

Open University Cyprus Hellenic Open University

Faculty of Economics and Management

***Master's joint post graduate Programme
Enterprise Risk Management (ERM)***

MASTER THESIS



**Effective Risk Management Methodologies for Digital Transformation Banking
Projects
A case study for The Digital Transformation Programme in a major Bank in Cyprus**

Marianna Piripitsi

Supervisor

Dr.PandelisIpsilandis

May 2020

Open University Cyprus Hellenic Open University

Faculty of Economics and Management

Master's join post graduate Programme

Enterprise Risk Management (ERM)

MASTER THESIS

**Effective Risk Management Methodologies for Digital Transformation Banking
Projects**

A case study for The Digital Transformation Programme in a major Bank in Cyprus

Marianna Piripitsi

Supervisor

Dr.PandelisIpsilandis

This thesis is submitted for the partial fulfillment of the requirements of the

Master's join post graduate programme

«Enterprise Risk Management (ERM)»

Faculty of Economics and Management

May 2020

BLANK PAGE

Summary

The main purpose of this research is to provide a closer insight to the understanding, application and utility of Risk Management Methodologies for the Digital Transformation projects in the Banking sector and more especially in the case of a major bank in Cyprus. In other words, it will examine how Project Management assesses and analyses risks through these methodologies in terms of the risk management processes in the Bank's project.

The first step to define the Project Risk Management process and practices is to understand the whole process with their proper techniques and tools with prime scope to mitigate and eliminate risks in general. This analysis could help in understanding of the idea and the attributes considered in the assessment of the project risk management.

Apart from this, this dissertation aims to define the existing knowledge and literature review and present some of the most important Information Technology Project Risk Management methodologies in order to complete this kind of project. Project Risk Management methodologies are discussed by presenting their structure and characteristics. There is an analysis of what is the process and significance in each step for the whole implementation of the Digital Transformation and specific key roles each methodology has.

The objective is to recommend a Project Risk Management plan to be developed in the specific or further Digital transformation projects in the banking sector. The collection of the data was made through specially formed questionnaires and interviews respectively to literature review. The IBM Project Executive has also provided some general information and presentations in terms of the general targets of the programme and specific goals of each project. That information is provided to the Bank's case subchapter.

Data Analysis and visual presentation show how the specific project analyses and faces risks within the project methodologies used. The analysis of the results chapter has been divided into four categories (1) Benefits, (2) Risk Management and Risk Management Approaches, (3) Challenges, (4) Suggestions. Those categories are extracted from the qualitative analysis tool Atlas.Ti and will be analysed in Chapter 4 separately. The questionnaire results were directly statistically displayed through Google Forms

The Risk management plan proposal for the specific project will be presented in the subchapter of the Chapter 4 Results. The specific plan has strong evidence based on the data which has been collected from interviews, questionnaires and researcher observatory.

Acknowledgements

First, the key to the successful completion of this master thesis was the continuous understanding and support of my family and friends through the post graduate program, as well as the duration of this dissertation, always reminding me of my capabilities to achieve my goals.

Further, I would like to thank my work colleagues for providing me with their inputs in terms of the project in order to complete the research.

The assistance of my supervising professor Dr.PandelisIpsilandis and his full support have been valuable since the first moment we came in contact, he showed faith in me and the subject of work, relieved my concerns and reinforced my determination for the best possible integration of this dissertation.

Table of Contents

Summary	i
Acknowledgements	ii
Chapter 1	1
Introduction	1
1.1 Background of this Dissertation	2
1.2 Importance of this Dissertation	3
1.3 Purpose of this Dissertation.....	3
1.4 Dissertation Structure	4
1.5 The Bank's case	6
1.6 Conclusion.....	14
Chapter 2	15
Literature Review	15
2.1 Introduction	15
2.2 Project Risk Management	15
2.2.1 Plan Risk Management	17
2.2.2 Risk Identification Process	20
2.2.3 Risk Analysis Approaches	26
2.2.3.1 Perform Qualitative Risk Analysis	26
2.2.3.2 Perform Quantitative Risk Analysis.....	30
2.2.4. Risk Response actions and control.....	32
2.2.5 Implement Risk Responses	35
2.2.6. Monitor Risks	36
2.3 Risk Management Approaches (for projects)	36
2.3.1 Agile.....	37
2.3.1.1 Scrum	39
2.3.3 Waterfall	45
2.3.4 Lean.....	48
2.3.4.1 Kanban	50
2.4 Digital Transformation in Banking Sector	54
Chapter 3	59
Research Methodology	59
3.1 Research Design.....	60
3.1.1 Research Aims.....	60
3.1.2 Research questions	61

3.1.3 Research instruments	62
3.1.4 Questionnaire design	63
3.1.5 Interview design.....	64
3.2 Ethical Issues	64
3.3 Data Collection.....	65
3.4 Data Analysis.....	66
3.5 Limitations.....	66
Chapter 4.....	68
Results.....	68
4.1 Benefits	68
4.2 Risk Management and Risk Management Approaches	69
4.3 Challenges	78
4.4 Suggestions	80
Chapter 5.....	89
Discussion and Conclusion.....	89
Annexes.....	91
A. Personal Interviews.....	91
A.1 Interview 1.....	91
A.2 Interview 2	97
A.3 Interview 3	106
B. Questionnaire Sample.....	114
C. Coding Table.....	120
Bibliography	121

Chapter1

Introduction

Risk Management is a commonly used term in several industries, including financial, healthcare, manufacturing or accounting and legal sectors. Regardless of the sector, each field has its own Risk Management Standards, but the main approach of the basic terms usually remains the same. The Project Management Institute (2008) stated that Project risk management belongs amongst the ten most critical parts in committing a project. It's significant to mention that PMI's publication Project Management Body of Knowledge (PMBOK) is widely used as a comprehensive summary of all project management processes and principles which is also considered the foundation for PMI certification. All processes such as Project scope statement, Cost Management Plan, schedule Management Plan, Communications Management Plan, Enterprise Environmental Factors, Organizational Process and Assets are correlated.

Information Technology (IT) projects are struggling to achieve success due to the demand of high budgets and complexity. The majority of the projects usually fail to meet deadlines, cost and quality targets (Kendrick, 2009). In such projects, each of the three primary targets, Cost, Time and Quality are likely to be subjected to risk and uncertainty. Most of the time, managers get the project into trouble in their attempt to minimize costs. The lack of proper risk management methodology can place projects in being highly hazardous.

The dissertation focuses on the IT project methodologies of Project Risk Management in Digital Transformation projects and examines the case of what approaches Project

Managers are using to manage and analyse risks in the specific digital transformation project of a major bank in Cyprus.

This chapter presents the background and explains the importance and the purpose of this dissertation. The dissertation structure is also presented here. Finally, it introduces the case of the banks' in terms of several projects and how IBM is involved as a strategy partner and discusses many parts of the project as defined in the project statement of work.

1.1 Background of this Dissertation

Bask Iyer, CIO of Juniper Networks Martha Heller (2014) said "It is time to step into digital!". This is a new powerful slogan in the market for all types of business. It is a fact that one of the tendencies in the banking industry is that the largest banks have invested big sums in establishing digital transformation. Such transformational projects are facing a huge number of challenges that businesses are constantly trying to find successful ways to overcome.

For the successful completion of the bank's digitalization requires a high budget due to the high number of different technologies involved and the large volume of data. For example, cloud infrastructures and modern communication channels must be integrated with the bank systems. Moreover, centralized platform availability could help monitor the security and compliance requirements.

Another challenge for financial companies is that Information Technology projects tend to possess a high rate of failure by shortage of time, resources, funds, etc. A successful project concludes delivery completion exactly on time within the forecasted budget while illustrating the desired quality standards. The absence of clear and specific scope and objectives, correct time and cost estimations can lead to the lack of appropriate project planning (Kendrick, 2015). Project Management is essential for taking the correct decisions, managing scopes, budgets, resources and risks in an effective way to detect signals and take suitable actions in advance.

Hence, this research could be an important indication of the present project situation so as to become more effective and proactive or even become a prototype to be considered for future progress and provisions for other relevant projects.

1.2 Importance of this Dissertation

Nowadays, a bank Information Technology development decision tends to be the nerve centre of technology. Gartner Inc. (2009) defines that digitalization in bank sector could be "the back-end data processing applications for processing all transactions that have occurred during the day and posting updated data on account balances to the mainframe." The rapid advance in the technology field, helps banks obtain or retain more customers by adopting improved technology and systems such as e-banking and mobile banking.

From an operational perspective, the technology power reduces the transaction costs, improves customer service and offers convenience both to banks and its clients.

However, the process of banking digitization due to its complexity stakes potential harmful risks which may cause failure to projects.

Hence, the main concept of the dissertation is the possible methodologies of Project Risk Management in Digital Transformation projects and examines the case of what approaches Project Managers are using to manage and analyse risks in the specific digital transformation project of a major Bank project.

1.3 Purpose of this Dissertation

The aim of this dissertation is to study the risk management processes in a specific digital transformation project in the Banking sector, and to discuss the extent of an effective management strategy based on the pre-arranged business scale.

The research outcome is expected to contribute to a recommendation for the case company so it can develop suitable customized project risk management, as well as to introduce a guide for digital transformation project regarding project risk assessment and

management. It intends to examine and present the selected data which will derive followed by conclusions and interpretations of the results.

The research questions established and to be studied are:

- What are the main points and differences among various Risk Management approaches proposed by professional organizations?
- What Project Management Methodologies were used in the specific Bank's DT Programme to assess risks?
- How does a Project team assess risks and implement an effective risk management strategy?
- What Project Risk Strategy can be proposed?

To achieve the above-mentioned goals, we start with an extensive literature review which includes the project risk management process assessment including the practices for each process, as well as its relationship with the Project Management methodologies (Agile, Scrum, etc.) used in Digital Transformation banking projects.

Moreover, the project risks which are being faced during the implementation will be assessed, how they will be assessed, which means and practices the Project Management will be identified, analysed and classified. Following that, qualitative research will be conducted via personal interviews and questionnaires.

Finally, with the research results, the researcher will be helped to create a Project Risk Plan for banking projects who desire to go into digitalization.

1.4 Dissertation Structure

This dissertation uses a major banking project undertaken by IBM Company aimed at supporting the transformation of the whole bank as a case study that will provide insight as to the Risk management process in Digitization of banks in Cyprus.

Due to the complexity and the several technology involvements, the project is facing many risks. According to Project Management Institutes (2008), the Project Risk Management is part of the Project Management duties. So, the dissertation is going to peer how Project Management assesses these problems.

In the first chapter of this dissertation, the relevant theory is analysed, as well as its importance to the banking sector and then its purpose, where the individual goals are presented and briefly described among each goal and explains the purpose of the dissertation's results. Lastly, the last point of the first chapter refers to several parts of the Bank's project including each project goal. After the completion of each project, the project will hopefully succeed with the integration of all projects - technologies.

In the next chapter, Literature Review, the researcher discusses Project Risk Management processes generally and after this, the dissertation focuses on the process tools and techniques including some examples of Informational Technology Project Management methodologies and characteristics which are also discussed. Furthermore, in the same chapter, there is also a part discussing Digital Transformation in the Banking sector in general.

In the Research Methodology chapter, the required data for the research are presented in order to achieve the dissertation goals. After this, the available data through the literature review are discussed, combined with proposed methods to analyse the available data. The researcher chooses the most fitting method, the qualitative methodology via personal interviews with experienced Senior resources in the project. By the discussion of the results, the researcher has the ability to reach conclusions about the assessment of project risks and to create a Project Risk Plan.

Finally, in the last chapter, the research is completed with a proposal by the researcher to the banking sector for a better utilization of a Project Risk Plan supporting banking digital transformation projects. In the same chapter, the strong and weak points of the dissertation are presented along with the researcher's final conclusions.

This dissertation is completed by important and complementary annexes which includes the interview script.

1.5 The Bank's case

This thesis aims to examine the case of a major's Banking Digital Transformation program. It is worth mentioning that the Bank is leading to the decision to leap into digitalization and selected IBM as the strategic partner.

The bank has a total 121 branches in the country and some abroad. The main scope of the bank is to improve to excellence its financial products in a digital competitive advantage world. As the ex- CEO said, "Embracing modern ways of working and modernizing our IT environment is a must. We are excited about this program and the opportunity to work with IBM in delivering this essential formulation in our continuing Transformation" (IBM News Release, 2017) and will be implemented by an enterprise-wide process re-engineering program which will digitize and automate the processes meanwhile directing routine customer interactions towards digital channels. The redesign of the digital channels will be applied by the IBM IX capabilities.

On the other hand, the IBM General Manager of Banking and Financial Services, Likhit Wagle said "With IBM's help, the Bank will use market leading digital innovation to improve efficiency and agility across the organization in order to provide a significantly superior experience to its customers"(IBM News Release, 2017).

Next, the main idea and high-level goals of the Program are presented.

Pillar 1: "Become more customer centric"

- Develop a robust and scalable application integration and orchestration layer that will foster reusability of business and technical components, provide the foundation to rapidly deploy future major initiatives and reduce maintenance and development costs. Develop Master Data Management capabilities for customer and product data
- Branch transformation initiative to improve customer experience, boost self-service and optimize service.
- Provide enhanced unified desktop platform to the branches and client face channels, integrating advanced sales and services platform capabilities and enabling advanced 360 customer view.
- Upgrade Internet with advanced features and improved user experience

- Define the bank's mobile strategy and drive the implementation of new mobile propositions. Explore enterprise mobility alternatives for Reconfiguration Management and client facing personnel
- Develop customer experience management capabilities and capture and analyse customer feedback through all channels
- Optimize segmentation. provide campaign management and advanced campaign execution and evaluation capabilities. Implement and integrate NBA capabilities.

Pillar 2: "Safeguard the Bank's capital & insure steady revenue generation"

- Provide uniform workflow, content management and related tools for deployment across the bank – to support re-engineering of loan origination processes, approvals, debt management, remedial etc. Support process re-engineering with advanced analytics
- Enhance the informational and analytical foundation of the Bank to be able to provide advanced customer insights and informed analytics
- Aims to enhance core banking systems to enable customer-oriented process implementation (e.g., cards, Cost Insurance Freight, deposits, and related functional services). Rationalize portfolio and reduce Total Cost Ownership (e.g. ATM Switch).

Pillar 3: "Maintain Operational Excellence"

- IT Support Services - Improved IT operation & management processes with emphasis on improving application development methods and techniques providing on demand and cloud capabilities

The case of the research Bank had a vision to create a significant and sustainable competitive advantage by greatly enhancing the digital banking service with the construction of an Agile Technology Ecosystem. The following are some of the required technologies to accomplish the Digital Transformation programme in the specific case study.

Application Programming Interfaces (APIs) Economy:The bank research opens its Application programming interfaces (APIs) to corporate customers enabling them to integrate directly to the Bank system, gaining a Science Training Programme (STP)

experience. Bank reduces cost from eliminated branch visits, targets potential income from relevant fees and creates client- bank dependencies.

Mobile Payments (Apple Pay, Android Pay, Samsung Pay): Mobile Applications allow customers to securely store the credit card information on their devices, eliminate plastic and perform transactions by placing their phone near a Point of Sales (POS).

Cognitive computing: Can help banks mine for insight as big data grows rapidly in volume, variety and complexity. The technology can be applied to understand any form of unstructured information. Through this, the case Bank will be able to offer quick and personalized services to customers. It can also be seen as a potential competitive advantage, given the vast customer data the Bank has or can collect given its market share.

Chatbots: A chatbot is an artificial intelligence software used to simulate intelligent conversation through written or spoken text. Not considered as intelligent enough yet to be adopted for significant operations in the Financial Industry, something which can be expected over the next few years. Ultimately it could be used in customer support, call centers and even simple transactions.

Blockchain: The technology has the potential of changing the entire banking landscape. The basic premise of the technology is to eliminate any middle layer in transactions by distributing the information over the internet making it impossible for anyone to control or make unauthorized changes. This can have huge implications on how payments are made or how contracts are taken or enforced. Technology startups are emerging while a consortium with the largest banks is working to define practical applications of this technology.

Crowdfunding: It uses internet-based collaboration tools to raise money to fund projects. People are funding projects that are part of community culture or in return for equity. Banks are evaluating crowdfunding as a potential disrupter.

The Digital Transformation which is structured in three (3) pillars. Channels redesign, CRM & Unified Front End and Technology Foundation. An Innovation layer will service all three pillars:

A successful Digital Transformation requires the channel Reinvention which is a complete redesign of customer channels with an emphasis on mobile and a high level of personalization based on cognitive insights derived from internal and external data.

The Digital front office applies to the digitized end to end processes to drive agility, faster execution / customer onboarding and world class, omni- channel experience through the new CRM and branch front- office initiatives. Introduce mobility for sales personnel and customer service.

From the other hand, Agile Delivery is another part of the Digital Transformation in Banking. This is a new approach for Information Technology delivery, shifting focus from run-the-bank to change-the-bank, leveraging technology to infuse innovation and drive process optimization. Reduce time-to-market and streamline delivery using a digital factory approach.

A significant part is the process simplification and standardization across business units to improve time to market, increase agility and drive the substantial structural cost reduction (-20%) planned in the business case. The aim is to gradually redesign branch & back-office processes and deliver a sustainable operating model leveraging a hybrid cloud infrastructure.

The Ecosystem development of the business and technology infrastructure required to expand the Strategy Partner. Targeted initiatives that will infuse innovation, increase collaboration with clients. fintech and the present Bank ecosystem and attract Gen Z customers.

In detail below several parts of the program with the initial goals are listed. Subsequently, IBM gained much more projects and opportunities for the bank research and added some more value to the customer. However, there appeared some risks and delays to some parts.

Joint Innovation Capability (JIC):

For both the Bank and IBM, innovation is a central characteristic to their strategies. Both companies realize clearly that innovation is crucial in transforming their business models, additionally developing a robust innovation capability is integral to being able to sustain

this demanding transformation. The Statement of Work outlines the framework that allows the Bank and IBM to work together, identifying the different sources of innovation that IBM can bring. Likewise, the objective is to ultimately generate innovation and transfer innovation capabilities to the management of innovation in the bank's environment.

The major bank will share with IBM, its strategic vision and innovation initiatives currently underway within the business and in the technology organization, to establish a baseline for the joint collaboration by the two organizations on innovation.

IBM has a continuous investment in its Research & Design labs that generates significant contributions to its services and products. This output will be available to the Bank as part of this Joint Innovation Capability. The Bank's Joint Innovation Capability will leverage IBM services, tools, methodologies and development technologies.

The "Office of Innovation" jointly managed by the Bank and IBM will be created as soon as the Digital Transformation Program is set up. During the first months of the Program, the Bank and IBM work to detail the mission, define the structure, processes and resource / skill requirements, as well as the initial focus areas of the Innovation stream.

The joint Innovation stream will be active throughout the duration of the Digital Transformation program culminating with the transfer and exclusive management by the Bank during the last cycle of this project.

The mission of both parties Joint Innovation Capability Initiative is (JIC) to envision and develop revolutionary ideas which elevate business value of innovation to the specific Bank, providing information and access to leading technologies, research capabilities and business process innovation-while facilitating the smooth migration from concept to proof-of-concept, the way it has been planned, along with its full implementation.

This capability will be cultivated and staffed by IBM, in conjunction with the Bank within the first year of Transformation. The indispensable knowledge and experience will be shifted to the Bank progressively over the course of the Transformation, with the corresponding centre being run by the Bank, parallel to IBM's support, by the fulfilment of the Transformation.

Unified Front End (UFE):

The main objective of this engagement is to deliver to the bank a new Unified Front End ("UFE") solution that will provide Microsoft Dynamics 365 for Customer Engagement, On Premise Deployment (CRM) and financial transactions functionality and:

- Cover the Bank's functional requirements. The user experience will be defined during the analysis phase and jointly agreed between the two parties,
- Implementation of UFE will replace the existing Counsellor and Finesse applications and provide a new platform for the Bank to perform the functions which are currently executed in Counsellor and Finesse,
- Incorporate in a Unified Front End the Bank' branch applications,
- Expose re-engineered branch and back-office processes. Process re-engineering is a significant aspect of the Digital Transformation Project. Underlying processes will be redesigned based on Bank' requirements and may differ based on the business line, customer segment, product and employee role. During the project's lifecycle, at least subsequent processes should be revisited: customer onboarding, account opening, existing Counsellor work orders. As new processes are defined by Digital Factory, they should be easily integrated in UFE and become available under the right context screen to match the context of the process.

For example, for a new customer level process, UFE should include a clearly defined and flexible mechanism to add an "action" that will initiate the process for the selected customer. This action should apply on the bank's security policy to display actions only for relevant roles. This applies also for the context of account and card as well. Pending work orders per customer should be readily available within the Customer 360 view.

Digital Factory (DF):

DF is a key dimension of the Digital Transformation Project. It is a delivery structure that aims to standardize, industrialize and accelerate the Bank's software development process, including specification to software implementation and maintenance. The Digital Factory:

- Covers the redesign and development of the Bank's customer facing and internal processes. The main target is to develop reusable processes for all business lines (where possible) which will be exposed to the different channels (including for instance UFE, 1bank, mobile, external applications),
- Replenish integration with the Bank's back end systems for all projects as requested by the Bank. The support will furthermore include amongst other, transactional integration, data integration as well as integration with business processes, as well as implementation of published specifications,
- Implements specific applications, such as the new IBU Gateway,
- Delivers the externally facing APIs, such as payment service directive ("PSD2")-driven and open bank project APIs,
- Implements mobile banking initiatives based on the CX standards and guidelines to be developed through the "Customer Experience for Mobile ("CX)". The Bank will have the right to select which technology will be used by the cell related to the implementation of the above-mentioned mobile banking initiatives,
- Supports any other initiatives that the Bank may decide.

The DF will cover two (2) main functions:

- Product delivery ("Product Deliver"): The actual software development activities which are the main objective of the DF per se. It will supply professional services for the full software development lifecycle.
- Product maintenance and support for the implementations are delivered through the Digital Factory.

Customer Data Mart (CDM):

The specific project covers the analysis, design and implementation of a Customer Data Mart based on the "IBM Customer 360 view" asset. This asset contains, if not all, most of the

data that will be used for the initiatives undertaken by the Bank in the area of digital marketing ("Digital Marketing") but also in the area of analytics for creating the needed predictive and descriptive models ("Analytics"). The new data mart will suffice both Campaign Management System and Analytics initiatives of the Bank. It will also serve as the Data Mart for integrating derived data for Unified Front End through the service bus. The infrastructure details for securing relevant performance for Analytics and online queries workloads will be discussed and agreed during the detailed design phase.

Campaign Management System (CMS):

The present project defines the implementation of Bank's Digital Marketing initiatives which is also part of the overall Digital Transformation Program. The implementation of Campaign Management foundational capabilities aiming to achieve marketing process automation, enable centralized decisioning capabilities and establish the overall Governance structure for the Marketing Management & Operations functions as well as supporting functions of the Bank. It covers:

- The Campaign Management System implementation based on the IBM Marketing Platform, integrating the solution with the new Customer Data Mart.
- The digital campaign execution channels through the IBM Marketing Cloud and Bank's existing infrastructure (Email, SMS, Push, Internet Banking)
- The integration of the solution within the Bank's operational environment. The Campaign Management System (CMS) will evolve in parallel with the UFE implementation (Counsellor replacement). The UFE will integrate with the CMS, retrieving lists for campaign execution, pushing to the CMS the response history for branch and call centre executed campaigns and displaying the response history for other channels.
- Supporting services to the Bank's Marketing Operations department(s) to better leverage and expand the solution.

Customer Experience for Mobile (CX):

The goal of the engagement will be to redesign the customer experience for the Bank's mobile presence considering the overall objective for a seamless omni-channel customer experience. The engagement described in the present Scope of Work document is the first step towards an upgraded, fully differentiated mobile presence as it will:

- Drive the required decisions and define the detailed roadmap for the implementation of the prioritized mobile initiatives (product backlog).
- Define the customer experience standards (for instance camera, fingerprint, face recognition), guidelines and templates that will be used throughout the program to implement mobile initiatives.
- Develop a prototype based on the above standards that will then be expanded to become the first Minimum Viable Product (MVP) Deliverable of the Digital Transformation Program (through the Digital Factory Mobile implementation structure). This prototype will be non-functional which means that it will just simulate the user experience.

The customer experience foundation will then be leveraged by the Digital Factory for the development of the Bank's mobile roadmap following an agile approach with continuous releases.

1.6 Conclusion

The researcher, in order to implement the research, firstly attempted to understand the specific case of the Bank, the main goals of the project as well to distinguish the relevant practices used in the whole Programme on how Project Management identify, analyse and respond to that risks.

Following this, the researcher briefly analysed the kinds of approaches used by the completion of the bank's projects as well as to create a reliable and comprehensive research plan for the purposes of the research.

Chapter 2

Literature Review

2.1 Introduction

An impactful Project Risk management process requires each project governance to devote an adequate amount of time to plan the future activities of their project. There can be inputs, tools and techniques and outputs in order to provide guidance for implementing the project strategy and objectives. A key aspect of developing a proper risk plan is to mitigate issues and problems and catching opportunities on time.

In order to accomplish the established goals and implement the strategy, a project risk management plan is often created as it is an effective tool for providing direction to the project scope (Kerzner, 2017).

Usually, company's projects have been involving clients. So, there is a need to communicate company's procedures (regarding risk management) together with client's processes in order to find a common way to work and avoid the risks.

2.2 Project Risk Management

An increasing number of firms' projects maintain as their main vision to implement new products, processes and other types of change. Successful projects need to meet deadlines, cost, quality and performance. However, in a project cycle, risks and challenges are facing due to complexity and other significant factors. Small and large projects must communicate an effective Project Risk Management plan in teams in order to avoid the possible failure.

What it is defined by the Association for Project Management (APM, 2006) about risk is “an uncertain event or set of circumstances that, should it occur, will have an effect on the achievement of the project’s objectives”.

On the other hand, the Project Management Institute’s PMBOK (2018) has given a very similar definition “an uncertain event or condition that, if it occurs, has a positive or negative effect on a project’s objectives”.

Both APM and PMI standards have developed their own processes in order to deal with risks including tools and techniques to either reduce the probability of occurrence of an event or reduce its impact on the project. Events or impacts cannot provide only negative (threats) effects but positive (opportunities) as well.

This can be noticed in the definitions provided by PMI and APM:

“Project risk management includes the processes of conducting risk management planning, identification, analysis, response planning, and monitoring and control on a project. The objectives of project risk management are to increase the probability and impact of positive events, and decrease the probability and impact of negative events in the project”.

Project Management Institute, 2008

Project risk management is a structured process that allows individual risk events and overall project risk to be understood and managed proactively, optimizing project success by minimizing threats and maximizing opportunities.

Association for Project Management, 2006

In accordance with Prince2 Standards (**Office of Government Commerce, 2017**) the Risk Management procedure starts with identifying, assessing, planning, implementing and communicating the risks. Each individual step has its risk management systems and tools.

The Project Risk management process has been analysed in this chapter according to the Project Management Institute (PMBOK, 2018) since the specific project case is based on these Information Technology perspective guidelines.

1. Plan Risk Management
2. Identify Risks
3. Perform Qualitative Risk Analysis
4. Perform Quantitative Risk Analysis
5. Plan Risk Responses
6. Implement Risk Responses
7. Monitor Risks

2.2.1 Plan Risk Management

The literature has widely acknowledged that is the process of defining how to conduct risk management activities for a project. It ensures that the degree, type, and visibility of risk management are commensurate with both the risks and the importance of the project to the organization (PMBOK, 2018).

Kendrick (2009) analysed the three reasons which a project can be failed. One reason is that the project objectives may be outside the technical capabilities available. A second failure reason could happen to a possible deliverable, but all the rest have unrealistic objectives. The last and the most frequent reason is that there is too little smart work. It is worth mentioning that the risk and project planning enable projects to distinguish among and to deal with all three situations.

Avoiding any failure for any mentioned reason, Project Governance must prepare and decide Project Risk Plan document before the starting of the project. This document sets out the strategic requirement for risk assessment and the whole risk management procedure. Generally, the risk management plan should be produced at the estimating or contract tender stage to ensure that adequate provisions are made in the cost build-up of the pilot document.

This plan intends to define the course of action and areas to which risk management applies, particularly the risk types to be investigated in order to meet the project's objectives. Additionally, it will specify which tools and techniques can be used to all processes such as risk identification and assessment processes. Lastly, it sets about the type, content and frequency of reports, defines the roles of the risk owners and interprets the impact and probability criteria in qualitative or quantitative terms regarding cost, time and quality(Lester, 2017).

Tools and techniques are addressed in the Project Risk Management plan and each of them can be involved to each or to most Project risk management steps.

Plan Risk Management Practices

1. Expert judgment

Judgment and expertise should be considered from groups or individuals with specialized training or knowledge on the subject area.

2. Data Analysis

- Used to understand and define the overall risk management context of the project.
- A stakeholder risk profile analysis may be performed to grade and qualify the project stakeholder risk appetite and tolerance.
- Depending on assessments, the project team can allocate appropriate resources and focus on the risk management activities.

3. Meetings

- The risk management plan is developed in the planning meeting.
- Risk cost elements and scheduled activities are determined in prior.
- Templates for risk categories and definitions of terms are tailored to the project.

Generally, the main **content** of a project risk management plan (Project Management Institute, 2018) includes:

Strategy: Describes the general approach to managing risk on this project.

Methodology: Determines the approaches, tools, and data sources which might be used to perform risk management on the project. Different types of assessments may be appropriate, depending upon the project stage, the amount of information available, and flexibility remaining in risk management.

Roles and responsibilities: Outline the lead, support, and risk management team membership for each type of action in the risk management plan. Team members are assigned roles and their responsibilities are determined.

Funding: Funds needed to perform risk management related activities. Establishes the cost for the application of contingency and management reserves.

Timing: Defines how often the risk management process will be performed throughout the project life cycle. Risk management activities are included in the project schedule. Results should be developed early enough to affect decisions. The decisions should be revisited periodically during a project execution.

Risk Categories: Ensures a comprehensive process of identifying risk to a consistent level of detail and contributes to the effectiveness and quality of Risk Identification.

Definition of Risk Probability and Impact: Definition of risk levels based upon probability and impact to be defined that are specific to the project context.

In comparison with PMI (2018), PRINCE2 Risk Management Strategy (2017) also includes the Early Warning Indicators which is specifying the correct action whether critical aspects are reached.

Risk Tolerance is also appearing in PRINCE2's strategy by defining the risk expectations of the Project Governance and the threshold level of risk exposure, clarifying when the risk should be escalated.

2.2.2 Risk Identification Process

Dr Galli (2017) stated that identifying risks also implies the decision of which of them provide delivery impact on the project.

The risks and threats can lead to project delay and reduce the quality output (Burnes, 2005).

Massive projects with high level of complexity risks should be raised and identified at the initiative stage. All members must raise risk any time and when this occurs, the Risk Originator should identify a risk applicable to an aspect of the project (e.g. scope, deliverables, timescales), and inform the Project Manager, preferably through a formal and written communication (Purdy, 2010).

PMBOK (PMBOK - PMI, 2018) has separated risk identification methods in three steps and have defined the systematic risk approach for organizations and researchers. These steps are:

- Identification
- Analysis
- Monitor and Control.

Each step has its own tools and techniques to be more effective.

