DESIGN PROJECT MANAGEMENT
EXPLORING THE COMBINATION OF DESIGN THINKING PROCESS AND THE PHASE-ORIENTED PROJECT MANAGEMENT PRACTICE

IKENNA KARL OMEJE
ABSTRACT
The majority of companies around the world today use project management as a means to actualizing their goals. Even though this has been successful so far, recent factors such as globalization and developments in the information technology (IT) sector have created a need for a rapid, innovative and progressive approach to project management. The phase-oriented project management as recommended by the Project Management Institute (PMI) is progressive and versatile, but the effect of these factors listed above on a the changing workforce/working environments needs to be analyzed; since the overwhelming emphasis is usually on a fast-paced output system conditioned by an ever competitive environment. For example, how efficient is every project group member’s knowledge and expertise used in actualizing the most innovative outcome? In Dealing with the effects as stated above, design thinking was identified as one modern methodology that could be incorporated into the phase-oriented project management method to improve human capacity for innovative management processes.

Based on the background above, this master thesis would proffer answers to the following questions; what systems have been established over the years to mitigate the challenges of changing working environments? How do challenges in 21st century phase-oriented project management process affect working environments? How can we solve these challenges using design-thinking processes?

To answer these questions, an in-depth study of the phase-oriented project management was made; the outcome was validated by interviews with some project managers, and then analyzed in order to expose the limitations involved in this project management style. Secondly a case study of Design thinking was carried out in Openlab Stockholm, reflections from 14 participants from the program was used as data in analyzing the Design-thinking process. Together this constituted the basis for the thesis analysis.

The research showed that there are existing challenges in phase-oriented project management, problems such as: staff under utilization, lack of ownership and over dependence on the project manager, on the other hand, there were positives from design thinking such as: innovative idea generation, improved passion for project and cross functional self-organizing groups.

Finally, this report explores the combination of Design thinking process and the phase-oriented project management practices.

KEY WORDS: Phase-oriented project management, Design Thinking, Work environment Indicators, Combination.
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GLOSSARY

PMI Project management institute ........................................................................................................ 22
POV Point of View .................................................................................................................................. 33
POPM Phase-oriented project management ............................................................................................. 34, 35, 36, 38
DT Design Thinking ............................................................................................................................. 35, 36, 37, 38
1 Introduction
This chapter contains an introduction to the thesis topic. The problem description, aim of thesis, and research questions

1.1 Background:
Project management institute defined project management as the application of knowledge, skills and techniques to execute projects effectively and efficiently (Project Management Institute, 2013).

In the 1950s, the first project management methods were formulated to deal with the emerging mechanical and constructional challenges of that time, these managerial capacities dealt with topics like scheduling, cost controls, and work breakdown structures; tools such as CRM (critical path method) and PERT (program evaluation review technique) was also developed in this time for aerospace engineering and the construction sector. In the 1950’s, tools and techniques where developed to support the development of complex projects that were mainly based on a systems approach whereby the project was treated as a mechanical activity (Priemus & Bert van wee, 2013, s. 84)

Over the years lots of insight has emerged as to different factors that affect the modern workforce, these factors include but are not restricted to:

Globalization This phenomenon has dominated almost every aspect of lives in the 21th century, ranging from the way information is accessed to the mode people communicate and from the location of the clients and customers to the nature of projects that arise due to the diversification of business locations (Kossek & Lautsch, 2008). This has increased competition between organizations, as a result of that; there has been an added pressure on improved output, thereby diminishing the humanity in work places (Amabile & Kramer, 2013). The growing economic pressures of globalization have increased economic turmoil where employers have lessened the attachment to workers at all ends of the workforce (Ernst & Kalliath, 2012). The open global markets has added pressure in meeting project targets, and increased the possibility of working with collaborative virtual peers around the world with varying time zones, thus requiring a round the clock schedule, This is unobtainable as humans but organizations are expected to carry this through, that is why flexibility in project management is a widely acceptable concept; so people can work according to when it is most productive (Lake, 2013).

The increased role of the Information Technology sector in companies, the integration of wide range of people from different background, and improved human rights and greater personal freedom has made present working environments different from the 1950s, for example, The technology tools we use on a daily basis also interact with, and bring changes to the spaces where it is used, that is- the furniture, fitting and services that characterized those spaces (Lake, 2013). Also many employees work with computers and are faced with a rise in portable e-work where they can be constantly
connected to their work online in and outside the office through smart phones, laptops, and an all round global work schedules (Kossek & Lautsch, 2008). All this has made the nature of work undergo dramatic changes within the last two decades, driven by forces such as globalization and the IT revolution (Wright, 2009). This has led some jobs to become obsolete, while creating other jobs that did not exist before (Malone & Laubacker, 2011).

**Generational difference** is another factor influencing work environments nowadays; scholars have identified four different generations that exists in a typical working place; the baby boomers, generation X and generation Y (Callanan & Greenhaus, 2008) and the millennials. These generational groups deal with situations in different ways, situations such as loyalty towards employers, attitudes towards work, attitudes regarding respect and authority, and training styles/needs. (Parry, 2014).

As a result of the factors listed above, the importance of investing in a sound organization management system or project management system cannot be over emphasized. The economist’s intelligence reports stipulates “that over 80% of global executives believed that having project management as a core competence helped in their successful navigation of the recent recession”. And despite how slow a business grows, most executive still believe beyond doubt that project management is the way forward. (Project management Institute, 2011).

In dealing with the dynamic nature of projects and project management practices; there are modern methodologies that has been created over the years to improve human capacity for innovative management processes, some of these methodologies have factors therein that could improve project management endeavors; design thinking is one of such methodologies.

Why design thinking?

According to Jurgen Appelo, the past few decades has witnessed an increase in complexities in various fields of life ranging from biology to physics, little wonder why Stephen Hawkins termed it the century of complexities. Project management in its own right has gone through such changes as illustrated by the first approach to project management-the hierarchal system, where an organization is designed and managed in a top-down fashion and power is in the hands of the few (Appelo, 2010), to a system that recognizes that organizations are a networks of people with various degree of competence, temperaments and abilities. Social complexity shows us that management is primarily about people and their relationships and not about department and profits (Appelo, 2010, s. xxxv).

Design thinking processes maximize the potentials of organizational human networks by exploring recent knowledge on brain activities. We are learning new things about our brains and recognizing different cognitive modes and how they perform in different context (Jeanne & Ogilvia, 2013). According to Tim Ogilvia and Jeanne Liedtka, tools used in design thinking activities such as Post-it cards and White board as well as techniques used, are all geared to stimulating our visual and
perceptive senses in addition to improving participation and ownership (Jeanne & Ogilvia, 2013). Traditional project management processes to an extent feels theoretical and detached from most of the project group members, but design in management helps to make things feel real. Most business rhetoric today remains largely irrelevant to the people who are supposed to make things happen (Jeanne & Ogilvia, 2013). Design thinking therefore helps with having a practical and systematic approach to problem solution and project management.

1.2 Work indicators
As mentioned earlier on, there has been significant changes in workplaces from what it used to be a few decades ago to what it is presently; changes in skills, attitude and environments directly or indirectly affects project management success.

There are three variables that organizations can target at workplace interventions in order to improve how the structure and culture of work influence the healthiness of the workplace, and by extension it’s productivity. They include - Work control, Social support and Work culture (Ernst & Kalliath, 2012). These indices when addressed create the balance needed in modern workplaces.

- **Social support**: the perception of support one gets from his working environment, the degree of support, confidence and stress-free environment one gets from his colleagues and superiors, that is the extent that one feels the social support provided by his/her co-workers and supervisors (Kossek & Baltes et al, 2011). The consequences of team stress can be catastrophic if the stress creates decision-making errors and inefficiencies (Heather M & Taylor, 2012).

- **Work Culture**: Creating a positive work culture that value employers giving equal energy and performance, to work-related activities as well as personal and family life (E.E, Colquitt , & Noa, 2001). Easily adaptable workplaces that support varied work strategies, help balance an individual’s work and home life—including systems and furnishings that accommodate organizational change with minimal time, effort, and waste (Obenreder & Robert et al, 2006).

- **Work Control**: this is the degree of ownership, control and the freedom one has as to where, when and how to work, the degree to which one feels in control over when and where and how one works (karasek, 1979) (Kossek: E.E & Lautech, 2006). Flexible work arrangements (FWAs) mean greater flexibility in the place of work, the scheduling of hours worked and the amount of hours worked. Such arrangements give employees greater control over where and when work gets done and over how much time they choose to work, leading to greater opportunities for employees to be able to enjoy an optimal balance between work and life responsibilities (Society for Human Resouce Development, 2008).

Using these productive workplace indicators or themes, it would be easier to visualize a hybrid of a project management style, using some established strengths of design thinking to argument the
weaknesses of the traditional project management method. These three variables: control, social support, and culture are levers that organizations can target in workplace interventions in order to improve how the structure and culture of work influence healthiness of the workplace (Kossek, Hammer, & et al, 2012).

Note: The indicators that measures a positive work environment:

- Work control
- Job control
- Social support

1.3 Problem Description

As the nature of jobs types, projects environments and workforce evolves due to conditions listed above, it is only logical that project management methods should evolve in order to accommodate these changes. Over the years there have been systems developed by different organizations to deal with changes in the workforce, these include SIXSIGMA developed by Motorola in 1986, LEAN project management designed to reduce waste in production, and SCRUM designed for the software industries.

