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AGILE ADOPTION IN INVESTMENT BANKS


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TITLE: AGILE ADOPTION IN INVESTMENT BANKS

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ABSTRACT

Many companies and organizations, regardless of industries, countries, size, and cultures, are in the process of transiting from traditional project management methods to Agile. When it comes to financial industry, today's investment banks, face more unstable market conditions, faster changes of worldwide politics, economies and technologies, stricter regulations, and greater pressure to meet customers' requirements and sustain revenue growth. Investment banks are usually full-service global financial institutions, which provide advisory and financing banking services, as well as sales, market making, and research on financial products. Therefore, investment banks are in great need to transform from traditional PM concepts to Agile. However, a big issue in investment banks is the lack of applying Agile. To address this issue, this thesis is focusing on "what is the current status of adopting Agile in investment banks", "why investment banks have not fully adopted Agile", "why investment banks should adopt Agile methodology" and "how to apply agile in investment banks".

The research of this thesis will be conducted using two main approaches. To answer the first three questions mentioned above, two main approaches, researching the existing articles and questionnaire survey among the investment banks employees, will be used. Based on the findings and conclusions of the research and the survey, recommendations will be provided to address how investment banks can successfully apply Agile within the organization. The results of the research will be able to provide a guidance for investment banks on how to smoothly transit from traditional project management methods to Agile, and help to bring more attention to this topic and stimulate more related research in the future.

KEYWORDS:

Investment banks; Agile; Change

1. INTRODUCTION

Many companies and organizations, regardless of industries, countries, size, and cultures, have been using professional project management theories and methodologies to manage the creation and development of their products and services. Most companies used to use traditional project methods such as Waterfall, Critical Path, Six Sigma, etc. However, due to the increasingly rapid changes in the world and the emergence and development of new technologies, Agile methods have become an appealing alternative for companies striving to improve their performance (Dikert, Paasivaara, & Lassenius, 2016). Agile was first adopted in IT industry, especially in IT software development area, and was originally designed for small, single-team projects. However, their shown and potential benefits have made them attractive also outside this context, particularly both for larger projects and in larger companies (Dikert, Paasivaara, & Lassenius, 2016).

Since the benefits of Agile method go beyond most of the traditional project management method, it becomes more and more popular and has been adopted within numerous companies in different industries, including financial industry (Jaubert, Ullrich, Dela, Marcu, & Malbate, 2014). In fact, today's financial institutions, especially investment banks, are facing more unstable market conditions, faster changes of worldwide politics, economies and technologies, bigger risks, more strict regulations, and greater pressure to meet customers' requirements and sustain revenue growth and retain market share at the same time in an increasingly competitive environment (Christou, Ponis, & Palaiologou, 2010). Therefore, investment banks are in great need to transform from traditional project management concepts to new agile methodologies. However, a big issue of current project management in investment banks is that despite project

management concept has existed in investment banks for years, the lack of applying new agile methodology is still occurring in most investment banks.

This issue happens for many reasons. First, most investment banks are usually across different countries, time zones, and cultures (Montoya, 2016). The size of the companies and the complexity of the organizational structure make it difficult to apply agile within the whole organization. Second, after the 2008 financial crisis, the financial regulatory environment becomes tighter than any time before. To comply with the regulatory and auditory requirement, these investment banks usually need to keep extensive documentation, which is an intrinsic component of waterfall method. Therefore, sometimes, waterfall method is remained due to the pressure of complying with all those regulations. However, the most important cause of this issue is that many investment banks don't know how to adopt and apply agile within their organization and the research regarding this topic is really limited out there. Due to the lack of research and guidance, many companies choose to keep the waterfall method as a safer option instead of a sudden change of management method and operating model (Kroll & Kruchten, 2003).

Therefore, this thesis aims to shorten the gap between practical needs and the research of the current status of adopting Agile in investment banks, why investment banks have not fully adopted Agile, why investment banks should adopt Agile methodology, and how to apply agile in investment banks. The purpose of this thesis is to provide some guidance and roadmaps that investment banks can follow to successfully transit from traditional project management method to new Agile method. To realize this purpose, this thesis will analyze this topic from four main aspects. This thesis first starts with identifying the current project management problems within the investment banks that require research. After identifying and clarifying the research problems, the literature review part summarizes the opinions from some current researchers. The

literature review is composed of four parts, which include Background of Adopting Agile in Investment Banks, Barriers to Adopting Agile in Investment Banks, Drawbacks of Waterfall Method and Benefits of Agile Method, and How to Apply Agile in Investment Banks. The literature review gives the audience a general idea of what has been discussed in the current research and what areas potentially require more investigation and research. After research on the specific topic, this thesis provides proposed solutions, focusing on what results are expected, how the results will be produced and how the problems will be solved. At last, this thesis will end with a solid conclusions and recommendations, emphasizing on the urgency and importance of researching this topic, and its practical meaning to the financial industry.

The thesis seeks to provide a qualitative research to identify practitioner approaches and assist investment banks to transform from traditional project management method to Agile and help the transition more smoothly. The major results from this thesis are practical and theoretical insights that will provide investment banks some guidance for the Agile transition in order to better deal with the increasing challenge of dynamism.

Overview of Chapter

- Problem Statement and Justification

A description of the current project management problems in investment banks.

- Literature Review – Analysis of Related Work

A literature review of existing research regarding the agile adoption in investment banks.

- Proposed Solution Approach

A description of approaches to be used for conducting the research and a summary of conclusions and recommendations drawn from the research results.

2. PROBLEM STATEMENT AND JUSTIFICATION

For the past decades, the development and evolution of Project Management theories and methodologies are fascinating. More and more companies begin to transition from traditional project management methodologies, such as waterfall to new agile methodologies in different industries, including finance industry. However, there is a problem with the use of project management in the investment banks. Despite project management concept has existed in the investment banks for a long time, the lack of applying the new agile methodology in investment banks is still occurring in the whole industry.

Today's financial institutions are facing huge changes in technology platforms, financial systems, payments processing systems, asset and risk management systems. And the way to deliver services to customers also changed significantly due to rapid change in the world and the emergence of new technologies. To respond to all these new changes, the financial services industry is a large consumer of IT services, with its IT spending in North America expected to reach \$71 billion, and to continue to grow at a four-year compound annual growth rate (CAGR) of 4.1 percent (Montoya, 2016). However, the barriers for investment banks to convert to Agile are still obvious. Because of a large amount of regulation within the financial industry especially for investment banks, investment banks often choose to continue with waterfall methodologies, which hamper them from the benefits of using agile, and negatively affect the proper operation and development of investment banks. Until today, there is little, if any research about how to apply the agile methodology in the banking industry. In order to remedy this situation, it is important to investigate why investment banks should adopt agile methodology and how to apply agile in investment banks.

