# Agile Transformation – Why some projects succeed brilliantly while others fail.?

Author

Gaurav Singh

A Dissertation submitted in partial fulfilment for the Masters of Science in Management

Submitted to the National College of Ireland, August 2020

**Abstract**

The “Agile Manifesto” been introduced for over 20 years, but even today, Agility remains a topical issue. The traditional methods for software development were widely used for over 40 years, But, in 21st century, Business environment has become unpredictable and highly complex, as competition has gone global, opportunities have been dynamic and organizations are facing rapidly changing technological and business environment.

The significance of Agile Methodologies could never be neglected as their positive impact have been the key factors of modernizing of Software development processes described by the practitioners highlights the categorial division of Agile Development Methodology. Agile methods have gain immediate popularity with its most functional focus on providing faster and flexible response to change in the flexible form of the design and production process by enabling customer involvement during the project lifecycle.

This research is entitled to walk around the organisational cultural and structural aspects as the focal point with people and team involving in the successful transformation and adoption to Agile Methodology and Agile Project Management. The purpose of this Masters Dissertation is to explore the Success and Challenging factors around a Software Agile Management Project experienced by the Project Managers and Software Development Team involved within the project during or within the agile transformation software development environment of an IT organisation.

The analysis from research studied on the Empirical findings and literature study identifies the Success Factors as Agile being iterative, incremental, flexible and continuous evolving process in a project environment, whereas the Challenging factors identified as organisation’ culture which is a complex activity for application of agile method as a whole during Agile transformation.

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**Student Number: x18204996**

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**Title of Thesis: Agile Transformation: Why some projects succeed brilliantly while others fail?**

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**Acknowledgement**

This Master Dissertation was written with the help of many extraordinary people who thoroughly helped and I would like to wish my gratitude to them.

Firstly, I wish to thank my supervisor Ms. Frances Keating for her continuous support, guidance, supervision and patience throughout this research project. Without her guidance it would have been a considerably difficult task to accomplish.

Secondly, I am indebted to the 10 Individuals who agreed to be interviewed for the Qualitative research. Their detailed input to the research study is much valuable.

Lastly, I would like to thank all the respondents to the Quantitative research survey as their inputs have gathered valuable data for the research study.

Thank you Again!
Gaurav Singh

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## Chapter 1 Introduction and Overview

This Chapter is dedicated to the introduction of the Research topic and its key studying areas followed by the research background and problem statement that can be considered as the talking point of the research. Further, A brief about the purpose and objective of this research backed by the questions which has been structured to seek the reasoning between the gap within the success and failure proportion of Agile Transformation with respect to the answers of hypothesis questions have been stated.

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### Ch. 1.1 Introduction

"*An act of gradually transforming an Organization's nature or form to one that I sable to thrive and embrace the flexible, collaborative, self-organizing and fast changing environment";* Agile Transformation.

The "Agile Manifesto" been introduced for over 20 years, but even today, Agility remains a topical issue. The traditional methods for software development (SD) were widely used for over 40 years, recalls as the early emergence of software development environment. As per Traditional Project Management (TPM) approach, project managers need to sort the upfront project planning and anticipation of details around a project execution (PMI, 2017, p.7) emphasized as a plan-driven approach before the start of a definable project, requiring a high degree of predictability (Larson and Gary, 2018).

But, in 21$^{st}$ century, Business environment has become unpredictable and highly complex, as competition has gone global, opportunities have been dynamic and organizations are facing rapidly changing technological and business environment. To remain competitive and recognizing the acceptance of change, organizations need to acknowledge the complexities to manage the risks involved with the dynamic and uncertain projects. (PMI, Ch. 2, 2017). These characteristics led the development for a fast-changing response and to explore flexibility towards challenges as Agile approach to Project Management.

Since the emergence of Agile Manifesto in 1990, the software industry has shown incremental interest in adopting the agile methods as projects within Information Technology (IT) system are still highly influenced of agile approaches. The agile methods are formalised methodologies which promotes continuous evolvement of solutions considering the requirements throughout the project lifecycle.

Today, various organizations claim to be agile or are already interested to adopt agile methodologies for managing their projects. A study by Forrester Report based on the interviews of the decision-making representatives of different companies in September, 2006 highlighted that agile was already being used in 17% of the enterprises wherein more than half of the rest of the companies were interested in going agile (Forrester Report, 2007).

For an organization, it is an undergoing hierarchical process of transforming to an Agile Methodological environment coming from a traditional methodological one. An organisation required to change its long-term organisational structure-cum methods, historical and working culture which makes the Agile transformation challenging for many organisations (Sanchez et. Al, 2016).

The significance of Agile Methodologies could never be neglected as their positive impact have been the key factors of modernizing of Software development processes described by the practitioners highlights the categorial division of Agile Development methodology which provides 1. Sustainable pace to the project development process by boosting the productivity (Beck, 1999); 2. Building trust between the development team and stakeholders by working in iterative development and demonstration of working software along with continuous feedback (Fowler and Highsmith, 2001); 3. Better response towards change during the development lifecycle by approaching the iterative paradigm that result in better risk management with producing quality software delivered adding value to the work (Moran, 2010; Highsmith, 2002).

The above said claims have promoted the Agile Development Methodologies and Project Management processes to widespread across the organizations to adopt and implement in their working environment, and as per findings of West and Grant, 2010, more than 50% organizations are reporting to adopt the Agile Methodologies.

**Ch. 1.2: Research Background**

The Agile Methods were developed to provide a solution to the traditional way of development which were entitled to have excessive documentation and having inefficient work teams which were insufficient to response the needs of fast-pace development world in 1990 (Cooke 2012, pp, 32-36).

In a report from 2006 which was followed up of the previously generated report in 1994 showcased that the percentage of successfully categorised projects were counted as 35% in the year 2006 (Rubinstein 2007), compare to 31% in the year 1994, Although, having an outright project failure dropped to only 1 % in the hear 2006 counted as 19% compared to the outright projects failure count of 20% in the year 1994. The difference might not be abysmal but still considerable having the increment in projects success rate.

Agile methods have gain immediate popularity with its most functional focus on providing faster and flexible response to change in the flexible form of the design and production process by enabling customer involvement during the project lifecycle (Novoseltseva, 2016). Since its existence it has been evident that Agile methods has been successfully adopted and implemented in the Software/IT organisations while the traditional organisations had been struggling with having challenges in adopting and implementing the Agile way of working (Cooke, 2012, p. 31).

In a Survey, Scott W. Ambler (2012) observed and highlighted the 5 major challenges of adopting the Agile Methods in an organisation which are categorised as 1. Waterfall working culture in the organisation, 2. Lack of trust between development teams or the management, 3. Lack of involvement from the stakeholders in the project, 4. Traditional governance and 5. culture of command control in the organisation. It is noticeable that out of 5 challenges, 3 are directly related to organisational culture. It is obvious that any new process or protocol within the organisation required coaching to understand and adopt the new processes or tools but challenges come more which are related to the rigidness of the organisation's waterfall culture and governance and command control environment (Ambler 2012), which highlights that the challenges related to Agile transformation goes beyond learning and implementing new tools and process rather related to the values and mindset of the teams and organisation's culture (Powers, 2017).

The iterative methods for development have been forming base for the Agile development methodologies with focus on shorter delivery timeframe and rapid responsiveness towards change. Since software development is highly uncertain and change can neither be predicted nor can be avoided, it should only be expected (Schwaber, 1996) which is why many companies who are using traditional methods for software development worry about changing their development methods and processes.

Researches done in past have widely focused on case studies related to agile transformation with explaining the dimension of organisational changes during the agile movement (Babuscio, 2009; Fraser *et al.*, 2006 and McCarthy 2003) as the methodological changes within the organisation bring series of issues since the organisation have adapted a different radical approach to continue with their business operations. Other studies have been performed on agile adoption within organisation since the effect of agile methods are different which is majorly due to the nature of agile methods, thus no unified strategy can be formed for agile adoption. Another study talks about the implementation of the agile methods in broad set of practices and multi-stage process approach (Sidky, 2007) meant for team work, interactions, boundary management and external response which is mainly an engineering approach. The studies do not include other issues with agile movement such as organisational cultural and structural issues.

This Research aims to study and understand the factors around Agile Project Management Methodologies which have been considered as a solution to transform from traditional industrial project management practices to bring the change factor in an organisational business models to conquer the rapidly changing competitive market due to the diversified demand of customers, change in regulations by the governments and various start-up with their diversifies and disruptive business models entering and sharing the market environment.

## Ch. 1.3: Problem Statement

The research is entitled to walk around the organisational cultural and structural aspects as the focal point with people and team involving in the successful transformation and adoption to Agile Methodology and Agile Project Management and their respective attitude and response towards the change in practices and processes. In recent years, various researches have been conducted around agile movements based on specific organisation environment (Barlow et al., 2011), movement along with specific methods involved (Cho, 2010) and movement within specific organisational culture (Asnawi *et al.*, 2012). I believe that such researches which are conducted with a perspective of having the participating team and people as the centre of the study are more valuable since.

Majorly all practitioners and researches have emphasized on engineering agile practices and adoption within the software development teams and stakeholders as propaganda for measuring of success parameter of agile methodological usage, which in contrast, has led to criticism by many practitioners despite having a wide adoption of Agile methodology in the Software development environment.

This highlights that achieving the agile values with implementation of agile manifesto which involves 12 agile principles (Beck *et al.*, 2001) subsequently requires comprehensive strategy for overcoming issues and challenges of agile migration since all aspects of an organisation are affected due to Agility and effective research is required to each aspect for agile exploratory methods.

## Ch. 1.4: Research Aim and Objectives

The “Agile” methodological umbrella is widespread and diverse enough that despite having various researches conducted around the agile adoption among organisations and in project management, there are claims and factors which are normative but yet to be tested in a broader spectrum.

The purpose of this Masters Dissertation is to explore the Success and Challenging factors around a Software Agile Management Project experienced by the Project Managers and Software Development Team involved within the project during or within the agile transformation software development environment of an IT organisation.

It is certain that in agile transformation, the success and failure of agile project management in long run is dependent on the participating people, teams, stakeholders in the process. Regardless of the role of the Project manager having a firm grip on Agile Processes, the participating software development team can either embrace or reject the systematic process and methods demanding change in their work and approach towards the transformation, and without their optimum support, the transformation and project success can unlikely to be achieve.

Three key areas broadly distinguish the agile transformation as the success or challenge factor is dependent on these factors, and the research will discuss on following:

1. Exploring the success and challenging factors during the transformation process.
2. Examining the impact of the change in practices or role of the participants in the transformation process.
3. Understanding the model and reasoning of rejecting or accepting the adoption of agile transformation.

The Research Objective is to understand the create understanding around the agile transformation and adoption process in the software development organisation(s) and investigating factors and findings leading to the success or failure results by means of interactive interviews and communication with IT professionals in a software development environment. The participants were selected and approached on the basis of their roles and expertise in the software development projects and team in an attempt to have broader and optimum representations from multiple groups.

**Ch. 1.5: Research Contribution**

The expected research contribution and studied conclusion will be beneficiary and subjective of interest for multiple groups such as Software Development Managers, Project Managers, Stakeholders and Organisation(s) as whole who are willing to undergo Agile transformation or are already using Agile practices as the research aims to investigate the pathways to successfully adopting the agile methodologies from ground roots perspective. The research would act as an advisable proposal for the Agile Project managers to their visionary perspective of the agile impact on project requirements adding values towards the goals. For the practitioners researching on the factor involved with the success or failures of agile transformation process.

**Ch. 1.6: Research Structure**
The complete research structure is outlined in the chapters as follows:

**Chapter 1: Introduction and Overview**
The titled chapter provides the introduction and overview of the background and problem statement around the agile transformation in software development environment.

**Chapter 2: Literature Review**
The chapter is entitled to the present the theoretical framework in detail as it focuses on providing the brief of the processes and methods involves in agile transformation studied from various research papers and journals. The introduction of agile methods followed by the implication of changes introduced to the organisational cultural and structural management, leadership strategies and requirement.

**Chapter 3: Research Methodology**
This chapter talks about the selected methodology for research, followed by the explanation on targeted specific audience for data collection which form the basis to the research to be conducted formulating the theoretical framework explained in chapter 2. Further, the discussion on the analysis method coupled with the generalisability, reliability, validity and ethics is made.

**Chapter 4: Analysis and Empirical Findings**
This chapter showcase the research analysis and findings gathered through the primary data collected from Qualitative and Quantitative methods to its theoretical linking representation and outcome variables.

**Chapter 5: Discussions on the Empirical Findings**
This chapter provides a linking viewpoint between the literature and the empirical findings gathered through the research medium.

**Chapter 6: Conclusions**
This chapter concludes the answers to research questions based on the discussion provided in the previous chapter.

## Chapter 2 Literature Review

This chapter implies to create enough theoretical knowledge and framework around the Agile transformation by reviewing the existed literature to the field of software development processes. To explore the shift of traditional management processes to agile management, A brief introduction of both terminologies followed by the examining discussion of agile methods and principles, change management theories in agile and cultural and structural aspects of agile transformation studies.

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### Ch. 2.1 Introduction

*"Project Management is the application of knowledge, tool, skills and techniques to project activities performed to meet the project requirements"* (PMBOK, 2013).

The literature review begins with the brief about the evolution of the software development industry and how Agile project management methods been introduced to efficiently improve the development process.

### Software Development

In its simplest form, the software development is the defining process for the software organisations through which delivery of software products are managed which is not just limited to the writing software codes. The methodology for development as per Avison and Fitzgerald (2006), recommends to the "collection of phases, processes and procedures, defined rules and techniques, products and tools documentation, training and management that develops a system". In broader prospect, all activities that results in a working software product such as research element, new product development, maintenance or redevelopment or reusing can be extended as software development process (Associates, 2012).

### Software Development Methodologies

There were no defined methodologies for software development until 1960s (Elliot, 2004). It is considered that the oldest formalised method is known to be for system development is termed as Software Development Life Cycle popularly abbreviated as SDLC. The main idea behind SDLC was "to formalise the development of information systems in a structured and sequential way of carrying out each stage of the software development life cycle right from the beginning till delivery of product system" (Elliot, 2004, p.87).

The mythological development requires planning, processes and extensive reuse (Boehm and Turner, 2003). This approach designed the Traditional Methods of development, pathway to the plan-driven approach having the constrain about the understanding of all the system requirements upfront by the development team with slight scope of change (not much) as majority of requirements would not be going to change (Hickey and Davis, 2004). Further

methods were classified and offered with the labels of waterfall and spiral models (Dingsoyr *et al.*, 2012) for software development life cycle which were rigid and staged in nature considered as heavyweight methods. The evolution of Traditional Methodologies formed way for the advanced models such as: incremental development model by (McConnell, 1996), evolutionary prototyping development model by (Gilb & Finzi, 1988) and adaptive development model (Wong, 1984). The latest in the order is "Agile" methodology.

An informative discussion about evolution of software methodologies was provided by Hirschheim, Klein and Lyytinen (1995) describing the seven generations of software development methodologies with a focus stating philosophies behind each of them.
The development methodologies were first emerged in:

**1950s** known as "**Pre-Methodology era**" defined as focused on the programming and specifying complex operational task (Somogyi and Galliers, 1987.

**1950s to 1960s** known for **"ad-hoc practices"** involved communication with programmers before building the system by them.

**1970s** known for **"structured"** development methodologies.

The emerging transition from "pre-methodological" to structure development system was due to the shift in building system which were primarily designated to computing specialised scientific application, to be designed for real world business requirements and processes (Avison and Fitzgerald, 1998). Despite of methodological evolution, the software development projects continued to facing issues of delay in completion, insufficient or unstable product and failing to meet the expectations by business teams.

The structured way of software development could not fix the arising issues with projects as by the 1970s, the numbers of Project with inaccurate estimation, delivered with considerable delay to defined initial time or exceeding the budget estimates at higher value, the state of software development was termed as "software crisis" (Brooks, 1987). The solution to crisis was repeatedly proposed as following specific methodological or technical paradigm. The evolution of these methodologies provided the project success as a solution, but the development standards and practices did not provide the improvement to the system functionality.

The traditional development method, namely the waterfall methods was introduced in 1970 by W.W. Royce, designed to overcome software projects issues (Guntamukkala *et al.*, 2006). The sequential development approach was widely adopted in highly structured industry mainly in largescale projects in public sector and military due to the key factors of Waterfall model being simple, structured, predictable and proving to be assurance (Boehm and Turner, 2003).
But, having considerable advantages, the traditional development methods after generations of methodological advancement and evolvement, have various issues such as inability to adopt change in requirements, delayed and insufficient deliverables, incomplete functionality than

anticipated and budget outruns. In conclusion the U.S Government Audits and Researchers agree the software projects stills facing challenges with (Standish group, 2009).

In a research from 1994, done by the Standish Group, on over 8000 projects with a group of 365 respondents representing respective software firms, showed interesting results. Johnson (2001), highlights that only 16% of the projects following traditional software development methods were completed in defined time line and being in the estimated budget frame having all the anticipated functionality agreed in the requirement gathering phase. Over 50% projects finished with overrun budget, delayed and achieving incomplete scope agreed, with over 31% of projects been cancelled.

In another study on over 1000 IT Projects in the UK, Taylor (2000) highlights that the most significant factor for failure was reported out as the "Scope management" in waterfall methodological driven projects. This signifies the takeaways which have been pointed out by Leffingwell (2007), about the assumptions associated with waterfall model which is proven to be false for many years in real word project development environment.

