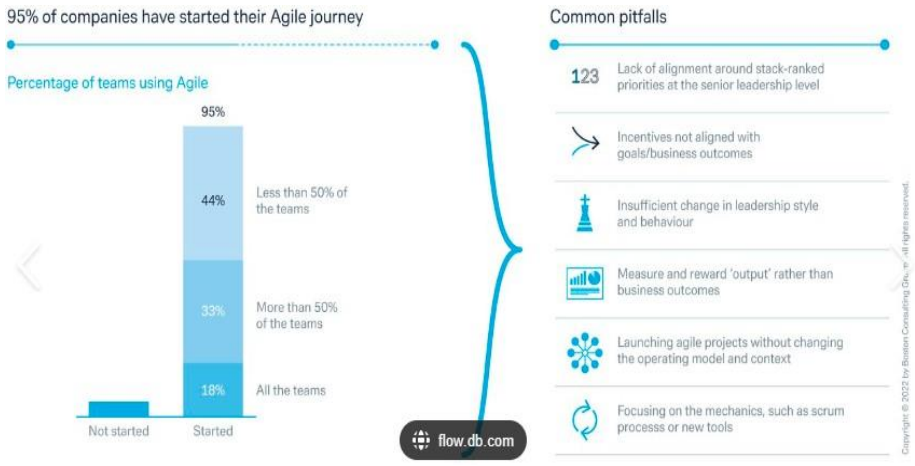

Figure 4.2: Enterprise agility addresses organizational challenges by making organizations align, iterate and grow

Source: BCG

According to Rene Visser, Head of infrastructure in ING, Netherlands, they did a complete redesign of the infrastructure organization, covering every last team and role, based on two key changes. Firstly moving away from the concept of silo teams that worked on service requests to multidisciplinary engineering squads that created infrastructure products and services. For example, the Linux squad would engineer a compliant operating system image and the tools required for application teams to perform second day operations. Specialized squads were also set up to create products for specialized infrastructure technologies such as a mainframe or data lake. Simplicity in roles was brought about by moving away from a broad range of specialized roles to a simplified set of engineering roles, simplified as engineers, product owners, chapter leads, agile coaches, and architects. These two changes made the target organization much simpler and slimmer than the one in existence till then

So how does it work?

The fundamental unit in ING's future head office organization is the 'squad'. Squads are self steering autonomous teams of up to nine people responsible end to end for their own specific

customer related mission. Squads are built around different disciplines, different areas of expertise and different backgrounds.

For example, the Squad Mortgage application concerns itself with developing and implementing the most customer friendly and most efficient way of moving from the first mortgage submission to final approval. And the Squad search engine is dedicated to developing the most customer friendly and effective search engine for ING's various digital channels. In squads, you could expect to find colleagues from marketing, product management, formula management, data analysis, user experience and IT, sometimes more than one or more of the other depending on the nature of the sports mission. Within each squad, product ownership is assigned to one spot member. This Product Owner is responsible for what a sport does, is in charge of the backlog and 'To Do' List and determines priorities. This does not mean the Product Owner is the boss.

Coordination between members of the same discipline takes place inside 'chapters'. There is, for example, a chapter Data Analytics, a chapter Customer Journey, Mortgages, a chapter Product Management Processes. Chapters determine how jobs should be tackled. The Chapter Lead is ultimately responsible for this and also represents the hierarchy for squad members taking responsibility for personal development, coaching and the performance management cycle of individual squad members.

How can we ensure coordination between squads?

That is where 'tribes' come in. A tribe is a collection of sports with interconnected missions. There is a tribe, securities and private banking, a tribe mortgage services, etcetera. As a rule, a tribe contains fewer than 150 people coordinated by the Tribe Lead who, although not the traditional boss of all tribe members, ensures that knowledge and insights are shared, establishes priorities and allocates available budgets. The Tribe Lead forms the interface with other tribes.

There is one more vital role, that of Agile Coach, the person who coaches individuals and sports and who helps them to grow and prosper.That, in a nutshell, is how most of ING head office used the Agile approach customizing it as per their requirements to maximize output. The agile approach involves flexibility in adapting to the needs of the moment. The forming of tribes is

very much a tailor made thing, dependent on specific goals and circumstances and that is an approach that may not suit all business functions and so a degree of trial and error will help establish what does and does not work in practice.The agile approach is in itself having agility and not cast in iron. That is what makes it such a valuable tool. Our world is changing quickly. New technology makes possible tomorrow what we can't even imagine today, and people have become accustomed to this rapid pace of change. As a company, this means that you need to adapt continuously to meet shifting customer demands and embrace new possibilities.

Fig 4.2a: ING Bank Agile Organisation structure

Source: https://agilebusinessmanifesto.com/agilebusiness/agile-transformation-at-ing/

More and more of clients contact banks primarily online or via their mobile phones. They expect the same experience whether they contact over the phone, by chat, or in one of ING's branches. Until 2015, ING worked according to classical structures and hierarchies.It had some advantages, but it doesn't work in an age of fintech, big data and hyperconnectivity. Something had to change with the desire to innovate and meet customer needs and experiences as a starting point and inspiration from digital innovators like Spotify, Google and Netflix. Embracing the Agile way of working as an organization, you say goodbye to trusted structures - It's a bold move. Changed ways of managing and organizing. Goals change, analyzing your values change and you communicate differently.

Agile working is our mindset. You don't act agile, you are agile. You need to trust each other, take responsibility and make things happen. This creates a happy and involved workforce that shows initiative and is prepared for change.

Why did ING succeed to achieve this?

Squads, small autonomous teams with end to end responsibility for their own customer related purpose with a mix of people from different disciplines, customer journey experts, data analysts, IT developers.And UX designers. The Product Owner oversees the squads work and takes responsibility for the output. Agile coaches secure the squads culture, skills and way of working to ensure they operate as a high performing team. Squad members share expertise and develop their craftsmanship.within a particular chapter for example the data analysis chapter or product management process chapter the chapter lead secures the personal development of the chapter members and helps define how to get a job done

Opening up potential and impact

Communication and collaboration sit at the core of effective agile practices. For Adam Walendziewski the Global SME Director at ING Bank, the most influential change made was to co-locate the teams. ‘From day one, communication was better,’ he confirms. ‘It’s powerful to have people sitting together. Instead of trying to articulate ideas on email or online platforms such as Jira, they were able to discuss how to approach challenges face-to-face. Team members need to have conversations, to bring together different perspectives and open up new lines of thinking. Getting everyone together in this way wasn’t straightforward, it needed room planning – so we could align our sprints across different tribes and squads.’ Agile philosophy is centered on a desire to delight the customer – not only fulfilling their needs, but going above and beyond to create enthusiasm and advocacy. ‘Before we started working in an agile way,’ Adam remembers, ‘we built completed solutions and then delivered them to the customer and discovered their response. ‘Now we get that vital feedback much earlier in the process. We create mock-ups and prototypes so that customers can try out new online banking pages for themselves. When we have their feedback, we base our onward development work around the

customer’s perspective so that we are adapting our approach to real-time evidence of their needs. "We are constantly fixing and adapting our agile way.

Results - ING Germany has concluded a year of radical change with strong business results. The bank, which has been operating with completely agile structures and applying agile working methods for several months now, achieved pre-tax earnings of EUR 1.352 billion in 2019 (2018: EUR 1.322 billion).“In 2019, we showed that we are capable and willing to implement change as an organization," says Nick Jue, CEO of ING Germany and Head of Region Germany. “The fact that we have also succeeded in achieving a very good result and have grown again in almost all areas is down to the enormous commitment of all ING Germany employees.” The number of the bank’s employees rose to 4,125 in 2019 (2018: 3,985). With Interhyp included, ING employed 5,561 people in Germany and Austria in 2019 (2018: 5,353).

(Disclaimer: All the information about ING Germany provided here is based on the preliminary IFRS-consolidated financial statements of ING Holding Deutschland GmbH, Frankfurt am Main,

4.3 - Case Study : The Amazon Model

Amazon's agile project management model is rooted in the company's culture of innovation, customer obsession, and relentless pursuit of excellence. As one of the world's largest and most successful technology companies, Amazon relies on agile principles and practices to drive its product development, operational efficiency, and customer-centric approach.

Key elements of Amazon's agile project management model include:

Customer-Obsessed Culture:

At Amazon, customer obsession is ingrained in every aspect of the company's operations. Agile teams prioritize customer needs and feedback, focusing on delivering value quickly and continuously iterating based on customer insights. This customer-centric approach drives innovation and ensures that Amazon's products and services remain relevant and competitive in the market. Jeff Bezos in his new book, 'Invent & Wander', reminds Amazonians to pay attention to competitors, but to obsess over customers.

Two-Pizza Teams:

Amazon follows the "two-pizza team" model, where teams are kept small enough to be fed by two pizzas. These small, cross-functional teams are empowered to take ownership of projects and make autonomous decisions. By keeping teams small and agile, Amazon fosters innovation, agility, and accountability, enabling faster decision-making and execution.As Colin Bryar and Bill Carr describe them in their fascinating new book ' Working Backwards: Insights, Stories, and Secrets from Inside Amazon, two-pizza teams were small, autonomous, measured by a well-defined set of metrics. Owned responsibility for all aspects of their area of focus: design, technology, business results, etc. In time, two-pizza teams evolved into single-threaded leader (STL) teams, a term borrowed from computer science that means to only work on one thing at a time.

Agile Development Practices:

Amazon embraces agile development methodologies such as Scrum and Kanban to manage its software development projects. Teams work in short iterations or sprints, delivering incremental value to customers and stakeholders. Agile ceremonies, including daily stand-ups, sprint planning, and retrospectives, facilitate communication, collaboration, and alignment within and across teams. Quoting Harvard Business School professor Sunil Gupta, who argues that some of Amazon's simplest business strategies – like their obsession with the customer and insistence on long-term thinking – are approaches that companies, big and small, should emulate.

Data-Driven Decision-Making:

Amazon is known for its data-driven approach to decision-making. Agile teams leverage data and metrics to inform their product development efforts, measure performance, and identify opportunities for improvement. By analyzing customer data, market trends, and operational metrics, teams can make informed decisions and prioritize initiatives that have the greatest impact on customer satisfaction and business outcomes.Amazon utilizes data-driven decision-making across various facets of its operations. For instance, in product development, data analysis of customer behavior, preferences, and market trends informs decisions on new features and offerings. In logistics and supply chain management, real-time data is used to optimize inventory levels, streamline delivery processes, and reduce costs. Additionally, data-driven algorithms power personalized recommendations and targeted marketing campaigns, enhancing the customer experience and driving sales. Overall, Amazon leverages data extensively to make informed decisions, improve operational efficiency, and stay ahead in the highly competitive e-commerce landscape.

Experimentation and Innovation:

Amazon always encouraged a culture of experimentation and innovation, where teams are empowered to take risks, experiment with new ideas, and learn from failure. The company's

"Day 1" mentality, emphasizing the need to maintain a startup-like mindset and continuously innovate, drives creativity, agility, and resilience across the organization."Day 1" is a mantra at Amazon, embodying a mindset of constant innovation and customer-centricity. It signifies the urgency and agility of a startup, regardless of Amazon's size. Founder Jeff Bezos emphasizes maintaining a sense of "Day 1" to avoid complacency and continue pioneering. It encourages relentless experimentation, risk-taking, and customer obsession. This ethos prioritizes long-term thinking over short-term gains, fostering a culture where employees are empowered to challenge the status quo and pursue bold ideas. By staying in a perpetual state of "Day 1," Amazon sustains its innovation, agility, and success in a rapidly evolving marketplace especially in the aggressive data driven marketplace.