Having to choose between different project management methodologies that would be effective could be a daunting task especially in a multi-dimensional and innovative project, this is because different methodologies have its strength and weaknesses as related to specific projects. When selecting an appropriate one there are a few dozens of factors you should consider. Each project management methodology carries its own strengths and weaknesses. (www.tutorialspoint.com, 2014)

1.3 Aim of thesis (objective)

Most companies currently operate in project modules comprising of various individuals with varying skills and abilities, putting an emphasis on human beings could be a game changer; it is therefore imperative that the best project management method is used to enhance these varying human capabilities. The biography of Steve jobs as captured by an article “Google rules” (The New York Times, 2011) described how human relation management is one of the most important assets Google has for it’s success, where team building and motivation is key.

Employees are a company's greatest assets - they're your competitive advantage. You want to attract and retain the best; provide them with encouragement, stimulus, and make them feel that they are an integral part of the company's mission. (Mulcahy, Anne M., 2014).

The aim of this thesis is to develop a conceptual project management model that would combine the creative, personal and freedom –like approach of design thinking and the functional, structured and purposeful approach of a phase-oriented project management method. However, in the cause of this

1 Search word, project management methods, project methodologies, types of project management methodologies
thesis the final concept would not be tested. Getting the best from a project management method should depend on maximizing the potentials of individuals in a project team, that means seeing these individuals first as human beings as opposed to employees.

1.4 Research Question
The main research question aims at answering how we can cope with current phase–oriented project management challenges using design-thinking processes, making it more adaptable for innovative working environments. Exploring the research question above, it is therefore pertinent to answer the following sub questions:

1. What systems have been established over the years to mitigate the challenges of changing working environments?
2. How do challenges in 21st century phase-oriented project management process affect work environment?
3. How can we solve current project management challenges using design-thinking processes?

The questions above show a wide area of interest, this thesis therefore would be divided into 2 parts:

In chapter 3 and 4, the author aims to have a theoretical background on some project management systems that has been developed over the years to maximize production efficiency in changing working environments, this aims to give an insight on the feasibility of developing and combining project management systems. Secondly, the author aims to understand the challenges posed to phase oriented project management method in the 21th century through gaining a different insight/perspective on a project process- a case study “Attracting companies to Farsta” a project carried out under the auspices of Openlab and Stockholm business region using design-thinking activities as well as analyzing data (interviews and studies) on current project management methods.

Part 2: The author aims to develop a concept solution to the limitations deduced from the project above. The solutions from this thesis project would not be designed to alter the structure of design thinking and the phase-oriented project management method but rather to proffer add-ons in other to maximize the efficacy of the project management method.

1.5 Limitation
In this project, emphasis would be on the initiation, planning, and control stages of project management; as this reflects the various modes of operations that support a feasibility or explorative project similar to the project carried out with design thinking. In blending design thinking and project management, the data on phase-oriented project management which includes studies and interviews would be restricted to the project management institute (PMI) recommended processes, tools, and method. Consequently managers with this practice would be consulted.
Lastly, the time frame assigned to this thesis is 12 weeks; this has limited the opportunity to have a wide range of interviews with different project managers from different fields, and thus has affected the validations of the findings.
2: SUMMARY OF SOME PROJECT MANAGEMENT SYSTEMS (literature review)

This chapter contains project management methodologies that have been developed over the years to improve efficiency by different stakeholders in order to address certain needs arising from perceived changes in their organizations.

There are different project management methods in existence in today’s project environment, but this thesis would be limited to four project management systems that would aid the progression of this report, due to the fact that it forms in parts the basis and composition of the combining systems (Design Thinking and the phase-oriented project management).

2.1 Scrum methodology

Scrum methodology is an integral part of the design thinking process as designed and promulgated by Stanford University California USA; it serves as the driving medium for the Openlab process, using visual interactive objects such as post-it cards and white board. Before going into design thinking, it is important to understand scrum methodology, due to the fact that it is the vehicle that drives the design thinking process.

Scrum is a project/product management framework used in complex systems by a group of people (seven or more) with varying areas of expertise. The goals are achieved by breaking down the project or product into small pieces that build on established pieces through a fixed length iterations, which typically lies within a two weeks or thirty days option or as designed by the scrum team.

Scrum framework provides a structure for teams to personalize their innovative skills on complex projects by taking it sprint by sprint in a specified time frame. It is a management framework for incremental product development, using one or more cross-functional self-organizing teams of about seven people each. It provides a structure of roles, meetings, rules, and artifacts. Teams are responsible for creating and adapting their processes within this framework (Michael James, 2012).

Scrum system enables the breaking down of projects to achievable segments or pieces, which enhances creativity and response to regular feedback and possible alteration, apart from the direct influence on the project or product, it keys into the human element; the ability to improve, interact and grow among other things. Scrum supports our need to be human at work: to belong, to learn, to do, to create and be creative, to grow, to improve, and to interact with other people. In other words, Scrum leverages the innate traits and characteristics in people to allow them to do great things together (Schwaber, 2009).

Scrum system

In order to complete projects, certain structures must be in place, scrum provides the structure for teams to tackle the difficulties associated with organization and project processes, this is achieved by the creation of three distinct groups, namely:
1. Product owner
2. Scrum development team
3. Scrum master

**Product owner:**

The scrum product owner is usually a key stakeholder; he or she has the vision of what the project or product the team is about to take on, and conveys that vision to the rest of the team, he or she usually has an in-depth understanding of what is expected from the team, and constantly re-prioritizing the project backlog as well as maintaining customers interest.

**Scrum development team**

The scrum team consists of cross-functional individuals in a project team. Everyone in the project teamwork together in a collective and unified manner towards the target intended to be achieved in a sprint. Within the scrum framework, all work delivered to the customer is done by dedicated scrum teams. A scrum team is a collection of individuals working together to deliver the requested and committed product increments (International Scrum Institute). Scrum teams have a horizontal working structures with no acclaimed leader but a group of equals with distinct functions assigned by the team, the project or product usually determines the composition of the team. A scrum team is comprised of a group of people ranging from five (5) to nine (9), though it is possible to have a scrum arrangement for larger project teams comprising about 1000 people, by having a scrum of scrum meetings. This is achieved by having representatives of different scrum meetings in a different level of scrum, and that could be pushed to another level of scrum meeting depending on the size of the first base scrum teams.

![Fig 1. Scrum of scrums meetings (Mike Cohn)](image)

**Scrum masters**

Scrum Masters could be referred to as the scrum team facilitator, he is responsible for making sure the team works accordingly. He ensures that the team is not over-reaching in a sprint, but yet not complacent. The authority the scrum master have in the team could be likened to that of a personal trainer; he pushes you to do what is required but cannot make you do what you do not want to do.
Scrum masters ensure this process happens as smoothly as possible, and continually help improve the process, the team and the product being created (Schwaber, 2009).

**Scrum meetings**

Scrum meeting can be divided into 4 continual processes, they include sprint planning meeting, daily scrum, sprint review meetings and the sprint retrospective meetings.

![Scrum process diagram](image)

**Fig 2. Scrum process**

**Sprint planning meetings**

At the beginning of the sprint the team would have to decide what aspect of the project or product should be worked on (backlog). The project owner has the responsibility to point out which aspect is most important to the project or product. At this stage the team also has the responsibility to negotiate or determine the scope of the work to be carried out in the sprint exercise. At the end of this exercise the selected items are then broken down to initial list of sprint task, and voluntarily picked by committed team members to be done before the next daily scrum.

**Daily scrum**

During the stipulated period for the project, scrum members are obligated to meet on daily bases for 15 minutes; this would enable members brief the scrum team on exploits of the sprint task assigned to them previously. Every day at the same time and place, the Scrum Development Team members spend a total of 15 minutes reporting to each other (James, Scrum Reference card, 2013). The briefings include the status of the task, the next line of action as well as the difficulties associated with the task. The daily scrum presents room for sprint analysis; new task might arise as a result of this, other wise the initial task list would be maintained, other impediments affecting the team would also be addressed if need be. The team may find it useful to maintain a current Sprint Task List, a Sprint Burn-down Chart, and an Impediments List (James, Scrum Reference card, 2013)The daily scrum is also referred to as ‘The daily stand-up meetings’ this is to discourage the prolongation of meetings.
Participants in scrum meetings are encouraged to address the meeting in a peer-to-peer manner as against reporting your work status to your boss.

**Scrum meeting review**

Scrum sprints are designed to come up with a tangible product. After sprints, a sprint review meeting held; this is the demonstration of the sprint outcome to the product owner and any other interested party. After Sprint execution, the team holds a Sprint Review Meeting to demonstrate a working product increment to the Product Owner and everyone else who is interested (James, Scrum Reference card, 2013).

The product owner at this stage assesses the commitment of the team, the outcome of the process, signifies what aspect of the project is done, and what items should be returned to the project or product backlog for future sprints.

The scrum meeting review are equally opened to external stakeholders and acts as a means to re-measure the requirements and expectations of the stakeholders and equally help refine understandings and perception of the scrum team.