Project Management Institute (2018) was mentioned to 7 tools and techniques for the identification of the risks.

Risk identification Practices

1. Expert Judgments

Experts with relevant experience can suggest possible risks. Previous studies support that experts like specialists and analysts are granted the knowledge and flexibility to be able to translate their experience and models into judgements relevant to the issue. For example,

analysts have their own tasks to formulate and decompose the specific challenges therefore helping in improving the specialist's reasoning.

However, there is also the generalist role, which could be the Program Manager who has broadened knowledge of several or even all the risks in the specific project or had similar experience in equivalent projects (Chapman & Ward, 2003).

2. Data Gathering Practices

What Cooper et al (2004) said in his book gathering risk information might include historical data, theoretical analysis, empirical data and analysis, informed opinions of the project team and other experts and stakeholders' concerns.

a) Interviewing: Risks are identified by interviewing experienced project managers or subject-matter experts. The person in charge of risk identification identifies the appropriate individuals, briefs them on the project, and provides information such as the Work Breakdown Structure and the list of assumptions. The literature has widely acknowledged that the Work Breakdown Structure is the tasks assigned by the project team to the relevant experience resource. Through Work Breakdown Structure technique in subtasks or work packages, Project management should be able to estimate and plan the project cost and if required a risk factor can also be added and creates a risk register for a subsequent, more rigorous risk assessment (Lester, 2017).

Previous studies defined that interviews, surveys, market research with key intended users will help to uncover risks and can shift in the assumptions the project is based upon. For example, Agile methodology projects which will be analysed in the next chapter, supports that the key members involvement can minimize the wrong deliverable risk successfully (Kendrick, 2009).

b) Brainstorming: Probably is the most frequently used risk identification technique. Brainstorming technique performed by the project team, although a multidisciplinary set of experts can also perform this technique. The goal is to obtain a comprehensive list of risks that can be addressed later in the qualitative and quantitative risk analysis processes. Under the leadership of a facilitator, the team generates ideas about project risk. The

sources of risk are identified in broad scope, posted, categorized by type of risk, and then the definitions sharpened.

c) Checklists: Are lists based on historical information and knowledge that has been accumulated from previous similar projects and other sources of information.

An advantage of this method is the quick and simple risk identification. However, the disadvantage of using a checklist is that building a checklist with every possible risk is impossible, and the user may be limited to the categories that appear on the list. Care should be taken to explore relevant items that do not appear on a standard checklist. The checklist should itemize all types of possible risks to the project and should be formally reviewed at every project-closing to incorporate new lessons learned and improve it for use on future projects.

In brainstorming sessions were involving executives with more than 15 years' experience to identify risk factors and subfactors in the process. Also, it is added that, in such sessions, they were given checklists of possible risk to be identified. However, in such sessions, executives were developing the risk structure (Kumar, 2002).

What Chapman & Ward (2003) stated about the identification approach is that brainstorm sessions and *creative* techniques for the project team to consider risk issues. In such an approach, the involvement of experts with a high level of experience and backgrounds, utilize the thought of others and make the team to view situations from an unfamiliar perspective.

3. Data Analysis

a) Root cause analysis: This type of analysis determines the primary causes of a project's risks. Its fine tunes the definition of the risk and risks are grouped by causes. In 2015, Lowensen was presented that an effective method of Root cause analysis must be followed by the below stages:

1. Identifying the problem- symptoms
2. Collection of the data from resources
3. Identifies the possible causal factor
4. Recommendations and Implementations of the information

b) Assumption and constraint analysis: Every project is conceived and developed based on a set of hypotheses, scenarios, or assumptions. Assumptions and constraints analysis are a technique that explores whether the assumptions are valid. Identifies project risks from inaccuracy, inconsistency, or incompleteness of assumptions. These project risks are the mental concept that exists when considering an activity in the future (even if this risk is not measured or characterized). It comprises two main features:

- i) values at stake (consequences with respect to something that humans' value) and
- ii) uncertainties (what will the consequences be?).

Alternative ways of explicitly formulating this idea exist.(Aven, 2020)

c) SWOT analysis: This technique ensures the examination of the project from each of the SWOT (strengths, weaknesses, opportunities, and threats) perspectives to increase the breadth of the risks considered.

The literature has widely acknowledged SWOT analysis is a similar method with scenario analysis. Several delivery solutions projects across to closure need to revisit both the identified weaknesses and threats in order to ensure that any that are adequately addressed in your planning are noted as risks (Kendrick, 2015).

d) Document analysis: Includes a structured review of the project plans and assumptions, both at the total project and detailed scope levels, as well as reviews of prior project files and other informational sources.

These contradictory findings suggest that for external projects, the consultant company needs to prepare this document because the customer is not expertise and trained for that. Consultant need to submit the Statement of work to the customer in order to get the relevant approval to proceed. Based on this approved document, Project Manager can estimate the work effort and price accordingly (Kerzner, 2017).

e) Interpersonal and team skills: Includes but not limited to facilitation to ensure clear risk descriptions, identity and overcome bias and resolve disagreements.

Interpersonal and team skills are required by project managers and experts in order to observe matters of uncertainty. Looking risks in different technical perspectives and can

give attention to what is requested and what is change of request. Negotiation or other resolution techniques are used to resolve these situations (Yoe, 2019).

f) Prompt lists: A prompt list is a predetermined list of risk categories that might give rise to project risks and which can be used as a framework to aid in idea generation.

Such lists include problems and issues that may affect specific aspects compiled from previous project experience. Whole list concludes that the activities could be affected by unexpected situations. Author supports that this practice benefits projects to save time and give attention to real responsibilities. However, past problems may not be applicable in the specific project (Lester, 2017).

Chapman & Ward (2003) have given as example the use of prompt lists by analysts which they could fill in details of the activities making up each project activity in order to adapt for the risk management objectives. A frequent question they use is “what are the uncertainties associated with this component activity?”.

g) Meetings

Risk Workshops: A type of meeting, could include brainstorming and may be conducted by a skilled facilitator in order to gather risk data. A good facilitator, during workshops, follows an agreed agenda and keeps a clear record. Listening and paraphrasing skills are required for its job and need to have the ability to attract people in discussions and meeting creativity participation (Kerzner, 2017).

Risk Identification Outputs

1. Risk Register

What the Project Management Institute (2018) stated about Risk Register is that it contains the outcomes of the other risk management processes beginning with the Risk Identification process and becomes available to other Project Management and Project Risk Management processes.

Kendrick (2015), in Creating Risk Register part of his book mentioned that when a risk appears and is visible it is good to log it with a clear description, not in a complicated way and also mentioning the consequences. The collection of clear risks definition could

support the analysis and assessment process. Author defined that a risk register list could be a table, spreadsheet, database or even a specialized risk tracking application. An effective risk register should be provided by a clear risk description including the root causes and uncertain assumptions, the assessment of probabilities, the estimation and description of the risk impacts, the overall rating and the triggers or signals that each risk may occur. In addition, in this list must mention the potential risk owners who are identified in this phase and responses are used as inputs to the Risk response planning process. Risk response planning process should refer to a contingency or recovery summary.

Author Harris (2009) characterized Risk register list as a safeguard because this effectual way could alert top management to avoid project failure in terms of cost, delivery on time or quality in case management will act on time to sensible evaluation of the risks.

2. Risk Report

Risk report is presenting information on sources of overall project risk and provides a summary information on individual project risk and is developed progressively throughout the Project Risk Management process. The quarterly reporting of risk should become part of project cycle reporting processes in order to avoid projects being out of scope.

Previous studies suggest that all kinds of projects should be required monthly risk reports in terms of the status and progress by project leaders to a supervisory authority. These reports act as a project review board or linked to the project sponsor, owner or users.

Internal body structure is used for such reports and also should be filled with summary risk details by all sources. The recipe of the structure is the output of the risk register list information. However, the risk report mention its risk nature and source, if previously any risk reported what any changes in these parameters since the previous report, responsibility for risk treatment and an abstract of the risk treatment plan, which will summarize the salient details of recommended actions, principal decision points and criteria for closure, and will provide a reference to the detailed risk treatment plan for the source of risk in question (Cooper et al, 2004).

3. Project Documents Updates

Documents that may be updated include but are not limited to:

Assumption log: New assumptions and constraints may be identified, and existing ones re-evaluated.

Issue log: Should be updated to capture new or changed issues.

Lessons learned register: Can be updated with information on techniques that were effective in risk identification, to improve performance in later phases or projects.

2.2.3 Risk Analysis Approaches

2.2.3.1 Perform Qualitative Risk Analysis

An effective risk analysis method considers priority risks that appear in each existing activity, processes or plans in order to mitigate or control the risk. Qualitative analysis tools and techniques are describing risk's likelihood and consequences based on nominal or descriptive scales. On a quick required assessment, this method is helpful due to easy review or screening (Cooper et al, 2004).

1. Expert judgment

Used to assess the probability and impact of each risk to determine its location in the matrix. Various studies have found (Lester, 2017) that from the experience of past projects and the involvement of expert resources, the impact and effects can be easily rated as High, Medium and Low and decide the risk to be taken.

2. Data gathering

Interviews can be used to assess the probability and impacts of individual project risks, as well as other factors. According to Yoe (2019), interviews practice is important to gather risk data. Within that technique, experts are asked well-prepared questions allowing them to recognize project possible risks and topics for discussions and also see them in new perspectives. Qualitative research with interview technique prefers open questions in order to be simply answered while each question is addressing a single topic in the same language with interviewee.

3. Data analysis

a) Risk Data Quality Assessment: A technique used to evaluate the degree to which the data about risks is useful for risk management. It involves the examination of the extent of understanding of the risk, the availability of risk data, the quality of the data and the data reliability and integrity.

The contradictory findings suggest that sundry risks are not well understood in all levels due to its data complexity and periodical occurrence. However, some other risks are unique and appear frequently to past projects as well. This type of data quality assessments tends to evaluate the probabilities and impacts for the appeared risks which most of the time are based on insufficient information. Qualitative risk assessment helps to analyse the information in order to develop a special treatment for these risks examining the data mentioned above to categorize probability and impact. For cases where information is weak, experts or other sources should be sought out for better information providing (Kendrick, 2015).

b) Risk Probability and Impact Assessment: Into Project Management Institute words (2018), Risk probability is the likelihood that a risk may occur. Risk impact (or consequences) is the effect on project objectives if the risk event occurs. These two dimensions of risk are applied to specific risk events, not to the overall project. This technique helps the identification of those risks that should be managed aggressively. Risk probability and impact are rated according to the definitions in the Risk Management Plan.

Kendrick (2003) demonstrates the analysis method for qualitative probability assessment, which is using three level ranges, assigning:

- High 50 percent or higher (Likely)
- Medium Between 10 and 50 percent (Unlikely)
- Low 10 percent or lower (Very unlikely)

Risks with low impact are documented in the watch list for future tracking.

Project Risk Plan is also referring to the three ranges of impact with “High”, “medium”, or “low” which set objectives and plan like:

- High Project objective is at risk (mandatory change to one or more of scope, schedule, and resources).
- Medium Project objectives are okay, but significant re -planning is required.
- Low No major plan changes; the risk is an inconvenience, or it will be handled through minor overtime work.

Risk = Impact x Probability

4. Interpersonal and team skills

Facilitation improves the effectiveness of the qualitative analysis of individual project risks and overcome bias.

5. Risk categorization

Risks are a group to determine root causes and develop effective risk responses. Categories include sources of risk and the area of the project affected. The Resource Breakdown Structure (RBS) and Work Breakdown Structure (WBS) can be used to categorize risks. Risks can also be categorized by common root causes (Hopkin, 2017).

6. Data representation

a) Probability and Impact Matrix: A matrix that assigns risk ratings (very low, low, moderate, high, and very high) to risks or conditions based on combining probability and impact scales. The risk rating is determined using a matrix and risk scales for each risk.

The organization must determine which combinations of probability and impact results in a risk being classified as a high risk with dark grey light condition, moderate risk with grey condition, and low risk with light grey condition for either a cardinal or ordinal approach. The risk score helps put the risk into a category that will guide risk response actions.

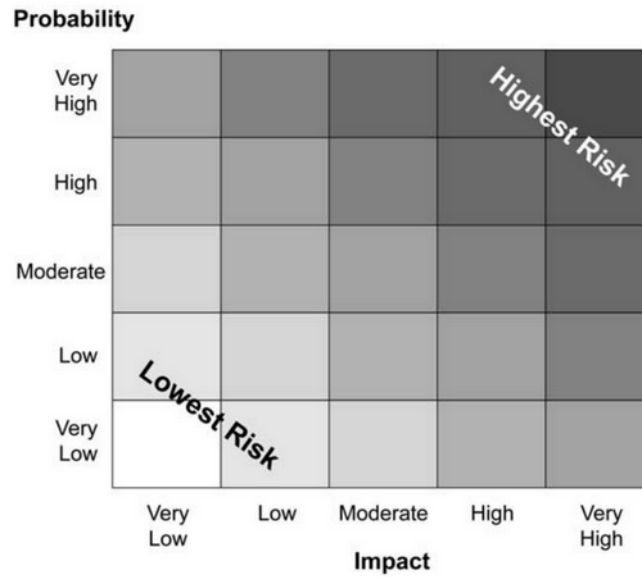


Figure 2.1: Probability and Impact Matrix in 2003

Source: Tom Kendrick

High risk in the overall assessment tends to be high right level, with very high impact and probability. Risks up to a determined level are selected for representation to the management for decisions to mitigate risk. Representing the outcome of risk assessment, requires also the ranking of the risks against the risk appetite of the corporation or the risk criteria that have been established.

ISO 31000:2009 is describing risk rating and ranking as risk evaluation in combination of likelihood and impact of a risk. Additionally, this terminology is the level of risk. Each organization produces its unique definitions in terms of the size, nature and complexity of the project (Hopkin, 2017).

b) Hierarchical charts: The literature has widely acknowledged that this type of chart adapts with risks which have been categorized with more than two parameters, and the probability and impact matrix cannot be used. A bubble chart could be used, for example. Determines which risks are urgent. Indicators that determine urgency include time to affect a risk response, symptoms and warning signs and the risk rating. This assessment is combined with the risk ranking defined in the probability and impact matrix to provide the final risk severity rating (Yoe, 2019).

7. Meetings

Risk workshop: A type of meeting, could be facilitated with main scope to assign a risk owner to each individual risk. During those meetings several additional risks may appear (Cooper et al, 2004).

2.2.3.2 Perform Quantitative Risk Analysis

Quantitative analysis uses numerical ratio scales for likelihoods and consequences, rather than descriptive scales. (Cooper et al, 2004)

1. Expert Judgment

Using experts with relevant, recent experience to identify potential cost and schedule impacts, evaluate probability, interpret the data, and make tool recommendations.

For example, in Information Technology Projects, in order to avoid risks, project Managers need to allow technical experts to participate in assessments. Nevertheless, expert diversities may cost and requires a lack of time (Aven, 2020).

2. Data Gathering

Interviewing: Used to quantify the probability and consequences of risks on project objectives. The information needed depends upon the type of probability distributions that will be used. For instance, information would be gathered on the optimistic (low), pessimistic (high) and the most likely scenarios if triangular distributions are used, or on mean and standard deviation for the normal and log normal distributions. For effective risk response strategies, it is important to document the rationale of the risk ranges.

Probability distributions: Represents the uncertainty regarding the duration of schedule activities and the cost of project components. Discrete distributions can be used to represent certain events.

3. Interpersonal and Team Skills

An example of Interpersonal and team skills, a facilitated workshop can build consensus among participants and use creative approaches to deal with conflict or bias.

4. Representations of uncertainty

Where the duration, cost or resource requirement is uncertain, the range of possible values can be represented in the model as a probability distribution.

5. Data Analysis

a) Sensitivity analysis: Determines which risks have the most potential impact on a project. Vose (2008) using Tornado Diagram tends to indicate the input interaction to the value of the output and check if the results are behaving as it is expected. This interaction is represented by a bar chart providing an easy and quick identification overview to the most influential risk parameters.

It is good to mention that this type of data risk analysis is commonly used into project processes. However, there are two different methods to complete it but both methods plot the variable against a statistic that takes values from -1 where the output is completely dependent on the input and when the input is large, the output is small. Although when both are 0 means that there is influence at all and +1 the opposite of -1., when the output is completely dependent on the input and when the input is large, the output is large as well.

b) Expected monetary value (EMV) & Decision tree analysis: Kendrick (2015) described EMV as it is calculating the average outcome when the future includes scenarios that may or may not happen. He also defined its formula by multiplying the value of each possible outcome by its probability of occurring and adding them together. EMV usually is structured as a decision tree which is represented by a diagram that describes a decision under consideration and the implications of choosing one or another of the available alternatives. This type of analysis attempts to break down a series of events into smaller, simpler, and more manageable segments and it incorporates probabilities of risks and the costs or rewards of each logical path of events and future decisions. Solving the decision tree indicates which decision yields the greatest expected value to the decision-maker when all the uncertain implications, costs, rewards, and subsequent decisions are quantified. It is worthy to say that decision tree analysis involves the multiplication of probabilities by a specific \$ value (EMV) of a decision to perform analysis as to which decision path is best but alternatives are showing also.

Kumar (2002) said that this graphical tree has branches where stands of the possible action- event combinations and the payoff is written at the end of each. Decision tree analysis has similar details as a matrix showing depict multiple stage decisions as well.

c) Modelling and Simulation: Uses a model that translates the uncertainties specified at a detailed level into their potential impact on objectives that are expressed at the level of the total project.

Project simulations are typically performed using the Monte Carlo technique. Author, in Principles of risk analysis book (Yoe, 2019) analysed that this process can replace any other quantitative model since it is an effective software tool for assessing risks easily, using any spreadsheet model. The Monte Carlo outputs are based on input distributions of values (calculations, intermediate calculations or model outputs) which are analysed using any statistical techniques to support decision making.

For a cost risk analysis, a simulation may use the traditional project Work Breakdown Structure as its model. Work Breakdown structure is a document with full details with several work packages with the resources needed to comprise the project completion. This document also provides the cost items associated with each WP that have an element of uncertainty. There could be some risks or opportunities as discrete events that may affect the cost as well (Vose, 2008).

2.2.4. Risk Response actions and control

1. Expert Judgment

Input from knowledgeable parties pertaining to actions to be taken on a specific and refined risk.

2. Data Gathering

Interviews with stakeholders can be used to develop responses to individual project risks and overall project risk.

3. Interpersonal and Team Skills

Facilitation can help risk owners understand the risk, compare response strategies, and overcome bias.

4. Contingent Response Strategies

Response plans designed for use if predefined conditions occur. Risk responses identified using this technique, are also known as fallback plans. What Ward and Chapman (2003) acknowledged is that contingency planning indicates a consciously accepting of risk. Project Managers set resources apart from the project in order to cope with adverse impacts if they cause. Therefore, the project manager may set aside a contingency reserve of physical resources, finance, or time in case of need. Risk analysis may be useful to determine the appropriate level of contingency provision.

5. Strategies for Project Risk

a) Avoid: Where the level of overall project risk is significantly negative and outside the agreed-upon risk thresholds for the project, an avoid strategy may be adopted. Avoiding risks may affect the project plan or approach to eliminate the risk, protects the project objectives from the risk impact, or relaxes the object that is in jeopardy. Some undesired risk events that arise early in the project can be avoided by clarifying requirements, obtaining information, improving communication, acquiring expertise (Cooper, 2004).

b) Exploit: Where the level of overall project risk is significantly positive and outside the agreed-upon risk thresholds for the project, an avoid exploit strategy may be adopted.

Exploit strategy also removes the uncertainty associated with positive risks. The actions taken help to ensure that the risk occurs. Moreover, this response includes adding talented resources to reduce the time of project completion or providing better quality.

c) Transfer/share: If the level of overall project risk is high but the organization is unable to address it effectively, a third party may be involved to manage the risk on behalf of the organization. For financial projects, risks may transfer to a third-party company such as insurance, performance bonds, warranties and guarantees that will compensate the loss of the event of a casualty covered by the policy. With this solution, the company will decrease the financial impact that should occur by the risk (Wideman, 2001).

Assigns ownership of a positive risk to a third party who is best able to capture the opportunity to benefit the project. Sharing includes forming risk-sharing partnerships, teams or joint ventures.

According to Kendrick (2003), risk transfer response is not a common strategy for technical projects but accepting the risk either if happens or not. Any impact on the budget falls outside the project, limiting the resource impact. For example, if the project has resource skill scarcity, the project manager has to hire an expert or consultant to get work done. However, the risk does not actually transfer to the third party but remains to the team.

d) Mitigate: These strategies involve changing the level of overall project risk to optimize the chances of achieving the project's objectives. Reduces the probability of impact of an adverse risk event to an acceptable level. Taking early action helps reduce the probability of an adverse risk occurring and/or the severity of the impact and is more effective than repairing the consequences after the risk has occurred. Must take into consideration the mitigation costs given the likely probability of the risk and its consequences (Kendrick, 2015).

e) Accept: Where no proactive risk response strategy is possible to address the overall project risk, the organization may choose to continue with the project as currently defined, even if overall project risk is outside the agreed-upon thresholds. Project team makes a conscious decision to not change the project plan to handle the risk and may also not be able to identify any other suitable response strategy other than accepting the risk (Yoe,2019).

f) Escalate: Escalation response is appropriate when the project team or sponsor agrees that an opportunity/threat is outside the scope of the project or that the proposed response would exceed the project manager's authority. Escalated opportunities/threats are managed at the program or portfolio level, or other relevant part of the organization (PMBOK, 2018).

g) Enhance: Increases the probability or positive impacts of an opportunity by identifying key drivers of the positive-impact risks. For instance, delivering on time or earlier additional resources are required. (PMBOK, 2018).

6. Data Analysis

a) Alternatives analysis: A comparison of the characteristics and responses of alternative risk response options.

b) Cost-benefit analysis: Can be determined if the impact of individual project risk can be quantified in monetary terms.

7. Decision Making

Can include multicriteria decision analysis and can help prioritize risk response strategies. Criteria may include cost of response, likely effectiveness of response, timing constraints, and others.

2.2.5 Implement Risk Responses

1. Expert Judgment

For the implementation of the risk responses, expertise should be considered from individuals or groups with specialized knowledge to validate or modify risk responses if necessary and decide how to implement them in the most efficient and effective manner.

2. Interpersonal and Team Skills

Interpersonal and team skills that can be used for this process include but are not limited to influencing. Some risk response actions may be owned by people outside the immediate project team or who have other competing demands. The project manager or person responsible for facilitating the risk process may need to exercise influence to encourage nominated risk owners to take necessary action where required (Crouhy et al, 2014).

3. Project Management Information System (PMIS)

Project management information systems can include schedule, resource, and cost software to ensure that agreed-upon risk response plans and their associated activities are integrated into the project alongside other project activities.

2.2.6. Monitor Risks

1. Data Analysis

Chapman and Ward (2003) have fully acknowledged that the following two data analysis practices are used for the data analysis monitoring process:

- a) **Technical performance analysis:** It compares technical accomplishments during project execution to the project plan's schedule of technical achievement. Deviation can imply a risk to achieving the project's objectives.
- b) **Reserve Analysis:** Compares remaining contingency reserve to the amount of remaining risks to determine if the remaining reserve is enough.

2. Audits

Examines and documents the effectiveness of the risk responses for identified risks and their root causes. Risk audits also examine the effectiveness of the risk management process. The Project Manager is responsible for ensuring risk audits are performed (Cooper et al, 2004).

3. Meetings

Risk reviews should examine and document the effectiveness of risk responses and may result in identification of new individual project risks, reassessment of current risks, closing of risks that are outdated, and more. The risk review can be part of a periodic status meeting or can be a dedicated risk review meeting (Chong et al, 1999).

2.3 Risk Management Approaches (for projects)

This chapter presents and analyses the Project Management methodologies involved in the market. There could be shown the process and framework of each methodology and what practices are used for the implementation of each Information technology project or in other words, software projects.

2.3.1 Agile

Stellman and Greene (2017) have defined that Agile has a sequence of methods and methodologies which aim to mitigate and resolve specific issues into software development and implementation teams. Both included methods and methodologies which cover project management, design and improvement processes with relevant practices. In their book, Stellman and Greene (2017) characterized Agile as “mindset”. People who have not worked before towards Agile practices assumed the existence of a huge difference in their effectiveness. This type of mindset concentrates on sharing information between the team for project decisions instead of sharing info only to the project manager to make the decisions. Each agile methodology - framework has its unique values.

According to Cobb (2015), people at all levels working with Agile morale:

“are motivated and empowered to do their work and take pride in doing it well because the environment is built on solid values, including respect for people and all parts of the organization work together more collaboratively in a spirit of partnership toward common goals”.

In agile projects, the business requirements describe the work results and then project team to ensure the vision and requirements are delivered exactly as requested (Cole & Scotcher, 2015).

PMI Agile book stated (2017) that “Agile approaches to project management aim for early, measurable Return on Investment through defined, iterative delivery of product increments. They feature continuous involvement of the customer throughout the product development cycle.”

The Agile Manifesto

The Agile Manifesto that was originally created in 2001 aims to avoid the failure of software development projects. Agile project management focuses on continuous improvement, scope flexibility, team input, and quality performance. An agile approach differs from a conventional approach because a more rapid decision-making process replaces the traditional decision-making hierarchy (project manager, sponsor, steering review, etc.)

Manifesto for Agile Software Development value:

- Individuals and interactions *with processes and tools*
- Working software *with comprehensive documentation*

Scenarios

- Customer collaboration *with contract negotiation*
- Responding to change *with following a plan*

Backlog: a great way to manage changing requirements

Iteration: repeatedly performing all of the project activities to continuously deliver working software.

A main advantage to go through Agile Project Management is because this approach is focused on the business results. Good business results do not always mean the fastest delivery times, but also the high quality delivered.

Moreover, Agile project management objects to reduce time to market. This accomplishment has some ways to do it. First, it simplifies the requirements definition practices in order to avoid too much time. The efficient and simple way is improving projects to deliver functional requirements as much as possible and mitigate nonvalue added work.

Another benefit is that it concludes a higher team productivity and provides lower costs because it avoids the unnecessary overhead and does work sequentially.(Cobb, 2015)

According to PMI Agile Book (2017) there are twelve Agile Principles:

1. Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
2. Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
4. Business people and developers must work together daily throughout the project.
5. Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
6. The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
7. Working software is the primary measure of progress.
8. Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
9. Continuous attention to technical excellence and good design enhances agility.
10. Simplicity—the art of maximizing the amount of work not done—is essential.
11. The best architectures, requirements, and designs emerge from self-organizing teams.
12. At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

Figure 2.2: The Twelve Principles behind the Agile Manifesto in 2017

Source: PMI Agile Book

2.3.1.1 Scrum

The literature has widely defined that “Scrum is generally called a framework rather than a methodology because it is meant to provide a framework for organizing the work rather than a more specific, well-defined methodology or how the work should be done (Cobb, 2015).

Mckenna (2016) noted that Scrum is one of the most popular frameworks in the market, encouraging short feedback customer loops, lowers risk and allows Return on Investment

(ROI) to be achieved the sooner. He also added that this method matched more with Agile Methodology and required the role of the Product Owner (PO), Scrum Master and Team member.

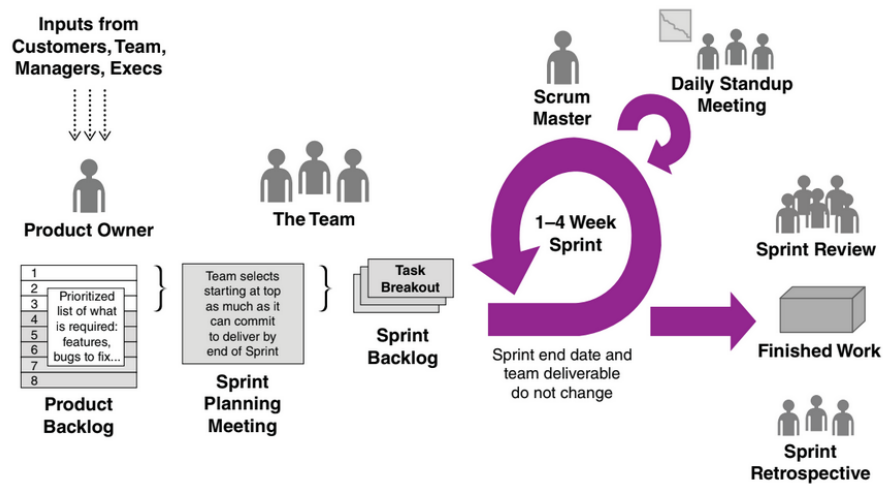


Figure 2.3: Scrum framework in 2015

Source: Charles G. Cobb

Previous studies suggested that Scrum methodology supports the project delivery and contributes in helping the team to achieve the defined objectives and to get stuff done. Cole & Scotcher (2015) also characterized Scrum as a complete and perfectly formed package which is covering the theory (fundamentals and guiding principles), team roles (Product Owner, Scrum Master and the development team), events (sprint, sprint planning, sprint review, retrospective, daily stand ups) and artefacts (the product backlog, the sprint backlog, etc).

Project Team

As already mentioned, the project team includes three important roles. The Product Owner, the Scrum Master and the team leader who are committed to the project. The Scrum framework clarifies their roles and responsibilities and provides each individual with the autonomy to make the necessary decisions regarding the project success.

Product Owner

Product Owner's main responsibility is the Product Backlog. Product backlog contains the requirements list which the Product Owner can understand in business and delivery perspective. It can be said that it is a list full of stuff that needs to get done that will turn the vision into reality. According to Cole & Scotcher (2015) the Product Owner must pay attention to the product backlog because this can contribute to the team communication, mitigate project risks and manage the relevant expectations. Moreover, managing backlog and keeping it up to date is important especially from the start of the project where it is full of functional requirements and features written as user stories. Typically, the Product Owner has to maintain the list with all the visible work including faults, non-functional requirements, improvements, enhancements, new feature requests ordering them by business value. Indeed, this is a difficult daily task and Cole & Scotcher (2015) has advised POs to have refined backlog visible to the whole team because this builds trust along the team.

Another main responsibility is to add stories (user stories) into Backlog in order to prioritize them according to the business value which can be rapidly changed. These user stories are written in the backlog from user perspectives and have simple non-technical descriptions focusing on features. The stories are provided there with the current top business value by the PO understanding on how customers use software and what value they get from it. Furthermore, is responsible to articulate what the customer wants and why it is important, is not responsible for how the product will be delivered. Except for the user stories, there are also the epics which are big user stories that need to be converted to user stories. However, epics can be organized easily without complexity (Mckenna, 2016). Author characterized epics:

"in terms of music. You can sort your music by genre, artist, album, and song. Each level gets a bit more specific and complex. You can look and see that you have a lot of music in the Heavy Metal genre, and then break it down and see how many songs there are by album and/or artist. If you want to group your music by a certain theme, you can. Same thing with the Backlog using epics".

Scrum Master

Another key role for managing an Agile project with Scrum framework. The Product Owner could be the customer who is responsible for the project outcome. However, Scrum Master has the role of development leader consultant. The Scrum Master has the responsibility to push and enhance the team cooperation for the customer requirement delivery. Moreover, SM has the authority to assign tasks to project team members in the most effective manner possible. It is noted that Scrum Master acts like a “coach” and “project manager” to mitigate project risks and remove obstacles, as well as to facilitate meetings for decision progress discussions (Wiraeus&Creelman, 2019).

