UNIVERSITY OF BAHRAIN

College of Information Technology



Value Realization of IT Investment in Public Sector in Kingdom of Bahrain

A Thesis Submitted in Partial Fulfillment of the Requirement for the Master Degree in Information Technology

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DECLARATION

I declare that this work is the result of my own investigation and that it has not already been accepted in substance for any degree, nor is it currently submitted for any degree.

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Dedication

This work is lovingly dedicated to my parents, Mr. Rasheed, and Mrs. Hadya and to my brothers and sisters, who served as my inspiration, my strength, and motivation in fulfilling my dreams and in accomplishing this work successfully.

Acknowledgement

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List of Contents

Subject		Page No
ABSTRACT		II
Dedication		III
Acknowledgement		IV
List of Contents		V
List of Tables		X
List of Figures		XIII
List of Appendices		XV
List of abbreviation		XVI
CHAPTER 1: INTRODUCTION		
1.1	Background of the study	2
1.2.	Problem statements	4
1.3.	Research questions	5
1.4.	Objectives of the study	6
1.5.	Significance of the study	6
1.6.	Definition of terms	7
1.7.	Research limitations	9
1.8.	Outline of the chapters	9
	CHAPTER 2: LITRITURE REVIEW	
2.1	Enterprise IT Governance of (EGIT)	12
2.2	Value Concept	15
2.3	The importance of investing in IT	20
2.4	Best practice for governing value of IT investments	23

2.4.1	Val IT (Value of IT framework)	24
2.4.2	PRINCE2 (Projects IN Controlled Environments)	25
2.4.3	ITIL V3 (Information Technology Infrastructure Library)	25
2.4.4	MSP (Manage Successful Program)	25
2.4.5	MOF (Microsoft Operations Framework)	26
2.4.6	VMM (Value Measuring Methodology)	26
2.4.7	COBIT5 (Control Objectives for Information and Related Technology)	27
2.4.8	Val IT to PRINCE2	31
2.4.9	Val IT to ITIL V3	31
2.4.10	Val IT to MSP	31
2.4.11	Val IT to VMM	31
2.4.12	Val IT to MOF	32
2.4.13	COBIT5 to Val IT	32
2.5	Val IT in details	33
2.6	Status of governing value of IT investment in Kingdom of Bahrain	36
2.7	Previous studies on IT value management	39
2.7.1	Police Case Study	40
2.7.2	Investment Portfolio Management at ING	43
2.7.3	IT Value Management at KLM	45
2.7.4	Characteristics of organizations that succeed in achieving the IT investment value	48
2.7.5	IT project managers challenges	48
2.8	Chapter Summary	50
CHAPTER 3: METHODOLOGY		
3.1	Research conceptual framework	54

3.2	Val IT customization	55
3.3	Research Approach	66
3.3.1	Quantitative approach vs Qualitative approach:	66
3.3.2	The research Method	67
3.4	Sample	67
3.5	Research Instrument	69
3.6	Validity and reliability	70
3.7	Data Analysis	72
3.8	Chapter Summary	73
CHAPTER 4: ANALYSIS AND DISCUSION OF THE FINDINGS		
4.1	Governmental Entities Background	75
4.1.1	General Background	76
4.1.2	GEs external stakeholders	78
4.1.3	IT projects Background	80
4.1.4	Overview and discussion	83
4.2	Current situation of the selected GEs for realizing the IT investments value	85
4.2.1	Stage 1: Submission of idea	86
4.2.2	Stage 2: Opportunity Qualification	89
4.2.3	Stage 3: Business Case Assessment	91
4.2.4	Stage 4: Scheduling	95
4.2.5	Stage 5: Project Initiation	97
4.2.6	Stage 6: Scope definition	99
4.2.7	Stage 7: Benefit Planning	100
4.2.8	Stage 8: Benefit Harvesting	101
4.2.9	Stage 9: Reconciliation and Retirement	103

4.2.10	Summary of the Results and discussion	105
4.3	How far the current situation differ from best practice frameworks and tools	113
4.3.1	Stage 1: Submission of idea	113
4.3.2	Stage 2: Opportunity Qualification	115
4.3.3	Stage 3: Business Case Assessment	116
4.3.4	Stage 4: Scheduling	118
4.3.5	Stage 5: Project Initiation	119
4.3.6	Stage 6: Scope definition	121
4.3.7	Stage 7: Benefits Planning	122
4.3.8	Stage 8: Benefits Harvesting	122
4.3.9	Stage 9: Reconciliation and Retirement	123
4.3.10	Summary of the Results and discussion	124
4.4	Issues and challenges for the selected GEs that prevent realization of IT investment value	126
4.4.1	Challenges that affect the clarity and completion of the IT project requirements	126
4.4.2	Challenge of resistance:	127
4.4.3	Challenges that affect the performance of the vendor:	128
4.4.4	Challenges that affect the project manager performance:	129
4.4.5	Challenges that affect the use of program concept:	131
4.4.6	Challenges that affect the cooperation between GEs and external stakeholder:	131
4.4.7	Challenges that affect the project plan:	133
4.4.8	Challenges that affect the use of project management frameworks:	133
4.4.9	Challenges that affect IT initiatives where they remain as ideas:	134

4.4.10	Challenges that affect the transparency of cost and benefits	135
4.4.11	Summary of the Results and discussion	136
4.5	Chapter Summary and Recommendation	144
CHAPTER 5: CONCLUSION AND FUTURE WORK		
5.1	Conclusion	150
5.2	Future Work	152
REFERENCES		
APPENDINCES		
الملخص		

List of Tables

No	Table	Page No
1	Table (1): Summary of best practice (standards, methodologies, and frameworks)	28
2	Table (2): Mapping of Val IT processes to MSP, ITIL v3, Prince 2, MOF, and VMM	30
3	Table (3): Outsourced IT investments details between 2012 and 2014 (Tender Board, 2016)	38
4	Table (4): Submission of idea management activities	60
5	Table (5): Opportunity Qualification management activities	61
6	Table (6): Business Case assessment management activities	62
7	Table (7): Scheduling management activities	63
8	Table (8): Project initiation management activities	64
9	Table (9): Scope definition management activities	64
10	Table (10): Benefits Planning management activities	65
11	Table (11): Benefit Harvesting management activities	65
12	Table (12): Reconciliation and Retirement management activities	65
13	Table (13): GEs, IT projects, participant's aliases	76
14	Table (14): General background about GEs, participants, and IT projects in study	78
15	Table (15): External stakeholders of the GEs in study	79

16	Table (16): General background IT projects in study	81
17	Table (17): Responses by IT project managers "How does the top management look at IT department"	86
18	Table (18): Exercised and Gaps of Val IT activities for Submission of idea stage	114
19	Table (19): Exercised and Gaps of Val IT activities for Opportunity Qualification stage	115
20	Table (20): Exercised and Gaps of Val IT activities for Business case assessment stage	116
21	Table (21): Exercised and Gaps of Val IT activities for Scheduling stage	119
22	Table (22): Exercised and Gaps of Val IT activities for Project Initiation stage	120
23	Table (23): Exercised and Gaps of Val IT activities for Scope definition stage	122
24	Table (24): Exercised and Gaps of Val IT activities for Benefits Planning stage	122
25	Table (25): Exercised and Gaps of Val IT activities for Benefits Harvesting stage	122
26	Table (26): Exercised and Gaps of Val IT activities for Reconciliation and Retirement stage	123
27	Table (27): Challenges that affect the clarity and completes of the IT project requirements	127
28	Table (28): Challenges that increase the resistance	128
29	Table (29): Challenges that affect the performance of the vendor	129

30	Table (30): Challenges that affect the project manager performance	130
31	Table (31): Challenges that affect the use of program concept	131
32	Table (32): Challenges that affect the cooperation between GEs and external stakeholder	132
33	Table (33): Challenges that affect the project plan	130
34	Table (34): Challenges that affect the use of project management frameworks	134
35	Table (35): Challenges that affect IT initiatives where they remain as ideas	135
36	Table (36): Challenges that affect the transparency of cost and benefits	136

List of Figures

No	Figure	Page No
1	Figure (1): Outline of the chapters	10
2	Figure (2): Strategic alignment and value of IT-enabled investment (De Haes & Van Grembergen, 2015)	14
3	Figure (3): IT governance domain (De Haes & Van Grembergen, 2015)	14
4	Figure (4): The force of Value (Shillito & Marle, 1992).	16
5	Figure (5): Performance measurement approaches	18
6	Figure (6): Examples of hard and soft returns	19
7	Figure (7): Business case processes (Maes et al., 2014)	20
8	Figure (8): Comparison between IT investment characteristics to other types of investments (ITGI, 2006a),	22
9	Figure (9): Val IT - COBIT5 processes (ISACA, 2012)	32
10	Figure (10): Four fundamental IT governance-related Ares (Thorp J., 1998)	34
11	Figure (11): Val IT framework components (ITGI, 2008b)	35
12	Figure (12): Technological readiness in Bahrain (World Economic Forum, 2015)	37
13	Figure (13): Average cost of IT awarded tenders (Tender Board, 2016)	39
14	Figure (14): Value Governance Life Cycle (ITGI, 2007b)	40
15	Figure (15): Illustration of the research contribution	51

16	Figure (16): Research conceptual framework	54
17	Figure (17): Value governance stages (ITGI, 2007b).	57
18	Figure (18): Objective of IT projects	81
19	Figure (19): IT function role within the IT investment	85
20	Figure (20): Summarized result of the Submission of idea stage	89
21	Figure (21): Summarized result of the Opportunity Qualification stage	90
22	Figure (22): Summarized result of the Business case assessment stage	91
23	Figure (23): Summarized result of the Scheduling stage	93
24	Figure (24): Summarized result of the Project initiation stage	95
25	Figure (25): Summarized result of the Scope Definition stage	97
26	Figure (26): Summarized result of the Benefit Planning stage	98
27	Figure (27): Summarized result of the Benefit Harvesting stage	100
28	Figure (28): Summarized result of the Reconciliation and Retirement stage	105
29	Figure (29): Overall percentages of tested value management practices	110
30	Figure (30): Percentage of challenges impact for each category	111
31	Figure (31): Gaps and exercised Val IT practices in the selected GEs in each value governance stages.	125
32	Figure (32): Percentage of challenges under each category	136
33	Figure (33): Percentage of challenges impact for each category	143

List of Appendices

Appendix A: Interview Questions
Appendix C: Overall percentages of tested practices
Appendix D: Challenges Theme

List of abbreviation

CARS	Compliance, Audit, Risk And Security
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CIO	Chief Information Officer
CIO	Central Informatics Organization
COBIT	Control Objectives For Information And Related Technology
CSB	Civil Service Bureau
EGA	E-Government Authority
EGIT	Enterprise Governance Of IT
GE	Government Entities
IM	Investment Management
IRR	Internal Rate Of Return
ISB	Investment And Services Board
ITGI	IT Governance Institute
ITIL	Information Technology Infrastructure Library
KPI	Key Performance Indicator
MOF	Microsoft Operations Framework
MOF	Ministry Of Finance
MOS	Ministry Of Social
MSP	Manage Successful Program
NAO	National Audit Office
NPV	Net Present Value
PgMO	Program Management Office
PM	Portfolio Management

PMO	Project Management Office
PRINCE	Projects IN Controlled Environments
ROI	Return On Investments
ROITI	Return On IT Investment
SLA	Service Level Agreement
SLO	Service Level Objective
SMART	Specific, Measurable, Achievable , Relevant, Time-bound
Val IT	Value Of IT Framework
VG	Value Governance
VMM	Value Measuring Methodology
VMO	Value Management Office

CHAPTER 1: INTRODUCTION

1.1. **Background of the study**

1.2. **Problem statements**

1.3. **Research questions**

1.4. **Objectives of the study**

1.5. **Significance of the study**

1.6. **Definition of terms**

1.7. **Research limitations**

1.8. **Outline of the chapters**

CHAPTER 1: INTRODUCTION

This chapter discusses the background of the study, problem statements, research questions, significance of the study and research limitation.

1.1. Background of the study

Enterprise governance of IT (EGIT)[1] concept is not today's subject. It has been gained considerable attention among best practice firms (COSO, 1992; ITGI, 2001; ITGI, 2006; ISO/IEC, 2008) as well as academic literature (Brynjolfsson, 1993; Brown, 1997; Sambamurthy and Zmud, 1999; Thorp, 2003; De Haes & Van Grembergen, 2008a; Weill and Ross, 2009; Wilkin and Chenhall, 2010) in the last two decades. According to Van Grembergen and De Haes (2009); EGIT defined as "Board overseeing the definition and implementation of processes, structures, and relational mechanisms in the organization that enable both business and IT to execute their responsibilities in support of business/IT alignment and the creation of business value from IT enabled investments" .

Researcher realized that this study needed to be applied on the public sector, as it is clearly noticed the reason why studies have mostly been applied in international private companies (stakeholder pressure exists) whereas public sector has been given little attention. As claimed by Toomy (2009), where he mentioned that in the private organization, the pressure of stakeholder drives effective governance of IT. Lack of that pressure in the public organizations may clarify why governance of IT in public services is

[1] "Enterprise governance of IT," is equivalent to "corporate governance of IT," , "Governance of IT" and "organizational governance of IT." (Juiz, & Toomey, 2015)

less effective. Furthermore value of IT investment is very complex especially when talking about public sector as the value is almost non-financial, since the value can be realized, for example, by getting policy outcomes or quality of service (ITGI, 2008b).

The researcher also found that value governance should be tested in the public sector as the coverage of value management concepts by practitioners and academics are limited. Although, business value creation is important on the agenda of the organizations (De Haes et al., 2011).

Several international standards such as Information Technology Infrastructure Library (ITIL), project management methodologies such as Prince 2 or Project Management Institute's – Project Management methodology, or frameworks such as Value Measuring Methodology, Val-IT, Microsoft Operation Framework, or Manage Successful Program (MSP) were developed and used by particular business and IT firms. All of them were designed with a specific objective and hence had applicability or usability limited to its objective or purpose for which it was developed.

In the Kingdom of Bahrain, there have been significant changes in Governmental Entities (GEs), as they began to make strategic changes to align their business to IT (Tradearabia, 2016).. IT investments increased radically in Governmental Entities and many of them are spending large expenditures on IT investments expecting to realize the value from those investments (Tender Board, 2016). There are many drivers that make this research area highly important. Those drivers mentioned in the problem statement section.

To sum up, governing the value of IT-enabled investments is a challenge confronting not only Bahrain Governmental Entities but private and public companies around the world.

1.2. Problem statements

In addition to what have been mentioned previously by Toomey (2009) and De Haes et al. (2011) about the importance of studying the value governance in public sectors. The problem of realizing the value of the IT-enabled investment is not only limited to the Arab countries, studies showed that top enterprises in the world suffer from this problem. As an example Cook (2007) mentioned that only 35 percent of IT projects succeed while others failed or become challenged.

In Bahrain, there are many drivers where getting a clear understanding of the reasons that prohibit managers realizing the full IT-enabled investment benefits is important. Today IT is no longer about technology implementation, it is a mean to enable business outcome. Based on an initial observation, the following are some of the drivers of this research:

1. There is no structured approach used to realize value from IT-enabled investment in the public sector in the Kingdom of Bahrain (Tradearabia, 2016).
2. Some IT investments remain challenged, failed, over budgeted or decrease the performance of the GE due to delayed implementation (National Audit Office, 2014).
3. A major percentage of GEs expenditure is due to IT investments costs and therefore, the overall expenditure versus profit is dependent on IT investments (Tender Board, 2016).

4. Oil cost decreased to half, which gave a sign for IT professional and business people work together to reach a degree of oversight and coordination of IT investments (Kane, 2016).

To sum up, from the previous drivers and literature, there is a need to study value realization of IT-enabled investments in the public sector. The scope of this research will be identifying issues and challenges preventing the GEs from realizing the value of IT investment from IT project manager's perspective. The reason behind selecting IT project managers, as they are managing the IT project and they are highly communicating with business people and top management where richness in data is expected. By reviewing the literature, such studies are limited for either Bahrain or Arab countries.

1.3. Research questions

The focus of this research is to investigate why many IT project managers of Government Entities (GE) are not realizing the value of IT investments. Three broad questions guide the study:

Research question 1: What is the current situation of the selected GEs for realizing the IT investments value based on value governance stages?

Research question 2: How far the current situation differ from best practice frameworks and tools based on value governance stages?

Research question 3: What are the issues and challenges for the selected GEs that prevent the realization of IT investment value to overcome any problem can occur in future projects?

1.4. Objectives of the study

This study aims to tackle issues, challenges, and gaps. Specifically identifying why many IT project managers of the Government Entities (GEs) are not realizing the value of IT investment by:

1. Investigate the proper tool for testing the value management practices.
2. Investigate the current value management practices that the selected GEs are practicing to realize the IT investments value.
3. Examine the tested value management practices on the selected GEs by comparing them to best practices.
4. Identify issues and challenges that prevent the realization of IT investment value
5. Suggest how to overcome the challenges, issues and Gaps in future IT projects.

1.5. Significance of the study

The need to tackle challenges of applying value management practices to enable the value of the IT-enabled investment is an important topic that reflects on the Enterprise governance of IT (EGIT) (De Haes et al., 2011). This study will fill a gap as there are limited studies that investigate this area in either GCC Countries or the Kingdom of Bahrain as well as worldwide.

This study increases the existing knowledge base of best practices and standards available worldwide by understanding, analysing challenges that prevent GEs from realizing the value of IT investments. The study will increase the awareness of the managers that might lead to a positive change.

1.6. Definition of terms

IT-enabled investment (equivalent to IT investment): are investments that treated as business programs, composed of a collection of business and IT projects delivering all the capabilities required to create and sustain business value (Thorp, John, 2003; De Haes, Van Grembergen, 2009).

Enterprise Governance of IT (EGIT): Board overseeing the definition and implementation of processes, structures, and relational mechanisms in the organization that enable both business and IT to execute their responsibilities in support of business/IT alignment and the creation of business value from IT enabled investments (Van Grembergen and De Haes, 2009).

Value: Value is complex, context-specific and dynamic. It is the relative worth or importance of an investment for an organization, as perceived by its key stakeholders, expressed in financial and non-financial terms (ITGI, 2006a).

Project: A structured set of activities concerned with the delivery of a defined technical capability based on an agreed schedule and budget. It is not important for the project to achieve a business outcome while it is important for the program (De Haes & Van Grembergen, 2015)

Program: Structured grouping of projects that are both necessary and sufficient to achieve a business outcome and deliver value. It is the combination of the "IT project" and all other business-related projects (De Haes & Van Grembergen, 2015).

Portfolio: Suite of investment programs, including those with no IT involvement to be managed as a portfolio in order to optimize to total value creation for the organization (De Haes & Van Grembergen, 2015).

Business case: A formal investment document with a structured overview of relevant information that provides a rationale and justification for an investment with the intent to enable well-funded investment decision-making (Maes et al., 2014).

Val IT framework: Comprehensive and pragmatic organizing framework that enables the creation of business value from IT-enabled investments. Designed to align with and complement COBIT (ITGI, 2008b).

Program management office (PgMO): The function responsible for supporting program managers, and gathering, assessing and reporting information about the conduct of their programs and constituent projects (ITGI, 2008b).

Project management office (PMO): The function for supporting project managers, including the definition and propagation of standardized methodologies and gathering, assessing and reporting information about the conduct of their projects (ITGI, 2008b).

Stage-gate: A point in time when a program is reviewed, and a decision is made to commit expenditures to the next set of activities on a program or project, to stop the work altogether, or to put a hold on execution of further work (ITGI, 2008b).

Value management office (VMO): The function that acts as the secretariat for the investment and services board (ISB) in managing investment and service portfolios, including assessing and advising on investment

opportunities and business cases, value governance/management methods and controls, and reporting on progress in sustaining and creating value from investments and services (ITGI, 2008b).

1.7. Research limitations

The study is limited to five Government Entities (GEs) in the Kingdom of Bahrain due to the limitation on time and resources. The interviews were done with IT project manager which represents one point of view, where further research is needed to extend the findings. Also logical generalization is reached as this study is qualitative.

1.8. Outline of the chapters

Following this introduction, the specific chapters of the study are presented in chapter two through five. Chapter two provides a review of the literature covering important components from academics and best practice. In Chapter three, the methodology and procedures utilized in the study are presented. Chapter four contains results analysis and discussion which include: background of the GEs in the study in which the methodology was applied, the answer of the first question of the research, the answer to the second question of the research, the answer to the third question of the research and recommendation. And Chapter five includes the conclusion and future work. As shown in Figure (1):

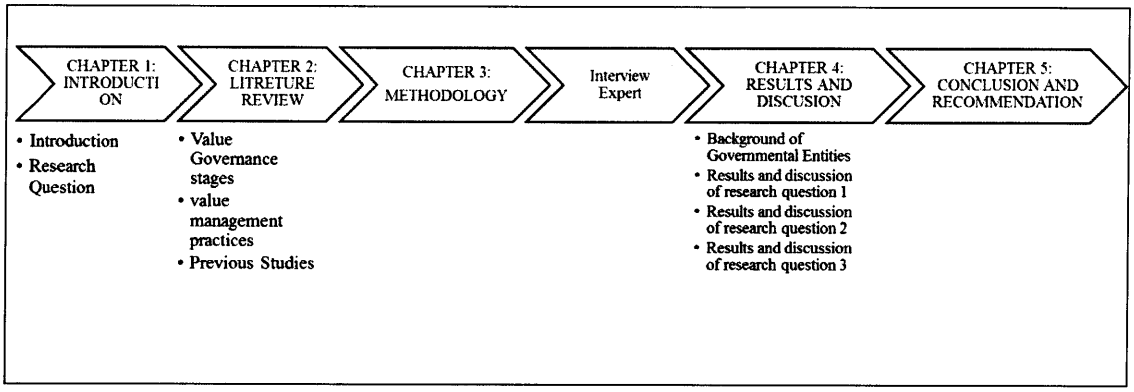


Figure (1)
Outline of the chapters

CHAPTER 2: LITRITURE REVIEW

2.1. Enterprise IT Governance of (EGIT)

2.2. Value Concept

2.3. The importance of investing in IT

2.4. Best practice for governing value of IT investments

2.5. Val IT in details

2.6. Status of governing value of IT investment in Kingdom of Bahrain

2.7. Previous studies on IT value management

2.8. Chapter Summary

CHAPTER 2: LITRITURE REVIEW

This chapter provides information on the concepts and overall research performed to meet the research objectives and tackle issues, gaps, and challenges of why many managers of the Government Entities (GE) are not realizing the value of IT investment.

The first section of this chapter provides an insight into the IT-related governance mechanisms/ concept through Enterprise Governance of IT (EGIT). The next section provides understanding on the value (benefit realization) concept in Information Technology field. The third section provides information on the importance of investing in IT and the concept of IT-enabled investments. The fourth section provides a comparison between selected related best practices available worldwide for value (benefit) realization from IT-enabled investments. The fifth section provides information on the best suited Val IT framework. The sixth section provides information on whether best-suited framework can be applied to the government entities in Kingdom of Bahrain and its related observations. The seventh section provides the review results of the related case studies on implementation / utilization of Val IT framework.