The assumptions are follows:

1. The Project development requirements can be upfront definable.
2. There are small changes involved during the software development cycle.
3. The system integration of the software product can be predictable in advance.
4. Predictable scheduling of software development can be performed.

Organisations had to look for more flexible and lower in risk software development methods due to the rapidly changing business demand and technological advancement. As listed by Georgiev and Stefanova (2014), multiple risks involved such as external, technological, cost, operations risks, demand for more flexible approach than of Traditional software development. The lack of feedback functionality and rigid nature of waterfall methods, new methodologies were developed to overcome the highlighting risks and issues, such aa Prototyping methods by McConnel (1996), the V-model by Sommerville (2010) and the Spiral Model by Boehm (1988).

Agile Development Methodology promotes the iterative approach for software development in contrast to the Structured and rigid approach of Water fall model. Agile focusing on adaptive planning throughout the project cycle, evolutionary development in continuous phases and flexible response to change requirements defined in Agile Manifesto (Beck 2001) defining agile methodological concepts encourages project development team to plan and perform tasks accordingly. Agile was developed as the solution to the issues highlighted with the previous methodologies, thus Agile Methods directly challenges the traditional methods of software development existed since decades in the software environment. Agile promotes less documentation, fast delivery pf product, iterative development approach, customer feedback and satisfaction and high-quality product development provide new values to the software development (Highsmith, 2001).

To summarise in a nutshell, Agile methodology is iterative, lightweight, incremental and adaptable development approach to counter change in a flexible way that embrace the development lifecycle in more efficient and productive manner. Agile requires minimum upfront planning, and approaches to small iterative development methods with making client feedback and requirements centric to the project plan to releases software in frequent working prototyping phases with collaboration to client to attain valuable feedback throughout the project development life cycle (Highsmith and Cockburn, 2001).

**Ch. 2.2: Traditional (Waterfall) vs Modern (Agile) Methodological Structure**

The traditional approach also known as the linear project management approach having a plan driven sequential approach to estimate the Project triple constraints: Time, Cost and Scope and managing the cost and time aspects in the project throughout while keeping the Scope as a fixed entity considered as a bureaucratic project management process (Sanchez *et al.*, 2019). The deliverables are planned basis on the pre-defined requirement as upfront planning (Mintzberg, 2016) paradigm of the project where the project managers are expected to achieve all the objectives defined in the project scope following the structured and underline project standards.

The modern Agile approach for project management follows an "adhocratic" approach to estimate the project triple constraints: Time, Cost and Scope and managing the Scope in a value driven approach by keeping Cost and Time variables as fixed entities to project objectives (Rose, 2010). The differential approach between the two methodologies argues the potential advantage of Agile Project Management Approach (APM) over the traditional Project Management (TPM) approach by means of handling Risk and Adding Value to the Project with its iterative and progressive approach of planning and development (Robins, 2017). Agile methods encourage flexibility of work within projects, which motivates and provide freedom to Agile teams to act more responsive, communicating and productive within project cycle (Sanches *et al.*, 2019).

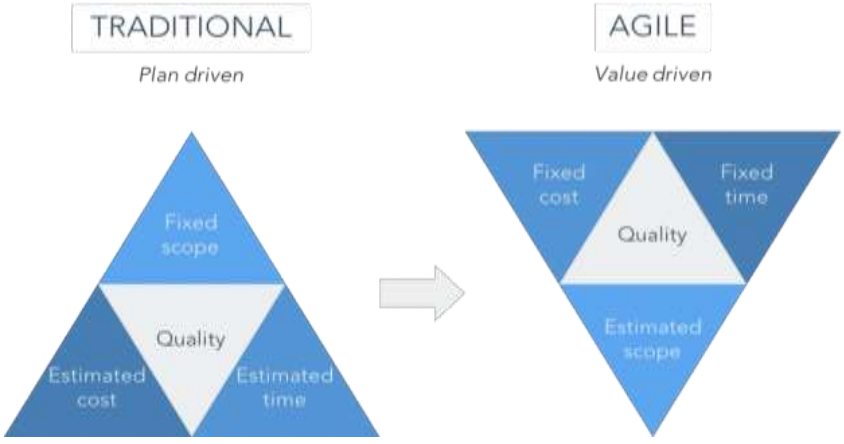


*Figure 2.1: Traditional vs Agile Approach illustration. Source: 'Project Planning – A complete tutorial', Robins, 2017*

To structure the project and plan the work phases of the project framework, a considerable approach is an important tool in a Project Management (Bakker, 2010). The “project as a tool” approach has been a conceptual base for the Traditional methodological framework despite of its shortcomings (Koskela and Howell, 2002).

Traditional approach of “project as a tool” could not satisfy the need of flexibility and responsiveness towards quick change requirements, which developed the insight for Modern approach of “project as a temporary organisation”(Packendorff, 1995) which emphasis on achieving efficiency and effectiveness by means of a quality and innovative work produced as deliverables outcome (Jugdevet *et al.*, 2001).

The methodologies under Agile Manifesto are different from Traditional way of development in many key ways such as, under traditional methodologies the planning phase is required to cover about 33% of project planning (PMBOK, 2000), Agile methodologies in contrast are anticipated to only 10% of work recommended in the planning phase (Anderson 2004; Coad et. al, 1999, Highsmith, 1999) or even less.

Further, the traditional way of development planned to deliver the working software or project system in the end of the project timeline whereas the agile methodologies focuses on delivering an early project system or working software in order to provide business value formulating over evolutionary process in an iterative development manner (Highsmith and Cockburn, 2001). The methodology focus of early delivery not just increase the potential of the project system but also reduce the risk factor in the change environment which is the result of delivering product in iterative manner keeping the scope of continuous improvement through the feedback protocol adding the business value and optimum customer satisfaction.

A recognizable fact about requirement gathering is that it is difficult to define the complete system requirements upfront, as methodologies had been highlighted in various research for creating requirement specification (Brooks, 1987; Zmud *et al.*, 1993), which is why traditional Waterfall methodology was more focused on delivering the project in the end, eliminates the user to interact with the software during the development phase. Agile were able to better adjust the requirement as they work towards ongoing progressive development way of working bringing user interaction on board throughout the project lifecycle.

**Ch. 2.3 Agile Manifesto**

In 2001, 17 independent software developers agreed to formulate and establish Four Agile Values and 12 Agile Principles and named it as the “Agile Manifesto” (Beck *et al.*, 2001) and immediately the proposed practices and procedures became famous among project managers and practitioners around the world. The four values of Agile Manifesto have been illustrated in the below figure which describes the propagandas as enabling the responsiveness and flexibility to change and involving customer to provide feedback during the product development phase of the project life cycle (Novoseltseva, 2016).

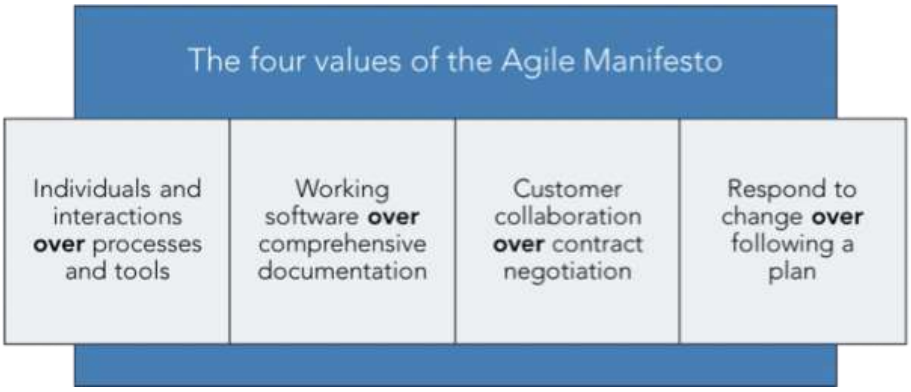


*Figure 2.2; Agile Manifesto Values, Source: Four Value of Agile Manifesto, Beck et al., 2001*

The Four Values of Agile Manifesto: (Dermot Bradfield, 2019)

1. *"Individuals and interactions over processes and tools",*
2. *"Working software over comprehensive documentation",*
3. *"Customer collaboration over contract negotiation",*
4. *"Responding to change over following a plan".*

Statistics and studies have showcased that the successful implementation of Agile methods are well acknowledged and adopted in a new entrant organisation who are building the organisational structure and culture around modern project management approach, while traditional organisations having hierarchical and classical organisational culture and structure are either facing challenges or adopting the Agile way of working at a slower pace as traditional organisation need to undergo an overall change in their working and operational system corresponding to the multiple teams and departments to adopt Agile Methods as whole (Cooke, 2012).

**Ch. 2.4 Agile Principles and Methods**

The Agile Methods containing group of best-practices under the umbrella of an iterative approach for software development were introduced in the 1990s in the rising era of the Internet. With the idea of thinking out of the box of Traditional Waterfall Model Development Approach, a group of software developers having expertise in different framework to each other, worked together to develop a modern approach for project management based on the iterative functionality and "adhocratic" approach. The Agile umbrella of framework since after, has produced various modern development methodologies and approaches such as SCRUM (Schwaber and Beedle, 2002) and eXtreme Programming (XP) (Beck and Andres, 2004) in the software development environment. The most widely used Agile framework these days is Scrum (Weber, 2015).

The Agile Framework and methods have mostly been adopted, developed and utilised by Software development organisations and industry wherein the non-software industries are trailing behind (Fitzberg *et al.*, 2013). Conceptually, the agile methods and framework have

been based on Agile Manifesto and are certain to be followed by the adopting project team on the core concepts but can skip on few principles though (Gustavsson, 2016) within the applied framework. The agile framework was originally developed to handle small projects having baseline small working teams. The framework was later improvised to be able to applied on large-scale projects but caused challenges while implementing (kahkonen, 2004).

**Ch. 2.4.1 Scrum**

As described, Scrum is the widely used Agile Framework for Software project development process (Weber, 2015). The popularity of Scrum adoption in the organisation is due to its easy implementation of iterative approach process within a small 8-12 (recommended) member team. The foundation for Scrum method comes from the End-user, Stakeholder or the User Story creation team (Product Owners), holding the functional question to changes in the product. The user stories developed and handled by the product owner(s), prioritised into product backlog (Bjorkholm and Brattberg, 2010, pp.12-13).

The scrum works in iterative sprints where each sprint can be planned from 1 to 4-week time interval, and the scrum teams participating in the development process plans the task around the sprints to be completed. A Scrum Master (not project manager) act as a coordinator and also leads the daily scrum meetings which are held to update the team on the progress of tasks or to raise any concern occur and require attention. The goal of each sprint is to complete all the tasks aligned and deliver a working demo of the result by the end of the sprint specific. The demo and Retrospective are modelled to showcase the progress, raise the concerns involved, share the knowledge available on current work to improve in the next sprint (Bjorkholm and Brattberg, 2010, pp.14-15).

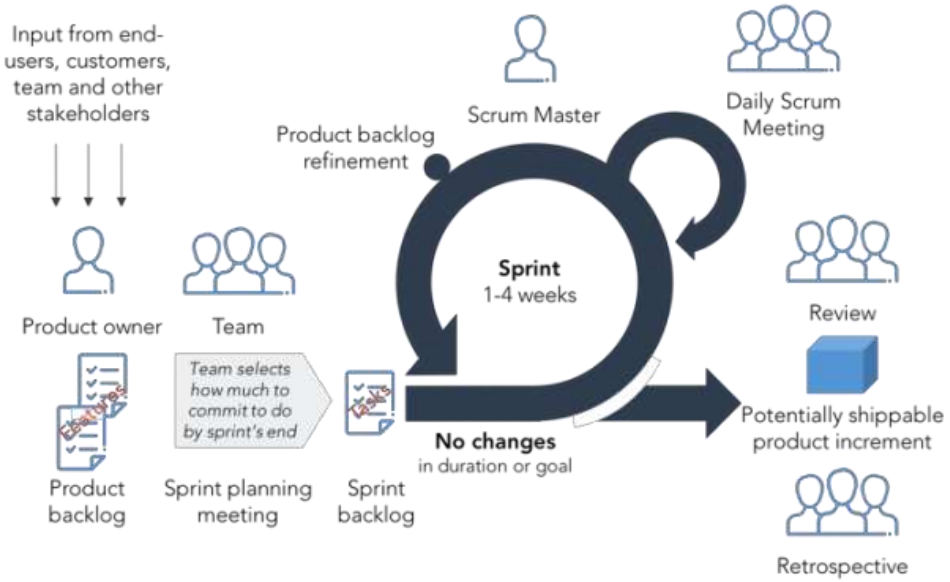


*Figure 2.3: Scrum Framework illustration. Source: 'The Scrum Primer', Deemer et al., 2010, p.5.*

**Ch. 2.5 Change Management in Agile Transformation**

During the life-span of an organisation, the change remains the ever-lasting constant function at both strategic and operational ends (Burnes, 2004). The approach to organisational development is directly incorporated to the change management of the organisation which is relative to the environmental need (Boje *et al.*, 2011). The technological world comprises of rapidly changing and continuous advancements, the scope for organisations to scale up with each change been introduced has gone narrow as larger organisation reaching to steadiness shows rigidness towards frequent changes, but are bound to response to keep the competitive advantage from the product perspective with continuous work and efficient efforts (Ackerman Anderson, 2001).

Traditional large organisations are dealing with the rapid changes where small organisational changes are manageable but large organisational changes have become point of concern for such organisations as such changes demands exponential planning and finances, where staying competitive in the business front goes in threatening upfront for the organisations (Cameron and Quinn, 2006). It is provident that such large organisational changes cannot be influenced by practitioners of change management being the driving force for the change implementation as it requires a leader to put forward the work of defining the roadmap and drive the organisation towards the change planned with leadership-skills.

Transformational change design can be motivated and driven upon factors such as: A received change approach termed for a sequential need of change to act on the change requirement driven by the external events, 2. A formalised strategic change requires to put in place for being upfront in the competitive market with updated in trend which requires strategy, concept, people and process to undergo change. A balanced agile approach can work around all 4 aspects can produce a success transformational outcome, whereas neglecting the right approach around the aspects can lead to failure outcome (Anderson and Ackerman Anderson, 2001).

## Chapter 3 Research Methodology

This chapter represents the descriptive methodology, approach and philosophy going to be used in the research study. The sub-divided chapters layout gives a walk through to the research process, information about the literature review and the scenario being followed by the researcher to conduct the research study. Further the study' viability, generalizability and reliability been included followed by the method of source data, analysis and critics are explained.

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### Ch. 3.1: Introduction

As mentioned in previous chapter 1.5 the research' aim and objective is to explore the success and challenging factor of Agile Project Management approach in the software development industry faces in agile transformation process.

Chapter 2 of the research represented and developed the framework of the research topic for making the term Agile Methodology understandable and to further understand the multi-level structure of Agile philosophy adoption, Agile management control and beneficiary factors to an organisation over traditional development methodology with Agile practices encouraging to perform efficiently to directly impact the project success and if not implemented rightly can negatively impact the project success rate. The Agile conceptualisation was produced that highlights the agile practices formulating with the feedback mechanism of the product development in continuous iterations promoted by the Agile Methodology, rather based on specific process practices or specific engineering technology for software development dominating the methodology framework. For instance, the complete testing of the theoretical framework represented in the research is not viable thus is not the part of the dissertation since it is beyond the scope of current research study. The research study focuses mainly on the impact analysis of the agile project management methods and development practices to being directly impactful to the outcome of the project system. This chapter represents the model to study the direct impact of agile practices implemented for project management in or during the agile transformation. The primary empirical question being addressed in the following research is:

**Agile transformation – Why some projects succeed brilliantly while others fail.?**

**Research Methodology**
The research methodology can be described in different ways, but the simplest way to quote is "a systematic way for providing a solution to a problem" (Rajasekar, Philominathan and Chinnathambi, 2006).

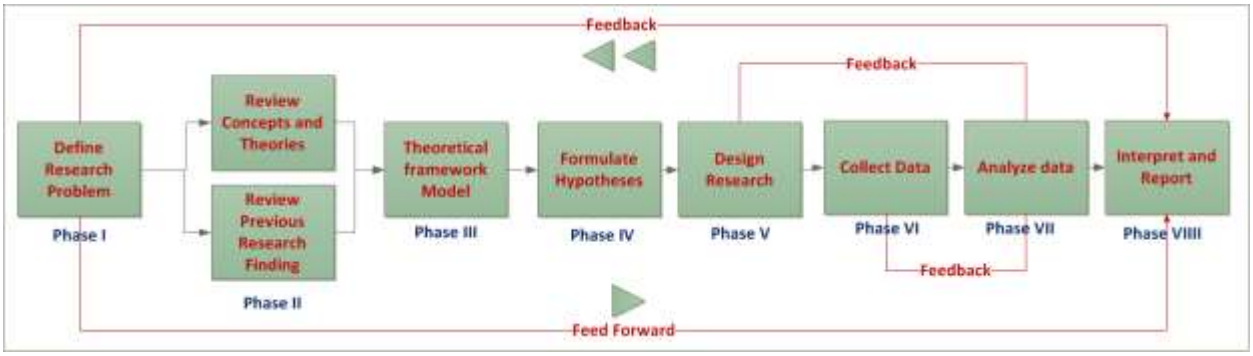


*Figure 3.1: Research Methodology*

**Methodology** is the standardised approach to academically analyse the applied method to the research study around any chosen topic. Comprising the theoretical analytical knowledge and applied principles to the body of methods presented to associated information. (Ishak and Alias, 2005).