The Sprints planning and the daily stand-up meetings are facilitated by the Project Scrum Master. The main scope of the meetings is to provide a full view of the tasks completed and lessons learned since the previous day’s meeting. Moreover, in these meetings the tasks that need to be achieved till the next session are presented and also contribute in helping the project team to remain positive and energized to meet the project milestones-objectives (Stellman& Greene, 2014).

US-based Certified Scrum Professional James Bass states, “The value of SCRUM is not measured in the amount produced, but on the success of the team to meet commitments, and continuously improve (Creelan, 2018).”

Cole and Scotcher (2015) stated that “An extremely important part of this role is to coach the product owner, the team and even the wider organization in agile best practice to make sure the job at hand is done efficiently. Key areas of focus are long-term product planning, effective and appropriate reporting plus acting on feedback in a timely way.

Events:

Sprints

Sprints include several stories (tasks) where the Scrum Master translates from business requirements to technical tasks for the team in order to achieve a specific requirement. Bibik (2018) argued that “a shorter Sprint duration the more visible the finish line and easier to plan and predict the outcome in order to decide the next requirement”. During

Sprints, the Product Owner is responsible to provide feedback to the team because it is easier to detect “mistakes”.

Sprint Planning

PMI Agile approach (2017) defined Sprint planning as “A collaborative event in Scrum in which the Scrum team plans the work for the current sprint. As mentioned above, the team, including the Product owner and Scrum master, participate in these plan sessions. Each Sprint planning length depends on the project complexity. Some Sprints last for 30 days and are timeboxed for 8 hours. This can be translated to eight hours of planning. For two weeks Sprints it four hours. Sprint planning meetings are divided into two parts: firstly, the team figures out what can be done and secondly how the work will get done. This means that the team writes down their Sprint goals in one or two sentences and works together to add tasks from the Product Backlog to the Sprint Backlog. Each item will be broken down or decomposed into daily tasks. The whole process concludes the Sprint planning. Sprint planning could also contain items and tasks (stories) from old Sprint plans that have not decomposed before (Stellman& Greene, 2014).

Sprint review

According to McKhenna’s experience as a Software Developer working in a Scrum approach (2016), stated that at the end of each Sprint, the whole team (team, Product Owner and Scrum Master) presents to the stakeholders the actual built results and asks for feedback in the Sprint Review Meeting. Moreover, during the meeting the team and stakeholders discuss the Product Backlog, and this enables all shareholders to know what the goal for the next Sprint is. In the Agile Guide, addressing a 30-day Sprint could be timeboxed to four hours.

Sprint Retrospective

The sprint retrospective meeting has a main scope which is the team improvement. In this meeting, the whole team has to participate including the Product Owner and Scrum Master. During this meeting, the team shares mistakes they have made during the Sprint and discusses events that were successful in their implementation and ways to improve their process. The last part of the meeting requests from the team to write down what kind of

specific improvements are required. A Sprint retrospective could last three hours for a 30-day Sprint (Cobb, 2015).

Daily Stand Ups

Daily Stand Ups could also be translated to a Scrum daily meeting because they are facilitated by the Scrum Master. The meeting's objectives are to check the progress of the team and to identify stoppers in the current sprint. Each team member has to answer three main questions like: What did you accomplish yesterday? What are you going to accomplish today? and, what obstacles are in your way? (Cobb, 2015)

Everyone in the team needs to be ready and focused (Stand up) to reply to these questions in order to avoid the meeting lasting longer. Additionally, a main benefit of the meeting is that it provides effective communication between the teams (Stellman& Greene, 2017).

Artefacts

Product backlog

The product backlog list contains the desired delivered product. It can be said that the Product owner backlog constitutes the shopping list ideas that needs to be "transparent, visible and easily accessible" at the delivered time, including tangible and non-functional stuff.

Further to the Product Backlog, the author stated that the Product Owner has full accountability to have it up to date. This means that the owner is responsible to provide delivery stuff priorities and can change or develop while items are getting added or removed as well as the product develops and more is learned about the product (Cole &Scotcher, 2015).

Sprint backlog

The Project Management Institute Agile guide (2017) has defined the sprint backlog as "A list of work items identified by the Scrum team to be completed during the Scrum sprint". The Sprint Backlog list contains all the undone functionalities to be done and decided during the spring planning sessions.

After the Sprint completion, the team is requested to make a presentation (demo) to the client with the delivered outcome in order to get feedback or adding or changing functionalities. The process with the Sprint backlog continues until the completion of the Product Backlog and the client satisfaction (Wysocki, 2019).

Advantages

- Flexibility and Adaptability to elaborate the requirements
- Creativity and Innovation to increase business value
- Improve the quality
- Lower costs due to higher productivity, prioritization etc.

Challenges

- People' s behavioural change /accepting changes
- Lack of skilled Product Owners from Business side
- Lack of dedicated cross- functional teams
- Distributed Team (different locations, working hours, time zones)
- Changing team membership
- Team needs to be trained

2.3.3 Waterfall

The literature has widely acknowledged that the Waterfall sequential approach is based on software development change in a linear way providing goals from one phase to another. Each phase requires the client product requirements to be cleared before the designing, building, testing and deploying phases, same with waterfall (Davis & Radford, 2014).

The framework can be easily understood and followed by the whole team and has a logical sequenced approach. It is well structured, helps to deliver on time, reduces time, effort and cost where the team has a phase completion deadline.

In case there are changes on the requirements during the phases, projects usually involve strict and time-consuming change control procedures. For example, if any change arises,

this will affect the next phase and more generally the project needs to be re-planned which can lead to a new process and costs more (Stellman& Greene, 2014).

The phases are separated as following:

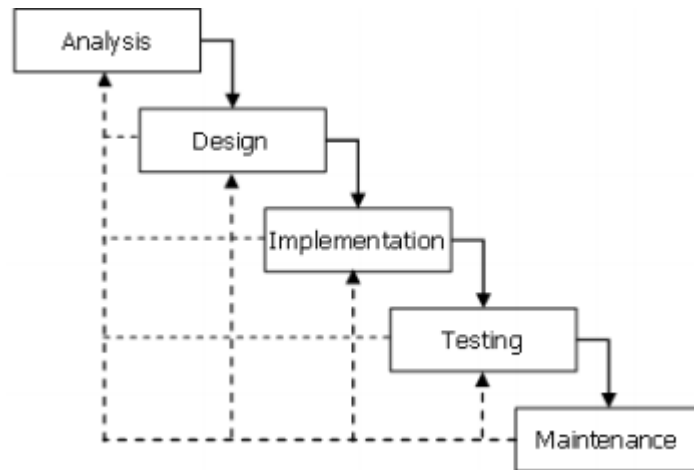


Figure 2.4: Waterfall framework in 2012

Source: Youssef Bassil

Requirements Phase

According to Mckenna (2016), in this phase the Business Analysts are requested to have understood what the business and stakeholders say in order to get the idea of the desirable outcome of the product and defining the requirements. Business Analysts need to be supporting the team and clearly clarifying to the team what is going to be designed and what is the business requirement out of this project. The main outcome of this phase is a kind of document that details the team’s findings. In line with the above, Davis (2013) stated

“In Waterfall, we plan out a schedule and do all of the project analysis before we flow down to the next level and start designing. When the analysis phase is finished, we do all of the design”.

On the other hand some other authors (Stellman& Greene, 2017) also argued that “A traditional waterfall team starts a project by building comprehensive requirement documents to determine what the team will build, reviews that documentation with the users and stakeholders, and then passes it on to the developers to build”.

Stellman & Greene (2014) suggested that some team members tend to try fixing problems in the documentation, however becoming opposite results because some people can write the requirements but interpreting differently.

Design Phase

In this phase, the Business Analyst or the Designer (or both) need to clarify and analyze the requirements with more detailed specifications in order to be understood by the Developers. Both will decide how the team will write the code including the languages and techniques for the best delivery functionality and value (Mckenna, 2016).

Implementation Phase

Developers are requested to develop exactly what's written through coding and transforming ideas into functional products. This means that they will go through the requirements (analysis documents) and transform them in order to create a software that resembles a viable product (Cole & Scotcher, 2015).

Verification Phase

Verification phase is handled by the testing team once the development is finished. What is requested by the team is to verify that the software matches the requirements document by testing it. They need to ensure that business analysts, designers and developers deliver a high-quality outcome to the customer. According to Mckenna (2016) the Quality Assurance Engineer needs to create test plans (scenarios) based on the design document. During testing, in case the test team discovers any defects they need to address it back to the development team. Once the testing team fully completes its tasks and everyone agrees that it is in a stable state, then the product is released to a beta period, meaning releasing to a subset of customers (company's friends and family) to try the product.

Maintenance Phase

After the Verification phase completion, in case everyone agrees to the product release and be Generally Available, then the team proceeds into the Maintenance phase. Mckenna (2016) notes that in case of:

“Sustaining engineers or developers address any defects discovered by customers, and businesspeople could decide whether another release of the product is needed. In my experience, the verification phase always threatened to push out the General Available (public) date because of the amount of time required to fix all of the defects. This resulted in a stress-filled mad scramble to make the General Available date. The quality assurance engineers and developers were also two separate teams. This led to an “us versus them” attitude—especially when stress levels were high”.

Advantages

- -Easy and simple to understand the approach
- -Each phase has its own deliverables and review progress
- -No overlapping
- -Easy for well understood project’s requirements

Challenges

- Delays testing until after completion may lead Bad quality risk (tight deadlines, no time for verification- testing)
- Client does not have full visibility until project completion
- Dependencies lead to project risks (delay, cost)
- Changes are difficult to implement
- Excludes the client and /or end user
- Business requirements could be difficult to translate
- High amounts of risks

2.3.4 Lean

Previous studies acknowledged that Lean is another Project Management approach providing to project easily and smoothly deliverables, however they are facing challenges as well. Therefore, Project Management needs to efficiently and effectively use the processes, tools and techniques. Stelman&Scotcher (2015) argued that

“The mindset of lean is sometimes called lean thinking. The term “lean” has been applied to manufacturing for many decades; it was adapted for software development

by Tom and Mary Poppendieck in the first decade of the twenty-first century. We'll use the capital-L term "Lean" to refer to this adaption of lean ideas to agile software development".

Lean is well focused on the client's requirements. Main principles of the framework involve: to eliminate waste by removing obstacles that block the continuous flow to deliver the desired value; the quality improvement by resolving appearing defects on time before the delivery. Pareto and Statistical process control charts are some of the quality management tools that Lean is using to range the quality and reduce waste. Additionally, the education of the resources is another principle. Kliem (2016) stated that in order to be a part of a Lean, it is required to fully understand and knowledge about the subject. So, Lean consultants provide full commitment in providing value to the client in order to be aware of the Lean principles, tools and techniques to adapt to a new culture. Lastly, the communication part is simply about talking with customers to efficiently understand what really means value for them to help them understand the relevant recommendations for improvement.

Consequently, a Lean project makes the customer "the centre of the world" in order to help to add value to its company's processes, operations, procedures, tools and techniques. Hence, value-added means the completion of the requirements that the client is willing to pay for, whereas non-value-added ones do not contribute to what the customer wants.

The Lean values are (Stellman& Greene, 2015):

Eliminate waste	<i>Find the work that you're doing that doesn't directly help to create valuable software and remove it from the project</i>
Amplify learning	<i>Use feedback from your project to improve how you build software</i>
Decide as late as possible	<i>Make every important decision for your project when you have the most information about it - at the last</i>

	<i>responsible moment</i>
Deliver as fast as possible	<i>Understand the cost of delay, and minimize it using pull systems and queues</i>
Empower the team	<i>Establish a focused and effective work environment, and build a whole team of energized people</i>
Build integrity in	<i>Build software that intuitively makes sense to the users, and which forms a coherent whole</i>
See the whole	<i>Understand the work that happens on your project—and take the right kind of measurements to make sure you're seeing everything clearly, warts and all</i>

Table 2.1 Seven Principles of Lean in 2015

Source: Stellman& Greene

2.3.4.1 Kanban

The Kanban framework requires the Lean thinking mindset or the Agile approach to be worked. This translates to the maintenance of the values and principles of that methodologies. A Kanban team in order to improve, it concentrates to eliminate the waste, considering the feedback to be improved etc. David Anderson explained the relationship of the Kanban Method with Lean: “The Kanban Method introduces a complex adaptive system that is intended to catalyse a Lean outcome within an organization.

“However, there are also projects who have Lean thinking but prefer to use another method for software development”.

(Stellman& Greene, 2015)

Authors acknowledged that the Kanban framework helps teams to improve the way of building software by providing a clear picture of the actions to take and how to interact with the rest of the outside team. Moreover, a team can easily identify any waste caused by inefficiency and unevenness and can also remove the root cause of that waste at an earlier stage. It is good to refer to the Kanban method as an improvement process.

Some of the practices are explained below:

Visualize

Visualized practice comes from the Lean thinking principle "*see whole*". This actually means to write down exactly what tasks the team does, not in detail. Additionally, the value "*decide*" late as possible is important here because the team is not required to write full details of how the software will be builded. There is a later phase to make decisions on how possible will change (Stellman& Greene, 2015).

According to Cole & Scotcher (2015), in the visual workflow going from To Do, In Progress to Done status. Some others use procedural stages to plan, design, draft, build, test, deploy, with to-do and done as bookends.

Brechner(2015) supported an online tool such as Jira to create this workflow but it is better for the team to have this signboard on their workplace wall to see their goals and improvements. In the signboard the team can use posted notes to visualize their progress and track the work as well. The signboard in the workplace tends to enable teams to work faster and have spontaneous communication.

Stellman& Greene (2015) in their published guide described the Project Management workflow starting with the team selecting tasks from the "backlog", the Project Management scheduled the work for the next period (depends), the team proceed with building the features, test team proceed testing the features, Project Manager verifies what test scenarios passed and schedule a presentation with the senior management. In case Senior management wants the team to make changes to the feature, the project manager does an impact analysis on the changes, and the feature moves back to step, if not, it moves to add the "done" feature in the next release.

Limit Work in Progress (WIP)

This process limits the mess on the Kanban work to be done - note cards. According to (Cole & Scotcher, 2015), doing many things in parallel is a risk for disaster. The Kanban WIP confines the number of tasks to be done any time in the project to ensure efficiency.

Therefore, Stellman and Greene (2015) gave an example about a Developer who has already done its tasks. The Developer in order to complete the tasks need to be started with Design, Building and then need to be sent what it finished to the test team to verify. However, the test team may have other tasks which are visible in the Kanban, and this may become overhead for the team. In order to avoid that, WIP limits the number of features that can move into that step.

This helps limit the team's options to make that decision easier in a way that will prevent overburdening and keep the features flowing through the workflow as efficiently as possible. When you finish designing that feature, for example, and you see that the workflow is already at its limit for writing code, then you'll look for other options and work on them instead and the test team won't get overburdened (Stellman and Greene, 2015).

Manage Flow & Feedback Loops

Kniberg and Skarin (2010) acknowledged this practice improves the way it delivers. The team while working identifies workflow issues and adjusts the WIP limits. The team has to mention these issues to the Project Manager so as to provide feedback and new ways or amendments of the workflow. Therefore, the team will be able to achieve a fast, smooth movement from To Do to Done status. Previous studies said (Stellman and Greene, 2015) "A Kanban team uses the managed flow practice by measuring the flow and taking active steps to improve it for the team".

Make Process Policies Explicit

This practice allows the team to write a work description and be visible to members who are affected by it. The Kanban policies agreed that their team's policies could be as simple as WIP limits columns, instead of writing long documents.

According to Pham and Pham (2013) suggested that Kanban teams could also define policies by adding “Definition of done” or “exit criteria” bullets to the bottom of each WIP column in order to be known when to advance the work items through the workflow.

In the Chapter talking about Kanban guidance, Stellman and Greene (2015) admitted that this practise is effective for collaboration because all team members understand why they are there.

Improve Collaboratively

(Cole & Scotcher, 2015) argued that

“Once the spotlight is on the workflow, ideas start to develop about how it can be improved. The WiP limit plays a key role in sparking discussions by forcing the team to focus on blockers to work in play when the limit is reached. An initial cap of no more than two tasks per person soon highlights problems that impede the flow; then the team simply faces up to those issues and resolves them”.

Advantages

- Flexibility on the requirements (no priority)
- Does not prescribe any roles
- No item size is prescribed (opposite of Agile/Scrum Sprints)
- Iterations are optional
- It allows you to add new items whenever the capacity is available, and it is event-driven and the board is visible to whole team

Challenge

- Team collaboration
- Risk for delay - no timeframes
- Distributed Team (different locations, working hours, time zones)
- Obsolete Kanban may lead to Development issues

2.4 Digital Transformation in Banking Sector

In the mid-1990s, people were about to buy their own cars and hail taxis so as to be able to commute, go to work or go to the local street market to buy their essential groceries and appliances. Furthermore, people would visit the bank branches to complete their banking transactions. In contrast to these days, when the world is dominated by technology. Nowadays people can buy their groceries, new cars, home appliances and hold taxis through the internet online shopping. People can also manage their banking accounts via banking applications at anytime and anywhere with no need to visit the bank branches. All the above have been accomplished due to the radical improvement of technology.

Indeed, this development within the recent years allows synchronous companies to decide or consider their organization's Digitalization or Digital Transformation. Digital Transformation can be translated to a complete change of an organizational culture. It must be stated that, getting a company into new technologies requires a big amount of investment moreover accepting the new mindset and the readiness to embrace the change. Apart from that, organizations should move forward with time and leap into the new digital world culture.

In 2017, Schwertner interpreted Digital Business Transformation as

“the application of technology to build new business models, processes, software and systems that results in a more profitable revenue, offer greater competitive advantage, and consequently higher efficiency. Businesses achieve this by transforming processes and business models, empowering workforce efficiency and innovation, and personalizing customer experiences”.

Warner and Wager (2017) argued digital transformation as

“the use of new digital technologies (social media, mobile, analytics or embedded devices) to enable major business improvements such as enhancing customer experience, streamlining operations, or creating new business models”.

Briefly, Digital Transformation possesses the capacity to modify the business models in order to provide a dynamic pace of the technology advance and implement innovative solutions which could encounter changes to customer and social behaviour.

Observed from the banking perspective, the transformation to digital solutions concerns the development of recent information and communication channels, which facilitate the latest devices (e.g. smartphones) and platforms to remodel in the way customers do their transactions, modify their market expectations, and transform the model of financial intermediation (Omarini, 2017).

The concept to become Digital is something new into the banking field and it is observable that presently, banks are shifting to this type of transformation decision. Globally, several banks make huge investments to acquire digital solutions to maintain a competitive advantage level and deliver high quality services to their customers. In order to achieve that and getting closer to its clients, banking digitalization is leading to data analytics and intelligence. The Indian banking sector, digitalization started many years ago and the future has become more transformative. Indian banks have tried to find solutions to increase revenues, improve the customer's experience, mitigate and manage company's risks as well as minimize costs (Deshpande,2018).

As mentioned above, achieving a Banking Digital reengineer requires multiple digital technologies and different approaches such as the Application Programming Interface Ecosystem (API), Cloud, Blockchain, Mobile, the Internet of Things (IoT), Artificial Intelligence (AI), Automation, DevOps, Agile, among others. In traditional banking the decision to go into Digital transformation could benefit the Bank beyond the traditional process of reengineering but to redesign the whole organization. (Diamond et al, 2017)

Using these technologies requires integration and a connection between them in order to complete a common system which will connect Branches, Information Technology and Customers. Obviously, these concluded to profoundly complex programs.

In order to accomplish the transformation of the whole Banking Ecosystem, technologies are not only what the bank needs. This decision requires a well-structured Change management plan to be applied so as to add more value to the bank systems and equally important to be easily socially accessible.

According to Scardovi (2017) bank organizations need to focus on five main components to support the development of the overall economic system and leverage the digital innovation to transform the business strategies and flows.

First Pillar: Data and information advance management

First component is focused on Big data and information in terms of designing, building and protecting the client's personal digital identification. With the assistance of innovative technologies, banks are in position to accumulate data which has derived from several sources through a technical and economical way. To be more specific, the Internet of things (IoT) technology allows the interconnection between physical devices such as connected and smart devices in order to collect and interchange data. The Global Standards Initiative on the Internet of Things (2013) defined the IoT as the infrastructure of the information society.

“The IoT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, hence resulting in improved efficiency, accuracy and economic benefit collaterally reducing human intervention. Cloud IoT service is a part of lots of successful businesses information systems”.

Second Pillar: intelligence by applied analytics, machine learning and artificial intelligence (AI) management

The second component concentrates on the gathering of huge amounts of raw data and sequenced information in an intelligent production. Shivakumar and Sethi (2019) explained that the Artificial Technologies (AI)

“can be exploited in a variety of tasks such as rules-based automation, provide personalized recommendations, pick up user's preferences, provide virtual assistance, customer service, and a range of other functions. AI technologies are preferred for user engagement, cost optimization, and to provide business value differentiation. AI technologies combined with natural language processing methods can provide powerful voice-enabled virtual assistants”.

Since 2009, Blockchain technology that records digital transactions has been developed in conjunction with bitcoin and is an information protocol. This is a public database, where all the financial operations around the crypto currency are recorded. Banks and insurance companies are investing heavily in blockchain technology because it permits them to

guarantee the security of customer data and identification. Additionally, the database can manage complex assets such as securities, stocks, derivatives, because it requires a lot of verifications. Some years before the certification of a bond or equity exchange took 3 days, today while using blockchain a process like this will take only a few minutes. In parallel, the infrastructure costs of financial institutions are significantly reduced. However, blockchain does not meet all management and application needs and must develop its information functions and guarantee the confidentiality of transactions (Puschmann, 2017).

Moreover, the big data technology will facilitate the provision of information about banks' customers and the banks' proposals to them regarding their commercial transactions. It will also enable real-time fraud to be tackled more effectively. However, the use of big data needs rules, notably about information security and confidentiality. The above results will immediately inflate over the counter transactions and will multiply complex financial products. The PSD2 Directive of 25/11/2015 harmonizes the rules on electronic payments. This Directive has been implemented since 01/01/2018 and aims to provide modern services effectively and inexpensively, in enhancing the protection of businesses and consumers within the single payment market in Europe. This directive also creates a single digital marketplace, promotes more secure digital payments, facilitates the entry of new players and products into the digital payment service, such as Amazon, Apple, Facebook, Google, which have a huge financial footprint and can even acquire banks (Roumeliotis, 2018).

Third Pillar: Interconnectivity and junction management

Authors (Shivakumar and Sethii, 2019) acknowledged that the third pillar is linked to the “core banking”. The core banking goal needs to be supported by multiple sales channels. These channels could be retail and investment banking, wealth management, insurance, etc. Additionally, through these sales channels there will be visible account information and will be able to perform real time transactions anytime and anywhere.

Four Pillar: New business solution design and management

According to Scardovi (2017), consecutive to the three pillars is the innovative business solution which will “enable the development of new, valuable, economic possibilities -

successful business models”. For example, the bank may assist merchants to organize the sales marketing campaigns of the organization in order to obtain a good penetration for new clients, trust and satisfaction.

Five Pillar: Trust and credibility management

Authors (Zachariadis&Ozcan, 2017) describe Application Programming Interfaces (API) as “a way for two computer applications to talk to each other over a network using a common language that they both understand”. This technology grants the opportunity to organizations to integrate several internal systems and the exchange of elements along with different departments. Hence, the system can be converted in that way to share data internally and upgrade the collaboration between the teams. Moreover, it provides access to information at any time and enhances employee productivity. External Application Programme Interfaces (APIs) can also administer real time access to banking customers as in to manage or/and to complete several bank procedures. (e.g. open account, etc.).

Shivakumar and Sethii said (2019)

“The open platform can be leveraged by bank partners such as payment partners, financial partners (who handle cards, insurance, mutual funds, trading, mortgages, etc.), financial technology (fintech), merchants, digital partners, lending partners, technology partners, telecommunications companies”.

According to an IBM Article (2017) Digital Transformation “helps your business to exceed customer expectations, chase new revenue opportunities and adopt fearless experimentation”.

Chapter 3

Research Methodology

The process of a research consists of some important sequential steps starting with the research findings area (literature) and followed by the formulation of the research questions. For the completion of this research, the design methods and techniques should have been chosen so to gather the required data. Consequently, the analysis and interpretation of the collected data should lead to the conclusions (Bryman and Bell, 2006).

The collection of the data can be done in several ways such as interviews, questionnaires, focus groups etc. In this case, the researcher has chosen an explanatory approach, including both qualitative and quantitative research methods. Aiming to record data related to how Project Managers assess risks in the selected case study based on their experience in such complex projects. According to Saunders et al (2019) the method should be based on the research problem. Saunders et al (2019) state:

“First, you may commence an exploratory project seeking to generate a direction for further work. Second, the scope of your research may be constrained by adopting restrictive theoretical propositions that do not reflect your participants’ views and experience”.

The explanatory method is the proper method for this thesis since it is needed to observe how people manage and overcome these risks and uncertainties. On the other hand, the quantitative method was used to perform some descriptive results which revealed the preferences of the tools, techniques and methodologies. The above were encountered to support the final suggestion.

In terms of research design there are many types of research such as experiments, surveys, action research, case study etc. (Saunders et al, 2019).

The case study for the Digital Transformation project in a major bank in Cyprus has been selected to understand and examine whether a Risk management plan and principles exist. Bearing in mind that this sector belongs to the knowledge area of Project Management, the researcher tried to associate whether the currently applied methodologies are effective enough in terms of tools and techniques.

The specific study was chosen because the researcher who is employed by the bank's Strategy Partner noticed involvement of several kinds of skills and experiences and this was an engaging part for the whole process. The position of the researcher is Project Management Officer (PMO) in the specific project, therefore permission has been taken from the Project Executive for conducting the research through the project's development and collecting data through observation, questionnaires and interviews.

Also, by being a part of this team, the researcher was enabled to recognize and be familiar with the events and examples which are mentioned in every kind of the data collected. The researcher asked questions in terms of the methodology phase risks and participants gave examples and events occurred through these phases. From these examples the researcher observed how the participants managed and responded to those risks.

3.1 Research Design

3.1.1 Research Aims

As it was mentioned before, the aim of this master is to study the risk management processes in a specific digital transformation project in a major bank in Cyprus. From the gathered data the researcher will be able to discuss the formation of an effective Risk management approach which will be a pre-set strategy in the business scale.

The given outcome will contribute to support a recommendation to the case company so it can develop a suitable customized strategy for the project's risk management, as well as to introduce a guide (use as reference) for digital transformation projects in connection to the project's risk assessment and management.

3.1.2 Research questions

The overall research aims to address the following questions which are presented in the current sub-chapter.

At first, the researcher studied the associated Risk Management processes and approaches such as the PMI, Prince, Agile etc. All the practises are described in the Literature review chapter, for each Risk management stage respectively. The specific research question is covered by the questionnaire results which shield light to the approaches and practices implemented in the program at each Risk management process phase.

- What are the main points and differences among various Risk Management approaches proposed by professional organizations?

Secondly, in the literature review chapter the researcher describes the Project Risk Management methodologies used in the specific project and what other options exist in the market so as to assess and manage potential risks. As the researcher mentioned above, the selection of the methodologies is examined through the questionnaire results. Needing to access a more thorough insight interviews were conducted.

- What Project Management Methodologies were used in the specific Bank's Digital Transformation Programme to assess risks?

On the third point, the researcher assesses how the managers apply the given methodologies in their projects and how they respond to frequent risks. Both questionnaires and in-depth interviews were used as data collection techniques for the specific question.

- How does a Project team assess risks and implement an effective risk management strategy?

Having collected all the data, the researcher will be able to propose a Risk Management plan to be further developed in the specific case study which can also be used as a guide for future company's Digital Transformation projects in the banking field.

- What Project Risk Strategy can be proposed?

3.1.3 Research instruments

The study was designed by the researcher who works in the specific company's project and could be considered as a participant observatory. Referring to Shkedi (2019)

“During participant observation, the researcher does not need any external instruments, with the concept of the “human as a research tool” coming to the fore. This situation of involvement and participation allows researchers to meet the participants almost intimately. The assumption is that something you've seen inside; you can't see from outside”.

A case study methodology was used for this research. The design of the research was planned within a combination of quantitative and qualitative research paradigm. The researcher has selected the specific design because it was well-matched so as to explore and gain awareness into Project Manager's understanding and experiences to manage project risks.

Questionnaires and interviews are the most familiar methods mainly implemented for this case study of a Digital Transformation Project in a major Bank in Cyprus.

The questionnaire survey was adopted for this research in effort to evaluate attitudes and skills in the sector of project risk management in a more comprehensive multiple-choice technique. It was addressed to all Project Managers in the bank's case programme due to the fact that only this position level handles and is aware of how the project manages risk.

As it was already mentioned, the Project risk Management expertise is one of the main duties of the Project Management, that is why they are the only appropriate participants to be involved.

The majority of the questionnaire responders were Project Managers (about 25) of IBM strategy consulting who are currently working on or have left the project.

At the initial stage, the researcher sent the questionnaire link to all the Managers, explaining the research scope as well. The questionnaires' main goal was to expose information about the methodologies' preferences and which practices they usually prefer to apply in for assessing the risks.

At the second stage, 3 interviews were performed, 2 of the participants are Project Managers responsible for more than one project and the other 1 is the Project Enterprise Architect who also possesses a significant role for managing technical issues and risks and at the same time assisting Project Managers in planning. It is worth mentioning that the Architect's feedback has significantly influenced the final project's suggestions.

The interview questions were carefully built in a semi-structure method, under these circumstances the researcher has the opportunity to expand into a deep discussion with the interviewees resulting in the exposure of data for the specific banking digital transformation project. The study is explanatory in nature; therefore, these speculations might be used for developing the Risk Management process of the current case study and comprehending similar Project risk Management approaches in Digital transformation projects in the banking sector.

3.1.4 Questionnaire design

The questionnaire was divided into five sections.

The first section deals with general information regarding the responders, such as how many years of experience they have in banking digital transformation projects and which type of methodology they prefer to use in their projects. Some questionnaire results will be presented in a more descriptive way according to the methodology used so as to give a strong justification related to the practise's effectiveness. Based on these results a Risk Management Plan will be proposed.

The second section refers to the tools and techniques which are implemented in each phase of Risk Management. The Risk Management process is separated into 5 stages, the Risk Identification, Risk Analysis, Risk response, Implementation of Risk Response and Risk Monitor. The questionnaire focused on the process of the Project Risk management and techniques applied, the actions taken for controlling possible risks according to the methodology which is used in their projects.

Meanwhile, the researcher asks which project methodologies they are familiar with and why they prefer working with one or mixed of two. Additionally, through the questionnaire

survey the researcher aims to gather information why these tools and techniques are more effective in line with the methodology applied.

Questionnaires were sent to participants in a well-structured form through the Web platform - Google Forms. Aiming to their complete comprehension of the questionnaire design, the email was sent to the participants accompanied with brief explanations of the research scope.

The mail provided the link to the questionnaire and reference to confidentiality. Clearing out that as all entries are anonymous and will be used only for the scope of this research.

3.1.5 Interview design

The researcher also accumulated data through interviews. The interviews were designed with a semi-structured approach. Initially the interview covers general information questions of the project such as their experience, their opinion of having a general risk plan to refer to, during the project, the scope of the program, etc.