Scalable Architecture and Infrastructure:

Amazon's agile project management model is supported by scalable architecture and infrastructure, including cloud computing services such as Amazon Web Services (AWS). Agile teams have access to a wide range of tools and resources that enable rapid prototyping, testing, and deployment of software solutions. This scalable infrastructure allows Amazon to innovate quickly, scale efficiently, and meet the needs of its growing customer base.Amazon's agile project management model exemplifies rapid iteration and customer-centricity. Teams work in small, autonomous units, prioritizing customer needs and feedback. They embrace uncertainty and adapt quickly, leveraging data-driven insights for informed decision-making. Amazon's two-pizza teams foster innovation, ensuring agility and accountability. Continuous integration and deployment enable swift delivery of value to customers. Leadership emphasizes a culture of experimentation and learning, encouraging risk-taking and resilience. Through this agile approach, Amazon continually evolves its products and services, staying ahead in the competitive landscape while delivering exceptional customer experiences.

Fig 4.3 : Amazon Web services

Source : https://topdigital.agency/amazon-web-services/

To summarize Amazon's success story where they built on understanding customer needs - This went beyond retail. Similar to Tesla, similar to Apple. One of the key innovations there, today's cash cow was Amazon Web Services, which targets not only a completely different set of customers, but also a completely different set of customer needs and requires a completely different business model than the traditional retail or ecommerce approach.The reason Amazon was able to do this is that they are fundamentally okay with failure.

Jeff Bezos, Amazon CEO and founder, always says Amazon is probably the best place in the world to fail.And invention and failure are two sides of the same coin.

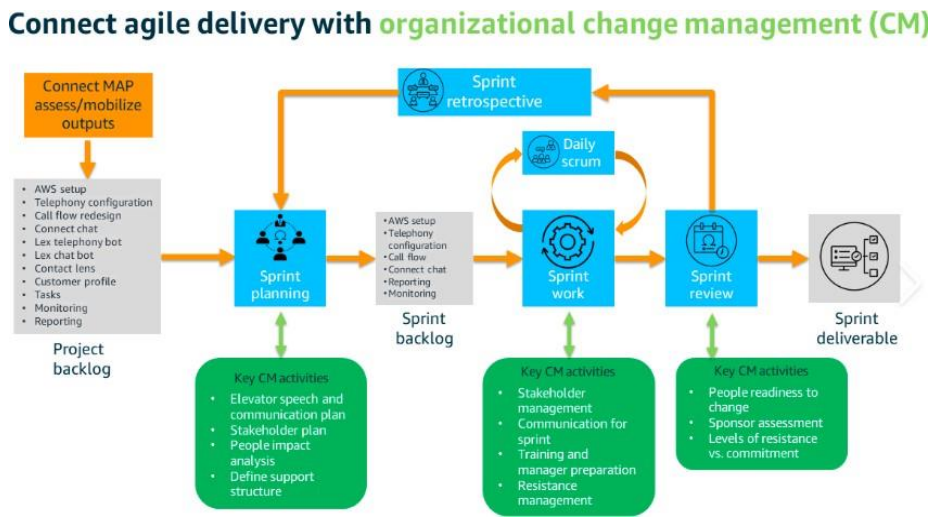

Fig 4.3a : Amazon Agile model

Source: https://docs.aws.amazon.com/prescriptive-guidance/latest/strategy-migration-connect/agile-methods.html

Some of Amazon's failures were Amazon Auctions, which was supposed to be something that tackles eBay.Ultimately, Auctions failed from which they built Marketplace, which was another risky bet which basically took off. Another failure was Amazon Locals, mostly comparable to Airbnb today. Maybe the idea was ahead of its time and maybe they did not execute well enough. Whatever it was, it did not result in the business success they imagined for the product before they started building. Finally, one of the biggest failures probably was the Kindle Fire phone where Amazon spent almost $2 billion building the product, and they wanted to compete with iOS, iPhone and Android. Ultimately, the product did not succeed. A lesson learnt from this failure by the same team, same leadership group was that they ultimately ended up building the Amazon Echo and Alexa devices. This goes well with the adage 'Failure is the stepping stone to success'.Venture capitalists know this really well. that success in venturing and innovation is a number scale

As mentioned earlier, Jeff Bezos's adage of innovation and failure being part of the same coin. and Amazon is the best place in the world to fail is very well known by Venture capitalists. They also know that success, inventory and innovation is a number scale.

Overall, Amazon's agile project management model is characterized by its customer obsession, decentralized decision-making, data-driven approach, and culture of innovation. By embracing agile principles and practices, Amazon has been able to maintain its position as a market leader in e-commerce, cloud computing, and digital innovation, continuously delighting customers and driving growth in a rapidly evolving landscape.

4.4 - Case Study : The **Google Model**

Google's agile model, also referred to as the "Google approach" is a unique adaptation of agile principles tailored to fit the company's culture, values, and business objectives. While Google does not strictly adhere to any specific agile framework like Scrum or Kanban, it incorporates agile principles into its software development processes, emphasizing flexibility, collaboration, and continuous improvement.

Key elements of Google's agile model include:

Iterative Development:
Google embraces an iterative approach to software development, where products and features are developed incrementally in short cycles. Teams focus on delivering small, frequent releases, allowing for rapid feedback, iteration, and course correction based on user input and market trends.Google has pioneered the "permanent beta" by launching unfinished software. This approach lowers expectations for quality and allows users to engage with the software and find problems and defects to be fixed. Agile methods have had a huge influence on the way software is created, and Google has applied this philosophy at scale to running a large company. Google has a bias toward taking action and learning from experience, which is very agile.

Small, Autonomous Teams:
Similar to Amazon's "two-pizza teams," Google organizes its engineering teams into small, cross-functional units known as "pods" or "squads." These teams are responsible for end-to-end delivery of features or products and are empowered to make autonomous decisions. This decentralized structure fosters agility, innovation, and accountability within teams. These small, autonomous squads are embodying its agile project management approach. Each squad comprises cross-functional members, fostering collaboration and diversity of expertise. They have autonomy over decision-making and execution, empowering innovation and ownership.

Google's "20% time" policy allows employees to dedicate a portion of their workweek to pursuing passion projects, fostering creativity and entrepreneurship within teams. This decentralized structure promotes agility, adaptability, and responsiveness to customer needs, enabling Google to innovate rapidly and deliver cutting-edge products and services in a dynamic and competitive tech landscape.

Agile Practices:

While Google's agile model is flexible and adaptable, it incorporates various agile practices such as daily stand-up meetings, sprint planning sessions, and retrospective meetings. Regular stand-up meetings and retrospectives facilitate communication and continuous improvement. These practices facilitate communication, collaboration, and alignment within and across teams, enabling faster decision-making and execution.These brief, daily gatherings provide a forum for teams to share progress, discuss challenges, and coordinate efforts in real-time. By promoting transparency and accountability, stand-ups ensure everyone is informed and engaged, facilitating rapid decision-making and problem-solving. Moreover, they encourage a sense of camaraderie and unity within teams, enhancing morale and motivation. Overall, stand-up meetings at Google play a vital role in driving productivity, efficiency, and innovation, enabling teams to deliver high-quality results and meet project objectives effectively.

Data-Driven Decision-Making:

Google is known for its data-driven approach to decision-making, and this principle extends to its agile model. Teams leverage data and analytics to inform their product development efforts, measure performance, and identify areas for improvement. By analyzing user feedback, usage metrics, and market data, teams can make informed decisions and prioritize initiatives that have the greatest impact on user satisfaction and business outcomes. Google's data-driven approach permeates every aspect of its operations, driving innovation, decision-making, and product development. Vast amounts of data are collected from various sources, including user interactions, search queries, and device usage. Advanced analytics and machine learning

algorithms analyze this data to extract valuable insights and trends. These insights inform strategic decisions, such as product enhancements, feature prioritization, and market expansion. Google's emphasis on experimentation and A/B testing allows teams to validate hypotheses and iterate quickly based on data-driven feedback. Furthermore, data informs personalized experiences for users, such as targeted advertising and customized search results, enhancing user satisfaction and engagement. Overall, Google's relentless focus on data empowers teams to make informed decisions, optimize processes, and deliver innovative solutions that meet the evolving needs of users and stakeholders in a rapidly changing digital landscape.A new study conducted by the Harvard Business Review (HBR) for Google Cloud found that organizations that took a data-driven approach to their work during the COVID-19 were best positioned to navigate the unrelenting upheaval of the past few years. In particular, using high-quality data that was accurate and integrated across the organization proved instrumental in real-time decision making at critical moments..

Experimentation and Innovation:

Google encourages a culture of experimentation and innovation, where teams are encouraged to take risks, test hypotheses, and learn from failure. The company's "20% time" policy, which allows employees to spend a portion of their workweek on projects of their choosing, exemplifies Google's commitment to fostering creativity, agility, and entrepreneurial spirit.Google's culture of experimentation and innovation is evident across its diverse products and services. For instance, Google's self-driving car project, Waymo, exemplifies its commitment to groundbreaking technology. Through extensive testing and iteration, Waymo has pioneered autonomous vehicle technology, revolutionizing transportation.That’s thanks to a head start in AI investment, some strategic acquisitions by sister company Google, and a close working relationship with the tech giant’s in-house team of AI researchers. Additionally, Google's innovative approach to search algorithms continuously enhances user experience and relevance. Features like Google Maps' real-time traffic updates and Google Photos' image recognition demonstrate its focus on practical applications of cutting-edge technology. Moreover, initiatives like Google X's "moonshot" projects, such as Project Loon for internet

access in remote areas, showcase Google's audacious vision and willingness to tackle ambitious challenges. Furthermore, Google's acquisition of companies like DeepMind and Nest Labs underscores its dedication to exploring new frontiers in artificial intelligence and smart home technology. These examples illustrate Google's relentless pursuit of experimentation and innovation to solve complex problems and shape the future.

Scalable Infrastructure:

Google's agile model is supported by a scalable and robust infrastructure, including Google Cloud Platform (GCP) services such as Google Compute Engine, Google App Engine, and Google Kubernetes Engine. This infrastructure enables teams to develop, deploy, and scale software solutions quickly and efficiently, facilitating rapid innovation and growth.Google's scalable infrastructure is the backbone of its vast array of products and services, enabling seamless performance and reliability at scale. The company's infrastructure is built on a foundation of innovative technologies, including its proprietary data centers, networking infrastructure, and distributed computing systems like Google Cloud Platform (GCP). Google's use of containerization with Kubernetes allows for flexible and efficient deployment of applications across its infrastructure, ensuring consistent performance and resource utilization. Additionally, Google's global network of data centers, connected by high-speed fiber-optic cables, enables low-latency access to services worldwide. Furthermore, Google's investments in machine learning and artificial intelligence technologies optimize resource allocation, improve system efficiency, and enhance user experiences. Overall, Google's scalable infrastructure architecture ensures the resilience, flexibility, and performance necessary to support its diverse portfolio of products and services while accommodating the ever-growing demands of users and businesses globally.