The current Agile adoption problems in investment banks are obvious. In summary, there're two major problems. First, investment banks are currently operating under a legacy technology system and are facing the need to respond to new financial conditions and regulatory environment, which require adopting the Agile method. The failure to adopt Agile methodology would lead to a slow response to development activities, changing market conditions and new clients' requirements. Second, the lack of historical knowledge on Agile adoption in investment bank industry has also impeded technology and service offerings, thereby impacting competitive advantages of investment banks.

3. LITERATURE REVIEW -- ANALYSIS OF RELATED WORK

Agile methods have become an appealing alternative for companies striving to improve their performance, but the methods were originally designed for small and individual teams (Dikert, Paasivaara, & Lassenius, 2016) and were first created and adopted in IT development industry. With the agile method continuing to show benefit in project management within different companies, it has been adopted in different industries.

Background of Adopting Agile in Investment Banks

Investment banks have changed significantly compared to decades ago. Today's financial institutions are facing huge changes in technology platforms, payments processing systems, financial systems, asset and risk management systems while attempting to deliver services in the way customers prefer. From m-payments and the ability to view and trade stock options via mobile phones, to e-payment and trends towards an increase in digital and online banking, to the need to rapidly process and keep track of accounts, balances, interest rates and identify financial trends, while reducing financial risk, the platforms and business applications banks and other

financial firms use have evolved enormously in recent years, and are continuing to do so at a rapid rate (Montoya, 2016).

Market conditions became difficult for the past few years after the 2008 financial crisis. Many financial institutions, especially investment banks are in great need to sustain revenue growth and retain market share in an increasingly competitive environment. IT departments within financial firms are feeling increasing pressure to improve efficiency and speed, while at the same time maintaining controls on cost and capital outlays (Montoya, 2016). The banking sector is well known for using large, sometimes monolithic, legacy systems. Unfortunately, the finance world is among a handful of industries that have yet to fully embrace the idea of project management methodologies and processes, including the technology that streamlines them (Nead, n.d.). Now, banks find themselves having to catch up with rapid advancements in software development that call for new service-oriented computing paradigms (Christou, Ponis, & Palaiologou, 2010). Because agile methods meet a lot of new requirements for banking to do business today, the trend for banks to transit from traditional project management to agile is necessary and is actually happening in some investment banks.

Barriers to Adopting Agile in Investment Banks

The 2008 financial crisis has hit financial industry and the whole economy hard all around the world. It has become the most severe financial crisis after the Great Depression in the 1930s. And two most important reasons that the 2008 financial crisis happened are due to people's underestimate of risks for numerous financial instruments and the loose financial regulatory environment. To remedy this situation and to prevent the same financial crisis to happen again, the government has enacted more strict regulations such as Sarbanes Oxley, SEC, FDIC, the Federal Reserve, Basel II and SEPA directives, etc. Because of a large amount of

regulation within the industry, banks have often continued with waterfall methodologies, or “the tried and true,” due to its perception of having more predictable, defined outcomes (Montoya, 2016).

Not only the increasingly strict regulatory environment hampers the adoption of agile, but also the size of most investment banks creates difficulty in applying agile within the companies. Agile methods were originally designed for small and individual teams. This creates unique challenges when introducing agile at scale, when development teams must synchronize their activities, and there might be a need to interface with other organizational units (Dikert, Paasivaara, & Lassenius, 2016). Many investment banks are actually multinational companies across different countries, time zones, and different cultures. The challenges of Agile adoption by financial institutions is often greatest within the largest firms, which must coordinate development between segregated teams that work individually on one component of the project (Montoya, 2016) or from different time zones and continents.

Another reason that agile is hesitated to be adopted in investment banks is due to the accuracy requirement when doing business. In financial services applications, even the smallest error can cause the loss of thousands or millions, especially when account sweeps and trades must be timed with extreme accuracy. The requirements for due diligence have caused many financial services firms to stay with waterfall development, where the documentation is extremely extensive, for compliance with auditory and other regulations (Montoya, 2016).

Drawbacks of Waterfall Method and Benefits of Agile Method

The traditional waterfall method is widely used in most of the financial institutions currently. However, waterfall method was not designed to have quick response to changes. Waterfall has its own sequence to follow. Once an application or project is in the testing stage, it

is very difficult to go back and change something that was not well-thought out in the concept stage or if some new requirements or new changes has shown up. Therefore, waterfall method is only suitable when the requirements are clear and fixed, the product definition is stable and the technology is understood and unchanged. In fact, delays in the anticipated launch dates for financial services projects have become notorious – and even expected – due to the lengthy process that waterfall requires. Financial institutions that choose to use waterfall to develop strategic projects often see these projects come in late, and over budget (Montoya, 2016).

Today, the economy and the market change so rapidly, as well as the customers' requirements. Agile model welcomes changes and also responds to changes quickly, which is really useful and even necessary to deal with uncertain market conditions. The benefits of agile development — a way of building software in small chunks and short spurts rather than in one big, long "waterfall" project — are well-known: faster-moving projects that are adaptable to change, collaborative groups, end-user feedback throughout the process, quicker successes (Crosman, 2016). Evidence indicates that agile software delivery results in a higher success rate for software projects as compared to waterfall delivery. The product is of higher quality, Quality Assurance costs go down, and more scope can be shipped to market in a shorter period of time (Adomavicius, 2016). In fact, according to some analysis, there's a tenfold decrease in costs for delivery of identical software products for tier 1 banks when an agile approach and toolset were used (Adomavicius, 2016).

Due to the drawbacks of waterfall method when facing the rapidly changing environment, financial services firms are turning, even though slowly, towards investigating Agile development methodologies. They want to reduce time-to-market and see the improved ability to incorporate customer feedback that Agile provides (Montoya, 2016). Agile gives organizations

flexibility and the ability to rapidly adapt and steer itself in a new direction. It's about minimizing handovers and bureaucracy, and empowering people. The aim is to build stronger, more rounded professionals (Jacobs, Schlatmann, & Mahadevan, 2017). Being agile is not just about changing the IT department or any other function on its own. The key has been adhering to the "end-to-end principle" and working in multidisciplinary teams to focus on solving the client's needs and united by a common definition of success (Jacobs, Schlatmann, & Mahadevan, 2017). A new spirit of financial institutions – led by top executives – will lead the way to address market changes, becoming more agile, and improving openness in day-to-day business (Jaubert, Ullrich, Dela, Marcu, & Malbate, 2014).