The second subject appears to be the selection of the project methodologies and how they assess and manage risks in distinctive phases of the delivery, as well as what type of risks might appear.

3.2 Ethical Issues

In the mail sent, together with the questionnaire link there was an explanation of the study scope which mentioned that participation is voluntary and that it would enhance the researcher's goal. In addition to this, the researcher on her behalf confirmed absolute confidentiality and anonymity by clarifying that any information given will be utilized only for the support of this study.

Prior to the interviews, the researcher had informal discussions with the participants in order to explain in detail and clarify their involvement and the terms related to the ethical issues of the research, including data collection, voluntary participation, anonymity and confidentiality. So, at this stage, the researcher also asked for the permission to record.

3.3 Data Collection

The study adopted a combination of quantitative and qualitative methods. The research results are the combined data gathered. Quantitative data was acquired through a semi structured questionnaire and qualitative data by the use of interviews from qualified individuals such as Project Managers who are actively involved in the program.

The questionnaire was sent to 30 Project Managers who work on the digital transformation program of the case bank or used to work in the past. Project Managers filled in a questionnaire for each project they managed (some of them co-run and manage two or more projects with different methodologies). The researcher managed to gather 25 responses in the period of 2.5 weeks. The questionnaire specimen is attached on the Appendix B.

The questionnaire sample is not big enough to summarize our research. The small sample was expected since the case company does not employ many project managers who are currently working on it or have possessed Digital banking transformation projects in the past mostly because this type of projects are new goals for the Banking customers. It is worth mentioning that the questionnaire was executed only in cooperation with members of IBM, the company which employs the researcher.

Moreover, a significant amount of qualitative data has also been gathered through interviewing the 2 Project Managers and 1 Senior Member- the Program Enterprise Architect.

The interview questions were completed online through Webex (company's tool for online meetings). The interviews were recorded after receiving the consent of each participant. The first interview was taken from the Enterprise Architect (Senior Member) of the Program and it lasted 1.15 hour. He was one who replied to more general questions related to the case as the other two replied to all the questions. These Project Managers are simultaneously working on more than one part of the project; therefore, they have views and opinions from various perspectives.

The first Project Manager provided data in 45' minutes and the second in 55'. The researcher tried to guide the conversation so as to gather as much information as possible

on how they assess the risks. They were directly asked to refer to specific challenges in how they were managed. Having all the necessary data gathered the researcher is able to study and analyse it and accordingly reach his own assumptions so as to be ready to present a trustworthy Banking Digital Transformation Project Plan (reference guide) for the specific case and other similar projects in the banking field. Since the researcher is working in the project can utilize its own experience as well.

3.4 Data Analysis

The data collected through the questionnaire method was instantly statistically displayed through Google Forms. The analysis aimed at describing the Risk Management methodologies used in the project together with the tools and techniques preferences of each Project Manager. A descriptive analysis was performed concentrating on the methodologies and the techniques used in each project methodology phase.

The interviews data collection was analysed by the researcher in order to acknowledge the basic categories. Shkedi (2019) said “Categorization, namely sorting and organizing data in an analytical order process, is what connects several data units, which we perceive as similar in some ways to categories or themes”. For the identification of the categories, the author well- read and understood the three interview transcripts in order to concede the relevant units of meaning. The qualitative data analysis tool Atlas.ti helped for the identification of the 34 codes (see appendix C) for the analysis purposes and 4 themes cropped from the codes: (1) Benefits (2) Risk Management (3) Risk Management Approaches (themes 2 and 3 were considered as one) (4) Challenges (5) Suggestions.

The IBM Project Executive has also given access to some additional information and presentations in terms of the programme’s goals and more specifically for each project.

3.5 Limitations

The study had several limitations. First, the global situation of Covid-19 has not allowed the researcher to have face to face meetings with participants and initiate more interviews to gather more data for the case study. Secondly, even though the duration of the interviews was long enough the main concern has not been completely discussed. Some participants

showed reluctance to devote sufficient time on this process. Another drawback might have been the misinterpretation of certain questions leading to imprecise answers. Despite the limitations, the findings are important.

Chapter 4

Results

This chapter presents the results derived from the analysis of the data collected from the case study - Digital Transformation Project in a major Bank in Cyprus. Results are reflected information collected through interviews, questionnaires, researcher's observation conclusions and some extra information related to the project retrieved from the IBM Project Executive.

4.1 Benefits

Generally, this programme has been divided into 3 main pillars. These findings were retrieved from the Executive partner of the project who is the only one who can provide certain confidential data presentations outlining the outcomes of the project. The researcher is aware from its experience that for the successful completion of the main scope the program has been separated into several parts. These parts- projects may be integrated or have versatile operations. The description of each project's goals is presented in the first chapter "Bank's case". The main pillars for the banking case study are:

Pillar 1: "Become more customer centric"

Pillar 2: "Safeguard the Bank's capital & ensure steady revenue generation"

Pillar 3: "Maintain Operational Excellence"

After talking with the participants during the interviews, it is clear that the main scope of the program is to transform the bank's technological background in order to be able to obtain and adopt a more modern way of working. Unavoidably, this interprets the involvement of new technologies such as API Economy, Cloud etc. Generally, targets the transformation of all system environments both software and hardware. This can be translated to the improvement of the bank's internal processes resulting in becoming more efficient and establishing effective flows due to the new technologies applied.

Additionally, the automation of the bank will vanish the manual work and the technology advance will allow them to come closer to their customers' needs. Consequently, the bank's workforce will need to devote less time in order to complete each task compared to the pre- technological transformation period. Therefore, they can be more productive in the same amount of time which in the financial work means more profit.

From the customer's perspective, this kind of transformation (DT), as for example the new Mobile Application which uses the automation technology and is user-friendly, enables the customer to do everything without visiting the bank's branch thus saving time - money. The Digital transformation focuses on creating more automated systems and processes in an easily accessible and friendly way for its users.

4.2 Risk Management and Risk Management Approaches

Throughout the scope of the study it can be observed that both, according to literature and collected data (questionnaire, interviews) that the Project Risk Management process is immediately linked with the tools and techniques which are presented in Chapter 2.

As it can be seen from the questionnaire results, a significant amount (92%) of the Project Managers agree that the specific project should have had a common Risk Management Strategy enabling them to track the potential risks. Conforming to the researcher's observation, Project Managers do not follow a particular Risk Management process, but they use certain practices in order to avoid and overcome risks. This is due to the high level of the project's complexity and a number of risks associated with it. It could be assumed that everybody is in a way managing risks but not all are aware of Risk Management processes.

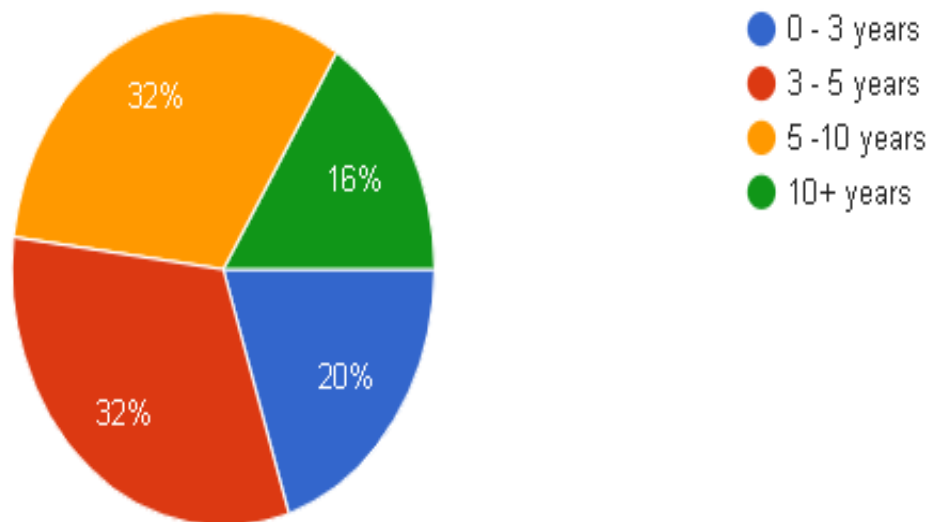


Figure 4.2.1 Project Managers Experience

Source: Questionnaire results

25 employees have participated in the study with experience in Banking Digital Transformation projects, 0-3 years (20%), 3-5 years (32%), 5-10 years (32%) and 10+ years (16%). It can be noticed from the interviews that the one who possesses the longest experience is more aware of Risk Management processes. The 11 years of past experience can be considered as an asset on his behalf and on the company's. This Project Manager maintains its own project risk log for his project due to be the most experienced in the Risk Management field and has also earned a range of Project Management personal certificates such as PMI and Prince.

According to this interviewee, it is important to have a relevant process as a reference guide because Project Managers could utilize it so to avoid future problems from becoming big issues in advance. Essentially, the early identification and effective management of the risks can free time and money.

One other interviewee argued that he has not observed any evidence leading to the existence of a formal Risk Management methodology. For instance, there is not any risk register or risk log encountering the possible risks handled. The Interviewee mentioned that each project manager usually handles its own project's risks before the project starts. The experience of each manager allows him to know up to an extent the expected risks and

the obstacles before the project launches. So, they try to prepare a work document which includes the Scope/ the main goals and the plans. The specific document communicates clearly to the client (bank) all the resources, roles and skills which are required together with the plan effort and the risks. All priority mentioned need to be included in the budget plan. Therefore, if both or either one of the sides fail to work effectively and act on time, thereupon the project will be at a high-risk level.

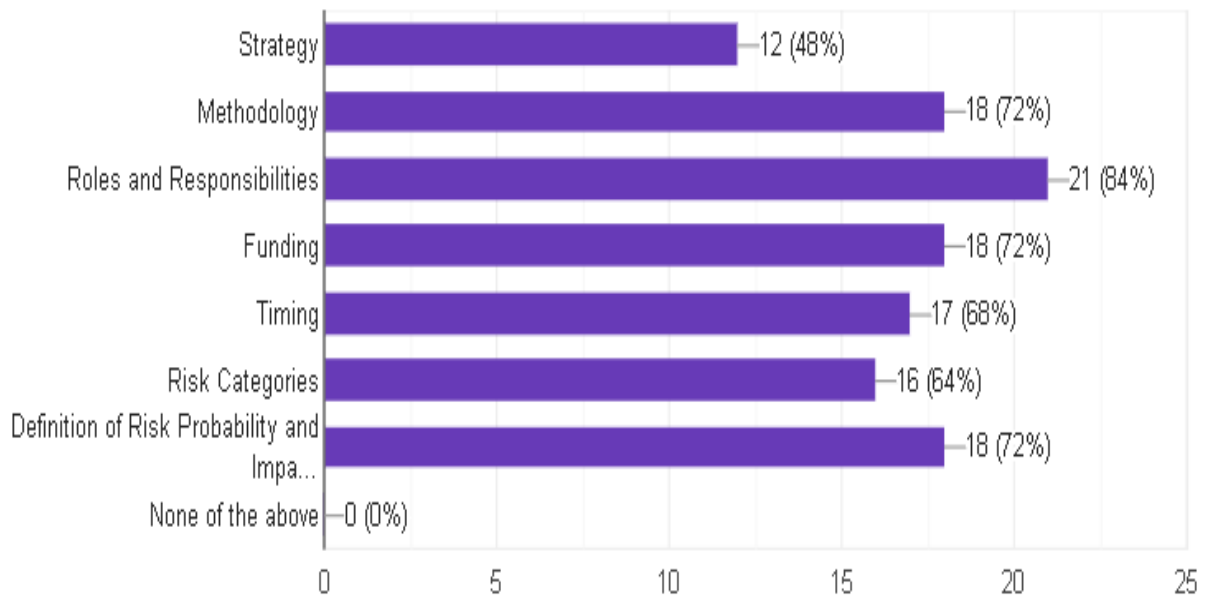


Figure 4.2.2 Project Risk Management Plan (parameters)

Source: Questionnaire results

According to the questionnaire results, it is shown that all factors are important to be encountered in this type of plan. Roles and Responsibilities (84%), Methodology (72%), Definition of Risk Probability and Impact (72%), Funding (72%), Timing (68%), Risk Categories (64%), Strategy (48%).

Results show that the most important thing on the agreed Scope document are the roles and responsibilities the project has to execute from both parties involved. For example, what type of resources should be employed for the successful completion of the project and what is the estimated work effort. The second-highest parameter seems to be the methodology, which its core is to explain the practical implementation of the project. It determines the approaches, tools, and data sources which might be used to perform risk management on the project. Different types of assessments may be appropriate, depending

upon the project stage, the amount of information available, and flexibility remaining in risk management. The definition of risk probability and impact parameter could estimate and display the project's risk level and status (& risk category). The risk levels are based upon probability and impact to be defined that are specific to the project context. Of course, funding and timing are also important parameters that project managers should also take into consideration in order to follow the scheduled time plan and be on budget. In the scope document, the strategy is not such an influential parameter, but it should be included in the Project Risk plan parameters.

Usually, as a means to deliver the actual product there are a number of tasks to be completed from all contributing sides: the case company, the Bank and at times from third parties (vendors, contractors). In case any of the organisation fails to deliver as planned, the other party will respond with escalation. Escalation response is valued as necessary when the project team or sponsor agrees that an opportunity/threat is outside the scope of the project or that the proposed response would exceed the project manager's authority. Escalated opportunities/threats are managed at the program or portfolio level, or other relevant parts of the organization. These actions lead in having a revised plan which is usually considered upon meetings.

The Enterprise Architect replied that there is not any common Risk Management methodology. Even Though he knows that some higher technical review meetings took place at the initial stage of the project's cycle. In such meetings the participants were the Project Governance from both collaborative sides. The Architect further mentioned that this type of projects, like the banking Digital Transformation are long term, which translates to 3-5 years and have a strong sense of Change Management starting from resources, culture, structure, vendors etc.

In the question about the frequency of the assessment, the first Project Manager referred to a weekly assessment which outputs the risk register. It is added that the evaluation of the risks results from the Risk Matrix method (likelihood x impact) which identifies the risk owner's side. The researcher knows that this type of method is implemented by all Project Managers on a weekly basis since a Steering Committee (Bank and IBM governance) takes place every two weeks so as to present the progress and the blocks of the project which incorporate the risks. The project implements which combinations of probability and

impact results in a risk being classified as a high risk with red colour condition, moderate risk with amber colour condition, and low risk with green colour condition. The risk score helps put the risk into a category that will guide risk response actions.

The second Project Manager believes that an internal assessment must be overall completed at the end of each phase (requirements, design, development, testing) which appears to be a part of the methodology section.

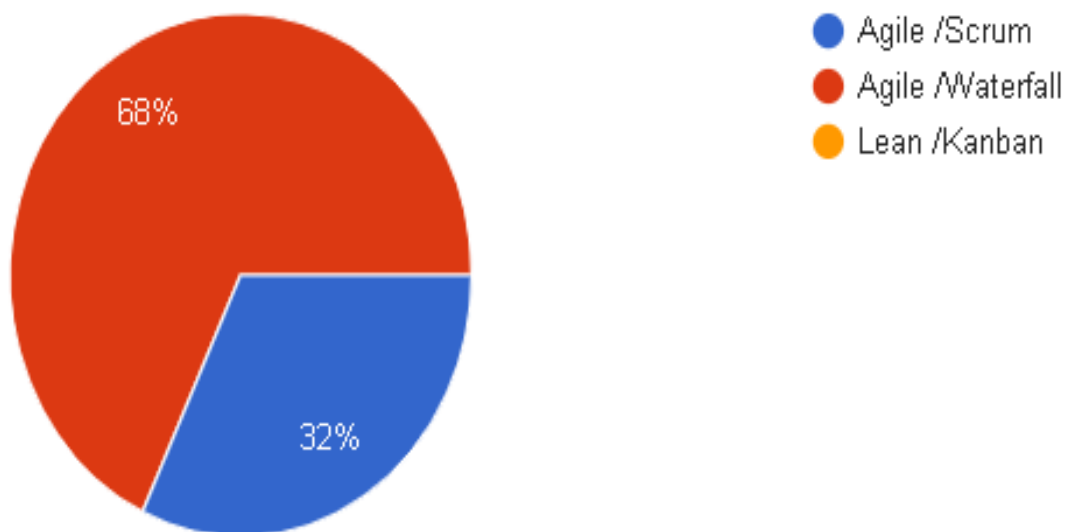


Figure 4.2.3 Project Methodologies

Source: Questionnaire results

In terms of the Risk Management methodologies, the project participants prefer to work with mixed Agile & Waterfall (68%), Agile & Scrum (32%), Lean & Kanban (0%). However, they are familiar with all the methodologies mentioned to the questionnaires: Agile (100%), Waterfall (96%), Scrum (80%), Lean (36%), Kanban (28%), Hybrid (2%).

Participants were asked why they have selected the combination of the specific methodologies and the results were that Risks can be easily mitigated (60%), Risks can be easily identified (56%), Easier team controlling (36%), Safer than others (24%), Requested by the client because previous did not work (4%), Methodology was defined at contract level (4%), It is easier for the client to understand (4%). Regarding Lean and Kanban,

Project Managers said that they did not manage any project in the past with these methodologies and also, they are not aware of them.

The Unified Front-End Project Manager (UFE) said that at the beginning the project exploited a more Agile approach and later on, altered it to a combination of Agile-Waterfall. Next step was to segregate the project into sprints (Agile event), at the same time Waterfall was maintained. This translates to the completion of each phase before proceeding to design, development and testing. In parallel, the company receives input from the Bank for each phase. It is highlighted that the project functions horizontally with Waterfall and vertically with the Agile iterations. The main reason for this mixture was the immediate delivery and the client invoicing which adds to the company's income. Therefore, working with Agile iterations per or maximum two months enables IBM to deliver the agreed requirements of the particular sprint to the client so as to be assessed and provide feedback for the product's improvement.

By managing the Campaign Management System project as well and always having as reference his former experience he claimed that it is a much smaller project in relation with the other project (UFE), that is why the latter uses only Waterfall.

On the other hand, the Enterprise Architect did not agree to this change methodology decision. Referring to his own experience, Agile is a more flexible model which accepts change easily. However, the Bank could not commit to it setting a major drawback in finalizing the business' requirements. For example, after 2-3 cycles of sprints IBM should have delivered the final product. Nonetheless in each updated sprint more things were added - requirements on the specific product. So, the Project Governance had issues with the deliverables and company's income.

The project challenges and the hazardous coordination with the bank has led the company to this amendment. Agile approach tends to provide late positive outcomes, but it seems that Agile has delivered huge parts of the programme such as the IBU (Web application), Mobile Application, PSD2, the Cards and Payments even though it is considered to be time consuming.

Furthermore, the Digital Factory project is composed of 2 Project Managers, the one works and coordinates on site with the Bank and the other one works in India (remotely) to

manage the team in India. As mentioned in the case study, an important part of the team works in India. The local Project Manager together with the Scrum Master, the Product Owner and the Development team (in India) work towards a more Agile approach following a Scrum framework. This type of project has been set up in a different methodology. Agile with Scrum is more operational for the factory due to the technologies provided through each project cell (IIB, IBU, BPM, etc.) hence it is easier to give sprint deliverables. It is a fact that each sprint has a 4 weeks interval from the upcoming one and all the cells start and finish at the same time (same cycle). Hence, each cell sprint has its own deliverables and scrum stand up calls for their daily update. The cell's sprint tasks may have a connecting variable between them. The Scrum Master is responsible to manage the factory teams.

Usually, the sequence of executing Information Technology Projects like the Digital Transformation in Banking, commence with the analysis of the business requirements, the design & development code and conclude with verification - testing phase. In order to fully understand how Project Managers, assess the risks, the researcher asked the participants to refer to concrete risks relevant to each phase and how their projects have overcome them.

The business's requirements are one of the bank's responsibilities and need to be fulfilled in high standards and on time as it has been pre-agreed. Sometimes this encounters high risk for the projects. Aiming to mitigate this type of risk, the contractual agreement limits the working hours, the required resources and the cost. What this means, is that through the Scope of work (Document Analysis) a specific structure and principles are set. In order to kick the project off, the bank must firstly provide the requirements. It also includes a structure of workshops for the business' requirements so as to be agreed and finalized. These workshops help to obtain quality input simultaneously. It is said that a small Risk management assessment is also registered in the document.

Another frequent risk occurring during this phase is wrong phrasing, namely the bank and IBM may not interpret the requirement in the same way, which leads to misunderstandings. Usually the Bank is not aware of the functionality of the new system, so this is a frequent phenomenon.

The above risk is categorized as a medium one and the mitigation action was to share the document with the bank on a regular basis targeting frequent comments and feedback. In case any issue is raised, the next step is to have a meeting with the client to clarify. The Digital Factory and Mobile Application Project Manager stated that:

“i.e. in the Wealth and Market project which is one of the several minor Work Order projects, the bank’s employee cannot comprehend what the reassign button means because she doesn’t know how the system works. Or for example on the UFE project where the requirements are not clearly stated, obviously leads to misinterpretations. In the phase when the Project Manager proceeds to a technical design and implementation, the bank interrupts the procedure by changing the requirements. Another example to support this is the Legal project which has failed to record an important part of the requirements and neither completion was done properly. Consequently, testing was wrongly carried out and that’s a point where we have to go back and create a new one including every parameter which was previously left out. This results in a double cost for the bank and creates unreliability issues for IBM.”

The project proceeds on the phase of designing & developing of the code which is another important stage. A Project Manager characteristically said high risk is en-calculated in the designing phase because there is always the possibility to lose any requirement. The need to simplify a technical solution, may drift the designer to lose the functional requirement. However, most of the Developers are senior which means that they are capable of designing the code. A common risk is that a developer may not be competent to understand what the analysis document writes and subsequently not implement the requirement in the way the bank imagines. The mitigation of this medium risk is that the IBM Business Analyst following the analysis of the document needs to be handed over to the developers explaining to them what the actual client requirement is.

Furthermore, the Business Analysts create the tasks in the Jira tool and assign them to the responsible developers. The equivalent tickets with their assigned tasks have a “time log” option, so IBM can prove the time which has been spent based on the agreement. The Project Manager has the ability to extract a report from this Jira tool checking the

development progress and the existing status of each task as well as who is responsible. Moreover, with the help of the tool Manager is able to see how productive the resources are and if the project faces any dependencies either internally or from the bank's side.

If the developers are not able to establish the timeframes and comprehend the requirements, then there is a severe gap between what they have developed and what is the client's desirable outcome. Obviously, the wrong development will affect cost due to the misalignment and the out of the scope plan, timeframe and hence delay. For example, if a specific resource wastes a month developing a wrong code this might lead in spending an additional half month so as to finish it correctly. When something similar occurs, the Project Manager needs to accept the risk and according to his own experience and knowledge evaluates the available development skills of his resources and estimates the effort needed for any resource and provides buffer effort in the plan to accept or mitigate all types of risks. Of course, there may also be dependencies from the bank's side, hence there is another risk that any of the collaborating sides may not be prepared to handle the situation.

A Manager referred to a Unit test code which does not enclose relevant risks because it is created by the developers. Actually, this development is a code quality indicator. If the implementation does not pass from the unit test, then wrong actions would not be detected. This is categorized as a low risk because the project is assigned to Senior Developers who are instructing the Junior ones in order to achieve improvement on the code quality. In addition to mitigating the risk, the code developed must be run through by unit tests from other developers. This type of cross check can improve the quality of the code. The Manager said that this action was not appropriate for the specific project due to work pressure.

The testing phase was carried out by the Unit Acceptance Testing (UAT) environment. UAT is IBM's environment to assure the high quality of the product before its final delivery to the client. In this phase the bank's responsibility is to provide the scenarios. In case the testing scenarios are wrong, this could be considered as a high risk because the client does not possess the relevant knowledge on the operation of the new system, it is not properly trained. Therefore, the lack of knowledge and experience might result in the scenarios being out of what has been priorly agreed. Generally, during testing IBM needs to avoid

coping with big issues (bugs- development issues). If this is observed, it directs that the requirement analysis, designing and development have been falsely executed. It is said that one action taken for the mitigation of these risks was to review the client's scenarios and test them in IBM's environment so as to be one step ahead from the client.

Surely, all risks need to be analysed and prioritized in terms of budget, cost, project plans and quality. Taking into account all the above parameters while analysing the risks, Project Managers must be equipped to recognize upcoming risks and their possible consequences on their projects plus they need to decide on how to mitigate and solve them at maximum. Project Managers must have the ability and the technical knowledge to identify whether the project is sustainable, or when needed to embrace the risks.

For example, if the project is waiting for any bank's service implementation, there is the risk not to deliver on time, the project development remains hidden for a long period (as it was prior calculated). Obviously, this becomes a priority and escalation action takes place due to its effect on the resource's capacity costs.

Both project Managers claimed that a weekly basis review and a follow up are the most applicable solutions to assess all the risks and take the relevant actions.

4.3 Challenges

It is a fact that such a huge and complex program could face numerous challenges until its final delivery. The project started in 2017 and indeed faced many difficulties until it found a normal and ongoing operational process. The Project Manager of the Unified Front End (and Customer Marketing Campaign) who is assigned the most significant and biggest project of the programme, within the discussion mentioned that there was no time to think and organize which was the most effective methodology for the project so to be adopted.

Another challenge was the cooperation with the third-party organizations- vendors who worked together with IBM and the Bank in the interest to provide more expert services for the fortunate delivery of the project. Based on the researcher's experience, the third-party's participation was important due to the fact that the software system belongs to the vendor's company, so their consulting was vitally significant. Inevitably, difficulties caused

the delay, setting the project out of scope and thereafter the huge cost of the project. First action was to remove vendors from the project and recrew new resources for this support.

Generally, IBM faced challenges and obstacles from the bank's perspective as well. The bank decided to go digital after the crisis of 2013. The huge amount of investment made the bank employees and government to be impatient for the technological solutions. This means that they wanted to have delivery outcomes as soon as possible. However, the project requires the bank's involvement and input for the project to fruitfully proceed. The diverse cultures of both companies, IBM and Bank concluded in confronting a huge challenge. IBM owns the role of the Strategy Partner in any case the bank does not have the required ability and the well-trained resources to ensure its undistracted cooperation with the company. At the beginning of the project, the bank lacked multiple important resources - skills, the weakest feature from their side was their incompetence to provide, discuss and agree on the Bank's business requirements for each project. Consequently, this caused delay and most of the projects were put out of scope (increasing the cost).

Bank employees were reluctant to embrace the procedure of this big change due to worrying of losing their job positions. They faced this occurrence as an obstacle and not as a chance to escalate on their work environment. This would have been avoided if the bank had organized a set of seminars in order to present the whole process of the project more clearly and offer some training leading to their reassurance of being safe.

Some other challenge was that IBM was fully prepared with their resources awaiting to start the project but after those unexpected delays, all had to be released until the bank was ready to set off. The bank also faced difficulties to cooperate with resources from different cultures, nationalities and time zones. IBM has employees from all parts of the world. One of the two main teams was located in India where needless to mention that the time zones were different, so at first phase communication was extremely difficult until it was later adapted.

Therefore, in order to make things proceed IBM started adapting and worked to the bank's style by employing mainly local resources. IBM even faced issues to find local resources with advanced expert skills of knowledge in this type of field. On the basis of the

researcher's observation, in these last 3 years the project has come a long way and both sides cooperate more efficiently.

4.4 Suggestions

Project Management has to manage and handle 10 unavoidable areas which are known as the knowledge areas and are displayed below in Figure 4.4.1. These areas have to be possessed by Managers. Risk project management is one significant category that most of the projects do not give attention to and mostly trust and refer to their knowledge and experience upon past projects. One substantial suggestion is that both organizations, the bank and IBM must provide courses to their Project Managers in order to gain expertise in this type of management. Acquiring knowledge in this sector will lead into taking more appropriate actions and decisions.



Figure 4.4.1 Project Management Knowledge areas

Source: PMBOK 2018

According to the researcher's observation the vast majority of the Project Managers and several resources participating in this case study have relevant experience in Banking projects however there is a small percentage which cannot be judged as experts. Even though in such a complex project, which demands a big amount of investments, it would be better to assign a bigger and more equipped, specialized team in the Project Management

office (PMO) so as to maximize the assistance and support given to Project Managers thus to handle the possible risks. Risk management is an area that PMOs do not get involved hence there are lots of aspects where these teams can provide perceptible support to Project Managers in their attempt to eliminate risks.

The PMO may have access into environments that a Project Manager does not have. Having the support of the team to the Risk identification process, offers a noteworthy amount of advantages. Firstly, PMO could initiate the process of risk identification data by implementing certain practices according to what has already been agreed and is recorded in the Project Risk Management Plan. This plan should be customly prepared to both parties'capabilities and the selected methodology. Questionnaire results reveal that projects working with the types of methodologies shown below, identify and gather risk data more effectively.

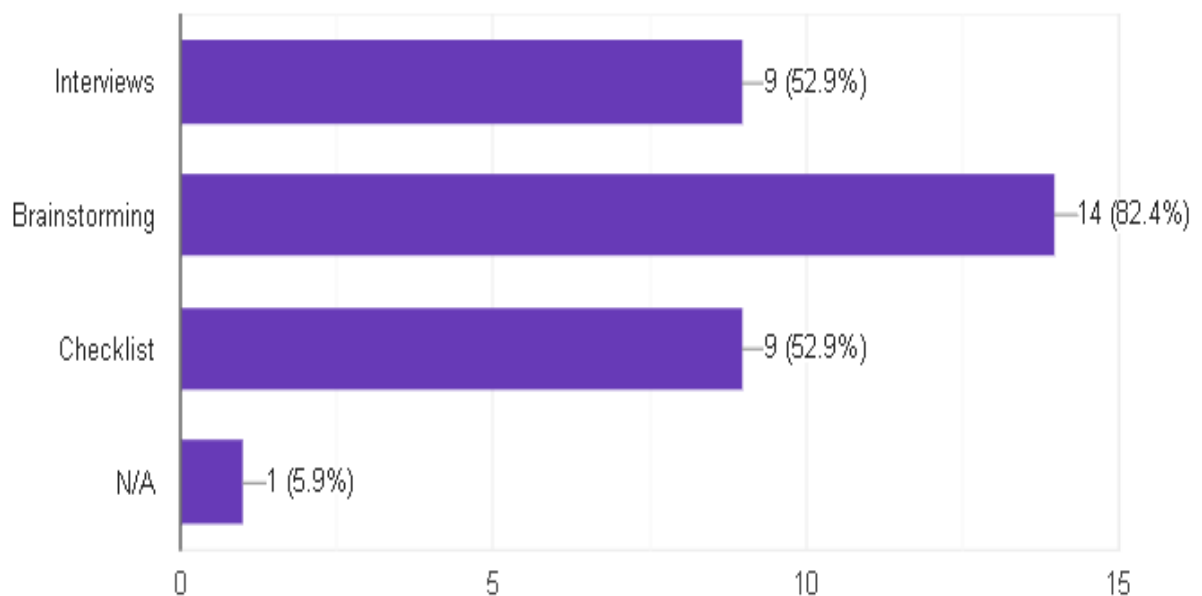


Figure 4.4.2 Agile with Waterfall practices

Source: Questionnaire results

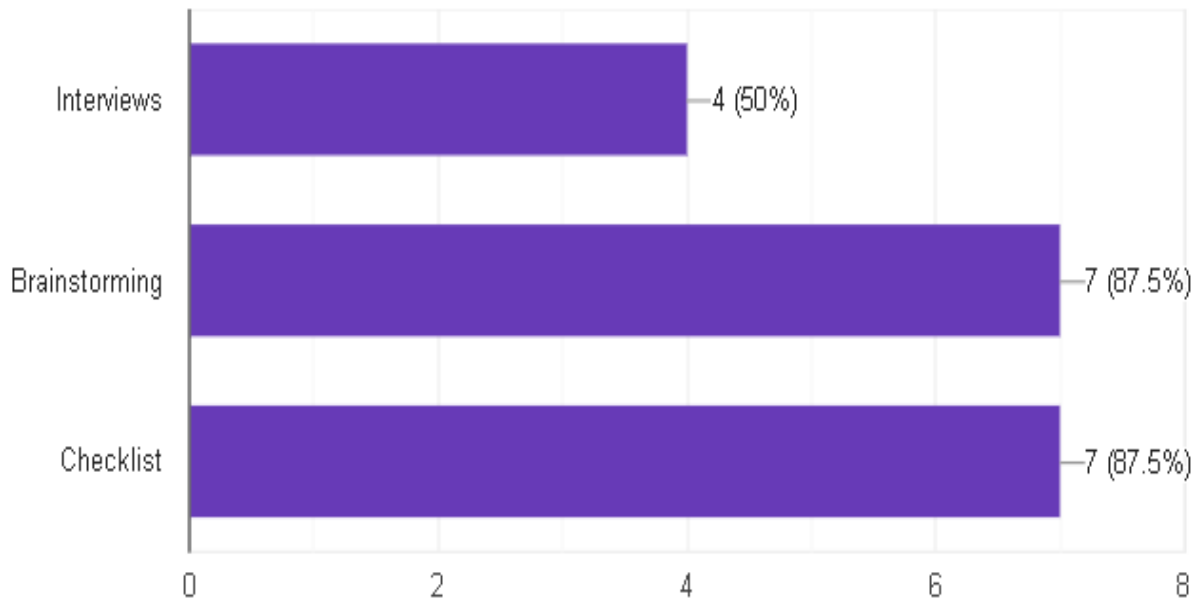


Figure 4.4.3 Agile with Scrum practices

Source: Questionnaire results

Agile with Waterfall projects methodology used 82.4% Brainstorming, 52.9% Interviews, 52.9% Checklists and 5.9% Not applicable. Agile with Scrum project methodology used 87.5% Brainstorming, 87.5% Checklists and 50% Interviews.