2.1. Enterprise IT Governance of (EGIT)

Enterprise governance of IT (EGIT) concept is not today's subject. It has been gained considerable attention among best practice firms (COSO, 1992; ITGI, 2001; ITGI, 2006; ISO/IEC, 2008) as well as academic literature (Brynjolfsson, 1993; Brown, 1997; Sambamurthy and Zmud, 1999; Thorp, 2003; De Haes and Van Grembergen, 2008a; Weill and Ross, 2009; Wilkin and Chenhall, 2010) in the last two decades.

Currently, academics and practitioners consider EGIT as an integral part of corporate governance (De Haes et al. 2013). According to ISO/IEC Standard 38500 (2008), IT governance is "The system by which the current and future use of IT is directed and controlled". On the other hand governance of IT includes "Evaluating and directing the use of IT to support the organization and monitoring this use to achieve plans". The definitions show the difference between IT governance and governance of IT. Governance of IT includes monitoring IT governance functions and needed functions of realizing the IT use from the business side. Furthermore, the definition shows that achieving business plan and creating the business value is a significant aim for all organizations.

In 2010, Wilkin and Chenhall did a survey in order to establish a taxonomy of IT governance. They found that the most important enablers are: achieving strategic alignment, risk management, value delivery and performance measurement. They also found corporate governance is a main influence on shaping IT governance which initiated different directions from academics and practitioners causing a move toward EGIT. EGIT focuses on involving boards and senior management in tactical and strategic directions of IT (De Haes et al., 2013). The below paragraphs provides further information on the three enablers such as Strategic alignment, value delivery, and performance management.

Strategic alignment is one of the most significant enablers in IT governance. It means achieving enterprise strategies through the undertaking of activities coherently by management levels of the organization (ITGI, 2007a). Strong relation and collaboration between IT and business are needed, that can be developed when the IT understand the business and there is a shared understanding of technology issues and opportunities. Figure (2)

shows the alignment between IT and business that in turn enables the business value from IT investment (De Haes, & Van Grembergen, 2015).

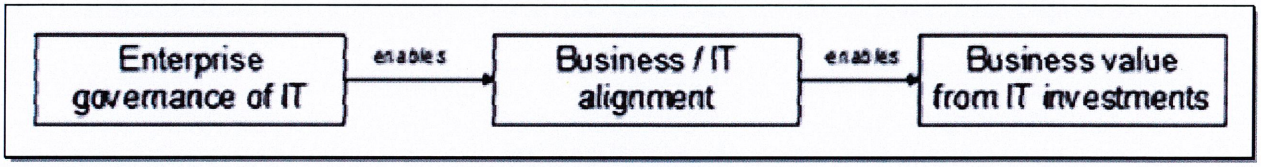


Figure (2)
Strategic alignment and value of IT-enabled investment (De Haes & Van Grembergen, 2015)

Value delivery as another IT governance enabler can be developed by creating new value, maintain existing value and eliminate any initiative or asset that doesn't not create sufficient value for the organization. Risk management includes all needed activities to address IT risks and use IT in managing business risks (ITGI, 2007a). Figure (3) shows the mentioned enablers besides others like performance measurement and resource management. Next section will cover value concept which is the research concerned in. These enablers provide a framework for the organization to understand, maintain and realize value from the investments of the organization, In order to understand the history of "Value" concept and its application or utilization to current IT world, the next subsection provides information on the value concept and its applicability.

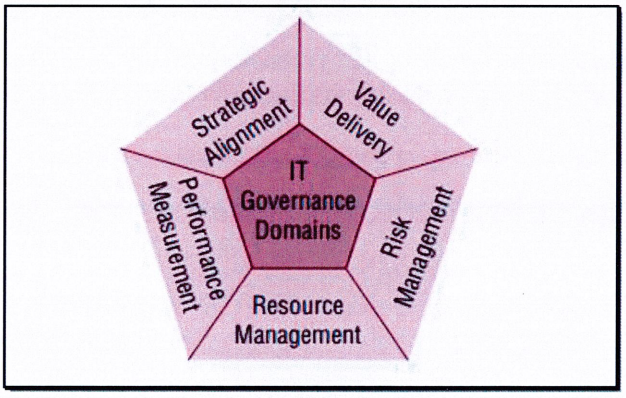


Figure (3)
IT governance domain (De Haes & Van Grembergen, 2015)

2.2. Value Concept

Value concept is known and followed since ancient ages. Ancient philosophers had covered it; the Greeks believed value is an essential principle existed in our environment that gave value to the items they reserved. In 1992, Shillito & Marle mentioned that:

"Value is a potential energy field between us and objects we need; it draws us to items in our environment that we find appealing. When this attraction is large, we expand our energy to acquire, possess, use and exchange objects that are rewarding. In this way, the potential energy of value is converted to the kinetic energy of human action". They gave a visualization of this concept describing the force of value as shown in Figure (4). The person with a need at the center of the drawing. Circles surrounding this person are particular needs. The perceived ability of need is represented by the size of each circle. Needs vary in cost, which is represented by the distance from the person to each need. The same principle can be extended to our study as an enterprise with a need is represented at the center of the drawing and circles surrounding this enterprise represent IT investments that are capable of satisfying particular needs. The perceived ability of each IT investment to satisfy the specific need is represented by the size of each circle. IT investment may vary in cost, which is represented by the distance from the enterprise to each IT investment.

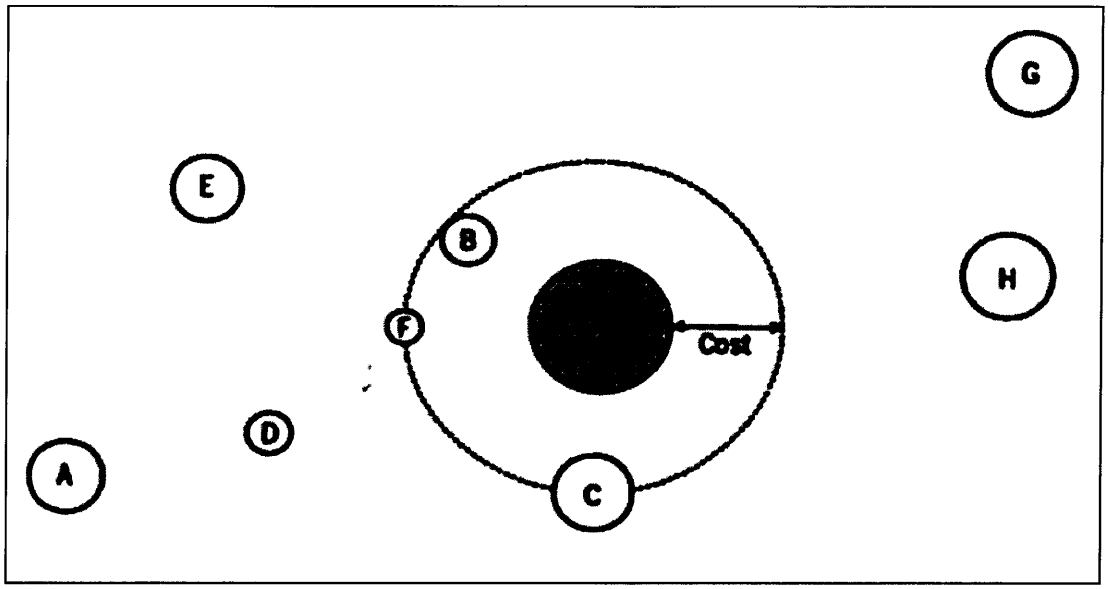


Figure (4)
The force of Value (Shillito & Marle, 1992).

This representation shows that realizing the value needs good governance to be able to direct and control the current and future use of IT.

Another definition from IT Governance Institute (ITGI) of value: "Value is complex, context-specific and dynamic. It is the relative worth or importance of an investment for an organization, as perceived by its key stakeholders, expressed in financial and non-financial terms" (ITGI, 2006a). For profit organizations, it is more in financial nature where a non-profit organizations value is more complex as it is not in financial nature (Employee value, Customer value, Project value, etc.) (Westerlind, 2004). There should be a change in the performance of the organization and apply management practices to generate the business value and realize financial and non-financial benefits optimally (ITGI, 2006a). It's clear that organizations need to know what to do with IT rather than concentrating on the technology itself.

De Haes et al. (2011) mentioned that the literature of business processes and IT governance cover in details about creating business value from the business processes. However, the corresponding methodology and metrics for obtaining and realizing value from business processes is not mentioned in such literature.

Many studies mentioned that the alignment between IT and Business strategies is important for enabling the creation of value from IT-enabled investment (Chan et al., 1997; Bergeron et al., 2003; Chan and Reich, 2007). De Haes & Van Grembergen (2015) mentioned that there are many financial instruments that can be used to quantify IT cost and benefits such as ROI (Return on Investments), NPV (Net present Value), IRR (Internal rate of return), and payback. They declared that a Problem occurs when dealing with intangible benefits such as customer satisfaction, and decision-making improvement. Furthermore users and different levels of management observe the value of IT differently. Many approaches have been developed for creating value from IT-enabled investments and aligning IT to business. Business value hierarchy, information economics, and balance score card are examples of managing and measuring the value creation from IT-enabled investment as shown in Figure (5).

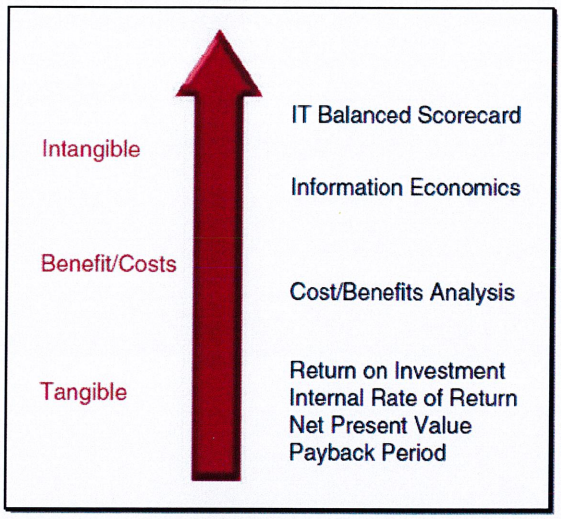


Figure (5)
Performance measurement approaches

Measuring value from IT is one of the essential element in the governance domains. Van Grembergen & De Haes (2005a) did a study on measuring and demonstrating the value of IT where they addressed that answers to many questions should be provided.

Another study described that the Value concept depends on meeting the stakeholder's expectations and the resources used to reach those expectations (Thorp, 2003b). Value can be managed and optimized through the below stated main steps (Tiernan & Peppard, 2004): Defining clearly the view of "Value" for an enterprise and for whom, selecting and executing investments, managing enterprise asset, and optimizing value with a reasonable use of resources and at an acceptable level of risk.

Returns are divided into hard returns and soft returns. Hard returns can be calculated while it is a challenge to calculate soft returns as they are intangible. The following Figure (6) show examples of hard and soft returns (Westerlind, 2004).

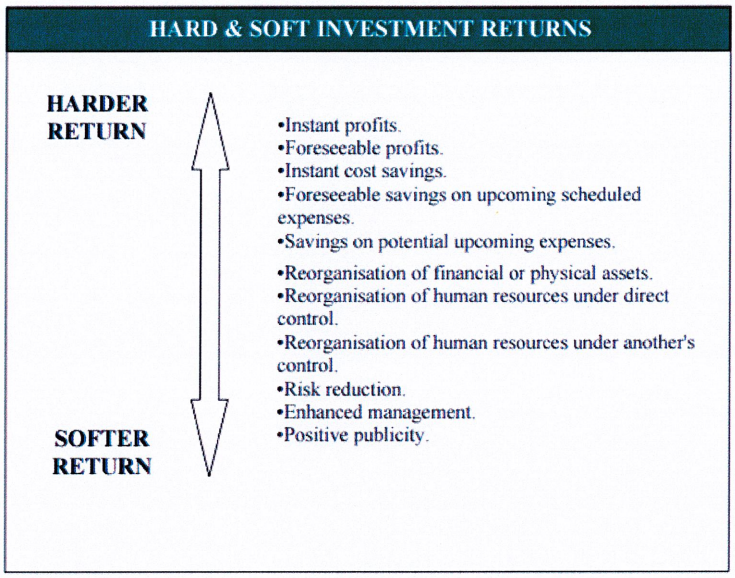


Figure (6)
Examples of hard and soft returns (Westerlind, 2004)

ROI (Return on Investments) is one of the most important financial indicators. It helps in determining whether to invest in a project or not. This indicator has been used to define Return on IT Investment (ROITI). ROITI is "The average of the Net Benefits (Benefits Annual Average) less (Recurring Annual Costs) divided by the Initial Investment Cost of the project" as mentioned in the following formula (Westerlind, 2004):

$$ROITI = \frac{Net\ Benifits}{Investment\ costs} = \frac{Benifits\ Annual\ Average - Recuring\ Annual\ Costs}{Investment\ Cost}$$

Maes, et al. (2013) mentioned optimal ROI can be obtained from the investments, organizations need to plan, review and execute the investments from beginning to the end of investment lifecycle. Also, it is extremely important to link the investments with the business goals and objectives. Such linkage and comprehensive management of investments can be made possible through development, review and execution of comprehensive business case. In another study (2014), they suggested dealing with the

business case as a process that runs in parallel of the investment lifecycle (pre, during and post implementation).

Figure (7) shows the four components of the business case: Business case development, Business case maintenance, Business case review and Business case accommodation.

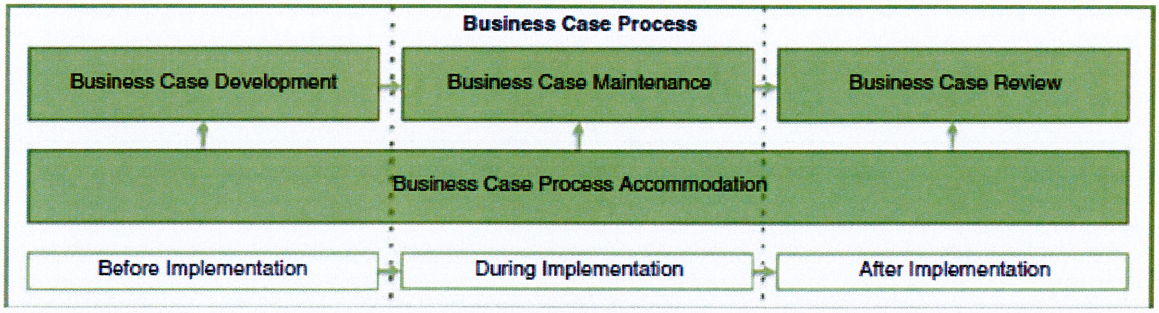


Figure (7)
Business case processes (Maes et al., 2014)

In "Business case development process" organizations should identify structured information to justify the investment idea. Where in "Business case maintenance process", organizations should monitor and update the business case with the investment implementation. In "Business case review" organizations should monitor realizations of the investment benefits and success. The review should include identifying evaluation criteria, investment effectiveness and efficiency. In "Business case accommodation" organizations should execute and adjust the business case to the investment implementation and organizational context. Business case accommodation process includes establishing: adaptable business case, templates, regular evaluation, and improvements, etc.

2.3. The importance of investing in IT

Over the past years, IT expenditure has grown rapidly and played an important role in any organization (Liao et al., 2015). Gunasekaran et al.

(2001) mentioned that organizations that want to survive in the long term they must invest in IT. IT is no longer about technology solutions. It is considered as a major instrument to enable the change in the business of both private and public organizations (Juiz and Toome, 2015). It is clear from that IT investment doesn't accomplish business value by its own. Studies showed that there is a two-way strong correlation between IT investments and organizational performance. That is, by investing in IT organizations will have better performance, and organizations with better performance, in turn, will higher IT investments (Weill, 1992; Hu, and Plant, 2001; Hu, 2005)

To create the business value of any organization, IT depends on many factors, such as management method, business process, and organizational structure (Bresnahan et al., 2002). From the major role of IT is creating the business value of the organization, it is important to know IT-enabled investment definition. IT-enabled investment is treated as business programs, composed of a collection of IT and business projects that deliver all the required capabilities to create and sustain business value (Thorp, John, 2003; De Haes, Van Grembergen, 2009).

For that, governing IT is an important issue because, without it, organizations face potential failure and loss of opportunity (Juiz, Toomey, 2015). In 2009, Toomey mentioned that organizations need to upgrade governance of IT not only for getting good corporate governance but also to identify "stakeholder value drivers". In the private organization, the pressure of stakeholder drives effective governance of IT. Lack of that pressure in the public organization may clarify why governance of IT in public services is less effective.

According to an investment research done by ITGI (2006a), well aligned and well executed IT investments have the ability to create the business value more than other types of investment. Figure (8) shows a comparison between IT investments to another type of investments. It includes characteristics of different investments including IT investment. Two main things can be noticed:

1. In the best case, the expected return on IT investments exceeds the expected returns from any other type of investment.
2. In the worst case, the liquidity and residual value of all investment have value but not in the case of IT investment.

Risk-Return Profile Various Asset Classes

Financing	General Investments	Return	Risk	Liquidity	Residual Value	Maximum Write Down
Balance Sheet	• Cash (money market)	Lo	Lo	Hi	Hi	At market price
	• Commodities (e.g., gold)	Med	Lo	Hi	Hi	At market price
	• Derivatives (hedging)	Hi	Hi	Hi	Depends	Unlimited/(for put options)
	• Private equity (e.g., Google)	Hi	Hi	Lo	Depends	At market price
	• Public equity (shares)	Hi	Hi	Hi	Med	At market price
	• Fixed income products	Lo	Lo	Hi	Hi	No write down
	• Collectibles (e.g., antiques)	Med	Med	Lo	Med	At market price
	Corporate Investments					
	• Real estate (office/factory)	Med	Med	Lo	Med	At market price
	• M&A (expansion policy)	Med	Hi	Lo	Depends	At market price
P & L	• **IT Investments**	**Med to Hi**	**Hi**	**Nil— Sunk Cost**	**Nil**	**At cost (TCO) > budget**

Figure (8)
Comparison between IT investment characteristics to other types of investments (ITGI, 2006a)

De Haes & Van Grembergen (2015) mentioned that investing in IT projects causing a worry for business managers as it is a black hole which means "large sums go in, but no returns (seem to) come out".

The previous paragraphs show the importance of IT and in turn the role of IT department. IT department can play different roles in any organization, especially when the IT strategy aligned to the business strategy. It can be either: service provider, a tool for innovation, or as rule-breaker business (Craig & Tinaikar, 2006). So as a conclusion, value management practices are highly needed to be practiced as investing in IT can be so worthy if executed and aligned well, it is also so risky if its intended value not reached or failure occurred and organizations can do nothing with it as it is sunk cost.

2.4. Best practice for governing value of IT investments

This section contains more details of many academics and practitioners efforts in order to participate in changing and adding on the management practices to ensure that there are right governance and management and optimize the realization of value as it is an essential part of enterprise governance.

As declared earlier in the previous section (Section 2.3), the importance of studying the value management of IT which is a basic component of EGIT. From academic and best practices there are no direct studies that take this topic. Although, there are many of studies contribute to value management of IT directly and indirectly. This section will cover some of them from both academics and best practices.

Several international standards such as Information Technology Infrastructure Library (ITIL), project management methodologies such as PRINCE 2 or Project Management Institute's – Project Management methodology, or frameworks such as Value Measuring Methodology, Val-IT, Microsoft Operation Framework, or Manage Successful Program (MSP)

were developed and used by business and IT firms. They were designed with the specific objective and hence had applicability or usability limited to its objective or purpose for which it was developed.

Before going further it is important to know basic definitions as there are different interpretations of the meaning of "Project", "Program", "Portfolio". For this study, definition mentioned by De Haes & Van Grembergen (2015) were used where it was not important for the project to achieve a business outcome while it is important for the program.

Standards and methodologies have been studied and reviewed in order to identify the best-suited tool that will satisfy the overall study objective. As mentioned in the following paragraphs.

2.4.1 Val IT (Value of IT framework):

Val IT designed mainly to optimize the realization of value from IT investments. Val IT focus mainly on value management practices in the full IT life cycle. It covers three main domains: Value governance, Portfolio management, and Investment management. In each domain, there are set of processes and each process including a set of activities and all have metrics that help organizations to measure their progress in each domain. Val IT covers two of four fundamental IT governance-related questions which are: "Are we doing the right things?" and "Are we getting the benefits?" Val IT has been issued by ITGI in 2006 to help organizations take the right decision on what to invest and how to realize the benefit of that IT investment, beyond the factors such as enterprise size, region, industry or revenue (ITGI, 2008b).

2.4.2 RINCE2 (Projects IN Controlled Environments):

PRINCE2 designed mainly for managing all kinds of projects effectively. PRINCE2 focus mainly on the business case drives all processes of the project management, consists of eight management processes: Starting up a project, Directing a project, Initiating a project, Managing stage boundaries, Controlling a stage, Managing product delivery, Closing a project and planning . Projects are segmented into stages to have efficient control of recourses and monitoring. PRINCE2 has been issued by OGC in 1996 to meet requirements of the enterprise depending on project complexity and risk (OGC, 2005).

2.4.3 ITIL V3 (Information Technology Infrastructure Library):

ITIL V3 designed mainly for IT service management to deliver high-quality IT services. There is five core area of ITIL V3: Service Strategy, Service Design, Service Transition, Service Operation and Continual Service Improvement. Version three include life cycle of IT management from IT service perspective which (Service Strategy and Continual Service Improvement) but not entire IT management and IT governance level. ITIL V3 has been issued by OGC in 2007 to develop a vendor-independent approach for managing service as there was an increased recognition of dependence on IT service (OGC, 2008).

2.4.4 MSP (Manage Successful Program):

MSP designed mainly for transformational change delivery and enterprise's strategic objectives achievement. It includes management program principles, Governance theme that explain how components of the program should be delivered, and Transformational flow that addresses life

cycle stages of program and project. MSP has been published by the OGC in 1999 representing proven program management drawn from public and private sector experiences (OGC, 2007)

2.4.5 MOF (Microsoft Operations Framework):

MOF refer to Microsoft Operations Framework designed mainly to achieve reliability for IT services and solutions. It uses questions to allow enterprises determine what they need and keep the IT organization running efficiently and effectively. It includes all activities that manage the services that are grouped into Service Management Function (SMF). Each SMF has a lifecycle: Plan, Deliver, Operate, and Manage layer. MOF has been issued by Microsoft providing guidance to IT practitioners and help them ensuring that IT investments deliver expected business value with an acceptable level of risk (Voon & Salido, 2009).

2.4.6 VMM (Value Measuring Methodology):

VMM designed mainly to be compliant with the Federal regulations, applicable to the federal government and Do-Able. VMM has three essential factors: Value, Risk, and Cost. Cost element structure needs to be developed considering missing or double counting cost. Risks need to be identified and mitigated. Value has five main factors, which are: direct user value, Social value, Government operational value, Government financial value, and Strategic / political value. VMM is designed to measure both tangible and intangible benefits. It has been issued by Federal CIO Council to assess electronic services value by Social Security Administration (SSA) and General Services Administration (GSA) (CIO Council, 2002).

2.4.7 COBIT5 (Control Objectives for Information and Related Technology):

COBIT5 covers the concept of EGIT. COBIT5 provides a framework for assessing enterprises to achieve the governance and management objectives of IT. It covers the full business and IT functions (end-to-end). It considers relations between IT and external and internal stakeholders. It covers three ISACA frameworks: VALIT, COBIT, and RISKIT. The management domain contains four subdomains: ''Build, Acquire and Implement" (BAI); ''Align, Plan, and Organize" (APO); ''Monitor, Evaluate and Assess" (MEA) and ''Deliver, Service, and Support" (DSS). Governance domain follows the EDM model ''Evaluate, Direct, Monitor". (De Haes et al., 2013).