### Ch 3.2 Research Philosophy

Research Philosophy is conceptualised in a research method based on the systematic assumptions and explanans been developed and observed throughout the research study. A close analytical idealization and understanding of relational paradigm between researched factual studies and philosophical beliefs highlighting the important factor behind selecting the appropriate philosophy for research and further study.

Research methodologies associated with Information Science and Study can be broadly divided into two branches: Qualitative and Quantitative (Lee and Hubona 2009). There are various research strategies and according to Saunders et. al (2009), there are four key strategies namely as: 1. Positivism, 2. Realism, 3. Interpretivism and 4. Pragmatism.

| | **Positivism** | **Realism** | **Interpretivism** | **Pragmatism** |
|---|---|---|---|---|
| Axiology | Objective Interpretation | Objective generally, Occasionally Bias | Subjective Interpretation | Objective and Subjective both viewpoints |
| Common Data Source | Quantitative | Either | Qualitative | Both |
| Epistemology | Based on 100% confirmed facts | Ideally based on facts | Based on subjective viewpoint | Derived from Observed facts or subjective viewpoint |

*Table 3.1– Research Philosophy (Saunders et al., 2009)*

The explanans has been performed from a Pragmatize paradigm which addresses both the subjective and objective viewpoints to a research study but having the Interpretivism

dominance as the research of social science is subjective (Smith, 1983) and interaction of humans on social front provide high complexity of viewpoint (Collis and Hussey 2009, p.57) this links the explanans to the research hypothesis which investigates around the human interpretation in an organisational changed scenario. Therefore, I wish to notify that research paradigm is Pragmatism having a cross-sectional nature, Axiology has been the driving force for selected methodology as the research will be analysed on Qualitative (Subjective) and Quantitative (Objective) data collection approach to the Agile transformation.

**Ch. 3.3: Research Design**

As the research is having Interpretivism dominance factor cross-sectional to Pragmatism the selective approach to the research design has been abductive, commonly used for Interpretivism (Collis and Hussey, 2009). As Taylor et. al (2002) described that greatest research does not progress through inductive (Case-to-result-to-rule) or deductive (Rule-to-case-to-result) approach, it is abductive (Rule-to-result-to-case) approach combines the theory of both inductive and deductive and present a hypothetical result.

To have a general approach to the whole study, the abductive approach had been selected, but having said that, the inductive and deductive approaches have been partially present since the research study was broken in phases. Phase 1 initiated with the theoretical knowledge gathering around the Agile transformation and has been supportive to prepare the questionnaire for conducting the interviews, thus has been adjusted throughout accordingly. The method is well suited for the research to channelize the comparing analysis. To point out, just like the research title “Agile” itself, abductively approach is iterative process (Blomkvist and Hallin, 2015, p.45) which allows to study the literature review and conducting the data collection simultaneously. This two-way approach provides the benefit of adjusting the two according to each other. The method was specially chosen due to its combinational working way assist to be attentive in finding empirical data but is a time-consuming method as well. To attain a quality data, time consuming method was allowed to proceed with.

Further, deciding between Qualitative and Quantitative approach during the early stage can be damaging to the research study as per Blomkvist and Hallin (2015). It is advisable to seeks the best approach to collect the empirical data throughout. The research has been conducted by accounting the advice to have a comparative empirical data and analysis to provide the findings and resulting conclusion by evaluating both Qualitative and Quantitative approach.

**Research Process Overview**

**Phase 1:** The project initiation stage mainly objective to gather the theoretical knowledge about Agile Processes and Practices. The unstructured searches of theoretical journals and research papers were studied to present the literature review represented in the previous chapter 2.

**Phase 2**: The phase was iterative with combination of more theoretical research for study was going along with creating the questionnaire and finalising the potential candidates for conducting the interview.

**Phase 3:** This phase was deductive where further theoretical search was initiated while waiting for the Project managers' interview. This period provided space to revisit the collected knowledge and reviewing the questionnaire prepared for the interviews.

**Phase 4:** This phase was inductive where interviews and quantitative data collection was in its final stage and sample data were mapped and cross-checked with the literature framework.

**Phase 5:** The final phase, consisting of analysis and discussion and re-visiting some of the Project Managers to cross-check the findings and knowledge gathering to have a validated quality empirical data and findings around.

**Conclusion of Research Process**

Each phase having its individual importance and key assistance in the research study provided necessary knowledge to evaluate the analysis to examine findings and key takeaways. The initial phases: phase 1 and 2 were shorter but were really important to understand the theoretical aspect and research potential. Phase 3 and 4 looked basic but had been most time consuming as to reach out the audience to gather the relative data was challenging.

**Ch. 3.4 Theoretical Framework**

To establish a theoretical framework around the research study has been the potential purpose of defining literature review, thus to comprehend the empirical data collected and analysed to attain findings and applied to framework to cross-check and identify the key factors giving the final result. The literature review provides the foundation to the research to be conducted as right foundation build up the selected approach to be justified with end result comprehending the important contribution towards the research (Ellis and Levy, 2006).

Noticeably, the literature review has been formed using multiple sources, mainly academic and peer reviewed journals and published book materials.

Literature review and framework presentation in the research document had been a thorough work in process subject to provide the in-depth knowledge gathered from various sources. Literature review has been undergone throughout phase 1, 3 and 4 whereas phase 1 was comparatively shorten compare to latter two. Literature searches were initially done openly on multiple platforms to have basic knowledge and understanding the theoretical background and scope of the topic specific. The unstructured search was limited to initial phase as all the literature gathered afterwards has been through selected medium. The published articles were searched on the basis of important keywords and article were reviewed on the basis of abstract and conclusion as first step of relatable search.

### 3.4.1 Sources

The research study has been conducted with usage of both primary and secondary sources for gathering the material. The material obtained by author himself is considered to be a primary source material (Blomkvist and Hallin, 2015, p.115). Data collected throughout the case study is considered as Primary sources. Secondary sources are material that has been collected by other researchers for ex. ResearchGate and Science Direct. All kind of literature materials, research articles and relative master thesis has been a secondary source to the research. Quantitative studies conducted in past has also been referred but such materials have been very minimal.

All the studies relevant to IT industries, Agile Principles and Agile Manifesto referred explicitly from the origin source for Agile has been primary source for collecting knowledge and material for the literature review.

The information about agile transformation within the software industry and software development environment relevant to Agile transformation and methodologies have been considered as secondary sources.

### 3.4.2 Criticism of Source

The sources used for the Research have been reviewed as per the checklist presented by Blomkvist and hallin (2015) for source criticism and evaluation purpose. This step has been helpful for validating the reliability and authenticity of the sourced data. Figure 3.2 represents the checklist for criticism of source adapted from Blomkvist and Hallin (2015, p.118).

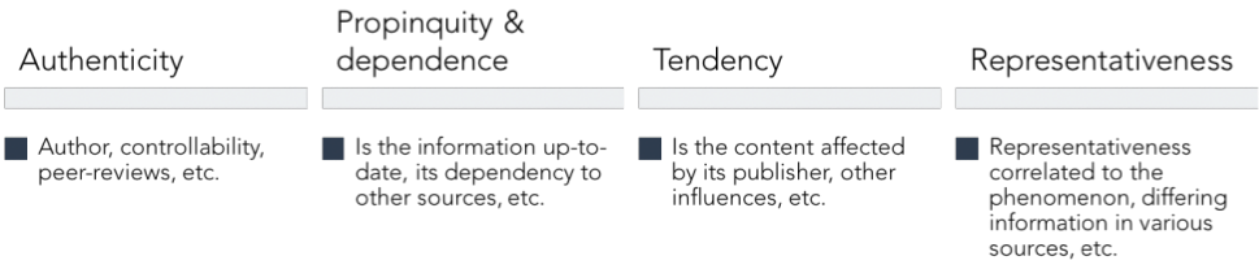


*Figure 3.2 Criticism of Source; Adapted from Blomkvist and Hallin, 2015*

### 3.5 Data Collection Procedures

The research study and representation are primarily based on the multiple interviews conducted. There are 2 parts for the research study conducted and represented based on the collected data. The first part has been the Qualitative Empirical data collected mainly in the phase 3. For the interactive interviews, specific audience such as Project Managers working in Software Development industry were approached. Total 10 Project Managers were interviewed and their experience and knowledge were gathered as valuable feedback and data collection for the research study.

The second part of the research study was collecting the Quantitative data via online survey. Though the Survey was created as an open form, the survey form was circulated to specific audience who are working in software development teams in respective organisations. The data collected were then analysed in a systematic structure to compare to the collective data of Qualitative approach i.e. to further analyse the findings from two different data collective approaches to form a new case finding with a wider generalisability spectrum.

### 3.5.1 Interview Methodology

The research interviews are formalised in relational level to formality and structure and categorised in three broad types such as: Structured Interviews, Semi-Structure Interviews and Unstructured Interviews (Saunders *et al.*, 2009). The interviews conducted as Qualitative approach were structured with prepared questionnaire to gather quality empirical data was a direct method to semi-structured interview. The questionnaire was formed with combination of follow-up relatable questions in order to ensure covering all the important viewpoint on the study. The key benefit to interactive interview selected as a part of qualitative data collection approach provide the open ability to gather data probing further details such as "adapt the questions as required, repeating or rephrasing if necessary, clear doubts, and ensure question has been understood in its rightful context." (Sekaran and Bougie, 2010).

The interview was conducted as an open-minded forum to welcome the answers unexpectedly, as it allows to approach a natural conversation encouraging an open and honest question-answer round. The "Smart Street Trick" of politely asking to describe more were used and the language used for interview was English or Hindi to kept the conversation simple while avoiding any potential language barrier. The questionnaire been answered in English only.

The questions were deliberately structured in follow-up parts with Part 1 asking general questions, Part 2 asking more role specific questions (project manager, scrum master, manager, top management etc.) and part 3 asking reflection questions. The answering to all the question were kept descriptive except 2 questions where multiple choice was presented to select. The interview structure was kept same for all the interviews to avoid any discrimination while analysing the collected data points. The length for interviews were 60 minutes approximately.

### 3.5.2 Online Survey Methodology

The second method of gathering Primary data for the research study, A survey research can be used to assess opinion, views, thoughts and feelings (Shaughnessy *et al.*, 2014) in data entry way of response to the questions asked in the digital forum. The survey approach to research can be designed as specific, generic or wider spectrum to the forum goal. Online survey is best to collect large data inputs in the shortest time span.

Data gathered through survey however has its limitations:

1. Reponses could be demographic selected i.e. data is not 100% certain.

2. Data inputs can be random mouse clicks as such responses does not represent views.
3. It is possible that single participant can submit multiple response forms.

For my research, as explained earlier in data collection procedure, the audience for survey data collection has been limited to the IT professionals working in Software Development Team. It is to be noticed that in Agile, Software Team comprises of following roles: Stakeholder, Developer, Solution Architect, Application Manager, Test Analyst, Business Analyst and Application Designer.

To keep the comparison between Qualitative Empirical Data and Quantitative Empirical Data, the Questions to both the participating audience have been kept same But, wherein the answers had entirely been subjective and descriptive in Qualitative Interview process, the Answers to the Survey have been structured Objective and predefined choices have been assisted to the participants to provide their respective inputs.

### 3.6 Reliability, Validity and Generalisability

In research study, it is quite often that the reliability and validity is discussed. Reliability refers to the correct manner of the study conducted and performed (Blomkvist and Hallin, 2015, p.50) and if repeated, the same result should occur (Collis and Hussey, 2009, p.64).

The reliability is generally very high, with significantly great replication when it comes to the positivistic paradigm. But in Interpretivism, the meaning of reliability is often different as for interpretivism authenticity of the study is priority. It is hard to replicate the study in the interpretivist since the study is directly influenced and affected by the researchers. To explain the observations and interpretations, an interpretivist ensures the understanding and explanation of the study by focusing on determining a structure to gain authenticity (Collis and Hussey, 2009, p.64).

## Chapter 4 Data Analysis and Findings Presentation

This chapter showcase the research analysis and findings gathered through the primary data collected from Qualitative and Quantitative methods to its theoretical linking representation and outcome variables. The structure for this chapter follows as 1. Introduction to Qualitative Theme analysis, 2. Analysis around the answers responded towards the questions, 3. Introduction and analysis to the answers to the Quantitative survey.

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### Ch. 4.1: Introduction

A vital part to any research study is considered to be the data analysis and empirical findings towards the responses to the research questions considered to provide informative conclusion to the research. The process of converting the raw collected data to represent into a meaningful information is Data Analysis. The primary focus is to analyse and observe the data codes to extract information that implies the supportive narration to the theory developed basis on the findings and observations concluding the research study (Fisher, 2010).

As highlighted in the chapter 3.3 - Research design, both Qualitative and Quantitative approach had been followed in this research to find important empirical findings. To analyse the dominant Interpretivism factor on the selected Pragmatism approach defined in the research design, 10 Software development Professionals such as Software/Agile Project Managers, Scrum Master, Product Owners were interviewed to gather the quality and in-depth data (Collis and Hussey, 2009) in-line to Qualitative data approach.

### Ch. 4.1.1: Thematic Analysis

Qualitative data is vital and diverse as the Qualitative approach itself is complex and diverse (Holloway and Todres, 2003) thus the fundamental method for the Qualitative analysis of this research has been deemed around the Thematic Analysis. Having a flexible nature for analysis benefit, the method goes for identifying and analysing themes or patterns reported around the collected data and describing the data in detailed organised manner.

Thematic analysis works on a different analytical approach in comparison to some other analytical methods which also seek patterns in qualitative data to describe the observations such as Grounded Theory and Interpretive Phenomenological Analysis, but both these methods search for pattern which are theoretical bounded around the entire data set, rather to data item such as data collected by interviewed of individuals , which as an argument raised the case-study analysis to a narrative analysis form (Murray , 2003 and Riessman, 1993). Thematic analysis offers more accessible form of analysis to early researchers since it does not comply entirely on detailed technological or theoretical approach to make a transparent analytical report.

### Ch. 4.1.2: Data patterns counted as Theme

Thematic analysis involves explicit consideration of discussed questions well in advance to data collection and required reflective dialogue throughout the analytical process as presented in the method section of thematic analysis paper (Taylor and Ussher, 2001). Within the data set, the pattern or theme represents the relation of captured data to the research question and research study regardless of what data portion provides the evidence to the relatable pattern or theme within the data set of the Qualitative analysis.

For example, Question #7 “What is your definition or understanding of “Agile Transformation”? been explicitly considered to analyse the significant pattern/theme of the knowledge of the interviewers as per their given responses, evident to the research title.

### Ch, 4.2 Findings from Qualitative Analysis Approach

The 10 respondents to the conducted interviews are IT professionals with having experience in Software project management having qualified knowledge about agile project management methodology. To begin with, the question to their current role in the software development industry was asked to evident the extensive knowledgeable and qualified participation for the research study.

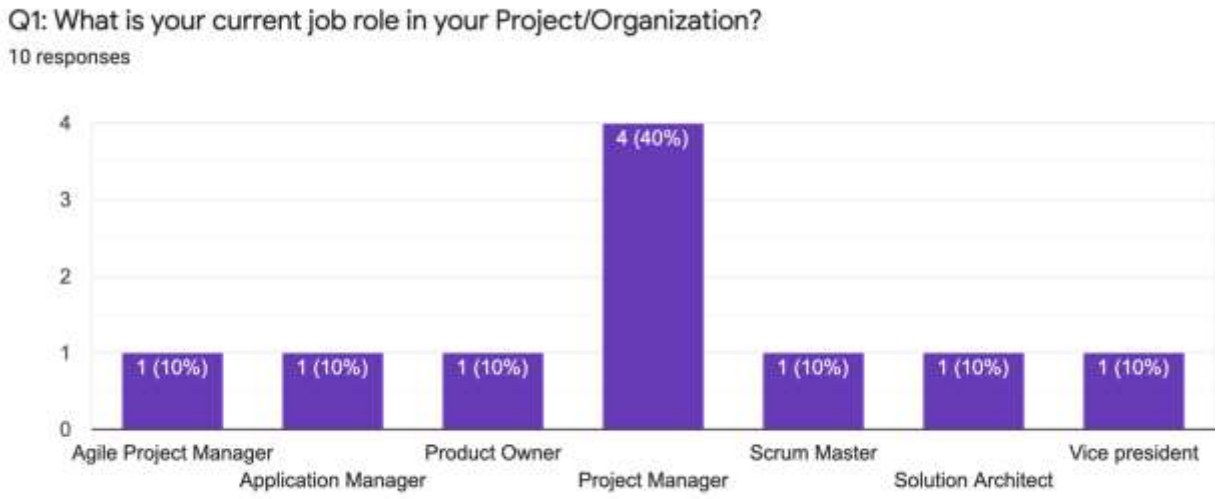


*Figure 4.1 Qualitative research respondents’ chart*

### Finding #1: How Software Project Managers understands the “Agile Transformation” as a process?

The common theme observed from the responses of the interviewees about understanding on “Agile Transformation” was change of mindset and being collaborative in work approach.

Various definition was produced by the respondents which broadly classified the “Agile Transformation” as adoption of a flexible and change mindset towards the work approach in a more collaborative and quick working environment.