Fig 4.4 : Google Cloud Platform

Source : https://www.edureka.co/blog/what-is-google-cloud-platform/

Overall, Google's agile model is characterized by its emphasis on iteration, autonomy, data-driven decision-making, experimentation, and scalable infrastructure. By embracing agile principles and adapting them to its unique culture and business needs, Google has been able to maintain its position as a global leader in technology innovation, continuously delivering products and services that delight users and drive business success. Google recognizes that Agile is not a one-size-fits-all solution. The company adapts its Agile practices to suit the context and constraints of each project. This flexibility is key to Agile's success at Google, allowing the company to apply the principles of Agile in a way that supports its goals for innovation and growth.

4.5 - Case Study : The Spotify Model

Spotify's agile methodology approach is widely regarded as a model for modern software development and organizational agility. Founded on principles of flexibility, collaboration, and continuous improvement, Spotify's agile framework has enabled the company to innovate rapidly, scale efficiently, and maintain a competitive edge in the dynamic music streaming industry.

Spotify’s culture is based on agile principles. One of the central tenets of Spotify's agile approach is its implementation of the "Squad" model. In this model, cross-functional teams, known as squads, are formed to take ownership of specific features or products. Each squad is autonomous, self-organizing, and empowered to make decisions independently. This decentralized structure fosters a sense of ownership, accountability, and innovation within each squad, as members collaborate closely to deliver value to customers.

All engineering happens in ‘Squads’ where teams are loosely coupled and tightly aligned. Cross pollination is encouraged and there is an internal open source model for code.Squads do small and frequent releases, which is enabled by decoupling. Their self-service model minimizes the need for handoffs, and through using release trains and feature toggles they get stuff into production early and often. Their culture is all about the people where focus is on motivation, community, and trust rather than structure and control.

Spotify’s product strategy was shaped by insights on how their audience segmented. Spotify knew that they essentially had two main types of users. Those that knew the music they wanted to listen to, which they referred to as “lean-forward” listeners. And those that didn’t really know the artists or the albums and they just wanted the service to help them discover music that they would love, which they referred to as “lean-back” listeners.

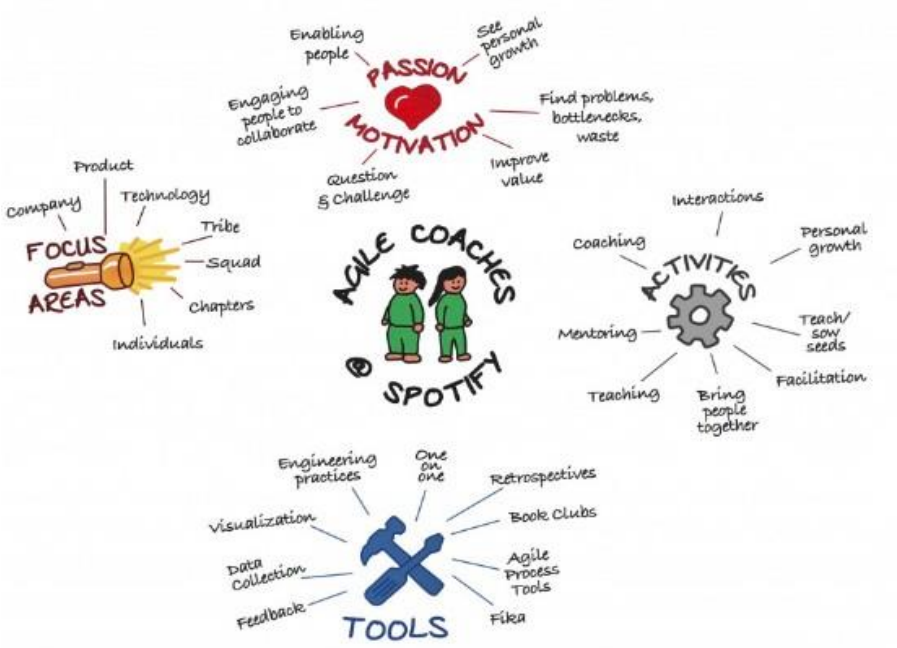

Fig 4.5 : Agile Coach role at Spotify

https://joakimsunden.com/2013/04/the-agile-coach-role-at-spotify/

Of Course every model also has its failures. About failure, the founder Daniel Ek put it nicely - “We aim to make mistakes faster than anyone else.We will inevitably make some mistakes along the way, but each failure is also learning. So if we fail fast, we learn fast and therefore improve fast. It's a strategy for long term success”. Spotify has a failed friendly environment where focus is more on failure, recovery and failure where teams celebrate failure and stories. Some squads even have a failed wall where people show off their failures and learnings. Failing without learning is, well, just failing. So when something goes wrong, it is followed up with a postmortem. This is never about whose fault it was. It's about what happened. What did we learn? What will we change? Post mortem is actually part of our incident management workflow, so an incident ticket isn't closed when the problem is solved, it's closed when teams have captured the learnings to avoid the same problem in the future. .In addition, all squads do retrospectives every three weeks to talk about what's working well and what to improve next.

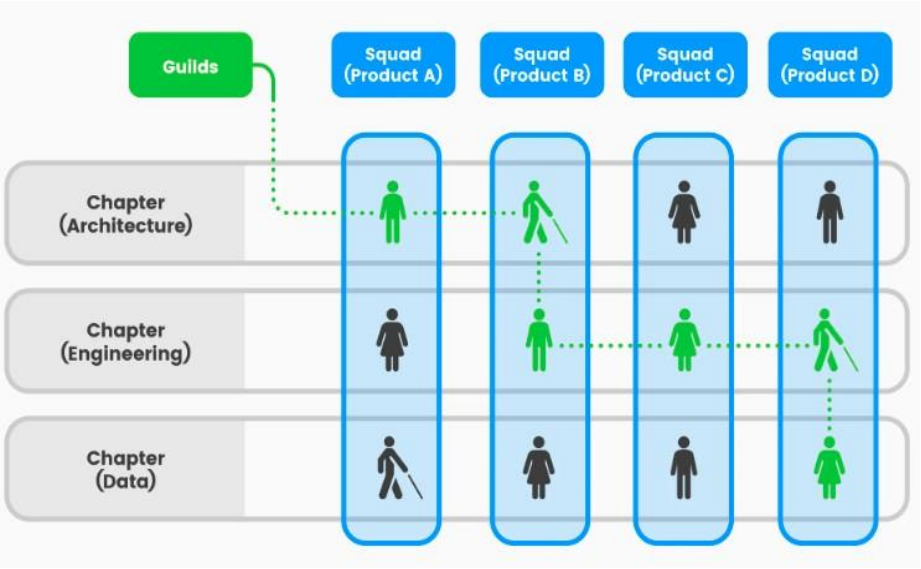

Fig 4.5s: Agile teams at Spotify

Source : Spotify's Agile terminology explained: What are Tribes, Guilds, Squads and Chapters? - 2021

All in all, Spotify has a strong culture of continuous improvement. Failure must be non-lethal, i.e. we need to learn from our mistakes to see that we don't fail again hence the concept of limited blast radius. The architecture is quite decoupled.So if the squad makes a mistake, it usually only impacts a small part of the system and should not bring everything down. Since the squad has entered the responsibility for their responsibilities without handoffs, they can usually fix the problem fast. Also, most new features are rolled out gradually starting with just a tiny percent of all users. This is closely monitored and once the future proves to be stable, it is rolled out to the rest of the world. So if something goes wrong, it normally only affects a small part of the system for a small number of users for a short period of time. This limited blast radius gives squads courage to do lots of small experiments.To learn really fast instead of getting to put code into production in that time, which is impressive. But again, failing is OK as long as they learn. Mainly, though, culture spreads through storytelling, whether it happens on the blog, at a

postmortem, a demo, or at lunch, as long as the team keeps sharing successes, failures and learnings with each other. At the end of the day, culture in any organization is really just the sum of everyone's attitudes and actions.

Spotify also emphasizes a culture of experimentation and learning. Squads are encouraged to iterate quickly, test hypotheses, and gather feedback from users through regular releases and A/B testing. This iterative approach enables Spotify to adapt to changing market conditions, customer preferences, and technological advancements effectively. Failures are seen as learning opportunities, and teams are encouraged to embrace experimentation as a means of driving innovation.

In addition to squads, Spotify employs other agile practices to support collaboration and knowledge sharing across the organization. For example, "Tribes" are formed by grouping related squads around a common mission or business area. This alignment ensures that squads are working towards shared goals and enables efficient coordination and communication across the organization.

Furthermore, Spotify utilizes "Chapters" and "Guilds" to promote expertise and skill development among its employees. Chapters are communities of practice within squads, where members with similar skills or interests collaborate to share knowledge, mentorship, and best practices. Guilds, on the other hand, are cross-squad communities focused on specific topics or skills, such as frontend development or data science. These communities provide opportunities for continuous learning, collaboration, and professional growth, enriching the collective knowledge and capabilities of the organization.

Quoting Dan Pink, Author, ‘Drive: The Surprising Truth About What Motivates Us’- “Control leads to compliance; autonomy leads to engagement.”. Spotify's agile methodology approach is characterized by its emphasis on autonomy, collaboration, experimentation, and learning. By empowering cross-functional teams, fostering a culture of innovation, and leveraging agile practices, Spotify has been able to deliver innovative products and features to its users rapidly while maintaining high levels of quality and customer satisfaction. As Spotify continues to

evolve and expand its offerings, its agile framework will remain a cornerstone of its success in the fast-paced and competitive world of digital music streaming.

Of Course every approach comes with its pitfalls. The caveat that needs to always be in mind is - Don’t copy the model. Seek to understand the structure, practices, and mindset behind Spotify’s approach. With that understanding, tweak the aspects of the model to fit your own environment. Your goal is not to be Spotify, but to leverage their model to improve how your organization works together. (Mark Cruth, 2019)

Summary - Case Studies

The adoption of Agile methodologies in Toyota, ING Bank, Amazon, Google, and Spotify has led to tangible results, revolutionizing their operations, fostering innovation, and enhancing customer satisfaction.

In Toyota, Agile methodologies have facilitated the transformation of its manufacturing processes, resulting in improved efficiency, quality, and responsiveness to customer demands. By implementing Lean principles and Agile practices like Kanban and Scrum, Toyota has streamlined production workflows, reduced waste, and accelerated time-to-market for new vehicles. Agile methodologies enable Toyota to adapt quickly to changing market conditions, optimize resource allocation, and continuously improve its manufacturing processes, ensuring its competitiveness in the automotive industry.

In the banking sector, ING Bank's Agile transformation has revolutionized how it delivers financial products and services to customers. By adopting Agile principles like cross-functional teams, iterative development, and customer-centricity, ING Bank has accelerated its digital transformation efforts, launching innovative banking solutions and improving customer experiences. Agile methodologies enable ING Bank to quickly adapt to regulatory changes, market trends, and customer preferences, ensuring its competitiveness in the digital banking landscape.

On a similar note, Amazon's Agile approach has been instrumental in driving innovation and maintaining market leadership across its diverse portfolio of products and services. By emphasizing experimentation, data-driven decision-making, and iterative development, Amazon continuously introduces new features, improves user experiences, and expands its market reach. Agile methodologies enable Amazon to respond rapidly to customer feedback, adapt to changing

market dynamics, and deliver cutting-edge solutions, solidifying its position as a technology powerhouse.

In Google, Agile methodologies have fueled innovation and maintained market leadership across its diverse range of products and services. Google's emphasis on experimentation, data-driven decision-making, and iterative development enables teams to quickly respond to user feedback, adapt to changing market dynamics, and deliver cutting-edge solutions. This Agile mindset permeates all aspects of Google's operations, from search algorithms and advertising platforms to cloud computing services and hardware products.