**Sprint retrospective meetings**

Every successful sprint end with a retrospective, as the name implies it is an act of looking back at a process concluded, reflecting on the good and bad and the kind of energy in the team as well as the outcome of the project or product in order to improve the process for the future - A special meeting where the team gathers after completing an increment of work to inspect and adapt their methods and teamwork. Retrospectives enable whole-team learning, act as catalysts for change, and generate action (Derby & Larsen, 2006)

One of the beauties of scrum is the feel for human touch; a good sprint retrospective meeting addresses the psychological aspect of the team’s welfare creating a safe atmosphere for discussing uncomfortable issues and avoiding blames and hostility. Retrospectives focuses not only on the development process but also on the team and team issues, team issues are as challenging as technical issues—if not more so (Derby & Larsen, 2006).

A good retrospective meeting often exposes processes and organizational limitations; a concerted effort between team members and the scrum master is needed to resolve this, according to Derby Easter and Larsen Diana, the gains of a good retrospective meetings include: improved productivity, improved capability, improved work quality and increased capacity (Derby & Larsen, 2006).
2.2 The Blending of Traditional and Agile Project Management by Kathleen Hass

In order to maximize project management efficiency, different project management styles have been blended together over the years, the essence of this blend is to optimize the strength of the combining styles. It should be noted that the idea behind this blend, instigated the objectives of this research.

Traditional project management according to project management institute is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements, in other words it requires deliberate and disciplined planning and control methods. Project management institute’s project management method is primarily a waterfall method with some modifications to enhance efficiency, but it still has the rudiments of a waterfall method which has distinct project life circle with recognizable phases, one task leading to the other. In this system a huge part of the project is planned upfront and requires a lot managerial input and standardized paperwork. (Hass, 2007)

According to a Kathleen Hass in a report titled “the blending of traditional and agile project management” she argued that success in global project performance records were troubling by presenting the data which included the following.

1. $80 -145 billion per year is spent on failed and cancelled projects (The Standish Group International, Inc.)
2. 25% - 40% of all spending on projects is wasted as a result of re-work (Carnegie Mellon) 50% are rolled back out of production (Gartner) 40% of problems are found by end users (Gartner)
3. Poorly defined applications have led to a persistent miscommunication between business and IT. This contributes to a 66% project failure rate for these applications, costing U.S. businesses at least $30 billion every year (Forrester Research)
4. 60% - 80% of project failures can be attributed directly to poor requirements gathering, analysis, and management (Meta Group)

Consequently, the Agile Project Management (APM) method could be introduced to help minimize these challenges. APM is a highly iterative and incremental process, where developers and project stakeholders actively work together to understand the domain, identify what needs to be built, and prioritize functionality (Association of Modern Technologies Professionals, 2015)².

The agile process consists of an iterative, redefining and development process where continuous communication and feedback from stakeholders is encouraged, these limits cost and create an avenue where the product of the project is in-line with what was intended.

² search words: project management, agile
After the initial elaborately process which includes the planning, the requirement definition and solution design phase is completed; the implementation of the project resumes, and this in turn requires a more detailed iteration of planning, requirements, design, building and testing processes taking place in waves till the completion of the project.

**The combination of Agile and Traditional project management**

As implied above the traditional project management approach is primarily a linear or waterfall approach where most of the brain exercise is done before hand and is delivered as a finished product with on the job modifications where it is absolutely necessary, that has been the norm for decades and this is the main difference between the Agile method and the traditional project method (Hass, 2007).

**The value proposition**

The approach comes from the greater flexibility and collaboration the agile method offers, with this; a guideline of plans is done up-front. As the team, which involves a user or stakeholder advances through the project; it gathers input and learns from the user/stakeholder feedback with the use of a visible or practicable prototype experience. These experiences would help the stakeholders refine or re-define the requirements and thus describe to the team what the organization really needs.

Practically minimizing the cost of change is one of the strengths agile brings to project management; it is easier and cost effective to change small modules rather than to change a developed and complicated design system or plan. This project flexibility and stakeholder/user cooperation adds value to the project as minimize cost (Hass, 2007).

**2.3 Lean project management**

This is a project management system that emphasizes the prevention of waste (MURA) extra time or material spends that does not add value to the product or service. It is a series of systems organized in order to maximize value and minimize waste - there is a significant difference between the traditional project management system and the lean project management system. The most significant difference
is their objectives, their architect and the placement of their phases, the relationship between the phases and the participants in each phase (Ballard & Howell, 2004). Lean project management is often associated with most product based projects such as ship building, movie making, software engineering products and all forms of work order systems such as plants and facility maintenance.

As the name implies project management is the ability to manage different systems, materials, resources and information in order to achieve a design or specific goal. We understand projects to be temporary production systems linked to multiple, enduring production systems from which the project (Priemus & Bert van wee, 2013) (Kossek & Lautsch, 2008) is supplied materials, information and resources. Every lean production system integrates designing and making a product (Ballard & Howell, 2004).

According to (Zabelle & Koskela, 2001), lean production systems are designed to achieve three fundamental goals:

1. Deliver the product
2. Maximize value
3. Minimize waste

The success of a Lean management system, which is to maximize value and minimize waste, are dependent on certain operations, this include planning, controlling and correcting; that is planning to set up specific goals, to control is to advance towards those goals and to correct is to change if necessary the means being used, or the goals being pursued (Ballard & Howell, 2004).

![Fig 4. Lean project management](image)

**Lean project delivery system (LPDS) model**

Ideally, projects are done in phases, just as the traditional project management phases include-initiation, planning and so on, so does Lean management system have its own unique phases and characteristics, The LPD model is organized in five phases: definition, design, supply, assembly and usage, these major phases are intertwined with eleven different stages which tend to overlap the major
phases.

The different phases cited above give rise to eleven stages: purposes, design criteria, design concepts, process design, product design, detailed engineering, fabrication, logistics, installation, start operation, maintenance and end of life (Ballard & Howell, 2004), (Pellicer & Alarcon, 2009).

The major difference between the Lean management system and Traditional project management styles lies in the definition of the phases, the interaction between phases and the participants in each phase (Ballard & Howell, 2004). These phases are explained below.

**Project definition**
As the name implies this involves understanding and analyzing the project to be embarked on, it incorporates different scenarios that could arise from the project, which includes customers expectation, stakeholders values and purpose, design concepts and design needs, this normally involves a conversation with various stakeholders. (Ballard & Howell, 2004).

**Lean design**
The relationship between project definition and Lean design lies in the act of reconciling values, concepts and objectives, this is achieved through an active conversation towards developing and aligning products and process design at the level of functional systems. Project can be redefined if there are opportunities more consistent with the values and objectives of stakeholders come up in the course of lean design. The project may revert to Project Definition if the ongoing search for value reveals opportunities that are consistent with customer and stakeholder constraints, e.g. if there is time and money enough (Ballard & Howell, 2004).

During lean design, important decisions are systematically deferred until the last responsible moment in order to allow more time for developing and exploring alternatives and to avoid specialist design/decision conflicts.

**Lean supply**
This consists of a product and process design, with detailed engineering, fabrication and delivery system, as well as measures and initiatives to reduce lead time for information and materials especially those involved in critical parts of the project.

**Lean assembly**
This is the delivery of the finished product along with relevant information associated with it. Lean assembly is deemed successful when the product has gone through a beneficial start-up.

2.4 Phase-oriented project management processes as recommended by the project management institute.
According to PMBOK guide, project management is divided into 5 basic process groups, these include: Initiation, planning, executing, monitoring/controlling, and closing.
This as you can see, above is the overall process summation of project management, each of this process requires a systematic procedure that facilitates the transition to the next. Project Management Processes are overlapping activities that occur at varying levels of intensity throughout each phase of the project. A process is defined as a set of activities that must be performed to achieve a goal (pm4dev.com). These systematic procedures include, but are not restricted to phase management, planning, controls, team management, communication management, procurement management and integration. It should be noted that these process groups as shown in fig 13 are very dependent on each other, their dependence lies on the outputs or deliverables of each process, in a multiphase project, some of these processes are repeated more than once to complete a phase, for example, planning could be repeated more than once when there is a new information during the feasibility phase of a project. The process groups are seldom discrete or one-time event; they are overlapping activities that occur throughout the project (Project Management Institute, 2013).

A 'task' does not necessarily have to be called a 'project' in order for project management methods to be very useful in its planning and implementation. Even the smallest task can benefit from the use of a well-chosen project management technique or tool, especially in the planning stage (Businessballs.com). All these create the effectiveness needed in a successful product outcome, as illustrated in the chart below.

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4 Search word: project management techniques, project management tools.
Process groups

Initiation

The initiation process are those set of actions taken to define a project or phase of a project, establish the scope, what it entails to carry out this project, its financial implications, the stakeholders that shape the projects either as target stakeholder or as project owners. The initiation process group consists of those processes performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase (Project Management Institute, 2013, s. 51). All the information is contained in an output in form as a project charter and project register. Another set of definitions carried out in this process is the project boundaries; this includes expected start and complete dates associated with the projects or phase thereby creating a structure for it.

A project boundary is defined as the point in time at which the start or completion of a project or project phase was authorized (Project Management Institute, 2013, ss. 51-53)

The essence of this process is to align stakeholder’s expectations with the project’s purpose, which would validate the project as well as avoid confrontations of ideas down the project line. Ideally large projects are divided into many phases, in each phase the initiation process should be carried out, in other to maintain and retain the initial trends set up in the project charter and project register.