How to Apply Agile in Investment Banks

For a giant organization, it's not easy to transform from a project management method that has been used for years to a new method, especially when the organization is across different countries, different time zones and different cultures. A sudden change of management method and operating model can be risky. When a financial service decides to go Agile, it makes sense for the transition to be implemented in stages (Montoya, 2016). It is better to make small changes at first, that will realize the most value. Therefore, the planning stage is really important. Careful planning can make the difference between Agile adoption that lets the firm enjoy all of the benefits, or one that falters (Montoya, 2016). Usually, all the key decision-makers and managers need to be in agreement before going forward with the transition plan. Prior to the transition, the tools to be used are selected, or developed and adapted for in-house use. This is an important part of the transition since the documentation of the tools can be critical for a firm that must comply with regulatory and auditory requirements (Montoya, 2016).

For some financial institutions, a hybrid approach may work best, especially at first, which means they combine to use traditional project management method such as waterfall and agile at the same time. In large organizations with intentionally heavy project management methodologies or for complex and large, highly-integrated systems, hybrid is the usual choice (Montoya, 2016). For some teams, agile is not ideal due to their resource management approach, so a plan-driven approach works best to plan the work. For some teams, they have to respond quickly to market changes in order to meet customers' requirement, then Agile is a perfect method to follow. In terms of trends toward Agile, any organization with web or mobile applications tends to move quickly toward Agile (Montoya, 2016).

Another option is to combine the Agile methods and Rational Unified Process (RUP) together to become an Agile Unified Process (AUP). Using Rational Unified Process only can sometimes sacrifice the firm with time, costs and flexibility. Agile Unified Process is an agile public-domain instantiation of Rational Unified Process. It's a simple, easy-to-understand approach to developing business-related software or conducting other projects using agile techniques and concepts while remaining true to Rational Unified Process. It applies agile techniques including agile modeling, test-driven design, agile change management, and database refactoring to improve productivity (Christou, Ponis, & Palaiologou, 2010). Agile cannot be applied in an organization overnight. To successfully apply agile within an organization, the transition needs go through several stages. The first stage is "Inception", during which the team identifies the project's initial scope, a potential architecture, and obtains initial funding and stakeholder acceptance. The second stage is "Elaboration", during which the team establishes the system's feasibility and proposed architecture. The third stage is "Construction", during which the team builds working software on a regular, incremental basis that meets the project

stakeholders' highest-priority needs. The last stage is "Transition", during which the team validates and deploys the system in the production environment (Christou, Ponis, & Palaiologou, 2010). These four stages are the general process to adopt and implement agile in an organization and ultimately transform an organization from traditional project management to agile. However, each organization should also consider their own specific situation and transit to agile based on their own needs and follow their own pace.

No matter what approach to use to apply Agile methods in the company, the people need to be prepared. According to some analysis, the finance and banking industry spends more on information technology projects than any other industry and has the dubious honor of having the highest project failure rate yet invests very little in project and program management training or professional development at the executive project sponsor level (Northcraft, 2017). To apply the new Agile methods and prepare people for the transition, training on new project management knowledge, especially agile methods need to be provided to the employees across the firm.

4. PROPOSED SOLUTION APPROACH

I choose Capstone GRAD 699, therefore, my proposed solution approach focuses on preliminary research in GRAD695 and continued detailed study/research in GRAD699 on the same topic.

Study Design

The problem identified in the earlier stage of this thesis is the lack of adoption of the Agile methodology and the lack of historical knowledge on Agile in investment banks. To further analyze and finally address the problems, this thesis is focusing on what is the current status of

adopting Agile in investment banks, why investment banks have not fully adopted Agile, why investment banks should adopt Agile methodology and how to apply agile in investment banks.

Methodology

The three questions of “what is the current status of adopting Agile in investment banks”, “why investment banks have not fully adopted Agile” and “why investment banks should adopt Agile methodology” are actually the foundation of this thesis. To research the current status of applying Agile in investment banks is the first step. Based on the results of the current status of Agile adoption in investment banks, it is important to figure out why investment banks have not fully adopted Agile and why Agile should be applied more often, which then provide a foundation on how investment banks can successfully apply Agile. To answer the above questions, I have two main approaches. The first approach is to research the existing articles which already discussed and analyzed this topic so that I can get more insights from other people and summarize the findings they have discovered. Since I also work in the financial industry, the second approach is to create a questionnaire survey and distribute the questionnaire to my colleagues and my friends within the investment banking industry. In fact, the “Questionnaire Survey” method was chosen over case study not only because of its feasibility since I personally also work in the investment banking industry, but also because of the difficulty of finding a perfect case of Agile adoption in investment banks. Therefore, a questionnaire survey is a good way to get the first-hand opinions and feedbacks from someone who’re working in investment banks regarding the current status of Agile adoption in investment banks.

The questions of “how to apply Agile in investment banks” is the most practical question to the banking industry. In reality, for most investment banks, it is not that they don’t want to use Agile, it is that they don’t know how to apply Agile in their companies and how to deal with

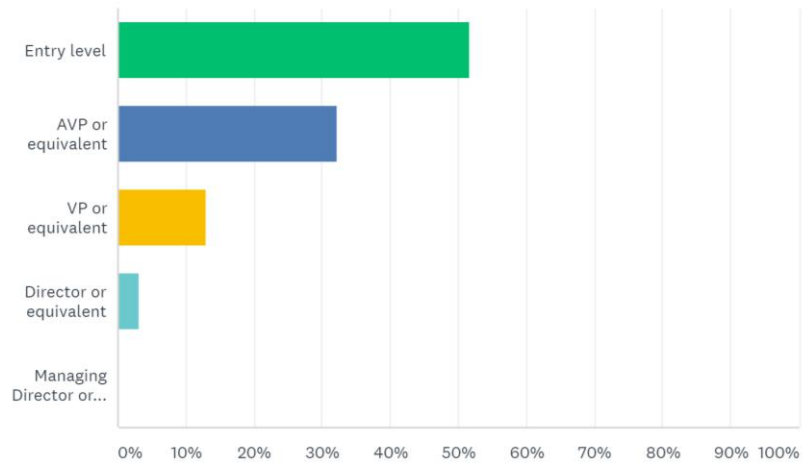
potential problems and threats after they apply Agile. Based on the findings and conclusions of the research of “what is the current status of adopting Agile in investment banks”, “why investment banks have not fully adopted Agile” and “why investment banks should adopt Agile methodology”, recommendations will be provided to address how investment banks can successfully apply Agile within the organization.