With these practices, PMO would be able to gather info regarding the project's risks and who is the owner of these and keep the Project Managers informed. This means that Project managers can focus their attention and engage on other important project issues as PMO will provide the data gathered through those practises. Both sides, the PMO team and Project Managers should try to optimize this collaboration for the project's benefit. Being one step ahead will assist Project Managers to manage risks which have already been identified more effectively. These risks may have an impact on other parts of the project, so the team can support Project managers to transparent into the details, impact and probability to establish a clearer point of view on the whole. Besides that, the PMO team has an inside view on all the projects in terms of the scope and is aware of any factor which might influence the development positively or negatively. This team is responsible to remark, register and follow up to the possible risks so that Managers are well prepared to act before these become an issue.

In terms of the analysis of the risks data, Project Managers should be able to understand the impact which a risk might carry and the harm it can cause to the project in the event of occurring. Obviously, analysing an unknown event is inherently difficult. The Project team must quantify financial variables and schedule the impact & probability of the event against the unknown for the project's protection. PMO should maintain the process of the risk analysis either Quantitative or/and Qualitative.

In the case of applying Agile with Scrum methodology it seems that data gathering, and data analysis are the most important practices of the risk analysis process in both qualitative and quantitative methods. Qualitative risk analysis owns a percentage of 87.5% of Risk Probability and Impact assessment seems to be the most effective method for this methodology and 37.5% to Risk Data Quality assessment practice. From this it is understood that assessing probability and impact is vital for project risk management.

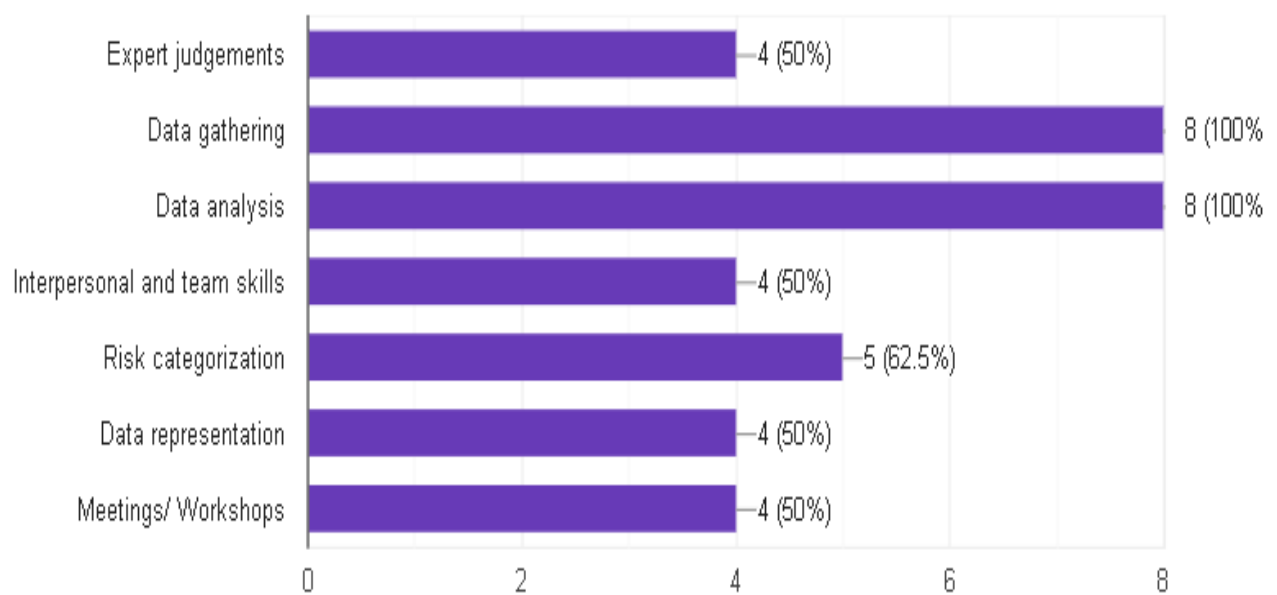


Figure 4.4.4 Agile with Scrum Qualitative risk analysis practices

Source: Questionnaire results

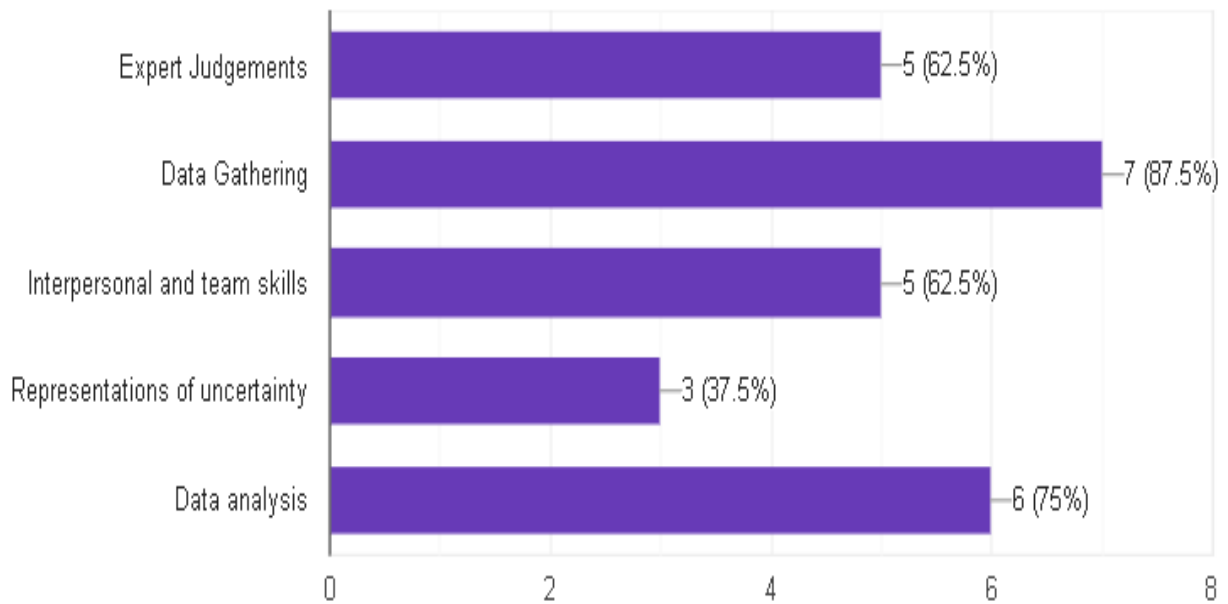


Figure 4.4.5 Agile with Scrum Quantitative risk analysis practices

Source: Questionnaire results

When Agile with Waterfall is used, we observe a trend to give more attention to the Expert judgements (such as the role of Enterprise Architect) 70.6% and then Data Analysis 52.9%, Risk categorization 52.9%, Meeting /Workshops 52.9% etc. Data analysis practices peer that Risk Probability and Impact assessment with 64.7% is again higher than the second one, Risk Data Quality assessment 29.4% and 5.9% assume that is not using any practice for data analysis.

On the other hand, quantitative analysis places more attention to Data gathering 70% (Interviews 76.5%, Probably Distribution 23.5%, 5.9% None of the above, 5.9% Not using), Data analysis 52.9%, Interpersonal and team skills 47.1%, Expert judgements 41.2%, Representations of uncertainty 29.4%, 5.9% None of the above and 5.9% Not using. Project managers assumed that these methods are more effective for the project's methodology with 70.6% and 23.5% are more familiar. The rest mentioned no use of it.

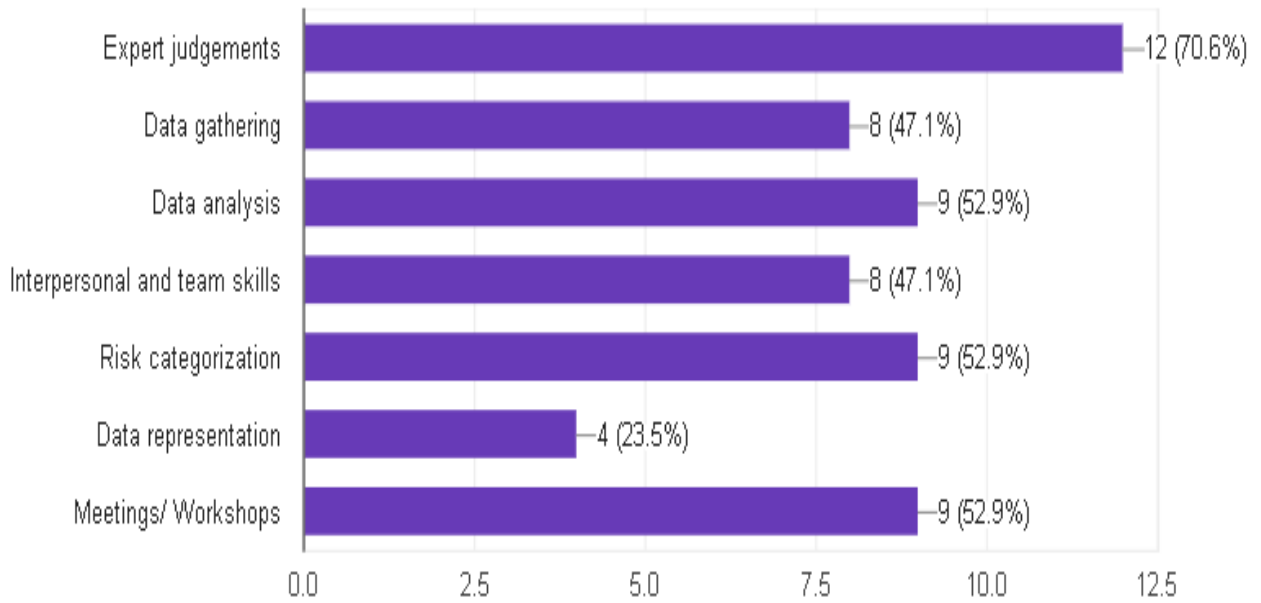


Figure 4.4.6 Agile with Waterfall Qualitative Analysis Practices

Source: Questionnaire results

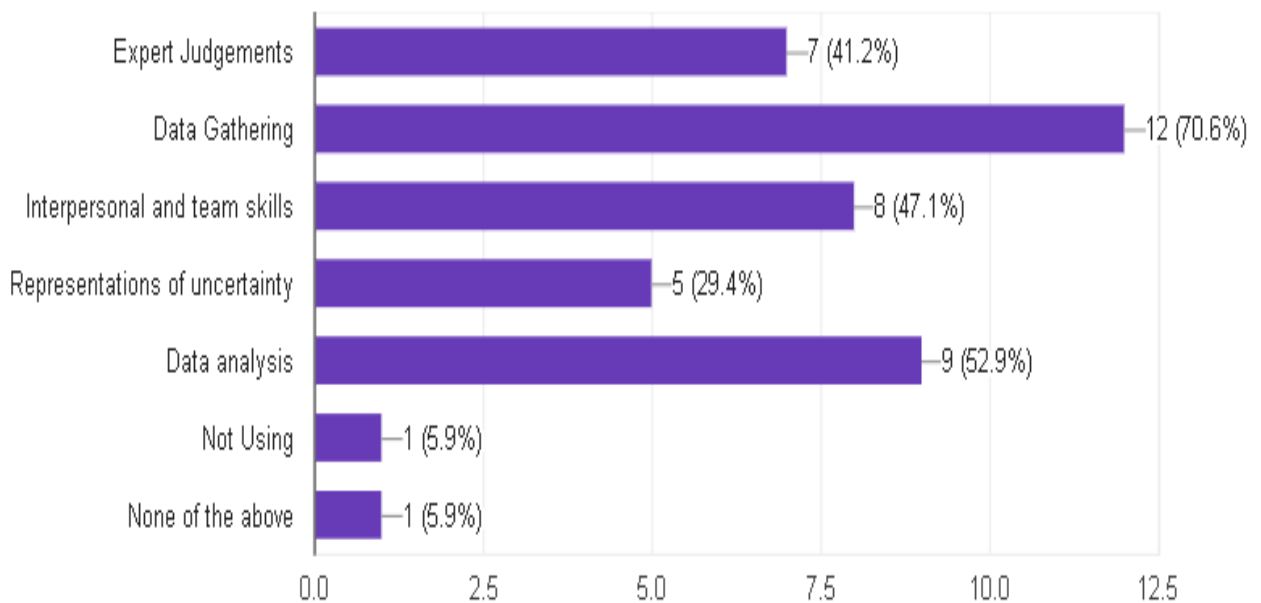


Figure 4.4.7 Agile with Waterfall Quantitative Analysis Practices

Source: Questionnaire results

The PMO team should be aware of which practices are the most effective for each particular methodology and need to register all the retrieved information in the project's central

repository so as to facilitate validation of the risk's analysis. After that, the team should act as an "early warning system" aiming to help recognize whether anything has changed and should obtain the capacity to interpret any occurrences in respect to the project's impact. All conclusions which have occurred from risk identification and risk analysis stages must be recorded into the Project's risk log document which is reviewed and revised at a later stage.

The Risk response step is an equally important part of the Risk management process in projects. The PMO team while on the process of supporting and assessing the risks is able to identify obstacles and opportunities.

In both methodologies the results shown below are related to the implementation of the risk response. It is clear that Mitigation, Avoidance and Escalation strategies are the most frequent actions and are highly applied. However, in the interview sessions, Project managers mostly mentioned applying the Mitigation and Escalation strategies so as to avoid impact to the project financials, timeframes and resources.

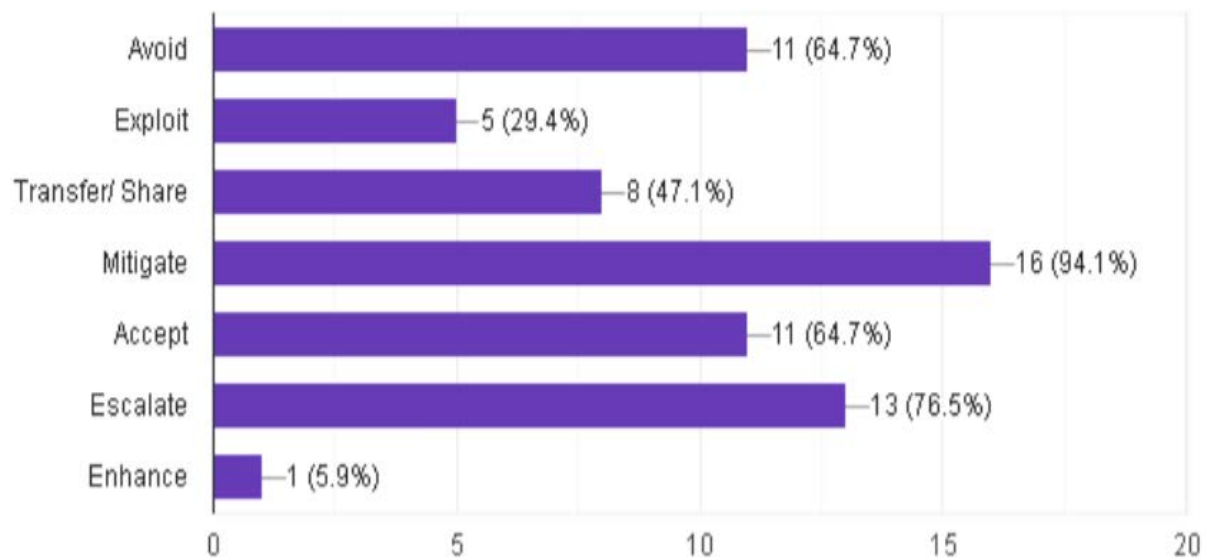


Figure 4.4.8 Agile with Waterfall Risk response strategies

Source: Questionnaire results

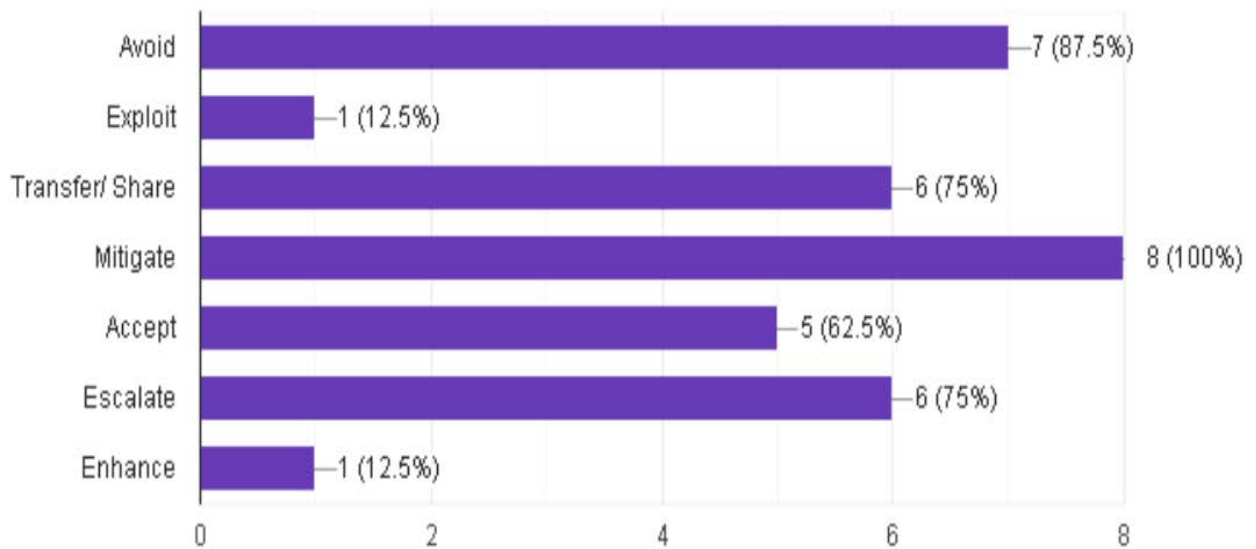


Figure 4.4.9 Agile with Scrum Risk response strategies

Source: Questionnaire results

Monitoring stage is a phase which comes after the completion of the implementation of risk response in order to verify that risks have indeed been mitigated or vanished.

The weekly project status meetings with both sides Project Managers need to remain in the project processes because managers can then present to the project governance the corresponding status and risks. In case there are stoppers/ dependencies on the project, both governance sides take their actions internally.

However, some team workshops and meetings need to be initiated in order to monitor whether there are project dependencies from the bank side or the organization's side. This can identify the involvement of more blockers and check whether there is any change. The team could inform the manager accordingly.

A concluding phase should be the review and the revaluation of the registered risks by the PMO team on a weekly basis so as to check whether they have been eliminated. In parallel, the risk log should be updated.

A reassessment should be initiated on the completion of each project cycle phase (requirements, designing, development, etc).

Based on the UFE Project Manager they should have been more thoroughly organized and well prepared for the forthcoming risks. The correct action and decision should have been made no matter the cost. From both parties' perspectives (bank and IBM) should have recruited well trained resources who hold a high level of skills. It is of great importance to have properly trained resources and their expertise of knowledge on the selected methodology that will be utilized. In the case of the bank, it seems that the resources are only aware of the traditional methodology - Waterfall.

Under these conditions the bank should have shown more interest to acquire knowledge and increase their employee qualifications by offering them a custom-made course on other innovative methodologies. A well-trained crew in Agile Methodology would armour us to avoid the excessive cost and delay by constantly adjusting and amending the plan to the bank's preferred methodologies. The right choice would be to invest more on their current resources. Right positioning is essential.

Project Managers who tend to work with the combination of Agile with Scrum and Agile with Waterfall seem to endeavour big issues in their attempt to manage this category of Project management. From the researcher perspective, it is clear now that the methodology selected in each project depends on the technologies needed to be provided to the client. It is proved that Agile with Waterfall works better for the bank's culture. Therefore, there is no right and wrong for the selection of the methodology. For further company's projects, IBM should highly consider in the agreement a methodology training course before any project kicks off.

Chapter 5

Discussion and Conclusion

Taking everything into account, the Digital Transformation provides many opportunities to the bank's organization and to its customers. For the implementation of such complex and time demanding projects, require a well-structured Risk Management for the mitigation of those risks.

The case study research of the specific major bank in Cyprus, shields like that Project Managers usually perceived risks as a negative event which may occur. Even though in theory, risk has both dimensions, the negative (threads) and positive (opportunity).

In terms of Risk Management, Project managers in the banking industry use tools and techniques described in the literature, however they are not actually aware of it. There are daily endeavours to manage risks in the specific case but there is not any structured way as it is described in the literature review section. Most of the research participants are willing and have agreed that a Risk Management process should have been developed in the project before its launch.

By applying the researcher's suggestions, it will be possible to identify the potential risks more easily. Additionally, it will provide the possibility to easily detect and identify risks owing high impact on time, quality and cost. With this way, managers should mitigate and respond by taking the proper actions. The case study research indicated that the most common strategy for implementation of risk response are mitigation and escalation.

What the research proved is that there is an unstructured plan of Risk Management strategy in the specific project in the banking sector. However, the knowledge of the implementation of Risk Management is what is missing from both case study organizations. Thus, for application of Risk Management in Digital transformation in banking sector's point of view further research should be facilitated.

Annexes

A. Personal Interviews

A.1 Interview 1

Ποιος είναι ο ρόλος σας στο έργο;

Είμαι Project Manager στα έργα Unified front End (UFE) and Campaign Management System (CMS).

Πόσα χρόνια εμπειρίας έχετε σε τραπεζικά έργα και πόσα σε DigitalTransformation τραπεζικά έργα;

Σε τραπεζικά έργα 11 χρόνια και τέτοιου είδους έργα 3 χρόνια.

Πιστεύεις ότι είναι καλό να υπάρχει μια ενεργή στρατηγική διαχείριση έργου και γιατί;

Ναι πιστεύω πως θα πρέπει να υπάρχει ένα riskmanagementstrategy και μία μεθοδολογία. Ο λόγος που τα χρειάζεσαι είναι κυρίως για να αποφύγεις τα προβλήματα μελλοντικά, να μπορέσεις να διαχειριστείς τα ρίσκα και να μην τα επιτρέψεις να υπάρξουν θέματα τα οποία κυρίως θα κοστίσουν αρκετά λεφτά. Τα πάντα στο έργο τα βλέπεις με τα λεφτά είτε χάσεις χρόνο είτε χρήματα. Ουσιαστικά πρέπει από την αρχή να μπορέσεις να αναγνωρίσεις τα ρίσκα και να μπορείς να τα διαχειριστείς.

Με ποια μεθοδολογία δουλεύεις στο έργο και αν υπάρχουν δύο μεθοδολογίες σε συνδυασμό, τι ήταν αυτό που σε οδήγησε στην απόφαση αυτή;

Στη μεθοδολογία του πρότζεκτ μάνατζμεντ χρησιμοποιούσαν μια μεθοδολογία που ήταν πολύ κοντά σε αυτό του Agile (με επαναληπτική προσέγγιση). Όταν ανέλαβα εγώ το έργο αλλάξαμε τη μεθοδολογία και την κάναμε ένα μίξ, χρησιμοποιώντας Waterfalland Agile.

Ουσιαστικά χωρίσαμε το έργο σε «sprints» (τα οποία δουλεύουν παράλληλα και σε κάθε sprint τρέχαμε το waterfall (δηλ ολοκληρώναμε με αυτά που απαιτούνταν, προχωρούσαμε στο σχεδιασμό, στην ανάπτυξη και προχωρούσαμε στο τεστ για να κλείσει το stream). Αλλά αυτά προχωρούσαν παράλληλα με δεδομένα που παίρναμε για το κάθε ένα ξεχωριστά. Ουσιαστικά οριζόντια ήταν Waterfall αλλά κάθετα κάπως σαν Agile με τις επαναλήψεις. Ο λόγος που το κάναμε αυτό ήταν να έχουμε γρήγορη παράδοση από βασικά ορόσημα για να μπορέσουμε να τιμολογήσουμε. Άρα δουλεύοντας σε πολλά πράγματα και έχοντας επαναλήψεις σε κάθε που σημαίνει ότι κάθε δύο και λίγα σε κάθε sprint είχαμε και το παραδοτέο, το οποίο έγινε δεκτό από τον πελάτη και περνάει ανατροφοδότηση για να μπορέσουμε να το ολοκληρώσουμε. Έτσι, μπορούσαμε να παραδώσουμε πολλά πράγματα σε λίγο χρονικό διάστημα, γι 'αυτό και βγήκαμε από το AgileModel και την εμπλουτίσαμε με το waterfallmodel. Στο CMS συνεχίζουμε με waterfall μοντέλο. Είναι πιο μικρό το έργο και ήταν πιο εύκολο να διαχειριστεί.

Ποιοι παράγοντες επηρεάζονται με τη επιλογή κάθε μεθοδολογίας; Τι προκλήσεις υπάρχουν;

Η προσαρμογή δεν ήτανε τόσο δύσκολη όσο η υλοποίηση του, δηλ το γεγονός ότι χωρίσαμε πολλά πράγματα τα οποία έπρεπε να τρέχουν παράλληλα, είναι πιο πολύπλοκο. Δηλ έπρεπε να ενισχύσουμε την ομάδα με παραπάνω κόσμο για να μπορέσουμε να καλύψουμε όλες τις ροές. Η μεγαλύτερη πρόκληση ήταν να βρούμε όλες τις εξαρτήσεις μεταξύ όλων των ροών και να τις οργανώσουμε και ουσιαστικά, δομώντας την ομάδα για να υποστηρίξεις ένα καινούργιο μοντέλο και το πλάνο που θα βασίζεται εκεί με τις προτεραιότητες και τις εξαρτήσεις.

Πόσο συχνά πιστεύεις πρέπει να γίνεται η αξιολόγηση κινδύνου σε κάθε έργο;

Αναλόγως τη διαδικασία που έχει επιλεγεί. Στην παρούσα διαδικασία εντοπίζουμε τους κινδύνους και τους καταγράφουμε. Εντοπίζουμε από πού πηγάζει ο κίνδυνος, και αξιολογούμε τους κινδύνους με τη μέθοδο των πιθανοτήτων και του αντίκτυπου που έχουν. Για να γίνει κάτι τέτοιο εντοπίζουμε τους παράγοντες που ελέγχουν τους κινδύνους λαμβάνοντας μέτρα για την άμβλυνση της ζημιάς. Η επισκόπηση του κινδύνου γίνεται εβδομαδιαία. Ο Διευθυντής έργου (projectmanager) διαχειρίζεται αυτή τη διαδικασία.

Ποια είναι τα πιθανά ρίσκα που αντιμετωπίζεις σε κάθε φάση του έργου και πώς τα διαχειρίζεσαι;

Στην ανάλυση των απαιτήσεων:

Η ανάλυση των αναγκών εξάγεται σε σχέση με τις ανάγκες των πελατών (custombusinesslines), τις οποίες ωστόσο μπορεί να μην τις γνωρίζει έγκαιρα οι ολοκληρωμένα. Αυτό είναι ένας κίνδυνος μεσαίου ρίσκου μπορεί και υψηλού. Οι δράσεις για το μετριασμό αυτού του κινδύνου ήταν ο περιορισμός του συμβολαίου ανάγοντάς το σε εργατώρες και workshops και αυτοί θα είναι οι συγκεκριμένοι συμμετέχοντες. Δηλαδή βάλαμε μία δομή σε αυτό και είχαμε ζητήσει και καταγραφή των αναγκών της επιχείρησης πριν ξεκινήσει αυτός ο κίνδυνος. Ουσιαστικά είχαμε βάλει ένα πλαίσιο στο πώς θα δουλεύουμε, με κάποιες αρχές (κριτήρια εισόδου και εξόδου) και είχαμε βάλει μία δομή στα workshops για να ολοκληρωθούν οι εργασιακές απαιτήσεις για να μπορούμε να παίρνουμε ποιοτικά δεδομένα από τον πελάτη. Με αυτόν τον τρόπο κάνουμε εξαγωγή της πληροφορίας την ίδια στιγμή. Ένα άλλο όταν γράφαμε εμείς ένα έγγραφο τεκμηρίωσης επειδή υπάρχει πάντα το ρίσκο να εννοεί ο ερωτώμενος αλλιώς αυτό που λέει και αλλιώς να το έχουμε καταγράψει εμείς (να μην το διατυπώσουμε με άλλο τρόπο δηλαδή).

Οι δράσεις μετριασμού αυτού του μέσου ρίσκου ήταν κατά τη διάρκεια που καταγράφαμε τις δηλώσεις των πελατών μας να μοιραζόμαστε μαζί του την καταγραφή για να μας επιβεβαιώνει τα λεγόμενά του. Αν και πάλι κάτι δεν ήταν σωστό καλούσαμε τον πελάτη ξανά, τηλεφωνικά, για επιβεβαίωση και συνεχίζαμε. Ποτέ δεν ολοκληρώναμε μία διαδικασία αν δεν λαμβάναμε ανατροφοδότηση κομμάτι – κομμάτι.