*“It is a mindset shift. Agile transformation for me is the change in the mindset of what a deliverable is, and then percolating that to the very fabric of the project and the organization”,*

*“A slow transformation which has wider impact with result as success and significant cases”,*

Some of the respondents mentioned traditional approach to be rigid and lengthy way of working in their statements in contrast to the Agile approach to be quick and flexible.

*“Agile means quick, so when an organisation transforms its development and delivery model from traditional waterfall model, that whole journey or process is called "Agile Transformation"”.*

The observation of respondents about Traditional approach can be highly considered which has been highlighted in the first literature published in 1970 on the “waterfall model” which emphasize the software development as a logical progression of steps (W. Royce, 1970). He introduced the water model, argued the single iteration operation of development process and suggested to be performed in multiple iterations, but it seems that his paper was not considered as whole as traditional water model has been considered as single iteration approach.

The Agile approach which emphasize on the short and multiple iterations was mentioned by one respondent in his response to the “agile Transformation” definition as

*“Continuous iteration of development and testing”.*

Another view about Agile transformation and methods is to transform the organisational way by adopting the development of product in multiple releasable segments which can be quick to response towards the changes and deliver quality products helping business to add value leading to achieve ultimate organisational goals which is a valuable agile principle.

*“Helping businesses transform by adoption of agile in mindset, approach, ways of working and as a result, delivering value add products and features to customers with speed and quality”,*

*“It’s basically constitutes of a flexible, collaborative, self-organizing, fast changing environment. The process is like building a multi-story apartment where you need to deliver at each level (floor) to achieve the ultimate goal”.*

The highlighting of quick deliverables and features to customer demands points out the prospects of highly achievable level of customer satisfaction which is another Agile Principle.

Further, the respondents highlighted Agile methods to be accurate and less risky due to the implementation of checkpoints as risk detection and prevention.

*“Being nimble, early detection and prevention of failure”,*

*“Detailed and accurate".*

Respondents pointed out that whenever agile methods are applied correctly, it produces successful project outcome. This is an important fact about any methodology applied in a project as methodology comprises of set of practice processes which requires to be implemented and followed up well to produce successful results.

*“I have worked in many agile projects which are successful and there are few which are not successful as well, because they were not implement well in agile”.*

**Finding #2: Corporate culture is the major trade-off involved in an organization’ perspective responsible to Agile Transformation outcome.**

When respondents were asked to give ranking to the challenges in an organisation environment according to their experience and understanding the order of the challenges mentioned are follows:

Based on the responses the ranking of the challenges were defined and Corporate culture has been most ranked challenge followed by the processes and guideline second ranked and management and leadership third.

Agile has been stated to be more suitable for some organisations and can deemed to be a failure if the organisation is having micromanagement or strictly top-down approach leaving less scope for flexibility (Kniberg, 2018).

Most interviewees responded towards the current demand of working industry as the key factor for organisations to adopt Agile and inherit responsive change management to remain competent in the software industry. The important keyword they highlighted to remain inevitable in the rapidly changing working environment is to be “Quick”.

*“Quick delivery, review of work frequently, retrospective which helps in improving the approach each time and swift working style”.*

The respondent addressed the agile way of working in iterative method for development as the demand of the customer and current software development scenarios to deliver optimum results as quality product developed in a continuous evolvement manner.

*“The software industries are expected to work quickly as the requirements changes frequently without leveraging time extension, so the development team not just the project manager or*

*any individual, have to adapt the iterative ways of working in sprints and delivering results in continuous evolving product environment which demands regular communication and reporting and working on frequently received feedback and challenges".*

Agile is recommended to cater the uncertain challenges and change in requirements in the middle of the project cycle with its sprint and iterative working for development the project system, which was well acknowledged by all the respondents in their responses in this portion.

Another factor which was responded as the major trade-off-cum-differential factor of Agile transformation from traditional software development methods is "Cost". There are factors involved which clearly demonstrate the cost increment factors with agile transformation on order to fasten the development cycle in quickly and efficient manner. As stated in literature, the agile transformation require change in organisation as while which includes, people, processes and products. Enhancing all the key areas comes with cost involvements.

*"Analyzing the Trade-Off between Traditional and Agile Software Development is cost",*

*"Aims to increase team efficiency and productivity",*

*"Staff training, tools training, flexibility",*

*"Frequent Demand for new versions of software, continuous improvement from the feedbacks, Lack of communication".*

In response to address the need to shift towards agile transformation regardless of cost involvement, a respondent added a key indicator to the discussion as "Value". Agile adds value in the project system which is greater positive measurement towards the success rather cost.

*"Shift from cost to value - define why value is more important than cost. 2) Demonstrate the ability to prioritise based on value metrics. 3) Measuring Value - real value measurement by defining and adopting value based KPIs".*

**Finding #3: Adoption of Agile framework provides explicit Improvements to Software Project Management.**

Water fall model and its planning upfront approach has been advocated as a classical argument of spending time for planning in the beginning phase to reduce the planning efforts by a factor of 50 to 200 in the latter development phases (Benington, 1987). It is a common practice approach of traditional development method to spend 20-40% time in planning and designing the project system upfront. However, in practical, respondents claim to deny this fact as most of the Project managers call it as a waste of effort and time as planning everything in advance is opposite to the uncertain nature of software development project system.

When asked about the project road mapping within Agile Framework, Interviewees referred Agile framework as an "Accurate" approach for planning in software project management which encourages the planning as an ongoing evolving process throughout the project system by emphasizing only 10% or less time devotion to planning in the early phases provides "Control" on project planning.

*"Agile eliminates planning everything in advance and divides in multiple sprints which is more controlled and accurate project planning",*

*"Yes, it is. Helps with following - customer satisfaction, superior product quality, flexibility etc",*

*"Yes, planning is best approach in agile methodology".*

The viewpoint of controlled and accurate project planning under agile methodologies, formulates another argument around the agile transformation as "Project Efficiency" which contributes immensely to the software project management. As per their experiences, interviewees described the adoption of agile practices and procedures to be persistent in improving the quality of deliverables and overall project efficiency.

The key factor has been highlighted as "collaborative" approach of development team working in iterative development system, which demands right people, working on tasks defined in modules which requires continuous efforts as per the feedback received against the work produced in evert module stage provides efficient and refined product in the end of the project life cycle.
When asked about the Agile procedures improves the project efficiency? The respondents answered as:

*"Since day 1 I have seen agile framework in my organization, but yes, I strongly agree, agile framework boosts project efficiency and quality of deliverables",*

*"Yes, because agile demands high contribution from the collaborative team and putting the right people at right tasks provide efficiency and quality to the product",*
*"Yes, definitely as we develop and deliver in small modules which goes through each cycle of quality assurance",*

*"Somewhat but success depends on team collaboration more than method used".*

The ongoing argument was further directed towards the next fundamental question of project budgeting and cost estimation which directly impact because of the "controlled" and module wise planning approach of the agile transformation in project management.

When interviewees were asked on the key factors about agile framework over traditional estimation process for project budgeting and cost estimation, most of the interviewees regarded the agile approach positively over traditional approach due to its controlled iterative

development practise. The key highlighter during this conversation seeks out as developing the product in multiple “Sprints” giving a controlled management of project system as respondents quoted:

*“Since work happens in sprints, budget can be controlled more accurately”,*

*“Yes, as it showcases detailed estimates of each module which is better than an approximate figure with traditional estimation process”.*

On the other hand, one respondent clearly washed out any positive argument around agile method towards the cost estimation process. He arguably stated that:

*“Not necessarily - agile does not predict/control cost estimates better than traditional estimation process. Adoption of agile can help deliver more "value" than traditionally estimated and delivered project as agile demands value gets assigned to all the work items, and then prioritise and deliver most valuable work faster with help of adopting agile methodologies, practices and techniques”.*

Further findings in the conversation point out the “Scope” management paradigm which seemed to be the driving factor of “Planning” in the agile methodology compare to the traditional method for project, as project scope is divided in the form of multiple modules or sprints. A sprint breakup in agile gives more room for understanding the scope in various stages of the development which can be illustrated and evolve through the development cycle by means of daily stand-ups and user story sharing over regular team communications.

When respondents were asked to describe the level of project scope planned clearly in their managed projects on the importance and integrity of scope management in agile, the respondents mentioned positive experience when it comes to defining and understanding the scope of project in agile approach project management system.

*“Somewhat clear, as with daily stand-ups and other methods like epic, story, task breakup helps. Scope of an Agile project is defined clearly in high level requirements and stored in the form of user stories”,*

*“Scope is most important to be clear and use story points”*

*“Somewhat clear as agile have variable scope management in a project which goes through regular stand ups, feedback and solutions helps throughout”*

*“Very clear on average”*

*“It was clear as we had a Release Prioritization Board to pick stories helping the whole team to understand the scope of the sprint”.*

**Finding #4: "SCRUM" is the solution to the modern project communication management problems?**

The documental approach of traditional methodologies like waterfall where emphasis on documentation for clearly defines stages which is easy to understand and follow as suggested in literature (Hughey, 2009) suffers in reality as information and communication in handed documented form lose is credibility. Keeping the document up to date throughout the software development life cycle is a cumbersome artefact.

Agile methods such as SCRUM encourages communication within teams on regular basis over information passed in the form of prepared documents. As the large organisations are globalised and within a project multiple teams at different locations works together, communication flow has become a complex and important factor in project management and success.

"*In agile scrum methodology, there is less emphasize on documentation and more stress is given on effective and constant flow of communication ".*

Agile (SCRUM) opposes the artificial approach of documentation; as everyone would arrive on a same understanding about project by handling the documentation without discussing within the team seems unrealistic in today's globalised working environment.

Agile (SCRUM) encourages lightweight documentation as documenting "*just barely good enough*" is comprehensive enough for engineering teams (Ambler 2007) as too detailed document could lend issues in transferring the knowledge. The interviewees shared their viewpoint on effective communication with Agile SCRUM methodology within the teams:

*"Scrums are quite effective as team receives feedback and response faster. Able to recognize sooner whether they are on the right track or not. In other words, they can learn more quickly and incorporate the information into their ongoing work",*

*"very effective",*

*"Agile emphasize on regular communication and encourages regular stand-up meetings to share inputs which provides transparency and clarity within teams towards their work and responsibilities for the project success",*

*"we submit all our work in the ticket management tools which helps us with communication being done on each ticket for each module or piece of work",*

*"Very much effective due to daily stand ups and one clear thought that everyone is equally responsible in the success of the sprint as everyone is treated equal and is answerable and questionable".*

Clearly, the respondent's applause the SCRUM for communication effectiveness highly. But does that mean that SCRUM is undisputed to issues when it comes to communication within teams? The response from few interviewees raises another argument about SCRUM

*"Very effective for intra project team communication",*

*"Scrum is highly collaborative, does help the GDD teams".*

The keyword "intra project teams" raising to the question on the effectiveness or related issues with SCRUM within a project which is distributed between globally participated teams.

Noticeably, the effectiveness of communication in Agile Scrum method is based on emphasis on regular communications within teams via daily stand-ups, receive and share feedback or concerns and tracking. Which when further drilled in the conversation around the topic, many respondents highlighted an issue with managing the continuous meetings amid the different time-zones the participating teams.

*"Different time zones cause issues",*

*"Since Scrum encourages daily stand-up meetings, managing those regular stand ups across global teams having different time zones cause issues".*

Another point of issues is when different teams are working on other prioritised work and requires to put front on urgent needs or issues raised which requires immediate handling causes issues in channeling.

*"dependencies which people put on a ticket to communicate to other person who will clear out the dependency in his tome zone",*

*"Daily stand-up meetings, coordination on urgent demand".*

The discussion leaves the conclusion on the Benefits and Conflicts which SCRUM brings on the tables respective to the participating teams and their location base.

*"Agile has gained a significant track and has been adopted by all ... Scrum is well-recognized amongst engineering teams, but a variety of teams ... This is one of the most problem faced by Scrum Master",*

*"Scrum based practices and techniques are best suited for co located teams, the ceremonies such as Daily Scrum, Sprint Planning, Sprint Review and Sprint Retrospectives are most efficient when all participants are in the same room/place - conducting all these ceremonies and events amongst distributed teams require more facilitation, organisation, coordination and clear verbal communication than a non-distributed team".*

**Finding #5: Agile Transformation leads to more successful project outcome than traditional methods.**

The key advantage of Agile over Traditional approach has been quantifying as its ability to response towards change in the Literature which elicit what customer demands. It is quite significant that not everyone, especially the customer is clear on the requirement from the very beginning of the software project, thus the rapid change requirements arise.

Any change introduced in the Product requirement affects the productivity, quality and efficiency of the software which are risks involved and since traditional water fall does not rectify all the risks till the product life cycle is completed, it involved high risk that can result a total failure of the project as well. Respondents highly agreed to the advantage factor of reduced risks with Agile management approach:

*"Definitely. Mistakes can be caught early in the development cycle which is always better. Absolutely, scrum advocated the continuous feedback to response the risks and changes involved to the development of product which makes the key success aspect of Agile over traditional development approach where feedback comes in the end of project system"*

*"Yes, we have risks that we can solve at an early phase as we have iterations to improve and create a mitigation plan for each risk. Compare to a traditional project where we prioritize the risk and solve only the high priority risks".*

Clearly the Agile transformation provides prominent benefits to the project success over the traditional project management approach. But the agile transformation cannot achieve overnight as it requires participation from multiple teams and departments in any organisation, which points towards another research question of this study as "Can two different methodologies such as Traditional (Waterfall) and Agile (Scrum) can be applied in the same project since the agile transformation is undergoing. This brings to interest to the interviewees as they answered with highlighting cautionary effects

*"It can be, but it should not be",*

*"Either one of them yes but not both at a time",*

*"It can depend on the project nature, but since approach of waterfall and agile contradict from the start, is should not combine and applied on a same project",*

*"Yes, when we have too many dependencies with multiple vendors to supply data and other information to deliver the project",*

*"Yes, it's possible. there will be challenges in coordinating and managing the two different methodologies-based areas within the same project though",*

*"It depends, as both the methodologies are different in their own context, it is advisable to align to one approach",*

*"Yes, it can be applied... Starting with waterfall and later on moved to agile".*

Interviewees were further asked on the potential outcome of the project having two different methodologies, as discussed in the previous question which regardless of agreeing of having the two approaches working on the same project, respondents produced doubtful responses as:
*"Not very efficient I would say",*

*"Again, it depends on the approaches applied to the modules of the project and it can be uncertain as result could be highly positive or negative. Chances of cost and time estimates to outrun are high if both the approaches were applied at the same time",*

*"It again depends on how and on what phases different approaches are applied, it could end up with cluttered outcome or no outcome at all or best of both the approaches outcome",*

*"At the same time, approach should be the same. Otherwise every plan, design will get wasted".*

But not all respondent was as doubtful as they answered with a positive viewpoint towards the question with added explanatory aspects around it.

*"The outcome will be good as the base of that approach will always be agile and only the length of the sprints and project might increase",*

*"Outcome can be successful - it's not that project will not be successful. However, it will require collaboration, coordination, communication, clear definitions and execution of roles and responsibilities and expectation management, when delivering with two different methodologies in the same project'.*

**Finding #6: The Key for successful completion of Transformation and Project is not the method applied but the Team.**

Strategic alignment of the Organisation perusing or ongoing with Agile transformation is a critical buy-in from Leaders as well as the Team responsible for adopting and working towards the success project outcome under the Agile Project Management setup.

The literature review describes the Agile Practices and Principles to encourage the teams to work collaborative and strategically aligned working environment.

*"Agile and Scrum practices help teams to collaborate and communicate in more freely, and encouraged to work efficiently in a coordinated environment".*

But having said that, the respondents highlights the importance of the mindset and role of the participating team towards the efficiency of work within the applied processes.

*"Somewhat but again team has a very important role more than method",*

*"Mostly yes but also it is the organisational culture and mindset of the people in team which drive the project efficiency over the incorporated processes".*

Another key aspect of the team efficiency and performance lies to the mindset and performance of the individuals within the teams as the achieving the project goals and quality of work is directly dependent on the projecting goals of the individual and his/her corresponding work to achieve those goals and achievements.

All the respondents who are handling multiple teams and projects within their respective organisations immediately agreed to the importance of the work put forward by the individuals within the team, which highly effects the project outcome.

*"Very important as every individual in the team can create a valuable difference with his work",*

*"Very very important as individuals can make or break teams",*

*"Very much as every member is assigned with tasks and has contribution to the overall sprint and project success",*

*"It does count but successful agile organizations focus on team performance when setting goals and evaluating performance",*

*"Every individual is important in an agile team",*

*"Very important as every individual is accountable and responsible to contribute with completing assigned work within the sprint framework for project to be timely completed and succeeded",*

*"Agile is as successful as whole team is successful - each member of team has valuable role in successful adoption of Agile as a whole for successful outcome",*

*"Each individual is equally responsible for the outcome of the project under agile methodology".*

In any project under transformation, a lot of emphasis is on the engineering and development teams and that puts the participating teams under pressure to be productive and efficient to complete the project in timely manner achieving the requirements goals with high quality product development.

The change that Agile introduces to the Project Development Life Cycle (PDLC) such as sprint planning, continuous feedback, clear scope throughout, sequencing the tasks order according to related goals comfortable to achieve within sprint planning give freedom and flexibility to the team which reduces the performance pressure low as compare to other project management methodologies, without compromising on the efficiency and productivity of work.