The questionnaire was designed with 22 questions, which covered the participants’ job titles and positions in the company, their experience with projects, their experience with different project management methodologies, the level of their experience with the Agile method and their opinions regarding Agile adoption in investment banks. To make sure the results of the survey and the conclusion of the thesis are convincing and not biased, a sample of 32 was chosen. The participants were also selected carefully to make sure they’re from different backgrounds with different positions and different titles, but have some experience with projects. The questionnaire was created in SurveyMonkey and a survey link was created. After some communication with the potential participants in the investment bank, I sent invitation emails including the survey link to each participant. The collection of responses was really successful. 32 participants received survey invitation and 32 responded. The response rate was 100%.

Findings

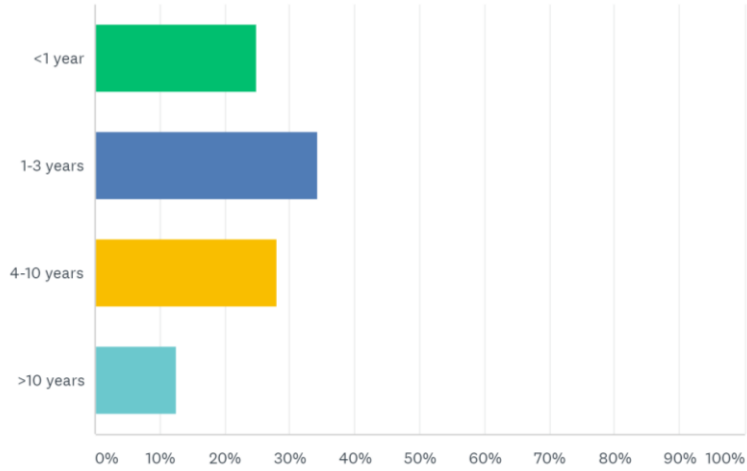
The survey questions were covered several categories, which included the participants’ job titles and positions in the company, their experience with projects, their experience with different project management methodologies, the level of their experience with the Agile method and their opinions regarding Agile adoption in investment banks. The analysis results of all responses really showed some insights of the current status of Agile adoption in investment banks.

The first part of the questionnaire is about the basic work information of the participants. Based on the responses, the job titles of the participants were distributed among Entry Level (51.61%), AVP (32.26%), VP (12.9%) and Director (3.23%) (Chart 1). The positions of the participants are all different, but mostly across project manager, analyst, IT/Software developer, etc. The keywords of the job positions showed that 35.48% of the participants were analysts, 9.68% were project managers and 6.45% were IT/Software developers. 62% of the participants have been working within the organization between 1-10 years (Chart 2), and 81.25% of the participants have been working in present positions between 1-3 years (Chart 3).



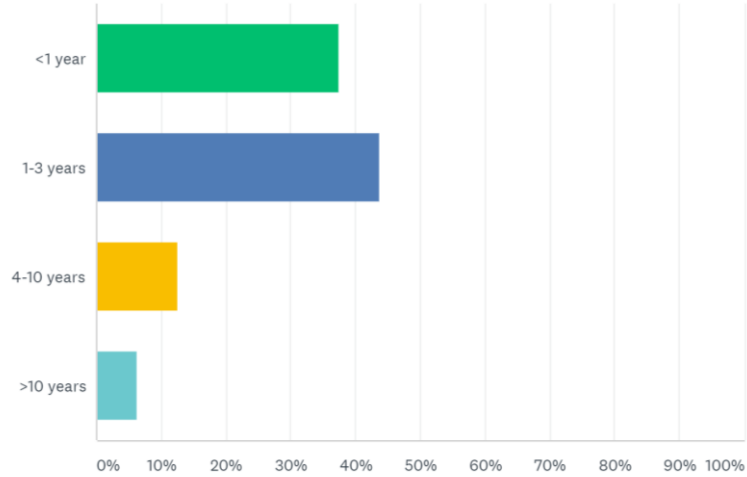
ANSWER CHOICES	RESPONSES
Entry level	51.61% 16
AVP or equivalent	32.26% 10
VP or equivalent	12.90% 4
Director or equivalent	3.23% 1
Managing Director or equivalent	0.00% 0
TOTAL	31

Chart 1: Job Title Distribution



ANSWER CHOICES	RESPONSES	
<1 year	25.00%	8
1-3 years	34.38%	11
4-10 years	28.13%	9
>10 years	12.50%	4
TOTAL		32

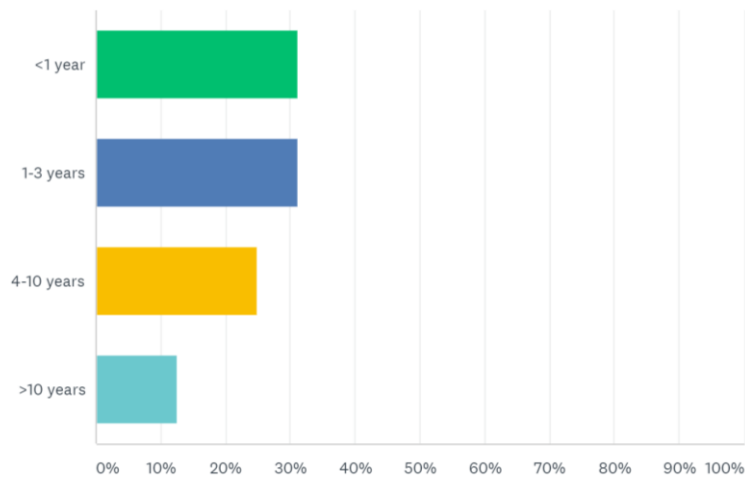
Chart 2: Years of Working in the Organization



ANSWER CHOICES	RESPONSES	
<1 year	37.50%	12
1-3 years	43.75%	14
4-10 years	12.50%	4
>10 years	6.25%	2
TOTAL		32

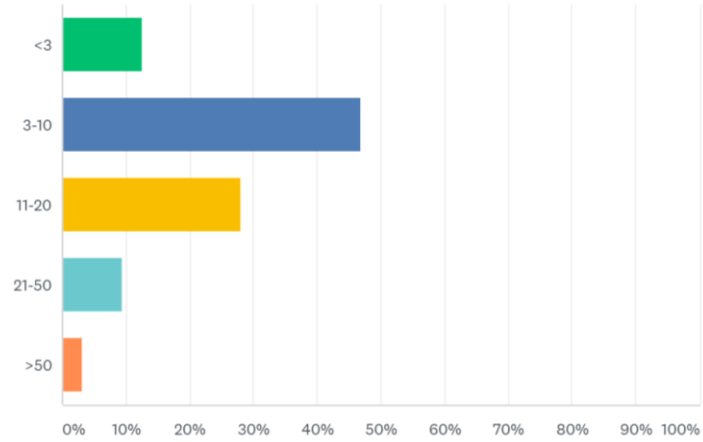
Chart 3: Years of Working in the Current Positions

The second part of the questionnaires is regarding the participants' experience with projects and the characteristics of the projects they involved. According to the responses, 62.5% of the participants have 0-3 years of experience with projects, and 25% have 4-10 years of experience with projects (Chart 4). For all the projects that the participants worked for, 46.88% of the participants were engaged in the projects with 3-10 members, and 28.13% were engaged in the projects with 11-20 members (Chart 5). The majority of the projects last within one year, of which 22.58% last within 3 months, 29.03% last within 3-6 months and 25.81% last within 7-12 months (Chart 6). The budget size of the projects varied significantly, of which 34.48% have a budget size within the US \$100,000, 27.59% have a budget size between the US \$500,000 and \$1,000,000. And the rest of the projects were distributed almost evenly between the budget size of the US \$250,000-500,000 and over the US \$1,000,000 (Chart 7).