Spotify's Agile transformation has revolutionized how it develops and delivers music streaming services, empowering teams to innovate and deliver value to millions of users worldwide. By organizing teams into autonomous "squads," "tribes," and "guilds," Spotify promotes collaboration, autonomy, and alignment with business objectives. This Agile structure enables rapid iteration, experimentation, and continuous improvement, resulting in frequent product updates, enhanced user experiences, and a competitive edge in the music streaming industry.

Overall, the tangible results of using Agile methods in Toyota, ING Bank, Amazon, Google, and Spotify demonstrate the transformative power of Agile methodologies in driving innovation, enhancing organizational agility, and delivering value to customers in dynamic and competitive industries.

While Agile methodologies have brought numerous benefits to organizations like Toyota, ING Bank, Amazon, Google, and Spotify, there are also challenges and disadvantages associated with their implementation.

In Toyota, the hierarchical nature of traditional manufacturing processes can pose challenges to Agile adoption. The shift towards Agile methodologies may require a significant cultural change and may encounter resistance from employees accustomed to more structured approaches.

Additionally, in a highly regulated industry like automotive manufacturing, compliance requirements and safety standards may conflict with Agile's emphasis on rapid iteration and flexibility, potentially slowing down adoption and implementation.

Similarly, in the banking sector, ING Bank's Agile transformation may face challenges related to regulatory compliance, security, and risk management. Agile methodologies prioritize speed and flexibility, which may conflict with the stringent regulatory requirements and security protocols inherent in the banking industry. Moreover, the complexity of financial products and services may require thorough documentation and extensive testing, which can be challenging to reconcile with Agile's preference for minimal documentation and rapid delivery.

In Amazon, Google, and Spotify, the fast-paced and dynamic nature of the technology industry presents its own set of challenges for Agile implementation. While Agile methodologies emphasize adaptability and responsiveness to change, the rapid pace of technological advancements and market shifts may lead to scope creep, feature overload, and technical debt. Moreover, the decentralized nature of Agile teams may result in coordination challenges, duplication of efforts, and lack of alignment with broader organizational goals.

Furthermore, Agile methodologies may not be suitable for all types of projects or teams within these organizations. Projects with well-defined requirements and strict deadlines may benefit more from traditional waterfall approaches, where predictability and stability are valued over flexibility and adaptability. Additionally, Agile methodologies require a high level of collaboration, communication, and self-organization, which may not always be feasible or effective in large, distributed teams or hierarchical organizations.

Moreover, Agile methodologies require a significant investment in training, coaching, and cultural change to be successful. Organizations may encounter resistance from employees who are accustomed to traditional ways of working and may struggle to adapt to the collaborative and iterative nature of Agile practices.

In summary, while Agile methodologies offer numerous benefits in terms of flexibility, adaptability, and customer-centricity, their implementation in organizations like Toyota, ING Bank, Amazon, Google, and Spotify may encounter challenges related to organizational culture, regulatory compliance, technological complexity, and project suitability. It is essential for organizations to carefully consider these challenges and drawbacks when adopting Agile methodologies and to implement them in a manner that aligns with their unique needs, goals, and constraints.

4.6. Summary - Focus Group Survey & Semi structured Interviews

The results of the focus survey revealed a clear preference for Agile as the preferred method of managing projects among 75% of the respondents. This reflects the growing recognition of Agile methodologies' effectiveness in navigating the complexities of modern project management. Interestingly, 25% of respondents advocated for a hybrid approach, combining elements of both Agile and Waterfall methodologies. None of the respondents expressed confidence in the Waterfall model working in isolation, indicating a shift away from traditional, sequential project management methods.

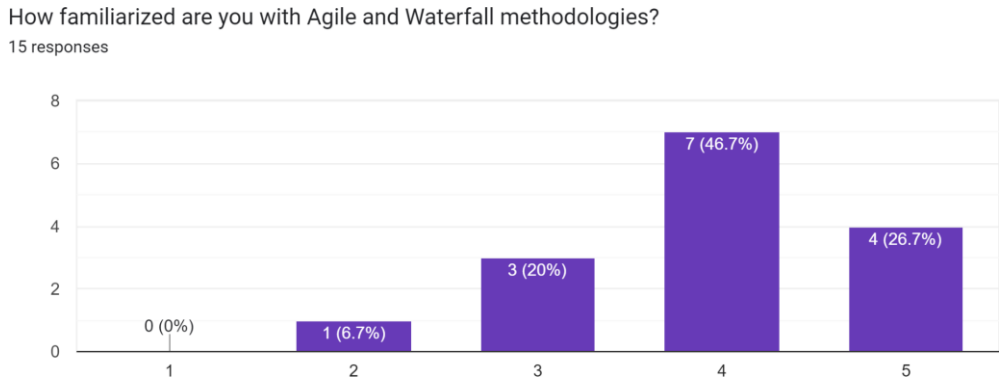

Fig.4.6 - Focus Group survey analysis - familiarity with agile and waterfall methodologies

Analysis - The survey methodology was meticulously designed to ensure that the respondents possessed a fundamental understanding of both the Waterfall and Agile methodologies. Their collective experience in project management spanned from 1 to 20 years, encompassing a broad spectrum of professional backgrounds. This deliberate approach aimed to gather insights from individuals with varying levels of exposure and expertise in project management methodologies.

Approximately 75% of the respondents demonstrated a high degree of familiarity with both Waterfall and Agile methodologies. This familiarity equipped them to make informed decisions regarding their preferences and opinions, thereby enriching the quality and reliability of the survey data. By including respondents who were well-versed in project management practices, the survey sought to capture nuanced perspectives and discern trends in methodology preferences.

The diverse range of experience among the respondents lent depth and breadth to the survey findings, enabling a comprehensive analysis of the factors influencing preferences for project management approaches. Overall, the careful selection of respondents with relevant backgrounds and knowledge ensured the validity and relevance of the survey results in understanding the

dynamics between Waterfall and Agile methodologies in contemporary project management context

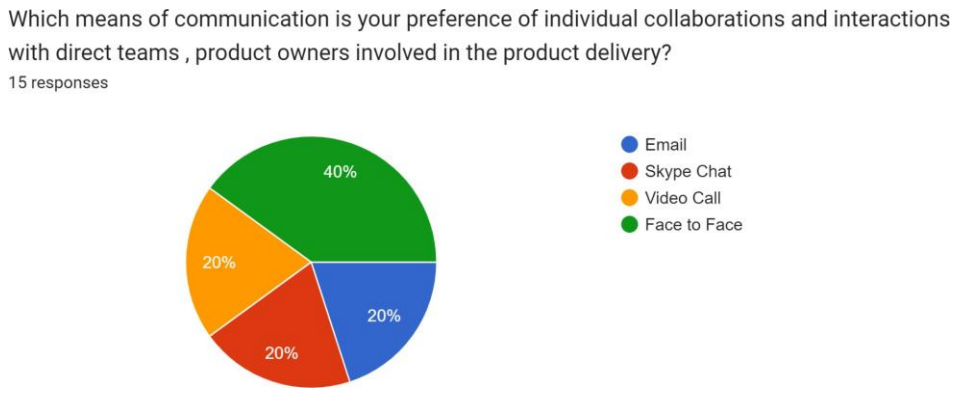

Fig.4.6a - Focus Group survey analysis - Preference of communication for collaborations & interactions

Analysis - In alignment with the essence of the Agile Manifesto's seventh principle, which emphasizes "Working software over comprehensive documentation," face-to-face communication emerged as the most favored method by 40% of the survey respondents. This preference underscores the manifesto's broader emphasis on valuing "Individuals and interactions over processes and tools." By prioritizing direct, in-person communication, agile teams reaffirm their commitment to fostering collaboration, transparency, and mutual understanding.

Face-to-face communication is recognized as the most effective means of conveying information and facilitating collaboration among agile teams. It allows for real-time feedback, promotes active listening, and encourages spontaneous idea exchange. Additionally, face-to-face interactions enable teams to build trust, foster camaraderie, and establish a shared sense of purpose, all of which are essential for high-performance teamwork in agile environments.

This preference for face-to-face communication not only highlights the enduring importance of human connection in the digital age but also underscores the Agile methodology's core values of adaptability, responsiveness, and customer-centricity. By prioritizing direct interpersonal interactions, agile teams can more effectively navigate complexity, address challenges, and deliver value to stakeholders in a dynamic and rapidly evolving business landscape

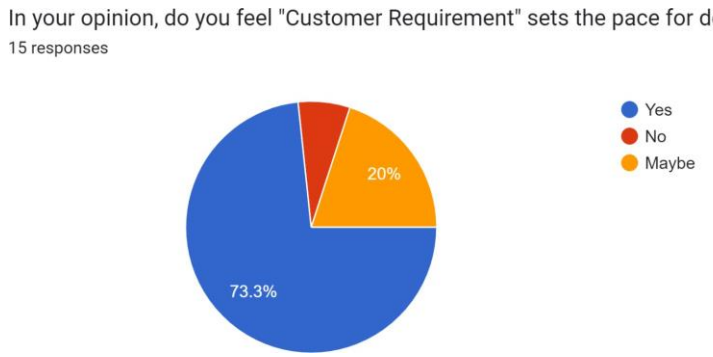

Fig.4.6b - Focus Group survey analysis - Customer requirement as the trigger

Analysis - The survey findings underscored a widespread consensus among 73% of respondents regarding the pivotal role of customer requirements in project management. This collective recognition highlights the significance of prioritizing customer satisfaction and value delivery throughout the project lifecycle. By embracing customer needs as the primary driver, teams can ensure that they remain focused on delivering the most impactful features first, thus maximizing the value proposition for stakeholders.

Customer involvement extends beyond initial scope discussions to encompass ongoing engagement in requirement refinement, acceptance criteria definition, and addressing assumptions or out-of-scope items. This inclusive approach fosters transparent communication, validates assumptions, and enables timely adjustments to project priorities. Moreover, it cultivates a collaborative environment where teams and customers work closely together to co-create solutions that align with evolving needs.

Ultimately, by prioritizing customer requirements, teams can enhance project outcomes, minimize rework, and deliver products and services that truly resonate with end-users. This customer-centric approach not only increases project success but also strengthens relationships and builds trust between project teams and their stakeholders.

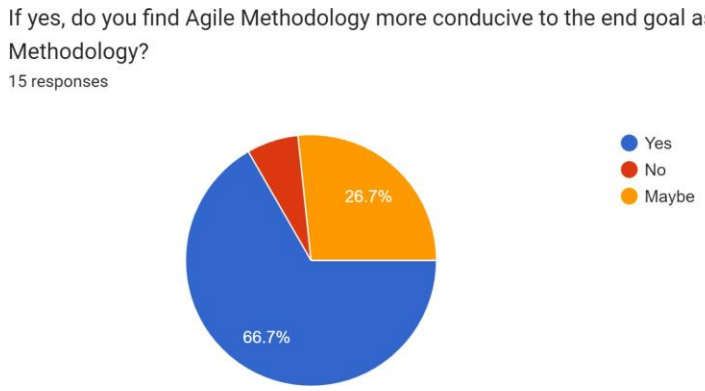

Fig.4.6c - Focus Group survey analysis - Agile or Waterfall - conducive approach

Analysis - The prevailing consensus favored Agile as the preferred approach for enabling continuous customer and stakeholder involvement throughout projects, facilitating regular feedback loops and adjustments. This ongoing engagement ensures that the product consistently meets customer needs and expectations, prioritizing customer satisfaction. Additionally, Agile methodologies effectively mitigate the overhead costs associated with rework to meet specific customer specifications. By promoting iterative development cycles and adaptive planning, Agile empowers teams to respond swiftly to evolving requirements and market dynamics. This flexibility enhances the product's alignment with customer preferences and market demands, ultimately optimizing the value delivered to stakeholders. Moreover, the collaborative nature of Agile fosters a transparent and communicative environment, where stakeholders are actively engaged in shaping the project's trajectory. As a result, Agile not only improves project

outcomes but also strengthens customer relationships and enhances overall project efficiency and effectiveness.