Planning process

The planning process consist of those series of activity performed to realize the scope of the project by articulating ideas to attain the objectives established in the initiation stage of the project. The outcome of this process is usually a project management plan and the project document that would be used to actualize the project. The planning process group consist of those processes performed to establish the total scope of the effort, define and refine the objectives, and develop the course of action required to
attain those objectives (Project Management Institute, 2013, s. 55). As the project proceeds, the
tendency of additional information as well as changing project characteristics becomes a possibility,
therefore the need to continuously revisit the planning process and to some extent the initiation
process becomes a necessity. This progressive detailing of the project management plan is called the
progressive elaboration, indicating that planning and documentation are iterative and ongoing
activities (Project Management Institute, 2013).

**Executing process**

This stage of the process consists of articulated actions performed to carry out the specified activities
on the project management plan. Executing process involves managing skills (human and mechanical),
resources as well as stakeholders expectations in line with the project management plan.
The executive process group consists of those processes performed to complete the defined in the
project management plan to satisfy the project specifications (Project Management Institute, 2013, s.
56).

**Monitoring and controlling**

These are set of processes required to track, explore and review the progress and performance of the
project, in other to identify situation that create a deviation from the project management plan, then
consequently proffer/initiate corresponding changes. The key benefit of this process group is that
project performance is measured and analyzed at regular intervals, appropriate events, or exception
conditions to identify variances in the project management plan (Project Management Institute, 2013,
s. 57).

The importance of Monitoring and controlling is not just limited to a particular process group but to
all aspect of the project especially in a multi-phase project. In a multi-phase project with many fonts
and schedule, the monitoring and controlling process coordinates various phases and streamlines the
project in line with the overall project managements plan and thereby avoiding damaging corrective or
preventive actions.

**Closing process**

This final process consists of all actions carried out to bring to an end all activities across all project
management fronts including the phases and any other aspect of the project (Project Management
Institute, 2013, ss. 56-58).
3 METHODOLOGY
The purpose of this chapter is to provide the reader with an understanding for how the thesis work was conducted, through a practical as well as a scientific perspective.

This thesis report has two focus areas. Firstly the case study at Openlab and the review of design thinking as promulgated by Stanford school of design USA, and the review of literatures concerning the traditional project management method (waterfall) making it a combination of an empirical and a theoretical approach.

This thesis intends to draw analysis and formulations from the general to the more specific making it a deductive research. Particular instances are deduced from general interferences, for this reason the deductive method is referred to as moving from the general to the particular. (Collis & Roger, 2013).

As time goes by behaviors change, therefore project management’s styles has to reflect this reality. Therefore this research emphasizes on the importance of human/peoples experience as well as my experience as deduced from project management and Design Thinking-guided project, under the auspices of Stockholm municipality and open lab. In other words, this thesis leans towards the interpretivist paradigm. Interpretive research focuses individuals and how they experience the social world; this means that data gathering is regarded as reflecting the researchers personal engagements with the research process (Ingleby, Dawn, & et al, 2009). This research is close to interpretivist paradigm since the author has personal experience in with the topic researched and has studied a wide range of project management methods. Through a wide range of theory studies and an actual practical use of this project management methods, and an analyzed result from an empirical data (interviews), followed up with deductions, comparisons and logical reasoning; a project management concept model can be developed.

![Methodology map](Fig 7. Methodology map)
3.1 Research style and purpose
The purpose of this study is to create a basis for improving the present project management style that reflects the present day realities as expressed in the first chapter, in other words attempting to bridge the gap between the PMI projects management styles that was introduced in the 50’s and 60’s and the apparent work changing conditions of the 21th century.

This is a normative research, since it involves gathering data, a case study and analyzing literatures already existing on the topic for the purpose of recommending improvements. Normative studies aim to achieving some desired goals or target, which are usually improvements over earlier levels (T.N & Rego, 1958).

![Diagram](image)

**Fig 2. Normative research curve**

3.2 Case study (Openlab)

Openlab is an innovative laboratory where societal challenges are solved in a new way by thinking outside the box. It comprises of students and people from all works of life, and various levels of experience in conjunction with state establishments such as, city of Stockholm, Stockholm county council, Stockholm administration board and higher institutions within Stockholm such as The Royal Institute of Technology (KTH) and Stockholm University. The proposals generated are radical, useable, concrete and innovative. “Students and researchers in all fields at our partner universities, and experts working for our public sector partners, non-profit organizations, companies, as well as private citizens are all playing a part” (Ivar Bjökman: Executive director, Openlab Stockholm).

In this process, visual language and creative expression is essential in order to relay thought impulses and ideas for communication and development of a new way of thinking or solving problems. Openlab allows inner thoughts to shine through without interference, here do it –think– do it again allows one to challenge the conventional way of doing things, allowing one’s spontaneous side to override one’s analytical instincts.

3.2 Data
Data for which this project is based on are gathered from different sources, as listed below.
• Reflections from Openlab
• Interviews
• Literature review

3.2.1 Reflections from Openlab
This is a mandatory feedback from OPENLAB participants on design thinking process and its relationship with the intricacies of the modern workforce, as well as its effects on a viable project.

• Participant criteria The participants ranged from 24-40 years with varying academic background. At the end of the program, 14 participants gave the consent for their reflections to be used as data for this thesis. The essence of this is to get feedback as to how these individuals from various fields were able to utilize design-thinking skills in achieving their goals. The findings, which include its strengths and limitation, would be deduced, and that would be used as a tool in the development of a model template.

3.2.2 Nature of interview
The interview would be for project managers, and the essence is to validate the results of the extended data collated from different sources (websites, journals, books), through their experiences using the phase-oriented project management method, and also their perception on work environment changes as it relates to globalization, technology, and the IT sector. Interview questions would be shaped from the collated data as described above.

• Participant criteria The participants for the interview were project managers from three different establishments - SWECO, SCANIA and SIEMENS, their selection criteria was based on their involvement in various innovative project management activities, it is believed that the participants are conversant with current practices in project management as recommended by the project management institute.

3.2.3 Literature Review
Published works and peer-reviewed works mainly from KTH BILDA, economic and business magazines that focused on procedures of project management, human perception as well as changing economic and global environment, were studied and analyzed, internet search engines such as Google search was also instrumental in this process.

3.2.4 Data Analysis
Exploring the second research question – how do challenges in 21th century phase-oriented project management process affect working environments?

• Data were gathered from books, articles, journal and documented interviews of some project managers on the limitations of current project management practices.
• The collected data in the exercise above were analyzed and validated through a round of interviews with some project managers.
• The validated information from these interviews was put through a S.W.O.T analysis chart. It is the author’s scientific ambition that the data from this exercise would give us an insight as to its limitations, and possible areas of improvements as it reflects current working environment.

Secondly, Design Thinking as a project management process was-

• Analyzed by participants of the Openlab workshop through feedback/reflections; highlighting its integral positives.
• The reflections was compiled, and segmented into like- categories, then a S.W.O.T analyses was carried out to identify the strength, weaknesses, opportunities and threats of design thinking and scrum.
• The positives were then used as solutions to the challenges identified in research question one.

Further more, in order to contextualize the analysis of the two research question above, the data gathered from previous documented researches that capture the conditions of current working environment (what, where and how employees/workers aspire to fulfill their most productive sessions) were categorized in 3 broad themes (work indicators as elaborated in chapter 1.2); These themes would form the basis for a system that could combine the qualities of Design Thinking process and waterfall project management method.

![Fig 9. Strategy for data analysis](image)

### 3.3 Validation

Validation of a project is normally achieved from a repeat of the study in another case in other to confirm the findings, but that is not the case with an interpretative paradigm, here it is difficult to simulate peoples experience which to some extent influences the outcome of the project. However, in
an interpretative approach it is believed that the activities of the researcher influence the research and thus it is difficult to replicate the activities (Collis & Roger, 2013). Interpretative research is a chain of interpretations that must be documented for others to judge the trustworthiness of the meanings arrived at the end. Written accounts must resonate with the intending audiences, and must be compelling, powerful and convincing (Creswell, 2012). Though it is important to note that the ideas and concept as expressed in this thesis report should have an impact on various levels of stakeholders in the project management world.

The method for analyzing this work that comprises of multiple observers, theories, methods and empirical materials is the methodological triangulation. Gathering information pertaining to the same phenomenon through more than one method primarily in order to determine if there is a convergence and hence, increased validity in research findings (kathryn, 1999, s. 171).

3.4 Ethics
Participant from the Openlab program, forwarded their responses to the author, their feedback described what they have observed during the program. It should be noted that the observations recorded in this thesis report reflects personal opinions of individual participants on design thinking and not on Openlab as an institution, suffice to say that these opinions are not the position of Openlab Stockholm as a body. With regards to the phase-oriented project management methods; the interview subjects responded to the question on a personal capacity, it had nothing to do with the procedures of their employers. So for the avoidance of doubts, no interviewee would be tied to a specific result. However since the thesis addresses design thinking and the phase-oriented project management procedures, which are in the open domain, there were no conflict associated with compromised information. The interview subjects and Openlab participants where sufficiently informed about the purpose of the thesis, their consent to use their responses as a source of data for the build-up of this thesis were sort after and approved.