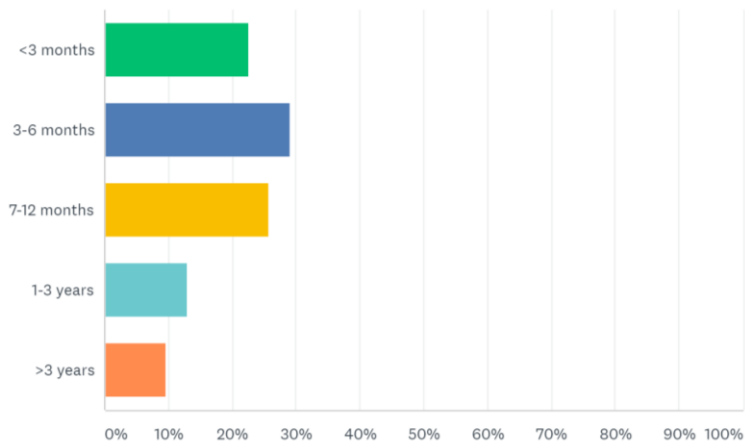
ANSWER CHOICES	RESPONSES	
<1 year	31.25%	10
1-3 years	31.25%	10
4-10 years	25.00%	8
>10 years	12.50%	4
TOTAL		32

Chart 4: Years of Experience with Projects



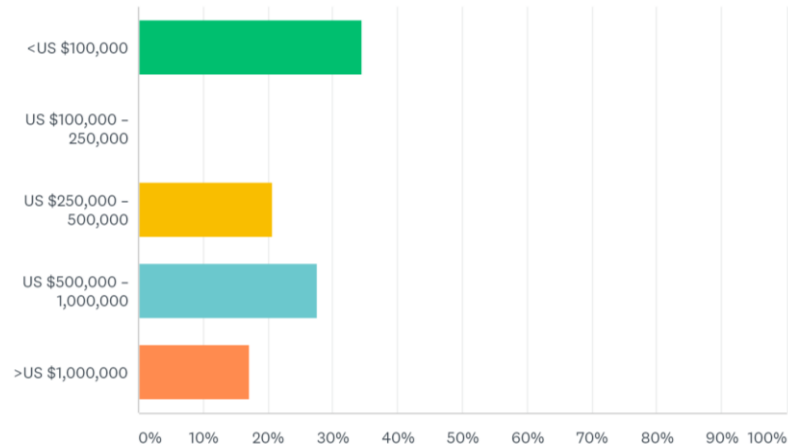
ANSWER CHOICES	RESPONSES
<3	12.50% 4
3-10	46.88% 15
11-20	28.13% 9
21-50	9.38% 3
>50	3.13% 1
TOTAL	32

Chart 5: Number of People Engaged in the Projects



ANSWER CHOICES	RESPONSES
<3 months	22.58% 7
3-6 months	29.03% 9
7-12 months	25.81% 8
1-3 years	12.90% 4
>3 years	9.68% 3
TOTAL	31

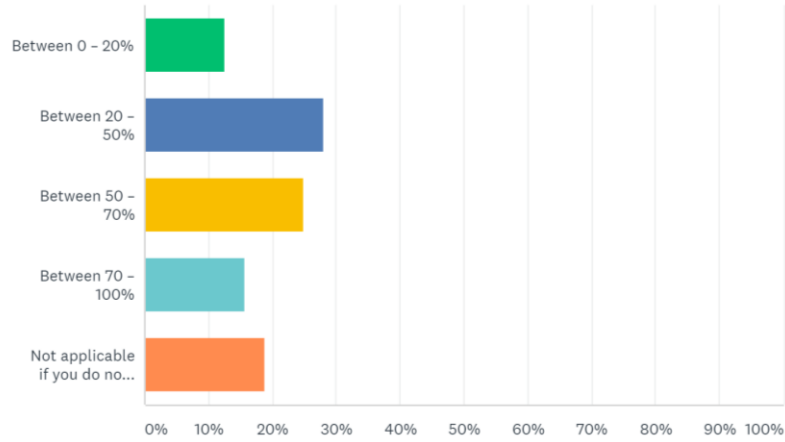
Chart 6: Length of the Projects



ANSWER CHOICES	RESPONSES
<US \$100,000	34.48% 10
US \$100,000 - 250,000	0.00% 0
US \$250,000 - 500,000	20.69% 6
US \$500,000 - 1,000,000	27.59% 8
>US \$1,000,000	17.24% 5
TOTAL	29

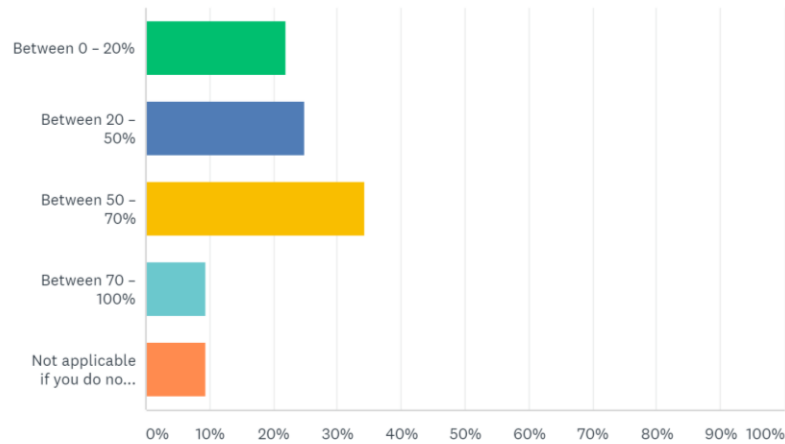
Chart 7: Budget Size of Projects

The third part of the questionnaire is regarding the participants' experience with different project management methodologies and the level of their experience with the Agile method. According to the responses, 68.76% of the projects use a mix of Agile and Waterfall methods or a mix of Agile and other project management methods. Only 12.5% of the projects use Agile model only. For those participants who have used a mix of project management methods for the projects they engaged with, the percentage of projects that use the Waterfall model only and the percentage of the projects that use Agile model only actually have similar distribution with the majority concentrating between 20% - 70% (Chart 8 & 9). Regarding whether there's a difference in the work activity/role when using Waterfall model as compared to the Agile model, 56.25% of the participants agreed there's a difference. However, surprisingly, 28.13% participants are actually not sure whether there's any change between using these two methods.