Στο σχεδιασμό και ανάπτυξη κώδικα

Κοινό ρίσκο το οποίο είναι δύσκολο να καταλάβει ο προγραμματιστής αυτό που γράφει το αρχείο και να υλοποιήσει ακριβώς όπως το έχει φανταστεί ο πελάτης. Αυτό κατατάσσεται στο μέσο ρίσκο. Ο τρόπος μετριασμού ήταν όταν ο ΒΑ τελείωνε τη συγγραφή του αρχείου και το παρέδιδε στους streamleaders τηλεφωνώντας τους για να τους εξηγήσει τα βασικά. Έπειτα συζητάει εβδομαδιαία με τους προγραμματιστές και τους δίνει καθοδήγηση στις καθημερινές δραστηριότητες. Ο streamleader όταν πήρε το αρχείο τα χώρισε σε καθημερινά παραδοτέα (artefacts) με κανονική περιγραφή. Κάθε εβδομάδα οι προγραμματιστές αναλαμβάνουν τις δραστηριότητες για να καλύψουν τις ώρες τους. Άρα

όταν ξεκινήσει η εβδομάδα γνωρίζουμε ότι δεν έχει κάποιες υπολειπόμενες δραστηριότητες. Τότε κάνουμε μια γρήγορη συζήτηση με τον BA, ο οποίος αναλυτής βρίσκεται ανάμεσα στο πελάτη και τον προγραμματιστή. Κατά αυτόν τον τρόπο μπορούμε να διαχειριζόμαστε αυτό το ρίσκο εβδομαδιαία. Αν και ίσως να μην είναι ακριβώς αυτό που επιθυμεί ο πελάτης, ωστόσο βρίσκεται πολύ κοντά και είναι διαχειρίσιμο.

Εμείς πρώτα κάνουμε μία δοκιμή του κώδικα (unittest), που έχει φτιαχτεί από τον προγραμματιστή, το οποίο δεν έχει ιδιαίτερα ρίσκα. Αυτή η δοκιμή αποτελεί ένα δείκτη ποιότητας του κώδικα. Δηλαδή αν υλοποιήσω το τεστάρω και σωστή δοκιμή δε θα βρω τα λάθη που έχω κάνει. Αυτό ανήκει στον παράγοντα χαμηλού ρίσκου (lowrisks) γιατί έχουμε αρκετούς ανώτερους προγραμματιστές. Ως παράγοντας μείωσης του ρίσκου έχουμε τους streamleaders οι οποίοι καθοδηγούν τους προγραμματιστές ώστε η ποιότητα του κώδικα να ανέβει κι επίσης έχουμε κάποιες περιπτώσεις όπου τον κώδικα που θα τον κάνει δοκιμή ένας άλλος προγραμματιστής. Εάν υπάρχει αυτή η διασταύρωση ελέγχου θα βελτιωθεί το επίπεδο του κώδικα. Ωστόσο, αυτό δεν είναι ιδιαίτερα επιτυχημένο κι αυτό γιατί δεν υπάρχει η πολυτέλεια του χρόνου, καθώς εργαζόμαστε κάτω από ασφυκτική πίεση.

Στην επαλήθευση

Ένας παράγοντας μετριασμού είναι το τεστ στο UAT. Ένα ρίσκο είναι ότι τα σενάρια που φτιάχνει ο πελάτης μπορεί να μην είναι σωστά, κάτι που στη δική μας περίπτωση αποτελεί υψηλό ρίσκο. Κι αυτό γιατί ο πελάτης φτιάχνει σενάρια τα οποία δεν ξέρει το σύστημα, δεν του έχουμε δώσει οδηγίες, δεν τον έχουμε εκπαιδεύσει και δεν έχει πρόσβαση στο σύστημα. Έχει μόνο πρόσβαση στο περιβάλλον που δεν είναι σταθερό. Άρα χωρίς τη γνώση και την εμπειρία τα σενάρια του δεν θα είναι με βάση το πεδίο εφαρμογής που έχουμε που έχουμε συμφωνήσει, κάτι που έχει παρατηρηθεί. Στο UAT δε θέλουμε να έχουμε πολλά σοβαρά θέματα και λάθος δεδομένα τα οποία σου χαλάνε τη στατιστική. Ως μέσω διόρθωσης ήταν να κάνουμε ανασκόπηση τα σενάρια που ετοιμάζει ο πελάτης τα οποία πρέπει να είναι στο πεδίο εφαρμογής του έργου. Επίσης για να μειώσουμε το ρίσκο τα σενάρια τα έχουμε και εμείς στο περιβάλλον μας. Δηλαδή είμαστε ένα βήμα πριν από τον πελάτη.

Πώς γίνεται η προτεραιότητα των ρίσκων αυτών;

Προτεραιότητα έχει η μέθοδος βαθμολόγησης που δίνουμε στα ρίσκα- RiskMatrix. Ανάλογα με την επίπτωση και τις πιθανότητες που μπορεί να εμφανίσει κάποιος εφαρμόζουμε τον κανόνα των προτεραιοτήτων. Με βαθμολογία 20 -25 είναι υψηλής προτεραιότητας, από 12-16 μείζονας, 5-10 μέση και 1-4 χαμηλής προτεραιότητας. Άρα η τροποποίηση γίνεται με τη βαθμολογία σύμφωνα με το ρίσκο.

Πώς ανταποκρίνεστε συνήθως στα ρίσκα (είτε είναι ευκαιρίες είτε κινδυνοί);

Συνήθως με ενέργειες μετριασμού, κλιμάκωση και αποδοχή. Υπάρχουν ρίσκα τα οποία είτε αποδέχομαι, άλλα μέτρα μετριασμού για να μην εμφανιστούν και κάποια ρίσκα τα οποία έχουν ημερομηνία λήξης. Πιο συγκεκριμένα, μόλις τελειώσει το development όλα μου τα ρίσκα κλείνουν μαζί με το development. Σε αυτήν την κατηγορία παρακολουθείς τα ρίσκα εβδομαδιαία και αναλόγως την πρόοδο του ρίσκου κάνεις τον κατάλληλο μετριασμό. Άμα δεις ότι στην επόμενη εκτίμηση το ρίσκο έχει ανέβει κατηγορία θα πρέπει να εκτελέσεις άλλο πλάνο δράσης μετριασμού. Το χειρότερο βέβαια σενάριο είναι το ρίσκο σου να έχει γίνει θέμα και να πρέπει να βρεις λύση. Υπάρχει βέβαια η κατηγορία των ρίσκων που τα κουβαλάς για μία ζωή, χωρίς ημερομηνία λήξης. Υπάρχουν όμως και κάποια με ημερομηνία λήξης τα οποία συγκεκριμένη ημερομηνία και υπεύθυνα άτομο. Για να μπορείς να το αξιολογηθούν την επόμενη εβδομάδα ή να κάνεις συνεχιζόμενη δράση το οποίο βλέπεις αν γίνεται κάθε εβδομάδα.

Συμφωνά με τα αποτελέσματα των ερωτηματολογίων οι Διαχειριστές του έργου τείνουν προς την Agile, Waterfall και Scrum μεθοδολογίες. Γιατί πιστεύεις η Lean και Kanban μεθοδολογίες δε χρησιμοποιούνται στο έργο;

Γιατί δεν την γνωρίζουμε. Γενικά τη διαχείριση ρίσκου δεν την χρησιμοποιούμε στα έργα. Περιέχει πολύ θεωρία. Θα πρέπει να εκτός από προγραμματιστή να βρείς και μια έμπειρη ομάδα η οποία μπορεί να έχει τη γνώση και την εμπειρία για να μπορεί να το τρέχει και να ξέρει αυτές τις μεθοδολογίες. Στη δική μας περίπτωση δε γνωρίζει κάποιος αυτές τις μεθοδολογίες γι αυτό και δεν εφαρμόζονται. Σε όλους πρέπει να είναι εμπειρικές οι μεθοδολογίες γιατί κανένας δε μπορεί να καταλάβει την ορολογία μπορώντας να δώσει σωστά την εισαγωγή δεδομένων. Η Lean απ' όσο γνωρίζω είναι για να κάνεις βελτιστοποίηση πολλά πράγματα όπως πόροι, προσπάθεια κλπ. Κι εγώ τη γνωρίζω

θεωρητικά χωρίς να την έχω εφαρμόσει κάπου. Εγώ είμαι πιο πολύ της παλιάς σχολής δηλαδή του Waterfall (το οποίο γνωρίζουν κι οι περισσότεροι), αλλά τα τελευταία χρόνια ξέρω και το PMI. Ωστόσο, γενικά θα πρέπει να γνωρίζεις τις αρχές της μεθοδολογίας (τα θεμελιώδη στοιχεία, πώς χρησιμοποιείται). Οι βασικές αρχές της Lean, αν δεν κάνω λάθος, είναι να κάνει με την αξία των πόρων που πρέπει να υπολογίσεις, να έχουμε συνεχόμενη βελτίωση και φυσικά να έχουμε σεβασμό στους ανθρώπους. Γενικά θέλουν να δίνουν αξία και τη ροή στο πελάτη. Σε ένα έργο ουσιαστικά έχεις μία ομάδα που μπορείς να εφαρμόσεις κάποιες μεθοδολογίες οι οποίες εξαρτώνται από σένα και πρέπει να τις κατανοούν κι υπόλοιποι. Δηλαδή αν θέλω εγώ τώρα να εφαρμόσω αυτή την μεθοδολογία - με σεβασμό για τους ανθρώπους (που απαρτίζουν τα συστατικά της ομάδας), εάν ο αρχηγός της ομάδας δε γνωρίζει αυτήν την μεθοδολογία τότε δε μπορεί να την περάσει σε όλη την ομάδα. Άρα ο κύριος λόγος είναι ότι λόγω της έλλειψης γνώσης και εμπειρίας από την ομάδα, δεν έχεις την πολυτέλεια να διδάξεις αυτήν την μεθοδολογία και γι αυτό δεν προτιμάτε. Την Kanban δεν την γνωρίζω.

Το DigitalFactory έχει στηθεί διαφορετικά το έργο. Εκεί έχεις ένα εργοστάσιο. Έχεις βάλει μία μηχανή που της λες μου δίνεις αυτά και μου βγάζεις από την άλλη αυτά. Είναι πιο εύκολο να στηθεί το Agile εκεί πέρα. Ακριβώς Agile όμως δεν είναι, έχουμε πάρει μόνο το κομμάτι της ανάπτυξης. Επειδή έχουνε sprints δε σημαίνει ότι έχουν Agile, απλά το έχουνε χωρίσει γιατί είναι εργοστάσιο και το κάθε sprint είναι ξεχωριστό. Εάν εφαρμόσεις το agile πάνω σε ένα έργο ουσιαστικά έχεις ένα πεδίο εφαρμογής και το έχεις χωρίσει σε μέρη που παραδίδεις κομμάτι - κομμάτι τα οποία έχει αξία. Για παράδειγμα, στο UFE για παράδειγμα να τρέχει agile στη διαδικασία του πελάτη κατά το ξεκίνημα και κάθε φορά να παραδίδεις ένα βήμα από τη διαδικασία είτε να παραδίδεις τα παραδοτέα. ΤοDF δε λειτουργεί έτσι, στο DF έχει sprints και λέει σε αυτό θα βάλω τα WO τάδε και τρέχει όλο το WorkOrder, δεν μπορεί να τρέξει το μισό. Δεν είναι καθαρό Agile αλλά έχει μία γεύση του agile. Και γενικά η τράπεζα δεν έχει μάθει να τρέχει έργα Agile κι αυτό είναι το πρόβλημα.

Πιστεύεις ότι όλο το πρόγραμμα πρέπει να ακολουθεί μια κοινή μεθοδολογία;

Δε συμφωνώ ότι όλα τα έργα πρέπει να έχουν την ίδια μεθοδολογία. Προτεραιότητες και εξαρτήσεις από άλλα έργα αυτό είναι το επικοινωνιακό. Εάν το DigitalFactory σε εξιτάρει και εσύ το έχεις σε προτεραιότητα και τους ενημερώσεις εγκαίρως τότε θα μπει κι αυτό στο πλάνο τους. Είναι ευθυγραμμισμένα μεταξύ των έργων.

Τι προκλήσεις έχεις αντιμετωπίσει μέσα από το προγραμμα; Τι ενέργειες θα ήταν καλό να ληφθούν υπόψη σε ένα νέο ενεργές πλάνο διαχείρισης κινδύνων;

Μεγάλη πρόκληση ήταν ότι δεν είχαμε χρόνο να οργανωθούμε, να φτιάξουμε μία δομή στην ομάδα, να φτιάξουμε ποιες μεθοδολογίες θα δουλέψουμε από την αρχή. Είχαμε πολλές αλλαγές συνέχεια στο έργο. Τη μεθοδολογία την βάλουμε από πριν αλλά είχαμε την πρόκληση στην οποία ο πελάτης ζητούσε κάποια πράγματα που δεν ήταν μέσα στο πεδίο εφαρμογής του έργου ή δεν ήταν στο πρόγραμμα μας να γίνουν όπως πχ τα demo. Από την άλλη έπρεπε να κάνουμε παράδοση γιατί αλλιώς θα σταματούσε το έργο. Μία άλλη πρόκληση ήταν οι εργολάβοι που είχαμε στο έργο γιατί το να δουλεύουμε τέσσερις εταιρίες πλάι-πλάι είναι πολύ χρονοβόρο και κοστοβόρο) και είναι πάρα πολύ δύσκολο. Δηλαδή πρέπει να το έχεις κάνει κάπου πετυχημένα και να το ξανά εφαρμόσεις. Σε ένα τόσο μεγάλο έργο απέτυχε γι αυτό και σταμάτησε η συνεργασία με την εταιρία Vendor. Αν κάτι θα έπρεπε να το δούμε από την αρχή θα έπρεπε οι υπεύθυνοι λήψης αποφάσεων αξιολογούν να ξεκινήσουν από την αρχή και να παίρνουνε αποφάσεις μη λαμβάνοντας υπόψη το κόστος.

A.2 Interview 2

Ποιος είναι ο ρόλος σας στο έργο;

Είμαι ο EnterpriseArchitect του προγράμματος

Πόσα χρόνια εμπειρίας έχετε σε τραπεζικά έργα και πόσα σε DigitalTransformation τραπεζικά έργα;

Σε τραπεζικά έχω 26 χρόνια και 5 σε **DigitalTransformation τραπεζικά έργα** (με τις πιο σύγχρονες τεχνολογίες).

Πιστεύεις ότι είναι καλό να υπάρχει μια ενεργή στρατηγική διαχείριση έργου και γιατί;

Το risk management δεν το χειρίστηκα εγώ αλλά ο Project Executive. Στο δικό μου το επίπεδο βλέπω πολλά από τα ρίσκα σε τεχνικό/σχεδιαστικό και αρχιτεκτονικό επίπεδο. Επίσης υπάρχουν και πολλά πολιτικά γιατί με αγγίζουν σε μεγάλο βαθμό.

Τυπική διαχείριση κινδύνου (riskmanagement) δεν έχω κάνει ποτέ μου, έχω δουλέψει πολύ με διευθυντές έργων (projectmanagers, PM) που τους έχω βοηθήσει, απλά δεν είμαι ειδικός σε αυτό το πράγμα. Εγώ δεν αντιμετωπίζω τα ρίσκα με κάποια συγκεκριμένη μεθοδολογία, πάω βάση της εμπειρίας μου, βάση των συναισθημάτων μου και τα αντιμετωπίζω όπως νομίζω εγώ καλύτερα και τις περισσότερες φορές δεν έχω πέσει έξω. Οι διαχειριστές έργων πρέπει όμως να το κάνουμε αυτό γιατί πολλά από τα ρίσκα δεν τα καταλαβαίνουμε εις βάθος με την έννοια ότι πολλά ρίσκα μπορεί να είναι τεχνολογικά, τεχνικά, πολύπλοκα. Για ένα μη καταρτισμένο τεχνικά PM να μην τα καταλαβαίνει κι αυτοί το αντιμετωπίζουν με κάποια μεθοδολογία η οποία τα βλέπει σφαιρικά και τα βλέπει σαν μαύρα κουτιά. Πόσο σημαντικό είναι αν έχει μετριάσμο το ρίσκο, ποια είναι η επίπτωση αν δεν το κάνω μετριάσμο, αν δεν το κάνω άμεσα, τι κόστος έχει ο μετριάσμός και τι επιλογές έχω κλπ. Το αντιμετωπίζουν σαν μαύρο κουτί, εμένα με ενδιαφέρει το τι είναι μέσα, τις περισσότερες φορές εμένα με ενδιαφέρει τι έχει μέσα. Τις περισσότερες φορές άρα έχουμε διαφορετικές οπτικές γωνίες.

Σε τέτοιου είδους έργα πρέπει να υπάρχει οπωσδήποτε γιατί είναι πολύπλοκα, δύσκολα και μακροχρόνια έργα. Δηλαδή DT έργο δεν κάνεις σε ένα χρόνο αλλά σε 3-5 έτη. Στην πορεία αυτή τα πράγματα δεν είναι στατικά, δηλαδή αλλάζουν οι άνθρωποι, αλλάζουν οι τεχνολογίες, αλλάζει ο ίδιος ο οργανισμός, το κράτος, οι εποπτικές αρχές, οι πολιτικές, έρχονται κρίσεις, έρχονται καταστάσεις οι οποίες πρέπει να αντιδράσει ο οργανισμός γρήγορα, υπάρχει ο ανταγωνισμός, μπορεί να υπάρχει κάποια αποδιοργανωτική εξέλιξη σε όποιο από αυτά τα μέτρα που σου λέω. Δηλαδή σε ένα μακροπρόθεσμο έργο γενικά υπάρχουνε πολλά ρίσκα ανεξάρτητα το τι είναι το έργο και όλα τα πράγματα μπορούνε να αλλάξουνε εσωτερικά και εξωτερικά στο οποίο κινείται το έργο. Άρα αυτό από μόνο του είναι ένα ρίσκο. Τώρα ειδικά σε προγράμματα μεταφοράς τα ρίσκα είναι ακόμη μεγαλύτερα γιατί τα προγράμματα ουσιαστικά έχουνε μία πάρα πολύ ισχυρή δόση διαχείρισης αλλαγών μέσα τους και ο μετασχηματισμός του ίδιου οργανισμού. Δηλαδή αυτό το έργο δε μπορεί να τρέξει απλά αλλάζοντας το λογισμικό που χρησιμοποιείς, δεν έχει νόημα αυτό. Το DT σε ότι αφορά το IT δεν προσπαθεί να αλλάξει το λογισμικό Α με το λογισμικό Β, αλλά προσπαθεί να αλλάξει τον τρόπο που δουλεύει το IT και τα προϊόντα που αυτό παράγει για να τα κάνει 100 φορές πιο αποτελεσματικά, αποδοτικά, ευέλικτα και με πολύ μικρότερο κόστος αλλαγών και συντήρησης. Αυτό το πράγμα σημαίνει ότι

πρέπει να ταρακουνηθούμε και να έρθουνε τα πάνω κάτω σε πάρα πολλά πράγματα. Όπως το πώς είναι στημένος ο οργανισμός, οι δομές του, η κουλτούρα των ανθρώπων, οι δεξιότητες που έχουν, να γίνουν προσλήψεις, να αλλάξει το πώς συνεργάζονται μεταξύ τους οι ομάδες, οι μέντορες, οι πελάτες, τα πάντα. Αυτή η μεταμόρφωση έχει πάρα πολλές αντιστάσεις. Δηλαδή οι άνθρωποι δεν είναι διατεθειμένοι να αλλάζουνε. Όταν έρχεται η τράπεζα και λέει τρέχει ένα πρόγραμμα σαν κι αυτό και θα βάλει και κάτι δεκάδες εκατομμύρια euro επένδυση σε αυτό το πρόγραμμα, αυτό δε σημαίνει ότι ο οργανισμός από κάτω θα ακολουθήσει και είναι πρόθυμος να αυτόμεταμορφωθεί. Συνήθως υπάρχουν αντιστάσεις κι αυτές οι αντιστάσεις δεν είναι ούτε φανερές ούτε μένουν ίδιες στο πέρασμα του χρόνου. Δηλαδή άλλος θα αρνηθεί να συνεργαστεί, άλλος θα σε σαμποτάρει, άλλος θα το δει με φόβο, άλλος θα πει τώρα τι γίνεται το DigitalTransformation, εγώ μπορεί να χάσω τη θέση μου, υπάρχουνε πάρα πολλά προβλήματα που κάνουμε τέτοιου είδους έργα να σκοντάφτουνε συνεχώς από πρόβλημα σε πρόβλημα, από αντίρρηση σε αντίρρηση, καμιά φορά και σε ανοικτό πόλεμο, πχ εγώ θέλω να αλλάξει αυτό το πράγμα, δεν θα το κάνουμε έτσι, θα το κάνουμε αλλιώς κλπ. Άρα η διαχείριση του ρίσκου σε τέτοιου είδους έργα είναι απαραίτητη. Υπάρχουνε πάρα πολλές διασταυρώσεις που θα φτάσει το έργο και θα πρέπει να λάβει αποφάσεις ή να κάνει λίγο πίσω ή να αλλάξει πλάνο ή να αλλάξει πορεία ή να κάνει κάτι παραπάνω, λιγότερο ή να αλλάξει προτεραιότητες για να μπορέσει να προσαρμοστεί στην πραγματικότητα και χωρίς πλάνο διαχείρισης ρίσκου αυτό δεν είναι εύκολο γιατί αυτά που σου λέω τώρα είναι σε πάρα πολλά επίπεδα, από το υψηλότερο ως το χαμηλότερο και από το πιο τεχνικό στο πιο ανθρώπινο. Επομένως είναι απαραίτητο το πλάνο διαχείρισης ρίσκου σε τέτοιου είδους έργα και πολλές φορές τα ρίσκα από μόνα τους θα επιβάλουνε και αλλαγή των τακτικών σχεδίων που συνήθως μπαίνουνε στο χαρτί με πιο ιδανικές συνθήκες κατά νου.

Μπορείς σε παρακαλώ να μας πεις λίγα λόγια για το συγκεκριμένο τραπεζικό πρόγραμμα;

Ο σκοπός του DT είναι να μετασηματίσει το τεχνολογικό υπόβαθρο της τράπεζας έτσι ώστε να της επιτρέψει να μπει στον 21ο αιώνα και να δουλέψει με τρόπους όπου η καινούργια εποχή επιβάλλει. Είτε αυτό λέγεται βασικό οικονομικό νέφος (cloudbasedeconomy), είτε λέγεται διαδικτυακή επιχείρηση, είτε ανοικτή επιχειρηματικότητα, είτε σε τραπεζικό επίπεδο να παρακολουθήσει και να είναι σύγχρονος

και καινοτόμος σε τύπου openbanking και γενικά να φύγει από μία φάση που είχε μείνει πάρα πολύ πίσω σε πάρα πολλά πράγματα και τεχνολογικά και επιχειρηματικά. Κι επειδή η επιχειρηματικότητα υπήρχε πάντα το παράπονο ότι η τράπεζα δεν βοηθάει την επιχείρηση να κάνει τα τελευταία πράγματα που θα ήθελε, αυτό το πρόγραμμα δρα σαν ενεργοποιητή για να επιτρέψει στην επιχείρηση να πραγματοποιήσει τα όνειρά της και να καταστεί ικανή και της μέσης ανατολής και σε κάποιους τομείς που ενδιαφέρουν την τράπεζα. Οπότε ο σκοπός είναι να είναι κάνει αφ' ενός ένα άλμα τεχνολογικό και αφετέρου να κάνει ικανή την επιχείρηση να πατήσει πάνω σε αυτήν την καινούργια τεχνολογικά προηγμένη υποδομή της τράπεζας για να κάνει πράγματα συμπαθητικά αλλά και να βελτιστοποιήσει εσωτερικά διαδικασίες, δομές και τρόπο εργασίας. Διότι η τράπεζα είχε μείνει σε ένα απαρχαιωμένο τρόπο λειτουργίας εσωτερικά και πώς δουλεύει και πώς συνεργάζεται (εσωτερικά και με άλλους). Το αποτέλεσμα ήταν ότι αυτό ήταν ανεπαρκές, δηλαδή τα πράγματα κινούνται πολύ αργά, το κόστος είναι τεράστιο και σε χρόνο και σε ανθρώπους. Η ποιότητα είναι πάρα πολύ χαμηλή και κανένας δεν είναι ευχαριστημένος ούτε αυτοί που ζήτησαν κάτι και δεν το παίρνουν όπως θέλανε είτε εσωτερικά είτε εξωτερικά, ούτε αυτοί που το υλοποίησαν που γκρινιάζουν ότι δε μπορούν να κάνουν κάτι καλύτερο γιατί δεν έχουν τα εργαλεία της τεχνολογίας κλπ. Επομένως, είναι πολλαπλά μέτωπα που προσπαθεί να δώσει λύσεις το DT, αλλά το πιο σημαντικό είναι το πρώτο, δηλαδή στρατηγικά είναι το πρώτο, πρακτικά είναι το τελευταίο. Δηλαδή ότι η τράπεζα είναι ένας βαρύς δυσκίνητος οργανισμός, πολύ αργοκίνητος με πολύ μεγάλο κόστος, μικρή παραγωγή και τεράστιο πρόβλημα ποιότητας σε αυτά που κάνει τουλάχιστον σε επίπεδο IT.

Πιστεύεις ότι στο πρόγραμμα ακολουθείται κατά γράμμα αυτή η διαδικασία?

Δε νομίζω, δεν ξέρω τυπικά τις μεθοδολογίες για τη διαχείριση του ρίσκου αλλά μπορώ να σου πω ότι γενικά προσπάθειες καταβάλλονται. Δε νομίζω ότι τις ακολουθούν κατά γράμμα τις μεθοδολογίες, αυτό που γίνεται είναι ότι υπάρχουνε πολύ τακτικές ανασκοπήσεις. Εγώ δεν έχω διαπιστώσει να ακολουθείται μια μεθοδολογία αυστηρά.

Με ποια μεθοδολογία δουλεύεις στο έργο και αν υπάρχουν δύο μεθοδολογίες σε συνδυασμό, τι ήταν αυτό που οδήγησε στην απόφαση αυτή;

Ξεκινήσαμε με Agile, στην πορεία πήγαμε με Waterfall. Εγώ δεν συμφωνούσα να αλλάξει αλλά ήταν απόφαση του υπεύθυνου του έργου. Ο λόγος που τον έκανε να αλλάξει ήταν ότι το Agile είναι εξ ορισμού ένα ευέλικτο μοντέλο που επιδέχεται πιο εύκολα αλλαγές. Η τράπεζα δε δεσμεύτηκε εύκολα, δεν οριστικοποιούσε εύκολα απαιτήσεις. Αντί τα sprints να καταλήγουν στο τελικό προϊόν μετά από δύο – τρεις κύκλους (sprints), αυτό δε συνέβαινε γιατί η τράπεζα σε κάθε sprint έβαζε πράγματα που στο προϋγούμενο είχε ξεχάσει. Κι αυτό το πράγμα ήταν σε εξέλιξη και αυτοί που κοιτούσαν το λογαριασμό άρχισαν να φωνάζουν και να παρακολουθούν γιατί μετά από 5-6 sprints δεν γινόταν παραδοτέα. Για παράδειγμα οι κάρτες και οι πληρωμές πήρανε 2,5 χρόνια και οι πληρωμές άλλα 2,5 χρόνια. Κι αυτό γιατί εκτός από τις δικές μας ομάδες βασιζόμαστε και στους ανθρώπους της τράπεζας. Δηλαδή η επιχείρηση καλεί να την αρθρωση ο πελάτης, να το εκφράσει, να το οριστικοποιήσει και να το επιβεβαιώσει ο πελάτης, δηλαδή οι αναλυτές της τράπεζας. Αποδείχτηκε ότι αυτό ήταν πάρα πολύ δύσκολο. Δηλαδή απλά δε μπορούσαν και αυτό πήγαινε από sprint σε sprint, και τελικά για να το μαζέψουν αυτό θα αλλάξουμε τον τρόπο συνεργασίας, δηλαδή οριστικοποιούμε ένα πεδίο εφαρμογής στην αρχή της προσπάθειας και μετά η IBM θα το παίρνει αυτό και θα το παραδίδει με μία Agile εφαρμογή αλλά πάνω σε ένα συγκεκριμένο πεδίο εφαρμογής. Τώρα το συγκεκριμένο πεδίο εφαρμογής με το Agile είναι αντιφατικοί όροι. Δεν πάει εύκολα το Agile με συγκεκριμένο πεδίο εφαρμογής. Στην περίπτωση του πελάτη αποδείχθηκε ότι δεν ήταν εύκολο να συνεχίσεις χωρίς να αγγίξεις τα όρια σου, να σου πει σταμάτα γιατί ξοδεύω χρήματα και δεν παίρνω τίποτα. Οπότε από αυτή την οπτική κινήθηκε και το άλλαξε. Τώρα αν ήταν αυτός ο μόνος τρόπος, αυτό είναι μεγάλο θέμα αλλά τελικά αυτό ήταν το κίνητρο.

Ποιοι παράγοντες επηρεάζονται με τη επιλογή κάθε μεθοδολογίας; Τι προκλήσεις υπάρχουν;

Γενικά επηρεάζεται η ομάδα και το κόστος με την αλλαγή στη μεθοδολογία. Εμείς αυτό που θέλαμε να πετύχουμε είναι να δέσουμε την τράπεζα με ένα συγκεκριμένο πλαίσιο έργου με ένα συγκεκριμένο πεδίο εφαρμογής και αν μετά κάνει αλλαγές πάνω σε αυτό, αυτό θα κοστίζει. Οπότε η τράπεζα πήρε αυτό που ήθελε τουλάχιστον τη διαχείριση ότι της δύναμε συγκεκριμένη υπόσχεση για χρόνο, κόστος με πολύ μικρές αποκλίσεις και εμείς περνάμε αυτό που θέλαμε ότι αν άλλαζε το αρχικό πλάνο εφαρμογής η τράπεζα θα το πλήρωνε αυτό. Επομένως φαινόταν ποιός έφταιγε που προηγουμένως αυτό το πράγμα δε

δούλευε καλά. Οπότε αυτό το πράγμα δούλεψε, κατά την άποψη μου θεωρώ ότι υπήρχε τρόπος να δουλέψει και με το Agile αλλά τέλος πάντων δούλεψε με το ζόρι.