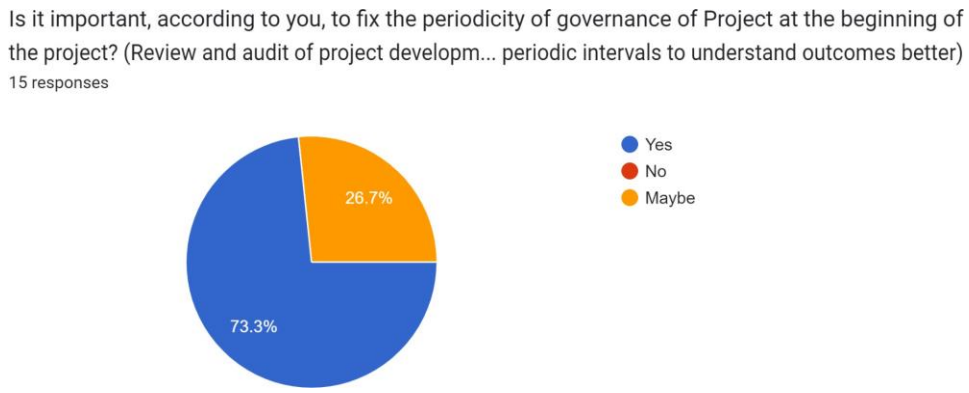

Fig.4.6d - Focus Group survey analysis - Periodicity of governance in projects

Analysis - 73% felt that Program governance serves as a pragmatic framework essential for achieving project success by overseeing and guiding program processes effectively. there was an overwhelming consensus that it encompasses the structured processes that steer a program towards efficient management, ensuring continuous oversight and control.

The team unanimously concurred that implementing pre-defined milestones for conducting health checks was crucial for business interests. Such checkpoints serve to enhance performance, mitigate risks, and facilitate accelerated growth by providing timely insights into program operations. Additionally, this proactive approach to governance enhances the organization's reputation and cultivates trust among stakeholders. By adhering to a systematic approach to program oversight, teams can identify potential issues early on, allowing for prompt resolution and strategic adjustments as needed. Ultimately, program governance not only ensures operational excellence but also reinforces the organization's commitment to delivering value, thereby fostering long-term success and sustainability.

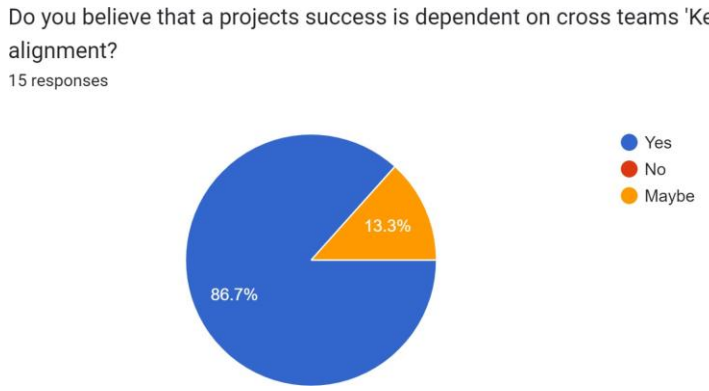

Fig.4.6e - Focus Group survey analysis - Alignment of KRA's impacting project success

Analysis - An overwhelming 87% of respondents concurred that aligning key result areas (KRAs) is crucial for effectively utilizing resources to support organizational goals. KRAs play a pivotal role in ensuring project success by summarizing the optimal resource allocation and expected outcomes of work dedicated to employees, departments, and the entire organization. They serve as a compass, guiding employees towards a clear understanding of their roles and responsibilities within the broader organizational context.

Agreement that KRAs offer a structured framework that helps prioritize efforts and streamline operations in alignment with strategic objectives came across in the survey as well as interviews. By defining clear expectations and performance metrics, KRAs empower individuals and teams to focus on tasks that directly contribute to organizational success. This alignment fosters synergy across departments and enhances overall efficiency and effectiveness.

Moreover, KRAs facilitate transparent communication and accountability, as they provide a common understanding of what needs to be achieved and how success will be measured. This

clarity promotes a sense of ownership and commitment among employees, driving motivation and engagement towards shared goals.

In essence, the alignment of KRAs is not only essential for optimizing resource utilization but also for fostering a culture of clarity, collaboration, and goal attainment within the organization.

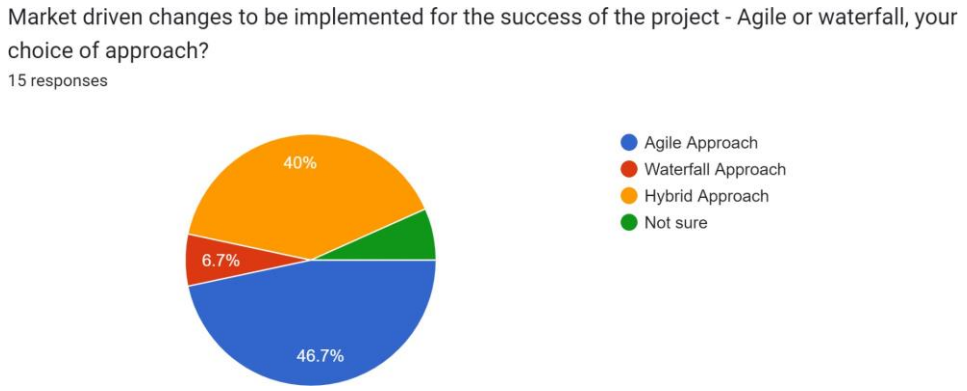

Fig.4.6f - Focus Group survey analysis - Market driven changes impacting project success

Analysis - This question elicited a mixed response, with 46% of respondents believing that Agile methodology adequately incorporated market-driven changes. Conversely, 40% felt that an approach combining elements of both Agile and Waterfall methodologies made the most effective use of data in response to market-driven changes.

This divergence of opinion highlights the ongoing debate within project management circles regarding the most suitable methodology for adapting to dynamic market conditions. While Agile is favored by a significant portion of respondents for its responsiveness, others advocate for a hybrid approach that leverages the strengths of both Agile and Waterfall methodologies to navigate market uncertainties more effectively.

Summary -

The unanimous agreement among 100% of respondents on the importance of collaboration and communication in project management underscores these factors' critical role in project success. However, respondents also highlighted the need for adaptable tools and processes, recognizing that project requirements and contexts vary. Through dialogue and iterations, agreed upon and signed off by clients, constraints can be effectively managed, ensuring project alignment with stakeholder expectations and priorities.

Constraints identified by respondents as potential obstacles in project execution include clarity regarding allocated budgets for project changes. This highlights the importance of transparent financial planning and communication throughout the project lifecycle to mitigate financial risks and ensure fiscal responsibility. Additionally, scope creeps emerged as a significant concern among respondents, posing a threat to project focus and timelines. Effective scope management strategies, such as clear project scopes, change control processes, and stakeholder engagement, are essential to address this challenge.

Moreover, the potential impact of experienced resources departing mid-project due to better opportunities was identified as a risk factor affecting project timelines. This underscores the importance of resource management and retention strategies to maintain project continuity and expertise. Strategies such as knowledge transfer, talent development, and proactive recruitment can help mitigate the risks associated with resource turnover, ensuring project stability and success.

The analysis of responses from the majority of respondents underscores the effectiveness of Agile methodologies in addressing complex projects, particularly in the context of banking where constant testing and interaction with stakeholders are imperative. Three key areas highlighted in the analysis include leadership, collaboration, and delivery. Agile methodologies offer a framework that fosters these aspects, enabling banks to tackle complex banking problems, integrate customer feedback quickly, and ensure continuous quality assurance.

In banking, where intricate financial systems and regulatory requirements often present complex challenges, Agile methodologies provide a structured approach to managing projects. By breaking down projects into smaller, manageable increments and prioritizing frequent testing and stakeholder engagement, Agile enables banks to navigate the intricacies of banking operations more effectively. The iterative and incremental nature of Agile development allows banks to adapt to changing requirements and market dynamics swiftly, ensuring that solutions remain relevant and responsive to evolving needs.

Leadership plays a crucial role in driving Agile transformations within banking organizations. Agile leaders champion the principles of Agile, providing vision, support, and guidance to teams as they navigate the complexities of banking projects. Agile leaders foster a culture of empowerment, collaboration, and continuous improvement, encouraging teams to take ownership of their work and innovate solutions that meet customer needs effectively. By fostering a culture of trust, transparency, and accountability, Agile leaders create an environment where teams can thrive and deliver value to customers.

Collaboration is another key aspect of Agile methodologies that is essential in the banking sector. Agile encourages cross-functional teams to work together closely, breaking down silos and fostering communication and collaboration across departments. By bringing together diverse perspectives, skills, and expertise, Agile teams can solve complex banking problems more effectively, leveraging the collective knowledge and experience of team members to drive innovation and creativity. Collaborative approaches such as daily stand-up meetings, regular retrospectives, and continuous feedback loops enable teams to align their efforts, share best practices, and address challenges collaboratively.

Delivery is the ultimate goal of Agile methodologies in banking, with a focus on delivering value to customers quickly and consistently. Agile practices such as iterative development, continuous integration, and frequent releases enable banks to deliver solutions to market faster, reducing time to market and increasing customer satisfaction. By prioritizing customer feedback and incorporating it into the development process, Agile teams can ensure that solutions meet customer needs and expectations effectively. Moreover, Agile methodologies emphasize continuous quality assurance, with a focus on testing and validation throughout the development lifecycle. By embedding quality assurance practices into every stage of the development process, Agile teams can identify and address issues early, minimizing risks and ensuring the delivery of high-quality products and services.

Furthermore, Agile methodologies are not limited to the realm of technology and can be applied to various departments within banking organizations, including Human Resources, Information Technology, Finance, and more. The universality of Agile approaches was repeatedly emphasized in the analysis, debunking the widespread misconception that Agile is solely a set of tech policies used by IT companies. Agile methodologies offer a flexible and adaptable framework that can be tailored to suit the specific needs and requirements of different departments within banking organizations, enabling them to improve collaboration, increase efficiency, and deliver better outcomes for customers and stakeholders alike.

In conclusion, Agile methodologies offer significant benefits for banking organizations, enabling them to address complex challenges, integrate customer feedback quickly, and ensure continuous quality assurance. By fostering leadership, collaboration, and delivery, Agile methodologies provide a structured framework for navigating the complexities of banking operations and driving innovation and excellence in customer service. The universality of Agile approaches ensures that benefits extend beyond technology departments, offering value to all areas of

banking organizations and ultimately benefiting customers and stakeholders throughout the banking ecosystem.

