Oula Yliperttula

Leading change with Agile

How Agile Project Management can affect an organisation's growth prospects

Author(s) Title Number of Pages Date	Oula Yliperttula Leading change with Agile How Agile Project Management can affect an organisation's growth prospects 34 pages + 3 appendices 5 May 2017
Degree	Bachelor of Business Administration
Degree Programme	International Business and Logistics
Specialisation option	
Instructor(s)	William Simcoe, Senior Lecturer Kevin McIntire, Senior Lecturer

The purpose of this thesis was to investigate if implementing agile methods can lead change in an organisation, if *Agile Project Management* can help the company grow and what are the consequences of applying agile methods to companies' project management processes. As businesses seek for agility and strive for a more unique competitive advantage, being organisationally agile (able to adapt to changing market conditions and reacting to changing stakeholder requirements) is important. This paper analyses available secondary data about agile and its implications to form an understanding of agile methods and the effects it has on project management processes. The traditional project management processes and related elements are clearly introduced, after which a qualitative approach to secondary data gathering is applied. The approach suited the research well, as detailed information about agile was sufficiently available. Conducting primary data was not used because of its risk of widening the thesis scope and because more adapt research results were already available.

The key findings were that most companies seek enhancements to managing changing priorities and acceleration in time-to-market when they choose agile. The same aspects were reported as the largest "actually realised" improvements, in addition to increased productivity and improved product visibility. Some barriers for adopting agile further in an organisation still exist, however, and the largest reasons were reported to be the ability to change organisational culture, as well as general resistance towards change. Still, the use of agile methods is increasing, and experience from agile in organisations is reaching maturity, meaning more companies have stayed using agile for years.

The study concludes that agile can create a good environment for growth, but as projects vary, it may be difficult to apply agile methods into existing organisational culture. Strong change management is needed to implement agile well, but if agile is successfully adopted, the company can benefit from the added organisational agility.

Keywords	Project management, growth, agile, organisational change

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Glossary

APM= Agile Project Management

ROI= Return-on-investment

PMBOK (-Guide) = Guide to The Project Management Body of Knowledge

1 Introduction

After establishing a need for organisational growth, a company needs to re-evaluate their management style accordingly. Many projects are defined by their result, but managing these projects usually stays the same. Project management, as defined in the Guide to the Project Management Book of Knowledge (from now on referred in the thesis as PMBOK), means "the application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed stakeholder needs and expectations" (PMBOK Guide, 2013:5). The book is published by Project Management Institute (PMI).

The PMBOK guide, since its original publication in 1996, has led the way for project managers and all interested individuals to learn how projects can be more easily managed. Intended to be "a subset of the project management body of knowledge that is generally recognised as a good practice", the PMBOK introduces the audience to the five processes of a project, as well as the ten knowledge areas of management processes.

Although PMBOK does not explicitly dictate towards a certain methodology, it is widely used to support the conception that the popular "waterfall" model is the right solution for project managers. In short, the "waterfall" model is a project that is carried out in sequences – when the first sequence is ready, the next will commence, and so on – all happening only once during the project's lifetime. This is widely regarded as the traditional project management model. Lately, however, another paradigm has captured attention in the field of PM, an idea described in PMBOK as the "adaptive project management life cycle".

The methods of adaptive project life cycle are commonly known as "Agile" methods. Agile project management (APM) has grown in popularity in the last two decades especially, mostly in the form of software development and after the publication of the Manifesto of Agile Software Development in 2001. While the approach has its roots in software development, the thesis will apply to on Agile Project Management in all kinds of companies, and not only organisations from the software industry.

The plan is to reach a conclusion on whether Agile can lead organisational change, what kind of effects does implementing APM have on company's project management processes, and could the company boost their growth with APM.

2 Literature review

This literature review comprises the theories and practices that relate to my thesis question. A profound understanding of the topics is needed to form a robust basis for research and the eventual analysis, as the analysis constantly refers to the PM methodologies and their application in growth organisations. In addition to a brief overview of projects, PM, and its relation to the thesis, the literature review will also define APM, as well as growth and change management, as they are all crucial parts of the thesis.

2.1 Project definition

The British Standards Institution defines the project to be "a unique set of co-ordinated activities, with definite starting and finishing points, undertaken by an individual or organisation to meet specific objectives within defined schedule, cost, and performance parameters" (BS 6079-1:2002). Projects can therefore be made in various lengths, and being temporary does not define the project to be short. The final creation can be a unique product, service, or a result, which will most likely last for a longer time than the project creating it (PMBOK Guide, 2013:3). They also often involve an element of risk, as they entail a level of uncertainty (Westland, 2006:2)

2.1.1 Project management and knowledge areas

"Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements" (PMBOK Guide, 2013:5). In addition to this definition, A Guide to the Project Management Body of Knowledge provides an extensive set of terminology and guidelines, which are globally used by PM professionals.

The management processes from the 4th edition (2012) were adapted by ISO[1], and the book was recognised as an industry standard by the American National Standards Institute (ANSI), which have carried on to the 5th edition, which is used for this thesis.

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[1] Comparison of ISO 21500 and PMBOK® Guide
http://www.sybena.pl/dokumenty/ISO-21500-and-PMBoK-Guide.pdf

The requirements for project management are also growing for various reasons. Risto Pelin (2011) states in his book *Projektihallinnan käsikirja* (The guidebook for project management) reasons for the increase of requirements for PM:

- The objectives of projects increase due to international competition
- The project organisations are becoming more complex, as there are many parties (companies, suppliers, second and third tier suppliers, vendors, etc.) involved. Work is also done globally in many different countries.
- The flow of information and managing communications becomes more challenging.
- The IT systems develop intensely. This has allowed the use of software that connects to companies' databases, therefore allowing for real-time project planning and controlling. The potential of these new technologies is not fully used.
- Different quality requirements of ISO 10006[2] and PMBOK. Project managers also require certifications in addition to increased professional requirements and career development.

(Pelin, 2011:19)

Knowledge areas

The PMBOK Guide introduces ten knowledge areas for successfully running a project.

- Project Integration Management
- Project Scope Management
- Project Time Management
- Project Cost Management
- Project Quality Management
- Project Human Resource Management
- Project Communications Management
- Project Risk Management
- Project Procurement Management

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[2] ISO Guidelines for quality management in projects
(available at https://www.iso.org/standard/36643.html)

- Project Stakeholder Management

Kathy Schwalbe (2009: 9) argues that only four of these (time, cost, quality, scope) are core areas, as they lead to specific business objectives. They are also the constraints of projects, meaning projects are limited by the scarcity of these factors, and this can affect the execution of a project, program, portfolio, or process (PMBOK Guide, 2013:533). The constraints are a common way to also measure a project's successfulness (Schwalbe 2009:12-13). The constraints are often formed in a triangle shape, as seen below.

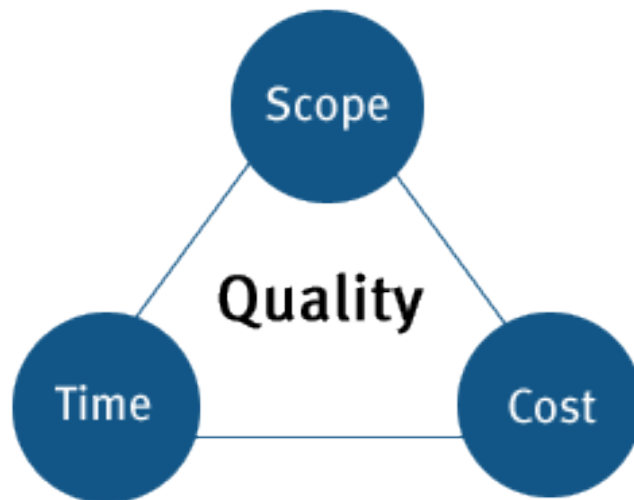Figure 1. The Project Management Triangle (Gianniris 2010)

Managing a project through its knowledge areas often means that an action in one knowledge area will require a change in one or more 'crucial triangle' areas shown above.