ANSWER CHOICES	RESPONSES
Between 0 - 20%	12.50% 4
Between 20 - 50%	28.13% 9
Between 50 - 70%	25.00% 8
Between 70 - 100%	15.63% 5
Not applicable if you do not use Waterfall Model	18.75% 6
TOTAL	32

Chart 8: % of Projects Using Waterfall Model Only

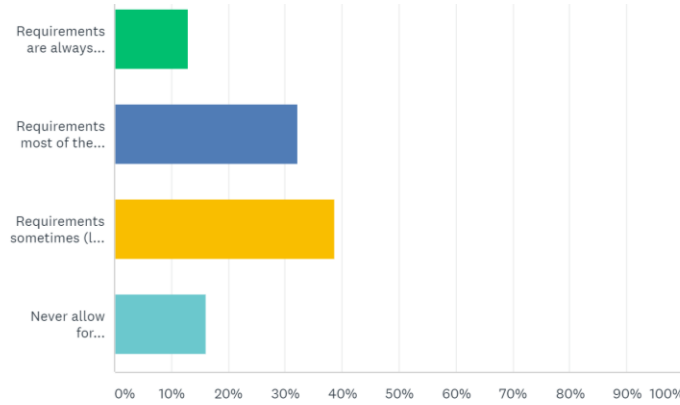


ANSWER CHOICES	RESPONSES
Between 0 - 20%	21.88% 7
Between 20 - 50%	25.00% 8
Between 50 - 70%	34.38% 11
Between 70 - 100%	9.38% 3
Not applicable if you do not use Agile Model	9.38% 3
TOTAL	32

Chart 9: % of Projects Using Agile Model Only

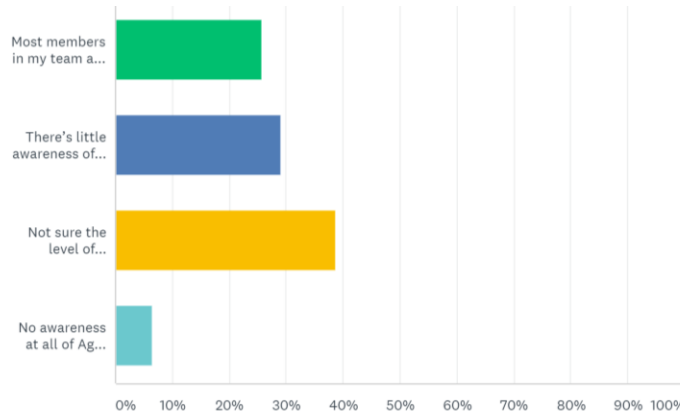
The fourth part of the questionnaire is regarding the participants' opinions of Agile adoption in investment banks. 77.42% of the participants believed the skills to be effective in customer relation, customer services, interaction, and communication are a priority for implementing projects compared to the skills to conduct comprehensive documentation. 70.97% of the participants agreed the requirements from the customers were allowed to change even when the execution of the projects has started (Chart 10). 68.76% of the participants believed the work activities and roles were clearly defined for the projects using Agile model. However, 74.19% of the participants believed there's little/no awareness, or not sure the level of awareness of Agile processes in the organization (Chart 11). 75% of the participants believed the Agile Model fits the environment and culture of investment banks. However, when considering the benefits of using the Agile model in investment banks, the participants' opinions distributed into five categories with the majority (48.38%) concentrating in Higher products/services quality and Increased project control (Chart 12). When it comes to the barriers to adopting Agile in investment banks, 28.13% of the participants believed it's due to the size of investment banks. 37.5% of the participants believed the stricter financial regulations, the size of investment banks, the requirements of accuracy and due diligence for the products/services provided by investment banks and the legacy project management models and systems all create difficulty for applying Agile in investment banks (Chart 13). Regarding whether the Agile method is strongly recommended to be used in the projects over Waterfall model, around 30% of the participants believed "Yes", while 65% participants actually remain neutral. Based on the responses from the participants, the culture of an organization and industry will also influence whether Agile or Waterfall approach is taken. A more hierarchical organization in a more regulated industry would

then to lean towards Waterfall. It also depends on the project, timelines, number of development teams and integration points and stakeholders as to whether Agile is appropriate.



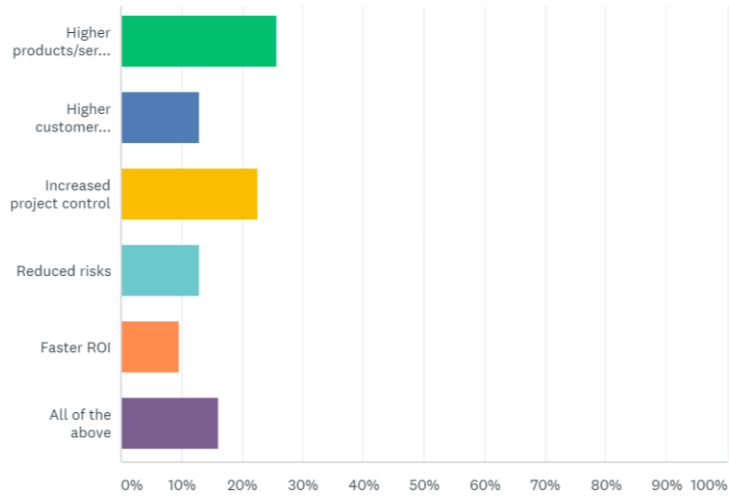
ANSWER CHOICES	RESPONSES
Requirements are always allowed to change and accommodated for the current release	12.90% 4
Requirements most of the time (greater than 50% of the scenarios') are allowed to change and accommodated for the current release	32.26% 10
Requirements sometimes (less than 50% of the scenarios') are allowed to change and accommodated for the current release	38.71% 12
Never allow for requirements to change for the current release, if they're changed, push these changed requirements to be implemented in the next release	16.13% 5
TOTAL	31