Excluding COBIT5 as an exception, it is clear that although there are many best practices participate directly and indirectly in enabling and delivering the value, they differ in the outcome deliverable and level of processes. Also, there are huge differences among them. Previous best practice is summarized in Table (1) in terms of definition, unit focus, issuer, year, outcome, level of IT life cycle, and metrics existence:

Table (1)
Summary of best practice (standards, methodologies, and frameworks)

	Val IT	PRINCE2	ITIL	MSP	MOF	VMM
Definition	pragmatic and comprehensive framework that enables business value creation from IT-enabled investments	process-based project management method that is scalable to meet enterprise requirements, depending on the project complexity and risk	approach to IT service management that consists processes focus on one function: effective IT service management	Program management practices For delivering transformational change	guidelines for achieving reliability comprehensively of IT services and solutions	A tool used to measure both tangible and intangible benefits of a project
Unit Focus	Governance of **IT-enabled investment** value in the full life cycle	**project** management in controlled environment	governance of the **IT service** management lifecycle	**Program** management life cycle	Reliability over **IT services and solutions**	assess **electronic services** value
Year	2006	1996	1990s	1999	2008	2002
Issued by	IT Governance Institute (ITGI)	Office of Government Commerce (OGC)	Office of Government Commerce (OGC)	Office of Government Commerce (OGC)	Microsoft	Federal CIO Council of USA
Outcome focus	Enable business value creation	Business case justification, resources, and project management	Effective and optimal IT service management with value realization of services provided	Strategic alignment of business goals with projects and resource management	implement the strategic concepts and tactical principles in an operational service environment	Measurement of tangible and intangible benefits of a project
Level of IT lifecycle	Governance IT strategy IT tactics	IT strategy IT tactics	IT tactics	IT strategy IT tactics	IT tactics	IT strategy IT tactics

From Table (1), it is clear that the above-mentioned standards, methodologies, and frameworks were developed and applied for specific purpose and objectives. From the review of the previous best practices, Val IT as a framework represents a suitable tool for this study. Val IT can manage the portfolio of IT investments in the entire life cycle including

governance, strategic and tactical levels. It has been designed specifically for IT investment for realizing the value of the business outcome. Val IT can be used to monitor measure and optimize both non-financial and financial returns. Val IT provides alignment of IT and business to enable creating value. It also provides a structured approach for managing the value of IT investment. Furthermore, it includes metrics that help enterprises to measure their progress (ITGI, 2008). It is clear that there is no alternative to Val IT to meet the study objective.

Another angle of mapping, Table (2) represent a mapping of Val IT processes to other mentioned standards, methodologies, and frameworks from IT life cycle perspective (Governance, Strategic, and Tactic).

Table (2)
Mapping of Val IT processes to MSP, ITIL v3, Prince 2, MOF, and VMM

IT Lifecycle	Val IT processes	Full Match		Partial Match		Unrelated / Minor match	
		MSP	ITIL V3	Prince2	MOF	VMM	COBIT5
Governance	VG1: Establish informed and committed leadership.						
	VG2: Define and implement processes.						
	VG3: Define portfolio characteristics.						
	VG4: Align and integrate value management with enterprise financial planning.						
	VG5: Establish effective governance monitoring.						
	VG6: Continuously improve value management practices.						
Strategic	PM1: Establish strategic direction and target investment mix.						
	PM2: Determine the availability and sources of funds.						
	PM3: Manage the availability of human resources.						
	PM4: Evaluate and select program to fund.						
	PM5: Monitor and report on investment portfolio performance.						
	PM6: Optimize portfolio performance.						
Tactic	IM1: Develop and evaluate the initial program concept business case.						
	IM2: Understand the candidate program and implementation options.						
	IM3: Develop the program plan.						
	IM4: Develop full life-cycle costs and benefits.						
	IM5: Develop the detailed candidate program business case.						
	IM6: Launch and manage the program.						
	IM7: Update operational IT portfolios.						
	IM8: Update the business case.						
	IM9: Monitor and report on the program.						
	IM10: Retire the program.						

Based on Table (2), there are many differences between Val IT and other best practices as mentioned in details in the following paragraphs.

2.4.8 Val IT to PRINCE2:

PRINCE2 has a very weak relation to Val IT. Only three processes in investment management domain of Val IT covered partially by PRINCE2. There is also a minor coverage in the Value Governance domain of Val IT (De Haes, Harrison, 2009).

2.4.9 Val IT to ITIL V3:

There is a partial relation between Val IT and ITIL V3 from the three Val IT domains perspective. ITIL V3 deals with service management as an asset to deliver value through service life cycle. In the other hand, Val IT focuses on managing the portfolio of investments in the three domains which include an explicit portfolio of IT services and resources. ITIL is deeply operational and there is a partial coverage of Val IT processes in the three domains (De Haes, Harrison, 2009).

2.4.10 Val IT to MSP

There is a strong similarity between Val IT and MSP in investment management domain. MSP didn't cover portfolio management or Value Governance. MSP cover all aspects of the strategic level of Investment management like Val IT and go deeper to cover operational level (quality, risk, and benefits realization) (De Haes, Harrison, 2009).

2.4.11 Val IT to VMM:

There is a partial relationship between Val IT and VMM in investment management domain and portfolio management. VMM didn't cover Value

Governance domain. VMM cover partial aspects of the strategic level and tactic level.

2.4.12 Val IT to MOF:

There is no direct relation between Val IT and MOF. As MOF work at the operational level and Val IT on the strategic level. Some MOF results feed Val IT processes as inputs (Voon, Salido, 2009).

2.4.13 COBIT5 to Val IT:

COBIT5 include Val IT, Figure (9) shows the where Val IT lay in COBIT5 processes.

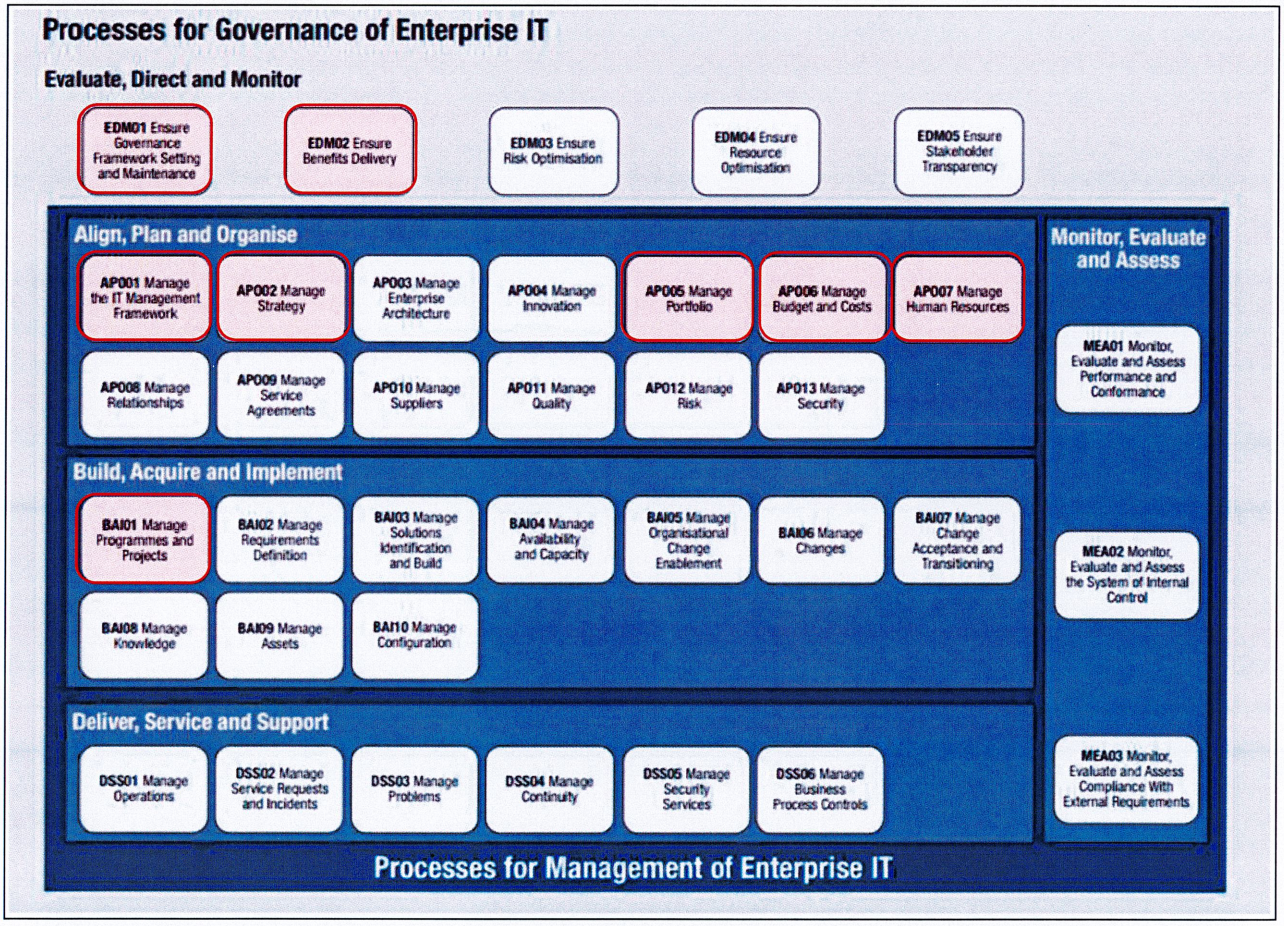


Figure (9)
Val IT - COBIT5 processes (ISACA, 2012)

Based on the previous mapping, Val IT represents the suitable tool to investigate issues and challenges of public organizations. It covers all process in the full IT life cycle to enable the business value from IT investments. That coverage will allow the study to include issues and challenges that enable government entities to realize the benefits and strength the EGIT.

Symons, Cardin, Cullen, and Belanger mentioned that any organization struggle in executing IT strategies of value delivery, not having a road map to select a proper investment or struggling in communicating the value to stakeholders could use Val IT as a tool. It is a roadmap to improve the decision of selecting IT investment (Symons, Cardin, Cullen, & Belanger, 2007).

COBIT5 is more than our scope, so exception for COBIT5, Val IT is the best-suited framework that can be used to enable the private or public firm to define, implement, manage and maintain the optimal value from the IT investments done by such firms. It meets the study objectives and can be used as a tool to tackle issues and challenges that faced by government entities to realize the value. More details mentioned in the methodology section in how Val IT can be used as a tool of this study.

2.5 Val IT in details

Val IT covers the enterprise governance view which helps executives to focus on two of four fundamental IT governance-related questions which are (Thorp J., 1998) as shown in Figure (10):

1. Are we doing the right things?
2. Are we getting the benefits?

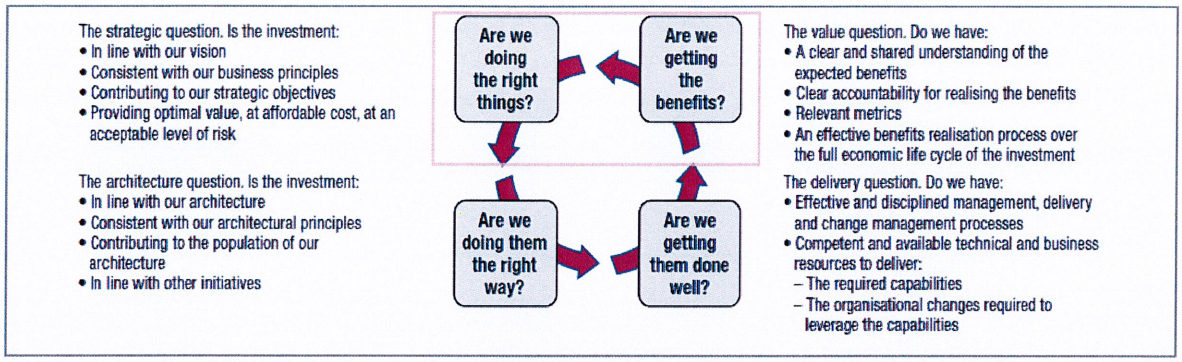


Figure (10)
Four fundamental IT governance-related Ares (Thorp J., 1998)

Val IT Framework components:

Val IT framework gets its strength as it is guided by a set of principles applied in value management processes that are enabled by key management practices and are measured by performance against goals and metrics (ITGI, 2008b). In order to ease understanding of the framework, Figure (11) contains the basic components of the framework which will be described below in details:

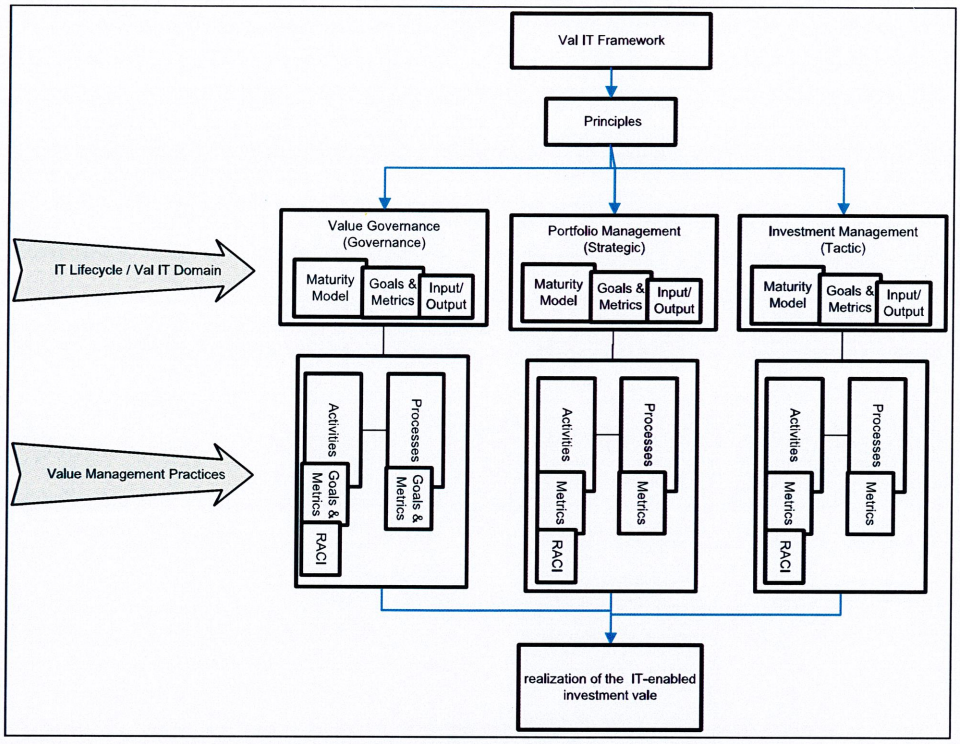


Figure (11)
Val IT framework components (ITGI, 2008b)

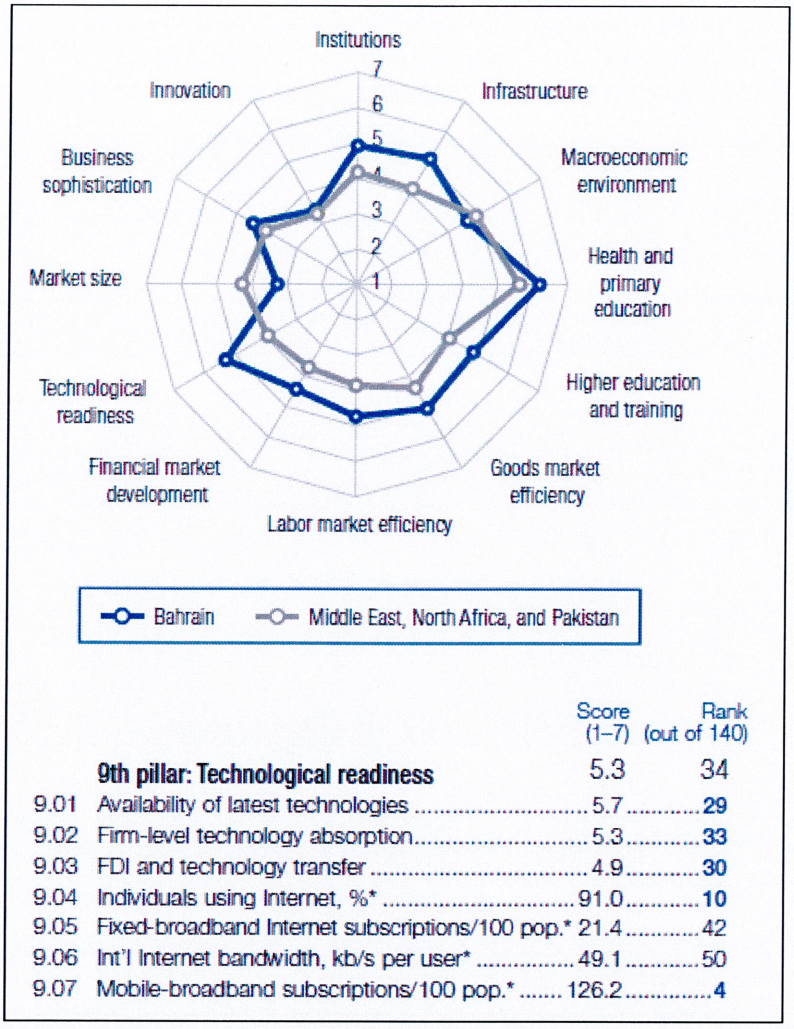
- There are seven principles for Val IT where enterprises will realize the value of IT investment.
- Val IT Management guidelines provide for each process goals and metrics, inputs and outputs, activity descriptions, and RACI charts (process, activities and metric).
- Val IT framework describes goals and metrics for specific objective at three levels: domains level (Value governance, Portfolio management, and Investment management), process level, and activity level.
- For each process in Val IT framework has Inputs which provide what is the needed from other processes (program plans, reports, etc. . .). For each process in Val IT framework, there are specific outputs delivered to other processes.

- For each process and activities in Val IT framework, there is a RACI chart provided (responsible, accountable, consulted and informed)
- RACI chart defined for typical roles, where they are well defined in the Val IT framework.
- Val IT framework provided a maturity model for each domain scaled from zero to five. Zero represent the lowest score (didn't adopt the basic practices recommended by Val IT) and five the highest score (they are leveraged to the Val IT practices to optimize and quantify the value and can continue to create the value of the investment).

2.6 Status of governing value of IT investment in Kingdom of Bahrain

Bahrain like any other GCC country has the social obligation to redistribute oil income to raise capital expenditure of the governmental entities -GEs and increase the productivity of the country (Cooper et al., 2008). Although there are many efficient Governmental Entities (GEs) serving citizens of the country through IT-enabled investments, computing actual benefits from such investments alone is a serious issue.

In IT field, Bahrain gained many awards, whether on the level of the Gulf or Arab or internationally. The latest one was ICT Sustainable Development Award (EGA, 2015). From index point of view, the Global Competitiveness report (2015) mentioned Bahrain global rank in technology readiness is 34 and the score is 5. 3 out of 7 (World Economic Forum, 2015). It is the highest rank among the Middle East Countries. As shown in Figure (12):



		Score (1–7)	Rank (out of 140)
	9th pillar: Technological readiness	5.3	34
9.01	Availability of latest technologies	5.7	**29**
9.02	Firm-level technology absorption	5.3	**33**
9.03	FDI and technology transfer	4.9	**30**
9.04	Individuals using Internet, %*	91.0	**10**
9.05	Fixed-broadband Internet subscriptions/100 pop.*	21.4	42
9.06	Int'l Internet bandwidth, kb/s per user*	49.1	50
9.07	Mobile-broadband subscriptions/100 pop.*	126.2	**4**

Figure (12)
Technological readiness in Bahrain (World Economic Forum, 2015)

Behind that success, many of legislations exist which enhance the role of information technology and in particular the role of governance (legalization and legal opinion commission, 2016).

Currently, International Monetary Fund mentioned that regional governments could lose US$175 billion in their economic surpluses because of falling oil prices. For that, there is a need to oversight and coordinate across projects (Kane, 2016).

In 2014, Bahrain National Audit report showed there are more than twelve IT systems were having problems of (National Audit Office, 2014):

- A large amount of money is wasted.
- Not getting the intended quality from IT investment
- Projects took very long time
- Lack of control/ Security

The report also mentioned that there were many mandatory IT systems which were not accomplished and effectively had degraded the performance of the GEs.

Bahrain GEs believe in the importance of IT to improve their productivity and performance. Table (3) and Figure (13) shows the number of IT awarded tenders that represent only part of IT investments cost per year by GEs in Bahrain. The researcher analyzed data related to IT investment tenders which are related either to operational cost like renewal and HR experts, or related to capital cost where new systems (hardware/ software) were needed. The table shows that a major percentage of GEs expenditure (about 30% over the last three years) is due to IT awarded tenders costs and therefore the overall expenditure versus profit is dependent on IT investments (Tender Board, 2016):

Table (3)
Outsourced IT investments details between 2012 and 2014 (Tender Board, 2016)

Year	IT awarded tenders	Cost (BD)	Average (BD/ IT investment)	Average cost of IT investment/ total average investment
2012	87	9, 678, 556	111247	23% (479851)
2013	111	18, 738, 061	168811	38% (443786)
2014	91	13, 497, 906	148328	30% (489987. 4 estimated)

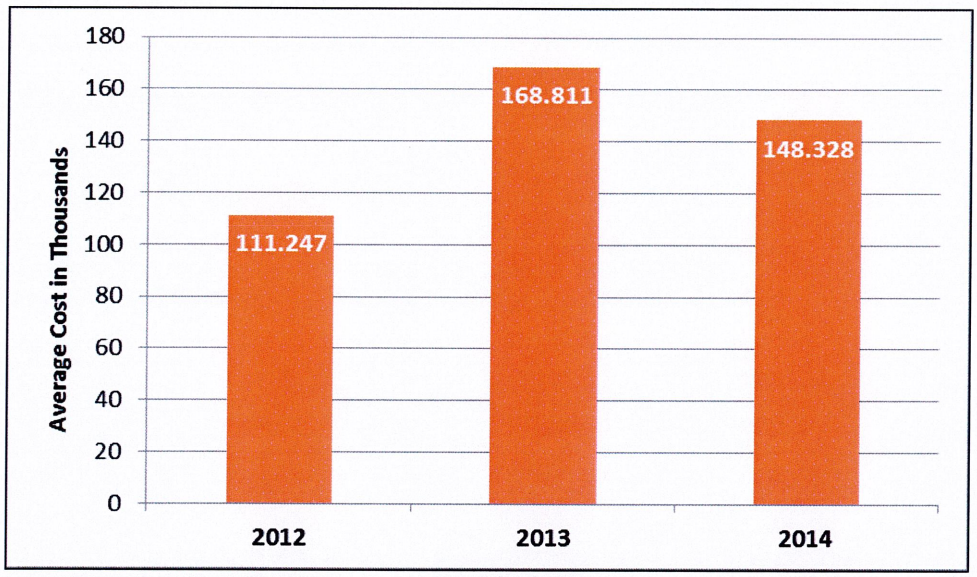


Figure (13)
Average cost of IT awarded tenders (Tender Board, 2016)

Most of the GEs do not have a structured approach to ensure that there is a value realization in IT investment done and optimally increase overall productivity (Tradearabia, 2016). Generally, such approach includes selecting what & how much to invest and efficiently manage its complex challenges to get optimal intended value. The absence of this approach lead to a large investment in IT are wasted or not getting the intended return from that investment. Some GEs used to measure such value by analysis of previous governance failures and there is a lack in using a standard which leads to leak in governing IT investments and inefficient cost (Omari et al., 2012).