In summary, the survey results highlight the prevailing preference for Agile methodologies in project management, driven by their adaptability, collaboration, and iterative approach. However, respondents also recognize the value of hybrid approaches and emphasize the importance of effective communication, adaptable tools, and processes in navigating project constraints. By addressing key challenges such as budget clarity, scope management, and resource retention, organizations can enhance their project management capabilities and achieve greater success in delivering value to stakeholders.

The findings from the survey reveal a significant consensus among majority of respondents regarding the importance of well-defined cross-team Key Performance Indicators (KPIs). These KPIs, according to the majority, should be meticulously outlined in terms of overlap and delineation of roles and responsibilities to facilitate issue resolution effectively. It was suggested that structured governance meetings, periodic interventions, and tools such as burndown progress charts should be employed to address impediments and challenges faced by teams, leading to proactive problem-solving.

Centralized governance emerged as a critical factor, particularly according to the 60% of respondents who emphasized the pivotal role it plays. They highlighted that centralized governance structures facilitate the decision-making process concerning cross-team KPIs, their impacts, and the clarity on next steps and their respective owners. This approach ensures alignment and accountability across teams, fostering a cohesive and collaborative environment conducive to project success.

In contrast, 20% of respondents acknowledged the importance of cross-team KPIs but suggested that their definition could evolve through iterations during the project's lifecycle. This adaptive

approach recognizes the dynamic nature of projects and allows for flexibility in adjusting KPIs based on evolving requirements and insights gained along the way.

Interestingly, 10% of respondents expressed a belief that the clarity of the project plan in terms of objectives to be achieved outweighed the need for explicitly defined cross-team KPIs. While acknowledging the importance of KPIs, they emphasized the significance of a clear and well-defined project plan as the primary driver of project success.

Insights gathered from interviews further underscored the importance of transparency and overcommunication in fostering alignment and collaboration among teams. Centralized governance mechanisms, involving key leads from various teams, were identified as essential for resolving areas of dissent and implementing mitigating strategies effectively. These learnings, drawn from past project experiences, highlight the critical role of effective communication and governance structures in navigating complex project landscapes and achieving desired outcomes.

In a nutshell, Governance pervades organizations.

In conclusion, the survey results and interview insights collectively emphasize the importance of well-defined cross-team KPIs, centralized governance, and transparent communication in project management. By fostering alignment, accountability, and proactive issue resolution, organizations can optimize project performance and enhance overall project success. These findings underscore the need for adaptive governance structures and communication strategies to navigate the complexities of modern project environments effectively.

Analysis :

How relevant is Agile versus primitive methodologies in addressing constraints in day to day banking ? How to classify these constraints for easier identification and modeling ?

The primary benefit of an agile approach as compared to a traditional up-front approach is its flexibility , helping take an incremental and iterative approach for teams to adjust to changing requirements , incorporating feedback from clients and stakeholders, and helping address new or repetitive issues as they arise. This speeds up the time to market by providing minimum viable product (MVP) that meets user needs and can be adapted quickly (Dan Biewener, 2023)
Agile methodologies have gained significant relevance in addressing constraints in day-to-day banking operations due to their adaptability, flexibility, and customer-centric approach. In contrast, primitive methodologies, such as traditional waterfall approaches, may struggle to cope with the dynamic and rapidly evolving nature of the banking industry. Here's how these methodologies compare in addressing constraints:

Agile Methodologies:

- Adaptability: Agile methodologies allow banks to respond quickly to changing market conditions, regulatory requirements, and customer preferences.
- Flexibility: Agile practices enable banks to prioritize and deliver value incrementally, allowing for course corrections and adjustments based on feedback.
- Customer-Centricity: Agile methodologies emphasize collaboration with customers and stakeholders, ensuring that banking solutions meet their needs effectively.
- Continuous Improvement: Agile approaches promote continuous learning and improvement, enabling banks to iterate on their processes and products to stay competitive.

Primitive Methodologies (e.g., Waterfall):

- Rigidity: Traditional methodologies like Waterfall may struggle to accommodate changes in requirements or market conditions, leading to delays and inefficiencies.
- Limited Customer Engagement: Waterfall approaches often involve minimal customer involvement until the later stages of the project, potentially resulting in misaligned solutions.
- Risk of Overruns: Primitive methodologies may carry a higher risk of budget overruns and missed deadlines due to their sequential nature and limited flexibility.

To classify constraints in day-to-day banking for easier identification and modeling, banks can use a structured approach such as:

Regulatory Constraints: Identify regulatory requirements imposed by authorities governing the banking sector, such as compliance standards, reporting obligations, and data privacy regulations.

Technological Constraints: Assess limitations related to banking systems, infrastructure, and technologies, including legacy systems, integration challenges, and cybersecurity risks.

Operational Constraints: Analyze constraints related to operational processes, resource allocation, and workflow inefficiencies, such as manual processes, bottlenecks, and scalability issues.

Market Constraints: Consider external factors impacting the banking industry, such as competitive pressures, changing customer preferences, and economic trends, which may pose constraints on banking operations.

Customer Constraints: Evaluate constraints arising from customer expectations, satisfaction levels, and demands for personalized banking experiences, including issues related to service quality, responsiveness, and accessibility.

By classifying constraints in these categories, banks can systematically identify areas for improvement, prioritize initiatives, and develop agile solutions to address constraints effectively, fostering innovation and competitiveness in the banking sector.

Constraints to Agile could be as follows :

- Poor resource planning : Since Agile works on incremental cycles , delivery of the end product or prediction of cost, time and resourcing becomes more critical as the project gets bigger and more complex.According to Brooks Law , adding people Tends to reduce the capability, efficiency, capacity, and throughput of the constraint in the short term.Due to the learning curve.Time spent in teaching and orienting.And the burden of intercommunication.
- Fragmented output – since incremental delivery is the key component to get the end result the output could be fragmented rather than a single cohesive unit
- Documentation and tracking : Since documentation happens throughout, especially around ‘build time’ and not at the beginning, it gets less detailed which is disadvantageous as many KPI’s cannot be set at the beginning of the project making progress tracking difficult

How can alignment of cross team KPI help in addressing issues and resolving conflict while solutioning constraints ? What is the role of centralized governance in meeting the planned objectives?

Aligning cross-team Key Performance Indicators (KPIs) can play a crucial role in addressing issues, resolving conflicts, and effectively solutioning constraints in a business environment. Here's how:

Shared Goals and Objectives:

When cross-functional teams align their KPIs, they are essentially working towards shared goals and objectives. This alignment fosters a sense of unity and collaboration among teams, reducing silos and promoting a collective focus on achieving overarching business objectives.

Improved Communication and Collaboration:

Aligning KPIs encourages teams to communicate more effectively and collaborate closely to achieve common targets. This enhanced communication facilitates the sharing of information, ideas, and resources, leading to better problem-solving and conflict resolution.

Clear Accountability and Responsibility:

With aligned KPIs, teams have a clear understanding of their roles, responsibilities, and performance expectations. This clarity fosters accountability, as each team knows how their performance contributes to the overall success of the organization. As a result, teams are more likely to take ownership of issues, proactively address conflicts, and work towards resolving constraints.

Enhanced Performance Tracking and Measurement:

Aligned KPIs enable consistent tracking and measurement of performance across teams. This allows organizations to identify areas of improvement, monitor progress towards goals, and proactively address issues or bottlenecks that may arise.

Strategic Decision-Making:
By aligning KPIs, organizations can make more informed and strategic decisions based on holistic insights into performance metrics. This enables leadership to allocate resources effectively, prioritize initiatives, and make course corrections as needed to address constraints and achieve planned objectives.

Centralized governance plays a critical role in ensuring that the alignment of cross-team KPIs effectively contributes to meeting planned objectives. Here's how centralized governance supports this process:

Establishment of Standardized Processes:
Centralized governance ensures that standardized processes and frameworks are in place for defining, tracking, and managing KPIs across teams. This consistency enables alignment and facilitates comparison and benchmarking of performance metrics.

Enforcement of Accountability:
Centralized governance establishes mechanisms for enforcing accountability and ensuring compliance with KPI alignment initiatives. This includes defining roles and responsibilities, setting performance targets, and implementing performance reviews to hold teams accountable for their contributions to organizational objectives.

Facilitation of Communication and Collaboration:
Centralized governance structures facilitate communication and collaboration among stakeholders involved in KPI alignment efforts. This includes coordinating cross-functional teams, facilitating regular meetings and discussions, and providing channels for sharing best practices and lessons learned.

Monitoring and Oversight:

Centralized governance provides oversight and monitoring of KPI alignment initiatives, ensuring that they are on track to meet planned objectives. This may involve regular reviews of performance data, identification of areas for improvement, and implementation of corrective actions as necessary.

Overall, the alignment of cross-team KPIs, supported by centralized governance, creates a framework for addressing issues, resolving conflicts, and effectively solutioning constraints, ultimately driving organizational success and achievement of planned objectives.

As elaborated above, Agile does not necessarily work in isolation unless certain milestone checks are added through ownership and metrics management

- Lean Approach : Mitigating the disadvantages of Agile by emphasizing across cross operational teams the importance of quality in delivery rather than just delivering a ‘working’ product helps set expectations right and gets it ingrained in individual KPIs
- Governance Model : Through Burndown charts and other MIS keeping a stringent documented model in place to help cross functional teams know about deviations from path helping improved communication to help realign and repurpose effort helps in reduced overhead of time , effort and manpower

As quoted by AntonioNieto-Rodriguez (2020) quoting the example of the US Airways Flight 1549 pilot’s safe maneuver despite both plane engines failing which shows that Governance is more about accountability and in today's day and time, governance is centralized at the levels at the top of the organization

Summary of Findings

In the evolution of banking practices, the approach to constraint management has undergone a significant shift from traditional methods to more agile methodologies. In earlier times,

constraints often manifested as a result of faulty processes identified through errors or customer complaints. These constraints arose due to a lack of involvement of end customers and delivery chain teams in the system construction process. As a consequence, the end result was not thoroughly tested and fine-tuned before implementation, leading to inefficiencies and suboptimal outcomes.

However, with the advent of agile methodologies in banking, there has been a transformative shift in how constraints are managed and addressed. Agile methodologies have revolutionized the banking sector by leveraging practices that harness expertise along the production chain, ultimately enhancing customer service, competition, and wealth management. One of the key benefits of agile methodologies is the automation of mundane tasks, which frees up teams to focus on critical items requiring human intelligence. By automating routine processes, agile methodologies streamline operations, reduce manual errors, and improve overall efficiency.

Moreover, agile methodologies facilitate faster product development and decision-making processes. By providing data points and enabling subject matter experts to work collaboratively in a Kaizen approach, agile methodologies empower banking institutions to adapt quickly to changing market dynamics and customer needs. This agile approach to constraint management aligns closely with the principles of continuous improvement and responsiveness, allowing banks to iterate on solutions rapidly and stay ahead of the competition.

A classical example of successful implementation of agile methodologies can be found in Toyota's approach to manufacturing. Toyota's renowned production system, often referred to as the Toyota Production System (TPS), embodies the principles of agility, efficiency, and continuous improvement. At the heart of the TPS is the concept of Kaizen, which emphasizes continuous incremental improvements to processes, products, and systems. By empowering

employees at all levels to identify and address constraints in real-time, Toyota has been able to optimize its production processes, reduce waste, and deliver high-quality products to customers consistently.