Chart 10: Allowance for Customers' Requirements Change



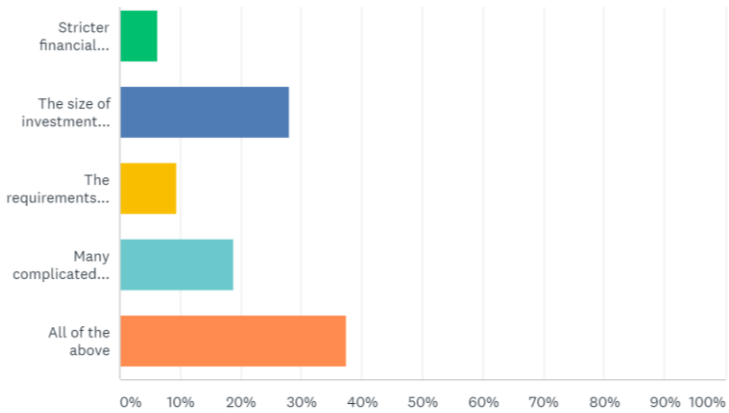
ANSWER CHOICES	RESPONSES
Most members in my team are aware of Agile Model processes, no training is required	25.81% 8
There's little awareness of Agile processes in my team, we need training	29.03% 9
Not sure the level of awareness of Agile processes	38.71% 12
No awareness at all of Agile processes in my team, we for sure need training	6.45% 2
TOTAL	31

Chart 11: The Level of Awareness of Agile Model Process



ANSWER CHOICES	RESPONSES
Higher products/services quality	25.81% 8
Higher customer satisfaction	12.90% 4
Increased project control	22.58% 7
Reduced risks	12.90% 4
Faster ROI	9.68% 3
All of the above	16.13% 5
TOTAL	31

Chat 12: Benefits of Using Agile Model in Investment Banks



ANSWER CHOICES	RESPONSES
Stricter financial regulations require investment banks to have more predictable, defined outcomes	6.25% 2
The size of investment banks creates difficulty in applying agile within the company	28.13% 9
The requirements of accuracy and due diligence for the products/services provided by investment banks	9.38% 3
Many complicated legacy project management models and systems already exist in investment banks for a long time and are hard to change	18.75% 6
All of the above	37.50% 12
TOTAL	32

Chart 13: Barriers to Adopting Agile

Conclusion

Agile is a much better method to deal with changing environment compared to traditional project management method, such as the Waterfall. Due to the benefits of Agile, it has been used more and more often in many industries. Today's financial institutions are facing huge changes in technology platforms, financial systems, payments processing systems, asset and risk management systems. And the way to deliver services to customers also changed significantly due to rapid change in the world and the emergence of new technologies. Market conditions became difficult for the past few years after the 2008 financial crisis. Many financial institutions are in great need to sustain revenue growth and retain market share in an increasingly competitive environment. Therefore, using the traditional project management to manage the investment banks is not enough. It is important to transit to Agile in order to cope with the rapidly changing world.

However, based on the findings of the survey, there is still a lack of use of Agile and even a lack of knowledge of Agile in the financial industry, including investment banks. For all the project implemented within the investment banks, only a small portion (<50%) of projects are using the Agile method. The Waterfall is still the dominant method to be used in most projects within investment banks due to the legacy systems and the requirements to comply with regulations. Another issue is the awareness of Agile method in the whole investment bank is actually surprisingly low and the proper training have not been provided. In some teams, Agile was used in some cases, however, due to the lack of training, the Agile process and methods were not strictly followed and therefore the benefits of Agile were not fully reflected in terms of efficiency, the quality of projects and clients' satisfaction.

Investment banks have their own uniqueness and complexity. The current situations outside and within the organizations, such as the stricter financial regulations, the size of investment banks, the requirements of accuracy and due diligence for the products/services provided by investment banks and the legacy project management models and systems all hamper the adoption of Agile in investment banks. However, according to the findings from the survey, there're still some bright sides. Even if the Agile method has not been widely used within the organization, there're still a great number of projects that already begin to use a mix method of the Agile and other traditional project management models. For the projects using Agile method, the activities, roles, and responsibilities do get clearly defined. A majority of the survey participants also believe the Agile model fits the environment and culture of investments bank. The benefits of Agile methods, such as higher products/services quality, higher customer satisfaction, increased project control, reduced risks and faster ROI, have already been noticed. That means the advantages of Agile methods have already been proved and the potential of wide use of Agile method will be supported by the organizations' vision and culture. Despite that the Agile method has not been fully applied in investment banks, there's a trend of converting from traditional project management methods to Agile methods. Even though the transition is slow, it's happening and is strongly supported by the executives and employees.

Agile is the future. The more rapid changes and the required ability of investment banks to quickly deal with those changes both call for the application of a new project management method. Even though the transition to Agile is not easy and cannot be completed overnight, the mentality of embracing changes and responding to changes quickly is already there. Change is the golden rule for an organization to survive and is exactly the foundation of adopting and widely applying Agile method.

Recommendations

Based on the current literature review and the findings and conclusions of the survey, the lack of application of Agile and the lack of Agile knowledge in investment banks are obvious problems. To address these issues, this portion of the thesis is to focus on how to apply agile in investment banks. To transit to Agile has a long way to go and there're many things that need to be done.

First, reduce project size. One of the reasons why Agile is not fully applied in investment banks is due to the large size of the organization and the large size of the projects. Starting on a large, complex project as a trial run for agile, a process that is new to the organization, is probably not the best idea. A divide and conquer approach when introducing Agile to the enterprise is preferred (Adomavicius, 2016). Select an initiative from the product portfolio and distill it to the smallest functional modules, allowing for the team to iterate on sub-components of the overall product. This gives the opportunity for the cross-functional team to familiarize themselves with the workflow, experience the rhythm of agile rituals, and build confidence in each other (Adomavicius, 2016). Smaller size for both the projects and teams gives the teams more flexibility and enable the team members to communicate ideas and solve problems more efficiently and effectively.

Second, reshape the culture. Investment banks always have their focus on the requirements of accuracy and due diligence for the products and services they provide. That's one of the intrinsic characteristics of investment banks. Agile methods can bring culture shock to a traditional company (Crosman, 2016). Different departments adjust to Agile differently. Some departments adjust to Agile quickly, while some departments still prefer a more stable and predictable environment. In agile, things happen fast, and people need to be willing to adapt to

changes quickly, to work with uncertainty and be accountable for the results (Crosman, 2016). Due to the change and uncertainty Agile brings to the investment banks, the flow of investment dollars is less predictable in agile projects than in traditional projects, therefore, it's going to be difficult to budget in the old way under the Agile model. This requires the investment banks to change their way of budgeting and adapt to the Agile model. Another cultural challenge the investment banks are facing is that Agile is hitting the banks' mindset of conservatism and risk-aversion. The nature of Agile is to embrace changes and create more flexibility, which may cause the managers to feel they have limited control over the process. Therefore, managers need to change their traditional way of managing and have the right people making correct judgments on what's being built and when and trust that they're doing the right thing (Crosman, 2016). Reshaping the culture to adapt to Agile is necessary for investment banks to position themselves well for future relevance.