3.5 Applicability
The results of this thesis are best applicable to exploratory/feasibility projects or consultancy organizations with innovative project or product management solutions in mind.
4. CASE STUDY (OPENLAB), DEDUCTIONS and ANALYSIS

4.1 Case study (open lab)

The Openlab project consisted of 21 participants divided into 3 different groups, two (2) groups of 7 and one (1) group of 6. These groups were assigned to projects that were within the feasibility or explorative project form and dealt with realistic societal issues, such as:

1. Biblioteket (Attracting young boys to the library) (7 persons)
2. Spira-Sjuksköterskans kompetens I framtidens vård (Improving nurse competence) (7 persons)
3. Södersken/southern lights-Ett helhetskoncept (Attracting factories in Farsta) (6 persons)

The project’s duration lasted for approximately 4 months; reflections on the project were carried out and submitted twice during the process. 14 correspondences were used in the course of this project thesis. As presented in the methodology page, the analysis of the participant’s reflections would be achieved through the compilation of like opinions that was subsequently subjected to a S.W.O.T analysis as shown below.

A design thinking and scrum approach to projects

Until recently there has been a general believe that people are divided into different categories; the scientists and the artists, and that has formed the basis for most of our societal structures (Annette, 2004, s. 177), but most creative innovators ranging from Da Vinci to Frank Gehry were able to balance these spheres of knowledge, therefore it is safe to assume that the balancing of these act leads to innovation. Some say the world is divided into humanities people and science people; artists and geeks; intuitive types and analytical types (Brown, Design Thinking , 2014). A creative organization is constantly on the lookout for people with the capacity and -just as important- the disposition for collaborating across disciplines (Brown, 2009).

Most successful firms in the 21th century are characterized by a great deal of creativity and innovation, which is the main essence of design thinking. Design thinking as a process originated from one of many postulations by a social scientist called Herbert A. Simon in his 1969 book titled the “science of artificial” on decision making and problem solving; in his research he articulated three stages in rational decision making (IDC), intelligence, design and choice this is described briefly by the diagram below (Brown, Design Thinking , 2014).
Building on Herbert’s research, in 1976 Robert McKim wrote a book titled *experiences on visual thinking*, in the book he explored the ability of perception thinking and how it could be improved, managed and utilized to solve world problems and change ideas and how we perceive things. Building on the researches conducted by Herbert and McKim; Stanford’s Rolf Faste in 1980 developed a concept called “design thinking”; a methodology for actualizing concepts and ideas- Design Thinking is “a formal method for practical, creative resolution of problems or issues, with the intent of an improved future result. In other words design thinking is defined as “a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success.”- Tim Brown, president and CEO of IDEO.

Fig 11. Design thinking process

4.2 Open Lab
Openlab uses design thinking and scrum methodology to solve challenging societal problems; design thinking for its creative and innovative out of the box approach to designs as well as its idea generating capabilities and scrum methodology to drive this process using its inclusive and iterative approach to projects.

*Task briefing: Attracting companies to Farsta* involving Openlab and Stockholm city council.

A design brief presents clients requirements for a job these may verbal or written, simple or complex. A brief contain a specific goal that is to be met by the design but it may also be couched in terms that
have varying interpretations (Gavin & Haris, 2009).

In the autumn of 2014, Stockholm Business Region Development A.B., the city executive office of Stockholm (Stadsledningskontoret) and Farsta municipal district department (Farsta stadsdelsförvaltning) presented a challenge to KTH OpenLab. The challenge involved finding ways of making the municipal district of Farsta in Stockholm more attractive for businesses. Increased employment, urban mix-of-use and city attraction were also pointed out as particularly important.

By using Design Thinking, an open-minded, explorative and integrative approach that is used to find solutions to big problems, a proposal was recommended to tackle the problems and the challenges that Farsta faces. To achieve this a group of multidisciplinary students was put together.

Outcome

Södersken/Southern Lights is an encompassing light installation that is strategically placed in different areas of Farsta. By using lighting, Södersken/Southern Lights aims to contribute to making Farsta a more integrated and mix-of-use district. As an identity-creating concept, Södersken/Southern Lights will increase Farsta’s ‘sense of community’. Eventually, Södersken/Southern Lights aims to attract dynamic businesses to Farsta.

4.2.1 Design thinking and scrum process

Empathy

Every project’s success depends on the stakeholders satisfaction, this means that the stakeholders needs and perspective should be really understood, the first step in design thinking is looking from the end users perspective, seeing what they see and feeling what they feel. Empathize is about exploring the nature of the problem and understanding the users and their needs (Hasso plattber, 2014, s. 18).

According to bootcamp bootleg by Stanford design school, achieving this requires:

- Observation: View users and how they behave in their natural environment
- Engagement: Interact with the users through interviews short conversations
- Immerse: Mirror the experiences of the user, in other words gain a first hand knowledge of the life of the user in the context of the study.

Before going into the field to empathize with the users, a sprint session is driven to plan the fieldwork and establish who the stakeholders are such as students, what the need is, as well as considering an extreme user. Interview of various stakeholders was given out as tasks, which was reviewed during daily sprints.
Define

Back from the empathize fieldwork the next stage was the define stage this involves the unpacking and analysis of the entire empathy findings then convert them into needs, tips and insights for further development. The define stage helps develop a deep understanding of the task as well as the stakeholders, and equally limiting the scope to a specific actionable problem statement better referred to as the point of view. The definition process is aided by the scrum methodology involving whiteboards, sprints, post it and individual tasks reviewed through daily sprints. Define stage synthesizes the main findings and act as a “persona” an ideal user to validate decisions later in the process (Hasso plattber, 2014).

Ideate

This stage was all about Idea generation based on the understanding of the needs of the user, as articulated by the point of view we had. At this point it was about flaring of ideas using various design generating methods such as impose constraints and prototype for empathy, then guided by design thinking brainstorming rules such as: One conversation at a time, go for quality, encourage wild ideas, be visual and defer judgment-no Blocking. During the ideate stage, the design team draws from the research gathered and the constraint established during the define stage; this information is used to create ideas with which to tackle the design brief (Gavin & Haris, 2009, ss. 19-20)

During the “Define” stage of the Openlab exercise, different components critical to the task was identified and expansively analyzed for solutions, these solutions were then mapped into groups of like terms, thus aiding the idea generation process. At the end of this exercise, 6 achievable ideas were generated, which was presented at the sprint review workshop.

The sprint review presentation is an Openlab exercise done at various milestones in the project lifespan; it is a review of all the sprint exercises done since the last sprint review in order to evaluate the groups progress; what they are doing and help them where difficulties exist.
Prototype

Four of the six Ideas presented at the sprint review were selected as a solution to the task; these selected ideas were moved on to the prototype stage. According to Stanford’s bootcamp bootleg “a prototype can be anything that takes a physical form- be it a wall of post-it notes, a role-playing activity, a space, an object, an interface, or even a story board”. For this project, models were built; an idea presentation was made to the clients to which we consequently got a feedback. This interaction was important because it helped the group to deepen our understanding of the task as well as the users, test and refine solutions in order to improve on the task as well as giving the group the objectivity to narrow down the ideas; this was aided by the use of the Pugh matrix. A prototype can also test the visual aspect; technical feasibility of a design solution, and a particular aspect of a design solution by presenting them, as they would be produce-a prototype do not need to be made with the final materials (Gavin & Haris, 2009, ss. 20-21).

Test

Having gone through prototyping, which involved a lot of testing and refinement and having narrowed down the ideas to one, we had to test our idea with the direct stakeholders. Since our project was about bringing companies to Farsta, it was only appropriate to create an interactive workshop with the residence of Farsta. The essence of this interaction was to get their response to the project and how receptive and acceptable this project would be in order for it to be successful.

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**Fig 13. Openlab process (design thinking/scrum)**

**Fig 14. Openlab process (design thinking/scrum)**

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6 POV (Point of view)
4.3 Deduction and Analysis

As described in the methodology section of this thesis, the analysis of the (PMI) project management method was analyzed in two (2) parts:

- A literature/Web review (journal and articles) of the PMI project management method was carried out; the findings were grouped and analyzed through a S.W.O.T analysis chart revealing its Strengths, Weaknesses, Opportunities and Threats.
- In order to validate these findings as described above, the results from the S.W.O.T analysis was articulated in an interview directed to different project managers.

The feedbacks from these inputs were used to discuss the output that will be presented below as deductions. The aim is to use the identified strengths of design thinking as an improvement to the limitations of phase oriented project management.

In contextualizing the data from the literature review and the SWOT analysis (as presented in appendix C) into indices for a modern working environment, the analysis of the phase-oriented project management method and design thinking would be summed up in the three (3) work indicators as described in chapter 1- indicators that measure positive work environment.

4.3.1 Work culture

**POPM- Ownership/micro-management:** There are three fundamental groups that lead to the success of a project, they include: the manager, the project team and the clients/stakeholders (Picariello, 2014). The project team is arguably the most important actor in the success of the project. Therefore, a sizable portion of the project would be achieved if the human elements are managed properly - *staff utilization* (McQuerrey Lisa), areas such as capacity, temperaments, culture, ego, disagreements, and opinions should be taken into consideration at all times within the organization. Some projects fail not because of the lack of resources or knowledge, but because of the lack of cohesion within a project team or the inability of the project manager or organization to fully utilize the talents available at their disposal.

Phase-oriented project management tends to be a gate-structured system, built on templates and documents driven by the vision of the project manager, as a result of that projects could seem more theoretical than practical thereby making some of the project team members seem aloof and disconnected (lack of ownership), and thus affecting the productivity of the group. Irrespective of the competence possessed by team members, a certain level of **interest, motivation and ownership** is needed to maintain a reasonable productive output.