2.7 Previous studies on IT value management

This section includes previous studies done on the same research topic. Also for each study comments are provided.

2.7.1 Police Case Study:

The ITGI (2007b) did a study to demonstrate the issues and challenges involved in managing IT-enabled investment and to understand the initiatives required to achieve desired outcomes. The core focus of this case study was to illustrate the management of IT investments through its full economic life cycle and ensuring clear accountability and measurement.

Context of the case study:

This case study takes an example of medium sized police service which took a large program of IT-enabled investment to upgrade its aging infrastructure and better support to its new business directions. Being a governmental agency, financial return on investment (ROI) couldn't be calculated in absolute terms. Therefore, the first step they took was to define "Value" for this governmental agency. The contributions made by the IT initiatives supporting the strategic plan of the agency to achieve business outcomes were defined. The IT projects were linked to the IT initiatives which were contributing the business outcomes. Also the governance framework was defined to steer, manage and execute the IT projects (ITGI, 2007b). Five 'stage gates' has been identified where the IT investment was analyzed by value governance body. As shown in figure (14):

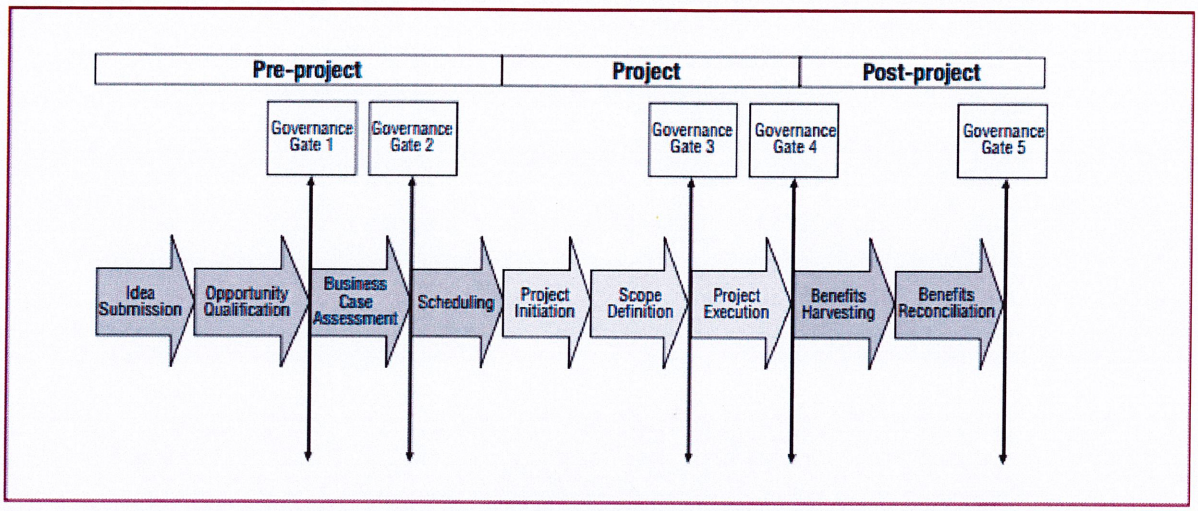


Figure (14)
Value Governance Life Cycle (ITGI, 2007b)

It starts with assembling the business case which is updated and checked if it is worthy to progress at governance gate 2, 3, and 4. Governance gate 5 check if the actual costs and benefits are reconciled to the last business case. Value governance body receives results for feedback, lessons learned, and forwarding the result to the government. Therefore, the agency was able to set up a framework for the selecting, executing and realizing the value (estimated outcomes aligned with the strategic plan of the agency) of the IT projects.

The researcher found that there are many good points in this case study. First of all "Value" definition at the earlier stage of the lifecycle when the overall strategy of the agency was formalized. Secondly, Value governance framework was formalized involving senior officials from all the areas of the agency. Therefore, responsibilities and accountabilities were well defined to contribute and participate in well-informed investment decisions. Thirdly, the overall value governance lifecycle was broken into pre-project, project and post-project parts. Further, the overall lifecycle was broken into the 5 stage gates to discuss, agree and conclude on the well-informed investment

decisions in an organized and efficient manner. Fourthly, the value governance perspective enabled the governmental agency to link the IT initiatives with the business outcomes as per their strategic plan despite being unable to evidence any financial ROI.

On the other hand, the researcher finds many shortfalls. First of all grouping of projects into portfolios which are linked to the services provided by the police agency were not defined. In the absence of portfolio level grouping, the management and governance of investment decisions based on the services being offered by the police agency may not be defined. Secondly, the categorization and management at each investment level were not made. In the absence of such investment management, the regularization of each investment made by the agency may not be achieved / formalized. Thirdly, the case study does not provide the actual measurement metrics for the success or failure of value governance framework defined for the police agency. The case study only provides the conceptual level information to understand the value governance and its application for the governmental agency.

To sum up, this case study provides a conceptual level understanding and brief information about the usage, application and advantages of implementation of value governance framework for the governmental agency in order to achieve the overall value (as per its definition) without calculation of financial ROI (such as net present value, discounted cash flows, etc.). The value governance framework is applicable to the research objective.

2.7.2 Investment Portfolio Management at ING

In 2006, ITGI had done a study to illustrate the importance and application of Val IT framework to a large scale private organization (ING).

Context of the case study:

The study depicts the solid business growth and increases in profit due to ING's superior business performance and robust IT Governance structure supported by innovative IT portfolio analysis. They implemented "Medium Term Plan" (MTP) which involved business owners and chief information officer to work collaboratively as Chief Investment Officer (CIO). The role of this innovative CIO was to balance risk and return of IT-enabled investments. Treating IT as an investment center (rather than as a cost center) help in increasing the possibility that IT will add to the value creation (ITGI, 2006a).

This case study had several processes from all the three domains (Value Governance, Portfolio Management and Investment Management) mentioned in the Val IT framework and provided high level information about practical implementation of such framework through the covering: the IT governance structure, Managing the IT investment portfolio, Inventory of the portfolio, Payback period of the portfolio, NPV (Net Present Value) of the portfolio, Risk vs. return of the portfolio, A general framework for IT governance, Key success factors, and strategic alignment between business and IT (ITGI, 2006a).

As per the case study, ING was heavily dependent on IT with its annual IT spend of about 25% of total operating expenditure and contribution of about 40% of the net operating income. Therefore, executive board and

senior management of the firm took IT governance and IT investment portfolio management very seriously by carefully limiting the IT expenditure and focusing on optimal increasing the overall contribution of IT spend to business profit. This objective was achieved through an organized and well-structured implementation of the concerned and applicable processes stated in the Val IT framework. However, due to large staff in IT department, it was possible to analyze, prioritize, design and implement the processes mentioned in Val IT framework. The case study also mentioned that the same methodology can be used by the similar or larger sized organizations. The case study also stated that for smaller or medium sized organization, a simpler model can be used to adopt Val IT framework and achieve value delivery from the IT-enabled investments of such organizations (ITGI, 2006a).

The researcher finds many good points in this case study. To begin with, this case study provides a high level practical design, concepts, and examples for analysis and implementation of the three domains stated in Val IT framework. It also provides the high-level mapping of Val IT processes to the execution process utilized by ING for implementing the Val IT framework. Furthermore, it explains the application of key value IT principles through practical concepts such as "full economic life cycle", "Key metrics", "payback period", "Risk-adjusted return of the portfolio", etc.

On the other hand, researcher finds many shortfalls. First of all, this case study provides summary or high-level information about the analysis and implementation of Val IT framework for a large scale private organization. Due to confidentiality reasons, the detailed implementation steps are not included in this case study. Although this case study mentions

about the annual review of IT dashboard for a period of six years and the overall evolution of the IT governance and IT investment portfolio, this case study does not provide details about the schedule of activities to be performed to design and implement IT investment portfolio. Furthermore, this case study mainly focuses on financial (tangible) benefits from IT investment portfolio. It does not provide the necessary guidance or practical information to measure and control non-financial (intangible) benefits from the It investment portfolio.

Overall, this case study provides an oversight of analysis and implementation of Val IT framework for a medium to large sized private organization. Some of the principles or practical approaches mentioned in this case study can be used by this study.

2.7.3 IT Value Management at KLM

In 2011, ISACA did a study for Dutch airline company (KLM) about implementation of value management practices of IT enabled investments. The core focus of this case study is to understand the design and implementation of value management practices through formation of Enterprise IT Governance framework (ISACA, 2011).

Context of the case study:

KLM is an airline company (more than 33, 000 staff worldwide). In 2009, IT department in KLM employed close to 1, 000 (internal and external) with large IT budget (approximately €300 million). KLM IT department wanted to create business value by providing reliable IT services to enable business changes. Strategic goals for IT were identified (ISACA, 2011).

The case study provides brief information about the approach taken by the KLM executive board to establish the Governance of Enterprise IT (GEIT) framework and high level roadmap for design and development of value management practices. The key change made by the Executive Board of KLM was to leverage the roles and responsibilities of the Executive Vice President (EVP) of the operations control and appoint him as Chief Investment Officer (CIO). Due to this change, the scope of IT governance which was earlier limited to IT was then increased to enterprise level forcing the EVP's and business stakeholders to discuss, analyze and contribute to design and development of Governance of Enterprise IT (ISACA, 2011).

"IT: A Collaborative Effort" was the launched project that focused on enabling stakeholders to have better understanding about the cost and value of IT. That enabled them to make informed decisions about how and what to potentially outsource. A roadmap to embed the value management practices within the enterprise and ensuring optimal value from its IT enabled investments was achieved. This roadmap depicts fair adoption of Value Governance basic principles and processes within the organization. Further, the projects of similar nature were grouped into portfolios depending on the prioritization, funding levels and business services. The hierarchy of approvals, job profiles and overall reporting lines were restructured suitable to portfolio of investments. Such practice was mapped with Portfolio management of IT enabled investments (ISACA, 2011).

The good points in this case study: it provides actual mapping of real life management or operational practices with the processes / activities mentioned in the Val IT framework. Also this case study denotes the importance of senior / executive management for design, implementation,

execution and monitoring of value management practices and EGIT. Furthermore, this case study provides the roadmap (in brief), reasoning and approach for design and implementation of GEIT in a medium to large scale organization. Although KLM had not used directly the principles and practices mentioned in the Val IT framework, it had heavily contributed to mapping and evolution of Val IT practices for the benefit of other similar sized organization

On the other hand, the shortfalls of this case study are: this case study does not provide detailed metrics for performance measurement and benefit realization. Also this case study assumes primary responsibility of business to define and implement the IT enabled investments. This may not be efficient way of implementing Val IT as it may not address the technical challenges or opportunities that may rather be well understood and handled by the IT department. Furthermore, some of the Val IT processes / activities are not mapped to KLM approach and hence not mentioned in this case study. Therefore, the reader of this case study may not have full picture of implementation of Val IT framework.

Overall, this case study provides good information about the roadmap, approach and implementation of value management practices in real life large sized organization. The importance of senior management commitment, GEIT and Portfolio of IT enabled investments is well explained.

2.7.4 Characteristics of organizations that succeed in achieving the IT investment value

A study done by Ward (2006), aimed to show examples that succeed in achieving the business value. He found that while 96% of respondents accomplished business cases, 69% were not satisfied the intended value. He also found that there is a positive impact of practicing Val IT. The study identified many characteristics available to organizations that succeed in delivering value:

First characteristic the selection of the program based on the ability to deliver the value not depending only on the needs, second characteristic having a well structure in place is usefulness if not everyone following and using them. Third characteristic business case should include benefit for all stakeholders. Benefits should be managed over the entire investment life cycle. Business accountability and ownership are assigned for all benefits in integrated and monitored planning. And last lessons learned collected from both successful and unsuccessful programs. Ward's study have many matches of Van Grembergen & De Haes (2005a) and Tiernan & Peppard (2004a) findings.

2.7.5 IT project managers challenges

Doraiswamy & Shiv (2012) wrote a book about Top challenges of IT projects. The book included 50 challenges in details and recommendation to overcome them. Unclear requirements, missed requirement, delay in document approvals, scope creep, unclear risks and issues are examples. Researcher noticed there is no categorization for these challenges and they are very general, for example unclear requirements, missed requirement can be combined as requirements related.

Another study showed the most pain points that affect achieving the value of IT investments. Those pain points are challenges in delivering the technical capabilities where organizations need to improve their value management practices. The second challenge related to the limitation of providing the transparency by having sufficient understanding of the IT expenditures, where most decision makers depend on subjective expenses and benefits. The third decision is that business hand over decisions of IT investment to the IT function, where IT function are taking the driver seats because there are unclear responsibilities and accountabilities. The fourth challenge referred to the gap in the communication between IT and business, which lead to a culture of blame. The fifth challenge is due to the executive's behavior that they keep focusing on managing IT cost rather than asking about the realized value which represent the main constraint. Sixth and last pain point is the failure of major investment (examples: ERP, CRM initiatives), failure referred to unreliable plan which causes huge cost and time wastage. Besides these challenges, the study mentioned many approaches applied Val IT (ITGI, 2008a). Researcher finds that there is no specification on which stage of the project may occur. This study identifies challenges that prevent IT project managers from realizing the value of IT investment with affected stage, related value management practices, and categorization depending on respondent's response.

Another study was accomplished to highlight Kingdome of Bahrain experience in developing National Enterprise Architecture Framework. The Enterprise Architecture included four layers which are: Business, information, application, and infrastructure. The study highlighted many issues that ministries had, for example, the involvement of senior

management is visible only in the initial stage of the IT service. Another issue was related to human resource shortage in IT function. Ownership of the services is not clearly defined, adding to that SLA and SLO is missed by many GEs. Also, the ROI of IT investment can't be justified enough due to the inconsistency alignment between business and IT (AlSoufi, Ahmed, 2012).

Júnior & Chaves conduct another study (2015) that covered two types of Risks in IT projects, risks of scope and organizational risks. The study covered telecommunications companies where actions for risk mitigation were proposed. There are seven risks that are related to scope which are: volatile environment, lack of stable requirements, project complexity, scope misunderstanding, failed identification of business rules, lack of process maturity, criterion changes of deliverables. Also, the study found that there are seven risks that related to the organization which are simultaneous organizational changes, cultural conflicts, internal conflicts, senior manager change, project owner change, insufficient resources, and withdrawal of support of top management.

Referring to the previous studies that covered different categories of challenges that can occur during the IT project lifecycle, Researcher concluded no unique categorization to the challenges. This study categorizes the challenges depending on responses received from participants.

2.8 Chapter Summary

EGIT is one of the most important topics today to create the business value from IT enabled investments. Achieving IT investment value represent

a problem not only limited to the Arab countries, as studies showed that top enterprises in the world suffer from this problem.

Several standards were developed for aligning IT to business and create value. All of them were designed with a specific objective and hence had applicability or usability limited to its objective or purpose for which it was developed. Val IT is the best-suited framework that can be used to meet research requirement.

The organization would typically have corporate governance structure. The Enterprise Governance of IT (EGIT) framework forms part of overall corporate governance structure and this EGIT framework encompasses the IT governance. The value management principles and practices are the resultant portion of the combined frameworks mentioned above. The figure (15) below provides a diagrammatic representation of the above-mentioned theory.

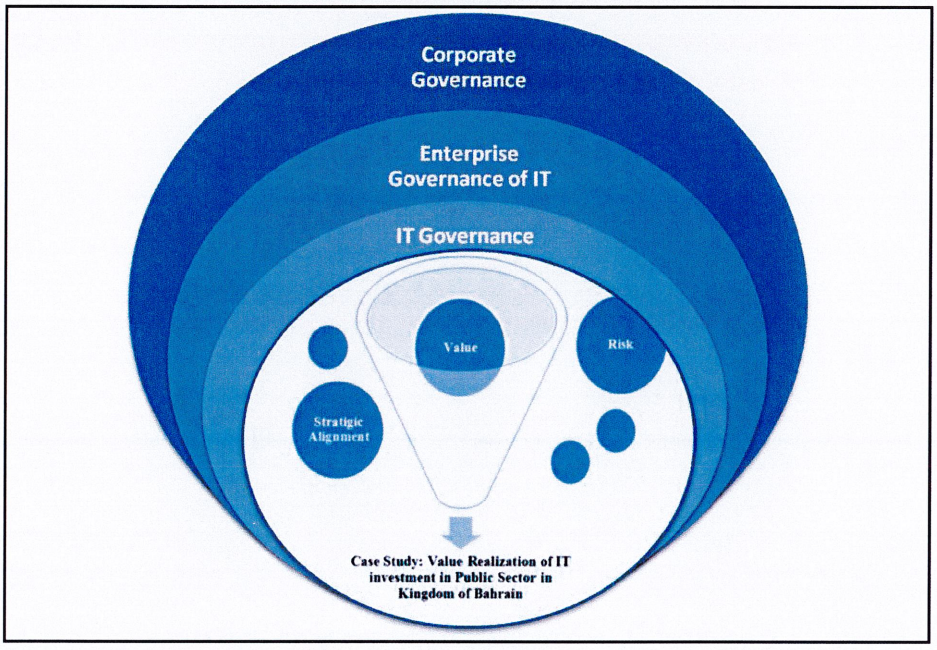


Figure (15)
Illustration of the research contribution

Typically, the literature of overall business strategy, IT strategy and its governance would cover information about creating and realizing value from the related investments. However, the methodology and the best practices to be followed for value governance, realization and management may not be adequate and appropriately formalized and exercised. This research studies value governance, realization and management principles and practices in detail and attempts to customize a best practice framework to be applied on the selected GEs as case studies to end up with intended challenges, issues, and gaps.

CHAPTER 3: METHODOLOGY

3.1. Research conceptual framework

3.2. Val IT customization

3.3. Research Approach

3.4. Sample

3.5. Research Instrument

3.6. Validity and reliability

3.7. Data Analysis

3.8. Summary

CHAPTER 3: METHODOLOGY

The purpose of this chapter is to cover the methodological aspects that have been followed in this study. This chapter describes the research conceptual framework, Val IT customization, research approach, sample, research instrument, validity and r ··ıbility, data analysis and chapter summary.

3.1. Research conceptual framework

The use of a visual summary allows understanding how the study of the topic adds to, extends, or replicate previous research already completed by other authors or researchers. Components of the Val IT framework and Value governance framework that were used to answer research questions are mentioned bellow:

Value management practices: Processes, Activities, and Metrics were used as guidance to generate questionnaire from the three Val IT Domain to cover the research objectives (ITGI, 2008b).

Value governance stage: Value Governance Stages (Submission of idea, Opportunity Qualifications, etc.) (ITGI, 2007b) will be used for classifying value management practices under each one of them.

To cover the objective of the study, the following steps were followed: First of all, Researcher categorized those value management practices to value governance stages. That was done after noticing a drawback in Val IT, that there is no order or execution cycle as mentioned in the Val IT framework (ITGI, 2008b). The categorization ease the process of tracking GEs situation in managing IT-enabled investments and answer the research questions.

After that related metrics of the value management practices were used to generate interview question that included ten sections, the first section included general information about the GEs, participants, and the selected IT projects. The aim of the first section mainly to have a general background about the GEs and satisfy the research conditions mentioned in sample section. The aim of the nine section to answer the current situation of the GEs which answer the first question of the research. Analyzing the results and mapping them to literature and best practice would lead to the gaps in the GEs, and here the second question of the research is answered. Many questions related to the challenges that participants faced, and this will answer the third questions of the research (A copy of the interview questions is located in Appendix A). Figure (16) shows how the interview questions were used as a guidance to answer research questions.

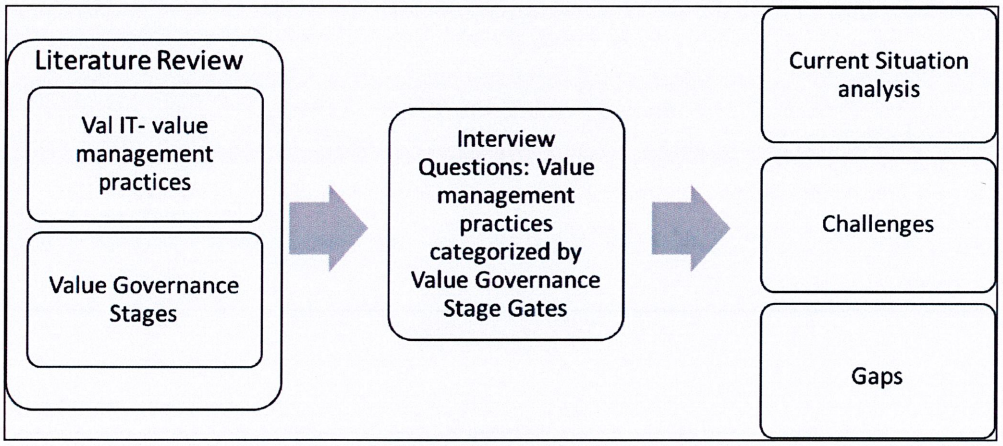


Figure (16)
Research conceptual framework

3.2. Val IT customization

One of the drawback noticed in Val IT, that there is no order or execution cycle as mentioned in the Val IT framework (ITGI, 2008b). For that Val IT

framework will be customized and used to cover research objective through the following steps:

- Activities (the lowest and detailed level of Val IT framework) has been categorized depending on the stages to ease the process of tracing GEs situation in managing IT-enabled investments. Stages are well defined in (ITGI, 2007b) but not clear what activities should be done in each stage.
- The categorization will ease understanding of questionnaire to managers, in which they will know what is needed to be done sequentially.
- After analyzing input and output of each process, these notes has been notified:
    - Processes in VG domain need inputs from external (Business Strategy, IT strategy, COBIT . . . etc.) or from the same level
    - Processes in PM domain need input from external, VG, or same level. There are cases that inputs from IM domain when it is related to update or feedback.
    - Processes in IM domain need input from external, PM, VG, or same level.
    - Classification of the activities of Val IT framework has been done depending on definitions of the stages and Val IT framework.