In the context of banking, adopting an agile mindset inspired by the principles of the TPS can yield similar benefits. By fostering a culture of continuous improvement and collaboration, banking institutions can effectively address constraints, enhance operational efficiency, and deliver superior customer experiences. Furthermore, agile methodologies enable banks to adapt quickly to regulatory changes, market fluctuations, and evolving customer preferences, thereby staying resilient and competitive in a rapidly changing landscape.

In conclusion, the adoption of agile methodologies in banking represents a paradigm shift in how constraints are managed and addressed. By embracing practices that prioritize collaboration, innovation, and continuous improvement, banking institutions can unlock new opportunities for growth, efficiency, and customer satisfaction. Drawing inspiration from successful examples like Toyota's TPS, banks can harness the power of agile methodologies to drive meaningful change and achieve sustainable success in today's dynamic and competitive banking industry.

Conclusion

The traditional waterfall model of project management, characterized by its sequential approach to development, often resulted in customer dissatisfaction due to its inherent limitations. In this model, the entire product was defined upfront, and development proceeded linearly through distinct phases, with no room for deviation or iteration until the final product was delivered. However, this rigid approach proved problematic when errors or bugs were discovered late in the development cycle, leading to extensive rework, delays, and ultimately, customer dissatisfaction.

In contrast, Agile transformation offers a paradigm shift in project management, enabling organizations to work more effectively with fewer resources while maintaining high levels of customer satisfaction. Agile methodologies, such as Scrum or Kanban, prioritize flexibility, collaboration, and continuous improvement, allowing teams to adapt quickly to changing requirements and deliver incremental value to customers.

One of the key principles of Agile transformation in banking is the emphasis on rapid delivery of changes to adapt to the evolving and competitive financial landscape. By breaking down projects into smaller, manageable increments, Agile enables banks to respond swiftly to market trends, regulatory changes, and customer needs. Rather than waiting until the end of a lengthy development cycle to deliver a fully defined product, Agile teams deliver value early and often, gathering feedback from stakeholders and incorporating it into subsequent iterations.

Crucially, Agile transformation promotes collaboration and cross-functional teamwork, breaking down silos and fostering a culture of shared ownership and accountability. In Agile, work is managed by cross-functional teams rather than compartmentalized departments, allowing for better communication, alignment, and coordination across the organization. This collaborative approach not only improves efficiency and productivity but also encourages innovation and creativity, as diverse perspectives and skills are brought together to solve complex problems.

Furthermore, Agile transformation allows organizations to combine craftsmanship with mass production, leveraging the efficiency of standardized processes while also embracing individual expertise and creativity. Agile teams are empowered to continuously refine their processes, experiment with new ideas, and strive for excellence in everything they do. This commitment to continuous improvement and excellence is fundamental to Agile transformation and enables organizations to deliver better products and services to their customers.

In conclusion, Agile transformation represents a fundamental shift in project management philosophy, enabling organizations to deliver value more effectively and efficiently in today's fast-paced and competitive environment. By embracing Agile principles such as flexibility, collaboration, and continuous improvement, banks can adapt quickly to change, enhance

customer satisfaction, and drive innovation and growth. Agile transformation is not just about delivering software faster; it's about fundamentally changing the way organizations work, enabling them to thrive in an increasingly complex and dynamic world.

The blending of waterfall and agile should occur at the beginning of the project, when, for example, in the Scrum methodologies, a product backlog must be prepared. Even though this product backlog may not be fixed in stone, our experience shows that most successful projects used the frequent delivery approach of agile (two weeks, four-week sprints) but with a robust preliminary definition of what would be the final product, or “customer experience.” In a bank that recently implemented a successful financial management project in just four months, a key success factor is that the so-called customer journey, and therefore the product backlog, was well defined, and documented up front.

In a waterfall world, we would have said that requirements and design phases had been well completed, with a high level of quality. The project enjoyed the agile approach by having product backlog deliveries every three weeks, and changes to that initial backlog were implemented easily, but just because the initial documents were thorough and as we sustain, we applied “waterfall attitude” to the initial stages.That would be a true example of blending approach to keep in touch with the changing times.In the future, projects will use a combination of agile practices, with a traditional approach, usually associated with waterfall projects. This should become the dominant successful methodology, even despite the pressure for quick deliveries and the unstoppable growth of agile philosophy.

In today's competitive world, time to market is a key factor for success. Customers have limited patience, they want the speed of agile, combined with the predictability of a thorough and traditional project schedule, (lets say , like waterfall) that eases their anxiety in launching new products and services to an increasingly demanding customer base. The competent project manager should collaborate with the product owner in helping prioritize the project deliverables with the ScrumMaster in building sprints and the forecast of releases, but also needs to spend

some significant time building a long term (the length of a complete project life cycle) project schedule that anticipates potential slippage.

Due to the nature of agile projects, project buffers must be applied here almost with no exception, otherwise the whole project may fail. If, for example, the business intent is to launch a product or service for customers very quickly, the agile project manager must build a very robust schedule to deliver the minimum viable product (MVP) to market in that time frame, and be very strict with new "must haves" that may arise through the sprints making the business and sponsor aware of the potential slippage of the MVP launch. This may make many stakeholders in the project believe that "This is not agile," and here is when the word "hybrid" and "blended" approaches appear, in the discussions between the agile teams and the product owner and project sponsor. What-if scenarios in managing schedules will be essential. This type of skill is very well developed when working on waterfall projects. When a "quick win" is necessary (and currently all business ideas need this) you may be waterfall—undercover—for the first launch and pure agile for the future evolution of your solution afterwards, because you already have something in the market and you gained the credibility to apply agile 100%.

The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.This is undeniably true. We fail to express on paper or with images all that we intend to achieve in a project. But we find a paradox here: the new generations express themselves more through social-networking apps such as Snapchat than through emails, let alone long documents, but also they use calm conversation or fruitful constructive dialogue and the continuous conversation that agile requires in the absence of long documents less. An approach that was already used in waterfall projects, and that combined with the product backlog covered before helps this interaction is the use of prototypes. Young agile teams love to have conversations over prototypes, mockups of what the product owner wants to receive. Young agile project teams are more image-oriented than text-oriented. They are more visual than conversational. Therefore, the project manager has to bring good drawing, sketching, and visual thinking skills into the agile project. We can't really substitute bulky waterfall

documents by conversations and interactions only, and use of visual transfer of knowledge (i.e., requirements) is highly advisable.(Rodov Alexander, 2016).

CHAPTER V :

FUTURE PERSPECTIVES

5.1 Summary

Looking ahead, the future perspective on Agile methodology in project management within the banking sector appears promising and likely to continue evolving in several key ways:

1. Enhanced Customer-Centricity :

Agile methodologies will increasingly prioritize customer-centricity in banking projects. This means not only delivering projects more quickly but also ensuring that they align closely with customer needs and preferences. Agile's iterative approach allows for more frequent feedback loops, enabling banks to adapt their offerings in response to changing market dynamics and customer expectations.Many leading banks are pouring tremendous resources into transforming customer experiences often with mixed results, understandably so. A customer’s banking relationship includes key journeys that range from onboarding and transacting to maintenance and problem resolution. Effective transformations must not only recognize the complexity of

these relationships but must also make a priority of the parts of the experience that matter most—in order to manage the cross-functional, end-to-end nature of customer needs rather than deferring to existing organizational structures.Depending on a bank's customer-experience goals, transformations can vary in regard to the time and resources required. In our experience, a handful of elements are necessary to execute any program that will deliver durable impact. These include, among other things, consistently focussing on value ensuring the customer's central role in any transformation, and the ability to scale a program. (Nicholas Maechler, 2018).

2. Integration of AI and Data Analytics:

As banks continue to leverage artificial intelligence (AI) and data analytics to drive decision-making and personalize customer experiences, Agile methodologies will evolve to accommodate these technologies. Agile teams will work closely with data scientists and AI experts to integrate predictive analytics and machine learning into banking projects, enabling more informed decision-making and proactive problem-solving.

3. Regulatory Compliance and Security:

Regulatory compliance and security remain paramount in the banking sector. Agile methodologies will continue to evolve to address these concerns, with a focus on building compliance and security into the development process from the outset. This includes incorporating regulatory requirements into user stories, conducting regular compliance reviews, and implementing robust security measures throughout the project lifecycle.

4. Hybrid Agile Approaches:

While Agile methodologies have gained traction in banking, there will likely be a growing trend towards hybrid approaches that combine Agile with other project management methodologies, such as DevOps or Lean Six Sigma. This hybridization allows banks to leverage the strengths of Agile while also incorporating elements of other methodologies to address specific project requirements or organizational preferences.

5. Remote and Distributed Teams:

The shift towards remote work in the wake of the COVID-19 pandemic has accelerated the adoption of Agile methodologies in remote and distributed team environments. Banks will continue to invest in digital collaboration tools and platforms to support Agile practices across geographically dispersed teams, enabling seamless communication, collaboration, and project delivery.

In summary, Agile and Waterfall methodologies represent two distinct approaches to project management, each with its strengths and limitations. While Waterfall provides a structured and predictable framework for project execution, Agile offers flexibility, adaptability, and stakeholder engagement. The choice between Agile and Waterfall depends on various factors, including project complexity, stakeholder requirements, and organizational culture. Ultimately, organizations must weigh the pros and cons of each methodology and choose the approach that best aligns with their project goals and objectives.

Overall, the future of Agile methodology in project management within the banking sector looks promising, with a continued focus on customer-centricity, integration of AI and data analytics,

regulatory compliance and security, hybrid Agile approaches, and support for remote and distributed teams. By embracing Agile principles and practices, banks can enhance their agility, responsiveness, and competitiveness in an increasingly dynamic and digital banking landscape. Agile and Waterfall methodologies stand as two pillars of project management, each with its distinct characteristics and suitability for different project types. While both methodologies are widely utilized and have proven efficacy, they diverge significantly in their approach and execution.

Agile methodology thrives on collaboration and adaptability, encouraging teams to work concurrently on various project aspects. Unlike Waterfall, which follows a sequential and linear progression through project phases, Agile embraces a more iterative and fluid approach. Agile recognizes the dynamic nature of projects, allowing for flexibility and responsiveness to evolving requirements and stakeholder feedback.

Waterfall, on the other hand, adheres to a rigid structure where project phases are completed sequentially, with each phase serving as a prerequisite for the next. This linear progression provides a clear roadmap for project execution but lacks the flexibility to accommodate changes or course corrections once a phase is completed.Waterfall's linear approach may struggle to accommodate late-stage changes or stakeholder feedback, as project phases are typically completed sequentially. This lack of flexibility can result in delays, cost overruns, or even project failure if significant changes are required late in the project lifecycle.

Customers are central to a wave of new opportunities and challenges facing banking executives, with regulators increasingly expecting banks to deliver on more than just credit-risk management and associated capital requirements. For example, regulators around the world increasingly examine customer complaints for examples of problematic sales practices and inadequate customer service. For the biggest banks, how they treat their customers is becoming more of a political issue, as any CEO who has been called before a congressional or parliamentary inquiry can attest.Customers’ loyalty is also at risk.

Banks face an expanding array of new competitors. The entry of companies like Alipay, Amazon Cash, Facebook Messenger P2P, WeChat, and other services skilled at customer ease and experience may, in the longer term, disintermediate traditional banks from customer relationships and reduce banks' distribution margins. Another consequence is that players outside the traditional financial-services industry are starting to set the benchmarks for customer experience in banking. Internet retailers and other e-commerce players typically sit atop customer-satisfaction rankings. Banks often lumber in the middle of the pack.