Εγώ βλέπω ότι δεν υπάρχει κάποια μεθοδολογία επίσημης διαχείρισης ρίσκου αν και είμαι σίγουρος ότι κάποια τραπέζια έμπαιναν κάποιες παρουσιάσεις απλώς έτυχε να μην είμαι εγώ σε αυτά. Αυτό που γινότανε σε τακτικό επίπεδο ήταν οι συνεδριάσεις αναθεώρησης με τις τεχνικές ομάδες, εβδομαδιαία συνεδρίαση για την ανασκόπηση του DigitalFactory σε επίπεδο διευθυντές έργου και στη συνέχεια συνεδριάσεις αναθεώρησης σε επίπεδο διευθύνουσας επιτροπής με δεδομένα από το επίπεδο των διευθυντών έργου. Άρα γινότανε αρκετά τακτικές και σε λεπτομέρειες ανασκοπήσεις για το πού είμαστε, πού πάμε, που κολλήσαμε, γιατί κολλήσαμε, τι καθυστέρησε, τι πρέπει να αλλάξουμε κλπ. Οπότε αυτός ήταν ο βασικός τρόπος να διαχειριστούμε τα όποια προβλήματα βγαίνανε. Στην πράξη αυτό που είδα, ήταν ότι πολλά θέματα έπρεπε να ανέβουν πολύ ψηλά για να λυθούν, που αυτό είναι ενδεικτικό ενός οργανισμού ότι δεν έχει κέντρο βάρους στις αποφάσεις. Δηλαδή για να λυθούν τα προβλήματα έπρεπε το πολύ να λυθούν σε επίπεδο διευθυντών έργου και αυτά δεν λυνόταν με αποτέλεσμα να πηγαίνουν πάνω σε επίπεδο διευθύνουσας επιτροπής. Που βασικά κατέληγε κλιμάκωση θεμάτων. Αυτό είναι ένα σε εξέλιξη ρίσκο στο έργο. Οι διευθυντές έργου δεν είναι εξουσιοδοτημένοι για να έχουν την εξουσία, την ισχύ να πάρουν αποφάσεις όταν αυτό περιλαμβάνει να δώσουν συγκεκριμένες εντολές, σε ομάδες σε διάφορα τμήματα. Αυτό φαίνεται να μην υπάρχει σαν κουλτούρα. Οπότε ο διευθυντής έργου με το που βγάλει κάτι τέτοιο αντί να πλακώνεται με τις διάφορες ομάδες και τους υπεύθυνους ομάδων (κυρίως για την τράπεζα) αναγκάζεται να το πάρει στην διευθύνουσα επιτροπή και η επιτροπή να δώσει εντολή για την λύση του θέματος. Με αποτέλεσμα να υπάρχει ένα γιγαντωμένο ρεύμα τέτοιων θεμάτων και αιτημάτων που πάει στην διευθύνουσα επιτροπή, ενώ δε θα έπρεπε. Η διευθύνουσα επιτροπή θα έπρεπε να ασχολείται περισσότερο με υψηλού επιπέδου ρίσκα, προσεγγίσεις, πολιτικά κλπ. Ένα κομμάτι της διαχείρισης έργου δεν γίνεται εκεί που πρέπει και πάει στην επιτροπή (που δεν πρέπει να ασχολείται).

Τι προκλήσεις έχεις αντιμετωπίσει μέσα από το προγραμμα; Τι ενέργειες θα ήταν καλό να ληφθούν υπόψη σε ένα νέο ενεργές πλάνο διαχείρισης κινδύνων;

Μία βασική πρόκληση είναι η κουλτούρα της τράπεζας η οποία είναι δημοσιουπαλληλική, σε μεγάλο βαθμό και κυρίως να μη θέλουνε να αλλάξουνε το οποίο δε συνάδει με την

απόφαση της τράπεζας σε αλλαγή μετασχηματισμού. Το άλλο ήταν ότι ελάχιστοι υπάλληλοι θέλουν να ασχοληθούν με την κατάρτιση τους και της εξέλιξής τους. Ήτανε απαθείς και αρνητικοί. Είχανε μεγάλη αντίσταση στην αλλαγή και επιπλέον πολύ κοντόφθαλμη των ευκαιριών που τους παρουσιάζετε. Πολύ μικρό ποσοστό οικειοθελούς συμμετοχής με τους ρυθμούς που απαιτεί το έργο, το οποίο απαιτεί έντονους ρυθμούς. Άλλη πρόκληση είναι το τεχνικό υπόβαθρο της τράπεζας είναι πολύ χαμηλό, υπάρχει τεράστιο κενό για να γεφυρώσουμε το έλλειμμα γνώσης που έχουμε σε πάρα πολλά κομμάτια όπως υποδομές, εφαρμογές, στη διαχείριση του έργου, στη ανάλυση δηλαδή το IT της τράπεζας είναι 20 χρόνια πίσω. Θέλει πάρα πολύ μεγάλη επένδυση σε πόρους με διάθεση να μάθουμε πώς να δουλεύουμε. Αυτό το πράγμα στο DigitalTransformation δεν το κάνει άμεσα, δηλαδή εμείς μέσα στο πεδίο εφαρμογής δεν έχουμε βάλει μελέτη σε επίπεδο διαχείρισης έργου άρα δεν το κάνουμε. Στην πορεία ο οργανισμός δε μπορούσε να ακολουθήσει γιατί δεν είχε διαχείριση έργου για να το οργανώσουνε και να τον συντάξουνε και να τρέχουνε τα διάφορα νήματα του προγράμματος.

Ακόμη και να είχε ProjectManagers μπορεί να μην είχε αναλυτές να τους υποστηρίξουνε, να μπορέσουνε να βάλουνε κάτω να δούνε τι χρειάζεται η επιχείρηση, να δοκιμάσουνε τις απαιτήσεις, να τις συζητήσουνε και να τις διαπραγματευτούνε, οριστικοποιήσουνε και να είναι υπόλογοι γι αυτές. Ένα μεγάλο κενό όχι μόνο σε τεχνολογία αλλά και σε πιο αβρές δεξιότητες. Η έλλειψη κουλτούρας διαχείρισης έργου, δηλαδή πλανάρω κάτι και δεσμεύομαι ότι θα το υλοποιήσω, Λείπει η κατάρτιση των διευθυντών έργου και οι αναλυτές για τις δομημένες απαιτήσεις για πλούσιες εφαρμογές. Αυτά οι δύο δεξιότητες είναι πολύ σημαντικές και λείπουνε. Έτσι αυτό ήτανε τεράστιο πρόβλημα για μας, κυρίως στον πρώτο χρόνο όπου εμείς βρεθήκαμε με ένα στρατό από ανθρώπους για να υλοποιήσουμε και να μην υπάρχει τρόπος να τους δώσουμε αυτά που απαιτούνται. Στη δική μας στελέχωση δεν είχαμε βάλει ένα στρατό από διευθυντές έργου και αναλυτές. Και στους πρώτους 6- 9 μήνες ψάξανε απεγνωσμένα να κάνουνε εντελώς αλλαγή κατεύθυνσης στην ομάδα. Δηλαδή διώξαμε όλους τους αναλυτές. Τους διώξαμε και λόγο γλώσσας και λόγω κουλτούρας. Οπότε τον πρώτο χρόνο ήτανε το ναυάγιο στο κομμάτι της ανάλυσης και αυτό μας πήγε πολύ πίσω. Βγήκαμε εκτός πλάνου και πολλά πράγματα αργήσανε πολύ, αυτό φάνηκε στις κάρτες κυρίως και λιγότερο στις πληρωμές, απλώς το μαζέψαμε στην συνέχεια στο δεύτερο χρόνο. Αυτό που μας έσωσε ήτανε το έργο IBU (webapp) το

οποίο έτρεχε πολλαπλά νήματα και έργα που, έτρεχε αυτό το πρόγραμμα. Η μεθοδολογία Agile γενικά άργησε να βγάλει θετικό αποτέλεσμα και συγκεκριμένα μεγάλα έργα αργήσανε (κάρτες και πληρωμές), όχι μόνο για συγκεκριμένα δικούς μας λόγους αλλά και εμείς αισθανθήκαμε ότι κολλάγανε και ευθέως μας ξελάσπωσαν 2 άλλα έργα, το PSD2 το οποίο το παρέδωσαν στους 5 πρώτους μήνες και το Mobile που έστω με καθυστέρηση βγήκε. Και κυρίως το IBU το οποίο ήτανε το μεγάλο έργο το οποίο είχε σύνθεση πολλών τεχνολογιών. Ουσιαστικά όλες οι τεχνολογίες του DigitalFactory και η ενσωμάτωση και ο μετριασμός από πολλά πράγματα που ήτανε παλιά μέσα στην τράπεζα. Τα ξεπέρασε όλα αυτά με υψηλές απαιτήσεις και ποιότητα. Εδώ έπαιξαν σημαντικό ρόλο οι αναλυτές που είχαμε βάλει σε μεταγενέστερο στάδιο και ο πελάτης με ένα άτομο που ήξεραν καλά στο επιχειρηματικό του σχέδιο. Το IBU επέδειξε ότι δεν έφταιγε ούτε η τεχνολογία μας, ούτε η μεθοδολογία που είχαμε και το πρόβλημα ήταν οι πόροι (αναλυτές) που είχαμε. Πριν το IBU δείξανε το πρόγραμμα μας ότι είναι αποτυχία, ότι δε βγάζει νόημα κανένα έργο, ότι κάποια συστήματα δε δουλεύουν κλπ. Τελικά αποδείξαμε το αντίθετο. Γενικά σε όσα έργα η τράπεζα είχε δικούς της αναλυτές όλα ήταν κολλημένα. Και γενικά το IBU ήταν παράδειγμα προς μίμηση και σε όσα έργα τρέχανε και ήτανε κολλημένα παρακολουθούνταν πιο συχνά η διαχείριση έργου τους. Επομένως, οι προκλήσεις γενικά μπορούν να λυθούνε αλλά απαιτούνται άνθρωποι από την τράπεζα που να μπορούν να συνεργαστούν μαζί μας και γνώση για την επιχειρηματικότητα τους. Αν δεν υπάρχουν αυτά τα δύο δεν μπορεί η IBM να βγάλει το έργο μονή της. Άλλη πρόκληση ήτανε ότι η τράπεζα γενικά κινείται σε μια οικονομία στην όποια ερχόταν από μια κρίση, και τα πράγματα είχαν βαλτώσει και ξαφνικά με το χρήμα όλοι ήθελαν αποτελέσματα του ΔΤ άμεσα. Δηλαδή μία πρόκληση ήταν ότι επειδή ήταν όλοι σε αναμονή πολύ καιρό, ήθελαν αποτελέσματα πολύ γρήγορα. Δηλαδή το τάδε έργο το ήθελαν τελειωμένο σε πολύ λίγο χρονικό διάστημα. Υπήρχε δηλαδή μια ανυπομονησία για όλες τις λύσεις. Με τον καιρό κατάλαβαν ότι τα πράγματα χρειάζονται κάποιο χρόνο ακόμα και με τις τεχνολογίες.

Μία άλλη πρόκληση ήταν ότι ο οργανισμός με τον καιρό άλλαξε, δηλαδή στο IT και στην ανώτατη διοίκηση. Αυτό δημιουργεί μεγάλο πρόβλημα γιατί τέτοιου είδους έργα χρειάζονται χρηματοδότες που θα τα κρατήσουν σε τροχιά και σε δύσκολες φάσεις θα συγκρατούνε. Όταν υπάρχουν όμως τέτοιες ανακατατάξεις έντονες, αυτός που ήτανε χρηματοδότης μπορεί πλέον να μην έχει την ισχύ, η να μην έχει κίνητρο να είναι

χρηματοδότης πια. Αυτό είναι πρόβλημα στο να μην έχει κάποιος να το στηριχτεί. Υπήρχαν στελέχη που άλλαξαν και έπαιψαν πια να έχουν ενδιαφέρον να στηρίξουν το πρόγραμμα, ή μπήκαν άλλοι στη θέση τους οι οποίοι το βλέπουν διαφορετικά. Το πακέτο εθελούσιας εξόδου που βγήκε στην τράπεζα ήτανε πρόβλημα για μας γιατί έγινε ένα πρόγραμμα για να φύγουν άτομα από την τράπεζα οι οποίοι δεν ήταν τόσο χρήσιμοι και τελικά έφυγαν οι άξιοι. Δηλαδή επετεύχθη το ανάποδο. Και τελικά από τους λίγους ανθρώπους που μπορούσαμε να κάνουμε τη δουλειά μας, ένα κομμάτι από αυτούς έφυγε. Ένα άλλο πρόβλημα ήταν ότι πολλά άτομα τις τράπεζας δεν αγκάλιασαν αυτό το πρόγραμμα, το είδαν αμυντικά στην αρχή και αρνήθηκαν να αναδομήσουν το τμήμα τους και να φτιάξουν ομάδες που χρειάζονταν, να φτιάξουν ρόλους που χρειάζονταν ή να συνεργαστούν αποδοτικά με άλλα τμήματα τις τράπεζας. Αντί να το αγκαλίσουνε αυτό το πρόγραμμα το αντιμετώπιζαν αρνητικά στην αρχή. Και τελικά τα πεδία της IBM αναγκαστήκαν να δουλεύουν με τον τρόπο που δουλεύει η τράπεζα παρά το αντίθετο. αυτό φρέναρε πολύ την απόδοση του ΔΦ σε τεχνικό επίπεδο. π.χ. ήθελες μια υποδομή να είναι τελειωμένη σε ένα μήνα και έπαιρνε ένα εξάμηνο. Δηλαδή αυτό αποτέλεσε μεγάλο τροχοπέδη στο να τρέξουν τα πράγματα όπως επίσης ξόδεμα χρόνου.

Στο επίπεδο διαχείρισης ρίσκου όλα αυτά λύνονταν με επισήμανση , συζήτηση και συναντήσεις ανασκόπησης και στο τέλος με κλιμακώσεις, γραπτά, ονόματα και μετρήσεις. το εργαλείο Jiratool βοήθησε σε όλα αυτό γιατί φαίνεται ανά γράμμα σε πιο είναι αναθεμένο κάποια δραστηριότητα και τι διάρκεια έχει. Οι αναφορές που βγάζαμε έκλειναν πολύ γρήγορα. η ποσοτικοποίηση ενός προβλήματος ήτανε πολύ σημαντική όπως και η επικοινωνία αυτών που εργάστηκαν. Στην ανάπτυξη το Jira βοήθησε παρά πολύ στο γεγονός ότι όλα τα έργα ήτανε καταγραμμένα βλέποντας την κατάσταση, σε ποιο είναι ανατιθέμενο, πόσο χρόνο έχει δουλέψει τους πόρους πάνω στο συγκεκριμένο έργο και έτσι με μία αναφορά μπορούσαμε να δούμε το τι έχει υλοποιηθεί από το πλανημένο πρόγραμμα. Τέλος βλέπαμε και την απόδοση του κάθε πόρου. Καταλαβαίναμε που ήμασταν, που πάμε και που χρειάζεται έξτρα προσπάθεια κλπ. αυτά έβγαιναν στατιστικά από τις αναφορές που δίναμε και αυτό αποτέλεσε καλύτερη κατανόηση.

γενικά χρειάζεται μεγάλη έμφαση στην στελέχωση των σημαντικών ρόλων. Αυτοί που κάνουν την διαφορά, άνθρωποι ποιότητας και εμπειρίας γιατί χωρίς αυτούς δε γίνεται. δεν είναι θέμα ποσότητας π.χ. οι Αναλυτές ή οι διευθυντές έργου ή οι αρχιτέκτονες. Η

στελέχωση λοιπόν δεν είναι θέμα αριθμητική και ένα λάθος που έγινε στο DF στην αρχή ήταν αυτό, ότι η στελέχωση ήταν περισσότερο ποσοτική παρά ποιοτική. Στον πρώτο χρόνο είχαμε συνειδητοποιήσει ότι η ομάδα που είχαμε πάρει από την Ινδία, δεν άξιζαν και ήθελαν αλλαγή. Εάν οι από πάνω σε επίπεδο δεν είναι εντάξει τότε οι από κάτω συμμορφώνονται. Εάν κτίζεις μια ομάδα που δουλεύει σωστά μετά είναι εφικτό να την στελεχώσης προσθέτοντας ανθρώπους γιατί θα προσαρμοστούν σε αυτό το τρόπο λειτουργίας. επόμενος είναι σωστό να ξεκινήσεις με ποιοτικούς ανθρώπου γιατί αυτό δε βελτιώνεται εύκολα.

A.3 Interview 3

Ποιος είναι ο ρόλος σας στο έργο;

Είμαι Υπεύθυνος έργου στο κομμάτι του MobileApplication και DigitalFactory.

Πόσα χρόνια εμπειρίας έχετε σε τραπεζικά έργα και πόσα σε DigitalTransformation τραπεζικά έργα;

Και στα δυο 3 χρόνια.

Πιστεύεις ότι είναι καλό να υπάρχει μια ενεργή στρατηγική διαχείριση έργου και γιατί;

Ναι, πρέπει πάντα να προετοιμαστείτε για να επιστρέψετε στην πορεία. Πρέπει να υπάρχει ένα πλάνο έργου και ένας συγκεκριμένος προϋπολογισμός για να είναι προετοιμασμένος για όλα τα ρίσκα.

Μπορείς σε παρακαλώ να μας πεις λίγα λόγια για το συγκεκριμένο τραπεζικό πρόγραμμα;

Ουσιαστικά είναι ένα πρόγραμμα το οποίο συμπεριλαμβάνει όλα τα λογισμικά (software και hardware) μαζί. Ο σημαντικός στόχος είναι να αλλάξει όλα τα περιβαλλοντικά συστήματα της τράπεζας, όλα τις διαδικασίες.

Στόχος 1 αυτοματοποίηση της τράπεζας για να εξαλείψει την χειροκίνητη δουλειά.

Στόχος 2 να γίνει πιο τεχνολογικά προηγμένη και έτσι να έρθει πιο κοντά στους πελάτες. πχ app κινητού γιατί μέσω της αυτοματοποίησης και μέσω των φιλικών προς τον χρήστη, σύγχρονων εφαρμογών. Προφανώς θα φέρουν πιο κοντά περισσότερους πελάτες, διότι το

να μην έχεις ένα app κινητού από το οποίο μπορείς να κάνεις τα πάντα πλέον χωρίς να πας στην τράπεζα, έχεις δύο καλά. Πρώτο γιατί φέρνεις περισσότερο κόσμο μέσα γιατί ειδικά στις νέες ηλικίες αυτό είναι το μυστικό και δεύτερο σημαντικό είναι ότι μειώνεις τον κόσμο στα υποκαταστήματα που με αυτό θα χρειάζεσαι λιγότερο κόσμο στα υποκαταστήματα. Ουσιαστικά αυτό που προσπαθεί να καταφέρει το DigitalTransformation είναι να φτιάχνει πιο αυτοματοποιημένες διαδικασίες, συστήματα που να είναι πιο εύκολα να τα χρησιμοποιήσει ο κόσμος έτσι ώστε να μειωθεί ο κόσμος στα υποκαταστήματα και εξίσου το κόστος της τράπεζας από υπαλλήλους. Είναι γεγονός ότι οι άνθρωποι που δουλεύουν στην τραπεζα και στο IT το καταλαβαίνουν, διότι στο τέλος της ημέρας τα συστήματα και οι διαδικασίες που φτιάχνουμε θα αντικαταστήσουν την δουλειά τους, την χειροκίνητη δουλειά.

Πιστεύεις ότι στο πρόγραμμα ακολουθείται κατά γράμμα αυτή η διαδικασία?

Γενικά δεν έχει πέσει στην αντίληψη μου ότι υπάρχει κάποια εσωτερική διαδικασία, δεν υπάρχει κάτι που να λέει, εντάξει αυτά είναι τα ρίσκα μας στο έργο, αυτή είναι η καταγραφή κινδύνων, αυτά είναι τα μετρά που έχουμε πάρει και το σχέδιο ανταπόκρισης μας και το πως θα τα ελέγχουμε. Δεν υπάρχει κάτι τέτοιο. Η διαχείριση ρίσκου ουσιαστικά γίνεται εντός κάθε έργου, κάθε εντολή έργου. Για παράδειγμα, στο digitalfactory έχουμε τα εμπόδια. Για παράδειγμα λέμε στη τράπεζα για να γίνει αυτό χρειαζόμαστε αυτά και τόσο χρόνο, αν δεν τα δώσει σε X μέρες δεν μπορώ να προχωρήσω και ουσιαστικά δε μπορεί να ολοκληρωθεί το έργο. Ουσιαστικά αναφέρονται ως ρίσκα ότι δεν θα ολοκληρωθεί ένα sprint έργο, σε περίπτωση που δε το πάρω. Με αυτό το τρόπο γίνονται κάποιες αντιδράσεις μετριασμού. Σε αυτό το έργο ουσιαστικά δεν υπάρχει συνολικό πλάνο διαχείρισης ρίσκου. Για παράδειγμα στις εντολές έργου έχουμε μια σειρά με παραδοχές στο πεδίο εφαρμογής του έργου το οποίο λέει για παράδειγμα για να κάνουμε παράδοση μέχρι τότε θεωρούμε ότι θα έχουμε πάρει αυτό. Αν δεν το πάρουμε θεωρούμε ότι το πλάνο να ξανά γίνει αναθεώρηση. Υπάρχουν ρίσκα που ο μετριασμός τους και το σχέδιο δράσης τους για την αντιμετώπισή τους είναι συναντήσεις και κλιμάκωση.

Με ποια μεθοδολογία δουλεύεις στο έργο και αν υπάρχουν δύο μεθοδολογίες σε συνδυασμό, τι ήταν αυτό που σε οδήγησε στην απόφαση αυτή;

Στο έργο είχαμε ξεκινήσει με ένα συγκεκριμένο μοντέλο το οποίο ήταν το Agile και έλεγε ότι το DigitalFactory θα παίρνει έργα και θα τα κάνει παράδοση σε μορφή Agile. π.χ. οι παραγγελίες εργασίας δεν δουλεύουν Agile, είναι πλέον Waterfall.

Αρχικά όμως όλο το κύτταρο του BPM ήταν Agile, δηλαδή ήτανε μέσα στα sprints τα πεδία του BPM και δούλευαν για κάθε έργο μέσα στο sprint. Τώρα όμως τα κύτταρα του BPM έχει μοιραστεί και δουλεύει με εντολές εργασίας το οποίο είναι Waterfall. Και αυτό γιατί καταλάβαμε ότι σε αυτήν την τράπεζα εν τέλη με τις εξαρτήσεις που έχουμε και τις αδυναμίες τους να ανταποκριθούμε μέσα στο χρόνο. Γενικά η τράπεζα δεν μπορούσε να ανταπεξέλθει στη μεθοδολογία Agile γιατί δεν είχαν κόσμο γενικά και δεξιότητες. Τέλος πάντων ήταν δύσκολο να ανταπεξέλθουνε και να δίνουν την πληροφορία που χρειαζόταν το DigitalFactory για να προχωρήσει. Η τράπεζα έχει συνηθίσει να δουλεύει με ένα τρόπο και αυτός ο τρόπος είναι ένας τρόπος μιας μικρής τράπεζας που προσπαθεί να βγάλει τα καθημερινά της, πέρα από αυτά που έχουν να κάνουν. Όταν όμως ήρθε η IBM με το έργο αυτό, το οποίο είναι τεράστιο και πιάνει όλα τα επίπεδα τις τράπεζας από την επιχειρηματικότητα, το λογισμικό, τα πάντα, δηλαδή έχει εξαπλωθεί σε όλα τα επίπεδα τις τράπεζας. Εν τέλη έχει φανεί ότι ούτε το Business ούτε το IT μπορούσε να ανταπεξέλθει στο να κάνει γρήγορο ψηφιακό μετασχηματισμό. Δηλαδή το έβλεπες από τις απαιτήσεις και μόνο του το Business δε μπορούσε να δώσει τα παραδοτέα στο χρόνο που πρέπει και ολοκληρωμένα μέχρι το πως είχε ανταπεξέλθει το IT στις τεχνικές ανάγκες. Όπου ξεκινάς με την υποδομή το οποίο ήταν πέντε βήματα πίσω και η εφαρμογή της τράπεζας το οποίο και αυτό δεν ήτανε σε θέση να διατηρήσουν.

Πιστεύεις ότι όλο το πρόγραμμα πρέπει να ακολουθεί μια κοινή μεθοδολογία;

Εξαρτάται από την τεχνολογία, την ομάδα με την οποία δουλεύεις στην τράπεζα, και εξαρτάται από το έργο. Έχει να κάνει με το πόσο εύκολο/δύσκολο είναι ένα έργο, έχει να κάνει με την ορατότητα δηλαδή τη σημαντικότητα του μέσα στην τράπεζα. Έχει να κάνει με τα χρονικά πλαίσια και με τα κόστη. Επίσης κάθε κελί έχει να κάνει με το ποιά ομάδα θα δουλέψει από την άλλη πλευρά. π.χ. το κομμάτι των μικρων επιχειρησεων δουλεύει σαν Agile διότι η ομάδα τις τράπεζας σε αυτό το κομμάτι είναι αποκριτική. Έχει να κάνει επίσης με τα τεχνολογίες, το BPM π.χ. έχει εξάρτηση από όλα τα υπόλοιπα κομμάτια (cells), το οποίο είναι αυτό που χρησιμοποιεί οτιδήποτε παράγουν τα υπόλοιπα κομμάτια, οπότε όταν το BPM είναι δύσκολο να δουλέψει σε sprints. Είναι επίσης δύσκολο να δώσει μία

Ελάχιστο μεταβλητό προϊόν (MinimumVariableproduct (MVP)) το οποίο είναι και καλά αυτό που πρέπει να δώσεις στο τέλος κάθε sprint στο Agile. Γιατί το BPM χρειάζεται IIB, μικροεπιχειρήσεις και για πολλά πράγματα έχει αλληλεπιδράσεις που αν δεν είναι έτοιμα τα αλλά δεν μπορεί να προχωρήσει και είναι δύσκολο να κάνεις το πλάνο του BPM για να ματσάρει με το πλάνο των sprints και των άλλων κομματιών. Γι' αυτό και θεωρώ ότι οι εντολές εργασίας είναι καλύτερα για αυτού του είδους έργα του BPM, άρα εξαρτάται. Δεν πιστεύω ότι όλα πρέπει να πάνε με μία μεθοδολογία, γιατί εξαρτάται από την τράπεζα, από το προϊόν, το λογισμικό, την ομάδα κλπ.

Θεωρώ ότι η Waterfall είναι πιο εύκολη για την τράπεζα, γιατί δεν είχαν μάθει με το Agile άρα στις αρχές του έργου ναί. Άλλα τώρα έχουν μάθει να δουλεύουν με το Agile. Εγώ με το Waterfall φοβάμαι ότι η τράπεζα νιώθει πιο άνετα και να μην δίνουν όσο έπρεπε να δίνουν, π.χ. μπορούν να γίνουν αλλαγές πάει και πιο μπροστά και πιο πίσω το σχέδιο οπότε κάνουμε ότι θέλουμε.

Καλό θα ήταν από τη μεριά της τράπεζας να γίνονται κάποιες εκπαιδεύσεις για τη κατάρτιση της συγκεκριμένης μεθοδολογίας, να μάθουν δηλαδή το πως δουλεύει η Agile προτού αρχίσει το έργο.

Πόσο συχνά πιστεύεις πρέπει να γίνεται η αξιολόγηση των ρίσκων?

Ανά έργο θεωρώ μετά από κάθε σημαντικό σημείο αναφοράς, το οποίο είναι το τέλος π.χ. το τέλος της ανάλυσης, το τέλος του σχεδιασμού. Η διάρκεια της ανάπτυξης εξαρτάται από το πόσο πολύ καιρό πάει η ανάπτυξη, πρέπει να γίνεται μια η δύο φορές, μιλώ γενικά. Διότι οι καθημερινές αναθεωρητικές συναντήσεις μπορούν να θεωρηθούν ως διαχείριση ρίσκου. Συνολικά για κάθε έργο πρέπει να γίνεται στο τέλος των ορόσημων αλλά στο τέλος της ανάπτυξης επειδή είναι εκεί που τα πράγματα είναι δυναμικά και αλλάζουν τελείως. Εκεί θα πρέπει να γίνονται πιο συχνά, κάθε 2 εβδομάδες.

Κάποιες πρακτικές για την ανίχνευση των ρίσκων είναι συναντήσεις καθημερινής εργασίας (BPM), κρίσεις εμπειρογνομώνων, λίστες ελέγχου, ιδεών και συλλογή δεδομένων. Ουσιαστικά θα δούμε τι μας λείπει, τι έχουμε, που έχουμε τα αδύνατα σημεία.

Ποια είναι τα πιθανά ρίσκα που αντιμετωπίζεις σε κάθε φάση του έργου και πώς τα διαχειρίζεσαι;

Στην ανάλυση των απαιτήσεων:

Για το κάθε διαδικασία χωριστά και μετά τα γραφουμε. Αρχικά τα καταγράφουμε, τι θα χιαστεί αυτό το έργο (documentanalysis), από πλευράς κόστους, προσπάθειας, δεξιοτήτων. Και εκεί κάνεις μία αξιολόγηση ρίσκου για κάθε έργο. Π.χ. για κάθε έργο έχεις Χ προγραμματιστές, ο ένας μπορεί να είναι αναξιόπιστος, αυτό είναι ένα ρίσκο το οποίο έχεις αναγνωρίσει. Και για να κάνεις μετριασμό το ρίσκο μπορεί αυτόν τον συγκεκριμένο προγραμματιστή να τον ακολουθήσεις καθημερινά. Πρέπει να κάνεις μια ανάλυση πολλών πραγμάτων για να καταλάβεις τα ρίσκα, πρέπει να κάνεις ανάλυση του τι είναι τα προαπαιτούμενα του έργου, έτσι να μπορείς να καταλάβεις τι ρίσκα έχεις όσον αφορά την εφαρμογή των απαιτήσεων, πρέπει να κάνεις μία ανάλυση ρίσκου ανάλυση του κόστους σου βγαίνει π.χ. με αυτό το κόστος και τη συγκεκριμένη ομάδα? Επίσης πρέπει να κάνεις ανάλυση ρίσκου της ομάδας σου, έχουν π.χ. οι δεξιότητες που χρειαζομαι για να βγάλω το έργο σε τόσο χρόνο? και εάν όχι τι πρέπει να κάνω.

Τα ρίσκα στη φάση των απαιτήσεων είναι διάφορα. Είναι το γεγονός ότι μπορεί το business να έχει χάσει και να μην έχει πει ένα μεγάλο μέρος των λειτουργικών απαιτήσεων γιατί ας πούμε μπορεί η επιχειρηματικότητα να μη γνωρίζει καθόλου πώς λειτουργεί το σύστημα. Άρα πολλά πράγματα να μην καταλαβαίνουν πως να τα ζητήσουν. Ένα δεύτερο κομμάτι είναι η ορατότητα των πραγμάτων, δηλαδή να ζητήσουν πράγματα τα όποια στα πλαίσια των απαιτήσεων είναι λογικά αλλά από την άποψη της εφαρμογής έχουν πάρα πολλή προσπάθεια. Το τρίτο είναι το πεδίο εφαρμογής του έργου να μην έχει γίνει σωστά και στο μέρος της λεπτομερούς ανάλυσης να καταλάβεις ότι η εκτίμηση που είχες δώσει για προσπάθεια δε σε καλύπτει γιατί εν τέλη οι απαιτήσεις είναι εν τέλη μεγαλύτερες από όσο πίστευες. π.χ. ο στο WealthandMarketproject στο οποίο είναι ένα από τα πολλά μικρά Workorderprojects, η κοπέλα από το προσωπικό της τράπεζας δεν καταλαβαίνει ας πούμε τι σημαίνει “reassignbutton” και όσο να της εξηγήσεις και να της πεις ποιες είναι οι απαιτήσεις, πως πρέπει να το πει δεν καταλαβαίνει πως δουλεύει το σύστημα. Η ας πούμε το έργο UFE που οι απαιτήσεις δεν είναι ξεκάθαρες άρα έρχεσαι μετά σε ένα τεχνικό σχεδιασμό και υλοποίηση και κάνεις ένα demo και σου αλλάζουν όλα τα δεδομένα εν μέσω υλοποίησης. η π.χ. το Νομικό έργο έχασε μεγάλο κομμάτι διότι οι απαιτήσεις δεν είχαν καταγράψει σωστά, ούτε η ολοκλήρωση έγινε σωστά, άρα ούτε είχε τεστάρει σωστά άρα

εκεί πέρα θα χρειαστεί να κάνουμε ένα δεύτερο έργο για να φτιαχτεί και εκεί έχει κόστος σε αξιοπιστία η IBM και η τράπεζα γιατί θα το πληρώσει εις διπλούν.