The inability of team members to share in the vision of the project manager, due to the disconnections as described above could force project managers to micro-manage, just to “make sure” things are right - *micromanagement* (McQuerrey Lisa), which ultimately could lead to a diminished output. Micro-
management collapses an organization, rendering it less effective (English, 2004). This scenario could indirectly limit the decision-making ability of the project team as every decision is moved upwards stifling the project team from taking risks, learning more, and exchanging ideas and opinion, which incidentally is the best way to improve ownership and inclusiveness (Sheid, 2013).

On the other hand phase-oriented project management gives a structure to the project; everybody knowing what is expected from them and when to execute their task (defined sense of direction). It gives a clear and a well-defined scope of the project that helps in better communication and distribution of responsibilities, among the members of the project and then everybody knows what to be done. (English, 2004).

**DT- Ownership/micromanagement:** The empathy stage of design thinking encourages group members to participate on a personal level in the dynamics of the task or project being managed, it helps in the understanding of the problems and gives insight to what could be the solution. Generating ideas using visual objects such as post-its and white boards as well as other creative tools associated with design thinking, leaves participant with a sense of entitlements. On the other hand, in the course of the idea generation process, some team members consciously or unconsciously cling more to their ideas, projecting domineering behaviors that is liable to cause conflicts within the group if not properly checked on time (Probability for conflicting ideas/personalities). One participant in his opinion reflects that ownership improves motivation, in his words:

“It relates to the participation, cooperation and personal responsibility in the project process. The motivation would greatly increase if one feels his effect on the project work and have good relationships with all other members of the group.

**POPM- Idea generation/creativity:** the difference between human beings and animals or robots is the formers ability to be creative and generate functional ideas, stifling these act from project teams renders this human asset useless creating a linear outcome that depends solely on the project manager (tunnel vision management). There are many ways project management fall into this trap:

- Decision making: decision making in some project management organizations tend to fall into a bureaucratic hole, that usually rotates among the same individuals in the upper echelon of the organization with limited or resisted channels for Idea generation from other parts of the project organization (technical and managerial non creativity). This action is usually driven by the fear of an unpredicted effect.

- Hierarchical origination/cooperate structure: Most organizations have a very formal mode of operation and find it very difficult to break from that style; in as much as a sense of responsibility and order is promulgated in this environment, most employees or project team members are not empowered and encouraged to be innovative by using their imagination to solve real problems, without the fear of a failed outcome or criticisms for not following
standard procedures. This is not saying that team members should run in different directions without restrain, but a good project management method should be able to reach that point where, there is a maximum utilization of everyone’s innovative skill, without adversely affecting the overall output of the project -process obsession (Project Management Learning).

- Over-formalized project management structure: Apart from the organizational structures, adhering strictly to project management structure as a method rarely encourages outside the box thinking, limiting creative efforts such as intervention and creativity-generating approaches like brainstorming sessions (McQuerrey Lisa). Project Management, by nature, enforces that routine process. Managers, usually leading humans, become lead by a process. Their managerial skills weaken, as there’s no need to sharpen them anymore: the process is clear and it should be followed (Project Management Learning).

**DT- Idea generation/creativity**: design thinking promotes out of the box ideas and rapid idea generation, one of the phrases commonly used in this process was “do first, think, do it again”. The idea emanates from the fact that most of the time; we are constrained by our own thoughts and the fear of other people’s perception of us, thereby limiting our ideas to the obvious (Innovative idea generation).

Design thinking aims to free people from those conditions allowing participants to explore their inner core, it is understood that no idea is a waste and that credible ideas could be built on not so credible ones, therefore every idea is welcomed. This process allows the freedom of self-expression promoting that creativity that resides in every individual and consequently giving rise to innovations (Freedom of expression).

“*In the beginning, I think it is important to have an open approach that takes in information from many different directions without defining too much*”

According to the participants, idea generation in design thinking boost moral, creates inclusive participation, improves motivation and is literally fun to do.

Creativity is one of the major benefits of Openlab’s design thinking process, due to its ability to help participants avoid the obvious solutions and think outside the box, the processes- from Empathy to Test are designed to achieve this purpose. The active participation, the visual connotations (writing or drawing on post-it card and white boards) to the no holds barred- idea generation, all encourage creativity, leaving participant motivated, relaxed and eased which in turn increases productivity (Improved passion for work).

4.3.2 Job control

**POPM- Leadership**: Leadership in project management plays a very essential role in the successful execution of a project. Most project managers stressed the fact that the leadership skills of a project
manger cannot be overemphasized, a bad or inexperienced project manager can cause all sort of damage to the project, from micro-managing the project to being authoritarian. Being dependent on a project manager could be a source of direction and stability for a project on one hand, or could be a source of confusion, indecision and conflict on the other, and not necessarily because of lack of the project management knowledge but for the lack of leadership or cultural skill required for the project-Dependent on project manager (Nibusinessinfo.co.uk, 2012). Leadership qualities come in different forms, some more project friendly than others, so it is important for the project manager to have basic leadership qualities in addition to a comprehensive vision to guide the project to completion.

Workflow management- Good leadership creates a system whereby workflow is measured and accounted for by making sure that the project is cost effective and that at any given stage in the project, the resources assigned to it is being managed efficiently-Workflow management (McQuerrey Lisa).

PMI project management is structured in a way that it does not give room for clear flexibility in workplaces for the employees, though it does for the project itself (possible to move from one phase to the other and vice versa). Better flexibility for this type of planning establishes expectations for staffers, provides clear directives and builds in procedures for quickly addressing unexpected outcomes (McQuerrey Lisa).

Understanding scope management is another issue relating to phase-oriented project management, as one participant project manager puts it-“One problem I have in my project is the ability to understand and identify scope management”-Peter Svard project manager, SWECO.

Having a functional workflow depends on the complexities of the project and the ability to fully comprehend the project scope (Uncertain scope management system), some project managers find it difficult to work out a strategy/project management plan suitable for a particular project and as a result of that, fall into difficulties and repetition along the life-circle of the project (Complex project management plan) (Holland, 2013).

DT- Leadership/Workflow management: in design thinking, leadership could be challenging due to its lack of a pronounced leader especially in the beginning stages of the process. The Agile scrum method is used to drive design thinking and in that process (Scrum) the scrum master cannot be identified as a leader but more like an organizer (Unbalanced leadership problems).

In this process, some people have a tendency to talk over other group members in an intimidating way thereby influencing the decisions of the group. This goes contrary to the principles of design thinking and that is why brainstorming methods such as impose “Impose Constraints” and “Body storming”
(Hasso plattber, 2014, s. 31&32) are recommended during idea generation or ideation phase of the project as well as an improved form of leadership to keep everybody in check.

The lack of a good leadership structure could lead to the lack of regulation; the possibility of going off topic, and a rise to conflicting ideas; in relation to idea generation the lack of a credible leader could limit the potency of the process -Wild goose chase if not regulated (Picariello, 2014).

“Imbalance in power issues consolidates confusion, especially when the group do not listen to each other’s contributions which then leads to frustration. Such problems should be solved immediately in order to create good working balance within the project team”- Lydia Wahlgren (KTH)

4.3.3 Social support

**POPM- Communication:** The importance of a leader in project management has been highlighted above, including his ability to have a plan and a vision; but it is equally important, that this plan and vision is successfully communicated to the project team as well as interested stakeholders. A lot of mistakes and failures arise from miscommunication; any event of miscommunication could prove to be enormously expensive -Communication overhead (Project Management Learning).

A project team is usually made up of different people, sometimes with varying, age bracket, cultures, discipline and experiences, so the mode of communication for one person or group of people could be different from the another, therefore having a central vision from a central source makes it almost mandatory, thus a successful project manager should be good in communication; a good communicator not only in words, but also by actions. Most project managers believe that communication for an inexperienced project manager could be difficult, because of the structured nature of the process (Holland, 2013).

**DT- Communication:** the structure of design thinking and SCRUM allows for participation in groups comprising of people with various skill set and years of experience (Cross-functional self-organizing groups). Participant’s reflections revealed that the Openlab process as witnessed in their various project groups promoted a high level of tolerance arising from accepting other people’s view on topics without prejudice, as well as curtailing and regulating temperaments (Self discipline/tolerance).

The ability to tolerate the opinion of group members leads to a healthy environment that promotes good communication as well as cross-pollination of ideas and this increases the general knowledge of group members as they learn from fellow group members from different fields.

“Good atmosphere within the group and fruitful cooperation affect the project member’s confidence. It is important to maintain a good working atmosphere within the group and help each other”
5. DISCUSSIONS AND CONCLUSIONS

The author aims to offer recommendations and develop a concept solution to the limitations deduced from the analysis in part 1 above. The solutions from this thesis project are not designed to alter the structure of design thinking and waterfall project management method but rather to proffer add-ons in other to maximize the efficacy of the project management method.

For a recap of previous chapters - in chapter one, the author established the change in working environments, from the industrial era of the 1950s to the information technology era of the 2000s and also described indicators to a productive modern workforce.

Secondly, samples of some project management styles that have been developed over the years to improve efficiency by different stakeholders and address certain needs arising from perceived changes in their organizations were illustrated.

Thirdly, data from participants of an Openlab program and some project managers, as well as information from literature researches were collated and put through a SWOT analysis chart revealing its strength, weaknesses, opportunities and threats.