Figure (17) shows the stages methodology concept used to map the Val IT framework for this research:

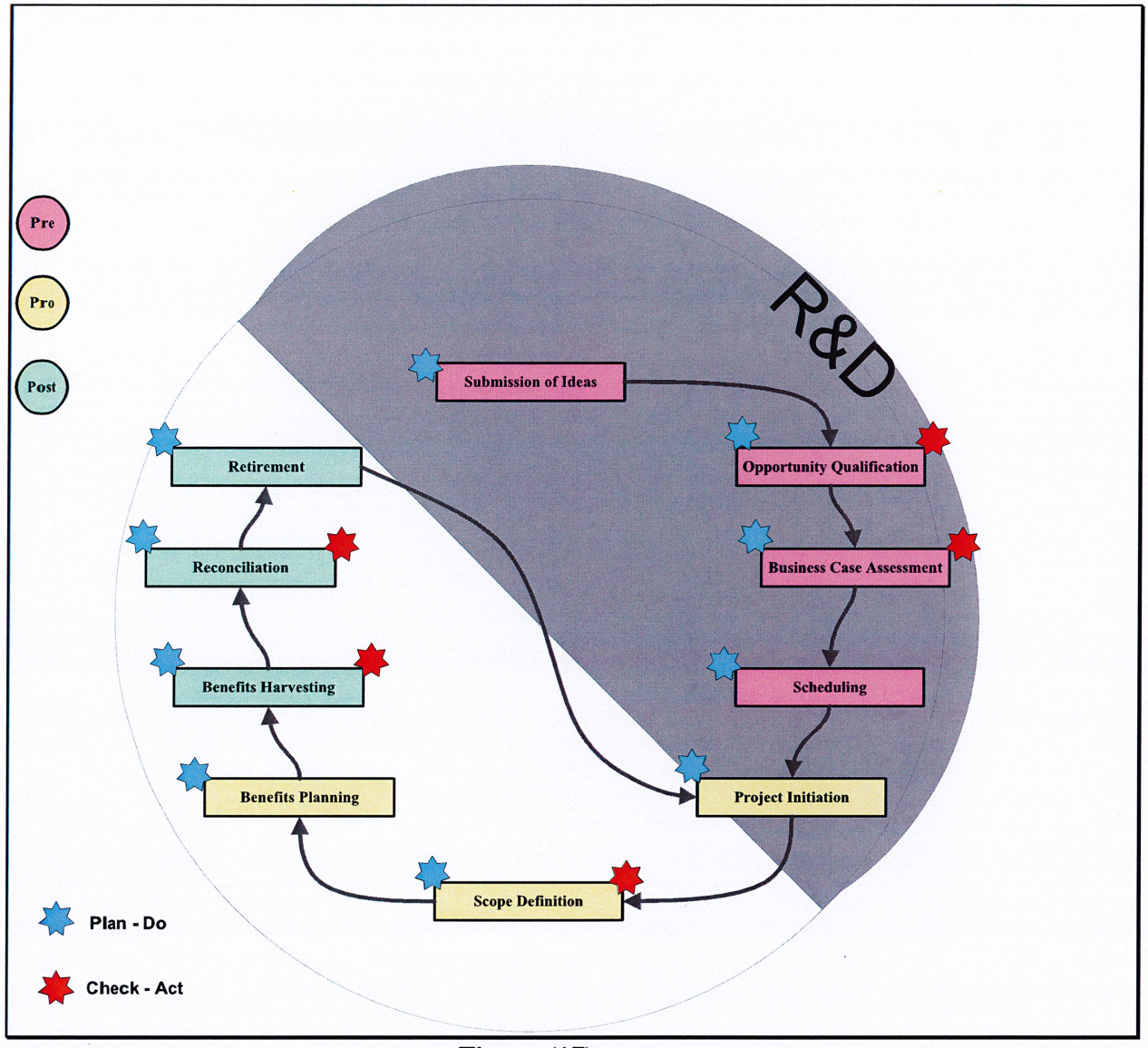


Figure (17)
Value governance stages (ITGI, 2007b).

There are 10 stages mentioned in the diagram (ITGI, 2007b), broadly, there are three durations mentioned in the above diagram:

Pre project – This is the duration when the processes related to the setup, research, analysis, etc. activities are performed. (Value definition and setup related activities)

Project – This is the duration when the project related processes are performed. (Value planning, design and implementation related activities)

Post project – This is the duration when the processes relating to benefits realization, retirement and lessons learned are performed (Value realization, retirement and reconciliation related activities)

There is a grey area marked in the above diagram which depicts the "research and development" duration. The research and development duration will trigger during the reconciliation stage to research, analyze and result into a finalized scope of investment for replacing the "to be" retiring investment. Therefore, in the above diagram, the "retirement" stage is looping back into the project initiation during which time the research and development duration shall have already identified another investment / portfolio related project to replace the retired investment.

Further, there are "blue colored" and "red colored" stars for the concerned stages in the above diagram. As mentioned in the diagram, the "blue colored" star represents the "planning" and "execution" (Plan – Do) related activities. The "red colored" star represents "monitoring" and "action" (Check – Act) related activities.

This stages methodology is then mapped with the Val IT framework and optimal categorization of each process / activity mentioned in the framework is performed.

During categorization of Val IT framework and mapping it with stages based methodology, a sequential flow of processes and activities can be realized as given below at the conceptual level:

- During first time implementation of Val IT framework, the value governance, portfolio grouping / management and investment management are sequential processes / activities.
    - The Value governance domain focus more on strategic level information needed to revise or modify the existing organizational structure, reporting lines, governance functions and responsibilities and accountabilities
    - The Portfolio management domain focus more on grouping and regrouping of similar type of investments needed to realize business initiatives based on the governance structure implemented during execution of value governance stage.
    - The Investment Management domain focus more on the individual investments from the portfolio of investments defined earlier during portfolio management stage.
- Once the Val IT framework is implemented and related value management group is identified then this group can perform any of the value IT domain activities at any point in time based on the need at that hour. Therefore, the value management activities then become operational activities to define, manage and maintain the value governance for the organization.

Therefore, as per the research, the mapping of stages with Val IT framework addresses the issue of sequential implementation of Val IT framework into an organization. The overall mapping of Val IT activities to stages shown in the following figures.

The above mentioned mapping provides sequential processes / activities for each stages. The sample of sequential flow of processes / activities resulting from stage gate mapping with Val IT framework is as given below2 (Table (4)- Table (12)):

Table (4)
Submission of idea management activities

Submition of idea	
VG1: Establish informed and committed leadership.	
VG1.1 Develop an understanding of the significance of IT and the role of governance.	X
VG1.2 Establish effective reporting lines.	X
VG1.3 Establish a leadership forum.	X
VG1.4 Define value for the enterprise.	X
VG2 Define and implement processes.	
VG2.1 Define the value governance framework.	X
VG2.2 Assess the quality and coverage of current processes.	X
VG2.3 Identify and prioritise process requirements.	X*
VG2.4 Define and document the processes.	X*
VG2.5 Establish, implement and communicate roles, responsibilities and accountabilities.	X*
VG2.6 Establish organisational structures.	X*
PM1 Establish strategic direction and target investment mix.	
PM1.1 Review and ensure clarity of the business strategy and goals.	X
IM1 Develop and evaluate the initial programme concept business case.	
IM1.1 Recognise investment opportunities.	X
IM1.2 Develop the initial programme concept business case.	X

[2] Note: X means tested in the questionnaire, X* means not tested but recommended to apply it in the specified stage gate specially for challenges, X** means applied indirectly

Table (5)
Opportunity Qualification management activities

Opportunity Qualification	
VG1: Establish informed and committed leadership.	
VG1.5 Ensure alignment and integration of business and IT strategies with key business goals.	**X**
VG3 Define portfolio characteristics.	
VG3.1 Define portfolio types.	**X**
VG3.2 Define categories (within portfolios).	**X**
VG3.3 Develop and communicate evaluation criteria (for each portifolio category).	**X**
VG3.5 Define requirements for stage-gates and other reviews (for each category).	**X***
PM1.2 Identify opportunities for IT to influence and support the business strategy.	**X***
IM1 Develop and evaluate the initial programme concept business case.	
IM1.3 Evaluate the initial programme concept business case.	**X**

Table (6)
Business Case assessment management activities

Business Case Assessment	
VG3 Define portfolio characteristics.	
VG3.3 Develop and communicate evaluation criteria (for each portifolio category).	X
VG3.4 Assign weightings to criteria.	X
PM3 Manage the availability of human resources.	
PM3.1 Create and maintain an inventory of business human resources.	X
PM3.2 Understand the current and future demand (for business human resources).	X
PM3.3 Identify shortfalls (between current and future business human resource demand).	X
PM3.4 Create and maintain tactical plans (for business human resources).	X
PM3.5 Monitor, review and adjust (business function allocation and staffing).	X
PM3.6 Create and maintain an inventory of IT human resources.	X
PM3.7 Understand the current and future demand (for IT human resources).	X
PM3.8 Identify shortfalls (between current and future IT human resource demand).	X
PM3.9 Create and maintain tactical plans (for IT human resources).	X
PM3.10 Monitor, review and adjust (IT function allocation and staffing).	
PM4 Evaluate and select programmes to fund.	
PM4.1 Evaluate and assign relative scores to programme business cases.	X
PM4.2 Create an overall investment portfolio view.	X
PM4.3 Make and communicate investment decisions.	X*
PM4.5 Adjust business targets, forecasts and budgets.	X*
IM2 Understand the candidate programme and implementation options.	
IM2.1 Develop a clear and complete understanding of the candidate programme.	X
IM2.2 Perform analysis of the alternatives.	X*
IM3 Develop the programme plan.	
IM3.1 Develop the programme plan.	X
IM4 Develop full life-cycle costs and benefits.	
IM4.1 Identify full life-cycle costs and benefits.	X
IM4.2 Develop a benefits realisation plan.	X
IM5 Develop the detailed candidate programme business case.	
IM5.1 Develop the detailed programme business case.	X
IM5.2 Assign clear accountability and ownership.	X
IM5.3 Perform appropriate reviews of detailed candidate programme business case and obtain sign-offs.	X*

Table (7)
Scheduling management activities

Scheduling	
VG4 Align and integrate value management with enterprise financial planning.	
VG4.1 Understand the enterprise's current budgeting practices.	X
VG4.2 Determine the financial planning practices needed for value management.	X
VG4.3 Determine optimal financial planning practices, over what periods and who should be the budget holders for different types of expenditures.	X
VG4.4 Determine optimal IT funding practices.	X
VG4.5 Identify financial planning changes needed	X*
VG4.6 Implement financial planning changes.	X*
VG4.7 Define the structure, content and use of business cases.	X*
PM2 Determine the availability and sources of funds.	
PM2.1 Determine overall investment funds.	X
PM4 Evaluate and select programmes to fund.	
PM4.4 Specify stage-gates and allocate funds to selected programmes.	X*
IM4 Develop full life-cycle costs and benefits.	
IM4.3 Perform appropriate reviews of full life-cycle costs and benefits and obtain sign-offs.	X

Table (8)
Project initiation management activities

Project Initiation	
VG5 Establish effective governance monitoring.	
VG5.1 Identify key metrics.	X**
VG5.2 Define information capture processes and approaches.	X**
VG5.3 Define reporting methods and techniques.	X**
VG5.4 Identify and monitor performance improvement actions.	X**
PM3.10 Monitor, review and adjust (IT function allocation and staffing).	X
PM5 Monitor and report on investment portfolio performance.	
PM5.1 Monitor and report on investment portfolio performance.	X
PM6 Optimise investment portfolio performance.	
PM6.1 Optimise investment portfolio performance.	X**
PM6.2 Reprioritise the investment portfolio.	X*
IM6 Launch and manage the programme.	
IM6.1 Plan projects, and resource and launch the programme.	X
IM6.2 Manage the programme.	X
IM7 Update operational IT portfolios.	
IM7.1 Update operational IT portfolios.	X
IM8 Update the business case.	
IM8.1 Update the business case.	X

Table (9)
Scope definition management activities

Scope Definition	
IM6 Launch and manage the programme.	
IM6.2 Manage the programme.	X
IM9 Monitor and report on the programme.	
IM9.1 Monitor and report on programme (solution delivery) performance.	X
IM9.2 Monitor and report on business (benefit/outcome) performance.	X*
IM9.3 Monitor and report on operational (service delivery) performance.	X*

Table (10)
Benefits Planning management activities

Benefits Planning	
IM6 Launch and manage the programme.	
IM6.2 Manage the programme.	**X**
IM6.3 Track and manage benefits.	**X**

Table (11)
Benefit Harvesting management activities

Benefits Harvesting	
VG5 Establish effective governance monitoring.	
VG5.3 Define reporting methods and techniques.	**X**
VG5.4 Identify and monitor performance improvement actions.	**X**
IM9 Monitor and report on the programme.	
IM9.1 Monitor and report on programme (solution delivery) performance.	**X**
IM9.2 Monitor and report on business (benefit/outcome) performance.	**X**
IM9.3 Monitor and report on operational (service delivery) performance.	**X**

Table (12)
Reconciliation and Retirement management activities

Reconciliation and Retirment	
VG6 Continuously improve value management practices.	
VG6.1 Implement lessons learned.	**X**
IM10 Retire the programme.	
IM10.1 Retire the programme.	**X**

There are possibilities of having activities in more than one stage, especially for reporting during pro and post project, they are same but the purpose is different. During the pro for following the progress while post the final reports.

3.3. Research Approach

There are three approaches in social research: qualitative, quantitative, and mixed (Creswell, 2003). The following section handles a comparison between two approaches from many perspectives. Then it is followed by the suitable approach for this study.

3.3.1. Quantitative approach vs Qualitative approach:

There are many differences between the two approaches, as shown in the following paragraphs:

Flexibility: the Quantitative approach used to conduct social positivist research that uses fixed measurements, or tests a hypothesis while Qualitative approach more flexible than the quantitative approach used to discover unanticipated findings (Bryman, 1984).

Frequency: Quantitative approach concerned with the frequency of phenomena in the social studies, while the Qualitative approach is a set of techniques used to describe, translate, and decode the problem. (Rowlands, 2005).

Data: Data in Quantitative approach are a form of numbers while Data in the Qualitative method are not in a form of numbers (Punch, 1998).

Example: Example of Quantitative methods are: survey and laboratory experiments. Those methods used basically to study natural phenomena. In the other hand, Qualitative methods include case study, action research, and ethnography. Those methods used to study cultural and social phenomenon (Myers, 1997).

3.3.2. The research Method

Depending on the previous section (3.3.1), researcher finds the topic of this study is quite new especially for the case of Bahrain and not much covered in literature in this field. Furthermore, there are limited data about the GEs where there is a need to discover them and it is expected to get unanticipated findings besides of what will be gotten from best practice. Measurement of frequency will not be used, the study attempt to describe the problem in a real setting by using the existing measurement tools for testing. Case study method will be used in this study. The data will be collected in the form of recorded responses of semi-structured interviews. Furthermore, researcher reviewed previous studies that used Val IT and finds that qualitative approach has been used.

As a conclusion of the previous paragraphs, the qualitative approach is deemed more suitable than a quantitative approach, as participant's point of view in the context is needed and limited data available about how they communicate with the existing practices of their GEs.

3.4. Sample

As a result of using the qualitative approach, nonprobability sampling suited this study. Nonprobability sampling includes many sampling techniques for market surveys and case study research. The following paragraphs include brief about each technique

Critical case sampling is one of the purposive samplings that enables researcher to select best cases that enable to answer the research question and meet the objective. For this research critical case sampling suits this study to obtain issues, gaps and challenges of managers in GEs. In critical

case sampling, critical cases are selected where they make a point dramatically where logical generalization can be reached (Patton, 2002).

Researcher carefully selected the critical cases of the study by ensuring the following steps: Letters for data access has been sent to ten different GEs. GEs that accept the invitation nominated candidates that can participate in the study. The critical cases are GEs, participants, and IT projects. The logical generalization can be reached since the study covered all cases that may occur of the research variables. Researcher collect more data if any of the following conditions not satisfied:

Critical cases of GEs: where the data collection should continue until the cases included the case where: IT department is responsible for managing the IT project, IT department is not responsible for managing the IT project, IT department is responsible for achieving the business value, IT department is not responsible for achieving the business value. The combination of such critical cases cover all possible possibilities.

Critical cases of IT project: where the data collection should continue until Systems resulting from IT projects are: Insource, outsource. The IT projects were of high priority and completed one year before the study. The aim to cover all kinds of IT projects (insource, outsource) and completing one year as there should be an achievement on value. Choosing IT projects of high priority to scope the role of value governance body and the GE staff where they should perform their best performance.

Critical cases of participants: where the data collection should continue until participants Participate in managing IT projects have at least 4 years full-time experience in managing IT projects in the public sector. The

aim of scoping the years of experience and their role to trust the data of the participants.

The aim of such selection of the critical cases to represent a case of all possible occurrences to have all possible reasons that prevent GEs from realizing the value of IT investments. This is where the logical generalization can be reached.

3.5. Research Instrument

Semi-structured interviews are one of the non-standardized interviews that is used widely for qualitative research (King, 2004). Using semi-structured interview allow having list of questions and themes that are flexible to omit, add or change questions in the interviews depending on the conversation flow. Probing the questions needed especially when participants choose not to disclose sensitive information that they don't wish to discuss (Saunders et al., 2011). Interviews can afford interviewee a chance to hear themselves about things they didn't think about previously (Silverman, 2007).

The study needs collecting extensive data to tackle issues and challenges and gaps in value management practices in five GEs of Bahrain. The information provided by interviews participants who are mostly managers, consisting of words or ideas in the form of verbal description with evidence whenever available. The results are rich and detailed set of data although interaction with interviewees will impact on data collection (Silverman, 2007).

A letter of invitation was sent that include an introduction and needed interviewee. It included the purpose and significance of the study, highlights

voluntary participation, require their permission to be interviewed and assures anonymity and confidentiality of their responses.

The interviews were taken one hour of two sets and were guided by an interview guide to enable data collection in a consistency manner. Questions were derived from details processes covered by Val IT.

Interview questions included ten sections. The first section of the interview questions aimed to provides general information about the GEs, interviewees, and the selected IT projects in term of the type of relations between the GEs, the interviewees' professional profiles, background information about the IT projects. The result of this section represented in separated chapter to satisfy sampling techniques used which is critical case sampling.

3.6. Validity and reliability

In any social research, there are important factors need to be considered namely: validity, internal validity, external validity and reliability (Yin, 1994). They are important as they are means to reduce the possibility of accomplishing wrong results and increase worthiness (Morse et al., 2002). They can be used for ensuring and judging the quality of any social research (Yin, 1994).

Validity can be accomplished by choosing correct operational measures for the study concepts. There are three tactics can be followed to guarantee validity. First, using multiple sources of evidence (triangulation). For this study, triangulation is done by gathering evidence mainly in interviews form, notes and documents if available. Second, establishing a chain of evidence from question to the case study and tracing it back to the

question. For this study establishing a chain of evidence is done by allowing the research supervisors be as an external observer to follow the evidence from question to the case study and tracing it back to the question. Third, reviewing draft of the case study report by participants (Yin, 1994)

Internal validity can be accomplished by determining a causal relationship, by which conditions lead to other conditions can be shown. There are three tactics, either by pattern matching, explanation building, or time series analysis. This study built explanation by identifying issues, gaps and challenges of practicing value management practices of IT-enabled investment (Yin, 1994).

External validity can be accomplished by generalizing the study findings, (Yin, 1994). The objective of the qualitative approach is to provide rich description from small group of individuals in a particular setting. In this research, critical cases of GEs have been chosen. Those critical cases are markedly different.

Reliability can be accomplished if the study operations can be repeated within same results (Yin, 1994). There are two tactics for reaching the reliability as mentioned by Yen, first using case study protocol that include instrument, general rules that should be followed. For this study, case study protocol is followed consisting conceptual model, instructions, participant information sheet, and interview questions. Second by developing case study database by keeping database and reports that contain database of the primary data (audio, notes, documents) and analysis report.

3.7. Data Analysis

Most data of this study are qualitative in nature (semi-structured interviews, reports, notes). According to Whittaker (2006) Analyzing, qualitative data is the most difficult and least developed. This study used narrative data to analyze interviews by following LeCompte's guidelines (LeCompte, 2000).

Tidying-up is the first step is that involve ordering interviews, putting notes, creating files, cataloging documents, reviewing research questions, comparing research questions against the collected data; identifying missing data; obtain additional data, and filling gaps. For this study, the interviews will be recorded, notes and questionnaires will be sorted and filed. In case any missing data found, question results will not be considered.

Finding items is the second step that involves selecting and sorting the frequency of themes /ideas, declare and oversight them. For this study, ideas/themes will be sorted and oversight them and get their frequency.

Creating stable sets of items is the third step that involves organizing themes into groups, making comparisons to show contrast or match and assemble them. For this study, Data organization will be done, themes will be identified subdivided if necessary.

Creating patterns is the fourth step that involves looking for similarities, correlations, sequences, co-occurrence, or corroboration. For this study, similarities among the selected GEs will be looked for.

Assembling structures are the fifth and last step that involve structuring patterns that have been assembled. For this study, a meaningful structure will be created.

3.9 Chapter Summary

This research aims to investigate why GEs of Bahrain not realizing the business value of IT investments. It is focused on value management practices are done by IT project managers categorized by value governance stages. The qualitative approach is more suitable than a quantitative approach for this research. Typical case sampling will be used to obtain issues, gaps and challenges of the critical cases. Case study approach was used relying on a semi-structured interview with a panel of managers in the GEs.

CHAPTER 4: ANALYSIS AND DISCUSION OF THE FINDINGS

4.1. Governmental Entities Background

4.2. Current situation of the selected GEs for realizing the IT investments value

4.3. How far the current situation differ from best practice frameworks and tools

4.4. Issues and challenges for the selected GEs that prevent realization of IT investment value

4.6. Chapter Summary and Recommendation

CHAPTER 4: ANALYSIS AND DISCUSION OF THE FINDINGS

This chapter answers the three research questions, as shown in the following sections. The first section covers background about GEs in the study. Then first research question was covered, which talks about the current situation of the selected GEs for realizing the IT investments value under each value governance stage. The third section covers the second research question by comparing the current situation with the best practice framework that has been chosen earlier "Val IT" under each value governance stage. The fourth section includes the answer to the third research question which includes the issues and challenges for the selected GEs that prevent the realization of IT investment value. Those challenges are combined from either the IT projects in the study or from participant's experience. Each section ended up with summary and discussion. The chapter ended up with summary and recommendations.

4.1. Governmental Entities Background

This section includes results of the first set of interview questions (the interview questions provided in Appendix A – General Question). The researcher analyzed the resulted data using LeCompte guideline as mentioned in the methodology (LeCompte, 2000). Collected data was reordered, tidied up, combined and summarized where possible. This section provides general information about the GEs, interviewees, and the selected IT projects.

The researcher conducted the interviews with six candidates nominated by five GEs. GEs names have been masked for confidential purposes as Alpha, Beta, Delta, Gama and Zeta. Nominated candidates from the GEs

were asked to talk about their knowledge and experience in value management practices performed over IT projects and IT assets. The IT projects were selected by candidates while going through the interview questions. The interview was semi-structured where some questions were skipped by the researcher as they were answered in other question or found it inapplicable to the case where participants can't answer the question.

There was limited data available about the type of IT projects in Government Entities in Bahrain. The general questions aimed to satisfy the research conditions. For each GE, there was one candidate nominated, however, Delta nominated two for the interview. The IT projects (or IT system resulting from the IT projects) are also renamed as shown in Table (13) (for confidentiality reasons):

Table (13)
GEs, IT projects, participant's aliases

GE	Alpha	Beta	Delta	Gama	Zeta
IT Project	Alpha_IT	Beta_IT	Delta_IT, Theta_IT	Gama_IT	Zeta_IT
Candidates	Alpha_Candidate	Beta_Candidate	Delta_Candidate Theta_Candidate	Gama_Candidate	Zeta_Candidate

4.1.1. General Background

This section provides general background information about the GEs, its IT department and the interviewee.

Alpha: As per the structure of Alpha, there are four referential authorities who are higher than IT department staff and the IT department are dependent on these referential authorities for their administrative and management practices / decisions. The interview was conducted with the IT director who has experience of more than 20 years in the IT field in different GEs and more than 10 years of experience in managing the large IT projects.

He was the program manager of Alpha_IT project. Alpha_IT project was launched in 2010.

Beta: There are three referential authorities from IT to the board. The interview has been conducted with the system development manager who has experience of more than 20 years in IT field in both private and public sector. Out of 20, 13 years of experience was in managing IT projects. He was the project manager of Beta_IT project. Beta_IT was launched in 2014.

Delta: There are three referential authorities from IT to the board. The interview has been conducted with two candidates. The first candidate is a chief manager who has experience of more than eight years in IT field in the public sector, four of them in leading and managing IT projects. He was playing the IT project manager role within "Delta_IT" project. The second is a chief manager who has fifteen years of experience in IT field, nine of them in managing and leading IT projects. She was the program manager within Theta_IT project. The Delta_IT and Theta_IT were launched in 2010, 2009 respectively.

Gamma: For Gamma case, IT department didn't manage the Gama_IT project. They depend on the vendor to take the responsibility of executing Gama_IT, where the IT project manager was the head of the business unit in Gama. The interview was conducted with the head of business unit who has experience of more than 26 years in public sector managing IT and non-IT projects. He was the IT project manager within Gama_IT project. Gama_IT was launched in 2007.

Zeta: There are four referential authorities from IT department to the board. The interview has been conducted with a head of a section that has

experience of more than 8 years in public sector managing and leading IT projects. He was the IT project manager within "Zeta_IT" project. Zeta_IT was launched in 2010. Table (14) summarizes the above information which was elicited from the participants.

Table (14)
General background about GEs, participants, and IT projects in study

Government Entity	Alpha	Beta	Delta		Gama	Zeta
Reporting line from IT to board	4 levels	3 levels	3 levels		NA	4 levels
Participant years of experience	more than 20 years	more than 20 years	Less than 10 years	11-20 years	more than 20 years	11-20 years
Participant position	IT director	System Development Manager	chief of the department	chief of the department	head of the business unit	head of the section
Participant Role within the IT project	Program manager, IT Project Manager	IT Project Manager	IT Project Manager	Program manager	IT Project Manager	IT Project Manager
IT project (IT system)	Alpha_IT	Beta_Project	Delta_IT	Theta_IT	Gama_IT	Zeta_IT
Launched Year	2010	2014	2010	2009	2007	2010

4.1.2. GEs external stakeholders

GEs has many relations with each other when it comes to IT projects. Participants mentioned that those relations are classified as needed dependencies where the support or the approval is needed. Researcher classifies the respondents, which show that GEs depend on Ministry of Finance (MOF), E-Government Authority (EGA), Central Informatics Organization (CIO), Civil Service Bureau (CSB), Ministry of Social (MoS), Tamkeen, and National Audit Office (NAO). As summarized in Table (15):

Table (15)
External stakeholders of the GEs in study

Government Entity	MOF	EGA	CIO	Tender Board	CSB	MOS	Tamkeen	National Audit Office	Number of external Dependencies
Alpha	No	Yes	Yes	Yes	No	Yes	Yes	No	5
Beta	No	Yes	Yes	Yes	Yes	Not Known	Not Known	Not Known	4
Delta	Yes	Yes	Yes	Yes	Yes	Not Known	Not Known	Not Known	5
Gama	Yes	Yes	Yes	Yes	Yes	Not Known	Not Known	Not Known	5
Zeta	No	Yes	Yes	Yes	No	Not Known	Not Known	Yes	4
dependencies (%)	40	100	100	100	60	20	20	20	

According to the table, 40% of the GEs in study need Ministry of Finance (MOF) for budgets approval or in case change on cost occurred. 100% of the GEs depend on EGA as there are common IT projects with EGA, e-services provided in EGA portal, performance reviews done on the IT projects. 100% of the GEs depend on CIO as they are connected to their Government Data Network (GDN), use many CIOs applications, and follow CIO security policies. 100% of GEs approach Tender Board when the cost of IT project exceed 25000 BD, where the IT projects should go to tendering process. 60% of GEs approaching Civil Service Bureau when need an IT human resources. Ministry of Social is a supporter for Alpha as many social committees are engaged in many IT projects and provide awareness on new trends and technology in IT field (especially awards), and help in reaching citizens. Tamkeen provides Alpha many training programs related to IT. National Audit Office make reviews on ERP systems of Zeta.

Participants mentioned that there were IT projects that had high business value for the GEs but had been delayed or canceled due to the existence of such dependencies. They expressed their opinion on dependencies, as either "Thank God we don't need XGE", "The project become lengthy because we depend on XGE", or "There are ways to get our

target without approaching XGE". Although, they appreciated their existence as supporter or process governor.

4.1.3. IT projects Background

Participants were asked to select an IT project of high priority that they managed. They were then asked general questions about the IT project that they had selected. Research coded, combined, and summarized the results as shown in Table (16) and Figure (18).

IT projects objectives: Based on the information yielded from the first section of the interview about the objective of the IT projects, it was clearly noticed that all the GEs in question sought to achieve their business objectives by aligning their IT projects with their business strategies. The researcher categorized these objectives on the basis of frequency: increase service efficiency (for citizens, GEs, or staff), time reduction, cost reduction (drivers, papers, effort...), automation, solve legacy system issues, increase transparency, be green, and increase performance of employees, as shown in Figure (18) by percentage. Increasing the service efficiency and reducing cost and time were occurred mostly (20%).

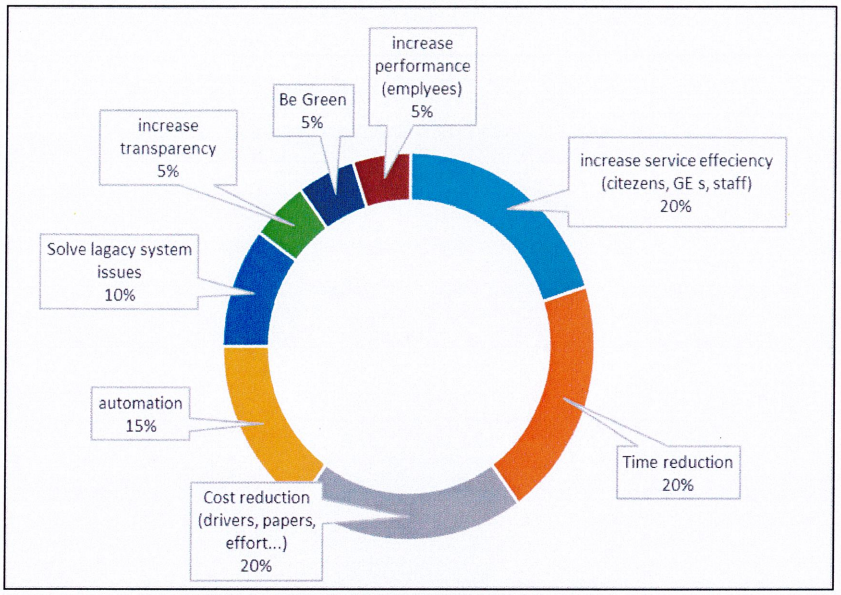


Figure (18)
Objective of IT projects

Table (16)
General background IT projects in study

IT project	Type	periority	Capital expenses	operational expenses	planned execution duration (months)	Actual execution duration (months)	Difference between planned and Actual (%)	lifetime (years)	IT is reponsible for managing the IT project	IT is responsible to achive the bussinees value of the IT project
Alpha_IT	outsource	high	15	25	7	7	0%	3	Yes	Yes
Beta_IT	inhouse	high	Not calculated	Not calculated	6	7	17%	15	Yes	No
Delta_IT	outsource	high	8	3	8	24	200%	7	Yes	Yes
Theta_IT	outsource	high	15	5	36	60	67%	6	Yes	Yes
Gama_IT	outsource	high	90	Not calculated	24	24	0%	5	No	No
Zeta_IT	outsource	high	50	50	6	9	50%	5	Yes	Yes
Average			36	21	15	22	51%	7		

The following are results (based on Table 16):

IT projects nature: The above table shows that all of the participants selected IT projects of high priority and most of them were outsourced.

Capital Expenses: Percentage of capital expenses compared to total IT capital expenses of IT projects reached its maximum of 90% and 8% minimally. The average capital expense of all IT projects is 36%, which

shows that there is huge cost spent on the IT projects. For the case of Beta, the participant mentioned that they didn't calculate capital/ operational expenses as the project was developed and implemented by in-house resources. Operational Expenses: Percentage of operational expenses compared to total IT operational expenses of IT projects reach its maximum of 50% and 3% minimally. The average operational expense of all IT projects is 21%. For the case of Gama, the participant mentioned that for Gama_IT they didn't calculate the operational expenses at that time. For some cases, participants mentioned that they include salaries of internal resources (Alpha as an example) whereas others not such as Zeta.

The difference between planned and actual duration: Planned and actual execution duration of the IT projects highly differ among the IT projects, for the case of Alpha_IT, Beta_IT, Gama_IT, and Zeta_IT they almost met the execution duration as planned (50% or less). On the other hand, there is a huge difference in the case of Delta_IT and Theta_IT (more than 50%). The average difference of all IT projects reaches 51%. The average lifetime of systems resulting out of the IT projects is seven years where it reached maximally 15 years. Beta Participant refer the long lifetime of the IT project as he mentioned that in-house projects stand for long especially with the high quality of resources (human and non-human).

Different cases / scenarios included in the study: The table shows that there are different cases included in the study. The first case where IT department is responsible for managing the IT project as well as achieving the business value of it. The second case where (Alpha_IT, Delta_IT, Theta_IT, and Zeta_IT) IT department is responsible only for managing the IT project and business department is responsible for achieving the business

value. A third case that IT department is not responsible for managing the IT project or achieving the business value as they depend on an outsourcing vendor who is responsible for developing the system resulted from the IT project (Gama_IT case).

4.1.4. Overview and discussion

To sum up the findings of this section, there are eight GEs that their role is important when it comes to IT investments. Which are: Ministry of Finance (MOF), E-Government Authority (EGA), Central Informatics Organization (CIO), Civil Service Bureau (CSB), Ministry of Social (MoS), Tamkeen, and National Audit Office (NAO). They are involved in supporting, governing, providing a service or financing the IT projects executed by the scoped GEs.

By referring to the Westerlind study (2004), objectives of the IT projects in the study are all intangible benefits. Which show the needed effort from GEs for measuring the intangible benefits.

Expenses of IT projects in the study, on an average, constitutes 36% of capital projects expenses and 21% from project operational expenses. There is a high dependency on the vendors where 83% of the IT systems resulting from the IT projects in the study are outsourced and their average lifetime is seven years.

The researcher noticed an observation in the methodology used for calculating the operational and capital expense of the IT projects in the study. There is no consideration of the internal resources (human and non-human) used for executing the IT project that could affect the total cost as per the methodology mentioned in the literature by Westerlind (2004). Also,

there is another issue in calculating the total cost, for example, the recurrent cost was not included in the full economic life cycle cost as mentioned by some participants (Delta participant mentioned that they included the operational cost for 5 years while the lifetime for 7 years). Such information should be included carefully in the business case because it affects the needed justification for IT investment as mentioned by Maes at el. (2013) in the business case definition.

There is a huge difference between the planned and actual duration of the IT projects in the study which reaches 51% in average. Such difference was noted due to many reasons as detailed in section 4.4. For that dependencies or reasons for such delays should be considered for risk assessment and cost variance (cost impact) and such reports should be submitted to the concerned top management for comparison and their final decision.

Three scenarios were considered which were: IT department is responsible for managing the project and achieving the business value (76% of the IT projects); IT is responsible only for managing the IT project; and where IT department not responsible for managing the IT project or achieving the business value.

Case Studies for this research covered all the necessary conditions that were scoped for this research. In the study cover all the needed cases for the research conditions. As all critical cases exist and logical generalization is reached. Critical cases for GEs are included as summarized in the following Figure, which shows in most of the GEs in the study, IT function is responsible for both achieving the value and managing IT project. Figure

(19) provides the cases for the selected GEs where IT function is responsible for achieving the business value as well as managing the IT project.

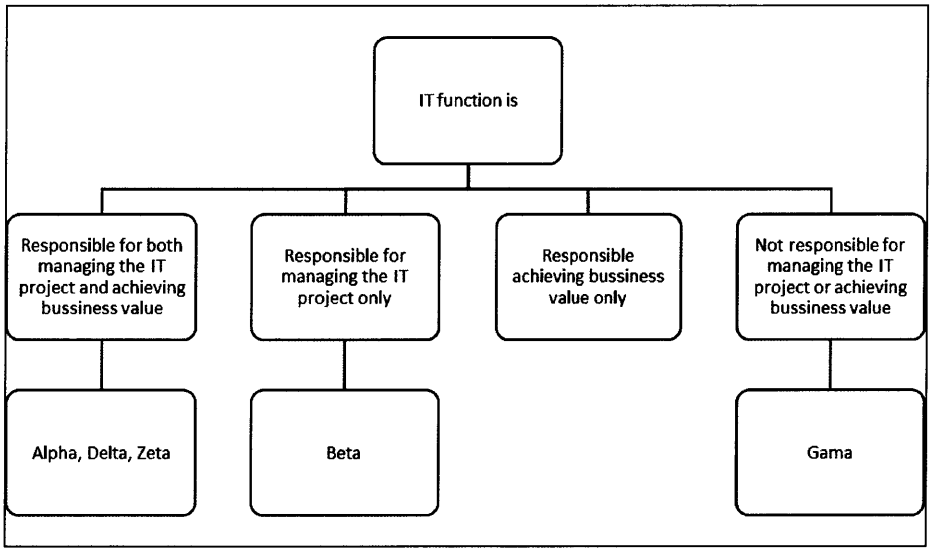


Figure (19)
IT function role within the IT investment

Further, the researcher noted that IT systems resulting from IT projects are either from in-house resources (17% of the IT projects) or from outsourced resources (83%). All are high priority projects and completed one year ago. The participants were having more than four years of experience in managing IT projects in the public sector.

4.2. Current situation of the selected GEs for realizing the IT investments value

This section includes results from interviews to cover the first objective of the study which is the current situation of the selected GEs for realizing the IT investment value based on the nine stages of the value governance (Refer to Appendix A).

4.2.1. Stage 1: Submission of idea

Responses from participants have been summarized as shown at the end of this section Figure (20). The following paragraphs are the analysis of the findings for submission of idea stage based on Figure (20).

Result related to setting and structure of the GEs

For all the applicable GEs, there is an alignment between the execution of IT projects and IT strategy and also between IT strategy and business strategy of all GEs. However, IT strategy span differs among the GEs; Beta and Zeta have IT strategy span for five years, Alpha for one year, Zeta for two years. Therefore, the average span of IT strategy was noted as three years. All of the interviewed participants mentioned that the senior management considers IT expenses and investments for their departments. Table (17) provides information about the importance given by senior (top) management on the IT department work.

Table (17)
Responses by IT project managers "How does the top management look at IT department"

How does the top management look at IT department?	
Alpha_Participant	They never rejected any business case that is submitted by IT. Currently, they observed lots of support compared to previous management
Beta_Participant	Top management appreciates IT role and they look at IT as investment
Delta_Participant	The top management considers that the combination of cost and investment need to be governed.
Gama_Participant	NA
Zeta_Participant	Top management was found to be cooperative. Budgets were quickly approved and increased whenever felt necessary for core IT projects

The executives (senior management) didn't have difficulties in understanding IT strategy. They were aware of IT capabilities and limitations. 60% of the GEs had clear accountabilities and responsibilities documented for each role in relation to the sample IT project. Adequate segregation of duties was noted. However, 40% of them had some gaps. For instance, Zeta's and Gama's participants mentioned that there is a gap due to the shortage of resources, segregation of duties can't be maintained. Also, all GEs had documented current and future planning of funds, human resources, and such things are monitored and required remedial actions were taken where necessary.

80% of GEs rejected/ postponed initiatives from IT due to one or more of following reasons: it is not the right time now; lack of resources; the request is not aligned to the business strategy; the cost exceed the current system cost; or value (benefit) was not justified enough. Most commonly noted reasons for rejection of an IT initiatives was: low capacity (Human, Non-Human), inapplicable as they don't want to take the risk of failure, less priority, high cost, lack of stakeholder cooperation, not aligned to the business, out of IT strategy plan, etc.

Results related to the IT project

83% of the IT projects hasn't been initiated/ requested by IT but by another GE or by the top management. Although it is not initiated by IT, IT was responsible for making the initial business case. In the case of Zeta where the IT project initiated by IT department; the participant mentioned that there is no rewarding depending on contribution at projects level.

Although the IT initiatives were all resulting out of the respective business strategy, the triggering points were different for all the GEs. For the case of Alpha_IT, it was unplanned, but the business case accomplished and aligned to the business strategy. For Beta_IT case, it was also unplanned and has resulted as there was a change in the business strategy. For the case of Delta_IT was planned and selected using criteria. For the case of Theta_IT, it was planned to serve the request from another GE. For the case of Gama, Gama_IT serve most of the business strategy outcome. For the case of Zeta_IT, the IT project resulted for solving the daily issues. In the initial business case approval process, there was a gap in most of the IT projects (67%). According to Val IT, the business case should be approved by IT, Business owners and submitted to top management for approval. However, such activity wasn't observed for most of the IT projects.

	Government Entity	Alpha	Beta	Delta	Gama	Zeta		%
Setting and structure	IT project aligned to the IT strategy	Yes	Yes	Yes	NA	Yes		80
	IT strategy aligned to the business strategy	Yes	Yes	Yes	NA	Yes		80
	Span duration of IT strategy development	every year	five years	two years	NA	five years		
	Executives have any difficulties in understanding or contributing in IT strategy	No	No	No	NA	No		80
	there are clear accountabilities and responsibilities for each role	Yes	Yes	Yes	partially	partially		60
	There is a current and future planning of funds, HR, resources	Yes	Yes	Yes	Yes	Yes		100
	planning of funds, HR, resources are monitored, remedial actions are taken	Yes	Yes	Yes	Yes	Yes		100
	Did the IT department initiate an opportunity and it has been rejected?	yes		yes	NA	yes		75
	Have you ever reject a received opportunity?	Yes	Yes	Yes	NA	Yes		80
	Did the IT department initiate an opportunity and it has been rejected?	Yes	Yes	Yes	NA	Yes		80
IT project	**IT project**	**Alpha_IT**	**Beta_IT**	**Delta_IT**	**Theta_IT**	**Gama_IT**	**Zeta_IT**	0
	Who requested (or initiate the need of) the IT Project	others	others	others	others	others	IT	83
	others	top management	other entity	top management	other entity	top management		60
	Whether initial business case is accomplished?	Yes	Yes	Yes	Yes	Yes	Yes	100
	Who took the responsibilities of making the initial business case?	IT	IT	IT	IT	outsource	IT	83
	the following list are included in the initial business case:							
	□ Alignment to the business strategy (business outcome)	Yes	Yes	Yes	Yes	Yes	Yes	100
	□ Benefits at high level	Yes	Yes	Yes	Yes	Yes	Yes	100
	□ Cost at high level	Yes	Yes	Yes	Yes	Yes	Yes	100
	□ Risks at high level	Yes	Yes	Yes	Yes	Yes	Yes	100
	□ Resources at high level	Yes	Yes	Yes	Yes	Yes	Yes	100
	Number of versions	1		3	15			
	Who did the approval (Sign off) of the initial business case that has been accomplished?	IT, Secretary General	IT, Bussiness, and CEO	IT, CEO	IT, Bussiness, and CEO	Stakeholder, not IT	IT, Top management	67

Figure (20)
Summarized result of the Submission of idea stage

4.2.2. Stage 2: Opportunity Qualification

Responses from participants have been summarized as shown at the end of this section Figure (21). The following paragraphs are the analysis of the findings for opportunity qualification stage based on Figure (21).

Result related to setting and structure of the GEs

60% of GEs don't have a proper categorization of IT projects for satisfying business outcome of a portfolio. Qualification criteria are based on the experience of the people presenting the opportunity (80% of GEs). The

result of this qualification process is not considered by most of the GEs (80%).

Results related to the IT project

Although qualification criteria are missed as mentioned above, the participants mentioned that there is a high confidence in meeting most of the qualification areas as shown in the result. The results of the above table show that all IT project consider meeting stakeholder needs. 67% of IT projects have identified KPIs. Zeta participant mentions that there is a shortage of resources where they cannot apply this practice. 50% of participants consider an alternative course of action. Zeta participant mentioned that they look for alternative methods in an ad-hoc manner. The "Expected outcome" from the IT projects was identified in most of IT projects (83%). Changes in business processes were timely identified in most of IT projects (83%).

		Alpha	Beta	Delta	Gama	Zeta		%
Structure and Setti	There is portfolio for IT enabled investment	Yes	No	Yes	No	No		60
	There is qualification criteria for IT projects	experience driven	experience driven	Yes	No	experience driven		60
	qualification result has been used	No	No	Yes	No	No		80
	Who is responsible for qualifying the bussiness case	Strategy Comitee	IT, bussiness	IT	NA	IT		20
		Alpha_IT	**Beta_IT**	**Delta_IT**	**Theta_IT**	**Gama_IT**	**Zeta_IT**	20
IT project	Whether the IT system resulting out of the IT project is grouped to any portfolio	Yes	No	Yes	Yes	No	No	50
	Check on the satistfaction of qualification area							
	☐ Stakeholder needs will be satisfied	Yes	Yes	Yes	Yes	Missed	Yes	83
	☐ KPIs are identified	Yes	Yes	Yes	Yes	Missed	No	67
	☐ Alternative course of action	No	Yes	Yes	Yes	Missed	No	50
	☐ Expected outcome	Yes	Yes	No	Yes	Missed	Yes	67
	☐ Changes on business processes identified	Yes	Yes	Yes	Yes	Missed	Yes	83
	☐ Duplication / rearrangement identified	Missed	Missed	Yes	Yes	Missed	Missed	

Figure (21)
Summarized result of the Opportunity Qualification stage

4.2.3. Stage 3: Business Case Assessment

Responses from participants have been summarized as shown at the end of this section Figure (22). The following paragraphs are the analysis of the findings for business case assessment stage based on Figure (22).

Result related to setting and structure of the GEs

Criteria for selecting IT project exists only in Delta, where the combination of risk, cost, and benefit was used. On the other hand, 80% of GEs depend on the experience. Alpha participant mentioned that in normal cases they look first at value, second for the cost, and third for risk depending on his experience. He also mentioned that he don't believe in scoring as it is not dependable (depend on people's weight and not always their weights are correct). Zeta participant mentioned that they look only at the value that can be achieved where cost have never been an issue. Beta participant mentioned that they look at the cost effectiveness and second to risk.

There are many committees in GEs where they differ among the role they play within IT project. Results show that Board of directors exists in 80% of GEs. Delta participant mentioned that board of directors plays a big role in governing IT investments. On the other hand, the board of directors in the other GEs participate in the big/ huge cost projects only. Auditors exist in most GEs cases (80%) and their role to audit the resulting systems. Investment service board where they are accountable to create the value exists and they differ in positions from directors as in the case of Alpha to IT director as in the case of Zeta. 40% of cases don't have IT steering committees. Participants have different expressions about the existence and role of IT steering committee. Alpha participant finds it very helpful and the

achievement of the IT projects increased more efficiently where Zeta mentioned that they don't have an active role. Beta participant express that they had an IT steering committee but it is no longer exists. As Alpha participant expressed: "IT steering committee is no longer exists, there were an IT steering committee before where a direction of the IT projects and prioritize them".