Στο σχεδιασμό και ανάπτυξη κώδικα

Πολλές φορές έχω υιοθετήσει και σχεδιάσει τις απαιτήσεις. Το πιο μεγάλο ρίσκο στο σχεδιασμό είναι το να χαθεί κάποια απαιτούμενο, π.χ. επιχειρηματική κατανόηση της λύσης που κάνεις. Δηλαδή όταν πας και κανεις σχεδιασμό (functional and technical) σε κάτι υπάρχει ο κίνδυνος εκεί με το να θες να απλοποιήσεις κάποια πράγματα τεχνικά, να χάσεις κάποια από τις επιχειρηματικές απαιτήσεις. Αυτό είναι από τα μεγαλύτερα ρίσκα που έχεις. Ένα άλλο είναι για να καλύψεις όλες τις απαιτήσεις να φτιάξεις ένα σχεδιασμό ο οποίος δεν είναι εφικτός, δηλαδή να είναι πολύ σύνθετος. Η ανάπτυξη είναι να μην μπορείς να φτιάξεις timeframes, να έχεις ξεφύγει από τις απαιτήσεις, να μην τα έχεις κατανοήσει σωστά δηλαδή να έχεις ξεφύγει από το τι έφτιαχνες και το τι έπρεπε να φτιάξεις. Αυτό βάζει μετά πολύ χρόνο στο τεστάρισμα. Προφανώς φεύγεις από τα timeframes, δηλαδή αν έπρεπε να φτιάξεις κάτι σε ένα μήνα και ο προγραμματιστής φτιάχνει κάτι σε ένα μήνα το οποίο είναι λάθος και θες άλλο μισό μήνα για να το ξανά κάνει σωστά τότε έχεις ξεφύγει από το χρόνο που είχες. (θέμα timeframes, κόστους, καθυστέρησης). Σε τέτοιες περιπτώσεις η κάνεις αποδοχή το ρίσκο ή αν ξέρεις ότι υπάρχει αυτή η περίπτωση προφανώς χάνεις περισσότερο χρόνο. π.χ. ξέρω ότι αν βάλω αυτό τον προγραμματιστή είναι σίγουρο ότι κάτι θα ξεφύγει από τα απαιτούμενα παραδοτέα. τι σημαίνει αυτό? σημαίνει ότι θα βάλω περισσότερο χρόνο του αναλυτή να εξηγήσει στο προγραμματιστή τι πρέπει να κάνει. Υπάρχουν διάφοροι τρόποι ανάλογα με το έργο και ανάλογα με το σημείο προβλήματος και το ρίσκο για να το αντιμετωπίσεις. Σε κάποια μπορεί να πεις ότι απλά το πλάνο μας είναι πιο ελαστικό άρα μπορώ να το δεχτώ, σε κάποια μπορεί να πεις ότι έχω ήδη βάλει ένα ρυθμιστή για δύο εβδομάδες που σημαίνει ότι μπορώ να το κάνω μετριάσμο, μπορεί δηλαδή να χωρέσει αυτό το ρίσκο. Άρα ουσιαστικά έχεις ρίσκα σε κάθε φάση τα οποία είναι και εσωτερικά αλλά είναι και τις τράπεζας. Δηλαδή να μην μπορεί η τράπεζα να ετοιμάσει για να σου δώσει τα απαιτούμενα μέσα στο χρόνο, και αυτό εμάς μας έχει σταματήσει την ανάπτυξη πάρα πολλές φορές. Άρα αυτό είναι ένα άλλο ρίσκο, να είσαι εσύ έτοιμος και η ομάδα που συνεργάζεστε να μην είναι.

Στην επαλήθευση

Το ρίσκο που έχει άδω είναι να μην έχει γίνει καλό testing. Γενικά όλα ξεκινάμε από τις απαιτήσεις-παραδοτέα, δηλαδή το πόσο καλό είναι ένα έργο έχει να κάνει με το πόσο καλή είναι η κατανόηση από όλες τις ομάδες το τι ζητάει ο πελάτης. Άρα στην περίπτωση του εστίς αυτό που μπορώ να σκεφτώ είναι το testing να είναι άψογο. δηλαδή να πάνε πράγματα στον πελάτη τα οποία πρέπει να έχουν υψηλή ποιότητα.

Πώς γίνεται η προτεραιότητα των ρίσκων αυτών;

Τα πράγματα που πρέπει πάντα να σκέφτεσαι σε ένα έργο είναι το κόστος, timeframes και το η ποιότητα διότι δεν θες να βγεις εκτός προϋπολογισμού, εμείς σαν IBM επίσης δεν θέλουμε να βγούμε εκτός χρονοδιαγράμματος διότι βγαίνεις εξίσου εκτός κόστους και δεν θέλουμε να κάνουμε εκπτώσεις στην ποιότητα. Αναλύοντας τα ρίσκα, καταλαβαίνουμε τι σημαίνει το κάθε ρίσκο για το έργο μας. οπότε όταν αναγνωρίζεις τι σημαίνει αυτό εκεί είναι που αναγνωρίζεις και την προτεραιότητα του κάθε ρίσκου, δηλαδή ποιο είναι αυτό που οπωσδήποτε πρέπει να το αντιμετωπίσεις και να το λύσεις. Και επίσης πιο είναι αυτό που μπορείς να πεις οκ , μπορώ να ζήσω με αυτό, και ας πούμε μπορώ να το ξεπεράσω σε περίπτωση που συμβεί. Δηλαδή αν είναι ας πούμε κάτι που περιμένω από την τράπεζα να μου υλοποιήσει μία υπηρεσία, το οποίο αν δεν γίνει μου κρύβει όλη την ανάπτυξη για πολύ καιρό κάτι που προφανώς είναι σοβαρό και αποτελεί την 1 η προτεραιότητα και πρέπει να αντιμετωπιστεί άμεσα. Άρα βασικά γίνεται κλιμάκωση μέχρι που να γίνει κάποια κίνηση για να προχωράνε. Όμως σε περίπτωση που έχουμε ένα ρίσκο π.χ. είχαμε το ρίσκο λόγω του COVID 19 η ιντερνετική ομάδα δεν μπορούσε να τεστάρει χωρίς δίκτυο της τράπεζας για τουλάχιστον 2 εβδομάδες (workingremotely), για να αντιμετωπίσουμε αυτό και διότι το ρίσκο αυτό έχει να κάνει και με άλλα πράγματα, εκεί το κάναμε αποδοχή και απλά κάναμε το πλάνο μας λίγο πιο ελαστικό. πήγαμε 1 -2 εβδομάδες πιο μετά.

Υπάρχουν περιπτώσεις πολλές. Για παράδειγμα η ανικανότητα της τράπεζας να φτιάξει κάτι. Ε αυτό για μας είναι μία εκδοχή άρα μπορούμε να το πουλήσουμε διότι ξέρουμε ότι η τράπεζα δεν θα καταφέρει να το κάνει στο μέσα στο χρονικό πλαίσιο. Επειδή ξέρουμε κιόλας ότι αυτό μπορεί να κάνει hide το έργο κάνουμε πρόταση για να το κάνει η IBM, προφανώς και παραπάνω κέρδος στην IBM.

Πώς γίνεται η παρακολούθηση των ρίσκων;

Οι συναντήσεις που κάνεις κάθε τόσο για να βλέπεις που είμαστε με αυτό και αφού δεις τι γίνεται, που υπάρχει πρόβλημα, πρέπει να κάνεις κυρίως κλιμάκωση διότι πολλά πράγματα δεν είναι δικά μας, δηλαδή αυτά που είναι δικά μας ρίσκα τα κάνουμε εσωτερικό χειρισμό μέσω συναντήσεων και διευκρινίσεων. Επειδή όλο το έργο το τρέχουμε εμείς μπορούμε να κάνουμε εμείς ως πούμε διακοπή στα εσωτερικά μας πλάνα. Οτιδήποτε όμως έχει να κάνει με την τράπεζα και το παρακολουθούμε εκεί συνήθως κάνουμε το κλιμάκωση.

Συμφωνά με τα αποτελέσματα των ερωτηματολογίων οι Διαχειριστές του έργου τείνουν προς την Agile, Waterfall και Scrum μεθοδολογίες. Γιατί πιστεύεις η Lean και Kanban μεθοδολογίες δε χρησιμοποιούνται στο έργο;

Δεν έχω δουλέψει σε κάποιο έργο, δεν έχω άποψη.

Με Agile/Scrum δουλεύει ο κυρίως στο DigitalFactory. Είναι πιο λειτουργικό για το DigitalFactory διότι τα κελιά του είναι τέτοια και η τεχνολογίες είναι τέτοιες οι οποίες μπορούν να δώσουν γρήγορα αποτελέσματα μέσα στα sprints. Τα sprints μας διαρκούν 4 εβδομάδες, και όλα τα κελιά ξεκινούν την ίδια στιγμή και τελειώνουν μαζί. Παρόλα αυτά το κάθε κελί έχει στα sprints του έχει διαφορετικά παραδοτέα και κάνουν διαφορετικά κλήσεις scrum. Παρόλο που μπορεί να έχουν σχέση μεταξύ τους αυτό πρέπει να το χειριστεί ο υπεύθυνος του scrum.

Τι προκλήσεις έχεις αντιμετωπίσει μέσα από το προγραμμα; Τι ενέργειες θα ήταν καλό να ληφθούν υπόψη σε ένα νέο ενεργές πλάνο διαχείρισης κινδύνων;

Η αλήθεια είναι ότι γενικά η τράπεζα δεν έχει καταρτισμένο προσωπικό για να αντιμετωπίσει ένα έργο σαν το DT. Παρόλα αυτά δεδομένου ότι εγώ με αυτούς τους ανθρώπους έχουμε να δουλέψουμε, με αυτές τις δεξιότητες, αυτό το οποίο με έχει βυθίσει έμμεσα πάρα πολύ είναι να αναγνωρίσω ποιοι είναι οι άνθρωποι οι οποίοι μπορούν να βοηθήσουν και ως τι βαθμό μπορούν να βοηθήσουν και να χρησιμοποιώ αυτούς τους ανθρώπους για να προχωρήσω σωστά τη δουλειά μου.

Οπότε σίγουρα έχει να κάνει με ποιες ομάδες έχεις να κάνεις. Στο πόσο κακά ή καλά θα πάει ένα έργο έχει να κάνει και με το ποιο πλάνο ρίσκου και ποιες παραδοχές πρέπει να

εισάγω, έχει να κάνει σίγουρα και με ποιες ομάδες έχω να κάνω. π.χ. έχοντας μια ομάδα τώρα στο μυαλό μου ξέρω ότι θα μου πάρει λιγότερο χρόνο από μια αλλά συγκεκριμένη. Δεύτερο, επειδή η ομάδα μας είναι μεγάλη και βρίσκεται σε διαφορετικές ζώνες ώρας, διαφορετικές ηπείρους, ωστόσο πάλι είναι σημαντικό να δεις πώς κερδίζεις τις ισορροπίες μέσα σε μια τέτοια ομάδα. γιατί στις αρχές είχαμε προβλήματα στο να δουλέψουμε όλοι μαζί. Αυτό όμως τώρα έχει αρχίσει να πέφτει σαν πρόβλημα γιατί έχουμε μάθει το πώς δουλεύει ο καθένας, το πώς να δουλέψουμε ως ομάδα το τι χρειάζεται ο καθένας για να προχωρήσει και να δουλέψει (στα 2.5 χρονια)

Θα έπρεπε υπάρχει μια ομάδα η οποία κυνηγάει συγκεκριμένα τα ρίσκα, να καταγράφει και να κάνει μετριάσμο των ρίσκων και να κρατάει σε εγρήγορση τους διευθυντές έργου, να κάνει ανάλυση ρίσκων. Ουσιαστικά να βοηθήσει τον ProjectManager.

Θα ήτανε βοηθητικό να υπήρχε αυτή η ομάδα για να βοηθάει τον ProjectManager σε αυτό.

B. Questionnaire Sample

Section A: General Questions:

1. Do you wish to continue?

- Yes
- No

2. In which parts of the project are you working on?

- Digital Factory
- Unified Front End
- CX Mobile
- Campaigns
- Filenet
- FIST
- GTS

3. How many years of experience do you have in Banking Digital Transformation projects?

- 0 - 3 years
- 3 - 5 years
- 5 -10 years
- 10+ years

4. In your opinion, is it a good idea to have an effective Risk Management Plan in the project?

- Yes
- No
- Maybe

5. In your opinion, which parameters are important to be contained in a Project Risk Management Plan?

- Strategy
- Methodology
- Roles and Responsibilities
- Funding
- Timing
- Risk Categories
- Definition of Risk Probability and Impact
- None of the above

6. With which Project Management Methodologies are you familiar?

- Agile
- Scrum
- Lean
- Kanban
- Waterfall
- Other

7. With which Project Management Methodologies are you familiar?

- Agile /Scrum
- Agile /Waterfall
- Lean /Kanban

8. Why do you use this methodology in your project?

- Risks can be easily mitigated
- Risks can be easily identified
- Safer than others
- Easier team controlling
- Other

Section B: Project Risk Management

9. Which of the Risk Identification practices listed below do you use?

- Expert Judgements
- Data gathering
- Data analysis
- None of the above
- Other

10. If you are using Risk Data gathering, which of the methods listed below do you use?

- Interviews
- Brainstorming

- Checklist
- Other

11.If you are using Risk Data Analysis, which of the methods listed below do you use?

- Root cause analysis
- Assumptions and Constraints analysis
- Strength, Weak, Opportunity, Threads (SWOT)
- Document Analysis
- Interpersonal and Team skills
- Prompt list
- Meeting/ Workshops
- Other

12.For Qualitative Risk Analysis, which of the practices listed below do you use?

- Expert judgements
- Data gathering
- Data analysis
- Interpersonal and team skills
- Risk categorization
- Data representation
- Meetings/ Workshops
- Other

13.Why have you selected the above practices for the Qualitative risk analysis?

- I don't know any other practices
- More effective for my project's methodology
- I'm more familiar with the above
- Other

14.If you are using Data Analysis practice, which methods listed below do you use?

- Risk Data Quality assessment
- Risk Probability and Impact assessment
- Other

15.Why have you selected the above methods for Data analysis?

- I don't know any other practices
- More effective for my project's methodology
- I'm more familiar with the above
- Other

16.Which of the following Data Representations listed below do you use?

- Probability and Impact Matrix
- Hierarchical Charts
- Other

17.Why have you selected the above representations for the Data?

- I don't know any other practices
- More effective for my project's methodology
- I'm more familiar with the above
- Other

18. For Quantitative Risk Analysis, which of the following practices do you use?

- Expert Judgements
- Data Gathering
- Interpersonal and team skills
- Representations of uncertainty
- Data analysis
- Other

19. Why have you selected the above practices for Quantitative risk analysis?

- I don't know any other practices
- More effective for my project's methodology
- I'm more familiar with the above
- Other

20. Which of the following Data Gathering methods do you use?

- Interview
- Probability distribution
- Other

21. Why have you selected the above methods for the Data Gathering techniques?

- I don't know any other practices
- More effective for my project's methodology
- I'm more familiar with the above
- Other

22. Which of the following Data Analysis practices do you use?

- Sensitivity analysis
- Expected monetary value (EMV)
- Decision tree analysis
- Modeling and Simulation
- Other

23. Why have you selected the above methods for the Data Analysis techniques?

- I don't know any other practices
- More effective for my project's methodology
- I'm more familiar with the above
- Other

24. Which practices do you use for the Risk Response Plan?

- Expert Judgement
- Data gathering

- Interpersonal and team skills
- Contingent response strategies
- Strategies for Project Risks
- Data Analysis
- Decision Making
- Other

25. Which of the following methods do you use for the Risk Response Data Analysis?

- Alternatives analysis
- Cost-benefit analysis
- Other

26. Why have you selected the above methods for Risk Response Data Analysis techniques?

- I don't know any other practices
- More effective for my project's methodology
- I'm more familiar with the above
- Other

27. Which Strategies do you use for the Project Risks?

- Avoid
- Exploit
- Transfer/ Share
- Mitigate
- Accept
- Escalate
- Enhance
- Other

28. Which factors influence the selection of Project Risk Strategies?

29. How do you Implement the Risk Response?

- Expert Judgement
- Interpersonal and team skills
- Project Management System
- Other

30. Why have you selected the above methods for Implementing Risk Response?

- I don't know any other practices
- More effective for my project's methodology
- I'm more familiar with the above
- Other

31. Which of the following practices do you use for Monitoring Risks?

- Data analysis
- Audits

- Meetings
- Other

32. Why have you selected the above methods for Monitoring Risks?

- I don't know any other practices
- More effective for my project's methodology
- I'm more familiar with the above
- Other

33. Which of the following techniques do you use for Monitoring Data analysis?

- Technical Perform analysis
- Reserve analysis
- Other

34. Why have you selected the above methods for Monitoring risk Data Analysis?

- I don't know any other practices
- More effective for my project's methodology
- I'm more familiar with the above
- Other

C. Coding Table

Table of Codes (Atlas.Ti)
1. Benefits of DT Programme
benefits of DT programme
benefits of DT programme_tackling cost in terms of time-consuming and workforce
benefits of DT programme_modernization/coming in line with contemporary demands
2. Methodologies
combining agile and waterfall methodologies with emphasis on Waterfall methodologies
reasons for combining agile and waterfall methodology
importance of combining methodologies
importance of training banks in Agile
not a specific methodology, risk management based on experience
benefits of Agile methodology
perceptions about agile/scrum methodology
perceptions about the Lean/Kanban methodology
perceptions about the use of the same methodology in different projects
3. Risk management, prioritizing risks, taking actions for dealing with risks
absence of a holistic risk management plan
bank aspects that were affected from the implementation of the project
cases of risks and monitoring the risks
frequency of risk assessment in projects
perceptions for effective risk management
potential risks in all phases of the project
prioritizing potential risks
risks in development (anaptixi)
risks in relation to testing
taking actions for dealing with the potential risks
taking responsibility for own projects through internal managing and monitoring
4. Challenges encountered through the project
specific challenge_sociocultural context (economic crisis)
specific challenges_aspect of constant changes
specific challenges_aspect of time
specific challenges_cost effectiveness and time constraints
specific challenges_culture of the organisation
specific challenges_lack of trained workforce
specific challenges_lack of workforce and appropriate infrastructure
specific challenges_large team and from different countries
potential challenges_people's reaction to change
specific challenge_changes in the organisation
5. Suggestions for the project_specific team managing the risks

Bibliography

Aven, T. (2003). Foundations of risk analysis: A knowledge and decision-oriented perspective. New York, NY: John Wiley & Sons Ltd. <https://doi.org/10.1002/0470871245>

Aven, T. (2020). The Science of Risk Analysis Foundation and Practice. Retrieved from <https://b-ok.cc/book/5249439/2f458d>

A Guide to the Project Management Body of Knowledge (PMBOK® Guide) - Sixth Edition and Agile Practice Guide. (2018). PM Network, 32(11), 71. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=132602249&site=ehost-live>

Association for Project Management (APM). (2006). APM body of knowledge, 5th ed. Cambridge, United Kingdom: APM.

Auriga (2016). Digital Transformation: History, Present, and Future Trends. Retrieved from <https://auriga.com/blog/digital-transformation-history-presentand-future-trends/>

Bassil, Y. (2012) A Simulation Model for the Waterfall Software Development Life Cycle. Retrieved from <https://arxiv.org/ftp/arxiv/papers/1205/1205.6904.pdf>

Bell, E.&Bryman, A. (2006)The Ethics of Management Research: An Exploratory Content Analysis. Retrieved from<https://doi.org/10.1111/j.1467-8551.2006.00487.x>

Boehm, B. & Turner, R. (2003). Using risk to balance agile and plan-driven methods. *Computer*, 36(6), 57 – 66. [doi:10.1109/MC.2003.1204376](https://doi.org/10.1109/MC.2003.1204376)

Brechner, E. (2015) Agile Project Management with Kanban. Retrieved from <https://b-ok.cc/book/3385662/fc9d49>

Buganová, K., Jana, Š. (2019) Risk management in traditional and agile project management. Retrieved from <https://www.sciencedirect.com/science/article/pii/S2352146519303060>

Burnes, B. (2005). Complexity theories and organizational change. *International Journal of Management Reviews*, 7(2), 73–90.

Chanias, S., Myers, D.M., Hess, T. (2019). Digital transformation strategy making in pre-digital organizations: The case of a financial services provider. Retrieved from <https://www.sciencedirect.com/science/article/pii/S0963868718300143?via%3Dihub>

Chapman, C. and Ward, S. (2003). Project Risk Management processes, techniques and insights. Retrieved from <https://b-ok.cc/ireader/648099>

Cole, R., and Scotcher, E. (2015) Brilliant Agile Project Management: A Practical Guide to Using Agile, Scrum and Kanban. Retrieved from <https://b-ok.cc/book/3521447/292de6>

Cobb, C. (2015) The Project Manager's Guide to Mastering Agile: Principles and Practices for an Adaptive Approach Retrieved from <https://b-ok.cc/book/2495533/1f1a16>

Cooper, D.,F., Grey, S., Raymond, G., Walker, P.(2004). Project Risk Management Guidelines: Managing Risk in Large Projects and Complex Procurements. Retrieved from <https://b-ok.cc/book/459938/bdd7d5>

Creelman, J. (2018) Agile Project Management and Strategy Execution: The Role of the “SCRUM” Retrieved from <https://www.linkedin.com/pulse/agile-project-management-strategy-execution-role-scrum-james-creelman>

Crouhy, M., Galai, D., Mark, R. (2014) The essentials of Risk Management. Retrieved from <https://b-ok.cc/book/2647619/f67538>

Davis, B. (2013) Agile Practices for Waterfall Projects. Shifting Processes for Competitive Advantage. Retrieved from <https://b-ok.cc/book/2713587/b38d28>

Davis, B. & Radford, D. (2014) Going Beyond The Waterfall. Managing Scope Effectively Across the Project Life Cycle. Retrieved from <https://b-ok.cc/book/2713922/75488f>

Deshpande, B,N. (2018). Digitalization in Banking Sector. Retrieved from <http://210.212.169.38/xmlui/bitstream/handle/123456789/4568/ijtsrd18677.pdf?sequence=1&isAllowed=y>

Diamond et al (2017). Realizing tomorrow today Digital Reinvention in banking. Retrieved from <https://www.ibm.com/downloads/cas/JNWAXJOL>

Kumar, D., (2002). Project Risk Management: A Combined Analytic Hierarchy Process and Decision Tree Approach. Retrieved from

<http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=6307746&site=ehost-live>

Galli B. J. (2017). Risk Management in Project Environments: REFLECTION OF THE STANDARD PROCESS. *Journal of Modern Project Management*, 39–49. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=125356358&site=ehost-live>

Gartner Inc. (2012). IT Glossary. InCore Banking System. Retrieved from <http://www.gartner.com/it-glossary/core-banking-systems/>

Heller, M. (Sept, 2014). Step Into the Digital Leadership Void. Retrieved from <https://www.cio.com/article/2601445/step-into-the-digital-leadership-void.html>

Hopping, C. (2019, Mar 06). Banks and insurers underestimate digital transformation challenges, finds capgemini. IT Pro, Retrieved from <https://search.proquest.com/docview/2188504224?accountid=36196>

IBM (Oct, 2017) Realizing tomorrow today Digital Reinvention in banking. Retrieved from <https://www.ibm.com/downloads/cas/JNWAXJOL>

IBM News Releases Armonk NY & Nicosia (Jul 2017) . Bank of Cyprus Taps IBM Technology and Expertise to Fuel and Accelerate Digital Transformation. Retrieved from <https://www-03.ibm.com/press/us/en/pressrelease/52896.wss>

Jorgensen, M (2005). "Practical guidelines for expert-judgment-based software effort estimation," in IEEE Software. Retrieved from [doi: 10.1109/MS.2005.73](https://doi.org/10.1109/MS.2005.73)

Kendrick, T. (2009). Identifying and Managing Project Risk. Retrieved from <https://b-ok.cc/book/462329/83c1b7>

Kerzner, H., (2017) Project Management, A Systems Approach to Planning, Scheduling, and Controlling Twelfth Edition. Retrieved from <https://b-ok.cc/book/3402442/bb5a13>

Kniberg, H. &Skarin, M. (2010). Kanban and Scrum making the most of both. Retrieved from <https://b-ok.cc/book/2611826/fb2c6d>

Mckenna, D., (2016) The Art of Scrum: How Scrum Masters Bind Dev Teams and Unleash Agility. Retrieved from <https://b-ok.cc/book/2802261/b4ba8e>

Mitchell, J., Chong, Y., Brown, E.(1999) Managing Project Risk: Business Risk Management for Project Leaders Retrieved from <https://b-ok.cc/book/843825/cde4d0>

Lester, A., (2017) Project Management, Planning and Control. Retrieved from <https://b-ok.cc/book/3419303/27d0d0>

Lowensen, C. J. (2015). Learning from Mistakes and Near Mistakes: Using Root Cause Analysis as a Risk Management Tool. Retrieved from <https://reader.elsevier.com/reader/sd/pii/S1546084314001850?token=DDED2F5641C4121B0573E2D7AE5A782ECCC31EB87A1462B8EFFB540A03D0AF8CA23C2460CE7310DD7593B3AC6391374C>

Omarini, A. (2017). The Digital Transformation in Banking and The Role of FinTechs in the New Financial Intermediation Scenario. Retrieved from <https://mpra.ub.uni-muenchen.de/85228/>

Otieno, J.P., (2013). An Assessment of the Role of Risk Management Practices in Core Banking Software Project Success: A Case of Commercial Banks in Kenya. Retrieved from <http://dx.doi.org/10.6007/IJARBSS/v3-i10/312>

Wideman, M. (2001) Project and Program Risk Management. A guide to managing risks and opportunities. Retrieved from <https://b-ok.cc/book/695439/db4c11>

Pham, A.T & Pham D.K (2013) Business-Driven IT-Wide Agile (Scrum) and Kanban (Lean) Implementation. An Action Guide for Business and IT Leaders. Retrieved from <https://b-ok.cc/book/2370008/3706e4>

Project Management Institute (PMI), Standard Committee. (2004). A guide to the project management body of knowledge, Newton Square, PA.

Project Management Institute (2008). A Guide to the Project Management Body of Knowledge (PMBOK Guide) 4th Edition. Retrieved from <https://b-ok.cc/book/828159/d318cc>

Project Management Institute (PMI), (2017). Agile Practice Guide. Retrieved from <https://b-ok.cc/book/3418658/493ef5>

Project Management Institute (PMI), (2018). A Guide to the Project Management Body of Knowledge (PMBOK® Guide) - Sixth Edition and Agile Practice Guide. Retrieved from [http://web.a.ebscohost.com/ehost/detail/detail?vid=9&sid=6a0b0a37-ba80-4ac3-9d04-5befc5b27b23%40sdc-v-
sessmgr01&bdata=JnNpdGU9ZWwhvc3QtbGl2ZQ%3d%3d#AN=132602249&db=bsul](http://web.a.ebscohost.com/ehost/detail/detail?vid=9&sid=6a0b0a37-ba80-4ac3-9d04-5befc5b27b23%40sdc-v-
sessmgr01&bdata=JnNpdGU9ZWwhvc3QtbGl2ZQ%3d%3d#AN=132602249&db=bsul)

Risk Management in Project Environments. (n.d.). Journal of Modern Project Management. Retrieved from <http://web.b.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=6&sid=a5aeac60-8692-4d20-a845-aabbf128fe50@sessionmgr103>

Roumeliotis, P. (2018) Digitisation and technological challenges of the banking industry. Retrieved from <https://doi.org/10.12681/homvir.20187>

Purdy, G. (2010). ISO 31000:2009—Setting a New Standard for Risk Management. Risk Analysis. Retrieved from [doi:10.1111/j.1539-6924.2010.01442.x](https://doi.org/10.1111/j.1539-6924.2010.01442.x)

Puschmann, T. (2017) Banking without banks: Will technology transform financial intermediation? Retrieved from https://www.oenb.at/dam/jcr:5be5b9fe-1643-47dc-a179-67a364efc5ba/puschmann_vowi_2017.pdf

Saunders, M., Lewis, L. & Thornhill, A. (2019) Research methods for business students. Retrieved from https://www.researchgate.net/profile/Mark_Saunders4/publication/330760964_Research_Methods_for_Business_Students_Chapter_4_Understanding_research_philosophy_and_approaches_to_theory_development/links/5c53056f299bf12be3f0e2cf/Research-Methods-for-Business-Students-Chapter-4-Understanding-research-philosophy-and-approaches-to-theory-development.pdf

Schwertner, K. (2017) Digital Transformation of Business. Retrieved from <https://pdfs.semanticscholar.org/51bb/4fd609d174438fb8911f283d48d34ef1e894.pdf>

Shivakumar, S.K, and Sethi, S. (2019) Transforming Legacy Banking Applications to Banking Experience Platforms. Retrieved from https://doi.org/10.1007/978-1-4842-4303-9_10

Shkedi, A. (2019) Introduction to Data Analysis in Qualitative Research. Practical and theoretical Methodologies with optional use of a software tool. Retrieved from <https://b-ok.cc/book/5285840/fec657>

Sols, A. (2018). A Comprehensive Approach to Dynamic Project Risk Management. Engineering Management Journal, 30(2), 128–140. Retrieved from <https://doi.org/10.1080/10429247.2018.1450030>

Stellman, A., &Grenne, J. (2015) Head-first Agile. A Brain-Friendly Guide Retrieved from <https://b-ok.cc/book/3601170/7f6c24>

Stellman, A., &Grenne, J. (2017) Learning Agile. Retrieved from <https://b-ok.cc/book/2481170/e6fe39>

Vose, D. (2008) Risk Analysis - A Quantitative Guide. Retrieved from <https://b-ok.cc/book/551167/c64796>

Vives, X. (2019). Competition and Stability in Modern Banking: A Post-crisis Perspective. Retrieved from <https://www.sciencedirect.com/science/article/pii/S0167718719300098?via%3Dihub>

Warner, K., Wager, M. (2017). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. Retrieved from <https://doi.org/10.1016/j.lrp.2018.12.001>

Westerman, G. (2011) Digital Transformation: A roadmap for Billion-dollar organisations. Retrieved from [https://www.capgemini.com/wp-content/uploads/2017/07/Digital Transformation A Road-Map for Billion-Dollar Organizations.pdf](https://www.capgemini.com/wp-content/uploads/2017/07/Digital-Transformation-A-Road-Map-for-Billion-Dollar-Organizations.pdf)

Wirkus, M.(2016) Adaptive Management Approach to an Infrastructure Project. Retrieved from <https://www.sciencedirect.com/science/article/pii/S1877042816308928>

Yoe, C. (2019). Principles of Risk Analysis: Decision Making Under Uncertainty. Retrieved from <https://b-ok.cc/book/3711279/e97f5b>