Fig 15.strategy for Combined analysis & recommendation
5.1 Recommendations

**Recommendation for a combined project management method**

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<th>Indicators</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social support</strong></td>
<td>Concepts and methodology that supports a domineering and over reliant power on the project manager.</td>
<td>Concepts and methodology that tilts more to a horizontal power distribution, but still maintaining the leadership and organizational skills of the project manager.</td>
</tr>
<tr>
<td><strong>Work culture</strong></td>
<td>The perception of projects as series of detached theoretical procedures that must be accomplished using templates, procedures and techniques.</td>
<td>Introducing concepts that engage project groups, both on a physical and a visual level, through frequent meetings, continual conversations, post-it card, and white boards for improved visual communication.</td>
</tr>
<tr>
<td></td>
<td>Procedures and methodology with emphasis on project for projects rather than project for people.</td>
<td>Concept and procedures that avoids predefined conclusions, but rather projects that are permeable, flexible and allows constant consultations with stakeholders/clients.</td>
</tr>
<tr>
<td><strong>Work control</strong></td>
<td>Training and development of procedures that depend more on project management methodologies rather than driven by creative and innovative ideas.</td>
<td>Building frameworks that focuses on value creation and innovation by introducing flexible work arrangements; this would make the project team more productive by ensuring psychological and emotional balance.</td>
</tr>
</tbody>
</table>

*Table 3. Table of Recommendations*

**DESCRIPTION**

**Social support**

As established earlier - leadership in a phase-oriented project management, is very vital to the success or failure of projects. Bad project managers directly increase the failure rate of projects; as a result of this, measures has to be taken to steer the project manager’s influence to a more positive direction and at the same time reduce the negative influence they possess. Achieving this proposal means taking a cue from design thinking/scrum process, where everybody in the project group has equal stakes while the scrum master acts as the facilitator. Though in order to be better result oriented and structured; the project manager should take the form of a purposeful facilitator who navigates the project and the project team. Some procedures that can achieve these conditions are listed below:

- Arrange scrum-like meetings were project groups would have to come together in a peer fashion on a regular bases for project analysis, project review and project projections.
• The project manager should coordinate meetings, set agenda and move motions, as well as assign tasks to participants.
• Allow project solutions or methodology to grow organically within the group with minimal interventions.

**Work culture**

People are more possessive of projects when they feel that their inputs and ideas either collectively or individually contributes to the progress of the project, applying the points as suggested above improves the ownership mentality needed to partake on the overall vision on a day to day or phase to phase basis. The key to this point is in giving the project team the right to own the project, by making them feel it. Gaining empathy on a project helps to put a human face on any project making the outcome as human oriented as possible. This could be achieved through:

• Allowing mixed and fairly restricted idea generation activities where every body’s voice is heard, while the best solutions is chosen by the team.
• Making the meetings frequent, and as brief, active and vibrant as possible.
• Introducing visual and cognitive stimulants such as post it, white boards, pen and paper as well as time keeping mechanisms. All these apparatus improves mental alertness and presence during meetings.
• Put more emphasis on collectively understanding the definition and scope of the project by taking a cue from design thinking empathy structures through observation, engagement and immersion (see chapter 4.2).
• Making the clients or stakeholders part of the project’s growth by introducing frequent presentations in form of design thinking’s prototyping and testing during the project, in other maintain the scope and expectations of the clients and/or stakeholders.

**Work control**

Unstable workers tend to be less productive due to their inability to concentrate on the task at hand; instability of a project team member could be as a result of many different reasons including personal/family issues. This invariably leads to a robot-like approach to project management thereby eliminating innovation and creativity.

Introducing a flexible work structure for most part of the project could help the workers plan a bit better and go round their problem thus concentrating on the task at hand. The emergence of technology has made this feature easier to accomplish nowadays, helping people to connect whenever wherever. A flexible work Arrangement in project management could be achieved through a sprint
structure method used in design thinking/scrum process: mirroring this in a phase-oriented project management could be achieved through the following procedures:

- Breaking down the project into assignable tasks, allowing people or groups to work where, and when is most convenient for them.
- Having a time limit for the completion of the task in order to maintain the structure and timing of the project.
- Allowing people or groups to present their solution to the project team for review and adoption into the program.

**Recommended Project management Framework**

![Diagram](image)

*Fig 16. Recommended project management process*

### 5.2 The Process Description

1: Initiate and Prepare

Introducing Design Thinking style of Empathy and Definition into the initiation and preparatory stages of a phase-oriented project management method would help:

- Build a bond or comradeship within the project group, as they get to work together towards gaining understanding of the project.
- Allow project team members build a relationship with the project, in order to promote project ownership.
- Group members gain a deep insight into the project through research, interviews, observation or any medium that is deemed fit.
- Collectively figure out certain aspects of the project’s foundation such as the scope management plan.
Fig 17. Empathy and define in project management

2: Execute and close

Introducing Ideation and Prototyping into the executing aspect of PMI project management method would help

- Improve the generation and cross pollination of ideas, which improves the general quality of outcomes.
- Create a platform for knowledge sharing and skill improvement through the mixture and keen participation of team members.
- Test the functionality of your project in order to limit mistakes and corrections by involving stakeholders and client.
- Enhance innovative ideas.
- Improves the flexibility of working conditions, by using a detailed work breakdown structure (WBS) conditioned by regular but brief sprints.
- Continually engaging the skills and knowledge of the project team.

Fig 18. Ideate and Prototype in PMI project management

5.4 Effects of thesis limitation

The case reference for writing this thesis report was a project carried out under Openlab; a feasibility/exploratory project, it was innovation based, therefore the author focused more on enhancing the structures responsible for:

- Gaining a better insight of a project
- Facilitating a process conducive to an innovative solution based management.
Consequently the author cannot guarantee it success rate in every project, rather it was designed for projects with innovative solutions and ideas as it deliverables, though due to its flexibility it could be recommended for other project forms.

Due to the limited time factor (12 weeks), understanding the intricacies in phase-oriented project management posed a challenge, it was difficult to gain access to a wide range of project managers and project members as the author would want to in order to get a detailed first hand impression of what it takes to work in a project team or as a project manager in a changing working environment. Rather the bulk of the research was articulated through journals, books and articles from different project managers and further validated by an interview with 3 project managers. A wide scale testing of this process as recommended, has not been carried out as a result of limited time structure.

Lastly, the author’s background might also influence the result due to the lack of different perspectives during analysis. However having a background in project management could be an advantage in making a qualitative analysis. Needless to say that having various perspectives during analysis could resort to a slightly more concrete conclusions.

5.4 Suggested area of research continuation
As mentioned previously, a more solid theoretical research should be made for further strengthening of the conclusions. Furthermore, the results of this thesis report should be further tested in different project scenario and thus fine-tuned accordingly.

5.5 Summary
In this report, the author tried to combine design thinking processes and the phase-oriented project management method; to achieve this the author used the identified strengths to argument the challenges associated in both processes as it relates to the structures/themes that support an innovative and work conducive environment in the 21th century.

These structure or theme includes: Work control, Work culture, and Social support. Some of the identified challenges in Phase-oriented project management where listed as follows:

- Staff under-utilization
- Micro-management
- Lack of project ownership
- Technical and managerial non-creativity
- Tunnel vision management
- Communication overhead
- Process obsession
- Over dependence on a project management

To improve some of the inefficiencies of the method as listed above, some characteristics of design thinking/Scrum process where introduced, and some of them are listed below:
• Innovative idea generation process
• Freedom of expression
• Methodology for improved passion for projects
• Cross functional self-organizing groups
• Self discipline/tolerance
• Low bureaucratic overheads
• Methodology for an improved practical feel for the project.

Building this concept entailed integrating Empathy, Define, Prototype and Testing to the PMI project management structures.

Below is a diagrammatic representation of the strategy used for this process.

The workflow process

1. What challenges exist in the present day or 21st century project management process?
2. Which of these challenges could be solved using design-thinking processes?
3. How to streamline various activities and operations to improve current project management processes?

Design Thinking/Scrum Process

PMI Project management

Literature Review Reflections Literature Review Interview

ANALYSIS (1)

(2) Identified comparative theme for improvement
• Work culture
• Work control
• Social support

(3) Recommendations

---

Fig 19. Workflow structure
References


Interviews and Reflection participants

Peter Svard. Regional manager SWECO Stockholm
Chinedu Ngene PMP. Siemens Finspång, Sweden
Sydney Onyemachi. Scania Södertalje

Maksym Feshcuck (KTH)
Andreas Rehn (KTH)
Viktor Wennström (KTH)
Anna-Belle Ericsson (KTH)
Stieg Andersson (stockholms university SU)
Lisa holz stockholms university SU)
Lydia Wahlgren (KTH)
Sara Eriksson
Erika Wajntraub Bakszt (SU)
Karenina Gunnerson
Johanna Thuresson
Flor Luna
Jon Hulander (SU)
Anette Waaler (KTH)
Appendix A

INTERVIEW QUESTION GUIDE FOR PROJECT MANAGERS

Work background

1. What is your project management background?
2. Describe your typical project management process?
3. What is your most challenging project management process?

EMPLOYEE WELLBEING

4. Do you feel your views are always represented in your project outcomes?
5. Do you have a clearly defined and structured project management process?
6. Is the defined process strictly used or do you deviate a bit to suit your project?
7. If yes to 6, where in your opinion could there be possible improvement?
8. Do you feel that your creative, analytical and practical abilities are fully harnessed in your work environment through the project structure?
9. Do you feel your present working process promotes a healthy family life style?