Third, provide proper training. Based on the findings of the survey, one of the reasons why Agile has not been popularized within the organization is the lack of awareness and the lack of proper training of Agile method across the firm. Some departments or teams have been using the traditional project management methods and tools for a long time, and don't have any knowledge of the new Agile method. Some departments or teams have heard about the Agile method. However, they haven't had any systematic, professional training about Agile models, processes, and tools. Due to the lack of proper training, many teams don't know how to use Agile to implement projects. They had to stick with the old methods and tools, and develop their own processes when conducting projects, even if that means inefficient. It's not uncommon for an organization that is starting an Agile transformation to line up some basic training for their teams to learn what Agile is and how they fit into this new framework. Training is vital before the

action is taken, and even more important to keep taking action. There's no way an Agile transformation will succeed without at least some level of training (Trapani, 2014). Therefore, for teams who work on projects, mandatory training need to be provided and it's required for the teams to complete the training. Considering everyone trains and learns differently, organizations also should offer a wide range of ongoing training and coaching options for individuals and teams at all levels of Agile experience and at all levels of the organization. Investing in ongoing education, especially for team members in key decision-making and project-guiding roles, communicates the company's desire to maintain the most fit and effective workforce, and to get the most out of their Agile framework (Trapani, 2014).

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APPENDICES

QUESTIONNAIRE

Agile Adoption in Investment Bank

Note: The questionnaire should take about 10 minutes to complete. Please note that completion and return of the questionnaire implies consent. You have the right to decline to answer any particular question.

1. What is your job title?

- a. Entry level
- b. AVP or equivalent
- c. VP or equivalent
- d. Director or equivalent
- e. Managing Director or equivalent

2. What is your position? _____

3. How long have you been with your present organization?

- a. <1 year
- b. 1-3 years
- c. 4-10 years
- d. >10 years

4. How long have you been in your present position?

- a. <1 year
- b. 1-3 years
- c. 4-10 years
- d. >10 years

5. Have many years of experience do you have with projects?

- a. <1 year
- b. 1-3 years
- c. 4-10 years
- d. >10 years

6. How many people are engaged in the project you worked for?

- a. <3
- b. 3-10
- c. 11-20
- d. 21-50
- e. >50

7. What was the length of the project (from plan to completion)?

- a. <3 months
- b. 3-6 months
- c. 7-12 months
- d. 1-3 years
- e. >3 years

8. What is the budget size of the programs/projects you worked for?

- a. <US \$100,000
- b. US \$100,000 – 250,000

- c. US \$250,000 – 500,000
- d. US \$500,000 – 1,000,000
- e. >US \$1,000,000

9. Which project management model does your projects use?

- a. Use Waterfall Model only
- b. Use Agile Model only
- c. Use A Mix of Agile and Waterfall
- d. Use A Mix of Agile and other Models
- e. Use Other Models only

If you use other project management models other than Waterfall or Agile, please specify:

10. If your projects use a Mix of development models, define what % of projects use the Waterfall model only?

- a. Between 0 – 20%
- b. Between 20 – 50%
- c. Between 50 – 70%
- d. Between 70 – 100%
- e. Not applicable if you do not use Waterfall Model

11. If your projects use a Mix of development models, define what % of projects use the Agile model only?

- a. Between 0 – 20%
- b. Between 20 – 50%
- c. Between 50 – 70%

- d. Between 70 – 100%
- e. Not applicable if you do not use Agile Model

12. From your experience working on projects, is there a difference in the work activity/role of your jobs when using Traditional Waterfall Model as compared to the Agile Model?

- a. There's a change in work activity/role in the Agile Model compared to the Waterfall Model
- b. There's no change in work activity/role in both the Waterfall and Agile Model
- c. Not sure whether there's a difference in work activity/role in both the Waterfall and Agile Model
- d. Not applicable – if you do not use the Agile Model

13. Which of the below skills (choose one) are a priority for implementing projects?

- a. Skills to conduct comprehensive documentation
- b. Skills to be effective in: customer relation, customer services, interaction and communication

14. On your projects, do you permit any allowance for your customers to change their requirements, once the project execution has started?

- a. Requirements are always allowed to change and accommodated for the current release
- b. Requirements most of the time (greater than 50% of the scenarios') are allowed to change and accommodated for the current release
- c. Requirements sometimes (less than 50% of the scenarios') are allowed to change and accommodated for the current release
- d. Never allow for requirements to change for the current release, if they're changed, push these changed requirements to be implemented in the next release

15. Are the work activities and roles are clearly defined for the projects you work on using Agile Model?

- a. The work activities and roles in most Agile projects (greater than 50%) are clearly defined
- b. The work activities and roles in some Agile projects (less than 50%) are clearly defined
- c. Not sure whether the work activities and roles are clearly defined in Agile projects
- d. Not applicable – if you do not use the Agile Model

16. What is the awareness level of Agile Model process in your organization?

- a. Most members in my team are aware of Agile Model processes, no training is required
- b. There's little awareness of Agile processes in my team, we need training
- c. Not sure the level of awareness of Agile processes
- d. No awareness at all of Agile processes in my team, we for sure need training

17. Do you think whether Agile Model fits the environment and culture of investment banks?

- a. Yes
- b. No
- c. Not sure

18. What do you think are the benefits of using Agile Model in investment banks?

- a. Higher products/services quality
- b. Higher customer satisfaction
- c. Increased project control
- d. Reduced risks
- e. Faster ROI
- f. All of the above

19. What do you think hamper the adoption of Agile in investment banks?

- a. Stricter financial regulations require investment banks to have more predictable, defined outcomes
- b. The size of investment banks creates difficulty in applying agile within the company
- c. The requirements of accuracy and due diligence for the products/services provided by investment banks
- d. Many complicated legacy project management models and systems already exist in investment banks for a long time and are hard to change
- e. All of the above

20. Do you recommend Agile Model process to be implemented in your projects?

- a. Yes, I strongly recommend
- b. No, I do not recommend
- c. Neutral

21. Do you strongly recommend the Agile Model processes over the Waterfall Model in your projects?

- a. Yes, I strongly recommend
- b. No, I do not recommend
- c. Neutral

22. Congratulations, you have just finished the survey. Thank you very much for your participation. You may provide additional comments in the box below: