

AMERICAN UNIVERSITY OF BEIRUT

IMPROVING PROJECT MANAGEMENT METHODOLOGY  
AND MATURITY - CASE STUDY FOR A LEBANESE  
FINANCIAL ORGANIZATION WITHIN THE  
INFORMATION TECHNOLOGY FIELD

by  
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A project  
submitted in partial fulfillment of the requirements  
for the degree of Master of Business Administration  
to the Suliman S. Olayan School of Business  
at the American University of Beirut

Beirut, Lebanon  
May 2012

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## ACKNOWLEDGMENTS

I would like to thank Dr. Waleed Nasr and Dr. Victor Araman for their guidance throughout the development and revision of this project.

I would like to thank my parents for their continuous motivation and support to pursue my MBA degree at AUB.

Finally, I would like to thank my fiancée for her patience and encouragement that pushed me to give my best in this paper.

## AN ABSTRACT OF THE PROJECT OF

Abdel Ghani Mohammad Yamout for Master of Business Administration  
Major: Business Administration

Title: Improving Project Management Methodology and Maturity - Case study for a Lebanese Financial Organization within the Information Technology field.

Information Technology projects are becoming of much importance because they play a major role in implementing organizations' strategy and achieving competitive advantage. Therefore, improving the way projects are managed and delivered is gaining interest in the last few decades. The systematic approach for improving organization's project management (PM) practices and infrastructure is already discussed in the literature in many maturity models; however, the existing models are generic, lack quantification and do not include up-to-date project management practices. In this paper, I develop a novel maturity model (Simple Information Technology maturity model or SIT-MM). This new model is based on project management body of knowledge (PMBOK 4th edition), is dedicated towards information technology application area, integrates state-of-the-art tools and techniques and presents the findings in quantitative manner. Afterwards, SIT-MM is applied in the IT department of a financial organization that has problems in its project management methodology. The findings show very low maturity scores in terms of adopting best-practices and readiness and support for project management. This paper adds to the literature a simple maturity model that can be easily applied in the IT industry to assess PM maturity and plan and prioritize improvement initiatives.

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*To*

*My Beloved Family and  
Fiancée*

# CHAPTER 1

## INTRODUCTION

In the financial sector, where technology is the main facilitator of the business strategy, much importance is given to the information technology (IT) department. This department is responsible for turning the vision of the organization into reality by delivering IT solutions. Moreover, catching the opportunities requires fast delivery, efficient budgeting and satisfying what the market requires.

As a consequence, organizations are constantly delivering innovative IT solutions to face the fierce competition., Top financial institutions continuously manage concurrently hundreds of projects; however, with that huge number of projects comes the risk of failure, especially if organizations do not have an "efficient" and "effective" process that pushes their projects from initiation till completion. This process should help allocate resources, manage financials/time, and make sure that work focuses on business needs; this process is called project management methodology (PMM).

Failure after failure, financial organizations ask: "what is the best way to manage projects?" But a more relevant question is "Do we have the right infrastructure in place to deal with our expanding project portfolio?" and "How can we assess such capability?" Project management maturity models are used exactly for that purpose; they help analyze and evaluate current PM practices, benchmark industry best-practices, define systematic approaches for finding process gaps and justify an organization's spending for progressive improvement (Pinto 2010).

To assess the maturity of the financial institution selected for the purpose of this thesis, I decided to develop a novel maturity model suitable for the case at hand.

Available models in the literature are often generic and do not target a specific application area; moreover these models are often complex and hard to apply requiring the intervention of consultants and experts in the field. Furthermore, it seems to me that most of the available models exclude some of the state-of-the-art practices because they are not regularly updated.

Furthermore, most of the available maturity models existing in the literature (discussed later) offer qualitative conclusions that are hard to quantify. This lack of quantification is particularly problematic when the models' results and conclusions are meant to justify an improvement initiative at an organization that has an objective to re-engineer its available PM process.. Finally, we should note that the available models we encountered do identify the lack of a formal methodology for PM processes but they do not specify exactly what tools/techniques have a higher priority in the development of such a new PM methodology.

In this MBA project, I start by exploring the project management process and project management maturity models. Afterwards, inspired by the most recognized maturity models in the field (VA: reference), I develop a maturity model specifically designed for the Information Technology (IT) sector that covers some of the most up-to-date tools and techniques (VA: put this in a footnote: as defined by the PMBOK as you did not define PMBOK yet). Then I use a case study approach to apply the developed model on one of the top five banks in Lebanon. In the last section I summarize my findings and suggest recommendations.

# CHAPTER 2

## LITERATURE REVIEW

### **2.1. General Overview**

#### ***2.1.1. What Is A Project?***

To discuss project management, it is important to understand the concept of project. A project is a "temporary endeavor undertaken to create a unique product, service, or a result" (PMI 2008). Temporary means that it has a defined beginning and end. The end marks a specific moment in time when the project has met its objective or, on the contrary, its objective cannot be met; however, temporary does not apply to the product, service or result as those are usually of lasting duration.

In general, work can be categorized as a project or operation; people might mix them up. Both of them are performed by individuals, require limited resources, incorporate planning, executing, monitoring and controlling and are performed to achieve organization objectives and strategy (PMI 2008). On one hand, Operations are usually an ongoing work effort and a repetitive process that follows the company procedures in order to "sustain the business" (Schwalbe 2010). They usually include routine tasks and their outcome is predictable with minimal uncertainty. On the other hand, as mentioned before, projects are temporary and have a finite end. Projects usually have an impact on operations and vice-versa. As a result of that, there is an interaction between the project team and the operations team (PMI 2008). For example, the project team might interface with the operations to build a prototype, test it and find the appropriate timing to transfer it after it is completed.

As per the PMBOK (Project Management Body of Knowledge), Projects have

many other attributes that differentiate them from operations. First, a project is unique, has a well defined objective and creates a unique product, service or result (Schwalbe 2010). Although it has repetitive elements in its phases, this does not change the fact that it is unique; for example, all software projects require testing; however, the testing process requires different test cases and therefore is unique per software. Second, a project is developed using progressive elaboration: It is defined broadly in early phases and as time passes details become clearer. Third, projects require resources (usually limited) from various areas to achieve their unique purpose. This might include internal resources that cover many departments like IT, marketing, sales and finance; moreover, external resources might be needed like consultants and suppliers. Fourth, projects require a sponsor or a customer. The primary sponsor usually provides the direction of the project and the necessary funding requirements. Usually, senior managers of the company are the sponsors because sponsorship needs power. Last but not least, projects involve uncertainty. This is due to the fact that projects are affected by many internal and external variables and are unique. Due to projects uniqueness, it is usually hard to accurately predict costs and time, control supplier delivery dates and manage project team members the same way it was done during other projects (PMI 2010).

PRINCE2 (Projects IN Controlled Environment) defines a project as “a management environment that is created for the purpose of delivering one or more business products according to a specified business case”. It also defines it as “a temporary organization that is needed to produce a unique and predefined outcome or result at a pre-specified time using predetermined resources” (OGC 2005). It is understood that a project is not a normal operational business but a management environment that is created. PRINCE2 says that a project should have an “organized and controlled start, middle and end” (APM Group 2006).

As a general rule, every project is constrained in different ways by its scope, time and cost goals. This is defined in project management as the triple constraint. Here, scope is the work/deliverable expected by the customer, time deals with the expected date to complete the scope and cost includes decisions related to budget requirements and authorizations. Those three dimensions must be adjusted according to a project's priorities; for example, if time is most important and the project is behind schedule, then additional costs might be incurred and scope might be reduced. In short, successful project management requires balancing those three goals (scope, time and cost) and satisfying the project sponsor (Schwalbe 2010). In some cases all three constraints are met but the customer is not satisfied and quality of the end-result suffers. Good project management is the answer to these kind of problems.

### ***2.1.2. Project Management***

Change is a fact of life. Projects are means by which organizations achieve change. Project Management (PM) is recognized as the most efficient way of managing such change because it is the process by which projects are defined, planned, monitored, controlled and executed to deliver the end product and achieve the agreed objectives on time and to the specified cost and quality (OGC 2005). Structured PM means managing projects in a logical, organized way, following defined steps (APM Group 2006).

PM can also be viewed as trade-offs among several goals; managers decide which are more important and which can be dropped or delayed in order to achieve overall success for the organization (Klastorin 2004). PM helps to keep cost, time and risk under control (APM Group 2006). It helps reducing and managing risk. It can be said that project management is a discipline. It applies concepts, principles, tools and techniques to improve performance. It helps to increase the probability of having



successful project (IIL 2011).

PM is more than just the tasks of a project manager. It is the combination of roles and responsibilities of everyone assigned to the project, the organizational structure with clear reporting and communication pathways as well as the set of processes to deliver the required end result or product. It ensures that everyone is aware of what is expected of them. PM is an iterative process. It is the “direction of activities associated with the execution of a project while controlling limited resources efficiently and effectively, and ensuring that the end goal is successfully achieved” (OGC 2005).

According to the Project Management Institute’s PMBOK (Project Management Body of Knowledge), PM is “the application of knowledge, skills, tools and techniques to project activities to meet project requirements” (PMI 2008). Project managers must not only meet specific scope, time, cost and quality goals of a project, they must also meet the needs and expectations of the people involved and affected by the project.

According to PMBOK, project management framework includes:

- Satisfying stakeholders' needs and expectations. Stakeholders include project sponsor, project team, suppliers and even project opponents who do not want the project to succeed
- Being knowledgeable in core functions like scope management, time management, cost management and quality management
- Being knowledgeable in facilitating functions like HR, communication management, risk management and procurement
- Using skills, tools and techniques necessary for project success and eventually organization success

Project Management tools and techniques are essential for managing complex

projects. They assist project managers in carrying their work functions like scheduling, estimating costs, etc... Some key tools include Gant charts, project critical path analysis, kick-off meetings, progress reports, etc... moreover, different tools are more effective in different situations. It is crucial for the project team to decide what is appropriate according to the project in hand (Schwalbe 2010).

When project management is applied to a collection of ongoing projects, it is referred to as program management. The principles of project management apply to program management (PMI 2008).

PM has been described by some as bureaucratic paperwork that does not add any value to a project, or a methodology for projects without any relevance to other business activities. It has been seen by some as being an overhead imposed on the project. But in reality, PM provides both organizations and individuals with choice and flexibility (OGC 2005).

Despite its added value, project management is not a "silver bullet" that guarantees project success and it does not work on all projects in the same way; however, PMs should always work on upgrading their skills and learning from their own mistakes and successes (Schwalbe 2010).

### ***2.1.3. Project Management in the Information Technology Context***

As in other application areas, project management is on the rise in information technology departments. A recent study shows that the most sought-after corporate IT workers in the United States in 2011 are the ones with no deep technical skills like programmers, whose jobs are outsourced to third-party providers, but are generalists with a technology background who know the business and can use technology to add business value. Here comes the role of workers with project management skills (Collett

2006).

Although project management is a universal language that can be applied regardless of application areas, information technology projects have some unique attributes that must be taken into consideration because they have an impact on project management application.

Information technology projects should not be managed in isolation but in the greater organizational context. According to the systems view of project management, projects can be managed as systems (systems philosophy). Their scope is defined and divided into components to evaluate their problems, opportunities and constraints (Systems Analysis). Moreover, the last component of the systems view is systems management. Here, project managers must address the technological, business, and *organizational issues* in order to satisfy all key stakeholders within the organization. As an illustration, key IT professionals are captivated solving technical issues and forget business issues related to the project like "does it make financial sense to pursue this new technology upgrade?" (Schwalbe 2010)

Unlike projects in many other industries, projects labeled as information technology projects can be very *diverse*. Some are small scale with small number of stakeholders like developing a simple access database. Others are huge projects that involve multiple departments and the analysis of long complicated business processes for automation. Types of hardware, network infrastructure, database technology and programming language for application development are few among many variables project managers have to deal with in IT projects.

Due to the nature of IT projects, team members working on a specific project can be very diverse having computer science, mathematics, physics, management information systems or even business degrees. IT Project managers sometimes have to

gather input from stakeholders coming from all those backgrounds for a single project; however, this task can be challenging (Schawlbe 2010).

In addition to that, IT projects involve *diverse technologies*; it is not easy for an IT project manager to form, manage, facilitate communication and resolve conflicts for a team that encompasses a java programmer, an oracle database administrator, a security specialist and a graphic designer. Moreover, technology changes rapidly which makes their task even more difficult. IT project managers, working in a fast *paced environment*, must have in place *a fast paced process* to manage projects in hands.

Other trends that have an impact on IT projects include outsourcing and virtual teams.

#### ***2.1.4. Project Failures and Success***

Although IT is becoming more reliable, faster, and less expensive, the complexity and risk of managing IT projects is still challenging. According to the 1994 chaos study, which is a survey conducted by the Standish Group of 365 IT managers, only 16% of IT projects were successful and 31% were considered a failure in terms of time and budget. However, the situation is getting much better. In today's numbers, the percentage of successful projects increased to 35% and the failures diminished to 19%.

In addition to that, the chaos study lists the top 10 reasons for project failures. As a starting point, project failure is defined. Projects, which are considered to bring value to an organization but who exceed budget and/or schedule, are considered as failures. For those failed project, top factors that contributed to the failure are listed below:

- Incomplete requirements
- Lack of user involvement

- Lack of resources
- Unrealistic expectations
- Lack of executive support
- Changing requirements and specifications
- Lack of planning (Johnson 2006)

According to another web-based survey conducted by CompTIA, poor communication ranked as the number one reason for projects failures followed by insufficient resources and unrealistic schedule deadlines. Communication is an important aspect of project management as it is a key factor in setting project goals, requirements, as well as realistic schedule and budget constraints (Rosencrance 2004).

Another point of view stresses on the importance of “IT governance” to ensure alignment with business strategy and add controls. "IT governance addresses the authority and control for key activities in organizations, including IT infrastructure and Project management" (Schwalbe 2010). A recent study shows that the lack of *progress monitoring*, linking of systems to business, auditing, financial inspections, planning and control can lead to project failures. All those aspects are addressed by proper IT governance (Wilson and Avison 2006).

Interestingly, the chaos study also lists key factors for successful projects. It appears that successful projects have a strong non-technical component in terms of executive support and user involvement which lead to clearly defined requirements and scope. The technology and tools play a less important role. As at 2006, top factors that contribute to project success are the following:

- User involvement
- Executive management support
- Clear business objective

- Optimized scope and requirements
- Agile Process
- Project management expertise and formal PM methodology
- Standard tools and infrastructure
- Skilled resources (Johnson 2006)

Many other studies have concluded that project success depends on the way projects are managed, i.e. the extent to which project management sets clearly defined goals, wins executive support, manage project scope, plans for phases, communicates with all stakeholders, manage risks and reports progress on timely manner (Nicolas 2010).

Other approaches describe other reasons for project success:

- According to the value-driven approach, projects are considered successful if they add value to the organization, even if they fail to meet budget or schedule constraints.

- As for the socio-technical approach, it splits the responsibility of achieving project goals and implementing technology between the developer and the end-user. Moreover, continuous communication between the two parties is essential for success.

- On the other hand, the knowledge-management approach stresses on the importance of experience in collecting data, synthesizing it and sharing it among organization team members to learn from past projects. Reasons of success and failures are summarized in lessons learned documents. Those documents, if used properly, can be transformed into best practices that improve the organization process maturity and help complete projects the most effective and efficient way.

- According to the project management approach and as advised by the chaos studies, better project management is a major factor for successful project completion.

This approach focuses on shifting organization processes from ad-hoc to standard methodology. As a result, project success does not depend primarily on the team, but more on the established processes and infrastructure in place.

- Last but not least, according to the Value-driven Change leadership (VDCL) view, project success does not depend only on PMBOK principles but also on other principles. A survey showed that the following PMBOK principles are associated with success:

- Manage project scope
- Manage schedule and resources
- Initiate project with a business case/charter
- Manage project risk
- Maintain project sponsorship

As for VDCL principles associated with success, they include:

- Focus on goals of the business case
- Allow time for reflection and learning from past experiences
- Design and evaluate alternatives for end product architecture and business functions
- Establish the architecture of the product since the first release and account for architecture in the project plan
- Agile Project Management

In addition to that, this survey concluded that, to evaluate project success, senior managers focused more on project outcomes than meeting baseline schedule and budgets. Moreover, PMBOK principles related to cost management and time management seem to be more important for external contracted IT projects than developing internal IT solutions (Nicholas 2010).

### ***2.1.5. IT Project Management Methodology***

As mentioned before, PM methodology (PMM) is a major factor in project success. Organizations often lack the standards or guidelines they must follow to manage projects. Some small companies adopt a set of templates or examples of good project management plans and mistakenly consider those documents as PM methodology. Moreover, project management steps are usually common-sense to senior managers with experience; however, new IT project managers do not know how to create project plans or how to report projects' status in non-technical terms. Therefore, organizations must define a methodology to be followed, provide trainings about it and enforce its application. The definition of a PM methodology is a proof of an organization's commitment to good project management, which proved to be a major factor in project success (Marchewka 2010).

The right PMM helps avoiding most of the common causes and effects of project failure. Without a PMM, the people who sponsor a project, the ones who manage it and the ones who work on it are all likely to have different ideas about the way the project should be organized and when it should be completed. There will be confusion surrounding the project about responsibility, authority and accountability of each group or individual related to the project (APM Group 2011).

Another reason for having a PMM is to improve the way projects are managed within an organization. It provides the project team with a standardized "game plan" for implementing project and product lifecycle. Team members can focus at the task at hand instead of always worrying on what to do next; therefore, product development becomes more predictable and the chances of success increase.

Although projects fail even with a PMM in place; however, a methodology can incorporate experiences and lessons learned for continuous improvement. Over time,



the methodology becomes more mature by incorporating industry best-practices and lessons learned (Marchewka 2010).

A good PMM guides a project through a controlled, well-managed and good set of activities to meet the project's objectives and achieve the desired results. The principles of a good PMM are:

- A project is a finite process with a start and end
- Projects need to be managed in order to be successful
- All parties must be clear about the “why, what, how, who, when and where”

of the project (OGC 2005).

The key benefits of a PMM are:

- Repeatable management approach
- Teachable methodology
- Building on experience
- Flexible decision points
- Control of deviations from plan
- Provides regular management reports
- Sensible involvement of stakeholders
- Structured communication among stakeholders (OGC 2005).

Although each project is unique, they have common characteristics that can be formalized into a structured process which allows the people involved in managing them to manage more effectively. Most projects share common causes and effects of failure as well as risks. In order to ensure that managing change is achieved in a structured and controlled manner, projects need to be conducted using a methodical approach (Charvat 2003).

A methodology provides a plan for managing and controlling IT projects. It is

like a template for initiating, planning, and developing an information system. Regardless of the product at hand, the processes needed to manage projects are almost the same. As a result, the methodology recommends the phases, deliverables, processes and tools for supporting an IT project until its completion. It is used to successfully complete a project on time, within budget, and according to agreed specifications (quality) (Marchewka 2010).

In simpler terms, a PMM is a series of steps through which the project progresses to a successful completion. The methodology should lead the work of all team members throughout the life cycle of the project (APM Group 2006).

A PMM is neither a quick fix nor a temporary solution. It provides the high-level PM framework with steps required to successfully manage a project. Moreover, due to the dynamic and diverse nature of IT project, a good PMM should be flexible enough to adapt for the needs of the organization (Marchewka 2010).

As a first step to define an Information Technology Project Management methodology, we should differentiate between the project Lifecycle (PLC) and the software development lifecycle (SDLC).

#### 2.1.5.1. The Project Lifecycle (PLC)

The project lifecycle is "a collection of logical stages or phases that maps the life of a project from its beginning to its end. Its aim is to define, build, and deliver the product of a project" (Marchewka 2010). Usually deliverables at the end of each phase are approved before proceeding to the next phase; however, to fasten the process, sometimes the next phase is started before approval (fast-tracking).

Project management institutions and communities use different approaches to define those stages, yet most methodologies share the following steps:

- The first step is to define project's goal(s). For a project to exist it must add business value to the organization and the project goal should support that. This goal should be well defined to drive other phases of the project.

- The second phase is planning. Questions like what are we going to do (scope), how are we going to do it, who is going to be involved (resources), what is the estimated time and budget, must be answered in this phase. Moreover, deliverables, tasks, resources, and time to complete each task must be defined for each phase of the project. This initial plan is called baseline plan and is used as a reference for monitoring performance.

- The third phase is execution of the baseline plan. Most of the implementation happens here; therefore, scope, schedule, budget, and people are managed to achieve project's goal. Moreover, project's performance is communicated to stakeholders until a finished product is delivered to the organization or customer.

- The fourth phase is closing the project. In this phase, the project sponsor checks if the work is completed as planned and accepts the deliverables.

- Last but not least, the project is evaluated to check if it is achieving the goal/value that was forecasted on project initiation. This evaluation can be in the form of financial return on investment or lessons learned documentation; this will help improve the process of future projects (Marchewka 2010).

#### 2.1.5.2. Information Technology Development Lifecycle (SDLC)

Although projects follow a project lifecycle, information systems development follow a product lifecycle (SLDC), which focuses on creating and implementing the project's product – the information system.

Historically, people have solved problems using these steps: (1) determine the

problem; (2) understand it; (3) develop a plan; (4) execute it; (5) assess whether the solution works (Russ, December 2002). This was the basis behind the system (or software) development life-cycle (SDLC) models or methodologies. SDLCs are mechanisms to ensure that software systems meet the established requirements and that the software development process is efficient and predictable. The software development life-cycle models (SDLMs) support software development projects. They help the projects deliver products with expected quality and functionality, on time and on budget (Wallin November/December 2002).

SDLCs are divided into two major groups; traditional (or heavyweight, disciplined and plan-driven) and agile (or lightweight). Both give much importance to quality. Both have their strengths and shortcomings (Robert and Tomayko 2006).

The traditional methods are structured ones and are based on the classic waterfall. The models are usually top-down approaches. Top-down means that there is emphasis on planning and design, and a complete understanding of the overall system before starting with coding. Traditional approaches assume that a complete set of requirements has to be defined early in the life-cycle and the development costs can be controlled by managing change. The mostly known traditional model other than the waterfall is the spiral model which is used for very large projects (Office of Government Commerce 2006).

Starting from the late 1990s, there is an increasing interest about newer methodologies in software development. These are the agile methods. They have been increasingly used in projects and are being accepted by the developers. The use of the term “agile” started in 2001, when a group of several creators, developers and practitioners of the new methods had a workshop, created the “agile alliance” and came up with the “manifesto for agile software development” which is comprised of decisions

that value the following:

- “Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over following a plan
- Responding to change over following a plan” (Agile Alliance 2001).

Agile adopters criticize the standard approach as being time consuming and heavily relying on fixed requirements by the end-user. Agile methods are mostly incremental and iterative. They use short iterative cycles, involve users to establish and verify requirements, and rely on the development team’s tacit knowledge as opposed to extensive documentation. They are considered as a compromise between no process and too much process. Many organizations have shown interest in agile methods for smaller projects because they find the traditional methods very bureaucratic and inflexible. A development method can be called agile when it is incremental, cooperative (good and constant communication between customer and developers), straightforward and adaptive to changes in requirements (allows last minute changes). The most known agile methods, which shorten time to delivery, are RAD (Rapid Application Development), scrum, XP (extreme programming), AUP (agile unified process) and DSDM (dynamic systems development method). According to the XP approach, a system is delivered in many releases with one or several implemented functionalities. Development and testing of each release can take weeks or months but not more, and then developers move to another release (Marchewka 2010).

Software engineers have to know how to evaluate different methods of software development and decide on the appropriate method which works for the purpose of their work (Miller 2005). Moreover, the chosen method depends on the size and complexity of the project, as well as the experience and skills of the project team.

According to the Computing Curricula 2001 of the Association for Computing Machinery (ACM), “software development requires choosing the tools, methods and approaches that are most applicable for a given development environment. The one size fits all approach is not appropriate in software development. It depends on the situation and conditions” (ACM 2001).

#### 2.1.5.3. The PLC and the SDLC

As described above, the project lifecycle (PLC) focuses on the phases, processes, tools, and skills for project management, while the system development lifecycle (SDLC) focuses more on creating and implementing the product or the IT system. Moreover, the chosen SDLC approach will not only define the software processes to be followed but it will also be a critical factor in defining the project plan in terms of phases, deliverables, resources and in estimating the project's budget and schedule (Marchewka 2010).

While defining any IT project management methodology and whatever SDLC model is chosen, the product development activities (SDLC) will be part of the execution phase of the PLC. This integration of project management and systems development activities is what distinguishes IT projects from other PM application areas.

As a first step to develop an IT project management methodology, we will start by visiting the two most recognized project management methodologies developed by the Project Management Institute (PMI) and the UK office of government commerce (OGC).

## **2.2. Leading Project Management Organizations and Methodologies**

The two leading project management approaches that provide best practices, standards and principles for successful management of projects are Project Management Body of Knowledge (PMBOK) and Projects in Controlled Environments (PRINCE2).

### ***2.2.1. Project Management Body of Knowledge (PMBOK)***

The Project Management Body of Knowledge (PMBOK) is owned by the Project Management Institute (PMI). PMI was founded in 1969. However, the first standard guidebook was not produced until 1987; this was followed in 1996 with the release of an updated version. In early 2001, PMI updated the document and published a 2000 version (PMBOK's official second edition). Later in 2004, the third edition of the guide was published. The current edition (4<sup>th</sup> edition) was published in 2008 and is now considered an American National standard. Based on the PMBOK, PMI was the first organization to offer professional qualifications specifically for project managers. Today, PMI offers many types of certifications. The most comprehensive certification is the Project Management Professional (PMP) which tests the examinee on all the concepts of the PMBOK.

PMBOK is considered to be a 'best practice guide' and is widely recognized as the de facto standard of project management knowledge. It has been applied in numerous industrial sectors to manage a wide range of projects including: management projects (general), departmental projects (functional), industrial specific projects (technical), product development (marketing) and governmental projects (public). From the perspective of PMBOK, project management is viewed as a number of interlinked processes that are directed towards delivering the desired results.

The PMBOK approach uses a framework which consists of several major

components including: 5 process groups, 9 knowledge areas, 42 sub processes (which include hundreds of tools and techniques). The 5 major groups of management processes are initiation, planning, execution, monitoring, controlling and closing.

The initiation process aims to facilitate the set-up and authorization of the project. Initiation defines the overall direction, high level goals and major deliverables which will ultimately be used to determine if the project has been successful.

The planning group process involves devising and maintaining a workable scheme to accomplish the project goals within the projects constraints which are defined during initiation.

In the execution group of processes, activities, people and other resources are coordinated to efficiently carry out the project plans according to agreed upon baselines. During execution, the project progress against the various project plans is monitored with appropriate control through the project management monitoring and control processes group.

Monitoring is generally carried out by the project manager through regular interactions, communication and discussion with stakeholders to ensure that the project is on track. The controlling processes ensure that the project objectives are met by initiating change request whenever corrective measures/actions are necessary. Among the central process groups – planning, executing, monitoring and controlling groups of processes are iterative throughout each phase of the project.

Finally, as the project activities are finalized and the project is formally accepted, the project is brought to an orderly end using the closing group processes. Within each process group, individual processes are linked by their inputs, outputs, as well as specific tools and techniques.

The second component of the framework is the 9 knowledge areas which can



be mapped to the process groups and provides the expertise to carry out the specific processes. The 9 knowledge areas are: project integration management, project scope management, project time management, project cost management, project quality management, project human resource management, project communications management, project risk management and project procurement management. These knowledge areas are classified as either core or facilitative, and describe the key competencies that project managers must develop to be effective. The core knowledge areas include scope, time, cost and quality management while the facilitating functions include human resources, communication, risks and procurement management (PMI 2008).

Getting certified in the PMBOK approach for project management will help managers improve project management in the organization they are working in by doing "real-world" implementation. This approach provides a fluid process with general guidelines without step-by-step directions. It is an approach to keep the project time, cost, quality, scope, resources and risk in balance. The five process groups of PMBOK do not necessarily allow the work to progress; they serve more as a mechanism to identify and oversee the flow of actions within the project. Each of those processes has unique activities that guide the project work from concept to completion. Project managers should identify the most appropriate activities for their specific projects. They should have a solid plan and execution of this plan (Marchewka 2010).

PMBOK is a comprehensive knowledge-based project management guide covering widely proven practices. This fact combined with its descriptive knowledge areas and easy to understand concepts makes PMBOK relatively simple and thereby accessible. Therefore, PMBOK can be applied regardless of the scale or nature of the project (PMI 2008).

### ***2.2.2. Projects in Controlled Environments (PRINCE)***

As per the Prince website ([www.prince2.com](http://www.prince2.com)), PRINCE was first developed by the Central Computer and Telecommunications Agency (CCTA) in 1989. It is a structured method for effective project management originally based on a project management method created by Impact Systems Ltd in 1975. It is also the de facto standard which has been used extensively to manage the UK Government Information Systems Projects.

Over the years, PRINCE has gained more wide reaching attention and has been used by many of the world's leading organizations. Through feedback from the adopters (organizations), PRINCE underwent a major revision in 1996 resulting in a more generic and business focused methodology known as PRINCE2.

There are two qualification levels in PRINCE2; foundation level for those to learn the basics and terminology of PRINCE and practitioner level which is the highest level for those who need to manage projects within a PRINCE2 environment. Its unique approaches in managing projects include:

- Organization of teams in managing a project and definition of their responsibilities.
- Processes that drive the undertaking in terms of the steps which can be taken to manage the project.
- A structure and content of the plans which should be constructed to document the intended progression of a project.
- A set of management and quality control applications that ensure a project is proceeding to work towards expectations.

PRINCE2 has also been increasingly viewed as 'best practice' of project management and adopted by leading organizations worldwide. It was designed to

accommodate any size or type of project. However, PRINCE2 does not address every skill or technique required to operate a project, rather it concentrates on the steps or processes that a project manager requires for accomplishing the project. Therefore, PRINCE2 is often referred to as a process-based approach. The key features of PRINCE2 are its focus on business justification, defined organization structure for the project management team and its product based planning approach. In addition, it places emphasis on dividing the project into manageable and controllable stages; therefore it is sufficiently flexible to allow application to any level appropriate to the project.

PRINCE2 is supported by processes, components and techniques. The process model covers activities from setting the project off on the right track, through controlling and managing the project's progress to completion. The process model provides the flexibility to establish a number of stages, each forming a distinct unit for management purposes. Each stage consists of products or outcomes, activities, a finite lifespan, resources and an organization structure. The completion of each stage is determined by the satisfactory completion of the agreed products. These stages are very much like the phases of the PMBOK process model. PRINCE2 calls these stages as starting a project, initiating a project, managing stage boundaries, controlling a stage, managing product delivery and closing the project. Project oversight, by the project board, occurs throughout the project through directing a project.

Moreover, planning is a generalized process that is accessed at all levels of the project as needed. While managing stage boundaries, PRINCE2 manages the sequence of the delivery of the product, groups products into self-consistent sets or natural decision points for feedback and review.

PRINCE2 identifies 8 key components or elements: business case, organization, plans, controls, management of risks, quality in project management,

configuration management and change control. These aspects describe the major elements of project management and how PRINCE2 incorporates and manages them. In PRINCE2, these aspects underpin the effective utilization of project processes and provide a mean to keep track and review the different project processes. They are used for performance measurement with benchmark standards and project objectives to help control any deviations within the project. However, these components are not as comprehensively described as PMBOK knowledge area.

Despite the worldwide recognition and implementation of PRINCE2, some negative impressions have been published. PRINCE2 is sometimes viewed as cumbersome, regimented or bureaucratic. It is appropriate for managing complex projects in the areas of business change, business performance improvement, system development/implementation and product development; however, its structured approach often limits the organization's flexibility in coping with a changing environment. As every project is different, a generic structured approach may not always be appropriate; furthermore, the generic nature of the templates may not be suitable for every type of project.

Additionally, the PRINCE2 structure has been perceived as increasing projects length, cost, delaying return on investments, and raising the risks of failure and the possibility of real requirements, objectives and expected standards not being met. Moreover, PRINCE2 requires a lot of documentation which adds little value to the overall performance of the project (Chin and Yap 2010). As a result of these perceived weaknesses and the heavy administrative workload involved, it is often argued that PRINCE2 is unsuitable for use on small projects.

### 2.3. Project Management Maturity

Because the number of organizations that are managing by projects continues to grow, there is an increased interest in developing a maturity model that shows a step-by-step method of increasing and maintaining an organization's ability to translate organizational strategy into the successful delivery of projects (Schlichter 2000).

In order for an organization to determine if its PM practices are mature, some agreed measures are required to enable it to see where it stands compared to best practices or competitors. In this way, a number of PM practitioners have developed “benchmarks” for assessing PM capability/maturity based on the principles of maturity models. This technique offers "systematic and analytic approach to measure and improve an organizations' effectiveness continuously" (Ibbs 2000).

The first purpose of such models is thus to assess organization’s current PM maturity. Moreover, the organization would diagnose its strengths and weaknesses, and identify gaps where improvement is required (Pennypacker 2003). This is especially important since each ingredient of the capability to deliver projects successfully requires a major commitment of time and resources. In this sense, PM maturity models would provide a guide for prioritizing organizations initiatives to progressively improve their PM capabilities.

In sum, the key objective of PM maturity is to benchmark missing practices and to rectify or improve detected weaknesses.

A recent review has shown that there are over thirty PM maturity models in the market. The following is a list of the major maturity models developed:

- Software Engineering Institute Capability Maturity Models in general.
- Project Management Maturity Model (PMMM), by Knapp & Moore
- PM Solutions’ Project Management Maturity Model

- The Project Management Institute's Organizational Project Management Maturity Model (OPM3)

- Kerzner's Project Management Maturity Model

- Berkeley Project Management Process Maturity (PM) 2 Model.

In order to provide a general overview of what these models are about, the following lines will tackle the last 4 models mentioned above with the main focus on the special characteristics of each.

- *PM Solutions' Project Management Maturity Model (Dekker 2012):*

The Project Management Maturity Model (PMMM) is a formal tool developed by PM Solutions and used to measure an organization's PM maturity. Published in book form by Marcel Dekker in 2002, the PMMM provides a logical path for progressive development and a strategic plan for moving forward PM maturity improvement within the organization.

The PMMM follows the Software Engineering Institute's (SEI) Capability Maturity Model's (CMM) five maturity levels, and examines maturity development across nine knowledge areas in PMO's PMBOK. For each of the 9 knowledge-areas (integration management, scope management, time management, cost management, quality management, human resource management, communications management, risk management, and procurement management). It goes from a low level to a higher level by implementing more mature related practices. The following is an illustration knowledge area (project cost management):

- Level 1: No established practices or standards. Cost process documentation is ad hoc and individual project teams follow informal practices.

- Level 2: Processes exist for cost estimating, reporting, and

performance measurement. Cost management processes are used for large, visible projects.

- Level 3: Cost processes are organizational standards and utilized by most projects. Costs are fully integrated into project office resource library.

- Level 4: Cost planning and tracking integrated with Project Office, financial, and human resources systems. Standards tied to corporate processes.

- Level 5: Lessons learned improve documented processes.

Management actively uses efficiency and effectiveness metrics for decision-making.

- *The Project Management Institute's Organizational Project Management Maturity Model (PMI OPM3) (Schlichter 2005):*

The Project Management Institute has been developing the OPM3 since May 1998 and the first release was launched at the end of 2003. Developed by hundreds of practitioners in the PM industry and government, the OPM3 is a “standard” that aims at providing help in 2 areas:

- Choosing the right projects to execute organizational strategies

- Implementing the processes, structures, and behaviors necessary to achieve higher PM maturity

The basic components of the OPM3 model are the following:

- Best Practices in organizational PM.

- The constituent capabilities necessary for the existence or attainment of best-practices.

- Observable outcomes signifying the existence or attainment of each relevant Capability.

- Key Performance Indicators, which are the means of measuring

each outcome.

- Model context, including the Organizational Project Management Process and the stages of process improvement.

According to OPM3, the individual elements that contribute to an organization's PM maturity or "Best practices" are classified under 10 categories as follows:

- Standardization and Integration of Processes
- Performance Metrics
- Commitment to the PM Process
- Alignment and Prioritization of Projects
- Continuous Improvement
- Using Success Criteria to Cull or Continue Projects
- People and Competence
- Allocation of Resources to Projects
- Organizational Fit
- Teamwork

A major characteristic of OPM3 is that it goes beyond assessing and guiding PM processes of individual projects, it also helps organizations develop the maturity to manage multiple projects together (program management) and to select and prioritize projects and programs (portfolio management). OPM3's unique feature is "the interactive database application accessible on the CD-ROM that warehouses the hundreds of Best Practices and thousands of Capabilities, Outcomes and Key Performance Indicators, as well as the thousands of dependencies between and among Best Practices-the first Standard of its kind to be published by PMI" (Schlichter 2005).

In sum, OPM3 identifies different Best Practices in organizational PM and



their related capabilities. Every Best Practice has been placed within a context called the “OPM3 Process Construct”, mapping it to the PM domains (Project, Program, and Portfolio management) and to the stages of process management (Standardize, Measure, Control, and continuously Improve).

The assessment using OPM3 is preferred to be outsourced through experts who understand the model and who have experience using it since it is a somehow sophisticated model.

- *Project Management Maturity Model (Kerzner's 2001):*

Harold Kerzner views project management as a core competency that organizations must develop in order to survive. Thus, he developed a Project Management maturity model that organizations can use to benchmark their Project Management practices with their competitors. This maturity model is an assessment tool for establishing Project Management excellence.

Here again, the model has five maturity levels (Appendix 1 – Table A1). Level 1 represents organizations lacking Project Management processes, while Level 5 represents organizations that are successful in the area of Project Management and are continuously improving their process.

The questionnaire used for assessment is explained in detail in Kerzner’s book and can be done electronically on IIL’s website ([www.iil.com/pm/](http://www.iil.com/pm/)).

- *Berkeley Project Management Process Maturity (PM<sup>2</sup>) Model:*

Investigators from the University of California at Berkeley, with support and sponsorship from the Project Management Institute (PMI) educational foundation developed the (PM<sup>2</sup>) Model and an associated Assessment methodology. The model was initially completed in 1997 but was continuously reformed to reflect advances in PM knowledge.

The model provides for 5 levels of maturity. In the most comprehensive version of the model, each level breaks PM processes and practices into nine PM knowledge areas (Integration, scope, time, cost, quality, human resource, communications, risk, and procurement) and six PM phases (initiating, planning, executing, controlling, closing, and project-driven organization environment). Each maturity level has key PM processes, organization's characteristics, and focus areas.

The "Guide to the Project Management Body of Knowledge Exposure Draft" was used by the study team as a primary reference. However, one process was added and called the Project-Driven Organization Environment which was devised to assess the PM "infrastructure" of an organization. This was revealed to be the least mature phase in a survey round.

The associated Project Management Process maturity Assessment Methodology brings into play a comprehensive questionnaire made of 148 multiple-choice questions for data collection. For every question, 5 answers corresponding to the 5 different levels of maturity are proposed. The objectives of the questionnaire are to identify specific weaknesses in the different PM knowledge areas and phases for possible improvements, and to calculate the PM/ROI using statistical relationship between PM maturity and project performance.

## **2.4. Analytical Review**

### ***2.4.1. Project Success Factors***

If we go through the studies about projects' success factors, we can easily extract some key reasons behind this success.

It appears that successful projects have a strong non-technical component in terms of user involvement and executive support. Those factors are crucial to set clear

expectations about the end result; moreover, they help reach agreed-upon requirements and hence limit the scope of work. This leads to fewer changes to requirements because the project has been initiated using a business case, has been properly planned and have involved all stakeholders in this planning; this is done without deviating from project goals mentioned in the business case.

Good and continuous communication seems to be another key factor for success; it is needed in every step of project management including setting goals, setting realistic schedules and budgets, involving stakeholders for requirement collection and scoping, reporting status to sponsors and management, etc...

Those key success factors can be translated into best-practices which can be integrated into a formal project management methodology. Moreover, this methodology, which becomes part of the organization's PM infrastructure, is another major reason for projects' success, especially if it is adopted by expert project managers who have an experience in PM tools and techniques. This will lead to an increase in PM maturity and will shift PM processes from Ad-hoc processes to standardization. In addition, this PM methodology should be controlled by a well established IT governance that makes sure that projects are monitored in terms of proper planning, progress, budgets, added business value and any other aspect that should be controlled.

Once this PM infrastructure is in place, completion of projects should be followed by a collection of lessons-learned documents; moreover, by feeding back issues encountered, success/failure factors and other lessons learned, the PM process becomes more efficient and more mature.

In addition to success factors that are related to traditional project management, other points, which are specific to the IT domain, seem to have an impact on IT solutions' successful delivery. Those points are: including the design and architecture of

the system in the project plan, choosing among many alternative solutions and fastening project delivery by using agile methodologies.

Last but not least, it was noted in all studies that there is no agreement on how project success is evaluated; however, there seems to be an agreement that, in internal IT departments that develop systems for other departments within the organization, projects are successful if they add value or achieve their goals even if they fail to meet budget or schedule constraints. Therefore, implementing a formal PM methodology, which helps complete projects on schedule, within budget and according to specifications, is very important. However, its effect on success is indirect through more effectiveness, and higher return on investment. This will free resources that are needed for implementing new projects which adds value to the organization.

#### ***2.4.2. Project Methodology***

As mentioned before, PM methodology is essential for project success. This methodology should include all best-practices that seem to be beneficial within the organization context. It should be a structured step-by-step procedure that can be documented and distributed among project managers. Once the process is standardized, it can be controlled in order to make sure it is adopted and that all project managers talk the same language. All team members know what to do, when to do it, have the needed authority to perform their work and are accountable for their mistakes. Needless to say, if methodology is documented, it can be improved from past experiences and solutions delivery is more predictable (depending on process and not on people).

A good PMM should take into consideration all the success factors (best-practices, tools and techniques) that were mentioned before; this includes user involvement, executive sponsorship, control deviation from plan, structured

communication and reporting of status, etc...If this methodology is well suited for the organization, it should help achieve projects on time, within budget, and according to specifications. Moreover, projects' sponsors will feel more value of their projects.

As mentioned before, the project lifecycle (PLC) is different from system development lifecycle (SLDLC); while developing an IT project management methodology (ITPMM), we should take into consideration the following:

- ITPMM should be flexible enough to adapt for the diversity of IT solutions; this includes configuring and implementing an off-the-shelf application (ex: antivirus) or developing an in-house application (ex: HR web application).

- Organization can implement multiple SDLC model according to project types; for example, if the project has clear requirements then standard methods like waterfall can be adopted; however, if the project is huge and the requirements are not clear and might change a lot, then agile methodologies can be adopted to deliver the project in multiple, incremental releases. This will allow reaching the end-user in a quick manner.

- ITPMM only recommends the phases, deliverables, tools and knowledge areas to support a project. After some experience, project managers should be able to choose steps, tools, techniques, methods according to their specific project needs and conditions.

- ITPMM should help achieve project objectives. This includes the primary goal of the project which is the form of completing the requested IT solution which adds value to the organization. In addition to that, other important objectives include scope, schedule, budget and quality.

- While developing the ITPMM, the project lifecycle (PLC) and the systems development lifecycle should be combined to plan and manage the processes and

product of an IT project. Moreover, system development lifecycle activities (whatever model is chosen) are part of the execution phase of the project lifecycle activities. The last phases of the PLC, like closing a project and evaluating it, occur after the system has been implemented and delivered.

All the processes, methods, and tools defined in the ITPMM come together to make up a project governance framework or project infrastructure.

#### **2.4.3. *PMBOK* vs. *PRINCE2***

Many people assume that PRINCE2 and PMBOK are alternative or competitive PM approaches and there must be a decision on which one to adopt. Based on several articles, it can be said that they are not the same and therefore not really comparable. PRINCE2 defines a detailed and formal step-by-step PM methodology for completing projects, while PMBOK can be considered as an encyclopedia or a source of information about almost all PM aspects. PMBOK says what a project manager and anyone on the PM team should know, whereas PRINCE2 describes what a project manager and others on the PM team should do.

PMI itself states that the “PMBOK guide is neither a textbook, nor a step-by-step, or a ‘how to’ type of reference”. PMBOK still requires its practitioners to employ a PMM so that work can be planned, performed and controlled effectively. PMBOK enriches PRINCE2 in almost all knowledge areas but mainly procurement or contract management, people management, cost management, time management and communication management. It covers the broad range of PM topics including organization structures, risk, project lifecycles and PM skills such as conflict resolution, teamwork and communication. Moreover, it helps in improving the “soft skills” of the project staff.

One of the main differences in them is that PMBOK uses the work breakdown structure (WBS) approach whereas PRINCE2 uses product breakdown structure (PBS) and product based planning (PBP) approaches. Since PRINCE2 focuses on deliverables and not the activities, with the combination of WBS and PBS, the deliverables may be clearer.

In summary, PRINCE2 is not meant to be stand-alone; it needs the experience and the knowledge depth of the PMBOK to fill it out. It is a ready-made structured methodology with templates and guidelines. Therefore, it gives the sense of "take it as-is or leave it". It is a bit rigid which makes it hard for a PM to adopt it for improving organization's current PM methodology. Moreover, its inflexibility limits the organization's ability to cope with change. On another hand, PMBOK, with its comprehensive knowledge areas, process groups and tools/techniques, is a guide that can be used to create a personal methodology by building and improving weaknesses of the current methodology.

As the purpose of this project is to increase PM maturity and develop an IT project management methodology, and as I am a PMBOK proficient who holds a PMP certificate, I consider PMBOK more suitable for this purpose. The main reason is that it gives me the needed flexibility to improve the current PM methodology with PMBOK knowledge areas instead of adopting the PRINCE2 methodology as it is. This does not mean that one cannot inject in developed ITPMM, the best-practices or methods applied by PRINCE2, where PMBOK lacks detailed info.

#### ***2.4.4. Project Maturity***

After accepting that PM is a must for successful project completion, organizations found that improving their PM process is essential. To start, they need to

benchmark their practices against industry best practices. Afterwards, they need to identify the level of sophistication in their PM process.

The answer for that kind of exercise is PM Maturity models. However, which PM maturity model is the best? The right choice is not straightforward.

All models discussed before are like a template for evaluating current practices, compare them to industry best-practices (gap analysis) and then define a plan to improve maturity level according to the findings. Let us start by comparing and contrasting the four maturity models highlighted before.

The first model discussed is PMI's OPM3. This model helps in choosing the right projects in-line with organization strategy and implementing the PM infrastructure. Some of the concepts that are common to other maturity models include best-practices, organization PM process and its continuous improvement, standardization and commitment, resource allocation and teamwork.

However, OPM3 is a sophisticated model that is hard to be applied in-house; it is even recommended to outsource it to experienced consultants who understand the model. This does not mean that one cannot benefit from unique items of this model like using success criteria to continue projects, checking process fit within the organization, applying KPIs to measure outcomes and improvements, managing and prioritizing multiple projects (program and portfolio management are outside scope of this paper) and benefiting from the stages of process management (from standardization to continuous improvement).

The other three maturity models are among the most well-known in the field. They include Kerzner's maturity model, PM Solution's Project Management Maturity Model, and Barkeley's Project Management Process Maturity model. Despite some differences in the terminology used, there is a common pattern among these models;



they all start on low maturity where practices are not planned, PM processes are ad-hoc, and there is no common language among project team members for project management. As the firm maturity grows, it begins to adopt best-practices, trains employees on them and develops and standardizes organization PM process/methodology. Finally, at high maturity, organizations go beyond applying PM practices to learning from past experiences and continuously improving its PM processes and practices. This is where the organization is considered as "project mature".

One thing to be noted is that those models do not delve into specific knowledge areas of project management (like time and cost management) to measure their maturity; they simply measure the maturity of the organization at the infrastructure level and not at the individual components level. Moreover, as those models were written in the 1990s and early 2000s, one cannot solely depend on them anymore because project management has advanced since then (Grant 2006).

In addition, the methods used in those models try to employ generic KPIs which are not tailored towards a specific industry. For example, making the organization "project driven" does not necessarily lead to better maturity in areas like in-house software development within information technology departments; therefore, applying those models to correlate maturity with project success was not successful because different industries and different project categories do not necessarily need the same level of maturity to successfully complete projects (Ibbs 2002).

To the best of our knowledge, no-one tackled before the specific application area of information technology; as this is a unique area with very unique processes and product lifecycles, it is a good opportunity to develop our own model. This model will

help discover weaknesses in each knowledge area and within the organization as a whole from an information technology perspective.

## CHAPTER 3

### SIMPLE INFORMATION TECHNOLOGY MATURITY MODEL (SIT-MM)

After analyzing the most recognized maturity models, we can learn from them to develop a new maturity model that is simpler, more applicable, and more tailored towards information technology application area.

To build that new model (SIT-MM), I will start from the previously mentioned models and update them to reflect latest advancements in project management knowledge areas. Moreover, the previous maturity models were developed in the late 1990s and early 2000s; therefore, it is essential to update them with the latest processes, tools and techniques found in the latest PMBOK edition (4<sup>th</sup> edition).

In addition to that, to make SIT-MM model more tailored towards information technology, I will be using the findings of the research paper developed by Brian Hobbs. This paper identifies the tools and techniques that are mostly used and with highest impact on project's performance within an information technology context (Hobbs 2006).

SIT-MM model will cover two project management dimensions. The first dimension tackles the maturity of the processes, tools and techniques that should be applied to successfully manage projects. This dimension is not covered in details in previously developed models; Its main scope is project management processes and not product specific activities (which are different by application area); however, as SIT-MM is more tailored towards information technology projects, techniques and processes that are not relevant in this application area will not be included in the model.

The second dimension of this model is organization infrastructure and support.

This dimension measures the level of commitment of the organization towards applying project management best-practices. Moreover, it deals with the standardization of project management procedures and how the culture and the management team support the adoption and the continuous improvement of those practices. In the next two sections, I will elaborate on each dimension.

### **3.1. Project Management Processes Maturity**

For each knowledge area of project management (as defined in the PMBOK: Integration, scope, time, cost, quality, human resource, communications, risk, and procurement), the proposed model will identify the maturity level; moreover, the findings of this dimension will pinpoint weaknesses in the organization project management processes for possible improvements.

First, at low maturity, there are no practices or standards. Processes are ad-hoc and lack documentation; in some areas, there is an informal process but used only for large projects (Processes might serve budgeting, scheduling, estimation, reporting, and performance measurements). However, at high maturity, processes that adopt industry best-practices are in place and applied whenever necessary.

Below are the characteristics of project management knowledge areas in both low and high maturity levels.

#### ***3.1.1. Project Integration Management***

Project Integration Management is at the heart of project management and is made up of the day-to-day processes the project manager relies on to ensure all of the parts of the project work together and are properly coordinated. It includes processes like developing project charter, developing preliminary scope statement, developing

project management plan, monitoring and controlling project work, integrating change control and closing the project (PMI 2008).

#### 3.1.1.1. Low Maturity

- There is no project charter that authorizes project's work, assigns project manager and defines high level scope and requirements.
- There is no project plan that details how the project will be executed, controlled and closed. This includes all subsidiary project plans and baselines like change management plan, scope management plan, scope baseline, cost baseline and schedule baseline.
- Project execution is not done by implementing the developed plans; Schedules, Budgets, activity lists are not followed. Moreover, there is not agreed-upon project management software to assist the PM in his work.
- Project work is not monitored and controlled using previously developed baselines. Nothing is done in case of performance strays and deviations from plan or quality standards are normal.
- There is no change control process to review, authorize and implement requested changes on scope, schedule and costs.
- Projects are not formally closed-out from the administrative part and from the contractual part. There is no formal acceptance of the end-product; there is no evaluation of the project success; moreover, lessons-learned are not documented and shared among teams.

#### 3.1.1.2. High Maturity

- Projects are requested using a business case/Statement of work. Afterwards,

projects are authorized, project managers are assigned and high level scope is defined using a formal project charter document. Moreover, a kick-off meeting initiates project work.

- A formal project plan with necessary baselines is developed to execute, monitor and close project work.
- If performance reports show that performance strays from the baseline plan (for example schedule is behind, budget is exceeded, scope deviates or deliverables do not meet specifications), a change request is issued to rectify the situation.
- A formal change control process is in place so all proposed changes can be documented, reviewed, assessed and decided upon.
- At the end of the project, it is formally closed. Sponsors accept the final deliverable and confirm that requirements are met. Resources are released to work on other project. Moreover, project outcome is evaluated and lessons-learned are documented.

### ***3.1.2. Project Scope Management***

Scope Management is one of the most difficult aspects of project management. This knowledge area refers to the work needed to create the end-product and the processes needed to create it. This includes collecting requirements, defining scope, developing a work breakdown structure (WBS), verifying scope and controlling scope (PMI 2008).

#### **3.1.2.1. Low Maturity**

- There is no clear definition of the functions of the system. Moreover, users are not involved during requirements' collection.

- Project scope is not clearly defined based on collected requirements and It is not updated upon change requests. Moreover, work is not broken down into manageable components (WBS) for scheduling and cost estimation.

- There is no agreed-upon process for verifying that scope was met and for accepting the completion of scope by the sponsor. Also, there is no configuration management process to document updated features of the product.

- Much additional work is done without being part of the scope baseline. Many changes are implemented even if they are unnecessary and do not go in-line with project objective. As an example, developers might do extra-work and do not stick to plan. Moreover, project managers do not check variances to rectify scope creep.

#### 3.1.2.2. High Maturity

- Users and other stakeholders use techniques like workshops and prototyping to collect and document requirements and functionality of the end-product. The output includes requirements documentation and requirements traceability matrix. Moreover, users are involved till complete requirements are collected.

- Project charter and requirements documentation are analyzed to produce scope definition. It includes a high level of the work included and the work not included in the project.

- Work is broken down into manageable components (work packages) that cover all the work to be done to complete the project. It is done by decomposing the work into phases or deliverables. The main output is scope baseline with a WBS dictionary that includes all the steps of the SDLC and the project management work

- Scope is verified and accepted by the sponsor to check if it meets initial requirements/scope. This includes inspection and testing of the product before formally

signing a "User Acceptance Form". A mature scope verification process includes configuration management which involves documentation and versioning of product specifications.

- Scope is controlled to diminish scope creep (unplanned work). Unnecessary changes to scope are discouraged; moreover, work performance is analyzed for variances from the plan. In case of differences, change requests are used to rectify the situation. Another aspect of mature scope control is to modify baselines before implementing changes.

- Scope management is done using automated tools like Microsoft project or other collection requirement tools.

### ***3.1.3. Project Time Management***

Project time management involves the processes required to ensure project is complete on time. It includes activity definition and sequencing, resource and duration estimation, and developing a schedule and controlling it (PMI 2008).

#### ***3.1.3.1. Low Maturity***

- There is no definition of activities or tasks that should be performed to complete the project scope and deliverables.

- Tasks are not sequenced in a project schedule network diagram (Example: What task should be done first, what follows it and if task A can only be completed after Task B is complete).

- Activities are not analyzed to estimate required resources and duration required to be completed.

- Activities are not combined in a project schedule baseline which is used



later for monitoring performance. Moreover, Gant charts and milestone lists are not used to define start/end dates of project stages.

- The schedule is not monitored and controlled in case it is behind the agreed-upon baseline. Nothing is done to rectify lateness in terms of change requests, overtime, etc...

### 3.1.3.2. High Maturity

- WBS is decomposed into specific tasks or activities with defined durations, costs, and resource requirements. Those activities are combined into activity list which includes all the work needed to complete the project according to requirements.

- Activities are sequenced and their dependencies and relationships are defined. This includes identifying external dependencies on other projects and sequential or parallel dependencies. Tools like precedence diagramming methods are used to produce project network diagram.

- Activities are analyzed to estimate resource requirements in terms of people and equipment. Resource calendar are matched with activity list entries to estimate required and availability of human resources and needed materials. The output is in the form of an organization breakdown structure and/or activity resource requirement.

- Activities' complexity and resources' availability/skills are used to estimate effort needed to complete the work; moreover, tools like three-point estimates, expertise and reserve analysis (adding buffer) are combined to output activity durations' estimates, which are appended to activity list document. To improve abiding by estimates, team members are involved heavily in this exercise.

- Activities' resource and duration estimates are summarized in a project schedule baseline which is used later for monitoring performance. Moreover, Gant

charts and milestone lists are used to define start/end dates of project stages. To generate project schedule, project manager use shortest path analysis (critical path), resource availability, and even change resource allocations to meet tight deadlines. A contingency reserve is allocated in schedules and used in case of emergencies.

- The schedule is monitored and controlled. In case it is behind the schedule baseline, a change is issued to rectify delays. Project managers apply schedule compression, resource leveling (re-allocations), performance evaluation, variance analysis and earned value management to meet milestones and project deadlines and prevent additional work.
- Moreover, software like Microsoft project is used to draw and follow up on due dates. Moreover, schedules are re-baselined in case of changes.

#### ***3.1.4. Project Cost Management***

As per PMI, project cost management includes everything needed to ensure that project team completes the project according to approved budget. It is crucial for project management because cost overruns are common during projects' execution (Johnson 2006). It includes processes like estimating costs, determining the budget and controlling it.

##### **3.1.4.1. Low Maturity**

- There is no estimation of the costs needed to complete project activities. In some cases the estimation is very basic (analogy) and results in poor and unreliable figures.
- Individual low level cost estimates are not aggregated to generate funding requirements and budget over a time period. Moreover, there is no cost baseline to

monitor performance and allow for stage reviews.

- There is no process to control changes to project cost baseline. In case of budget overruns, nothing is done to rectify the situation, especially that there is no initial cost baseline to monitor project spending. Budget is a "rough order of magnitude" and accuracy is low.

#### 3.1.4.2. High Maturity

- Organization generates definitive estimates of activity costs, in terms of labor and materials costs. Activity durations and resource requirements are used to assign dollar amounts to individual project activities. Multiple ways are used to generate accurate figures including parametric, bottom-up and analyzing vendor bids.

- Schedule baseline, scope baseline and resource calendars are used to aggregate individual costs (bottom-up) to generate cost baseline and milestones funding requirements. This budget includes reserves in case of emergencies and unknown risks.

- Costs are controlled to avoid cost overruns. Cost performance is monitored by comparing actual costs to planned budget. Performance meetings are used to analyze work performance reports and rectify over-budget situations. Here again, the change control system is responsible for controlling costs and updating baseline.

- Tools like "Earned Value Management" and MS Project are used to calculate variances based on initial cost estimates.

#### ***3.1.5. Project Quality Management***

Project Quality management includes processes and activities so project satisfies needs of all stakeholders (especially the sponsor/customer) and project's result conform to requirements. It includes processes like quality planning, quality assurance

and quality control with continuous improvement activities (PMI 2008).

#### 3.1.5.1. Low Maturity

- Quality is not planned. Project work is not integrated with organization quality standards; moreover, quality metrics (ex: web-application response time) and quality checklists are not defined. This includes product, project and process quality standards.

- Management is not involved to make sure that quality standards are applied in terms of software development process, project management process and continuous improvement. Moreover, best-practices and quality audits are not applied to ensure meeting quality standards.

- No quality control takes place to validate deliverables. Moreover, no testing takes place to verify that implied and un-implied requirements are met.

#### 3.1.5.2. High Maturity

- Quality is planned and is integrated in the design. Project work is directly integrated with organization quality standards and it conforms to quality assurance department procedures; moreover, to prevent defects and satisfy needs, quality metrics and quality checklists are defined at the beginning of the project and not as a response to bad quality (Prevention over inspection). System functionality, features, performance, reliability, maintainability are all discussed with customers and integrated in project scope.

- Scheduled or random quality audits are performed to assure that organizational processes (Project and product) are being applied to meet quality standards and metrics; this includes SDLC, project management, and change

management processes. Moreover, in order to achieve better quality of end-results, quality assurance departments apply improvements to the process by adopting industry best-practices and feedback from Quality Control (QC).

- Quality is controlled by inspecting the product before it is released to the customer. It is done to verify conformance to quality standards and requirements specifications. In IT environments, QC includes verification and validation. Verification is part of SDLC and it is done before delivery using peer-to-peer technical reviews to check code quality, documentation, etc... Business reviews are applied to check if functional requirements have been implemented as per customer needs. Moreover, validation is part of the project lifecycle and takes place after IT system has been developed. Usually it is in the form of unit, system and acceptance testing to make sure that scope is covered and that full requirements have been met. Results of those activities can be acceptance, rework and/or recommendation for improving the process.

- A proper configuration management database is in place; it includes the identified characteristics of the end-product and its versions. Moreover, it is regularly updated by configuration management specialists in case of any change applied.

### ***3.1.6. Project Human Resource Management***

Project Human Resource management deals with all the processes needed to make the most of people involved in the project work (from customer to team members). It includes developing the human resources plan, acquiring and developing team members, and managing and leading team member's performance (PMI 2008).

#### ***3.1.6.1. Low Maturity***

- HR Planning is not done during the project planning stage. Roles,

responsibilities, and reporting relationships are not documented. Skills needed and Training requirements are not identified; moreover, rewarding system (overtimes) and staffing decisions are not set according to specific time frames.

- There is no formal strategy for Acquiring team members. Resource pool is not used to check availability, skills and capabilities (job description). No negotiations with other teams take place in case they have the resource needed (cross-teams). In case of lack of a certain skill, outsourcing is not an option. Moreover, since there is no formal acquiring process, there is not a formal staff assignment and resource calendar updates.

- There are minor individual trainings, team-building and social activities to improve team performance. This includes interpersonal skills and technical skills. Moreover, team and individuals performance is not properly assessed and therefore not rewarded fairly.

- Project Manager does not motivate and manage team members. This is done mostly by functional managers. Moreover, PM does not perform performance appraisals neither have conversations with team members (regular meetings) to feedback about weak/strong performance. Conflicts among team members are ignored; issues faced are not logged and prioritized according to schedule needs. Moreover, team members are de-motivated because they are over-allocated, their accomplishments are not fairly rewarded or other team members are under-utilized. Last, project manager influences using coercive power and penalties.

#### 3.1.6.2. High Maturity

- Human resources are planned. Roles, responsibilities, and reporting relationships are identified and documented using a format like responsibility

assignment matrix (RAM or RACI) that link work items to responsible organization units (people or teams). Skills needed, training requirements and rewarding system are identified and included in the schedule and budget; moreover, staffing and skills requirements are identified according to specific time intervals.

- There is a formal strategy for acquiring team members and it includes internal resource pool that shows availability and capabilities. This kind of information is available in resource calendars that are constantly updated. Moreover, cases when consultants are needed are also identified. Inter-department negotiations take place to acquire resource needed (cross-teams). Subsequently, project documents are updated according to assignments and resource calendar are updated to reflect that.

- To improve performance and capabilities of the team, individual trainings and team-building activities take place. This includes interpersonal skills and technical skills according to tasks assigned; moreover, team-building activities are performed to improve collaboration among team members. Team is selected after identifying personality preferences and social styles to mix employees that are compatible together. A fair rewarding system is in place to help reward performance according to effort.

- Especially in matrix or project driven organizations, project managers are empowered enough to motivate and manage team members. They manage by observing, conducting conversations, building relations with team-members, evaluating their performance and giving them feedback. They play a leadership role in conflict management among team members and assign responsible resources to follow up on tasks and issue items (responsibility assignment matrix); regular meetings are held to improve teamwork. Moreover, motivation is achieved by rewarding accomplishments/expertise and by holding people accountable for their weak performance.

### ***3.1.7. Project Communication Management***

Project Communication Management includes all processes that deal with generation, collection, distribution and disposition of information in a timely manner and to the right people. It includes identifying the main stakeholders, planning and distributing communication, managing expectations and reporting performance (PMI 2008).

#### ***3.1.7.1. Low Maturity***

- Project managers do not spend the time to identify people involved in the project. Moreover, there is no strategy to manage stakeholders to improve their positive impact on projects' success.

- No formal planning for communication takes place; moreover, no standards defined how, when and to whom to distribute information.

- The organization infrastructure does not support information distribution. Stakeholders do not receive regular performance reports neither meeting minutes. Necessary technology (email, intranet, meeting rooms) is not in place to facilitate distribution; moreover, meetings are haphazard and not managed effectively.

- Project managers are not proactive with issue and conflict management. There is no formal issue documentation and ranking so they can be tackled according to their impact. Moreover, there are no rules for conflict resolution and escalation to higher levels.

- Project data is not collected from team members and there is no formal method to calculate variances in schedule, scope, budget and quality performance. In some other cases, scope, schedule, resources or costs are not estimated during the planning phase; therefore, even if data is collected for progress reporting, there is no



way to compare actual performance to plan to evaluate project status. In addition, project status and review meetings are not held to rectify variances in actual performance. In addition, reactions to cost/schedule overruns are minor which motivates people to take their time and spend more.

- There are no standard templates to develop project documents. Every team member develops documentation subjectively. Moreover, those are not kept up-to-date using collaboration tools with proper access rights according stakeholders' needs.

#### 3.1.7.2. High Maturity

- All people impacted by project are identified and documented. This includes business people, information technology department, sponsors, senior management, and even suppliers. Their interest, level of influence and corresponding management strategy is analyzed in a stakeholder register.

- Communication is planned since the project initiation phase. Stakeholder communication requirements, format, technology and method used (email, hard-copy, or meeting) and frequencies of communication are agreed-upon at startup (Example: progress meetings and its attendees are scheduled every other week to discuss status reports). Usually, this is done by analysis of project organization breakdown structure and by following organization standards.

- After planning communication needs, information like performance reports, meeting minutes, presentations and other notifications are distributed to corresponding stakeholders. Necessary technology is in place to facilitate distribution; Effective meetings with agenda items are held regularly. Other technology includes emails, cell-phones, meeting rooms, network-sharing and document management systems with proper access rights; Last, project managers deal with all communication channels and

team members are encouraged to communicate no matter how positive or negative is the information.

- Stakeholders' expectations and success criteria are managed according to their priorities and as analyzed during planning phase. Issues are logged, tackled and resolved according to their impact; in case of new requirements, changes are issued and logged to meet stakeholder's expectations. Moreover, conflict resolution norms are set before escalation to higher levels.

- Performance reports like status and progress reports are developed periodically and discussed in regular meetings to motivate employees, make them accountable for their tasks and solve issues and conflicts. Data is regularly collected from team members. Tools like earned value management are used to evaluate variances in schedule, scope, budget and quality performance; moreover, in case of discrepancies between planned and actual performance, change requests are issued to rectify situation.

- Templates are used to develop project documents. Moreover, project documentation, like Gantt charts, meeting minutes, requirements, change requests and status reports, are made accessible and kept up-to-date using a website, wiki, or document management software with proper access rights.

### ***3.1.8. Project Risk Management***

Project risk management is the process responsible for identifying, analyzing and responding to risks throughout the project lifecycle. It involves identifying potential risks, analyzing their probabilities and their impacts, planning responses to reduce their negative impact and monitoring identified risks to counter their effects (PMI 2008).

#### 3.1.8.1. Low Maturity

- Organizations do not have a formal process for project risk identification during the planning phase. Risks are identified after their occurrence rather than before. Therefore, there are no contingency reserves in case of delayed schedules or budget overruns.

- In some other cases some risks are identified using informal methods; however, those risks are not documented neither analyzed. Responses are not developed so risks are tackled on ad-hoc basis like fire-fighting.

- Progress meetings do not address potential risks in the horizon; in addition, if some risks are identified; they are not monitored neither updated.

#### 3.1.8.2. High Maturity

- Organization identifies different types of risks including categories like technology, people, organization, project management, process, market, and legal. To identify risks, project managers use questionnaires, interviews, analysis of assumptions, lessons-learned from older projects (Database of risks) and WBS walkthroughs; usually, a checklist covering all potential risk areas is used during the planning phase.

- Identified risks are documented and ranked according to their impact and probability of occurrence. Moreover, high impact risks are mitigated using risk response strategies which reduce their negative effect. Moreover, whenever it is feasible, risk is outsourced or avoided.

- Risks are regularly visited and analyzed in progress meetings so that risk response strategy is implemented in case of need. Moreover, risks are added, removed or prioritized throughout the project lifecycle.

- Contingency reserves are held by organization to reduce the risks related to

schedule or costs overruns.

### ***3.1.9. Project Procurement Management***

Project procurement management is the process responsible for acquiring goods and services (materials and human resources) for a project from outside the organization. It includes planning procurements, conducting procurement activities, contract negotiation, administration and closure (PMI 2008).

#### **3.1.9.1. Low Maturity**

- There is no formal procurement process with predefined steps and templates; moreover, Make-or-Buy decisions are not based on market analysis and expert judgments and evaluation of options.
- Solution providers are evaluated based more on intuition/politics and less on selection criteria and pre-defined metrics, without any scoring of proposals; moreover, there aren't long term relationships (partnerships) to improve quality of deliverables.
- Contracts are not regularly monitored to prevent schedule and budget slippage due to weak communication. Moreover, there is not a formal process to implement change requests.
- On contract closure, deliverables are not formally inspected to see if they meet the contract specifications. Moreover, contract is not evaluated to learn from its mistakes and procurement documentation is not stored, which makes finding archives a complicated task.

#### **3.1.9.2. High Maturity**

- Scope baseline and other project documents are analyzed to decide whether

to perform activities internally or outsource. Quantitative and qualitative analysis methods like SWOT analysis techniques are used to decide whether to develop in-house or to buy solutions.

- In high maturity organizations, procurement follows a formal process and uses specific templates like statement of work (SOW) and request for proposals (RFP).

- There are source selection criteria and procurement metrics to evaluate proposals and decide objectively to whom to give the contract. The seller who scores the highest in the evaluation process would be selected and granted the contract; moreover, organization has a long term relationship with certain suppliers, leading to better quality and consistency.

- Contracts used are for the best of the organization in terms of quality and costs. Usually fixed prices or time and material are chosen in a mature IT department.

- Contracts are administered by regularly monitoring performance of the supplier and doing corrective actions whenever needed. Scope, schedule and time factors are monitored and change requests are issued. Moreover, those changes are evaluated by using a contract change control procedure.

- On contract closure, deliverables are inspected and audited to see if they meet the contract specifications. The supplier is evaluated and lessons-learned are documented for future use; moreover, procurement documentation are stored in record management database.

### **3.2. Organizational Infrastructure Maturity**

As mentioned before, organization structure and support is essential for project success. For this reason, this second dimension of the SIT-MM model tackles the maturity of those aspects. It evaluates organizations' process assets like policies,

procedures, guidelines, project management and product development methodologies, quality assurance procedures, multi-projects management and prioritization, and change and configuration management. Moreover, this dimension also includes the existence of defined roles and responsibilities, support of senior management, availability of a centralized entity dedicated to project management, assessment of formality and standardization processes, awareness, training and control of PM process, and collection of PM data for continuous improvement of process.

Based on the 3 most recognized maturity models (Kerzner's maturity model, PM Solution's Project Management Maturity Model, and Barkeley's Project Management Process Maturity model), a new consolidated three-level model is developed to cover "organization infrastructure and support" maturity levels.

The characteristics of the three maturity levels are illustrated in the table below:

Table 1. The characteristics of the three maturity levels

Low Maturity Ad-hoc	Moderate Maturity Managed	High Maturity Optimized
<ul style="list-style-type: none"> <li>• No Common Language</li> <li>• Little or no Senior Management support</li> <li>• Informal Planning and Control</li> <li>• Ad-hoc and informal project management processes</li> <li>• No training for Project Managers</li> <li>• Dependency on Individual and not on process</li> <li>• Project data is not collected</li> </ul>	<ul style="list-style-type: none"> <li>• Senior management support</li> <li>• Defined and standardized project management processes and Templates</li> <li>• Formal Change Management Process</li> <li>• Defined and standardized System Development lifecycle</li> <li>• Formal Planning and Control</li> <li>• training programs for Project Managers</li> <li>• Organization support to PM methodology</li> <li>• Data is collected to monitor performance</li> <li>• Use of Project Management Application and Document Management</li> </ul>	<ul style="list-style-type: none"> <li>• Full management support</li> <li>• Multiple projects are managed together</li> <li>• Project office for tracking progress, defining and enforcing methodology</li> <li>• Continuous improvement of process through lessons-learned</li> <li>• Project driven organization with resource pooling</li> <li>• Formal Configuration management procedure</li> </ul>

# CHAPTER 4

## METHODOLOGY

### 4.1. Research Design

This case study project is based on the explanatory, qualitative and interpretive approach which consists of interviews done with Bank staff involved in IT projects and personal observations of documentation. It is a detailed study that adopts a practical approach to discover "what is the current state of project management in the information technology division?" Moreover, the newly developed SIT-MM maturity model is to be applied for this purpose. The following steps summarize this paper's approach:

- Develop a simple project management maturity model that is up-to-date and that is more specific to information technology projects (Already covered).
- Develop interview questions that fully cover the organization processes maturity and the organization infrastructure maturity dimensions of the SIT-MM model.
- Setup a protocol for analyzing interview results and mapping the answers to specific maturity levels.
- Conduct interviews with key persons in the information technology department and who have different roles in undergoing projects.
- Analyze the answers of the interviews to identify the level of maturity of project management processes and also the organization infrastructure as a whole. Moreover, the findings will be elaborated in a dedicated "findings" section.
- Afterwards, According to the findings, a set of recommendations will be presented in the discussion section.

## **4.2. Data Collection Technique**

The data collection techniques that Benbasat *et al.* (1987) described in the article —The Case Research Strategy in Studies of Information Systems is a fundamental source for this MBA project. In particular, the researcher focuses on the analysis of different undergoing IT projects, observes their activities from initiation till completion, and simultaneously interprets various interviewees' perspectives.

## **4.3. Sources of Information**

### ***4.3.1. Site Description***

Headquartered in Beirut, BankWIN is one of the top five banks in Lebanon. Originally established in 1944, its market share has grown over the years to be around 10% of the total of the Lebanese banking system today. It has 51 branches that cover all Lebanon and offer a wide range of novel products and quality services to both individuals and corporations. Moreover, BankWIN has a regional presence by advisory banking in Switzerland, commercial banking in Turkey and investment banking in Saudi Arabia and the Middle East. By the end of 2009, has a client-portfolio currently exceeding 130,000 customers. The corporate clients list boasts the top names across industries and services in Lebanon.

Nonetheless, the bank is in continuous state of re-invention to meet the needs of a changing world. Moreover, the key decision makers believe that they should invest in innovation and technology so that they could meet the needs of a demanding, global and mobile client base. Therefore, BankWIN continuously adopts the latest in banking technology and invests in human resources training and development.

The strategy of BankWIN is mainly enabled by a dynamic and hard-working Information Technology division. As per the business strategy priorities, this division is



like a bee community that is constantly delivering new IT solutions which are helping the business to grow and stay on top. Moreover, this approach is keeping BankWIN a pioneer in adopting new banking technologies and making its customers always the first to use new mobile technologies that facilitate their banking transactions.

As for the Information Technology division, it is comprised of about 75 employees who are headed by the Information technology division head. The IT head directly reports directly to the board. Under him, there are mainly three departments which are the application, networking and systems. Moreover, several sub-departments also exist under each department and their work is more specific like Cards and ATMs, Core Banking, E-banking, Windows and Linux, etc.... Those departments are headed by department heads or functional managers.

Consequently, the number of projects that are being requested from the IT division is growing exponentially. Due to this huge number of projects (managed concurrently), most IT solutions are not finished on time, budgets are exceeded, resources are always lacking and business owners are not always satisfied.

An initial look at the IT division shows that its structure is not ready to accommodate this amount of projects; this might be due to the fact that its infrastructure is not supportive and its project management practices are not mature enough when benchmarked to industry best-practices.

#### ***4.3.2. SIT-MM Interview***

In order to identify the maturity of processes and the organization support for project management in the IT department, SIT-MM maturity model is to be applied. The best way to apply the model is to sit with IT stakeholders and ask them how projects are currently being managed. For that reason, a set of questions, which are

directly related to the processes, methodology and organization support towards project management, were developed and grouped in SIT-MM interview questions (Table 6, Appendix A1). The reason behind choosing the interview approach over surveys is to have a chance to discuss open ended questions in person and to explain some key terminologies that might sound ambiguous, especially in immature project management environments.

The scope of those questions covers both dimensions of SIT-MM maturity model; therefore, the first 36 questions will be used to identify the maturity of the project management methodology and processes like integration, scope, time, cost, human resources, risk, communication, quality and procurement. In addition, the last section of the interview will be used to measure the degree of organization's support to project management. It includes topics to discover areas like standardization and commitment towards a project management methodology, knowledge and training of project managers and the use of agreed-upon PM software to manage projects.

#### ***4.3.3. Conducting the Interviews***

As mentioned before, BankWIN's IT department plays a major role in transforming the Bank's strategy into reality; it is always coping with all business departments to implement their business drivers. For this reason, the primary source of information for the case study on hand consists of interviews done with stakeholders involved throughout the development and implementation of IT solutions.

The case study spans over a period of 3 months starting beginning of year 2012; however, the IT projects were initiated before that date. As a staff in the IT department of the bank, my direct and indirect experience in these projects has provided an additional source of information that is considered valuable in the interpretation of

the data.

Different questions were asked to different persons according to their role and experience in managing projects; the main questions were asked to the two biggest IT project managers who are responsible of most projects in the IT departments (also called program managers); moreover, interviews were performed with other project's team members like developers, network administrators, business analysts and IT secretary. To investigate the written policies and procedures that are related to project management, some specific questions were asked to IT audits who are responsible of developing and controlling IT procedures.

An email with almost identical content was sent to all interviewees with a small introduction about my MBA project topic and the interview purpose. Moreover, the corresponding set of questions to be asked was also attached in the email; this made the interviews easier and straightforward because interviewees had time for reflection. Emailed persons replied with their convenient time to meet and conduct the interviews.

The questions sent in emails formed the structure of the interview; however, the discussion was open to other questions that I saw fit depending on the flow of ideas of the interviewees. The number of interviews done was 9, and the duration of each interview ranged between 30 to 90 minutes.

#### **4.4. Protocol for Analyzing Results**

The interview questions of the SIT-MM model cover the two dimensions of the model (process maturity and organization infrastructure); however, results will be analyzed separately.

#### ***4.4.1. Process Maturity Dimension***

For the process maturity dimension of the model, the answers of the first 35 questions will be summarized and analyzed for each knowledge area (Integration, scope, time, cost, human resources, quality, communication, risk and procurement). Afterwards, key information will be extracted from the results in order to quantify the findings.

For this quantification purpose, the results of the article "The perceived value and potential contribution of project management practices" will be used. In this article, the author (Brian Hobbs) uses a survey questionnaire with the most widely used tools and techniques as defined in the PMBOK. The survey was distributed to about 500 project practitioners working in the information technology domain. The results identify the most used practices and the ones with the greatest impact on projects' performance; moreover, a combined "intrinsic value" is also calculated to give a single score per tool/technique.

As the SIT-MM model is also based on the PMBOK tools and techniques, the article's intrinsic value is used to give weights (low = 1, medium =2 or high = 3) to each tool/technique practiced in each knowledge area (tools and Techniques weights in Appendix 1, Table A3); moreover, the results of the interviews will be analyzed to check if the above mentioned tools and techniques are being used, partially used or not used at all (0, 0.5 or 1). Afterwards, the maturity of each knowledge area will be calculated by multiplying the use of the tool/technique by its corresponding weight.

The findings scores will be discussed in the discussion section of this paper and will be used to set priorities for improvements as per the maturity status of each knowledge area.

#### ***4.4.2. Organization Infrastructure Maturity Dimension***

For the organization infrastructure dimension of the model, the interview answers will be combined with collected documentation related to current project management methodology practiced in BankWIN. Afterwards, the results will be analyzed to identify the current state of the organization infrastructure maturity (Ad-hoc, managed or optimized). Moreover, the IT department's can be in different maturity status for different infrastructure areas. For example, IT department can score High maturity in change management process but moderate maturity in PM methodology.

Afterwards, in the discussion section, the best-fit level of maturity will be discussed and priorities/recommendations for improvements will suggested.

## CHAPTER 5

### FINDINGS

#### **5.1. Processes Maturity**

##### ***5.1.1. Project Integration Management***

###### **5.1.1.1. Project Charter**

In some minor cases, the projects are selected and evaluated according to a business case provided by the business owners. Those business cases usually include the business need and its alignment with BankWIN strategy, high level requirements, and preliminary completion date and budget. However, those documents are rarely used and most of the times incomplete. Therefore, projects are directly started without feasibility studies and based on executives' subjective opinion (or what they think is a good opportunity to take at a specific moment).

In addition, there is not a project charter that defines objectives, summary schedule and budget, success criteria or even officially assigns a project manager; there is not a kick-off meeting to officially start projects and communicate project charters information; projects are started by simply being an item on the agenda of weekly meetings and project coordinators are assigned without empowerment to perform all their project management activities.

At very rare occasions, and in case of very large budget projects, some formal project manager assignment with kick-off meeting takes place.

###### **5.1.1.2. Project Plan**

At occasional cases and especially in projects that are considered as high

priority to management, some high level project plan is developed with summary budget and deliverables; however, during the project execution, many things are changed and the plans are never respected, never updated nor used as a baseline to track progress.

In the majority of cases, there is not any standards followed during the planning phase; therefore, most projects go directly from the business request to execution phase; moreover, deadlines are always very tight so PMs think it is a waste of time to plan and nobody controls if they do not.

#### 5.1.1.3. Managing Execution

As there is not really a sophisticated planning phase, projects are managed and executed as per the PM IT expertise and level of experience in project management; baseline plans are not followed nor executed; moreover, communication and procurement needs are satisfied on ad-hoc basis.

In addition to that, the culture does not promote planning and executing according to plans, especially that progress is not tracked according to baseline plans; therefore, only few project managers use their plans as a reference to execute and manage the work.

#### 5.1.1.4. Monitoring and Controlling Work

During the execution phase, no data is collected from team members to generate progress reports and compare actual to planned performance; team members can easily waste time on tasks and extra dollars to perform their tasks because there is not a baseline that is approved and should be followed; therefore, PMs and management are not alerted for delays or discrepancies until it's too late; moreover, change requests are not issued to bring actual performance to plans.

In case the project deadline is getting close, a red flag is raised during the weekly meeting; in this case, team members work extra-time and suppliers are billed for extra non-planned work to finish on time; however, all this work is not part of the initial scope of the project.

In addition, many changes are implemented during the execution phase without being formally issued and approved; however, in some cases with huge impact on time/scope/budget, change requests are issued before implementation.

#### 5.1.1.5. Change Control

The first problem with change at BankWIN's IT is that many changes are implemented in the final deliverables without following the "formal" change management process. Changes to requirements are sent via emails and implemented directly by developers; this leads to scope creep, budget overruns and delays in project delivery. Moreover, project documents are not up-to-date all the time.

The change management process currently in place is more theoretical and cumbersome which makes it hard to apply; this led each project manager to develop his own templates and process for managing changes.

Change process lacks best-practices like impact analysis, change control board approvals, rollback procedures and other important steps to update plans after change has been implemented.

#### 5.1.1.6. Closing Projects

At the end of each project, a formal acceptance and delivery takes place with the business owner. However, formal project documents are not collected neither saved in a dedicated database. Moreover, project managers do not do the effort to write lessons-learned documentation so other projects can be planned and executed more efficiently.



Table 2. Integration Management Scoring Table

Process Group	Process Group Weight	Tool/Technique	Weight	Score	Weight * Score
<b>Integration Management</b>	22	Statement Of Work/business case	2	0	0
		Project Charter w/ formal PM and scope	2	0.5	1
		Kick-off meeting	3	0.5	1.5
		Baseline Planning	2	0	0
		Use of PM software to plan, manage and control projects	2	0	0
		Progress Report	3	0	0
		Collection of Lessons learned	3	0	0
		Change Management Process	3	0.5	1.5
		Database for historical data (time/cost/lessons learned)	2	0	0

Integration Management maturity score = 4/22

Integration Management maturity weight = 22

### **5.1.2. Scope Management**

#### **5.1.2.1. Collection of Requirements**

Collection requirements in the ITD is usually improvised and achieved on ad-hoc basis. When team members are assigned the task of defining requirements, everyone might have different ways how to accomplish it. Some might meet with the business and get their feedback; others might decide to do a prototype and send it for approval; moreover, even though there is a template for requirement documentation, it is partially used and leads to high level requirements and consequently bad quality.

In addition to that, some key stakeholders are ignored during this phase. Sometimes ITD meets with intermediary business analysts in the absence of the end user; some other times, they do not collect security requirements which lead to misunderstandings and sometimes rework.

#### 5.1.2.2. Scope Statement and WBS

After the requirements are collected, it is rarely turned into scope statement that is approved by management and distributed to key stakeholders involved in the project. As an example, a project for installing antivirus in head-offices might take forever because it is not clear in scope statement to cover only head-office PCs; therefore, the project is huge and takes double the time because the assigned resource mistakenly covered all bank's branches part of the first phase of the project.

However, project managers usually know what is included in their project work and what is not (in terms of deliverables); however, it is not formally written, updated neither communicated; this leads sometimes to false expectations.

As for breaking down the scope into manageable components (work breakdown structure), this is rarely done using Microsoft project; only few project managers do the effort to develop a WBS before starting the actual execution and when they do it, they do not follow a methodology or involve their team members; other managers have the major deliverables of the project saved on their email and it does not include all the work to be done to complete the project.

#### 5.1.2.3. Scope Control

Due to incomplete requirements and informal and undocumented scope, it is very hard to control scope within ITD projects; sometimes, business analysts send additional requirements via email and they are implemented by developers without being assessed for costs and time needed; this kind of work is executed without being part of the change management process which filters unnecessary changes.

Scope creep is very common in this kind of environments; this leads to projects with delays and budget overruns because scope is not controlled.

#### 5.1.2.4. Scope Verification

After the work is done; the end product is usually sent for testing and acceptance by the business users. A formal user acceptance form (UAF) is signed by the business head to confirm that the deliverable fulfills all requirements and works as expected.

However, sometimes, deliverable is accepted and moved from testing to production environment; afterwards, operations discover unexpected behavior which was not tested before signing the UAF form; this is due to incomplete quality control process.

Table 3. Scope Management Scoring Table

Process Group	Process Group Weight	Tool/Technique	Weight	Score	Weight * Score
<b>Scope Management</b>	19	Requirements Analysis	3	0.5	1.5
		Requirements documentation	3	0.5	1.5
		Scope statement/Baseline	3	0	0
		Work Breakdown Structure	3	0.5	1.5
		Re-baseline of scope	2	0	0
		User Acceptance	3	1	3
		Use of PM software to manage scope	2	0.5	1

Scope Management maturity score = 8.5 / 19

Scope Management maturity weight = 19

### **5.1.3. Time Management**

#### 5.1.3.1. Activity Definition

When defining activities to produce the major deliverables of the project, many

times the level of details does not involve defining an activity list that will eventually lead to delivery. However, most project managers develop some key milestones with deadlines; as an example, the design phase of project A is due in June and the development phase is due in August. In such cases, it all depends on the resource allocated in order to decide his way in meeting the deadlines without any guidance on how to do that. This strategy worked for experienced team members but was a big failure for other junior members.

In some other cases, it was found out that the activity list is developed by project managers without enough technical background and without collaborating with necessary stakeholders; this led to unrealistic activity definition, a lot of misunderstandings and no-commitment from the executors of the task.

#### 5.1.3.2. Resource Allocation

In case the activities have been formally defined (most cases, only milestones and deliverables are defined), project managers have a hard time allocating resources during a specific time to perform the work. This is because every single resource is working on multiple projects at the same time; moreover, the priorities of those project (as per management) fluctuates at any time and especially when new projects suddenly popup.

Availability of resources at any given time is not recorded anywhere (resource calendar). Suddenly a resource might have to drop his project work to support a system on the live environment or solve an urgent incident or change request with high priority. Moreover, resources' skills are not recorded in an activity pool. This is acceptable in an environment where there are no cross-teams and it is enough for functional managers to know their resources' capabilities.

In short, there is chaos in resource allocation that makes it very hard to allocate resources to activities at the planning stage; therefore, most of the times the resource is allocated when the activity is due; however, many times he might be busy and this causes delays.

#### 5.1.3.3. Activity Duration

Since developing formal activity lists is not common and since resource calendars do not exist, it is very hard to estimate activity durations in BankWIN's IT; it is even harder to stick to duration estimates in an environment where resources are not dedicated to projects. Moreover, whenever tasks involve members from other teams and external suppliers, durations' estimates are most of the times inaccurate (especially when those durations are estimated by division heads/functional managers and enforced on team members).

However, some skilled project managers, involve the developers in estimating tasks durations and add some contingency reserve to deliver quality. This leads to more commitment.

#### 5.1.3.4. Developing a Schedule

Only few experienced project managers use Microsoft project to produce a project schedule with a defined milestone list; this leads to a Gant-chart with tasks being sequenced, analyzed and optimized using methods like critical path, parallel path and contingency reserve in case of unexpected events.

However, as mentioned earlier this is not the norm. The business is always in a hurry so they put unrealistic schedules without taking into consideration resource availability and the over-allocation of resources.

Most of the times, those schedules (if developed) are theoretical without much details; therefore, team members accomplish the work as they see suitable without referring the tasks defined the schedule baseline.

#### 5.1.3.5. Controlling Schedule

In major projects with high commitment from executive management, key milestones and deadlines are usually met by working overtime and contracting with external consultants.

However, due to inefficiency caused by multi-tasking on different projects (with fluctuating priorities) and working on live incidents, team members do not usually respect the schedule baseline and work as per circumstances. The situation becomes much harder in case the schedule is dependent on external suppliers who do not commit to deadlines. In addition to that, in case of changes to time or scope, the schedule baseline is dropped and rarely updated (Change management process is rarely used to control and update schedules).

To monitor projects' performance, weekly meetings are held to evaluate team's performance and try to solve any pending issues; however, the meetings are not based on the planned schedule baseline to check if the plan is being applied and task durations are respected; moreover, project managers do not have to submit progress reports on regular basis.

Table 4. Time Management Scoring Table

Process Group	Process Group Weight	Tool/Technique	Weight	Score	Weight * Score
Time Management	30	Activity List	3	0.5	1.5
		Schedule Planning w/ resource calendars and time estimation	3	0.5	1.5
		Activity Resource Requirement	2	0.5	1
		Contingency Reserve	3	0.5	1.5
		Critical Path Method	1	0	0
		Gant Charts	3	0.5	1.5
		Schedule Baseline	3	0.5	1.5
		PM Software for task scheduling	3	0.5	1.5
		Use of earned value (or equivalent)	2	0	0
		Re-baseline of schedule Baseline	2	0	0
		PM Software for monitoring schedule	3	0	0
		PM Software for resource leveling/schedule compression	2	0	0

Time Management maturity score = 10 / 30

Time Management maturity weight = 30

#### 5.1.4. Cost Management

##### 5.1.4.1. Cost Estimation and Budgeting

Project managers in the ITD department do not deal with costing/budgeting planning and control. First, if the higher management sees the project as a priority, a rough estimation of the budget needed is included in the ITD yearly budget. During the planning phase, project managers evaluate proposals from many suppliers and award contracts as per the budget defined in the global ITD budget. In case the costs exceed the budget, it needs board approval.

This estimation of the budget is based on the cost of the hardware, software (licenses) and external consultation to implement IT solution. Moreover, the cost of internal resources that work on the project is not taken into consideration at all.

During the planning phase, tasks are not linked to cost estimates; moreover, costs are not aggregated (bottom-up) to generate milestone funding requirements.

#### 5.1.4.2. Controlling Budget

To control budget, the secretary uses accounting codes that map to project names. Every time the supplier payment is due; it is paid after making sure acceptance criteria is met. This practice is introduced lately after many budget overruns occurred.

In some other projects, project managers keep spending money until full budget is depleted. Afterwards, they ask for additional budget and give explanation for their extra spending. This case happens a lot, especially in case of compliance projects which are mandatory for business continuity.

Table 5. Cost Management Scoring Table

Process Group	Process Group Weight	Tool/Technique	Weight	Score	Weight * Score
<b>Cost Management</b>	<b>11</b>	Top-down estimation of costs	1	0.5	0.5
		Bottom-up estimation of costs	2	0	0
		Baseline budget	3	0.5	1.5
		Use of earned value (or equivalent)	2	0	0
		PM Software for monitoring and controlling costs	3	0	0

Integration Management maturity score = 2 / 11

Integration Management maturity weight = 11

#### **5.1.5. Human Resource Management**

##### 5.1.5.1. Developing HR Plan

In case the project is in the hands of an experienced project manager who breaks down the work into detailed activity list, he develops an informal HR plan where



he maps activities to resources that will perform them.

However, that mapping occurs rarely and it is done on the IT section level and not on the resource level; moreover, as the planning phase is not formal, IT sections know as the project go that some task needs to be performed at their side. Here a problem arises: IT section resources are busy performing other tasks and delays occur.

#### 5.1.5.2. Acquiring Staff

Project team members are acquired usually from the internal resource pool (whenever the required skills are available); however, in case the expertise is missing or over-allocated, the work is outsourced to a trusted third-party. In some other cases, internal resources are trained to get the necessary skills to perform the work.

The problem that occurs at the staffing stage is that project managers always give too much attention on producing schedules with tight deadlines; however, they miss on checking the availability of the resources responsible of performing the tasks (resource calendars are not used). This leads to over-allocations and eventually delays in deliverables.

As the management says: "All employees in the IT department are over-allocated. Once they say they can't take it anymore, we stop giving them tasks". Too much multi-tasking seems to be un-efficient.

#### 5.1.5.3. Developing Team Members

Individual training is scheduled on a yearly basis for team members. It is done according to skills gap, to career path of the resources and to the recommendation of the functional manager. In some cases, readings and research is done while performing the task; however, this self-training is not part of the project schedule.

Some individuals are motivated enough to self-improve themselves with technical trainings; however, in some cases, those trainings are not taken into account by the rewarding system. This leads to de-motivation.

The problem mainly resides in the team-building activities that can ameliorate teamwork (which is essential in IT projects). This kind of training does not take place in the IT, leading to team conflicts and sometimes resignations.

#### 5.1.5.4. Managing Team Members

IT department in BankWIN is more functional than projectized structure. This means that functional managers have much more power on the team members than the project managers. This leads to un-efficient project management because project managers lack the power needed to mentor team members and help them perform their work. Moreover, they can't have team members' dedication to project's tasks.

As for rewarding, in many cases, project managers do not have feedback on team member's performance and therefore, they can't influence their yearly appraisal; therefore, team members do not feel the urgency to meet deadlines; therefore, they prefer to perform tasks assigned by their functional manager.

In case of issues faced by team members, they raise them during weekly meetings and try to find a solution according to issue urgency; however, issues lack ownership and therefore take time to be solved.

Table 6. Human Resource Management Scoring Table

Process Group	Process Group Weight	Tool/Technique	Weight	Score	Weight * Score
<b>Human Resource Management</b>	<b>13</b>	Resource Planning w/ Resource Assignment Matrix	2	0.5	1
		Resource Scheduling w/ Resource Calendar	3	0	0
		Training	2	1	2
		Team-building Activities	2	0	0
		Project Manager empowered to manage/reward team	2	0.5	1
		Issue Management and follow-up	2	0.5	1

Human Resource Management maturity score = 5 / 13

Human Resource Management maturity weight = 13

### ***5.1.6. Quality Management***

#### ***5.1.6.1. Planning Quality***

Some of the quality standards are part of the requirements documentation; moreover, coding standards and quality guidelines are also available as per IT policies and procedures. However, due to tight schedules and overlapping projects, quality standards are mostly overlooked and left for inspection phase (inspection over prevention).

#### ***5.1.6.2. Quality Assurance***

A lot of times, IT policies and procedure team develop best-practices and procedures as mandated by legal or external entities (like VISA and BDL). However, most of the times, those procedures are not used due to the lack of awareness and control (regular audits).

Moreover, there is not a formal quality assurance department that makes sure the right IT methodology (project management and software lifecycle) and

documentation is being applied by the project manager and his team. Therefore, every project manager performs the project work according to his experience, making the process unpredictable.

#### 5.1.6.3. Quality Control

As per the procedures, quality control should take place both internally inside the IT department and at the business side in the QA department; however, due to tight schedules and culture issues, the internal part is usually minimal, leading to lots of bugs and re-work; moreover, at the QA department, functionality testing is done to assure that the deliverable meets the requirements; however, due to the lack of experience, the test-cases are not comprehensive and do not cover all scenarios. This results in deploying on the live environment low-quality solutions that eventually might cause customer's dissatisfaction.

More recently, when releasing software for the testing phase, IT is issuing preliminary test-cases to help identifying all cases. In case testing succeeds and top management approves, the product is validated and is moved to production.

#### 5.1.6.4. Configuration Management

In small and medium projects, configuration management does not exist; there is no document that details the functionality and features of the system with versioning. On the other hand, for big projects, there is some kind of documentation that lists the functionality of the system; however, it is not always kept up-to-date.

The main reason for that is the lack of procedures that explain how configuration management should be done and the huge amount of change requests being applied to the system (with tight schedules). This leads to inefficient and unstable

environments that are hard to maintain and apply changes.

Table 7. Quality Management Scoring Table

Process Group	Process Group Weight	Tool/Technique	Weight	Score	Weight * Score
Quality Management	8	Quality Planning w/ scope integration	1	0.5	0.5
		Quality Standards Audits	2	0	0
		Quality inspection (Technical/Functional)	3	0.5	1.5
		Configuration Management	2	0.5	1

Quality Management maturity score = 3 / 8

Quality Resource Management maturity weight = 8

### 5.1.7. Communication Management

#### 5.1.7.1. Stakeholder Identification

At the initiation stage of the project, the main people affected by the project work are identified; however, the findings are not documented; moreover, a stakeholder management strategy, which includes their degree of influence (positive or negative) and how to minimize their negative impact on the project, is never developed.

#### 5.1.7.2. Planning Communication and Distributing Information

Communication planning is very subjective in BankWIN's IT; there is some agreed upon norms like creating a project group email, attending regular weekly meetings for follow-up and creating a shared folder that includes all important documentation (with proper access rights for group members); however, many project start and end without applying those norms because they are not procedurized neither controlled.

During the execution phase, this lack of procedures leads to chaos. Team members do not know if they must include x person in their email correspondences; sometimes, a shared folder is created at late stages and access to key stakeholders is never given; some other times, IT security requirements are not tackled leading to re-work;

Moreover, meetings are held on a regular basis but they are un-efficient. This is because they do not have agenda items, they do not have the right attendance, they are not run professionally and they tackle multiple projects at the same time.

#### 5.1.7.3. Managing Stakeholder Expectation

During weekly meetings, stakeholders mention their worries and the issues they are facing during the project execution. This is documented in the meeting minute's document that includes multiple projects without clear references to each project.

The main problem here is that many times conflicts are resolved by compromise which makes all parties happy; however, this comes on the expense of the project's performance.

#### 5.1.7.4. Performance Reporting

Weekly meetings are held with program managers to discuss progress and status of projects under their custody. During those meetings, they discuss their progress and what is achieved since the last meeting; however, this status review meeting talks about pending issues/tasks but do not base performance evaluation on baseline plans, especially that those plans do not exist or are not up-to-date. In case of delays or bad deliverables, rework and overtime hours are usually the solution; however, budget status is never discussed.

In case the top management needs a performance report about active projects in the IT department, an excel sheet has to be filled by each functional manager/project manager to put his percentage complete and if there is any changes to the delivery deadline. This is done in a very subjective way, leading to rough and inaccurate figures.

#### 5.1.7.5. Templates

The templates used for project management are very minimal and do not cover all stages of the project management lifecycle and SDLC (not comprehensive). Every IT section uses its own templates, which make it very hard for quality assurance to control and centralize methodology.

In case some templates have been developed, they are published on the intranet site but project managers find them ambiguous. This is because awareness sessions were not held to train on their use.

Table 8. Communication Management Scoring Table

Process Group	Process Group Weight	Tool/Technique	Weight	Score	Weight * Score
<b>Communication Management</b>	<b>13</b>	Stakeholder Analysis	2	0	0
		Communication Plan	2	0.5	1
		Project Website/shared folder	1	1	1
		Regular meetings to follow-up	2	0.5	1
		Project communication room	1	1	1
		Progress Reporting	3	0	0
		Templates	2	0	0

Communication Management maturity score = 4 / 13

Communication Management maturity weight = 13

### 5.1.8. Risk Management

The whole risk management concept does not exist in the IT department. There is not a formal process to identify risks and evaluate their impact and ranking: project managers have some risks that might occur in their mind; moreover, risks are tackled passively as they occur like fire-fighting.

As for contingency reserves, usually they are added to deadline by IT division head when reporting project delivery dates to top management; however, those reserves are not usually added formally to project plans to address schedule, resources or budget risks.

Table 9. Risk Management Scoring Table

Process Group	Process Group Weight	Tool/Technique	Weight	Score	Weight * Score
<b>Risk Management</b>	<b>10</b>	Database of Risks	2	1	1
		Risk Management Documents	3	0	0
		Risk Ranking and Monitoring	3	0	0
		Contingency Reserve	2	0.5	1

Risk Management maturity score = 2 / 10

Risk Management maturity weight = 10

### 5.1.9. Procurement Management

#### 5.1.9.1. Planning Procurement

IT department secretary at BankWIN has the procurement process in her head; as she says, there is a process but it is too complicated and hard to apply. Requirements are prepared and sent to multiple vendors as a Request for Proposal/bids. Vendors reply with quotation including specifications and feature of their solution and prices; moreover, the process is not documented and not controlled.



As for make-or-buy decisions, usually it depends on the application. Some functional managers prefer to do things internally by having access to source code of the supplier; others prefer to outsource the risk and send their requirements for the vendor.

Here the problem is that sometimes IT sections make make-or-buy decisions based on their intuition and preferences, without studying the pros/cons of the alternatives (in terms of costs, risks, resource availability). They end up taking wrong decisions that might cost the bank much more; moreover, project team members are not motivated or rewarded for suggesting in-house solutions that would save time and money.

#### 5.1.9.2. Conducting Procurement

To evaluate proposals, some experienced project managers send a questionnaire to all suppliers; afterwards, suppliers' answers are evaluated according to a pre-defined scoring system; however, most of the times, this is not the case. Proposals are received, checked with technical managers and the contract is awarded (after arguing the price/man days).

Many times the whole evaluation process is not necessary because the bank has long term relationships with trusted suppliers who offer material and consultancy needs at a good bargain.

As for the contracts used, suppliers charge mostly on time and material. However, the problem here is that vendor tasks depend too much on internal/external work; this leads to paying for extra man days that were not in the contract at the first place.

#### 5.1.9.3. Administering Contracts

Contracts are split into multiple payments according to milestones and deliverables; this makes the supplier stick to the contract in terms of quality and schedule as specified in the contract; moreover, in case of changes, the contract is amended.

However, most contracts do not include sections about penalizing the supplier in case of bad quality or delays. This leads to a lot of rework and suppliers not committing to delivery dates, which causes the entire project to delay.

#### 5.1.9.4. Closing Contracts

At the contract closure phase, a formal user acceptance form is signed. This is done after inspecting the deliverable(s) and checking that it matches with the acceptance criteria defined in the contract. Afterwards, the remaining amount due is paid to the supplier.

As for lessons learned, suppliers are not evaluated and lessons are not documented; only the IT secretary has this kind of information in her head; the problem here is that if the secretary leaves, all this experience is lost. On the good side, BankWIN mostly deals with big suppliers like IBM, HP and Microsoft.

Last but not least, most record management is done at the supplier side and not at the Bank premises; therefore, it is hard for the bank employees to know what is the current version installed in their environment. This leads sometimes to multiple requests with the same requirements.

Table 10. Procurement Management Scoring Table

Process Group	Process Group Weight	Tool/Technique	Weight	Score	Weight * Score
<b>Procurement Management</b>	<b>7</b>	Make-or-buy analysis	3	0	0
		Procurement process w/Bidder Conferences	1	0.5	0.5
		Bid/Seller evaluation	2	0.5	1
		Bid Documentation and Control	1	0.5	0.5

Procurement Management maturity score = 2/7

Procurement Management maturity weight = 7

## 5.2. Organization Infrastructure and Support Maturity

### 5.2.1. Project Management Knowledge

Most of the resources in the IT department that manage projects are functional managers. Moreover, only 3 of them have project management knowledge through certifications like PMP or Prince2. However, they never use this gained knowledge because "they have too many projects at hand and they do not think what they learned can be applied in their environment".

In general, at BankWIN's IT, project managers have minor PM knowledge; however, they are in charge of many projects because they are technically skilled. This lack of knowledge makes it very urgent to develop a customized IT project management methodology and apply it in the whole department.

### 5.2.2. PM Methodology, SDLC and Templates

Currently at BankWIN's IT department, there is a very basic and simple methodology which is called "Project Development Cycle" (Appendix 2).

In summary, the business initiates the flow by sending a business case followed by business requirements; ITD combines those requirements with security requirements

and sends the project for the steering committee for approval. The IT committee checks the project documents including the business case, requirements, vendors' proposals, project plans, human and material requirements then approves the project accordingly. Afterwards, IT designs the solution as a proof of concept and moves to development and implementation. Afterwards, it is tested internally by IT and externally by the business user who sign a user acceptance. Last, the solution is moved to production environment.

The lifecycle (or methodology) as described in the flow is more like a system development lifecycle which integrates some project management terminologies in a very superficial way. Words like business case, business requirements, vendors, sponsor, project manager, project plan, approved expenditure and HR resources are used but without procedures on how to perform those activities or who should perform them (roles are missing).

The first flaw in the methodology is that it is not detailed with a narrative or detailed procedure that explains how to perform mentioned steps like preparing a project plan for example. Moreover, it does not provide templates to guide how to develop mentioned project documentation in terms of content, level of details and the format of the output. Only few documents have templates like change request and user acceptance form.

The second flaw is that it misses important project management steps that help delivery and completion of projects on time, within budget and according to requirements.

The third flaw is that the methodology does not mention roles and responsibilities. Who is responsible for performing each activity and who are the stakeholders that are involved? Is it the role of the project manager, functional manager,

business analyst, the vendor, or the developer himself?

Last but not least, there is no awareness about the methodology mentioned. Most project managers manage their project differently and in their own way. This is due to the fact that there is no control whatsoever or checkpoints at different project stages to check if a standard methodology is used.

Due to those flaws in the methodology, it is very hard to track progress of projects, follow-up on budget expenditures, or even push tasks forward to meet deadlines. Moreover, this informal/Ad-hoc process makes project's results unpredictable.

### ***5.2.3. Management Support***

IT management is currently involved in all projects; however, the amount of projects is enormous so it is having a hard time to follow-up on progress and to solve pending issues. Moreover, management does not support the application of project management methodology with strong controls. This is proven by the fact that projects move directly from the business request phase to development/execution phase. Activities like scheduling, budgeting, managing scope are considered as optional steps especially in small and medium projects.

Lately, after many projects are taking forever to finish and initial budgets are exceeded, top management is asking for a way to control the mess.

### ***5.2.4. Organization Commitment to Project Management***

At this stage, the IT department is not committed to apply specific PM practices while managing projects. This is clear by the fact that there is not a formal project management methodology, no templates, no awareness, no mandatory training

for project managers and no control of the methodology used while managing projects.

However, only few functional managers are more professional than others.

Therefore, some departments have project managers who pass through major PM steps during their product delivery.

#### ***5.2.5. Project Management Training***

Project management training is done very rarely in the IT department.

Moreover, when it is done, PMs have a hard time applying what they learned because the culture does not support its application and no time is dedicated for those activities.

This is mainly due to the lack of knowledge and support in project management.

Nevertheless, some project managers are taking PM courses on their expenses.

#### ***5.2.6. Planning and Control***

By now it is clear that the methodology (even if it is applied) does not support developing project plans and controlling those plans. Moreover, if schedules and tasks are developed in the early phases of projects (done rarely), those plans are abandoned during project execution, are not followed to perform the work and are never updated in case of changes. Time, costs, scope, quality and resource allocations found in the plans are not applied neither controlled.

In addition to that, during weekly meetings, IT division head follows up on progress of projects; however, baseline plans are not used as references to compare actual to planned performance. This makes project managers unmotivated to plan and control.

In short, at initial phase, project managers have a deadline, a high level scope or milestones, and an initial budget; however, in practice, those initial figures are not

formally respected neither controlled.

### ***5.2.7. PM Software***

Some experienced project managers use MS Project to breakdown the work into tasks, estimate durations, assign resources to perform the work and develop project schedules. However, most PMs do not do that. Once this plan is approved, it is abandoned and ignored. It is never used to freeze baselines, to monitor and control scope /schedule or to perform resource leveling.

However, even in the planning phase (which is most of the times skipped), most project managers do not use MS project but prefer using MS excel, MS word or even have things in their mind.

### ***5.2.8. Summary Findings***

In summary, IT organization infrastructure can be summarized with the following:

- PM knowledge is minor most of the times; PMs do not have a common language to communicate about phases and documentation while managing their projects.
- Management does not fully support the application of PM tools and techniques; moreover, it is sometimes considered as a waste of time.
- IT project management methodology in place is very simple, includes minor PM best-practices and lacks necessary templates; moreover, it is not controlled and so not applied by most project managers. Therefore, project completion depends more on the individuals and not on the process in place.
- Most project managers are not trained for project management skills and

communication skills.

- Planning phase is skipped most of the times; however, whenever applied, baseline plans are not respected neither controlled.

- Project data like timesheets, actual performance, actual spending and progress reports are not currently collected during project execution phase.

- Change Management process is in place; however, it is partially implemented, needs automation and lacks a centralized database for document management.

- Project management software is sometimes used for developing initial schedules; however, it is not used for managing work and controlling schedules, budgets or resource usage.

- Multiple project are managed together using a simple excel sheet format. However, this is not done efficiently and it is causing delays due to interdependencies.

BankWIN's IT infrastructure can be mostly qualified as having low maturity; however, some minor items from medium maturity are partially applied.



Table 11. Procurement Management Scoring Table

<b>Maturity</b>	<b>Maturity Item</b>	<b>Applies</b>	<b>Partially applies</b>	<b>Does not apply</b>
<b>LOW (Ad-hoc)</b>	No Common Language	X		
	No training for Project Managers		X	
	Little or no Senior Management support	X		
	Ad-hoc and informal project management processes	X		
	Dependency on Individual and not on process	X		
	Informal Planning and Control	X		
	Project data is not collected	X		
<b>Medium (Managed)</b>	Senior management support			X
	Defined and standardized project management processes and Templates			X
	Formal Change Management Process		X	
	Defined and standardized System Development lifecycle			X
	Formal Planning and Control			X
	training programs for Project Managers		X	
	Organization support to PM methodology			X
	Data is collected to monitor performance			X
<b>High (Optimized)</b>	Use of Project Management Application and Document Management		X	
	Full Management Support			X
	Multiple projects are managed together		X	
	Project office for tracking progress, defining and enforcing methodology			X
	Continuous improvement of process through lessons-learned			X
	Project driven organization with resource pooling			X
Formal Configuration management procedure				X

## CHAPTER 6

### DISCUSSION

Previously, in the site review section, it was mentioned that the amount of projects being handled in the IT department is growing exponentially; furthermore, things were getting out-of-control in terms of too many delays, cost overruns, resource un-availability and business users' dissatisfaction. My first explanation for this was the unsupportive IT infrastructure to manage multiple projects efficiently.

After applying the newly developed maturity model (SIT-MM), the results came out to prove and quantify my initial explanation about the reason for project failures.

First of all, the "organization support" dimension of the model shows that BankWIN's IT is mostly categorized as having Ad-hoc (or low) maturity level. The management and the organization as a whole are not committed to project management. Project success depends on individuals and not on a formal PM methodology; moreover, project managers are not trained to plan and control projects using project management tools and software. Last but not least, the department is not able to run multiple projects efficiently causing delays and resources burnout.

As for the "processes maturity" dimension, the findings show clearly that the main processes, which have impact on project's performance and delivery and which are considered as best-practices by the industry, are lacking from the BankWIN's IT methodology:

- Integration management lacks the business case, baseline planning, progress reporting, use of project management software and collection of lessons learned. Its

score is a very low 4/22.

- Scope management results show un-efficient requirement, unclear scope definition and lack of re-baselining in case of changes. Its score is 8.5/ 19.

- Time management results show informal activity lists, poor scheduling and resources' planning, and inefficient progress monitoring. Moreover, PM software is not used to schedule tasks, assign resources and control schedule slippage. Its score is a low 10/30.

- Cost Management is poor due to un-efficient cost estimation, lack of baseline budget and lack of PM software to monitor and control budgets. Moreover, IT is still considered as a cost center so human resources (man-days) costs are still not included in costs estimations. Its score is a very low 2/11.

- Human resource management mainly lacks resource planning and scheduling (using resource calendars) and team building activities. Its score is 5/13.

- Quality management is not well practiced. It lacks quality assurance audits for application of standards, quality inspections and a formal configuration management procedure. Here again the score is a low 3/8.

- Communication management, which is a very important success factor for project management, is also immature. This is due mainly to non-existing stakeholder analysis, poor communication planning, inefficient meetings, and informal progress reporting. Its score is very low 4/13.

- Risk management is almost non-existing. Risk discovery, ranking and monitoring are not practiced at BankWIN IT, leading to lots of unexpected surprises and eventually project cancellation and failures. Its score is a very low 2/10.

- Procurement management is also immature. This is due mainly to poor Make-or-buy decision making. This leads to inefficient spending and misuse of existing

human power/ applications. Its score is a low 2/7.

Now that we have assessed the PM maturity in BankWIN's IT, we have a clear picture of the existing gaps. Where should we go from here? The main objective now should be developing an improvement plan. This will help the IT department move progressively from low to medium maturity at Phase 1, then to high maturity at Phase 2.

A detailed project plan is out of the scope of this paper; however, I will discuss some key aspects of this improvement project:

- The business case is "achieving higher project management maturity". This leads to better project delivery and alignment with business strategy.
- The main purpose of this project is to improve maturity by tackling all the gaps that were discovered during the maturity assessment phase.
- The scope of this project will be split on two consecutive phases. This way PM maturity will see improvements without having to wait very long. The first phase will include the following activities:
  - Regular training for project managers with mandatory certifications
  - Improving executive management support by increasing awareness about benefits of having a higher maturity
  - Implementing a formal PM methodology (discussed later), change management methodology and templates based on industry best-practices. This will lead to formal project planning and control; afterwards, awareness sessions will be conducted to help adoption of this new methodology.
  - Implementation of a "project management software" which helps planning, monitoring and controlling of schedule, budget and resources; moreover, it will enforce the use of standardized methodology.
  - Implementing the infrastructure for data collection from project

team members, leading to performance monitoring and proactive management.

- This project is a one year project with several milestones. Time will be mainly spent to develop a custom IT project management methodology (ITPMM), implementing a customized enterprise project management software (as per BankWIN requirements) and delivering the necessary training and mentoring.

- The budget of the project includes the costs for PM software licenses, hardware and implementation, man-hours for consultancy services and salaries of internal resources like Project management office personnel (discussed below).

The main party responsible of this improvement project is the project management office (PMO). This office will be created and its main objective is to implement the above improvement plan; after completion of this project, PMO will have other responsibilities including the following:

- Monitor compliance of projects' methodology, standards and templates using quality assurance audits
- Improve the policies and methodology by monitoring industry best-practices and emerging trends in project management;
- Collect lessons-learned from completed/failed projects and share this info among project managers
- Manage the resource allocation, communication and interdependencies among projects
- Train and mentor project managers and functional managers
- Collect status and performance data from project managers and alert executive managers in case of exceptions

As for the new ITPMM, the first phase of this project will re-engineer the current methodology by focusing on the suffering areas with the highest improvement

impact index (or III) (check Table A4, Appendix 1). This developed index is calculated using the following formula:

$$\text{Improvement Impact Index of tool/technique (III)} = \text{weight of tool/technique} * [(\text{full application} = 1) - \text{current application of tool (Not applied} = 0, \text{ Partial application} = 0.5, \text{ full application} = 1)]$$

The first version of the ITPMM methodology will give priority to the tools and techniques with higher III (Phase 1 tools are listed in Table A5, Appendix 1). As an illustration, "statement of work/business case" tool has an III score of 2 which is higher than the score of "project charter w/scope", which equals to 1; therefore, it is more urgent to integrate in the methodology the first tool because it might have a higher impact on overall project management performance. Later on, phase 2 of the improvement project can tackle remaining tools and techniques.

One drawback of this approach is that it does not take into consideration the number of tools and the current maturity state of process groups. No matter what is the maturity level of their parent process group, tools belonging to different process groups but having same III will have same priority for integration in ITPMM. One way to overcome that is to give higher priority to tools which belong to low-maturity process groups because they have a potential to improve the overall maturity of their parent process group. For that purpose, Adjusted III can be calculated by this formula:

$$\text{Adjusted III (AIII)} = \text{III} * (\text{Process Group weight} - \text{Process Group Maturity Score}) / \text{Process Group Weight}$$

After calculation of AIII, the tool with higher AIII would be selected for integration in ITPMM. After selection, the parent process group maturity would increase, leading to new Adjusted III for all tools; therefore, adjusted III for all tools should be re-calculated and another tool would be selected. This exercise should be

repeated until the budget reserved for integrating best-practices in ITPMM is reached.

In addition to that, the developed ITPMM methodology should be flexible enough to suit all IT projects' types. Projects like "in-house system development", "off-the-shelf application implementation" and "network infrastructure" should have different template project plans. This differentiation is needed because steps needed to accomplish those projects are unique for each type.

Moreover, ITPMM should have custom workflows and mandatory steps according to projects' size. Here, the size of projects should be identified in terms of budget, time-frame, effort needed, number of stakeholders involved, and complexity of deliverable. For example, it might be necessary to establish a shared folder and a communication room for a 500K (\$) project which develops a mobile banking application; however, this is not necessary for small in-house applications that automates the workflow of HR leave requests.

Last but not least, I should mention that the new SIT-MM model integrates all project management success factors which are mentioned in the literature (section B1.4 of this paper). First, user-involvement factor is integrated in requirement analysis, stakeholder analysis, communication planning and distribution, time estimation with team members, activity-list development and team building activities. Second, executives' support success-factor is included in the "organization support" dimension of the SIT-MM model. As for the communication factor, SIT-MM includes a dedicated knowledge area with tools like stakeholder analysis, communication planning, progress reporting, regular meetings and data collection from team members. Therefore, by adopting SIT-MM, practitioners should not double-check if project success factors are being implemented.

## CHAPTER 7

### CONCLUSION

As stated earlier, the main objective of this paper is to find a systematic approach for improving organization's support and adopting PM best-practices (in the IT department of a financial institution).

After doing some research on existing maturity models, I concluded that none of the existing models is straightforward for my objective. Therefore, I decided to use the PMBOK as a reference and developed my own maturity model (SIT-MM). This model is customized towards IT domain and yet simple to apply. Afterwards, I have applied the model on BankWIN and came out with a gap analysis report about the current maturity of project management.

My findings proved that SIT-MM model can quantitatively identify (using concrete figures) the maturity level of the information technology department at hand. Moreover, those findings can be used to plan and prioritize the progressive improvement of the project management methodology and infrastructure at the bank premises.

As a result, developing my own model, that combines state-of-the-art project management techniques which are tailored towards IT application area, is justified because it served my purpose perfectly. Moreover, other companies can use it to assess and quantify their project management maturity level and improve their IT infrastructure as well. To do that, all they need is a project management certified personnel who can use my questionnaire and parse the results to develop a gap analysis report. Therefore, there is no excuse for not reserving a budget for improving project



management practices in next year's IT budget!

Subsequently, this paper has added to the literature of project management maturity models. More specifically, it provided a new model which is simple and tailored specifically towards information technology. From this point, researchers can base on my findings to create even more specific models that differentiate between IT departments that provide in-house solutions and software development firms that deliver applications to external customers; moreover, a more sophisticated model can integrate project size and complexity while analyzing results.

Last but not least, SIT-MM can be further developed by including other dimensions that tackle pre-initiation phases like feasibility studies, selecting the right projects to be included in the IT portfolio, and areas like multi-project management and prioritization.

# APPENDIX 1

## TABLES

Table A.1. Kerzner's 5 Levels of PM Maturity

Level 1 (Common Language)
<ul style="list-style-type: none"><li>• <b>Interest and importance of PM is identified</b></li><li>• <b>Chaotic use of PM</b></li><li>• <b>No training in PM</b></li></ul>
Level 2 (Common Processes)
<ul style="list-style-type: none"><li>• <b>There is need for PM practices</b></li><li>• <b>Informal support of PM</b></li></ul>
Level 3 (Singular Methodology)
<ul style="list-style-type: none"><li>• <b>Management and culture support</b></li><li>• <b>Integrated Processes</b></li><li>• <b>Formal Methodology</b></li><li>• <b>Training on Methodology</b></li></ul>
Level 4 (Benchmarking)
<ul style="list-style-type: none"><li>• <b>Benchmarking against competitor best standards</b></li><li>• <b>Need to improve</b></li><li>• <b>Analysis and evaluation of current process</b></li><li>• <b>Project office</b></li></ul>
Level 5 (Continuous Improvement)
<ul style="list-style-type: none"><li>• <b>Lessons learned</b></li><li>• <b>Knowledge and experience transfer among teams</b></li><li>• <b>Mentorship program</b></li></ul>

Table A.2. Berkley's 5 Levels of PM Maturity (PM<sup>2</sup>)

Level 1 (Ad-hoc)
<ul style="list-style-type: none"> <li>• <b>No Senior Management Support</b></li> <li>• <b>Individual effort – No teamwork</b></li> <li>• <b>No consistent PM Methods</b></li> <li>• <b>No consistent data collected and analyzed</b></li> </ul>
Level 2 (Planned)
<ul style="list-style-type: none"> <li>• <b>Similar work</b></li> <li>• <b>Weak Teams</b></li> <li>• <b>Informal/Incomplete processes</b></li> <li>• <b>Informal Data collected</b></li> </ul>
Level 3 (Managed / Project Level)
<ul style="list-style-type: none"> <li>• <b>Informal training of PM Skills</b></li> <li>• <b>Formal planning and control (Methodology)</b></li> <li>• <b>Formal PM data managed</b></li> </ul>
Level 4 (Managed / Corporate Level)
<ul style="list-style-type: none"> <li>• <b>Teamwork</b></li> <li>• <b>Formal training for team</b></li> <li>• <b>Multiple projects management</b></li> <li>• <b>PM data collected, analyzed and managed</b></li> </ul>
Level 5 (Continuous Improvement)
<ul style="list-style-type: none"> <li>• <b>Organization is project-driven</b></li> <li>• <b>Dynamic</b></li> <li>• <b>Continuous improvement</b></li> </ul>

Table A.3. SIT-MM Process Tools and Techniques Weights

Process Group	Process Group Weight	Tool/Technique	Individual Weight
<b>Integration Management</b>	20	Statement Of Work	2
		Project Charter w/ formal PM and scope	2
		Kick-off meeting	3
		Baseline Planning	2
		Use of PM software to plan, manage and control projects	2
		Progress Report	3
		Collection of Lessons learned	3
		Change Management Process	3
		Database for historical data (time/cost/lessons learned)	2
<b>Scope Management</b>	19	Requirement Analysis	3
		Requirements Documentation	3
		Scope Statement/Scope Baseline	3
		Work Breakdown structure	3
		Re-Baseline of scope baseline	2
		User Acceptance	3
		Use of PM project for managing Scope	2
<b>Time Management</b>	31	Activity List	3
		Network Diagram	1
		Schedule Planning w/ resource calendars and time estimation	3
		Activity Resource Requirement	2
		Contingency Reserve	3
		Critical Path Method	1
		Gant Charts	3
		Schedule Baseline	3
		PM Software for task scheduling	3
		Use of earned value (or equivalent)	2
		Re-baseline of schedule Baseline	2
		PM Software for monitoring schedule	3
		PM Software for resource leveling/schedule compression	2
<b>Cost Management</b>	11	Top-down estimation of costs	1
		Bottom-up estimation of costs	2
		Baseline budget	3
		Use of earned value (or equivalent)	2
		PM Software for monitoring and controlling costs	3

“Table A.3 – Cont’d”

<b>Process Group</b>	<b>Process Group Weight</b>	<b>Tool/Technique</b>	<b>Individual Weight</b>
<b>Quality Management</b>	<b>8</b>	Quality Planning w/ scope integration	1
		Quality Standards Audits	2
		Quality inspection (Technical/Functional)	3
		Configuration Management	2
<b>Human Resource Management</b>	<b>13</b>	Resource Planning w/ Resource Assignment Matrix	2
		Resource Scheduling w/ Resource Calendar	3
		Training	2
		Team-building Activities	2
		Project Manager empowered to manage/reward team	2
		Issue Management and follow-up	2
<b>Communication Management</b>	<b>13</b>	Stakeholder Analysis	2
		Communication Plan	2
		Project Website/shared folder	1
		Regular meetings to follow-up	2
		Project communication room	1
		Progress Reporting	3
		Templates	2
<b>Risk Management</b>	<b>10</b>	Database of Risks	2
		Risk Management Documents	3
		Risk Ranking and Monitoring	3
		Contingency Reserve	2
<b>Procurement Management</b>	<b>7</b>	Make-or-buy analysis	3
		Procurement process w/Bidder Conferences	1
		Bid/Seller evaluation	1
		Bid Documentation and Control	1

Table A.4. SIT-MM tools and Techniques Improvement Impact Index (III)

Process Group	Process Group Weight	Tool/Technique	Weight	Score	Weight * Score	Improvement Impact Index (III)
Integration Management	22	Statement Of Work/business case	2	0	0	2
		Project Charter w/formal PM and scope	2	0.5	1	1
		Kick-off meeting	3	0.5	1.5	1.5
		Baseline Planning	2	0	0	2
		Use of PM software to plan, manage and control projects	2	0	0	2
		Progress Report	3	0	0	3
		Collection of Lessons learned	3	0	0	3
		Change Management Process	3	0.5	1.5	1.5
		Database for historical data (time/cost/lessons learned)	2	0	0	2
Scope Management	19	Requirements Analysis	3	0.5	1.5	1.5
		Requirements documentation	3	0.5	1.5	1.5
		Scope statement/Baseline	3	0	0	3
		Work Breakdown Structure	3	0.5	1.5	1.5
		Re-baseline of scope	2	0	0	2
		User Acceptance	3	1	3	0
		Use of PM software to manage scope	2	0.5	1	1
Time Management	30	Activity List	3	0.5	1.5	1.5
		Schedule Planning w/ resource calendars and time estimation	3	0.5	1.5	1.5
		Activity Resource Requirement	2	0.5	1	1
		Contingency Reserve	3	0.5	1.5	1.5
		Critical Path Method	1	0	0	1
		Gant Charts	3	0.5	1.5	1.5
		Schedule Baseline	3	0.5	1.5	1.5
		PM Software for task scheduling	3	0.5	1.5	1.5
		Use of earned value (or equivalent)	2	0	0	2
		Re-baseline of schedule Baseline	2	0	0	2
		PM Software for monitoring schedule	3	0	0	3
		PM Software for resource leveling/schedule compression	2	0	0	2

“Table A.4 – Cont’d”

Process Group	Process Group Weight	Tool/Technique	Weight	Score	Weight * Score	Improvement Impact Index (III)
Cost Management	11	Top-down estimation of costs	1	0.5	0.5	0.5
		Bottom-up estimation of costs	2	0	0	2
		Baseline budget	3	0.5	1.5	1.5
		Use of earned value (or equivalent)	2	0	0	2
		PM Software for monitoring and controlling costs	3	0	0	3
Human Resource Management	13	Resource Planning w/ Resource Assignment Matrix	2	0.5	1	1
		Resource Scheduling w/ Resource Calendar	3	0	0	3
		Training	2	1	2	0
		Team-building Activities	2	0	0	2
		Project Manager empowered to manage/reward team	2	0.5	1	1
		Issue Management and follow-up	2	0.5	1	1
Quality Management	8	Quality Planning w/ scope integration	1	0.5	0.5	0.5
		Quality Standards Audits	2	0	0	2
		Quality inspection (Technical/Functional)	3	0.5	1.5	1.5
		Configuration Management	2	0.5	1	1
Communication Management	13	Stakeholder Analysis	2	0	0	2
		Communication Plan	2	0.5	1	1
		Project Website/shared folder	1	1	1	0
		Regular meetings to follow-up	2	0.5	1	1
		Project communication room	1	1	1	0
		Progress Reporting	3	0	0	3
		Templates	2	0	0	2
Risk Management	10	Database of Risks	2	1	1	1
		Risk Management Documents	3	0	0	3
		Risk Ranking and Monitoring	3	0	0	3
		Contingency Reserve	2	0.5	1	1

“Table A.4 – *Cont’d*”

Process Group	Process Group Weight	Tool/Technique	Weight	Score	Weight * Score	Improvement Impact Index (III)
Procurement Management	7	Make-or-buy analysis	3	0	0	3
		Procurement process w/Bidder Conferences	1	0.5	0.5	0.5
		Bid/Seller evaluation	2	0.5	1	1
		Bid Documentation and Control	1	0.5	0.5	0.5



Table A.5. Improvement Plan (Phase 1) – Tools and Techniques

Those are the tools and techniques with III 1.5 and above and which are to be integrated in the new ITPMM (part of phase 1 of the improvement project)

<b>Process Group</b>	<b>Tool/Technique</b>	<b>Weight</b>	<b>Improvement Impact Index</b>
<b>Integration Management</b>	Statement Of Work/business case	2	2
	Kick-off meeting	3	1.5
	Baseline Planning	2	2
	Use of PM software to plan, manage and control projects	2	2
	Progress Report	3	3
	Collection of Lessons learned	3	3
	Change Management Process	3	1.5
	Database for historical data (time/cost/lessons learned)	2	2
<b>Scope Management</b>	Requirements Analysis	3	1.5
	Requirements documentation	3	1.5
	Scope statement/Baseline	3	3
	Work Breakdown Structure	3	1.5
	Re-baseline of scope	2	2
<b>Time Management</b>	Activity List	3	1.5
	Schedule Planning w/ resource calendars and time estimation	3	1.5
	Contingency Reserve	3	1.5
	Gant Charts	3	1.5
	Schedule Baseline	3	1.5
	PM Software for task scheduling	3	1.5
	Use of earned value (or equivalent)	2	2
	Re-baseline of schedule Baseline	2	2
	PM Software for monitoring schedule	3	3
PM Software for resource leveling/schedule compression	2	2	
<b>Cost Management</b>	Bottom-up estimation of costs	2	2
	Baseline budget	3	1.5
	Use of earned value (or equivalent)	2	2
	PM Software for monitoring and controlling costs	3	3
<b>Human Resource Management</b>	Resource Scheduling w/ Resource Calendar	3	3
	Team-building Activities	2	2
<b>Quality Management</b>	Quality Standards Audits	2	2
	Quality inspection (Technical/Functional)	3	1.5
<b>Communication Management</b>	Stakeholder Analysis	2	2
	Progress Reporting	3	3
	Templates	2	2
<b>Risk Management</b>	Risk Management Documents	3	3
	Risk Ranking and Monitoring	3	3
<b>Procurement Management</b>	Make-or-buy analysis	3	3

Table A.6. SIT-MM Interview Questions

Area	Question
Integration Management	1. How projects are officially started? Does this include developing a charter where project manager is assigned and preliminary scope and requirements are defined? Kick-off meeting takes place?
Integration Management	2. Is there a formal project planning phase where baselines are set before the execution takes place?
Integration Management	3. Is there a process to monitor and control work and change requests are issued to make things work as close as possible to baseline plans?
Integration Management	4. Is there a change management process to manage change requests?
Scope Management	How does requirements collection take place? What is the final output of this exercise? How do you involve users?
Scope Management	How do we turn requirements into scope and deliverables? Is there a work breakdown structure and activity list that can be assigned owner, cost, time, etc...? Any specific tools used to do that?
Scope Management	How scope is protected from change and in case of change that affects scope, is it planned and included in baselines?
Scope Management	How is scope verified by the end-user to see if it covers the initial requirements?
Time Management	How activity sequencing takes place, resources are assigned and effort and time needed are estimated? Is there any use of Resource calendars? Activity resource requirements? How is activity duration estimated (resources are involved)?
Time Management	How is schedule baseline developed? Using Microsoft project and Gantt Charts?
Time Management	How this schedule managed and controlled? Any strategies are used to meet deadlines?
Cost Management	How project are budgeted? How does cost estimation takes place (rough vs. bottom-up)?
Cost Management	Are cost estimates aggregated to activities and deliverables to generate budget baselines and milestones funding requirements? Any reserves?
Cost Management	How do we control costs to keep actual costs close to budget? Do we use a tool like earned value management, Microsoft office and performance meetings to monitor and control costs?
Quality Management	How do we plan quality standards of the IT solution? Are quality metrics and standards defined (as per QA procedures) and integrated in the project scope and deliverables? Prevention or inspection?
Quality Management	Is there a quality assurance department that is responsible of setting the quality standards and procedures like PM methodology, SDLC and regular audits are done to make sure application of procedures?

“Table A.6 – Cont’d”

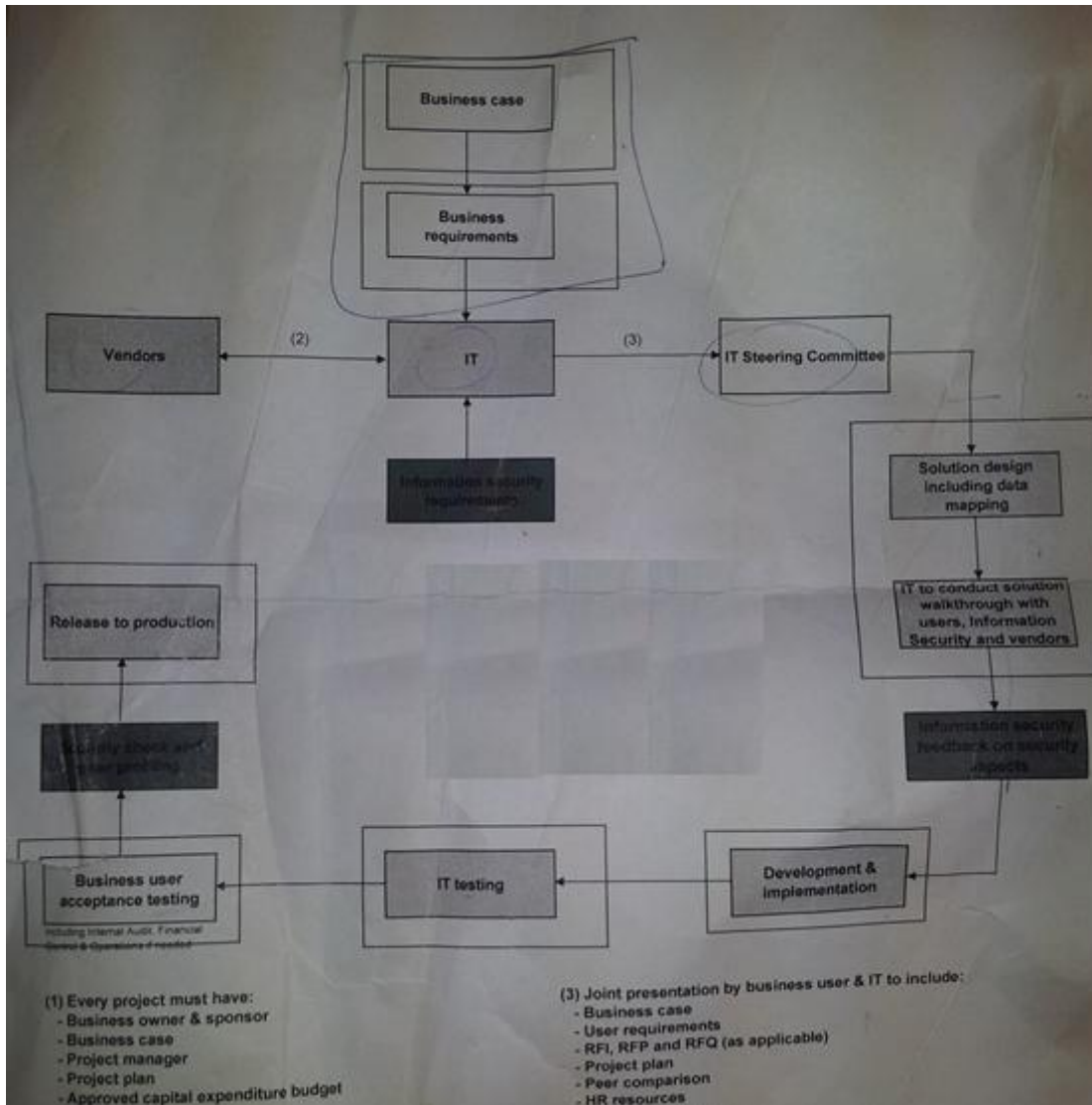
Area	Question
Quality Management	How does quality control take place? Is IT solution verified internally using Peer-to-peer code review, documentation review, functionality testing? Is there test-cases and test results to verify if requirements are met? Is end-product validated and accepted?
Quality Management	Is there a configuration management that is always up-to-date? (with latest functionality of an IT software/report/etc.. and version)
Human Resource Management	Is human resource needs for the project planned (including roles, responsibilities and reporting), skills needed, training needs, rewarding, how to get staff needed. Is there documentation in the format of RAM or RACI or OBS?
Human Resource Management	How do we acquire team members? Is there an internal resource pool with availability and capabilities and that is updated after project assignment? Cross-teams from different departments are used?
Human Resource Management	Does training occur to improve technical skills and collaboration among team members? Rewarding system takes into consideration self-improvement? Team building activities take place?
Human Resource Management	How PM manages his team members? Is project manager empowered enough to build relations, lead, evaluate performance, solve conflicts (meetings) and give Empowerment and Accountability as per RAM? Are accomplishments/expertise rewarded and bad practice also cleared-out. What kind of power is used (Coercive vs. Expertise)?
Communication Management	Is there a proper stakeholder analysis and documentation (with management strategy and degree of influence)?
Communication Management	Is there planning of communication requirements during planning phase (emails, CC, regular meetings, technology used (file-sharing vs. email), frequency? Any communication standards are set as per organization policy?
Communication Management	Information needs like performance reports and meeting minutes are distributed as per plan. Meetings are efficient to monitor performance and have agenda and minutes? Technology is in place to help (emails, file-sharing with access rights)? PM communication channels work and team members communicate well?
Communication Management	Are issues being logged and tackled (proactive) as per their impact? Moreover, changes are issued to meet stakeholder's expectations. Is their conflict resolution norms?
Communication Management	Data is collected from team members to regularly develop performance reports like status and progress reports (in terms of scope, schedule, budget and quality)? Is performance discussed in regular meetings? In case of discrepancy, how do we rectify situation?
Communication Management	Is there templates being used to develop project documents? Are they accessible and team members are aware? Document management system exists?

“Table A.6 – *Cont’d*”

Area	Question
Risk Management	Are risks (legal, market, technology, project management, etc...) being identified and analyzed early in the project planning (proactive approach) and contingency reserve is available? Is there approach to do that (checklist)?
Risk Management	Is there risk responses and mitigation strategies to reduce negative impact on project or even avoid?
Risk Management	Are risks regularly monitored to update and in order to trigger risk responses?
Procurement Management	How do you evaluate make-or-buy decisions? Is there a formal procurement process to buy equipment from outside with templates?
Procurement Management	Do you have a formal way of evaluation and selection of proposals? Long term relationships? What type of contracts do we use? Is it fixed price or Time and Material?
Procurement Management	Is there a way to administer and monitor contracts to keep them on track (in terms of costs, schedule, etc...)? Is there a change control procedure?
Procurement Management	Is there a formal acceptance of deliverable at end of contract? Is there a formal evaluation of suppliers on contract closure (lessons-learned)? Do we have a record management system (configuration management system) to keep track of procurement documentation?
Organization Infrastructure and Support	<ol style="list-style-type: none"> <li>1. Project Management Knowledge</li> <li>2. PM Methodology and templates</li> <li>3. Management Support</li> <li>4. PM Training</li> <li>5. Planning and Control</li> <li>6. Change Management Procedure</li> <li>7. SDLC</li> <li>8. Organization Commitment to PM</li> <li>9. PM Software</li> </ol>

## APPENDIX 2

### PROJECT LIFECYCLE



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