2.1.2   Project Processes

In addition to project management seen as managing the knowledge areas, project management can be viewed as a number of related processes.

A process is a series of actions directed toward a particular result (Schwalbe 2007:30). PMI (2013) describes the project phases as "Project Management Process Groups" (p.48). The groups are as follows:

- Initiating
- Planning
- Executing
- Monitoring & Controlling
- Closing

The Initiating Process Group is a series of processes that need to be performed to define a new project or a new phase of an existing project by obtaining authorisation to start the project or phase (PMBOK, 2013). It entails the processes that are needed to clarify the project objectives and what is needed to achieve them (Newton, 2015:8)
As stated in the Process Group and Knowledge Area Mapping (PMBOK 2013), initiating processes do not involve management activities from many knowledge areas. Although dependent on the nature of the project, the initiating process group only involves developing a project charter for Project Integration Management, as well as identifying the project stakeholders for Project Stakeholder Management.

The Planning processes further formulate and define the objectives, as well as define the scope of the project. They also create the project management plan and the documents used to carry out the project (PMBOK 2013). The management plan is included in the Project Integration Management knowledge area. Every knowledge area in a project requires planning, and thus the Planning Process Group is the only group where all knowledge areas are involved (24 management processes in total), including stakeholders, all of whom are encouraged to give an input in the planning activities by the project team (PMBOK 2013). Careful planning can be a crucial contributor in project's success, and poor planning can, in turn, produce various complications (Alexander, 2015).

Executing Process Group is vital, as it comprises all processes which are defined in the project management plan created earlier (PMBOK 2013). In the executing processes, activities are performed to meet different project specifications, and it involves managerial tasks in communication as well as stakeholder knowledge areas.

Managing procurements and coordinating human and non-human resources are also part of executing activities.

Monitoring and Controlling Process Group includes measuring and monitoring progress frequently to ensure different project objectives are met (Schwalbe 2007:80). It is important to identify any progress going differently than originally planned and to correct it if needed. This means identifying places where changes are required and undertaking corresponding actions to allow the project forward.

The project is finalised with processes in the Closing Process Group. This can happen either according to plan or prematurely if a project is aborted, cancelled, or a critical situation occurs (PMBOK 2013:58). Activities involved are usually administrative; reviewing the project or project phases, archiving project files, closing out contracts, documenting lessons learned, and receiving formal acceptance of the delivered work as part of the phase of a project (Schwalbe 2007:81).

While there is an order in which the process groups will be completed for a project, the individual activities are overlapping and occur throughout the project (PMBOK, 2013). The length of each activity varies from project to project (Schwalbe, 2007), but it is normal for the Executing Process Group to require 50-60 percent of resources and time available. The other groups' requirements vary strongly but initiating and closing processes generally require the least amount of resources and time (5%-10% each).

It should also be noted that Project Management Process Groups are different from project life cycle phases. Project phases compile logically related project activities together, and different Project Management Process Groups can exist within a phase. They also are generally completed sequentially, as opposed to the overlapping nature of Project Management Process Groups (PMBOK 2013:41), but they can still overlap in some situations. Project life cycle, then, is a series of phases required to complete the project. Each phase of a project life cycle is performed once.

2.2   Agile Project Management

To understand Agile PM, one needs to understand how the methodology came to be in the first place. Although Agile was given its name as late as 2001, the ideas behind it were developing long before that.

Possibly, the most notable of the earlier methodologies created to improve on the Waterfall model was the Spiral model from Barry Boehm. Boehm has written about the methodology in 1988, just when software was becoming more important and investments on software projects grew. The development of a corresponding method to carry out these projects was too slow. This led to increasing lead times and losses because the Waterfall model is very constrained in terms of risk assessment and management.

The answer was a Spiral model, which was created by Mr. Boehm to minimize risks by using prototypes and other means. It involves analysing risk at every stage of the project. Like a spiral, the product is being built progressively, creating more complete versions as the spiral spins outwards. The loops mark a point for risk analysis, and it is also where the customer is able to evaluate the work and suggest improvements. The analysis itself results in a 'go/no-go' decision, so if the risks are determined to be too great the project will be terminated (Frankovich, 1998).

2.2.1 Scrum

Another very influential methodology in the 1990s was the Scrum process. The name was taken from a paper by Hirotaka Takeuchi and Ikujiro Nonaka from 1986 called "The New New Product Development Game", where they used the rugby term "Scrum" to describe the importance of team work in new product development. They argued that teams work the best in developing new and complex products when they are handed objectives instead of clear tasks. The most successful teams in their examples were the ones that were assumed autonomy and room to enhance their procedures. The Scrum process, created by Ken Schwaber and Jeff Sutherland in 1995, implemented these principles to software development and further refines the ideas to enhance development quality and sustainability in software products.

The Scrum process "assumes that the analysis, design, and development processes in the Sprint processes are unpredictable" (Scwaber 1995).
Because the process itself is constructed in a way that assumes this, the possible risks can be more easily managed with increased flexibility and ability to answer to possible risks. Schwaber and Sutherland were also amongst the 17 software development leaders who published the Manifesto for Agile Software Development in February of 2001. The manifest acts as a basis for the majority of literature about Agile today.

2.2.2 Agile Manifesto and business objectives

As stated in the introduction, the idea of Agile has gained popularity in the growing software industry mainly because of their shared values. In the Agile Manifesto, the values are described as follows:

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

Figure 2. The values of Agile Manifesto (The Agile Manifesto, 2001)

The creators add that "while there's value in the items on the right, we value the items on the left more" (The Agile Manifesto authors 2001). Agile PM nowadays also covers the Scrum process, which is treated as part of the much larger entity of Agile. A survey in 2015 conducted by Forrester for professionals up-to-date of their respective firm's agile practices showed that 86% of them said the company was using Scrum processes. There are, however, many different types of hybrid practices that combine elements from many methods such as Waterfall, Lean, and Kanban. It is however well documented that software companies using Agile were using specifically Scrum processes.

The business objectives of using Agile PM are highlighted by Jim Highsmith in the book *Agile Project Management – Creating Innovative Products* from 2009. He argues that there are five key business objectives that help adapt a new approach to PM and management in general.

1. *Continuous innovation* – to deliver on current customer requirements
2. *Product adaptability* – to deliver on future customer requirements
3. *Improved time-to-market* – to meet market windows and improve return on investment (ROI)
4. *People and process adaptability* – to respond rapidly to product and business change
5. *Reliable results* – to support business growth and profitability

Figure 3. Key Business Objectives of Agile Manifesto (The Agile Manifesto, 2001)

In the first edition of the book, Highsmith introduced an agile process framework focusing on major phases of a project. The need for a more comprehensive framework has since grown, as various agile methods are now applied in more organisations and for more projects. For this reason, the second edition, which is used in this thesis, offers something called an Agile Enterprise Framework. The goal is to have a common framework for the organisation, even if the teams vary by location, culture, members, or support possibilities, regarding training or coaching.

The four-layered Agile Enterprise Framework is shown below in Figure 3.
The Portfolio Governance layer can be used to provide the organisations with a set of checkpoints to help evaluate the projects with emphasis on the common concerns of the executive branch, which the author describes to be "investment and risk. Executives want to know the value of the project (regarding ROI), and the certainty or uncertainty of obtaining the ROI. Executives don't care whether a requirement's document has been finished; they want to know about a project progress, investment, and risk." (Highsmith, 2009)
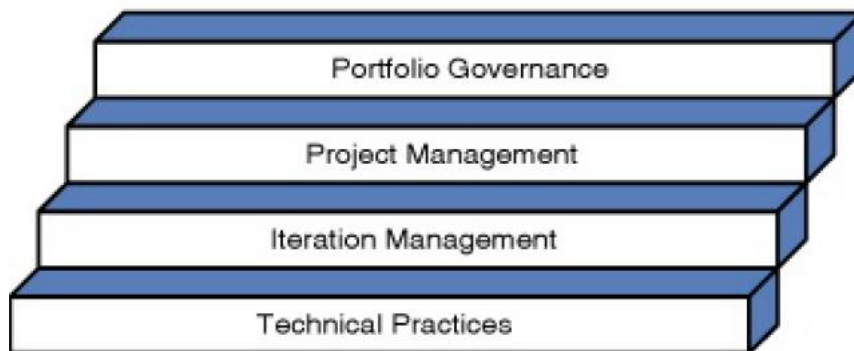
Figure 4. Agile Enterprise Network, Highsmith 2009

The Project Management layer can be used as a supplementary element of guidance to manage the release of the project, as well as managing the external stakeholders, i.e. the people outside the core team of the project. As Highsmith writes; ".. the Project Management layer focuses on overall project/release activities, assisting coordination among multiple feature teams and managing the project externals." (Highsmith, 2009)

The Iteration Management layer differs from project management in a sense that instead of dealing with external stakeholders, Iteration Management focuses on internally guide planning, execution, and team leadership towards the iteration at hand. Iteration Management can take place in day-to-day activities, and does not concern the overall project management, as they have different objectives.

The last one is the Technical Practices layer, which includes integration and test-driven development among others. Highsmith acknowledges that his book drives more focus towards the first three layers, but agrees that the foundation of effectively delivered projects lies in the technical arena. The layer is detached from the three earlier to make it easier for companies to apply to non-software projects. This does not mean that the layer is only applicable to software projects, only that it can be more useful in such projects. Highsmith points out that "in implementing agile methods in a wide variety of organzations, transforming technical practices are critical" (2009:23). The Agile Enterprise Framework can also be helpful in finding a place and time for agile practices in a growing organisation.

2.2.3   The phases of APM – Agile Delivery Framework

Carrying out an agile project requires processes, but they are different from the 5 project process groups in the PMBOK Guide. Highsmith has created a framework to fulfil this purpose, and they are shown in Figure below.

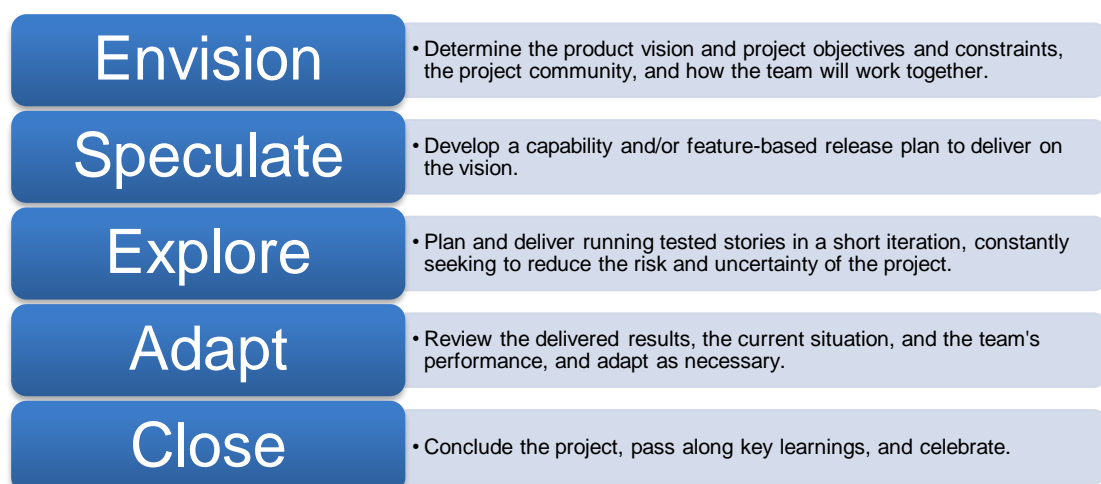| Envision | • Determine the product vision and project objectives and constraints, the project community, and how the team will work together. |
Speculate	• Develop a capability and/or feature-based release plan to deliver on the vision.
Explore	• Plan and deliver running tested stories in a short iteration, constantly seeking to reduce the risk and uncertainty of the project.
Adapt	• Review the delivered results, the current situation, and the team's performance, and adapt as necessary.
Close	• Conclude the project, pass along key learnings, and celebrate.

Figure 5. Five phases of APM, Highsmith, 2009:82

When put side-by-side with PMBOK Guide's processes, and differences can be seen instantly. While PMBOK Guide's process elements provide a straightforward approach to a project, the APM phases offer a framework which is true to the Manifesto, without losing the effectiveness of having a clear set of processes. "Process, per se, doesn't have to be negative, but it must be tied to business objectives" (Highsmith, 2009, 80).

2.2.4   APM in PM-2

A connection between APM and PM-2 (Project Management second order) is explained in an article by Manfred Saynisch in the Project Management Journal. The article defines a project as a "strongly goal-oriented system" (Saynisch, 2010). This systemic structure of PM is divided in Cybernetic Cycles which in the article are called "Worlds". The article explains the first and second-order cybernetic cycles (first used by Heinz von Foerster in 1979) as being the centre of governing the project-product process. "The first cycle (named *World 1)* represents the traditional management approach" (Saynisch, 2010). *World 2*, then, represents the vast extension of the traditional approach to the management of complexity.

The two worlds are accompanied by a third and fourth world, but these worlds do not control the project-product directly, as their characters are more infrastructural and logistical. How these worlds interact is explained in Figure 4 below.
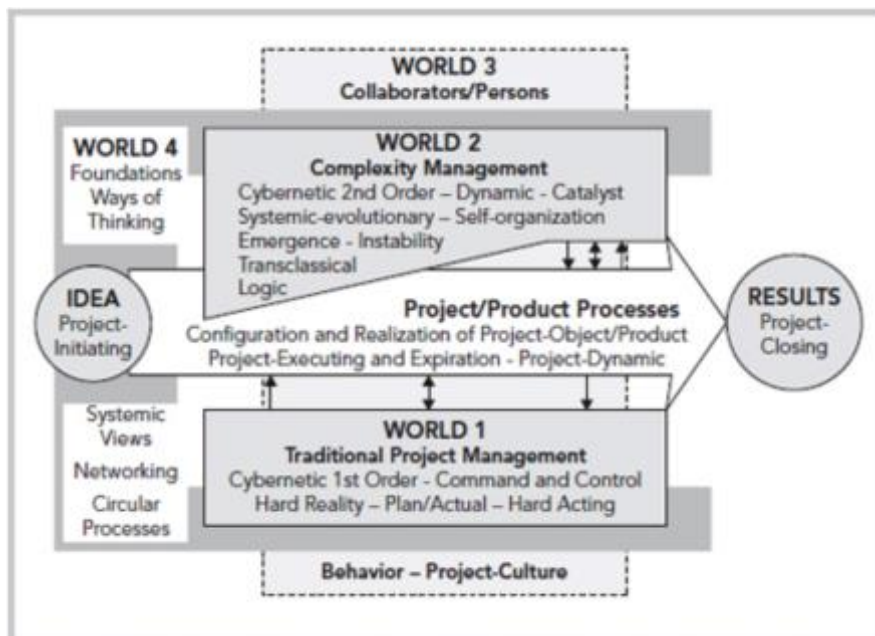

Figure 6. The systemic architecture and process model of PM-2 (Saynisch, 1997, 2002, 2004, 2005b, 2005c)

APM, as described in the article, "corresponds to the principles of PM-2, a precise cooperation of World 1 and World 2" (Saynisch, 2010). Therefore, APM addresses both cycles: World 1, the traditional approach to PM, and World 2 the universe of the management of complexity, as it values communication, observation and perception of project dynamics. However, it also relies on the standards of PM, such as the PMBOK Guide, ICB-3 of IPMA (2006) and ISO 10006:2003, about which most (nearly 75%, according to Saynisch) of PM literature has been written.

2.2.5 Comparing Agile and Waterfall

Kevin Thompson (2013) describes the key differences between Agile and Plan-Driven (Waterfall) software development strategies in the following manner:

Table 1.   Comparison of software development processes (How Agile should your Project be?, Thompson, 2013)

Plan-Driven Process	Agile Process
Predictive	Adaptive
Fixed scope	Fixed schedule
Adjust schedule to preserve scope	Adjustable scope to preserve schedule
Long development cycle	Short development cycle (e.g., 2-4 weeks)
Linear	Cyclic
Organises work into major phases	Organises work into small deliverables
Delivers value at project completion	Delivers value incrementally over time

While the differences are clear, it is not clear how each of them will affect the performance of the project. With help of a thought experiment, Thompson concludes that an agile project is more likely to deliver some value when uncertainty is high because it is better prepared for such environment. Thompson however adds that short iterations could potentially create more costs. Therefore, he states that each project's characteristics need to be understood, including the level of uncertainty. When everything in the project would go according to plan, a plan-driven strategy might be more suitable (Thompson, 2013:15).

2.3   Change Management and Growth

The first Change Management model did not emerge until the 1950s, when Kurt Lewin introduced his 3-staged Change Management Model of unfreezing, transitioning, and freezing. The unfreezing phase is created to identify different forces that maintain current behaviour and reducing/dismantling them to make place for new behaviour. The importance of the first stage was highlighted by E.H. Schein (1996:27):

> "The key [for Lewin's basic change model] was to see that human change, whether at the individual or group level, was a profound psychological dynamic process that involved painful unlearning without loss of ego identity and difficult relearning as one cognitively attempted to restructure one's thoughts, perceptions, feelings, and attitudes"

(Schein, 1996).

He argued that in addition to disconfirming the validity of current status quo and inducing survival anxiety, psychological safety was key in having actual change take place.

The most vital part in change management "becomes the ability to balance the amount of threat produced by disconfirming data with enough psychological safety to allow the change target to accept the information, feel the survival anxiety, and become motivated to change". With clear communication, employees will understand the need for change, work better towards it and the "unlearning" of old habits will be easier. The second stage is where the actual change takes place. It is where new methods are applied, new behaviours learnt, and new structures are created. The third stage, Refreezing, reinforces the organisational changes and makes them part of the organisation's normal procedures.

In 1978, McKinsey's Robert H. Waterman, Jr., Julien Philips and Tom Peters created a model which would later be known as the "McKinsey 7S Framework". The 7S elements (Strategy, Structure, Style, Staff, Skills, Systems, and Shared Values) are all connected to each other, meaning a change in one of them would require a change in the remaining six as well, similarly to the 4 constraints to a project in PMBOK.
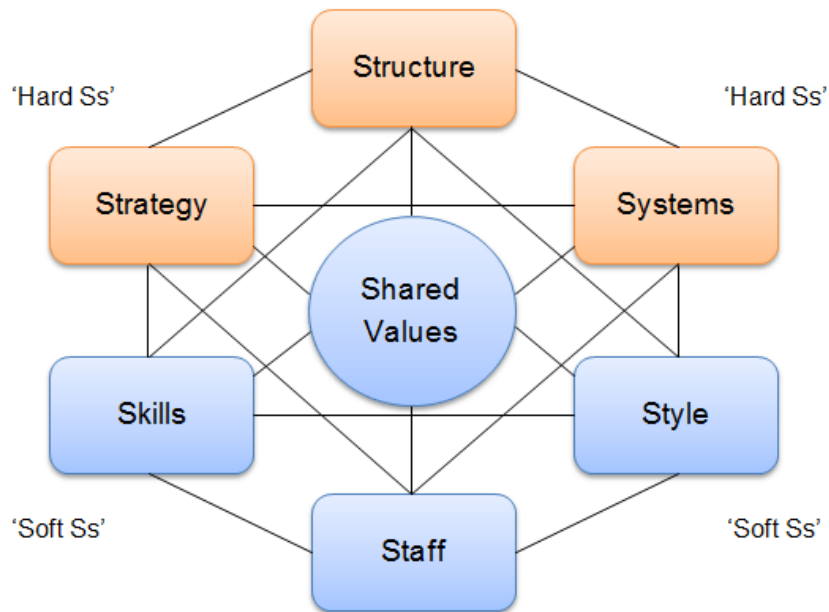
Figure 7. The 7s factors of the McKinsey model, Jurevicius, 2013

The "Hard S's" are the elements that are easier to identify and manage, whereas the softer elements are the foundation of the organisation and more likely to create a sustainable competitive advantage. The framework is used for various organisational operations, and it can be valuable when organisational design, and changing the design, is at question (Jurevicius, 2013).

John Kotter published his 8-Step Process in a piece called Leading Change in Harvard Business Review 1995. The steps are:

1. Establishing a sense of urgency
2. Forming a powerful guiding coalition
3. Creating a vision
4. Communicating the vision
5. Empowering others to act on the vision
6. Planning for and creating short-term wins
7. Consolidating improvements and producing still more change
8. Institutionalising new approaches

(Kotter, 1995)

These 8 steps provide valuable guidance in implementing change, and how the change can become a permanent structure in the company. The first two steps help employees understand why change is needed, the steps from three to seven are when the change is undertaken in the organisation, and the last step is to help the change to become the new "normal".

2.4   Organisational growth

"Growth is the development of incremental new business that provides sustainable improvements in company returns over time and supports the company in achieving a long-term positioning to deliver sector leading shareholder value consistently over time" (Lester, 2009:20)

Most common ways for companies to achieve organisational growth are Joint Ventures, licensing, optimising the existing product portfolio, entering new markets, gain outside financing, or developing new products. Growth can be measured in a variety of factors, one of which is comparing year-over-year top line revenues (Kato, 2016). Other factors, such as number of employees, market share or expansion in terms of opening new factories or sales outlets, can also indicate growth, but they do very little in terms of telling about the current financial status.

Larry E. Greiner (1972) defined the five phases of organisational growth as follows:
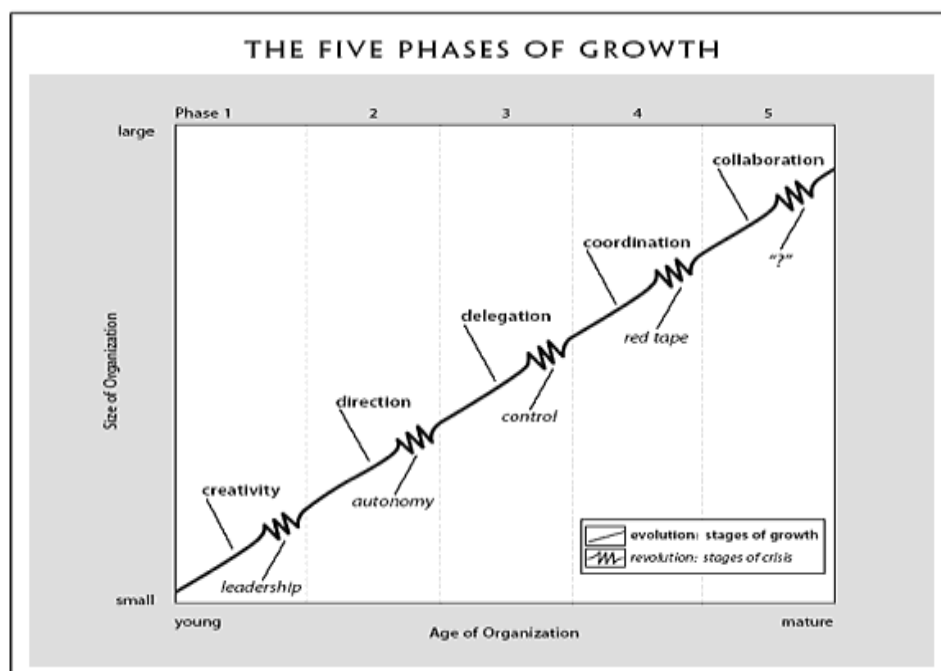
Figure 8. The five phases of growth, Greiner, 1972

The figure shows that an organisation goes through many stages before reaching maturity, with each "revolution" followed by further "evolution" and moving forward. Managing this growth is dependent on the company's ability to detect points of change. It is also vital for the company to be prepared to dismantle current structures in these situations.

ORGANIZATIONAL PRACTICES IN THE FIVE PHASES OF GROWTH

CATEGORY	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5
Management Focus	Make and sell	Efficiency of operations	Expansion of market	Consolidation of organization	Problem solving and innovation
Organizational Structure	Informal	Centralized and functional	Decentralized and geographical	Line staff and product groups	Matrix of teams
Top-Management Style	Individualistic and entrepreneurial	Directive	Delegative	Watchdog	Participative
Control System	Market results	Standards and cost centers	Reports and profit centers	Plans and invest-ment centers	Mutual goal setting
Management Reward Emphasis	Ownership	Salary and merit increases	Individual bonus	Profit sharing and stock options	Team bonus

Figure 9. Organisational practices in the tive phases of growth, Greiner, 1972

Figure 7 shows how the organisation changes in all phases of growth, and how all stakeholders change their roles and practices accordingly.

2.5   Summary

The literature review has acknowledged many theories which are relevant for this research. As the subject is concerned with project management, most of the literature has highlighted the general practices and analytical models relating the project management, but an understanding in change and growth management is also needed. The literature review also introduces the most popular aspects concerning APM.

However, to keep the research scope narrow enough, and to allocate resources effectively, the literature review does not cover the theories in too much detail. The end analysis was not affected by the pragmatic approach to the literature review, as the overall emphasis of the thesis is to help the reader understand the phenomena of growth and APM.

3   Research Methodology

Methodology is the way in which the researcher chooses to deal with a specific research question (which may consequently result in a problem definition) and how the research is then conducted (Jonker 2010:17). In this chapter, the author will present the methodology of my research, while also explaining the reasoning behind the choice for gathering, processing, and analysing information.

While there are many types of research, there are two basic approaches to research, the quantitative approach and the qualitative approach (Kothari 2004:5). According to Carrie Williams of Grand Canyon University (2007), a third approach would be a combination of the two, a mixed methods approach.
Based on this assessment, the researcher then selects one of the three approaches to conduct research (p.69).

Data collection is an important part of the research process, and there are two types of data to be collected: Primary data and secondary data. Primary data is collected solely for the research, and it is gathered for the first time. Therefore, primary data allows the researcher to collect data that is very specific to the research problem. However, primary data can be difficult to obtain. Collecting primary data can take a long time, and finding the right target group to gather information from can potentially hinder the completion of the research. It is also not always necessary, and while primary data is collected in the researcher's terms (therefore easy to analyse if constructed well), it can lead to wasting more resources than it gives.

Secondary data are the data which have already been collected by someone else and which have already been passed through the statistical process of handling the questions and answers to suit the research at hand (Kothari 2004:95). The disadvantages of secondary data mostly relate to the fact that the data is collected originally for another purpose. Hence, the material requires careful evaluation to determine if it can be used for new research. The researcher has no control over the collected data, and obtaining additional information related to the original research is difficult. Secondary data is, however, easy to collect, and it is usually found faster and more easily than primary data. As my thesis subject as a theory is so new, the irrelevance of old data available will not be an issue.

3.1   Secondary data gathering

The author deemed gathering primary data for this thesis unnecessary because the research was possible to conduct better with secondary data. Survey results provided by companies with contacts to thousands of professionals from different continents were helpful, and due to the nature of the thesis subject, a case project involving a specific company was not considered as useful. Especially, as each company has their unique way of implementing Agile, it is difficult to use results provided by one organisation to describe the broader situation in the market. Primary data would have been time-consuming and resource-heavy to collect. Additionally, collecting primary data could have widened the thesis topic in a way that would have resulted in a less focused analysis and conclusion.

Because the thesis statement handles a subject that cannot be expressed in quantity, as much as it can be expressed in quality or kind (Kothari 2004:1-2), the author will use a qualitative research methodology in collecting and analysing data. This is done by conducting a content analysis study, which Leedy and Ormrod (2001) define as "a detailed and systematic examination of the contents of a particular body of materials for the purpose of identifying patterns, themes, or biases" (p.155).

3.2   Data Analysis

The secondary data analysis was started by finding trustworthy sources with reliable information. Reliability is described by C. Robson (2002) as "consistency or stability of a measure". With consistency, one would, if research were to be repeated, obtain the same result (Koshy, 2010:98). As the research subject covers a very current project management theory, the internet is filled with surveys and blog entries about. Much of this information is however poorly referenced, and so the source of the information is hard to define. This rendered some articles useless for academic purposes. The qualified information was then categorised by their characteristics, such as publication medium, time of publication, and scope. Publication medium is important in determining if the publication is trustworthy and acclaimed. The time of publication assures the information provided can be used to describe or support an argument about a certain point in time. The scope of the data helps to determine the extent to which the results apply.

A survey that reaches only a handful of small companies in one country cannot be assumed to give similar results when conducted in many countries for variably sized companies.

3.3   Research question

The research for this paper is conducted to expand the knowledge of the author on the subject. However, the as the main thesis question is unique, in that it has not been fully researched, the objective of the thesis is also gathering the information available today and linking the data together to form a conclusion that has not been formed before. The thesis aims to analyse and answer the following question:

Can the application of Agile methods lead organisational change in a company?

The question clearly introduces the subject while still being interesting. The base question is supported by two other questions, to which an answer is provided in the conclusion part of the thesis.

The other questions are:

What consequences can Agile have on project management processes, and could the organisation boost their growth with Agile PM?

4   Introduction to current state of APM

This chapter will describe the use of APM in organisations, and how it can affect organisations growth prospects.

4.1   Flexible Project Management – a PMI article review

As previously stated, Agile techniques are most commonly used in software companies, but some parts of Agile can be used in non-software companies. Project Management Institute's Preston G. Smith and Jeff Oltmann (2010) argued that the projects in non-software projects share many of the same challenges that Agile has resolved for software projects:

- Turbulent environments in which changes inevitably happen at the most unwelcome time
- Unstable requirements that are never complete
- Customers who don't know what they want until they see it
- Technology that moves faster than the project can react
- Nimble competitors who put the project manager in a continual catch-up mode

(Smith, P. G., Oltmann, J., 2010)

The authors provide a set of tools which are meant to help organisations' non-software projects become more flexible. An environment for flexibility on an organisational level has to be created first. This applies to having the right people in the right place, and even very literally having the teams in the same space to make decisions faster and more efficiently. Flexibility is also not universal to be applied everywhere in the company in the same manner; it can be applied selectively to deal with uncertainty or any anticipated changes in a certain part of the project (Smith, Oltmann 2010).
The authors also argue that flexibility works best when changes in projects are frequent, and that critical decision-making points should be kept open for as long as possible to accommodate changes even very late into the project.

The flexible techniques introduced in the article are as follows:
- Accommodate unstable product requirements

- Plan the project expecting change
- Manage project risk continually

(Smith, P.G., Oltmann, J., 2010)

Contrary to popular product development theories and textbooks, creating a fixed product requirement never holds, according to research (Smith, 2007:32). Accommodating unstable product requirements from the beginning allows the project manager to be better prepared for changes when they eventually happen. This can generally be done in two ways; either specifying the product at a higher level, thus less subject to change, or to keep in touch with customers and users throughout the development to create an early warning system. Designing a product at a higher level means the product details are not specified in the beginning, as they are likely to change in the early stages. Instead, the product should be defined by how it will be used or the kinds of people using it. Keeping in touch with the customers and users allows the company to solve issues more effectively and with a more comprehensive understanding of the problem and how to avoid similar issues going forward. This is also stated as one of the four core Agile values, which holds customer collaboration over contract negotiation.

Planning for projects with an expectation for change, the article covers two methods: rolling wave planning and loose-tight planning. Rolling wave planning is described in the PMBOK Guide (p. 152) as "an iterative planning technique in which the work to be accomplished in the near term is planned in detail, while the work in the future is planned at a higher level". This means the activities are defined at a very late stage, and it is important to acknowledge the duration differences between activities to keep the project moving according to schedule. The article also notes that nevertheless, the method can be challenging to integrate into the company culture.

Loose-tight planning is an approach which imitates the iterative cycles of agile software development. The project is carried out in short iterations (often called sprints) which are one to six weeks in length. Activities are only planned for the current iteration, at the beginning of the cycle. After an iteration is carried out with a tight schedule, the future iterations are replanned during a loose period, complete with new information to help prioritise the activities of the coming iterations.

Continually managing project risk is vital, as new risks can emerge during the project as well. Smith and Oltmann state that while a procedural approach to risk management (first identifying the risks, then analysing and comparing them, prioritising and eventually take action against the most serious ones and monitor the progress against risk resolution plans) is most effective when the project plan is stable, it does not work when the project plan is in flux (Smith, Oltmann, 2010). Therefore, if flexible project management techniques are applied, the need for a more continuous risk management grows.

The article specifies that an intrinsic approach to risk management helps in a turbulent environment. This means everything the project manager does is to manage the project's risks. Communication is key, as the team needs to be up-to-date with any shifts in resources and optimally obstacles can be foreseen before they affect the project. Applying a flexible approach in this sense does not mean that the procedural approach should be removed completely, but instead, the balance would shift toward the intrinsic approach (Smith, Oltmann, 2010).

4.2   APM Surveys

Since APM has its roots in software development, the most comprehensive surveys about Agile have been conducted for software companies. VersionOne has conducted surveys for companies for over ten years. The *State of Agile* reports created from these survey results are a very useful tool in determining the current usage of agile practices in companies from all around the globe, especially because the results have been gathered for more than half the time APM has existed in total. The surveys are also mentioned in the Jim Highsmith book *Agile Project Management*, which gives more authority to the survey results.

VersionOne has conducted these surveys to highlight the value teams deliver from Agile development. The respondents have been employees of small, mid-sized, and large corporations, from all over the world and from different industries, such as software, healthcare, automotive, financial services, and government.

Since 2007, the surveys have stated the total number of respondents almost every year, only leaving it out from the latest report from April 2017. For the first ten reports, the mean respondent count is 3422 (rounded to the nearest even number), for the latest report. The questions and answers in the survey have varied over the years, but some core questions have remained the same for every year.

The answers to these questions were represented by percentages for each year, except for the report from 2009, which did not have any percentages for the core questions. This can only be assumed as being accidental, as the report from the next year followed the 2009 report's design elements and only added percentages with the updated information. An order of most popular answers was however included in a similar manner in the report from 2009 as it was in the other ten. This enabled the research to be conducted with less uncertainty, and the absence of percentages did not affect the author's ability to reach conclusions about the surveys.

The survey questions address the diversified methodologies inside agile and which of them were in use in the companies surveyed. As this information was not necessary for this thesis, the author concentrated more on the reasons behind choosing agile; Why companies chose agile and in what way they were looking to benefit from adopting it. The surveys also give an understanding about the various reasons why agile might be difficult to scale fully into an organisation. The most important results from the surveys can be seen in the charts provided as appendices 1-3.

Additionally, *Pulse of the Profession* reports by Project Management Institute (PMI) were chosen as part of the research, as they shared many of the characteristics (scope, the amount of respondents, relation to the research questions) of the VersionOne surveys, but also helped in connecting organisational agility to growth and change management. The survey has compiled yearly from over a thousand professionals globally from various experience levels and industries.

The PMI reports have been conducted annually since 2006, and while VersionOne's survey key questions remained the same, *Pulse of the Profession* reports have changing points of emphasis for each year, meaning comparing year-on-year development for a given factor could not be carried out. However, they are valuable in finding links between Agile approaches and change management.

4.3   Key findings

The chart in Appendix 1 shows the two most popular reasons companies chose to switch to agile. The most popular reason for respondents' organisations was the enhanced ability to manage changing priorities. A company can change its priorities e.g. to reposition itself on the market or to pursue a certain business opportunity, but it can also be a consequence of organisational change.
Both ways relate strongly to change management. The second most popular reason according to the survey was the accelerated time to market.

In some reports, this answer was formed differently to "accelerated product delivery", which essentially means the same. Both are referring to acceleration in speed-to-market (STM), i.e. bringing new products on the market faster. As customers' demands and technologies change ever faster, STM has become the latest key for companies to achieve competitive advantage (Chen, Reilly and Lynn, 2005). The three most popular answers were the same almost each year, with "increased productivity" placing third nearly each year.

Appendix 2 described the real benefits which the teams noticed after adopting agile. For the first three years, the reports showed the answers as "actually realised" improvement, and the results were then asked to be described with over 10% increase and over 20% increase for a given factor. For these years, the respondents noticed the largest "actually realised" improvement of over 10% with increased productivity. The second largest improvement was detected with reduced software defects and third with accelerated time to market. Within the first three years, almost 89% of respondents reported over 10% increase in increased productivity, whereas an improvement for the second and third factors were reported to have been improved for 85% and 84% of respondents, respectively.

From 2009 onwards, the question removed the classification of "over 10% increase" and "over 20% increase" and reformed the options to be a more vague depiction of "got better", "no benefit", and "got worse". For the chart, only the "got better" percentage was taken into consideration. The largest benefit for companies was seen with the "enhanced ability to manage changing priorities" each year. On average, the ability had gotten better with 88% of respondents. The second most improved aspect was increased productivity and "improved project visibility" was third.

The third Appendix lists the answers for the question regarding the barriers of implementing agile further in the company. The results indicate that the largest concerns for adopting agile further in the organisation are the ability to change organisational culture in such a way that agile methods can be applied, as well as general resistance towards change. These two factors were the two largest reasons in five years of the 11 yearly reports. Other barriers included "finding the right personnel with the right experience" and "---". While there is variance in the order the three barriers ranked in, the barriers themselves do not often change, as seen in the previous questions. Some of this can be explained by the limited amount of available options to choose from, but the results are still very consistent.

Other interesting results included the annual growth of agile experience in companies. Where in 2008, only 34% of respondents answered that they worked in organisations with over two years of experience from agile methods, the number climbed steadily (whenever the percentage was available), and by 2013, the percentage of companies with over two years' experience was 71. Due to a change in the options the question has had for the last three years, the specific percentage for the same scope is difficult to define, but the percentage of companies with over five years' experience from agile grew from 19% in 2013 to 28% in 2016. In an interview with InfoQ in 2014[3], Robert Holler, the CEO of VersionOne, stated that this growth points directly to maturity of the approach in organisations.

Other indications of increasing use of Agile have been the results from PMI's *Pulse of the Profession* project management surveys conducted since 2006. The report from 2012 is especially important regarding the research questions.
The report emphasises that change management and project risk management will become even more important core competencies when companies continue to pursue agility in order to leverage fluctuating market conditions (PMI 2012).