As banks pour more effort into improving experience, we find three missteps to be the most likely culprits when efforts fall short of the mark. First, many banks ignore the need to achieve early, quick wins to demonstrate value and build momentum for change. Teams eager to achieve dramatic impact set out to create moments of customer delight and fix pain points across all journeys or processes at the same time and are often overwhelmed by the complexity and costs of redesign. (Nicholas Maechler, 2018)

Agile's emergence can be viewed as a response to the limitations of the Waterfall model's rigidity. In today's fast-paced environment, characterized by rapid technological advancements and evolving market dynamics, projects often face uncertainty and unpredictability. Agile's iterative nature allows teams to adapt to changing circumstances and incorporate feedback throughout the project lifecycle, mitigating the risk of project derailment.

One of Agile's key strengths lies in its ability to accommodate significant technological changes without disrupting project continuity. In a constantly evolving technological landscape, projects may encounter unforeseen challenges or opportunities that require adjustments to the original plan. Agile's iterative approach enables teams to pivot and realign their efforts, ensuring that the project remains aligned with its objectives and delivers value to stakeholders.Moreover, Agile places a strong emphasis on stakeholder collaboration and engagement throughout the project lifecycle. By involving stakeholders early and frequently soliciting their feedback, Agile ensures that the project remains aligned with stakeholder expectations and priorities. This iterative

feedback loop enables teams to course-correct and make informed decisions based on real-time insights, enhancing project outcomes and stakeholder satisfaction.

Chapter VI

CONCLUSION

While Agile methodologies have gained widespread recognition and adoption across various industries, it's essential to acknowledge that they may not be universally applicable. In certain sectors, such as the Defense and Aerospace industry, where regulatory requirements, risk management, and confidentiality are paramount, adopting Agile approaches may pose challenges.

Charvat J.(2003) discusses emerging trends in Agile, such as the integration of Agile with other methodologies (e.g., Agile-Waterfall hybrids) and advancements in Agile frameworks. Agile is incorporating new tools and technologies to improve efficiency and effectiveness, including enhancements in collaborative tools and automation in recent times.Emphasis on the importance of learning from successful Agile implementations suggesting that future studies should focus on best practices and real-world case studies to understand how Agile methodologies are being adapted and refined in various organizational contexts.

In industries like Defense and Aerospace, where precision, reliability, and safety are of utmost importance, the need for strict protocols and rigorous control measures cannot be overstated. Projects in these sectors often involve highly sensitive information, classified materials, and stringent regulatory compliance requirements. As a result, there is a preference for structured project management methodologies that prioritize control, predictability, and adherence to predefined processes.

The Defense and Aerospace industry exemplifies the need for a disciplined and sequential approach to project management, akin to the Waterfall methodology. Projects in these sectors typically follow a well-defined project lifecycle, with clear milestones, deliverables, and approval gates at each phase. This approach ensures that requirements are meticulously

documented, risks are systematically identified and mitigated, and deliverables are thoroughly validated before proceeding to the next phase.

For instance, in the development of defense systems or aerospace technologies, there is often a rigorous testing and certification process mandated by regulatory bodies. Each phase of the project must meet stringent quality standards and undergo thorough scrutiny before progressing to the next stage. This meticulous approach helps ensure that the final deliverables meet the highest standards of safety, reliability, and performance.

Moreover, the nature of projects in the Defense and Aerospace industry often involves long lead times, complex supply chains, and interdependencies with other critical systems. Any deviation from the established project plan or introduction of changes late in the project lifecycle can have far-reaching consequences, including delays, cost overruns, and compromise of mission-critical objectives.

Despite the inherent challenges of applying Agile methodologies in highly regulated and risk-averse industries like Defense and Aerospace, there may still be opportunities for Agile-inspired practices to be incorporated selectively. For example, Agile principles such as cross-functional collaboration, iterative development, and customer-centricity can be leveraged in certain aspects of project management, such as software development or system integration.

However, it's essential to recognize that the adoption of Agile practices in these sectors may require careful consideration and customization to accommodate the unique requirements and constraints inherent in such environments. This may involve implementing hybrid approaches that blend the discipline and structure of traditional project management methodologies with the flexibility and adaptability of Agile principles.

In conclusion, while Agile methodologies offer numerous benefits in terms of flexibility, responsiveness, and stakeholder engagement, they may not be a one-size-fits-all solution, especially in industries like Defense and Aerospace where regulatory requirements, risk management, and confidentiality are paramount. The disciplined and structured approach of

methodologies like Waterfall remains well-suited to managing projects in these sectors, ensuring adherence to strict protocols, rigorous control measures, and the highest standards of quality and safety. However, organizations in these industries should remain open to selectively integrating Agile-inspired practices where feasible, to capitalize on opportunities for innovation and continuous improvement while mitigating risks effectively.Overall, Agile project management fosters a culture of adaptability, collaboration, speed, quality, and stakeholder engagement, ultimately enabling organizations to deliver value more effectively and efficiently.

In conclusion, it is evident that both traditional project management methods like Waterfall and modern Agile methodologies have their merits and demerits. While Agile is often lauded for its flexibility, adaptability, and stakeholder engagement, traditional Waterfall approaches have also seen success in the past. It is essential to acknowledge the contributions of Waterfall methodologies and not dismiss them entirely in favor of Agile.

Experienced project managers understand that Waterfall project management also requires team collaboration and involvement of end-users. The criticism directed towards Waterfall should be evaluated in absolute terms, considering the context and specific requirements of each project. Despite its rigid structure, Waterfall has demonstrated effectiveness in delivering successful outcomes, albeit perhaps not as frequently as Agile.

Research findings suggest that only a quarter of projects managed using Waterfall methodologies may have been complete successes. While this indicates room for improvement, it also highlights the need for a nuanced understanding of project management methodologies. Building the Agile manifesto and principles of software development was a necessary response to address the limitations and shortcomings of traditional approaches like Waterfall.

However, it would be remiss to ignore the challenges and potential failures associated with the Agile approach. Dependencies, especially those involving the human element, can introduce complexities and uncertainties during project execution. Additionally, the expenses incurred for

iterations and the management of timelines need to be carefully balanced against the anticipated benefits of the project.

Therefore, while Agile methodologies are preferred and have demonstrated results, the decision to adopt an absolute Agile approach or a combined approach depends on the nature and requirements of the project. Future research should delve deeper into understanding the factors that influence the success or failure of Agile projects, including the human element, dependencies, and cost-benefit analysis.

Furthermore, examining the effectiveness of hybrid approaches that combine elements of Agile and Waterfall methodologies could provide valuable insights into optimizing project management practices. By studying real-world case studies and conducting empirical research, scholars can contribute to the ongoing discourse surrounding project management methodologies and inform best practices for project success.Combining waterfall and Agile project management methodologies in banking can offer a balanced approach that leverages the strengths of both frameworks to effectively manage projects. In the context of banking, where regulatory compliance, security, and stability are crucial, while also needing to respond quickly to market demands and technological advancements, this hybrid approach can be particularly beneficial.For large-scale, mission-critical projects such as core banking system upgrades or regulatory compliance initiatives, the waterfall approach can provide structure and clarity. This involves sequential phases of planning, design, development, testing, and deployment, ensuring meticulous attention to detail and rigorous documentation. This methodology is well-suited for projects with clearly defined requirements and low tolerance for errors, typical in banking operations.

However, for areas where requirements are subject to change or innovation is needed, Agile methodologies can be integrated. Agile promotes flexibility, collaboration, and rapid iterations, enabling teams to adapt to evolving customer needs and market conditions. In banking, Agile can be applied to initiatives like digital banking platform enhancements, where user feedback and market trends play a significant role.

In practice, the hybrid approach might involve starting with a waterfall approach to establish the project's foundational elements, such as compliance requirements, security protocols, and architectural design. Once these are defined, Agile methods can be employed for iterative development and continuous improvement, allowing for frequent releases and feedback loops.

For example, in the development of a new mobile banking app, the project might begin with a waterfall phase to define regulatory compliance standards, security measures, and overall architecture. Subsequent Agile sprints would focus on feature development, with regular releases to gather user feedback and make iterative improvements based on market demands.

By combining waterfall and Agile methodologies, banks can strike a balance between stability and flexibility, ensuring compliance and security while also fostering innovation and responsiveness to customer needs. This hybrid approach maximizes efficiency and effectiveness in delivering high-quality banking solutions in today's dynamic and highly regulated environment.

In their paper "Customizing Project Management Methodology," Ali Cheema and Abdul A. Shahid (2005) addresses the importance and process of tailoring project management methodologies to meet the specific needs of different projects and organizations, to address the diverse challenges and conditions encountered in various projects.The framework involves assessing project characteristics, organizational culture, and specific project requirements to adapt methodologies effectively. The framework is designed to help project managers tailor methodologies in a way that aligns with their project goals and constraints.This will bring about benefits such as increased project efficiency, better risk management, and improved stakeholder satisfaction. By adapting methodologies to fit the project context, organizations can achieve more effective and streamlined project exe . There would be potential challenges in customizing project management methodologies, including resistance to change and the need for adequate training. Future studies should include strategies to overcome these challenges and ensure successful implementation of customized approaches.

In conclusion, while Agile methodologies offer numerous benefits and have become increasingly popular in today's dynamic business environment, it is essential to recognize the strengths and limitations of both Agile and traditional Waterfall approaches. By taking a nuanced and context-specific approach to project management, organizations can leverage the strengths of each methodology to achieve their strategic objectives effectively. Future research should continue to explore the complexities of project management and provide actionable insights to support decision-making and improve project outcomes.

Kent Beck: "I'm not a great programmer; I'm just a good programmer with great habits." - Kent Beck, creator of Extreme Programming (XP) and author of "Extreme Programming Explained."
Jeff Sutherland: "Scrum is like your mother-in-law, it points out all your faults." - Jeff Sutherland, co-creator of Scrum and author of "Scrum: The Art of Doing Twice the Work in Half the Time."
Mike Cohn: "User stories are part of an iterative, incremental approach to software delivery; an approach that works well with agile development methodologies." - Mike Cohn, author of "User Stories Applied" and co-founder of the Agile Alliance.
Ken Schwaber: "The ScrumMaster is responsible for ensuring that the team lives agile values and principles and follows the processes and practices that the team agreed they would use." - Ken Schwaber, co-creator of Scrum and author of "Agile Software Development with Scrum."
Ron Jeffries: "If you don’t see the value in test-first design, try it. You will." - Ron Jeffries, one of the authors of the Agile Manifesto and a pioneer of Extreme Programming (XP).

These quotes capture the essence of agile project management as advocated by prominent figures in the agile community.

APPENDIX A

SURVEY COVER LETTER

……

Good Day

To conclude the dissertation on the viability of approach in the Project Management , would appreciate if you could spare a few minutes of your time in sharing your thoughts on the same

This survey is confidential and does not require your signature. Your valuable inputs will help give direction to the approach required for this thesis

Thanking you in advance for sharing your inputs

Attached the link below as well for your convenience
https://docs.google.com/forms/d/1xXoeFmWCyr2L6hXkxtwSjW_6ekkK91AxYtZdepbx59Q/viewform

……

APPENDIX B

INFORMED CONSENT

Title Of Study

Agile Transformation in Banking

Primary Researcher

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Purpose of Study

In Partial Fulfillment of the requirements for the degree 'Doctor of Business Administration

Participants Initials

M.M.

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