All the respondents agree that Agile put less pressure and although anxiety being the person perspective in nature, Agile gives more room to perform and work in efficient and comfortable environment, they further stated about the pressure and anxiety of performance in agile approach as:

*"Definitely the pressure is very low comparatively to other models and more productive also.*

*"No pressure but key thing is each member in the team sticking to the role they have and not stepping into others",*

*"Anxiety is perspective, however agile methodologies allow you to plan the tasks and goals which are achievable and comfortable for the team during sprint planning, yes performance is expected from the team but agile gives leverage to aim for goals which are not intensive yet efficient",*

*"Anxiety is person perspective but since sprint planning gives scope to work as per complexity of task assigned, it gives comfort and scope for productivity and efficiency overcoming performance pressure",*

*"One could say there is high-performance pressure under Agile methodologies-based projects as it constantly pushes you to build, measure and improve. It's a good pressure though, as the value it brings and improves an individual as a whole is worth it",*

*"It depends on the magnitude of the project. A small tier project with agile with go smooth but a high tier project with small deadlines might create some pressure. That's the beauty of agile as it supports small deadlines to plan a project".*

**Finding #7: Agile is not just Methodology but a working approach which is not limited to IT-Software industries.**

Agile methods were introduced in software development but in recent years have expanded to non-software industries as well which is due to the fundamental method of Agile that follows a defined logic of 1. Plan, 2. Check and 3. Act (Fitzberg *et al*., 2013, p.863) which is a desirable requirement in Non-software industries which compliance regulatory nature of environment.

Usage of Agile outside the IT industry have been acknowledged in Automotive and Aerospace industries las per the market analysis studies (Kostron *et al*., 2016) which follows the Planning,

Designing, Change management and Product deliverables aspects of Management in Agile transformation.

Interviewees were asked to put their views on the usage Agile outside the Software Environment and they all had interesting responses in return which highlights the awareness and significance of Agile as more of an Approach to work rather just a methodology with strict processes and procedures.

*"Traditionally Agile was for software development, but yes it can be adaptable in other industries as well. Key factor is to have a mindset of Agile rather than just following some set of guidelines",*

*"I agree that Agile can be used as a process in project outside non-software industry as well.*

*"Yes, agile approach can be applied to any type of work not just software development",*

*"Agile is more of a working approach rather just methodology which encourages teams to work in a transparent and flexible way to ease out their work management. Which I think can be adapted by other industries than software development industries. Also, there are Non-IT companies who are adopting the agile methods in current times",*

*"Its way of working which certainty improves efficiency and early delivery having more scope to improve at each level which certainty will be beneficial for any industry",*
*"Absolutely - Agile methodologies can be applied to most of the industries and not just for software development. In fact, Agile is heavily based on Lean which was a methodology designed for manufacturing in automotive industry",*

*"For me agile is not just a process or methodology, it's more like a way of working. If you really imbibe the processes and approaches to your way of work you can improve on the efficiency which clearly shows that agile is not restricted to just software development management but organisation management".*

## Ch. 4.3 Introduction to Comparative Analysis

As described earlier in Ch. 3.3 Research design and restated in Ch. 4.1, both Qualitative and Quantitative approach have been followed to analysis the empirical findings in this research. Ch. 4.2 described the Findings from Qualitative approach – thematic analytical study.

Further to compound the Findings from Quantitative approach, a comparative analysis paradigm has been followed as this research having pragmatism approach to highlight the Agile transformation not just from the Project Manager's viewpoint which are largely showcased in previous chapter having dominant interpretivism factor, but the viewpoints of the development teams which comprises of Developers , Testers (QA), Technical Architect, Managers, Project Managers, Product Managers, supporting the positivism factor a to the research study.

### Comparative Analysis

Comparative analysis is conducted to gain a wider understanding to explain the casual process in relation to the explanatory variables (Pickvance, 2005) emphasising on the "explanations of the similarities and differences".

## Ch. 4.4 Findings from Quantitative Analysis Approach

The aim of analysing the Quantitative approach in this research is to represents the Quantitative perspective of the agile transformation in and around IT-Software Development industries. To proceed with, a Questionnaire survey was created and circulated to multiple IT Professionals specific to build the Quantitative audience for the research study. 30 Responses were received which have been utilized to conduct the analysis.

A Questionnaire Survey created as "Google Form" containing 27 Questions were circulated via digital medium such as emails and direct survey link in messages to the targeted audience to seek their valuable inputs. To have a comparative analytical viewpoint, the questions remained same as of Qualitative Questionnaire but with nature of response input as Objective.

The Quantitative data responses have analysed with the help of google analytics as the data size was too small, thus the usage of SPSS for analysis was refrained. The analysis has been showcased as per the findings approached in the previous chapter which will help us to showcase the different instances such as similarities and differences as per the Quantitative data response collected.

The questionnaire was divided in 6 segments which highlights the Key factors around the research study.

### 4.4.1 Evaluate respondent's awareness and Involvement in Agile Software Project Development environment.

**Segment 1:** This segment describes the job role of the targeted audience followed by their respective knowledge around the Agile Methodologies and Principles. Questions covered in this segment are from **Q.#1 to Q.#7**.

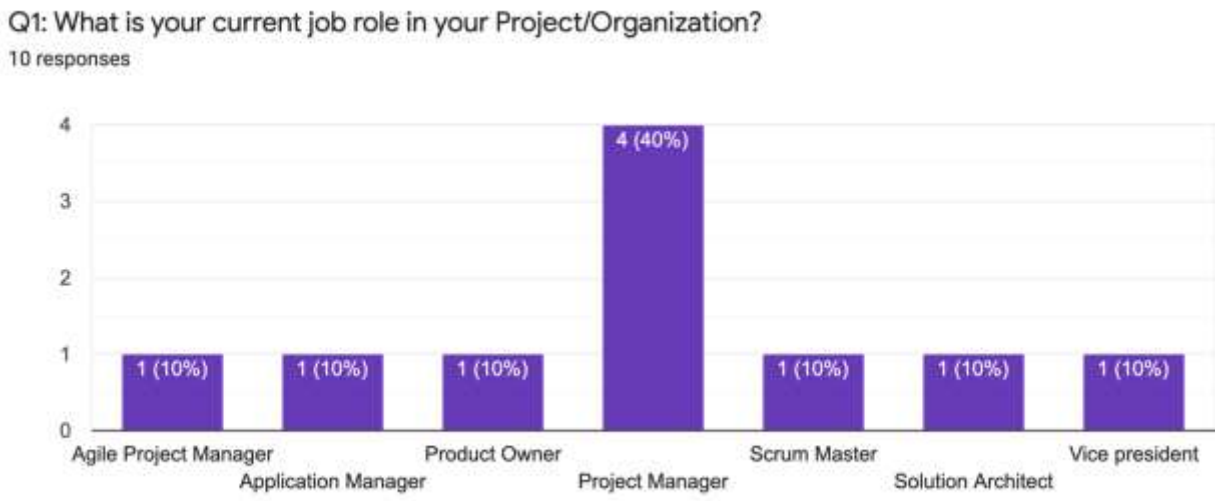


*Figure 4.2 Quantitative research Respondents' chart*

As mentioned, the targeted audience have been approached only from the IT-Software Development industry who are working in various roles as IT Professionals comprises of Software Development Team. *(See Appendix 4.2 for detailed list)*

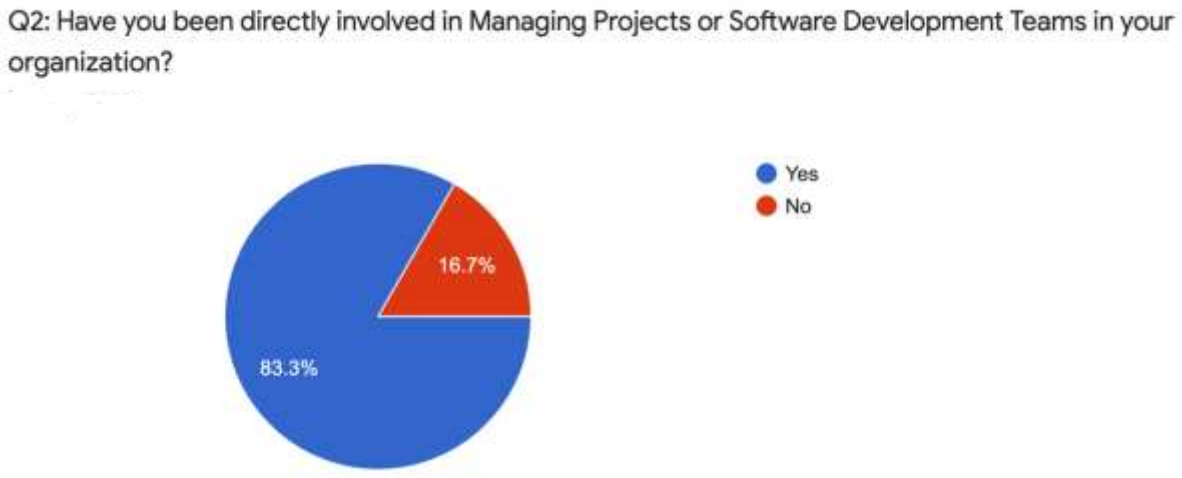


*Figure 4.3 Respondents' direct involvement in SDLC chart*

A whopping 83.3% of respondents were directly involved in managing the software development projects whereas the rest are involved in the development teams in the IT environment which showcase the quality and significance of the targeted audience relevant to the research study.

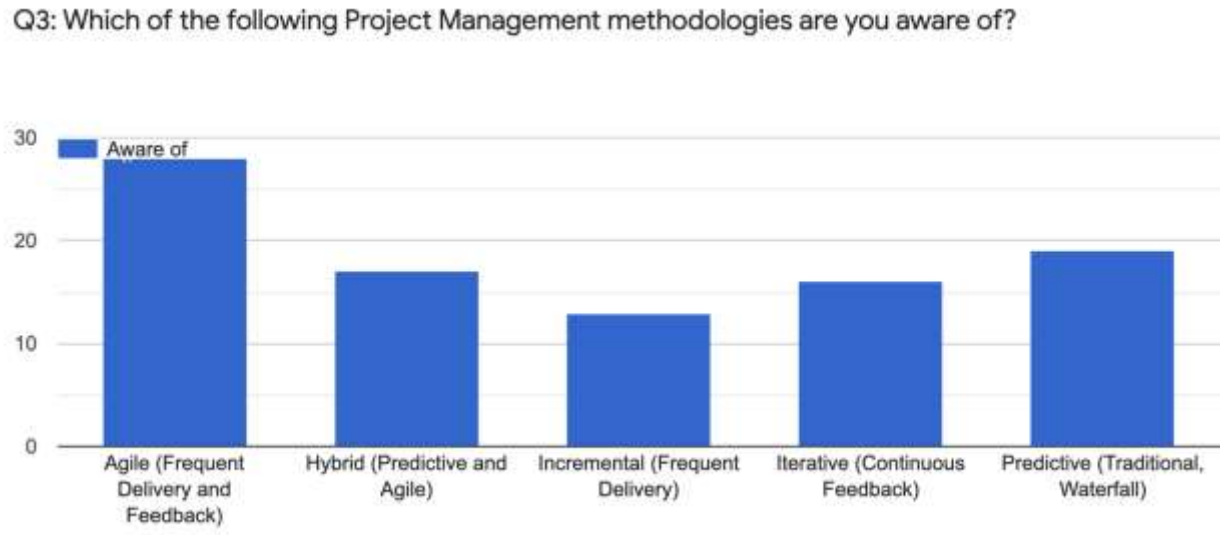


*Figure 4.4 Awareness chart indicating Project Management Methodologies*

| **Methodology** | **Responses** | **Awareness %** |
|---|---|---|
| Agile (Frequent Delivery and Feedback) | 28 | 93.33 |
| Hybrid (Predictive and Agile) | 17 | 56.67 |
| Incremental (Frequent Delivery) | 13 | 43.33 |
| Iterative (Continuous Feedback) | 16 | 53.33 |
| Predictive (Traditional, Waterfall) | 19 | 63.33 |

*Table 4.1 Respondent's Methodological Awareness % chart*

The table shows that the Agile is well known methodology among the responded IT professionals compare to other methodologies.

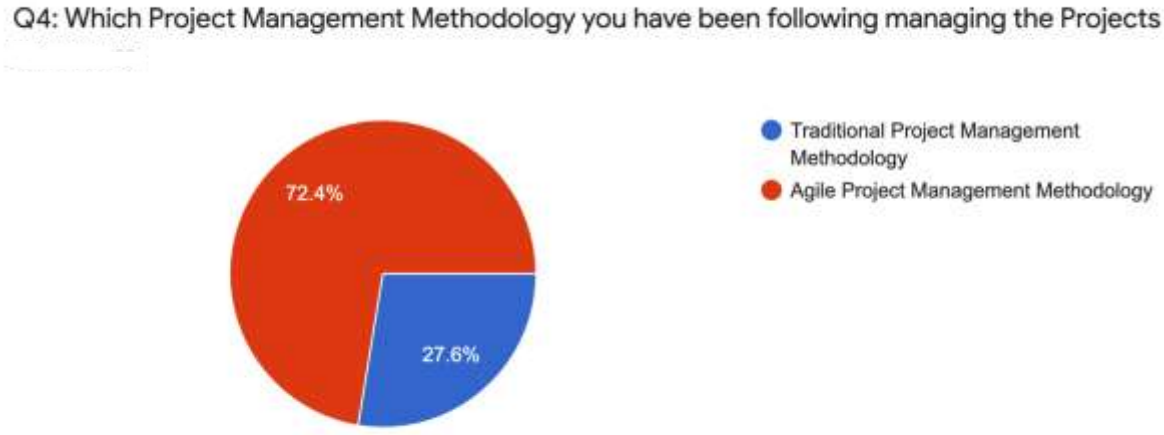


*Figure 4.5 Methodology being followed in projects chart*

**72.4%** of Quantitative Analysis audience acknowledged that they have been working with projects following Agile Project Management Methodology which is an exceptional ratio for the relatively responsive audience for this Research study.

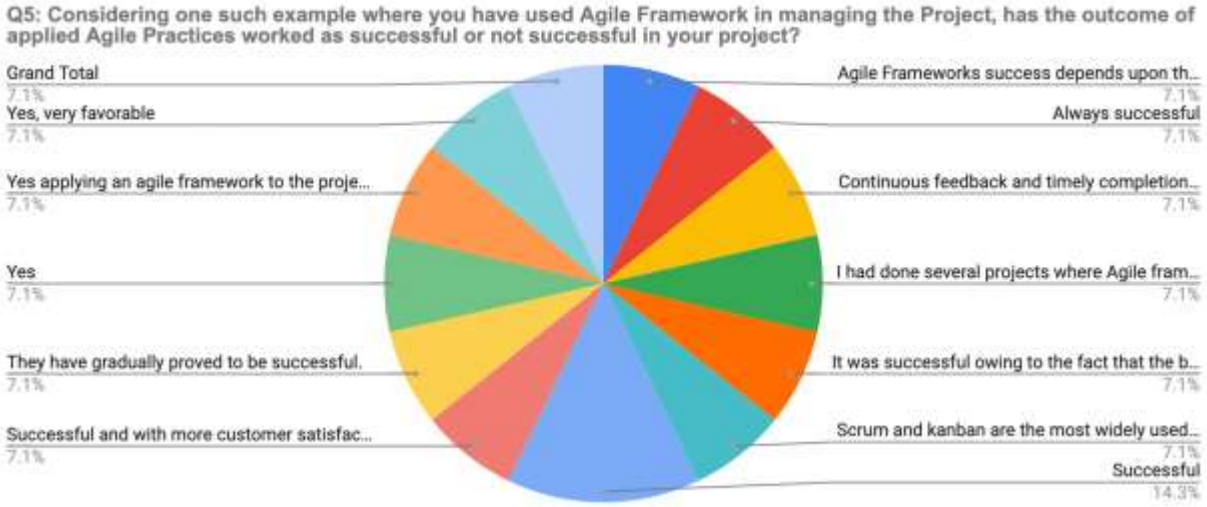


*Figure 4.6 Project Outcome with Agile Framework chart*

**90%** of respondents described that the project outcome following Agile Methods and practices were successful.

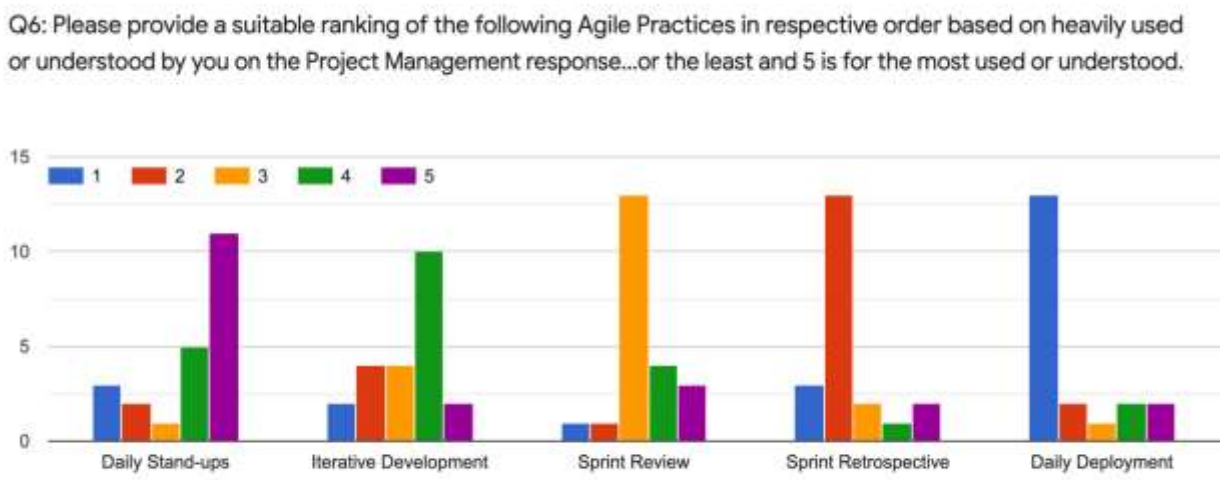


*Figure 4.7 Ranking chart for frequently used Agile Practices*

| Rank | Agile Practice | Total Score |
|---|---|---|
| 1 | Daily Stand-ups | 160 |
| 2 | Sprint Review | 146 |
| 3 | Sprint Retrospective | 144 |
| 4 | Iterative Development | 98 |
| 5 | Daily Deployment | 76 |

*Table 4.2 Ranking table for frequently used Agile Practices*

Q7: What is your definition or understanding of “Agile Transformation”?