IT risk and security committee exists in most cases (60%), where in some GEs one person handles this role. Program management office, project management office, and value management office doesn't exist in 80% of GEs.

Results related to the IT project

IT project is part of a program where the IT project plays a basic role to create and achieve high business benefits. The list mentioned in the questions is related to business and IT projects components where the participant mentioned what they accomplished for IT project. Business case for IT projects included the basic components: executive summary (100%), purpose (100%), objectives (100%), scope (100%), dependencies (100%), risks (83%), milestones (100%), organizational change impact (83%), program plan (83%), and value assessment (83%). Although most of IT projects included the business components, there were some gaps founded in the sub-components of the program plan, and value assessment (will be discussed under scheduling stage). Program plan didn't include benefit realization plan in all IT projects. Other components included in most of IT projects (component project plans, approach to risk and change management, the program governance structure, and controls.)

There was an assignment for all listed roles (Investment decision maker, program sponsor, program manager, project manager, project manager, service delivery, business benefits achiever, expenditures controller, and supporter). Participants hold different roles among the IT projects. 50% of the participants were Program manager, all of them were the project manager, 16% of them were service delivery, 33% of them were the business value achiever, and 16% of them were expenditure controller.

Among the role they took, there were many challenges they faced. They were having authority to act (83%), they had the required resources and competencies (67%), they had a clear line of accountabilities (50%), they understood their right and obligation (50), 67% of them they don't have the relevant performance measures.

The concept of having a balance in selecting IT projects is not considered to have a mix of IT projects in most of the GEs. For example in terms: (long term- short term) (High financial value) (High nonfinancial value) (High risk- low risk), etc. . . . Others have other opinions.

83% of participants are satisfied with the selection made on the IT project and they will not select another. Theta Participant will select another as the segment of beneficiaries is larger than Zeta_IT.

Consulting and taking the stakeholders agreement on the costs and benefits for which they will accept responsibility hasn't been obtained by 67% of the IT projects.

		Alpha	Beta	Delta	Gama	Zeta		%
Setting and structure	There is evaluation cretria for selecting IT projects (Scoring and wights)	No	No	Yes	No	No		80
	The following commitees exists							
	Board of directors	Exists, No role	Exists with role	Exists with role	Exists with role	Exists with role		80
	Compliance, audit, risk and security (CARS) – Auditor	Exists, No role	Exists with role	Exists with role	Exists with role	Exists with role		80
	Investment and services board (ISB) – portfolio owner	Exists with role	Exists with role	Exists with role	Exists with role	Exists with role		100
	IT steering committee	Exists with role	Not Exists	Exists with role	Not Exists	Exists with No role		40
	IT risk and security committee	Exists with role	Exists with role	Exists with role	Not Exists	Not Exists		60
	Head of human resources (HR)	Exists with role	Exists with role	Exists with role	Exists with role	Exists with role		100
	Program management office (PgMO)	Not Exists	Not Exists	Exists with role	Not Exists	Not Exists		80
	Project management office (PMO)	Not Exists	Not Exists	Exists with role	Not Exists	Not Exists		80
	Value management office (VMO)	Not Exists	Not Exists	Exists with	Not Exists	Not Exists		80
IT project		Alpha_IT	Beta_IT	Delta_IT	Theta_IT	Gama_IT	Zeta_IT	
	Program bussiness case component include							
	□ an executive summary	Yes	Yes	Yes	Yes	Yes	Yes	100
	□ a description of the purpose	Yes	Yes	Yes	Yes	Yes	Yes	100
	□ objectives	Yes	Yes	Yes	Yes	Yes	Yes	100
	□ approach and scope	Yes	Yes	Yes	Yes	Yes	Yes	100
	□ dependencies	Yes	Yes	Yes	Yes	Yes	Yes	100
	□ risks	Yes	Yes	Yes	No	Yes	Yes	83
	□ milestones	Yes	Yes	Yes	Yes	Yes	Yes	100
	□ organizational change impact	Yes	Yes	Yes	No	Yes	Yes	83
	□ Program plan	Yes	Yes	Yes	No	Yes	Yes	83
	□ value assessment	Yes	Yes	Yes	No	Yes	Yes	83
	Program plan components include							
	□ component project plans	Yes	Yes	Yes	Yes	Yes	Yes	100
	□ a benefits realization plan (baseline and target performance)	No	No	No	Yes	No	No	83
	□ the approach to risk and change management	Yes	Yes	Yes	Yes	No	Yes	83
	□ the program governance structure	Yes	Yes	Yes	Yes	No	Yes	83
	□ Controls (cost, interdependency, ownership)	No	Yes	Yes	Yes	No	Yes	67
	There is clear assignment for the folowing roles							
	□ Investment decision making 1	Yes	Yes	Yes	Yes	Yes	Yes	100
	□ Program sponsorship.....2	Yes	Yes	Yes	Yes	Yes	Yes	100
	□ Program management.....3	Participant	Yes	Yes	Participant	Participant	Yes	50
	□ Project management.....4	Participant	Participant	Participant	Participant	Participant	Participant	100
	□ Service delivery.....5	Yes	Yes	Yes	Yes	Yes	Participant	83
	□ Business benefits achievement 6	Yes	Yes	Yes	Yes	Participant	Participant	67
	□ Expenditures control.....7	Yes	Yes	Yes	Yes	Yes	Participant	83
	□ Associated support roles.....8	Yes	Yes	Yes	Yes	Yes	Yes	100
	For the selected roles , please select from the following whether they have the right authority to/ have :							
	□ act	Yes	Yes	Yes	Yes	Partially	Yes	83
	□ requisite competence (Suitable competencies)	Partially	Yes	Yes	Yes	No	Yes	67
	□ commensurate resources (required resources)	Partially	Yes	Yes	Yes	No	No	50
	□ clear lines of accountability	Yes	Yes	Yes	Yes	No	Yes	83
	□ an understanding of rights and obligations	Yes	Yes	Yes	Yes	Yes	Yes	100
	□ Relevant performance measures	No	No	Yes	Yes	No	No	67
	Do you have a view on the all related/dependent projects?	Yes	Yes	Yes	Yes	Yes	Yes	
	There are cases for :							
	□ Better alignment to business (less time and more efficient IT projects) [if not aligned]	No	No	No	Yes	No	No	83
	□ Better grouping of IT project to enhance the balancing	Not considered	Not considered	Not considered	Not considered	NA	Not considered	83
	□ Will you select this IT project	Yes	Yes	Yes	No	Yes	Yes	83
	Whether all stakeholders are consulted and their agreement on the costs and benefits for which they will accept responsibility is obtained.	No	Yes	No	Yes	No	No	67

Figure (22)
Summarized result of the Business case assessment stage

4.2.4. Stage 4: Scheduling

Responses from participants have been summarized as shown at the end of this section Figure (23). The following paragraphs are the analysis of the findings for scheduling stage based on Figure (23).

Result related to setting and structure of the GEs

There is a good tracking of the budget and the actual expenses incurred as confirmed by the participant of all the GEs. Generally, the funding of the IT project was either done by MOF or by the GE itself.

As per the participants of the GE, IT department works closely with the finance department. Below mentioned tasks are performed in most of the GEs:

- review the budget regularly,
- secure the budget (one time cost, recurrent cost) for one or two years
- Consider cost reduction when possible by changing the scope or using internal resources.
- consider recruitment for future IT projects
- Consider the reallocation of the budget for unplanned projects.

All participants mentioned that they don't have any issues with the finance department. Although Alpha participant mentioned that he has a challenge as the budget approval done annually and IT projects remains more than one year.

Results related to the IT project

- 77% of IT projects don't include SMART benefits when the project are in the "design" phase.

- Full economic cost is not considered in all the IT projects, as participants mentioned that they included only the cost of the IT project cost (one time or recurrent time)
- Benefits planning and realization was subjectively considered. In the case of Alpha GE, a study was conducted and mentioned the reduction in cost due to a reduction of the cost of papers).
- Delta_IT and Theta_IT projects considered ROI methodology for assessing the value
- Delivery and benefits risks were considered in most of IT projects (67%). Alpha participant mentioned that the delivery risk was covered as part of the contract with the vendor, but benefit-risk wasn't calculated due to change resistance.
- Strategic alignment and assumptions are considered in all IT projects.

	Government Entity	Alpha	Beta	Delta	Gama	Zeta		
structure	Do you track records of all funds/budget and their movements	Yes	Yes	Yes	Yes	Yes		100%
IT project	IT project	Alpha_IT	Beta_IT	Delta_IT	Theta_IT	Gama_IT	Zeta_IT	
	Bussiness benefits are:							
	□ Specific (goal)	No	No	Yes	No	No	No	83%
	□ Measurable (number)	No	No	Yes	No	No	No	83%
	□ Achievable (how can be accomplished)	No	No	Yes	Yes	No	No	67%
	□ Relevant (right goal and right person/source)	No	No	Yes	Yes	No	No	67%
	□ Time-bound (when)	No	No	Yes	No	No	No	83%
	Value assessment included							
	□ full economic life-cycle costs and benefits, both financial and non-financial	No	No	No	No	No	No	100%
	□ the value to be created and the envisaged rate of return;	No	No	Yes	Yes	No	No	67%
	□ strategic alignment	Yes	Yes	Yes	Yes	Yes	Yes	100%
	□ delivery and benefits risks	Yes	Yes	Yes	Yes	Missed	No	67%
	□ program relative score as assessed by the business sponsor	No	No	Yes	Yes	NA	No	50%
	□ Key assumptions	Yes	Yes	Yes	Yes	Yes	Yes	100%

Figure (23)
Summarized result of the Scheduling stage

4.2.5. Stage 5: Project Initiation

Responses from participants have been summarized as shown at the end of this section Figure (24). The following paragraphs are the analysis of the findings for Project Initiation stage based on Figure (24).

Results related to the IT project

50% of the participants evaluate that the IT project was done successfully where the rest finds it partially successful. 50% of them refer the success of the IT project to both organization structure and project manager equally where 50% of them refer the success more to the project manager due to the nature and complexity of the IT project. Participants mentioned complexity reasons as follows: the project is national wide, dealing with the external vendor, or challenges in the stakeholder cooperation.

There was a change during the execution. The concerned participant mentioned that the changes had impacted time of the project and the extra cost was paid by the vendor. Reasons for the changes differ for various IT projects to another. However, in general, they are changes in the business roles, vendor delay, change in the stakeholder needs, and change in the government regulation.

The necessary changes were evaluated and approved by the sponsor (in 83% cases) and change in the business case due to the above changes was considered only in 50% of the cases.

Updates on IT portfolio (used IT applications, IT services, etc. . .) considered only in case of Delta_IT. The researcher observes that the current status of the IT portfolio is not monitored or updated which would lead to unclear cost and unclear benefits.

Progress reports during the IT project execution were done in most of the IT projects (67%). Alpha participant mentioned that he didn't have time structuring as mentioned before. Zeta participant also had the same point of view, as he mentioned that there is a shortage of resources. He doesn't prefer to do that because top management doesn't have time to read such report, so doing that is useless. Alpha and Zeta participants mentioned that they mostly discuss to solve any internal issues.

The progress reports included: needed budget for the next stage if it is differ than the planned, identification of deviations, needed Remedial actions, and performance against scope, schedule, quality, etc.

The degree of similarities between the actual business case and the initiated one differ among the GEs IT projects. It reaches its maximum 100% and minimum 30%, which is 73% in average. Furthermore, 70% of the Human resources are IT specialist (full time+ part time) in front of 30% from the business.

		Alpha_IT	Beta_IT	Delta_IT	Teta_IT	Gama_IT	Zeta_IT	%
IT project	In general IT project done successfully	yes	yes	partially	partially	partially	yes	50%
	IT project success factor	Both	Both	Project Manager	Both	Project Manager	Project Manager	50%
	weather there was a change on cost, risks, benefits, time , etc	No	Yes	Yes	Yes	Yes	Yes	83%
	Did any change on the business case occur?	NA	Yes	Yes	Yes	No	No	50%
	Changes has been approved by bussiness sponsor	NA	Yes	Yes	Yes	Yes	Yes	83%
	Updates on IT portfolio has been considered	No	No	Yes	No	NA	No	67%
	progress reports has been submited during the execusion	No	Yes	Yes	Yes	Yes	No	67%
	□ Needed budget for the next stage gate	No	No need	No need	No need	No need	No	67%
	□ Identification of deviations	No	Yes	Yes	Yes	Yes	No	67%
	□ Needed Remedial actions	No	Yes	Yes	Yes	Yes	No	67%
	□ Performance against scope, schedule, quality,etc	No	Yes	Yes	Yes	Yes	No	67%
	Similarities of business case compared to real execution	100%	84%	75%	60%	30%	90%	73%
	Human resources were used for the IT project IT	4	22	2	2	3	3	
	Human resources were used for the IT project Bussiness	2	9	4	4	2	3	
	Human resources were used for the IT project Outsource	3	0	5	5	3	5	

Figure (24)
Summarized result of the Project initiation stage

4.2.6. Stage 6: Scope definition

Responses from participants have been summarized as shown at the end of this section Figure (25). The following paragraphs are the analysis of the findings for Scope Definition stage based on Figure (25).

Results related to the IT project

Results show that 67% of the IT project stick to the plans while 33% of them have a scope creep and the change impact had been evaluated before applying it to the project. Here it can be noticed that well structures GEs (as the case of Delta) easily accept the change while others mentioned that being strict to the plan is key success factor as some pay high attention to the planning stage (Beta) and the fact that they don't accept failure (Zeta).

A significant deviation in the scope exists in 67% of the IT projects. Deviations vary in nature and time took to solve it. Time for rectification the deviation took days to six weeks in average. An example of deviations as mentioned by participants: clarifying requirements to meet limited time, stakeholders' readiness, and regulation change. But all participants mentioned that they are preferring to stick to the project plan in future, and any major changes postponed to another project.

IT project	Alpha_IT	Beta_IT	Delta_IT	Theta_IT	Gama_IT	Zeta_IT	
Did you have any scope creep during the project?	No	No	Yes	Yes	No	No	67%
Did you evaluate the needed change before doing it?	NA	NA	Yes	Yes	NA	NA	67%
During the IT project execution, any significant deviation has been identified?	No	Yes	Yes	Yes	No	Yes	67%
The time lag between the identification of deviation and its Rectification		days - 4 weeks	days- 2 weeks			days- 3 months	

Figure (25)
Summarized result of the Scope Definition stage

4.2.7. Stage 7: Benefit Planning

Responses from participants have been summarized as shown at the end of this section Figure (26). The following paragraphs are the analysis of the findings for Benefit Planning stage based on Figure (26).

Results related to the IT project

Results show that participants find themselves that they can easily contribute to the strategy, although there are some gaps as the value is not mentioned on a yearly basis up to the retirement of the IT system resulting out of the project. 67% of the IT project get mapped to the strategic outcome and 83% of them identified complementary initiatives. On the other hand, none of the IT projects included the benefits up to the retirement of the system.

	Alpha_IT	Beta_IT	Delta_IT	Theta_IT	Gama_IT	Zeta_IT	%
Strategic contribution of the IT project was easily identified	Yes	Yes	Yes	Yes	Yes	Yes	100%
If yes/ May be please select if any of the listed below was done:							
□ Strategic outcomes mapped to the IT project	Yes	No	Yes	Yes	Yes	No	67%
□ Complementary initiatives was needed to be identified to achieve any strategic outcome (i.e. change business process, restructure the organization).	Yes	Yes	Yes	Yes	No	Yes	83%
□ benefit value mentioned in the business case included yearly benefit value till the retirement of the IT system due to the IT project	No	No	No	No	No	No	100%

Figure (26)
Summarized result of the Benefit Planning stage

4.2.8. Stage 8: Benefit Harvesting

Responses from participants have been summarized as shown at the end of this section Figure (27). The following paragraphs are the analysis of the findings for Benefit Harvesting stage based on Figure (27).

Results related to the IT project

Under program performance report, 67% of the participants mentioned that final reports on the performance of delivering the solution have been submitted. Solution delivery report included: schedule, budget usage, completeness, quality of functionality, user satisfaction, and the status of business and IT function internal controls. The driver of submitting the solution delivery report differs among the cases. Beta, Delta participant mentioned that it is needed from top management while Gama participant mentioned that it is not needed/ requested but he is doing it to show the performance of what he is responsible for. Alpha and Zeta mentioned that there is no need for such report unless for user satisfaction report.

Under business outcome reports, a final report of the business outcome has not been submitted by 67% of the IT projects. Participants mentioned

that benefits are realized where everybody can see it, especially as it is IT project, so reports are not needed. For the case of Alpha and Zeta participant, they will consider this practice in future because they have challenges in realizing the benefits (especially with the existence of IT steering committee in Alpha). Zeta, Beta finds reporting is not needed as there is a realization of their progress and there is a shortage of resources if they apply it.

Under operational performance report, 50% of the participants mentioned that there are reports that included service delivery which focused on sustained service delivery, contribution to value, and status of IT function internal controls for delivering capabilities effectively and efficiently.

In general, 67% of the participants finds that business outcome of the IT projects are partially achieved and 33% of them find it fully achieved. All business KPIs are either not monitored or not improved as expected.

	Alpha_IT	Beta_IT	Delta_IT	Theta_IT	Gama_IT	Zeta_IT	%
final report on program performance (solution delivery) has been submitted	No	Yes	Yes	Yes	Yes	No	67%
□ Schedule	No	Yes	Yes	Yes	Yes	No	67%
□ Funding/ used budget	No	Yes	Yes	Yes	Yes	No	67%
□ completeness	No	Yes	Yes	Yes	Yes	No	67%
□ quality of functionality	No	Yes	Yes	Yes	Yes	No	67%
□ user satisfaction	No	Yes	Yes	Yes	Yes	Yes	83%
□ the status of business and IT function internal controls (including the continuing acceptance of accountabilities for delivering capabilities)	No	Yes	Yes	Yes	No	No	50%
final Report on business performance (benefit/outcome) has been submitted	No	No	Yes	Yes	No	No	67%
□ Business changes being implemented	No	No	Yes	Yes	No	No	67%
□ Benefits realization against the benefits realization plan as documented in the benefits register,	No	No	No	Yes	No	No	83%
□ Status of internal controls for benefits realization.	No	No	Yes	Yes	No	No	67%
Final Report on operational performance (service delivery) has been submited	No	Yes	Yes	Yes	NA	No	50%
□ Focus on sustained service delivery	No	Yes	Yes	Yes	NA	No	50%
□ Contribution to value	No	Yes	Yes	Yes	NA	No	50%
□ Status of business and IT function internal controls for delivering capabilities effectively and efficiently.	No	Yes	Yes	Yes	NA	No	50%

Figure (27)
Summarized result of the Benefit Harvesting stage

4.2.9. Stage 9: Reconciliation and Retirement

Responses from participants have been summarized as shown at the end of this section Figure (28). The following paragraphs are the analysis of the findings for Reconciliation and Retirement stage based on Figure (28).

Results related to the IT project

The systems resulting out of the IT projects are not retired, although some of them replaced the legacy system as services continue. Alpha has a new IT project released few months ago to replace the Alpha_IT where enhancement has been considered. Beta_IT replaced a legacy system that was handled by another GE as a result of changes in the regulations. For Gama case, although the execution was done successfully but it was not fully released. As the system resulting out of the project faced many challenges (internal and external), it led to a change where the project separated into two phases the first phase has been released after including many changes.

Zeta_IT replaced a legacy system as a result of legacy system issues. This shows that although there are many challenges faced during the IT project, there is still the requirement for improvement and enhancing the processes. Some participants talked about there are some services which would end as a result of the IT project. (Example of services that about to end are print press division where their tasks have been decreased to 75 %.) Such changes are not included when designing the need of the IT project and as the participants mentioned they are known to all but decisions not taken among such changes.

83% of the participants mentioned that lessons learned are reviewed, discussed, and shared in meetings. They get reviewed of projects based (example: Delta) and some regularly (example: Alpha case each 4 years). Consideration of replacement or enhancement for future exists in all GEs.

	Alpha_IT	Beta_IT	Delta_IT	Theta_IT	Gama_IT	Zeta_IT	%
Whether there were formal closure approval of retirement	NA	NA	NA	NA	NA	NA	
Select weather:							
□ Closure done by the ISB and the business sponsor.	NA	NA	NA	NA	NA	NA	
□ Lessons learned reviewed and documented.	Yes	Yes	Yes	Yes	No	Yes	83%
□ Program has been removed from the active investment portfolio.	NA	NA	NA	NA	NA	NA	
□ Resources has been reassigned	Yes	Yes	Yes	Yes	NA	Yes	83%
Whether the research and development team or business people think in advance about the IT systems that will be replacing the IT systems that are about to retire?	Yes	Yes	Yes	Yes	Yes	Yes	100%

Figure (28)
Summarized result of the Reconciliation and Retirement stage

4.2.10. Summary of the Results and discussion

The following are highlights of the summarized results for the first research question which cover the current situation based on stages of value governance:

Submission of idea:

From a Structure point of view, alignment between IT strategy and business strategy was observed. The Top management gave required importance to the IT department in all GEs and consider it as an investment opportunity (as mentioned by all participants). Executives don't have difficulties in understanding IT strategy. Most of the GEs have clear accountabilities and responsibilities formalized and hence segregation of duties was observed. All the GEs have current and future planning of funds, human resources, etc. The required remedial / corrective actions were taken where necessary.

For IT projects, Most of the IT projects considered in this study were not initiated by IT department, but IT department was responsible for making the initial business case. Initial business case included all the components. Most of the initial business cases didn't include the approval from the all three main parties: Business owner, IT department, and Top management.

Submission of ideas in GEs: Good ideas of IT initiatives in GEs were driven by top management, or another GEs and rarely from IT. According to the responses from the participants adequate governance structure was available for accepting good ideas and preparing the initial business case. However, high dependency on the IT department and lack of engaging business owner in the early stage was noted.

Opportunity Qualification:

In most of the GEs, IT initiatives are not grouped under portfolios to satisfy a specific business outcome. Qualifying the initial business case process is experience based and there is no formalized method to take decision used from this process. There is no structured process for qualifying IT initiatives, but due to expertise exists in the GEs there is high confidence to meet each of stakeholders needs, KPIs, expected outcome, alternative course of actions and business change.

Business case assessment:

Structure: Criteria for selecting and assessing business cases of IT project is experience based in most of the GEs (80%). Many committees exist and have a role within the IT project (Board of directors, CARS

auditors, ISB, IT risk and security committee) while some others are non-existence (IT steering committee, PMO, PrgMO, VMO).

IT project: Business case for the IT projects are detailed and included: executive summary (100% of the IT projects in the study), purpose (100% of the IT projects in the study), objectives (100% of the IT projects in the study), scope (100%), dependencies (100% of the IT projects in the study), risks (83% of the IT projects in the study), milestones (100% of the IT projects in the study), organizational change impact (83% of the IT projects in the study), program plan (83% of the IT projects in the study), and value assessment (83% of the IT projects in the study).

Also, most of the plans exist (project plans, approach to risk and change management, the program governance structure, and controls) where benefit realization plan is limited in most of the GEs.