NATURE OF WORK

10. What suits you better; a vertical working structure (e.g. king to pawns) or a horizontal working arrangement with a project group organizer?
11. In the process of project management, brainstorming is a crucial tool- how do you effectively manage these storms in order to get the best possible outcomes?

TIME MANAGEMENT

12. Which suits you more: a structured time (07-16) or a flexible time that concentrates on work output?
13. Time management is important to project management as well as personal/family management. How do you utilize time so as to be productive at both ends?
14. After project evaluations, what have you learnt from other project leaders and your own projects to improve future ones?
15. What factors has greatly affected project management processes since the 1930s and what factor should be on the lookout going forward to the next 20 to 30 years.
16. In your opinion; what is the greatest influence of globalization and IT on todays project management styles.
För att utveckla kunskaper av sina erfarenheter krävs reflektion. Fördjupad kunskap erhålls bland annat genom att egna erfarenheter sättas i relation till andras och till teori i ämnet.

Ett medel för reflektion är att skriva. Att sätta ord på sina upplevelser är nödvändigt för att dra lärdomar om vad som faktiskt har gjorts och få en större insikt i hur det är möjligt att påverka det fortsatta arbetet till det bättre. Genom att skriva och därmed sätta ord på erfarenheter blir det tydligt vilken kunskap som har utvecklat.

En skriftlig reflektion är också ett sätt att från lärarhåll verifiera lärandet hos er studenter.

Med detta som utgångspunkt ger vi er i uppdrag att leverera en kortare text där ni beskriver vad ni lärt er av att framförallt jobba i integrerade team och hantera komplexa problem. Tidigare praktisk erfarenhet eller teoretiska kunskaper bör jämföras med era egna erfarenheter i projektet. Nedan ges de frågor som ska svaras på.

Inlämning på kurswebben senast 20141014.

Namn:

Tidigare utbildning/examina: ____________________________ antal år: ____________

Ev. pågående utbildning, samt på vilket universitet: __________________________________

hittills genomförda poäng på denna: ____________

Huvuddelen av min arbetslivserfarenhet är inom området: ____________________________

antal år: ____________

1. Beskriv en upplevd situation från ert teamarbete som du tycker exemplifierar en teamsituation som har haft betydelse för hur ni samarbetar och kommunicerar inom teamet.
   - På vilket sätt valde gruppen att lösa situationen?
   - Vad är styrkan i det valda sättet att lösa situationen?
   - Vad är bristen i det valda sättet att lösa situationen?

   - På vilket sätt valde gruppen att lösa situationen?
   - Vad är styrkan i det valda sättet att lösa situationen?
   - Vad är bristen i det valda sättet att lösa situationen?

3. Exemplifiera en situation då du har känt en hög grad av nedanstående samt vad du bedömer kan ha påverkat detta:
   - När du varit motiverad.
   - Öppenhet och tolerans för förutsättningslöst tänkande i teamet.
   - Glädje/Passion för arbetet.
Självdisciplin.
Självförtroende.
Frustration.


5. Vad har du lärt dig om din roll i gruppen och hur du kan påverka gruppens arbete för att nå gruppens gemensamma mål?

REFLEKTION 2

I den här reflektionsuppgiften ska ni först och främst reflektera kring arbetet i tvärdisciplinära projektarbeten. Ni ska utgå ifrån den komplexa frågeställning som ni arbetat med.

Inlämning på kurswebben senast 2014.12.09

Namn:
Tidigare utbildning/examina:
hittills genomförda poäng på denna:
Huvuddelen av min arbetslivserfarenhet är inom området:
antal år:

REFLEKTION 2

I den här reflektionsuppgiften ska ni först och främst reflektera kring arbetet i tvärdisciplinära projektarbeten. Ni ska utgå ifrån den komplexa frågeställning som ni arbetat med.

Inlämning på kurswebben senast 2014.12.09

a. Förtydligande av problembilden (empathize) (svaret ska omfatta 70-120 ord).

b. Analys, syntetisering (define) (svaret ska omfatta 70-120 ord).

c. Identifiering av behov och insikter (define) (svaret ska omfatta 70-120 ord).

d. Kreativt idéarbete (ideate) (svaret ska omfatta 70-120 ord).

e. Konceptualisering (test) (svaret ska omfatta 70-120 ord).

2. Redogör för och resonera kring hur beslutsprocesserna sett ut i ert team i samband med att ni utvärderat era koncept.

Inled med en kort beskrivning över vilka beslut som varit avgörande i er process och när dessa beslut togs (svaret ska omfatta 150-250 ord).

## Appendix C

1. **S.W.O.T ANALYSIS OF THE PHASE-ORIENTED PROJECT MANAGEMENT METHOD BASED ON THE REFLECTIONS FROM LITERATURE/WEB REVIEW.**

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>WEAKNESSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increased risk assessment <em>(Picariello, 2014)</em></td>
<td>• Communication overhead <em>(Project Management Learning)</em></td>
</tr>
<tr>
<td>• Cost containment <em>(McQuerrey Lisa)</em></td>
<td>• Time overhead <em>(Project Management Learning)</em></td>
</tr>
<tr>
<td>• Staff utilization <em>(McQuerrey Lisa)</em></td>
<td>• Tunnel vision management <em>(Project Management Learning)</em></td>
</tr>
<tr>
<td>• Ability to manage time</td>
<td>• Process obsession</td>
</tr>
<tr>
<td>• Ensure result meet requirements <em>(Picariello, 2014)</em></td>
<td>• Uncertain scope management system</td>
</tr>
<tr>
<td>• Reduce the chance of project failure <em>(Nibusinessinfo.co.uk, 2012)</em></td>
<td>• Technical and managerial non-creativity <em>(McQuerrey Lisa)</em></td>
</tr>
<tr>
<td>• Improved development and growth <em>(Picariello, 2014)</em></td>
<td>• Complex project management plan</td>
</tr>
<tr>
<td>• Defined sense of direction</td>
<td>• Dependent on project manager <em>(Nibusinessinfo.co.uk, 2012)</em></td>
</tr>
<tr>
<td>• Enhanced effectiveness in delivering services <em>(Picariello, 2014)</em></td>
<td>• Micromanagement <em>(McQuerrey Lisa)</em></td>
</tr>
<tr>
<td>• Workflow management <em>(McQuerrey Lisa)</em></td>
<td>• Lack of ownership</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPPURTUNITIES</th>
<th>THREATS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Versatility in projects types</td>
<td>• Uncertain project proposal</td>
</tr>
<tr>
<td>• Growing demand for project managers</td>
<td>• Lack of sufficient academic programs in project management</td>
</tr>
<tr>
<td>• Companies building strong project management disciplines</td>
<td>• Financial solvency of companies <em>(Tyson Bruce, 2010)</em></td>
</tr>
<tr>
<td>• Greater awareness and accessibility</td>
<td>• Personal issues (sickness, unanticipated termination <em>(Tyson Bruce, 2010)</em></td>
</tr>
<tr>
<td>• Easy implementation</td>
<td>• Stakeholders indecision/expectation</td>
</tr>
<tr>
<td>• Improved professional perception</td>
<td>• Resource constraints</td>
</tr>
<tr>
<td><em>(Project Management Learning)</em></td>
<td></td>
</tr>
</tbody>
</table>

*Table 2. Phase-oriented PM S.W.O.T analysis*
2. S.W.O.T ANALYSIS OF DESIGN THINKING/SCRUM PROCESS BASED ON THE REFLECTIONS FROM OPENLAB PARTICIPANTS

<table>
<thead>
<tr>
<th>Strength</th>
<th>Weakness</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Innovative idea generation</td>
<td>• Probability for conflicting ideas/personalities</td>
</tr>
<tr>
<td>• Freedom of expression</td>
<td>• Possible to go off rail</td>
</tr>
<tr>
<td>• Openness and tolerance within groups</td>
<td>• Unbalanced leadership problems</td>
</tr>
<tr>
<td>• Self discipline</td>
<td>• Possible time consumption</td>
</tr>
<tr>
<td>• Open communication (face to face)</td>
<td>• Wild goose chase if not regulated</td>
</tr>
<tr>
<td>• Low bureaucratic overheads (meetings, documentations)</td>
<td>• Unstable working hours</td>
</tr>
<tr>
<td>• Practical feel of the job</td>
<td>• Possible lack of compromise among project members</td>
</tr>
<tr>
<td>• Project ownership by group members</td>
<td>• Rising cost</td>
</tr>
<tr>
<td>• Improved passion for work</td>
<td></td>
</tr>
<tr>
<td>• Cross-functional self-organizing groups</td>
<td></td>
</tr>
<tr>
<td>• Regular stakeholder feedback</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Competition</td>
<td>• Limited to certain projects</td>
</tr>
<tr>
<td>• Fast changing market environment</td>
<td>• Unstable working hours</td>
</tr>
<tr>
<td>• Globalization</td>
<td>• Untrained group members</td>
</tr>
<tr>
<td>• Multi-disciplinary team approach</td>
<td>• Lack of awareness</td>
</tr>
<tr>
<td>• Fast changing tools/technology</td>
<td>• Lack of implementation</td>
</tr>
<tr>
<td>• Dynamic workforce</td>
<td>• Training resource availability</td>
</tr>
<tr>
<td></td>
<td>• Management commitment</td>
</tr>
</tbody>
</table>

Table 1. Design thinking/scrum SWOT analysis