**Responses:** The keywords filtered from the definition provided by the respondents are as: Quick, Mindset, Change, Reactive, Flexible, Daily scrum, continuous improvements, collaborative, fast changing, incremental, iterative and ability to adopt.

**Finding #1: Most of the respondents acknowledged the awareness and usage of Agile methods and principles which resulted as successful outcome for their managed or working in a software development project.**

### 4.4.2 Feedback to Organisational Structure and Perspective towards the Agile Transformation.

**Segment 2:** This segment describes the feedback of respondents towards the organisational structure and perspective towards Agile Transformation according to their experiences in an IT Organisational environment. Questions covered in this segment are from **Q.#8 to Q.#13**.

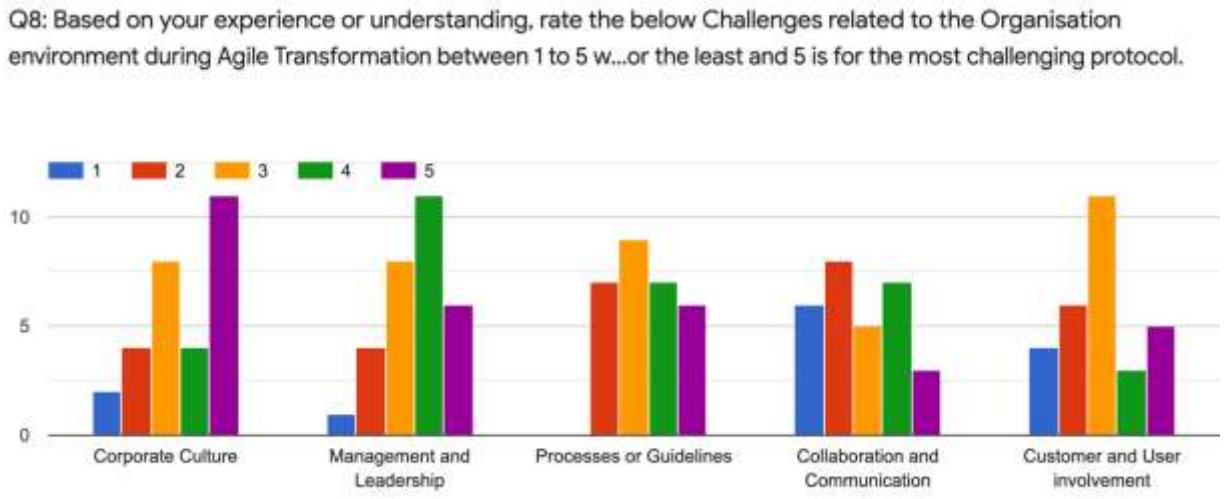


*Figure 4.8 Ranking chart for frequent Challenges In organisation towards Agile Transformation.*

| Rank | Challenges | Total Score |
|---|---|---|
| 1 | Corporate Culture | 72 |
| 2 | Processes or Guidelines | 66 |
| 3 | Management and Leadership | 60 |
| 4 | Collaboration and communication | 58 |
| 5 | Customer ad User involvement | 44 |

*Table 4.3 Ranking table for frequent Challenges In organisation towards Agile Transformation.*

The responses pointed out the Corporate culture to be the most ranked challenge which teams faces during agile transformation from an organisational perspective, followed by the processes and guideline within Agile manifesto at second and management and leadership buy-in as third.

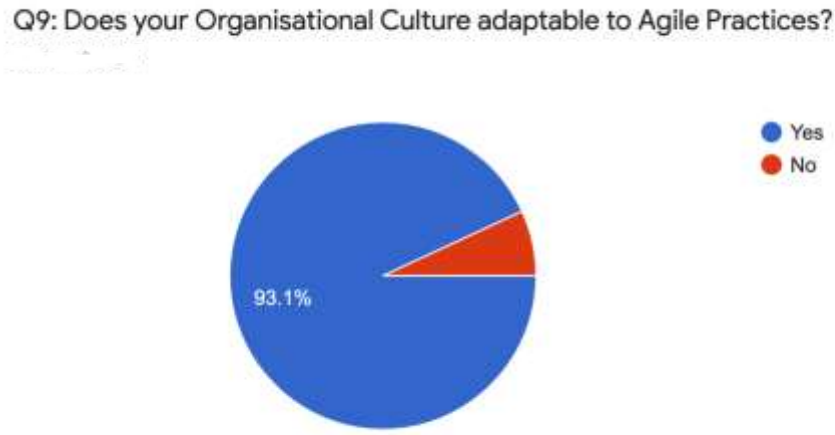


*Figure 4.9 Response about organisational adaptability to Agile Practices.*

Despite pointing out the corporate culture to be the most ranked challenging aspect for transformation, **93.1%** respondent still believed that organisational culture is adaptable to Agile practices.

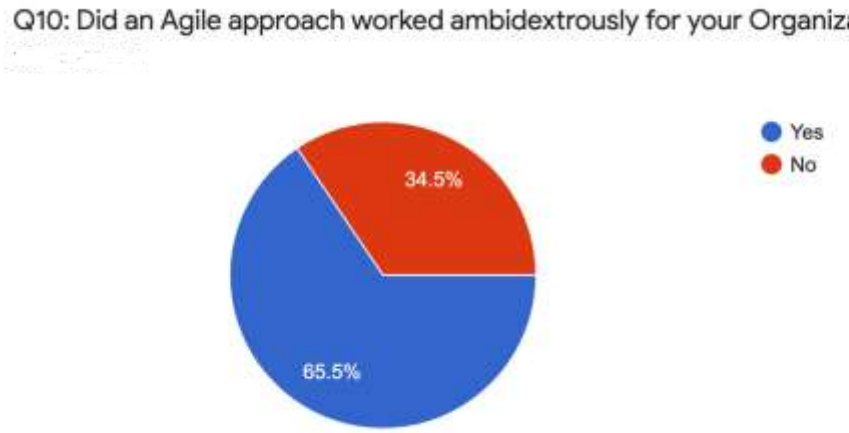


*Figure 4.10 Response for Working outcome of Agile in the organisation.*

When asked, **65.5%** respondents acknowledged that an Agile approach within a project used whenever has worked positively for the organisation.

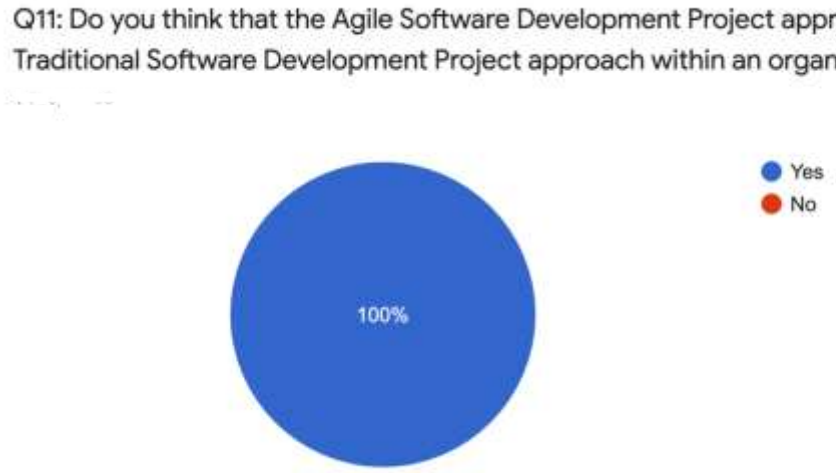


*Figure 4.11 Response about beneficial differential between Agile and Traditional SD Approach.*

When directly asked the benefits of Agile over Traditional software development approach, the Unanimous response has been given in favor of Agile Software Development approach.

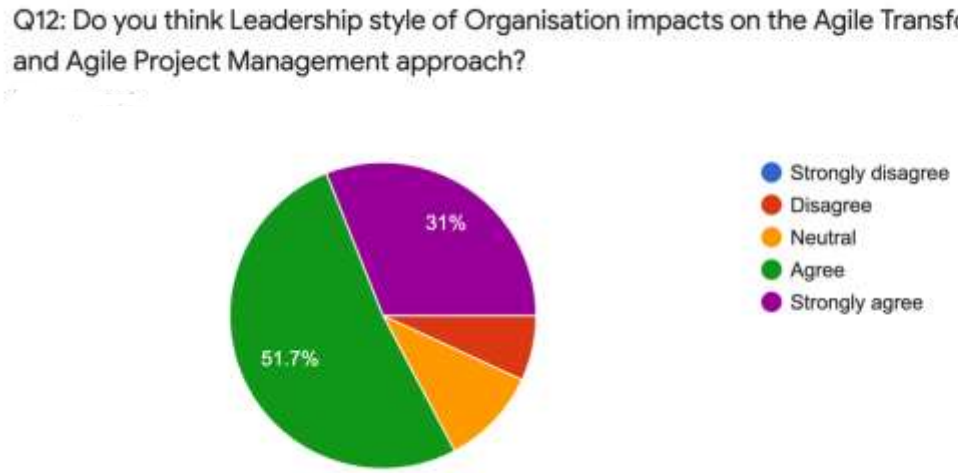


*Figure 4.12 Leadership impact on the outcome of Agile Transformation.*

Leader style is another key aspect where a strong influence on the organisation during or pursuing Agile transformation was highlighted as **31%** strongly agreed and **51.7%** agreed i.e. **82.7%** respondents are in agreement to the impact of leadership style within an organisation which is a huge ratio. A noticeable point from the responses is that the remaining stats show neutral response as further **10.3%** which ultimately resulted as **only 6.9%** respondents disagreeing.


*Figure 4.13 Response for trade-offs involved of Agile in the organisation perspective.*

When asked to pick major-trade-off(s) involved in an organisation' perspective towards transformation, **13.3%** picked Aiming to increase Team efficiency, while **20%** picked Aiming to simulate productivity while the larger audience about **56.7%** picked all options which includes aiming to enlarge creativity and providing flexibility along with first two.

**Finding #2: The statistics around the responses in this segments highlights that corporate cultural despite being adoptable to agile remains the most challenging aspect in agile transformation in organisation where leadership style plays a vital influential role where organisation' perspective towards agile practices aims to improve all aspects from team efficiency to productivity to providing a flexible working environment for all as Agile better guarantees a 65.5% successful project rate over traditional approaches.**

### 4.4.3 Impact analysis on Software Project Management processes with applied the Agile Transformation.

**Segment 3:** This segment describes the impact analysis on the Software Project management processes such as Project efficiency, Road mapping, Cost estimation and Project scope based on the input from respondents with applied Agile Transformation. Questions covered in this segment are from **Q.#14 to Q.#17**.

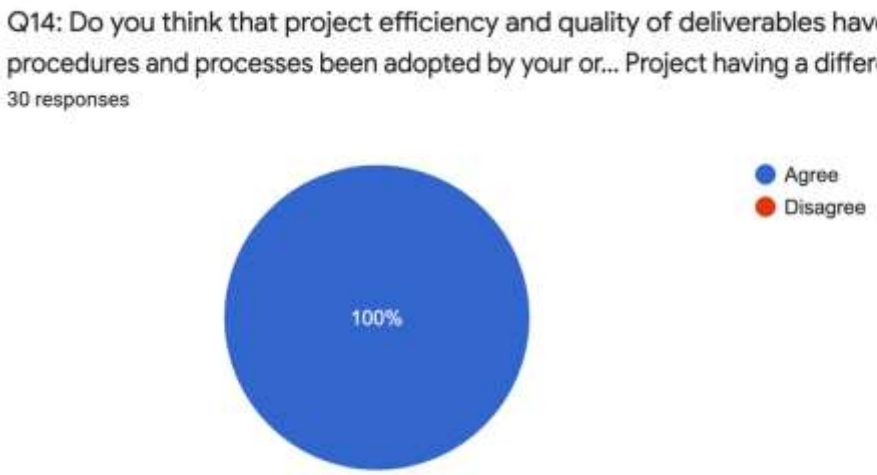


*Figure 4.14 Impact chart on Project efficiency with Agile.*

It is clear that unanimously people have voted that opting Agile has improved the efficiency and quality of deliverables in a project.

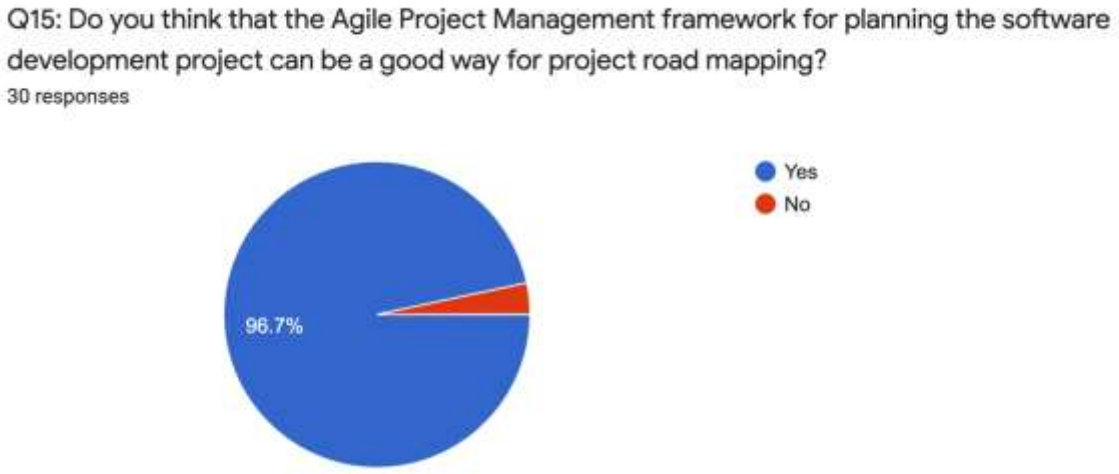


*Figure 4.15 Response for Project planning with Agile Project Management.*

A large number of respondents, **96.7%** precisely have agreed that Agile project management is a better planning approach for a project.

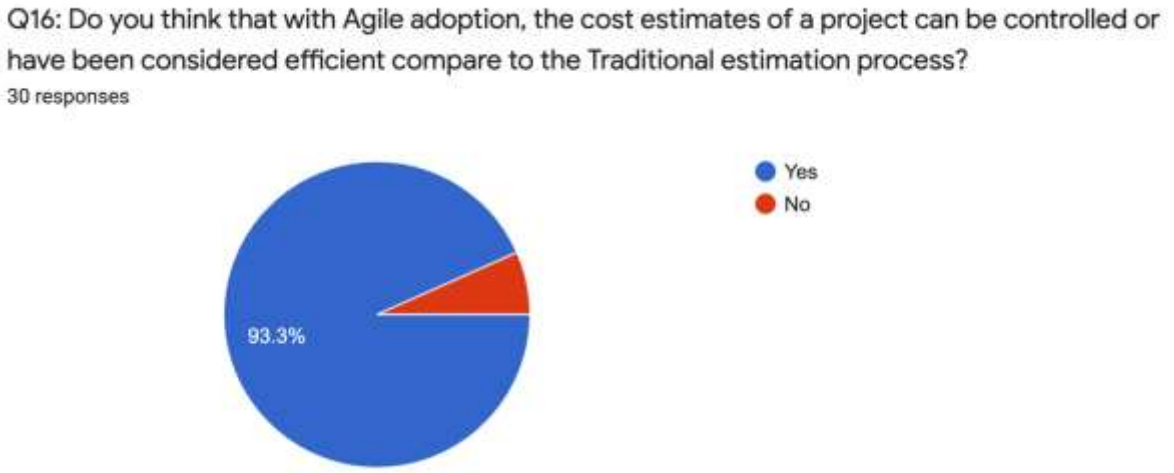


*Figure 4.16 Impact on cost estimation with Agile adoption in project management.*

Again, just like project planning, most of the people **93.3%**, have agreed a more controlled cost-estimation approach having agile project management process onboard.

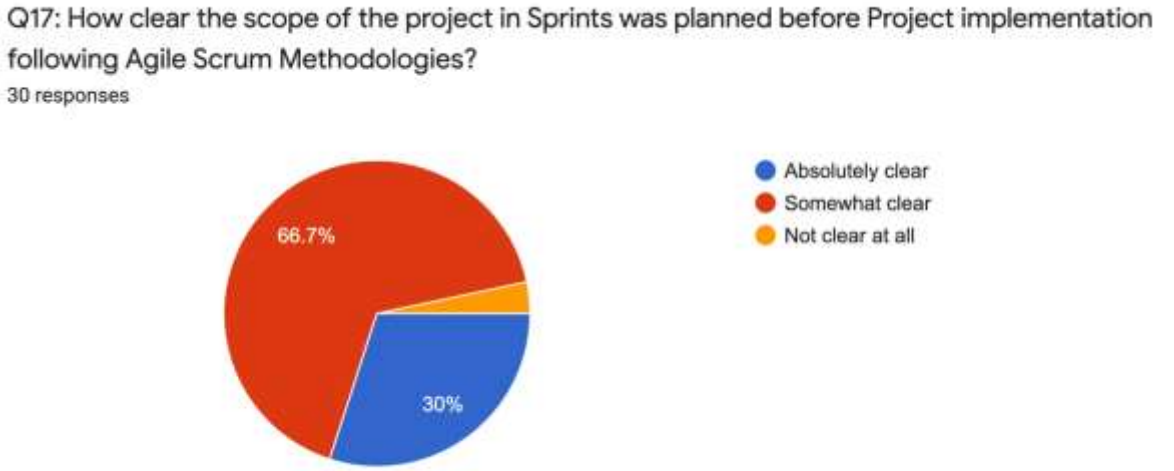


*Figure 4.17 Clarity of Scope define within sprint planning with Agile Scrum methods.*

Talking about the clarity of defining scope people responded positively as **30%** voted scope defined absolutely clear wherein **66.7%** said it to be somewhat clear. Only 1 out of 30 respondents said it not to be clear with Agile Scrum.

**Finding #3: The statistics responses clearly acknowledged the positive impression of Agile Project Management processes and procedures in a project in all the key areas such as planning sprints, defining scope, estimating cost which as a whole improves the overall project efficiency.**

### 4.4.4 Impact analysis of Agile SCRUM methods in Software Project Management.

**Segment 4:** This segment describes the impact analysis of Agile SCRUM methods used in Software Project management highlighting effectiveness or issues observed by respondents with applied Agile Transformation. Questions covered in this segment are from **Q.#18 to Q.#19**.


*Figure 4.18 Linear scale: value 1 to 5 (where scale 1 represents most effective corresponding to scale 5 as most ineffective value in decreasing order) representing the Effectiveness of Agile Scrum methods.*

The response statistics shows that a good **24.1%** respondents said Agile SCRUM to be very effective and **44.8%** said it to be effective which in total counts as **68.9%** along with **20.7%** responded the effectiveness as neutral, that in contrast count out only **10.1%** to responded Scrum to be non-effective.


*Figure 4.19 Rank chart representing the issues observed with Agile Scrum methods.*

| Issues Observed | Responses Count | Overall % |
|---|---|---|
| Time constraints during global Scrum stand ups | 18 | 60 |
| Product backlog challenges | 11 | 36.67 |
| Vulnerability over individualism | 13 | 43.33 |
| Progress tracking difficulties | 4 | 13.33 |
| None of the above | 2 | 6.67 |

*Table 4.4 Rank table representing the issues observed with Agile Scrum methods.*

The most highlighted issue has been stated as time constraint with managing scrum stand-ups with globally present participating teams.

**Finding #4: Most of the respondents acknowledged that the Agile Scrum provides effectiveness in communication within teams with the processes like daily stand-ups and regular feedback sessions, but same effective processes have been highlighted as a time constraining issue when it comes to arrange daily stand-ups within globalised participating teams.**

### 4.4.5 Conflict analysis between Agile and Traditional Software Project Management.

**Segment 5:** This segment points out the conflict analysis between Agile and Traditional Software Project management highlighting similarities, benefits and conflicts based on inputs by respondents. Questions covered in this segment are from **Q.#20 to Q.#26**.

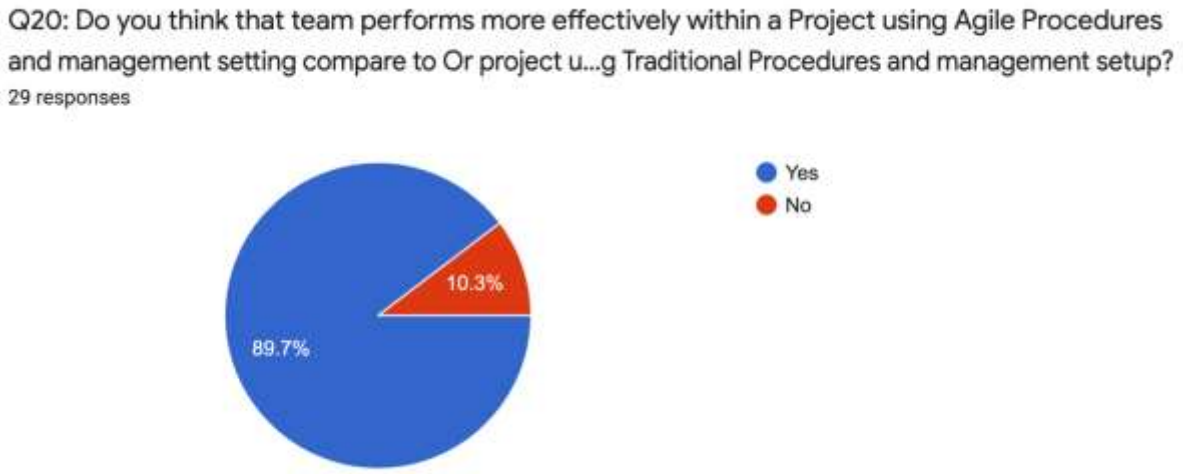


*Figure 4.20 Effective team performance with Agile over Traditional methodology.*

When asked about the efficiency improvement of participating teams in Agile SPM, respondents clearly ranked it over the Traditional SPM by **89.7%** votes.

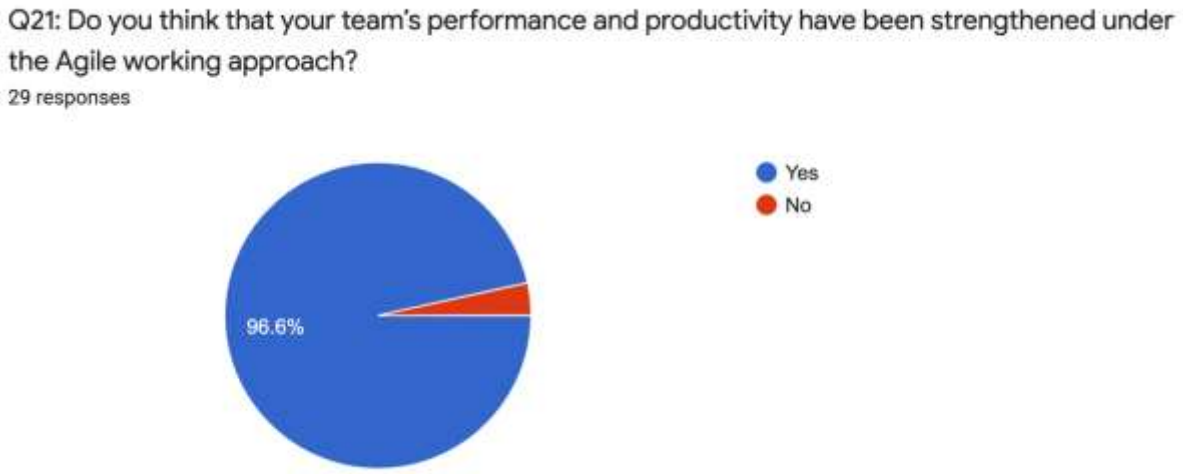


*Figure 4.21 Response on team performance improvement with Agile approach.*

Further, when directly asked about the respondent's own teams' performance and productivity improvement, the responses valued ever higher than previous one as **96.6%** respondents agreed on it.

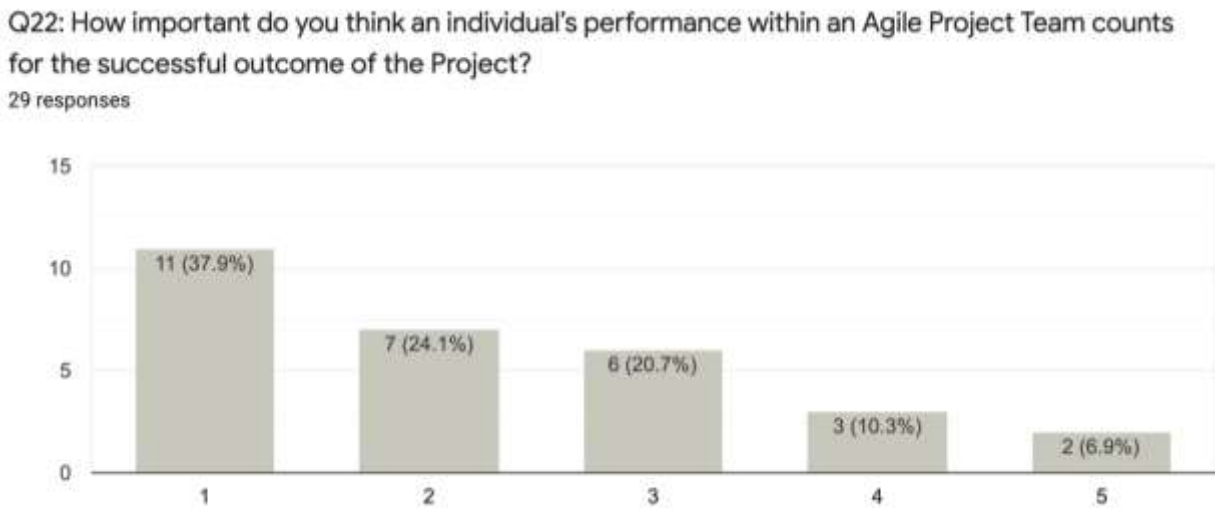


*Figure 4.22 Linear scale: value 1 to 5 (where scale 1 represents highly important while corresponding scale 5 as not important value in decreasing order) representing the individual performance impact in an Agile team.*

The responsive stats showcase that **37.9 + 24.1 = 62%** people evaluate an individual' performance in an agile project team as Important where **20.7%** agrees on neutral whereas a total of **17.2%** still says its team as whole matters rather an individual' performance.

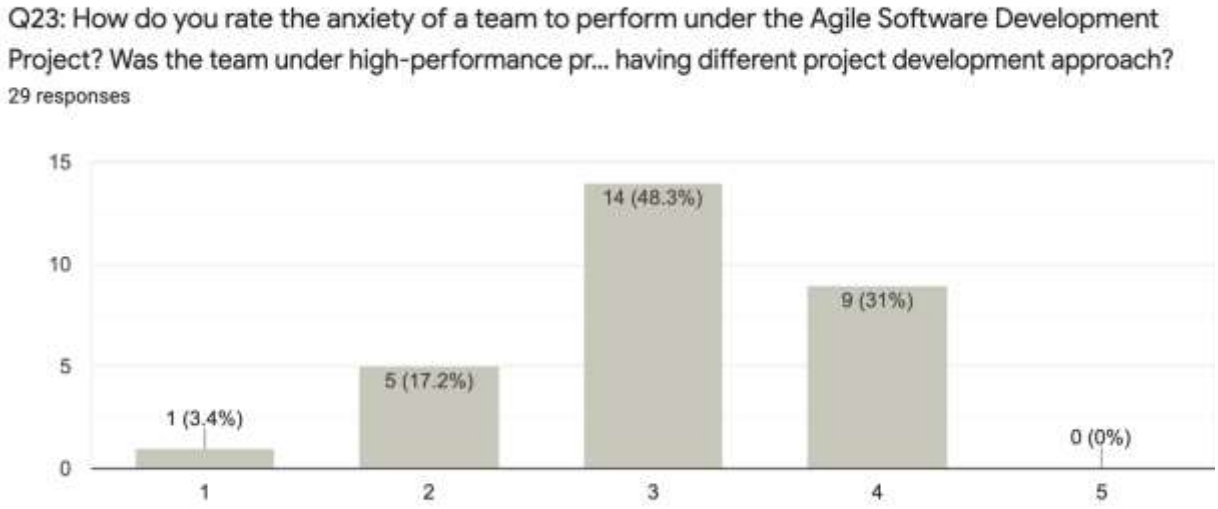


*Figure 4.23 Linear scale: value 1 to 5 (where scale 1 represents high pressure while corresponding scale 5 as low pressure value in decreasing order) representing the anxiety analysis of an Agile team.*

The anxiety level of an agile team has been evaluated as low pressurised compare to other methods in software development as only **31%** voted to have moderate pressure while **48.3%** voted a neutral pressure and 3.4 + 17.2 = **20.6%** said pressure to be lower in agile projects.

**Finding #5: the conclusive result of the above questions dictates the Agile Project Management approaches to be highly effective, efficient, productive and result oriented over the traditional project management approaches.**

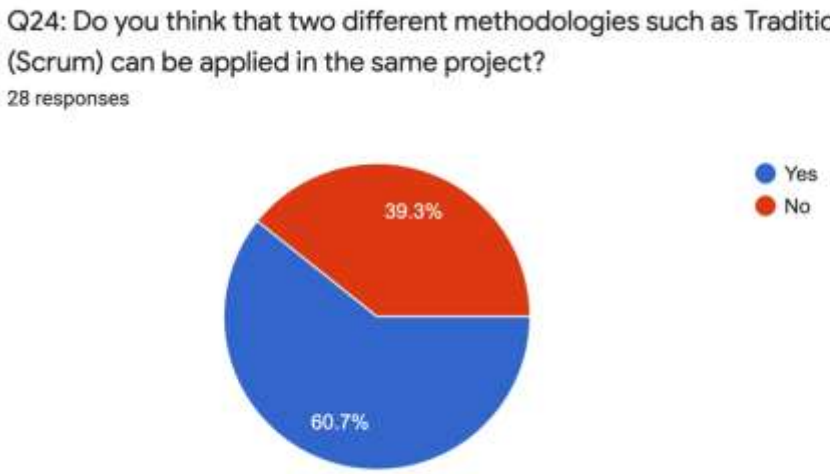


*Figure 4.24 Viewpoint on two methodologies applied together on same project.*

Asking about using two different methodologies within a same project, respondents agrees to it with **60.7%** voted in favor of the idea while **39.3%** voted against.

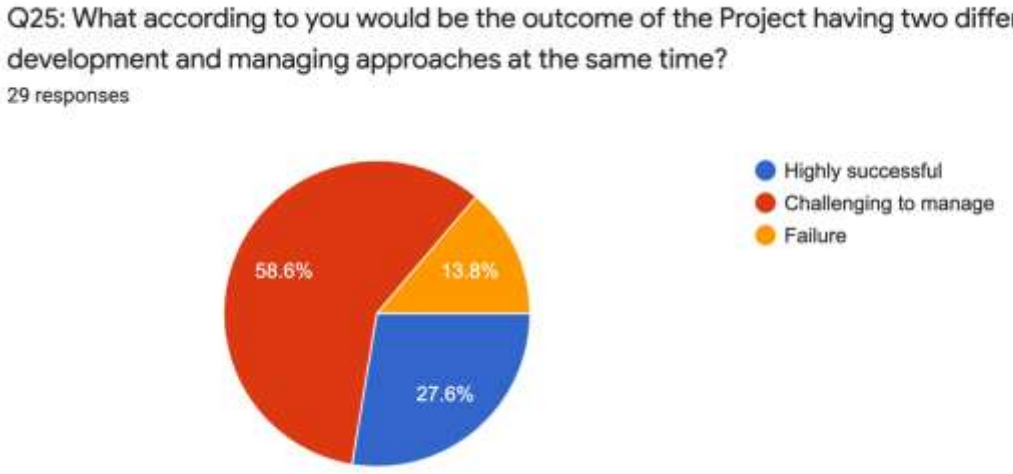


*Figure 4.25 Response for managing a project with 2 methodologies together.*

Further in the sequence, when people asked about the potential outcome of the project having two software development methodologies applied at same time, the majority of respondents pointed the project to be challenging to manage with **58.6%** votes, wherein **27.6%** agrees that

project will be successful while the remaining **13.8%** said the outcome of such joint venture will be total failure.

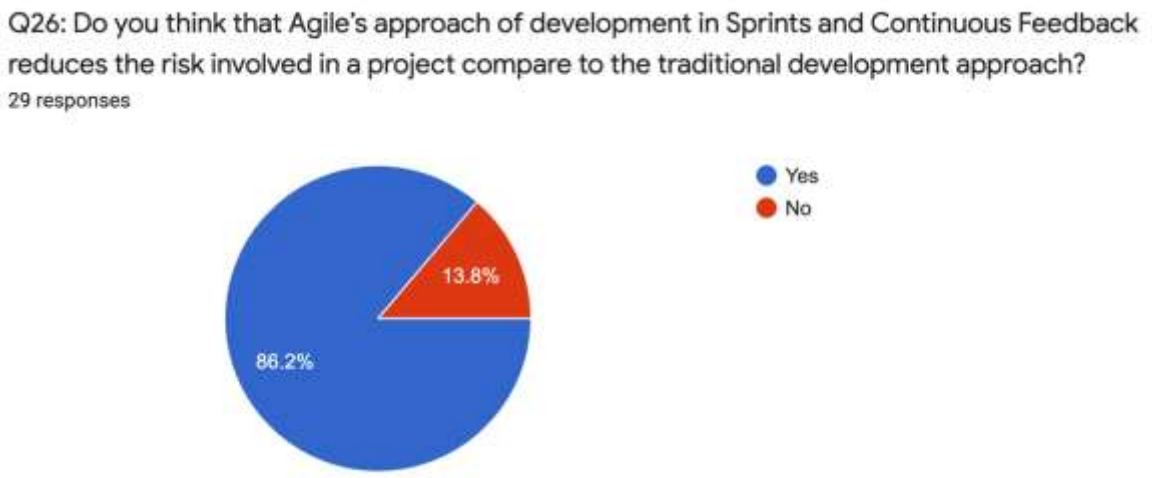


*Figure 4.26 Risk management analysis between Agile and Traditional approach.*

The respondents appreciated the flexible and module wise sprint development approach which based on the continuous feedback sharing acknowledged Agile approach to be reducing risk involves over Traditional approach by **86.2%** votes.