According to the survey, change management and risk management techniques are often used to manage projects, and this leads to higher success rates with over 70% of respondents. Striving for organisational agility will also lead to increased use of iterative/incremental project management methods such as Agile and extreme.

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[3] Interview with VersionOne CEO Robert Holler
http://tracks.roojoom.com/r/25535#/trek?page=3

For instance, respondents reported frequent use of Agile in 2010's organisations to be 24%, whereas the number has grown to 40% for 2017's report. In 2017, 71% of organisations reported that they use agile approaches in their projects sometimes or more frequently than in the past.

The 2015 report also connects the organisational agility to results from a survey conducted at the Massachusetts Institute of Technology (2006), which suggests that agile organisations can grow revenue 37 percent faster and generate 30 percent higher profits than non-agile companies (PMI 2015:17). Therefore, a conclusion can be drawn that applying agile methods have some effect on companies' growth opportunities. The 2012 *Pulse of the Profession* report on Organisational Agility also states that organisations effective at change management are more agile (PMI 2012). The respondents (1,239 in total) described the following practices and characteristics to relate to organisational agility in order of popularity:

- Quick response to strategic opportunities
- Shorter decision/production/review cycles
- Focus on change management
- Integrating voice of the customer
- Focus on risk management
- Interdisciplinary project teams
- Elimination of organisation silos
- Contingency planning
- Use of iterative project management practices
- Leveraging technology

(PMI 2012:3)

The 2012 report states that successful organisations are aggressively reshaping their culture and business practices in three areas: Change management, risk management, as well as standardised project, program and portfolio practices (PMI 2012:2). Organisational agility is also stated as a core differentiator in today's rapidly changing business environment in a report by the Economist Intelligence Unit, which compiled survey results from 349 executives around the world in 2009 (Economist Intelligence Unit Limited, 2009). Organisational agility is, therefore, an admirable capability in companies today, and it shares many linkages to APM can be found easily.

In the list above, quick responses are highly valued in APM, as well as shorter cycles, integrating voice of the customer, interdisciplinary project teams, elimination of organisation silos, contingency planning, and leveraging technology. Use of iterative PM practices is the definite use of agile, and is in this regard self-explanatory.

4.3.1 Agile's relation Project Process Groups

As stated before, the PMBOK Guide does not dictate towards a certain approach to project management. This is because projects are highly dependent on how they are carried out, and how these approaches are used in practice. The 4 Project Process Groups (Initiating, Planning, Executing, Monitoring&Controlling, and Closing) are all part of Agile projects, but they are completed in a different way.

Agile projects are completed in iterations, meaning each iteration can be viewed as a project itself, as it has a beginning and an end, and according to PMBOK (2013), activities from all Project Management Process Groups are performed in each iteration (p.45). However, as Michele Sliger (2008) of PMI argues, the iterations of agile projects are more properly referred to as phases or subphases in a project (Sliger, 2008). The iterative nature of agile projects is "perfectly" defined as "progressive elaboration" in PMBOK (p. 6). As agile project iterations are always about improving on what has already been completed, while still retaining the overall project objective, a comparison to progressive elaboration is understandable. The definition of progressive elaboration by PMBOK (2013) is seen below:

> "Progressive elaboration involves continuously improving and detailing a plan as more detailed and specific information and more accurate estimates become available. Progressive elaboration allows a project management team to define work and manage it to a greater level of detail as the project evolves."

(PMBOK 2013, p. 6)

Sliger maps the agile project life cycle to the project management life cycle provided by PMBOK Guide and this way shows that agile projects still follow the project life cycle and processes outlined in the book. The application of agile projects' iterations into a project life cycle creates a fractal. In the fractal, each release opens up a separate release including iterations, which subsequently comprise of smaller processes. The fractal is shown below:
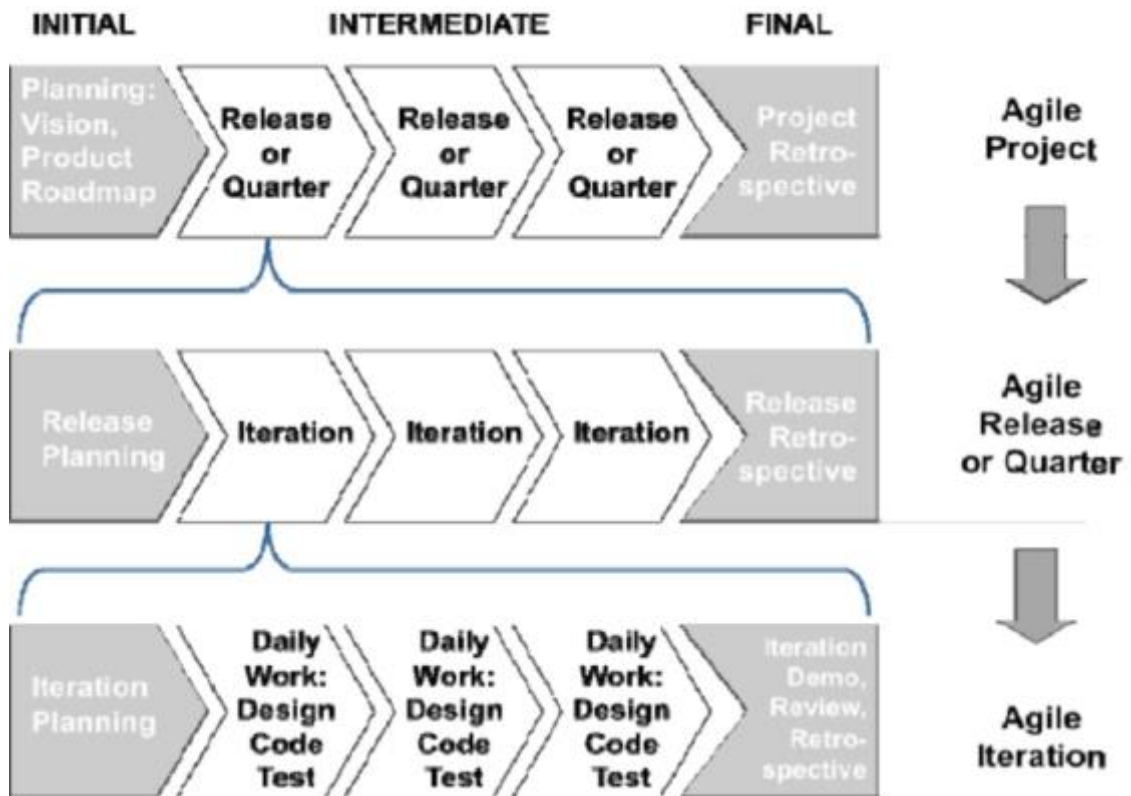
Figure 10.   The Agile Fractal, Sliger 2008

The Project Process Groups can be mapped in the agile fractal as follows:

Agile Fractal	Project Management Process Groups				
	Initiation	Planning	Executing	Monitoring & Controlling	Closing
Project	Business case or feasibility study	Project kickoff and visioning meeting Release roadmap planning	Iterative and incremental delivery of working software	Regular reviews of deliverables, progress, and process	Project retrospective
Release	Roadmap and release definition	Release planning meeting	Iterative and incremental delivery of working software	Regular reviews of deliverables, progress, and process	Release retrospective
Iteration	Iteration planning meeting	Iteration planning meeting	Work features through to completion (includes testing)	Task boards, burndown charts, daily stand-ups, acceptance of completed features	Iteration demo, review, and retrospective

Figure 11.   Process Groups in the Agile Fractal, Sliger 2008

The figure showcases the different activities that can take place inside each part of the agile fractal, but it does not describe the involvement of the ten knowledge areas of

project management. One substantial difference, according to Sliger, is the influence of stakeholders in a project. Agile projects, as previously stated, are generally carried out with short feedback loops with customers, i.e. stakeholders (Sliger, 2008). The third edition of PMBOK Guide (used by Sliger for the article) took the view that stakeholder influence is, in fact, stronger in the beginning and decreases as the project moves on. However, the newer edition of the PMBOK Guide used for this thesis addresses adaptive life cycles' requirements to keep the stakeholder involvement and influence high throughout the run of the project (PMBOK 2013, 40).