**Finding #6: it is evident with the findings from this segment of responses to the questions around collaborating two software project development approaches to work on a same project as single entity can be an average affair while Agile acting as a single approach reduces risk involve in the project drastically compare to traditional methods.**

### 4.4.6 Use of Agile approach in Non-Software Project Management.

**Segment 6:** This segment points out the successful usage of Agile Approach in Non-Software Development Industry based on inputs of respondents as per their knowledge or awareness. Questions covered in this is **Q.#27**.

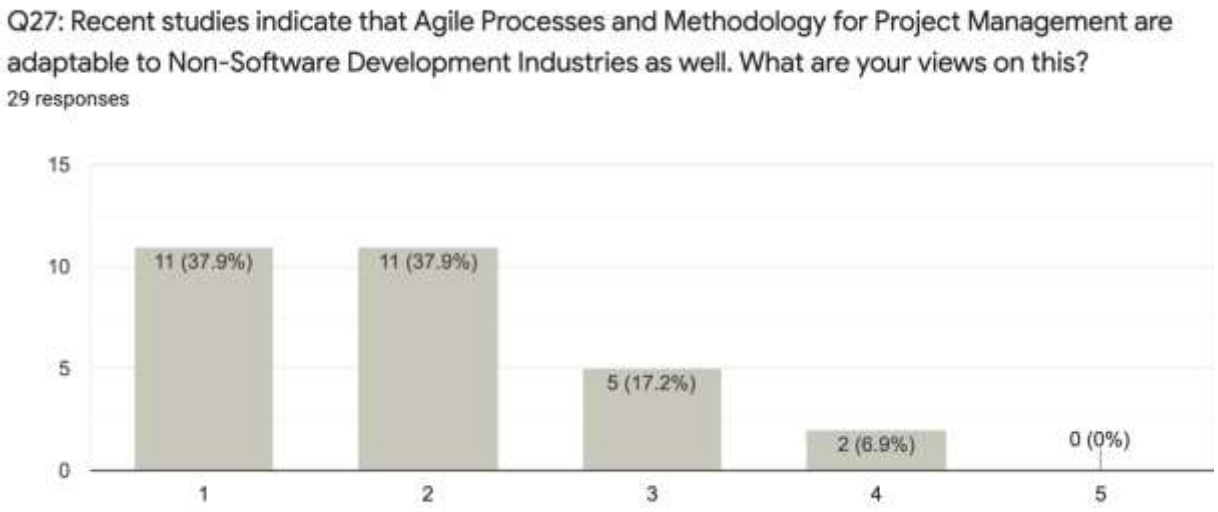


*Figure 4.27 Linear scale: value 1 to 5 (where scale 1 represents high agreement while corresponding scale 5 as not agreed value in decreasing order) representing the outcome response on Agile in Non-Software Project management environment.*

**Finding #7: The respondents showed clear understanding towards the Agile processes being adoptable in Non-Software industries and were extremely positive with its success in such industries as 37.9% highly agreed and 37.9% agreed to the adoptability, only 6.9% disagreed indicates the potential of Agile as a process.**

## Chapter 5: Discussions on the Empirical Findings

This chapter provides a linking viewpoint between the literature and the empirical findings gathered through the research medium.

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The aim for this research study is to explore the widespread “Agile Methodological Approach” and the related success and challenging factors involves with the Agile Transformation within a software development organisation. Moreover, the objective of the research circle around to a further extent by understanding the Agile Transformation within an organisation from the viewpoint of both Project Managers and Participating Development teams in order to seek the successive and pitfalls factors related to the transformation process.

The primary question for the research driving the sub questions were as:

RQ: Why some Projects succeed brilliantly while other fail in an Agile Transformation?

Sub-RQ: How do the participating development teams view at the Agile Transformation?
Sub-RQ: How Organisational culture and leadership style affect an Agile Transformation?
Sub-RQ: What are the deciding factors for a successful Agile project management?
Sub-RQ: What are the challenging barriers to an Agile transformation?

A Qualitative and Quantitative analysis were performed to understand the practical approach and outcomes of the Agile Transformation in the real-world software development scenario. The empirical findings analysed from the interactive face-to face interviews, followed by a survey questionnaire covering the same topics asked in the Qualitative analysis, have been quoted and presented in the previous chapter.

Basis on the captured data from a diverse respondent population, the answer appears to be the discrimination of the Success and Challenging factors involves with the Agile Transformation which were equally highlighted by both the target audiences.

**View on Agile Transformation** (Discussion on Finding #1)

The research analysis of Empirical Finding #1 from both Qualitative and Quantitative analysis, it is evident that not just the Project Managers but the Participating teams in the agile transformation were well aware of the importance and practices and principles of Agile as respondents showed clear understanding of the key factors such being flexible towards change, having a collaborative mindset, quick and efficient responses on the feedback received to deliver a quality product in regular interval to gain customer satisfaction.
*“Agility to me is being flexible towards change and act accordingly. So, the transaction from a rigid development structure of traditional waterfall model to a flexible development structure of Agile is an "Agile Transformation"”.*

The findings as per given responses clearly support the literature theory for Agile Transformation as Agile Methods were introduced to provide a solution to slow paced, insufficient working way over Traditional Methods (Cooke, 2012, pp. 32-36). The focus of Agile towards the evolutionary development procedure to better responds the change requirement is defining principle in Agile Manifesto (Beck *et al.*, 2001).

*"Adopting new ways of working with generative mindset using agile values and principles. Agile scaling frameworks are being used for transformation to new ways of working with gives better speed and quality with happier staff and customers".*

The fact that the respondents showed a clear understanding and well acknowledged the awareness and usage of Agile methods made them comfortable in adopting the Agile' iterative development cycle with customer involvement in project life cycle (Novoseltseva, 2016) to seek feedback and delivering quality product to gain customer satisfaction points directly towards the principle theory behind Agile Methodologies.

*"Making the organisation adaptable to new methods by practicing flexible methodologies in work environment which enhances employee job performance and satisfaction".*

**Challenge Factors of Agile Transformation** (Discussion on Finding #2)

Finding #2 highlighted the most challenging factor for an Agile Transformation to be the Corporate Culture as organisational perspective and leadership style plays a vital role in Agile transformation outcome.

The finding is quite evident to the literature, as studies in past researches have widely discussed about the organisation' dimensional changes with Agile Transformation, explaining an overhaul methodological changes bring series of issues during the agile movement (Babuscio, 2009; Fraser *et al.*, 2006) due to adoption of different approach for the business operations.

Further, the empirical finding points out that culture in not the only challenge as mitigating the cost of transformation also affects the outcome, but it is the organisation' perspective as per the historical culture that greatly affects the transformation outcome. Both literature and empirical findings provide relative viewpoint to the past studies as during a survey, Scott W. Ambler (2012) observed 5 major challenges that an organisation face while adopting the Agile methods and out of 5, 3 challenges were related to organisation culture.
Agile as per Kniberg (2018), stated to be more suitable for some organisation, while not for some which is due to the leadership/management style or hierarchy as organisation having top-down or micromanaged environment pertain less scope for flexibility which Agile demands.

*"The speed at which work happens changes drastically, so people will have to adapt to that due to the Sprint methodology. Daily reporting and communication are another major thing that changes".*

**Success Factors of Agile Transformation** (Discussion on Finding #3)

The empirical findings distinguished the purpose of agile transformation to improve the success factors of a project which comprises of better planning and procedures having a positive influence upon people involved working in a project towards achieving the optimum goals with continuous efforts to simplify the sprint modules planning, defining the clear scope to improve productivity and efficiency of project teams and project itself in terms of providing more control over risk and scope management along with controlled cost estimations.

The interviewees responded on the key factors involved in agile project management process referring to the Agile manifesto (Beck *et al.*, 2001) but highlighted the value addition paradigm of Agile methods over the Agile framework concepts.

*"Agile eliminates planning everything in advance and divides in multiple sprints which is more controlled and accurate project planning",*

Literature study highlighted that rigid and structured Traditional Approach to software development has multiple risk involved such as external, cost, technological and operations risk, which demanded a more flexible approach to handle, listed by Georgiev and Stefanova (2014), Agile introduced iterative development approach as a solution to mitigate risk management.

*"Working in iterative sprints and releasing software in modules give edge in risk and change control which eventually provide more budget and cost estimating control",*

An important aspect of the findings in this section described that although the challenge of Agile Transformation lied with the adoption of the Agile Methodologies but the Success implies and reflects with the understanding of the agile methods and principles which refers to the literature theory behind Agile Principles with adding value to the software development (Highsmith, 2001).

The iterative and incremental development approach of Agile with flexible response to change environment embrace the scope management of project in multiple sprints division which is incorporated on learning and feedback mechanism throughout the project development.

*"Agile scope management is different from scope management in a traditional project. ... Agile projects, however, have variable scope so that project teams can immediately and incrementally incorporate learning and feedback, and ultimately create better products".*

**Agile' Improvements over Traditional Approach** (Discussion on Finding #5)

As Charles Darwin stated, *"the one who will survive will not be the strongest or intelligent but the one who will manage the change accurately"*.

All the respondents acknowledged the key advantage of Agile is the ability to quickly response the change which is quantified improvement over traditional approach.

Both Empirical findings and Literature theories have identified the role of change in an organisational environment. In an organisational development, change is ever-lasting as both strategic and operational function (Burnes, 2004) and with the rapid technological advancement, organisations' ability to response the required change to retain the competitive advancement, in the most efficient and qualitative manner (Ackerman Anderson, 2001) adoption of Agile project management approach is an important aspects over traditional management approach.

Although as per literature, change is manageable in both Agile and Traditional Methodologies, but Change comprises of Risk and that makes Agile more efficient to handle the risk management is due to its "Continuous Feedback" approach which is well optimised throughout the project lifecycle in multiple stages of the product development.

*"Yes definitely, continuous feedback is one of the key aspects of agile which helps improve the development which further helps in a more refined and efficient product in comparison to traditional approach which doesn't have a defined mechanism of capturing feedback and inculcating it at the same time in the development phase",*

## Chapter 6 Conclusion

This chapter concludes the answers to research questions based on the discussion provided in the previous chapter.

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The purpose of this research study was to explore the Agile Transformation process from a wider viewpoint from not just the Project Managers but from the Participant team as well to distinguish the success and challenge factors involved in the Agile methods applied to the project and people involved during the agile transformation.

To have a background understanding, a detailed literature study was done from the related academic papers, previous researches on the similar topic, which was produced in the literature review chapter of this research. With a purpose of covering an untouched topic segment in available knowledge about Agile Transformation.

### Implications and Limitations

The selectively approached respondents for the data collection have been deliberately kept limited to state a clear scope of this research study by highlighting the insights of the experiences and thinking of modern software development project managers and teams which are directly involved in managing and channelizing projects and transformation.

The primary question for the research has been concluded based on the research study conducted throughout.

RQ: Why some Projects succeeds brilliantly while other fail in an Agile Transformation?
The analysis on the Empirical findings and literature study identifies the Success Factors as Agile being iterative, incremental, flexible and continuous evolving process in a project environment, whereas the Challenging factors identified as organisation' culture which is a complex activity for application of agile method as a whole during Agile transformation. These are critical aspects for transformation which acts as the foundation of initiative, implement a philosophy, purpose, mindset, approach and working way in the organisational environment with a change of concept and responsibilities towards the Project Management. While the success factor drives the success paradigm of agile transformation, the organisational perceptive coming from historical culture frame can affect the outcome of the Agile Transformation.

Sub-RQ: How do the participating development teams view at the Agile Transformation?
The study reflects the highly positive viewpoint of agile participating teams as awareness of agile methods and its key advantages are present in the mindset of the people.

Sub-RQ: How Organisational culture and leadership style affect an Agile Transformation?
The study indicates that the organisational culture which being the driving aspect of the transformation, can highly influence the people and processes within the organisation.

Sub-RQ: What are the deciding factors for a successful Agile project management?
The mindset of the participating people, their behaviour towards the process involved and overall culture of the organisation adopting or pursuing the agile project management are the deciding factors to the success.

Sub-RQ: What are the challenging barriers to an Agile transformation?
There is no significant barrier to agile transformation has been quoted in the research study, but argument around the importance of overhaul change in processes and operations within the organisation during the agile transformation along with influencing people participation has been produced.

From the above answers to the research questions, the research study concludes People and Processes being the core of the organisation driving the working project outcome requires a positive attitude towards the agile transformation for a potential positive outcome in a software development project environment.

The conclusion is entirely based in the observation made from the Empirical findings and literature theories within this research and further outcome and rightness in this conclusion can vary based on the viewpoint of people perspective.

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## Appendices

### Appendix 1 Search Tools

A multi-step systematic way of search for literature review material was approached around multiple sources (Aylward *et al.*, 2012). Various search engines presented in the table were used to gather relevant material accessing the sources to validate the quality study searches.

Most of the searches came across the phase 3-4 during the formation of theoretical framework. Various sources: NCI Discovery (NCI library' own search portal for journals), Google Scholar, ResearchGate, IEEE Xplore and ScienceDirect. Except Google Scholar, all the later search engines were accessed using the NCI student login to access full publications.

| **Search Tool** | **Access Duration** |
|---|---|
| Google | Phase 1 |
| Google Scholar | Phase 1-2 |
| NCI Discovery (NCI Lib Guide) | Phase 1-4 |
| ResearchGate | Phase 3-4 |
| IEEE Xplore | Phase 3-4 |
| ScienceDirect | Phase 3-4 |

*Table 8.1: Search Tools Overview*

### 1.1 Relevant Keywords Search

A systematic study through searching relevant search terms combined with keywords, identifiers, words and phrases combining with additive adjectives along with relatable references is very beneficial for research material over search tools (Ellis and Levy, 2006). All search words were used during multiple phases to search keywords, identifiers or combination of phrases to gain relevant results during searching material over the search tools.

Initially the search words were looked as individual identifiers explained in the table below. With passing time and gathered with initial knowledge, the combinations of words were utilised to search information in wider spectrum. The additive words and references usage provided important searches around literature review, articles and publications for the research study.

| Keywords | Additive Words | References to Identifiers |
|---|---|---|
| Agile | manifesto, mindset, principles, transformation, project management, leadership, | beck et al., Anderson & Ackerman Andersson, Kotter, Gustavsson, |
| Scrum | master, process | Deemer et al. |
| APM | agile project management | PMBOK, PMI |
| Agile in.. | software, development, IT, Automobile | Fitzberg et al., Gustavsson, Bjorkhom & Brattberg |
| | | |
| **Phrases** | | |
| Agile Principles | | |
| Agile Methodology Challenges | | |
| agile transformation success drivers | | |
| Traditional vs Modern Agile Management | | |

*Table 8.2 Relevant Keyword Search*

**Appendix 2 Qualitative Interview Schedule**

Interviews were scheduled to suite the participants as per their availability.

**TimeLine for Qualitative Data Collection**

| Interview # | Current Role in your Project/Organization? | Date of Interview |
|---|---|---|
| 1 | Scrum Master | 2020-06-23 |
| 2 | Agile Project Manager | 2020-06-24 |
| 4 | Project Manager | 2020-06-25 |
| 3 | Project Manager | 2020-06-26 |
| 5 | Project Manager | 2020-06-28 |
| 6 | Product Owner | 2020-06-29 |
| 7 | Project Manager | 2020-07-01 |
| 8 | Vice President | 2020-07-02 |
| 9 | Solution Architect | 2020-07-06 |
| 10 | Application Manager | 2020-07-06 |

*Table 8.3 Interview Schedule*

**Appendix 3 Ethical Consent sent with Online Surveys**

Greetings!

I Gaurav Singh, would like to thank you for taking out your time to provide your valuable information as I invite you to take part in the following research study which requires the data to the dissertation questionnaire using the experiences and perceptions of the IT professionals working in Software Development Life Cycle.

The conducting research is associated with my post-graduation dissertation, as I am pursuing MSc in Management from the National College of Ireland. My dissertation topic focuses on the Agile Transformation and its impact in the Software Project Management environment.

I would like to inform you that participation in this Dissertation Questionnaire is Voluntary. You can opt to withdraw from the survey at any given point and your responses will not be documented. If you are happy to complete this questionnaire, all your responses will remain anonymous and confidential. The data will be secured in a password-protected file that will be accessed by myself and my thesis supervisor.

The questionnaire has been prepared to capture your information on the topic-specific based on your experience and perceptions about Software Project Management, especially around Agile methodology. The survey would take 10-15 minutes to complete in total. Please bear with me until the end.

All aggregated data will be analyzed and discussed in my final thesis. No individual response will be presented or discussed and will be deleted after the timeframe as per the guidelines of the National College of Ireland.

For further queries kindly feel free to write to me at (gauravsinghit12@gmail.com).

Thank you and keep Safe!!