The article by Sliger also ignores the APM Delivery Framework previously introduced by Jim Highsmith (Envision, Speculate, Explore, Adapt, and Close). These are two different ways to approach the traditional project management process groups; other integrates agile practices to the existing groups, whereas the other creates completely new groups. The agile fractal and process groups within are, however, explained in more detail, and therefore it could be used more easily.

5   Conclusions

The objective of this thesis was to analyse Agile Project Management, an iterative approach to project management, and its ability to lead change in an organisation. The two interdependent questions set a hypothesis for APM's applications to boost organisational growth and the changes it may have on general Project Management Process Groups.

The analysis was conducted using secondary data, i.e. already collected data, which proved to be useful, as it supported the research with data compiling responses from all over the world, thus helping the author form an understanding about the collective state of APM. Also, a review of an article by two Agile Alliance members about flexible project management helped understand APM, as the two PM approaches share common values, such as being prepared for change and strong management of changing requirements.

A company's ability to change is crucial in today's business environment, as competition is often more global than before, and project management requirement for businesses are increasing. Using the information gathered from secondary data, research has concluded that applying APM methods in a company can help change the organisation. Change is encouraged in APM, and changing an organisation can happen faster using agile methods than a more conservative method, such as Waterfall. Change, however, is a sum of many different factors that will ultimately each affect how a wanted change is being carried out. Different change management techniques are needed to implement change, but there is indication that APM can indeed help create a favourable environment for change to take place in.

It was noted that according to research, an increase of organisational agility leads to increases in profitability and faster revenue generation. As APM methods increase organisational agility, it can be concluded that applying APM in organisations can increase profits and generate revenue faster. However, these results were gathered from one survey. Therefore, further research is required before a distinctive trend in the field of project management can be clearly perceived.

The use of agile methods is on the rise, not only in software projects but non-software projects as well.

The gap between agile methods and traditional project management methods has decreased, as the use of mixed project management methods has grown in popularity. By using mixed methods, a company can benefit something from agile, while still retaining some old structures and procedures that have existed before.

The most popular reasons for companies to implement agile are very clear, as they for years have remained essentially unchanged.

The ability to react to changing priorities and a faster time to market are what most companies look for when they choose an agile approach. The most reported, actual, improvements companies have noticed after implementing agile were the abilities looked for when originally choosing agile, as well as increased productivity and decreased number of software defects. Many companies have been satisfied with agile, as many of them have stayed using agile approaches in their project management, shown by the increased amount of companies with a long experience with agile.

However, some barriers for adopting agile further still exist. The ability to change organisational culture and general resistance towards change were reported to be the largest barriers for using agile elsewhere in the company. The reasons behind these hindrances are unknown, but applying stronger change management, using known change management methods, could prove to be useful when trying to change the organisation's project management approach.

Furthermore, the effect of agile to traditional project management elements, such as the project management process groups, was analysed. As projects are completed in an iterative manner, the nature processes may change, as displayed by the Agile Fractal. Each iteration is a project – initiating, planning, executing, monitoring, and controlling – a certain deliverable, and this deliverable is developed further by the next iteration. The iterations are usually completed within four weeks, and this allows the team to be prepared for changing requirements by the customer or other stakeholders, as stakeholder involvement and customer feedback are gathered on a more frequent basis.

APM can be carried out in various ways, and while the basic principles of project management processes and the practices applied in them can be fairly easily perceived, using them in a project depends on the objectives and other specifications of the project.

This needs to be kept in mind when evaluating the application of these conclusions any further. The author's aim of this research was to gain knowledge about the research subjects, and to collect existing data to support the statement. While the thesis may help in forming an understanding of the subjects, applying the discussed methods in a project requires more thorough research and analysis. However, the thesis has created a foundation of subject-related knowledge. The author believes that the foundation is useful in any future discussion about the necessity of APM.

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VersionOne survey results

Year	Top 1 reason for switching to agile	Second largest reason for switching to agile
2006	Enhanced ability to manage changing priorities (89%)	Increased productivity (81%)
2007	Enhanced ability to manage changing priorities (30%)	Accelerated time to market (24%)
2008	Accelerated time to market (22%)	Enhanced ability to manage changing priorities (21%)
2009	Accelerated time to market	Enhanced ability to manage changing priorities
2010	Enhanced ability to manage changing priorities (72%)	Accelerated time to market (78%)
2011	Enhanced ability to manage changing priorities (81%)	Accelerated time to market (77%)
2012	Enhanced ability to manage changing priorities (78%)	Accelerated time to market (73%)
2013	Enhanced ability to manage changing priorities (81%)	Accelerated time to market (75%)
2014	Accelerated time to market (59%)	Enhanced ability to manage changing priorities (56%)
2015	Accelerated time to market (62%)	Enhanced ability to manage changing priorities (56%)
2016	Accelerated time to market (69%)	Enhanced ability to manage changing priorities (61%)

VersionOne survey results – Largest actually realised improvements after adopting agile

Year	Largest improvement after adopting agile	Second largest improvement after adopting agile	Third largest improvement after ad
2006*	Accelerated time to market (86%)	Increased productivity (87%)	Reduced software defects (86%)
2007*	Increased productivity (90%)	Reduced software defects (85%)	Accelerated time to market (83%)
2008*	Increased productivity (89%)	Reduced software defects (84%)	Accelerated time to market (83%)
2009	Enhanced ability to manage changing priorities	Improved project visibility	Improved Alignment between IT and objectives
2010	Enhanced ability to manage changing priorities (87%)	Improved project visibility (78%)	Improved Alignment between IT and objectives (68%)
2011	Enhanced ability to manage changing priorities (84%)	Improved project visibility (77%)	Increased productivity (75%)
2012	Enhanced ability to manage changing priorities (90%)	Increased productivity (85%)	Improved project visibility (84%)
2013	Enhanced ability to manage changing priorities (92%)	Increased productivity (87%)	Improved project visibility (86%)
2014	Enhanced ability to manage changing priorities (87%)	Increased productivity (84%)	Improved project visibility (82%)
2015	Enhanced ability to manage changing priorities (87%)	Increased productivity (85%)	Improved project visibility (84%)
2016	Enhanced ability to manage changing priorities (88%)	Improved project visibility (83%)	Increased productivity (83%)

VersionOne survey results – Largest barriers for companies to further adopt agile

Year	Largest barrier	Second-largest barrier
2006	Finding personnel with the right experience (21%)	General resistance towards change (20%)
2007	General resistance towards change (36%)	Finding personnel with the right experience (34%)
2008	Ability to change organisational culture (45%)	General resistance towards change (44%)
2009	Management opposed to change	Lack of up-front planning
2010	Ability to change organisational culture (51%)	General resistance towards change and availability of personnel with the right experience (40%)
2011	Ability to change organisational culture (52%)	Availability of personnel with the right experience (40%)
2012	Ability to change organisational culture (52%)	General resistance towards change (41%)
2013	Ability to change organisational culture (53%)	General resistance towards change (42%)
2014	Ability to change organisational culture (44%)	Availability of personnel with the right experience (35%)
2015	Ability to change organisational culture (55%)	General resistance towards change (42%)
2016	Company philosophy or culture at odds with core Agile values (63%)*	Lack of experience with agile methods (47%)*