For all the GEs, the participants mentioned that most of the roles such as Investment decision maker, program sponsor, program manager, project manager, service deliver, business benefits achiever, expenditures controller, supporter, etc. were played either by themselves or by relevant authorities within the GE.

Balanced investment mix is not considered in most of the GEs. However, there is a high level of satisfaction of the selected IT projects in most of the GEs. Furthermore consulting and taking the stakeholders agreement on the costs and benefits for which they will accept responsibility hasn't been obtained by 67% of the IT projects.

Scheduling:

Budgeting process was considered in all GEs and they don't have any issues. On the other hand, there are challenges related to benefits characteristics and

value assessment process by most of the GEs which directly affect the ROI methodology.

Project initiation:

To sum up, no failed IT project exists and most of the GEs believe that it is due to the support from concerned authorities of the GE or mainly from the project manager.

Business cases differ from the initiated one in most of the IT projects (73% of similarities in average). Changes in the business case were evaluated and approved by the concerned stakeholders including the justifications / reasons behind such changes (examples of change reasons: changes in the business roles, vendor delay, change in the stakeholder needs, and change in the government regulation). Furthermore, 70% of the human resources responsible for the IT project are IT specialist (full time+ part time) and 30% from the business.

Portfolio of IT investments is not monitored by most of the GEs. Progress reports are submitted in most of the IT projects, which includes: needed budget for the next stage if it differs than the planned, identification of deviations, needed Remedial actions, and performance against scope, schedule, quality, etc.

Scope definition:

There is no clear issue/ challenge related to this stage. GEs generally strict to the IT projects plans, also there are many scope deviations occurred and all of them are either due to the stakeholders understanding of the scope or external reasons. Generally, it is noticed that solving the deviation take a

long time compared to identifying of the deviation and reporting it. But all participants mentioned that they preferred to stick to the project plan and any major changes postponed to another project.

Benefit planning:

Contribution to the strategy is easily identified, although there are some gaps as the value not mentioned in yearly bases up to the retirement. Most of the IT project get mapped to the strategic outcome and complementary initiatives were identified. But none of the IT projects included the benefits until the retirement stage reached.

Benefit Harvesting:

Program performance report (Solution delivery) and operational report (Service delivery) were submitted to top management in most of the IT projects. On the other hand, business benefits report submitted only in 33% of the IT projects.

Reconciliation and Retirement:

In general, there is a consideration of the lessons learned from IT project execution in most of the GEs. Many management practices were not tested because all IT project still not retired.

For having an overall percentage overview, tested value management practices have been categorized to good practices, opportunities that need improvements, and issues where more information are needed about those practices. Only the applicable and tested practices were included in the percentage. Overall, there are 115 practices are tested weighted equally.

Inner percentage represent the average percentage of each stage depending on occurrences (Appendix C includes details of the overall percentages).

Weight= Number of tested practices under each stage / total (115)

Inner percentage= $\sum average\ percentage\ of\ each\ practice$

Overall percentage= Weight * Inner percentage

Figure (29) shows the overall percentages of value management practices. It shows that out of the 115 practices, 71% of them where good practices, 23% of them where opportunities for improvements and 6% of them were issues where more information are needed. Details of those practices shown in Figure (30).

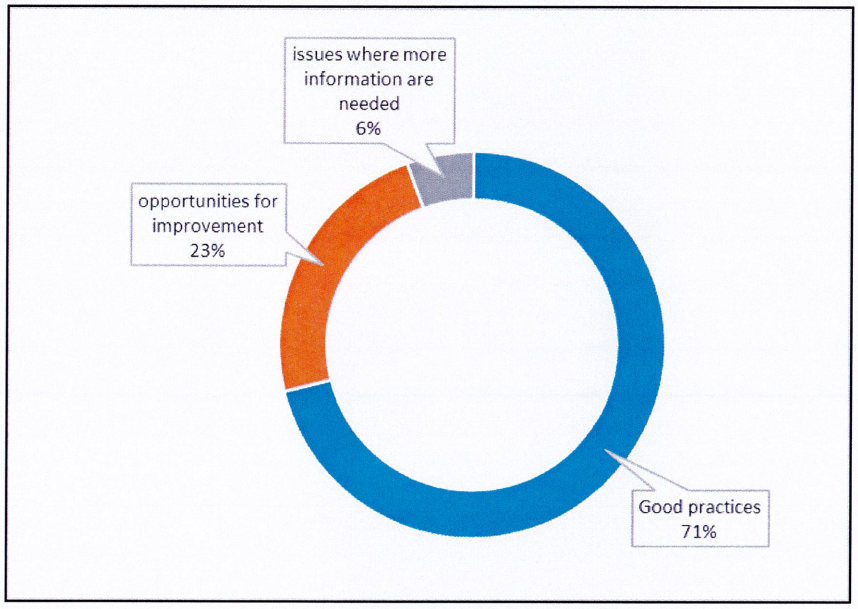


Figure (29)
Overall percentages of tested value management practices

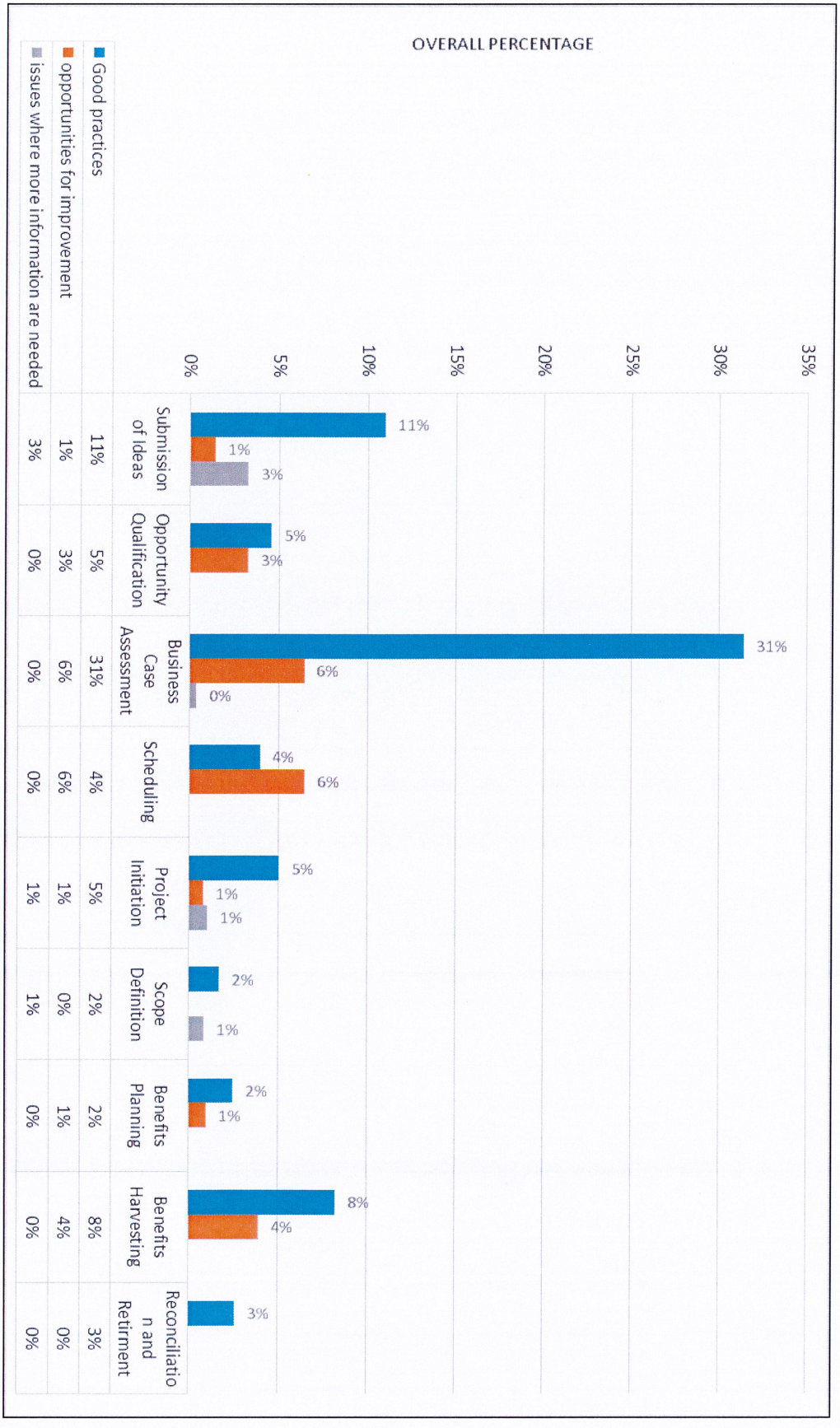


Figure (30)
Percentage of challenges impact for each category

De Haes et al (2011) mentioned that methodology for realizing value from business processes is not mentioned much in the literature, but in this research results shows the needed efforts from GEs to realize the value through the different value governance stages.

One of the obvious objectives of Val IT framework when developed was to show the role of business people within the IT investments. Results show that most of the challenges are related to value management activities that are related to benefits planning and realization which is according to Val IT business people role. There is an overlap between IT function role and business function, where in some cases IT play the benefits achiever and sometimes as IT project manager. This would lead to intervention in the roles and responsibilities that should be given to IT and thereby affect their performance by the time. This situation discussed broadly in the literature where IT and business functions should be aligned to achieve the value (Juiz and Toome, 2015).

Referring to the governance of IT definition (ISO/IEC, 2008), results showed that, more efforts are needed to evaluate and direct the use of IT. Many Gaps support these findings, for example, IT initiatives are not grouped under portfolios to satisfy a specific business outcome, there is no structured process for qualifying IT initiatives, IT initiatives in GEs were driven by top management, or another GEs and rarely from IT, etc....

The high dependency on IT function to achieve value, poor engagement of business people in the early stages and not having reliable plans, all show that there is a need for involving boards and senior management in tactical and strategic directions of IT as mentioned by De Haes et al. (2013).

Referring to AlSoufi and Ahmed (2012) study that covered Bahrain Ministries, founded challenges still exist. For example, senior management involvement and support were highlighted highly by most of the participants but that involvement not strong as needed when it is related to the monitoring stage where benefits planning and harvesting reports were needed. Also, shortage of human resources was a challenge in many cases. The study showed that ownership is an issue, as the responsibility of achieving the business value from IT investment is not unified by all cases in the study.

Gama_IT case represents an example of IT investment where there is a black hole, where the final solution of the IT project was not released as planned as it is illustrated by De Haes & Van Grembergen (2015). The result of this stage matches the finding of Ward's (2006), that while all GEs did the business case, they didn't achieve the planned outcome.

4.3. How far the current situation differ from best practice frameworks and tools

This section includes mapping between the first objectives of the study (current situation of GEs) to Val IT activities based on value governance stages. IM, PM, VG referred to the domain name followed by the number of the activity, the details of the activities are founded in the Val IT framework. This will show another point of view of the exercised practices in the selected GEs, which is from Val IT framework.

4.3.1. Stage 1: Submission of idea

Table (18) show the results of mapping the results of the first objective (the current situation of the GEs- Submission of idea stage) to Val IT activities, where there are few activities of Val IT were not exercised.

Table (18)
Exercised and Gaps of Val IT activities for Submission of idea stage[3]

Val IT process/ activities	Exists (+)/ Gap(-)
VG1: Establish informed and committed leadership.	
VG1.1 Develop an understanding of the significance of IT and the role of governance.	+
VG1.2 Establish effective reporting lines.	+
VG1.3 Establish a leadership forum.	+
VG1.4 Define value for the enterprise.	-
PM1 Establish strategic direction and target investment mix.	
PM1.1 Review and ensure clarity of the business strategy and goals.	+
IM1 Develop the initial program concept business case.	
IM1.1 Recognize investment opportunities.	-
IM1.2 Develop the initial program concept business case.	+ -
VG2 Define and implement processes.	
VG2.1 Define the value governance framework.	+
VG2.2 Assess the quality and coverage of current processes.	+

As per above table, the overall leadership, governance, clear accountabilities and responsibilities, resource planning, and strategy alignment were noted for all the GEs which is in line with some Value Governance (VG) related activities. Similarly, some activities in Portfolio Management (PM) and Investment Management (IM) were observed for some GEs.

However, over dependency on IT department for project execution and benefit realization without adequate support and accountability from concerned business/ Non-IT units was noticed by the researcher, thereby the activities such as VG 1.4 and IM 1.1 were not followed completely / adequately.

[3] Note: (+) Sign means the after analyzing the result of the current situation the activity exists where (-) sign means there is a gap in that activity.

4.3.2. Stage 2: Opportunity Qualification

Table (19) show the results of mapping the results of the first objective (the current situation of the GEs- Opportunity Qualification stage) to Val IT activities, where many value management activities illustrated in the GEs, as well as some, are missed.

Table (19)
Exercised and Gaps of Val IT activities for Opportunity Qualification stage

Val IT process/ activities	Exists (+)/ Gap(-)
VG3 Define portfolio characteristics.	
VG3.1 Define portfolio types.	-
VG3.2 Define categories (within portfolios).	-
VG3.3 Develop and communicate evaluation criteria (for each portfolio category).	-
VG3.5 Define requirements for stage-gates and other reviews (for each category).	-
IM1 Evaluate the initial program concept business case.	
IM1.3 Evaluate the initial program concept business case (Qualification)	+ -
VG1: Establish informed and committed leadership.	
VG1.5 Ensure alignment and integration of business and IT strategies with key business goals.	+

As per above table, the results show that although there are gaps exercising adequately the value management practices, all the GEs top management had expressed high confidence in IT department for their tactical/ operational level of understanding and handling. Some of the gaps noted were as follows:

Portfolio types including categories (example: Portfolio of finance related, operations related, etc.) (VG 3.2, VG 3.3) were not defined. This is important for this stage as all IT initiatives that collected from the first stage need to be re-duplicated, re-arranged and grouped within a special portfolio and category. IT projects are categorized depending on the business outcome they achieved with qualification methodology used for IT initiatives (IM1.3)

to make sure there is a potential to justify next stage requirement (assessment).

Results show that there is no unique methodology for the GEs although they mostly have a common relations, beneficiaries and type of IT projects.

4.3.3. Stage 3: Business Case Assessment

For Business case assessment stage, many value management practices were illustrated but some were missed for most of the GEs, as shown in the following Table (20):

Table (20)
Exercised and Gaps of Val IT activities for Business case assessment stage

Val IT process/ activities	Exists (+)/ Gap(-)
VG3 Define portfolio characteristics.	
VG3.3 Develop and communicate evaluation criteria (for each portfolio category).	-
VG3.4 Assign weightings to criteria.	-
PM4 Evaluate and select programs to fund.	
PM4.1 Evaluate and assign relative scores to program business cases.	-
PM4.2 Create an overall investment portfolio view.	+
IM2 Understand the candidate program and implementation options.	
IM2.1 Develop a clear and complete understanding of the candidate program.	+
IM3 Develop the program plan.	
IM3.1 Develop the program plan.	+
IM4 Develop full life-cycle costs and benefits.	
IM4.1 Identify full life-cycle costs and benefits.	-
IM4.2 Develop a benefits realization plan.	-
IM5 Develop the detailed candidate program business case.	
IM5.1 Develop the detailed program business case.	+
IM5.2 Assign clear accountability and ownership.	+
PM1 Establish strategic direction and target investment mix.	
PM1.3 Define an appropriate investment mix.	-
PM3 Manage the availability of human resources.	
PM3.1 Create and maintain an inventory of business human resources.	+
PM3.2 Understand the current and future demand (for business human resources).	+
PM3.3 Identify shortfalls (between current and future business human resource	+

Val IT process/ activities	Exists (+)/ Gap(-)
demand).	
PM3.4 Create and maintain tactical plans (for business human resources).	+
PM3.5 Monitor, review and adjust (business function allocation and staffing).	+
PM3.6 Create and maintain an inventory of IT human resources.	+
PM3.7 Understand the current and future demand (for IT human resources).	+
PM3.8 Identify shortfalls (between current and future IT human resource demand).	+
PM3.9 Create and maintain tactical plans (for IT human resources).	+

As per above table, there is a view on the overall dependent and related IT projects as mentioned in (PM4.2). The detailed business case is developed as illustrated in (IM1.5). Also, plans are all set except for value realization plan (IM3.1). Roles and responsibilities are assigned within full authority (IM 5.2).

On the other hand, there were many gaps and enhancement opportunities identified for the GEs. According to Val IT, there is a gap as there should be evaluation criteria with weights for each critical case/ idea should be developed (VG3.3, VG3.4) and use the result to select proper IT project (PM 4.1, IM 1.3). The second gap identified as the absence of value realization plan in the business case document and project plan. Consulting and taking the stakeholders agreement on the costs and benefits for which they will accept responsibility hasn't been obtained by most of the GEs (IM5.3)

In Val IT, setting assumptions for committee's role exists, and most of them exists (Board of director, CARS auditors, ISB, IT risk and security committee) within a role for the IT project in most cases, while some are absent in their existence or role (IT steering committee, PMO, PrgMO, VMO).

Committees exist and mostly have a role within the existence of the IT project. The absence of Project management office, program management office and value management office refer to the fact that there is no need for that much of structuring. Also they don't have time and the segmented beneficiaries from IT project is not big to have resources for that task. Others mentioned that there is a shortage of the resources so they cannot afford for that. Researcher finds that IT department don't feel the value of getting the structured approach as an example some participants don't find that there is a value from getting project management office, value management office and value management office.

There is a gap in having a balanced investment mix of IT projects by most of the GEs (83%) (PM1.3). According to the Val IT, it is important to have a balance in the investment of portfolios. Theta Participant suggested that balance factor or portfolios can be defined based on the beneficiaries' segment size. The definition, review and optimal management of targeted balance component are required for better project management and benefits realization. The researcher finds that PM3 process illustrated indirectly as there are assigned roles and committees adding to the question that was asked about the current and future human resources in the submission of idea stage.

4.3.4. Stage 4: Scheduling

Scheduling uses the results of value assessment of the IT projects using scores and then select the best project that create value to the GEs within the range of the available budget. According to Val IT there are many value management activities illustrated where others are missed as shown in the following Table (21):

Table (21)
Exercised and Gaps of Val IT activities for Scheduling stage

Val IT process/ activities	Exists (+)/ Gap(-)
VG4 Align and integrate value management with enterprise financial planning.	
VG4.1 Understand the enterprise's current budgeting practices.	+
VG4.2 Determine the financial planning practices needed for value management.	+
VG4.3 Determine optimal financial planning practices, over what periods and who should be the budget holders for different types of expenditures.	+
VG4.8 Regularly review financial planning and budgeting practices.	+
PM2 Determine the availability and sources of funds.	
PM2.1 Determine overall investment funds.	+
IM4 Develop full life-cycle costs and benefits.	
IM4.3 Perform appropriate reviews and obtain sign-offs.	-

As per above table, all the GEs applied the budgeting practices (VG4) but lack to attach the score of IT investment to the business case. Using SMART benefits can ease the process of value assessment as mentioned in Val IT, but it is not practiced in most of the IT projects (IM4).

Funding practices and management of project cost can be enhanced by adequate usage of ROI methodology (cost and benefits).

The researcher noticed some issues in the costing process, specifically with the recurrent cost as it didn't include the full economic life cycle cost as mentioned by some (Delta participant mentioned that they included the operational cost for 5 years while the lifetime for 7 years).

4.3.5. Stage 5: Project Initiation

According to Val IT there are many value management practices illustrated while others are challenged for Project Initiation stage as shown in the following Table (22):

Table (22)
Exercised and Gaps of Val IT activities for Project Initiation stage

Val IT process/ activities	Exists (+)/ Gap(-)
VG5 Establish effective governance monitoring.	
VG5.1 Identify key metrics.	+
VG5.2 Define information capture processes and approaches.	+
VG5.3 Define reporting methods and techniques.	+
VG5.4 Identify and monitor performance improvement actions.	+
PM3 Manage the availability of human resources.	
PM3.10 Monitor, review and adjust (IT function allocation and staffing).	+
PM5 Monitor and report on investment portfolio performance.	
PM5.1 Monitor and report on investment portfolio performance.	+
PM6 Optimize investment portfolio performance.	
PM6.1 Optimize investment portfolio performance.	+ -
IM6 Launch and manage the program.	
IM6.1 Plan projects, and resource and launch the program.	+
IM6.2 Manage the program.	-
IM7 Update operational IT portfolios.	
IM7.1 Update operational IT portfolios.	-
IM8 Update the business case.	
IM8.1 Update the business case.	+

As per above table, the business case differs from the initiated one in most of the IT projects (73% of similarities in average) which show the challenge faced in IT projects and managing them (IM6.2). Changes are evaluated and approved by sponsors in most GEs. This is aligned to what has been mentioned in Maes et al. study (2014) under Business case maintenance process. This is also illustrated in Val IT (IM8, IM6).

In term of reporting, progress reports are submitted in most of the IT projects, which includes: needed budget for the next stage if it differs than the planned, identification of deviations, needed remedial actions, and performance against scope, schedule, quality, etc. This is aligned to (VG5). However, the portfolio of IT investments is not monitored by most of the

GEs. Therefore, there a gap was noticed for selection of active and optimal portfolio, as mentioned in (IM7).

Participants were aware of the role of both project managers and organization structure as a success factor, but due to the nature of project, project manager role is needed more. This matches to what is mentioned by Ward (2006), that having a structure in place is usefulness if not everyone following and using them.

Researcher finds that there is kind of optimization processes (PM6) exist due to the fact that most of the IT projects in the study were urgent and GEs accept them agilely with keeping the alignment to the business strategy.

4.3.6. Stage 6: Scope definition

According to Val IT, there are many value management practices illustrated for Scope definition stage, as shown in Table (23). This stage is managed in most cases as scope creep rarely happened (IM6. 1), deviations are monitored and solved. Researcher finds that there is no issue to have a change during the project especially with cases that includes changes with great value. It is important to mention that well-structured GEs (that use project management framework) accepting the change even with their responses, this is noticed by the researcher with voice note. Although all participants mentioned that they preferred to stick to the plan and any major changes can be made later.

Table (23)
Exercised and Gaps of Val IT activities for Scope definition stage

Val IT process/ activities	Exists (+)/ Gap(-)
IM6 Launch and manage the program.	
IM6.2 Manage the program.	+
IM9 Monitor and report on the program.	
IM9.1 Monitor and report on program (solution delivery) performance.	+

4.3.7. Stage 7: Benefits Planning

Table (24) included exercised and gaps of Val IT activities for Benefits Planning stage, Strategic contribution identified in terms of mapping the strategic outcome to the IT project and needed complementary initiatives (IM6.1), but not the benefits (IM6.2).

Table (24)
Exercised and Gaps of Val IT activities for Benefits Planning stage

Val IT process/ activities	Exists (+)/ Gap(-)
IM6 Launch and manage the program.	
IM6.2 Manage the program.	+
IM6.3 Track and manage benefits.	-

4.3.8. Stage 8: Benefits Harvesting

There are many Val IT activities of the Benefit Harvesting stage illustrated from Val IT as shown in Table (25):

Table (25)
Exercised and Gaps of Val IT activities for Benefits Harvesting stage

Val IT process/ activities	Exists (+)/ Gap(-)
VG5 Establish effective governance monitoring	
VG5.3 Define reporting methods and techniques.	+
VG5.4 Identify and monitor performance improvement actions.	+
IM9 Monitor and report on the program	
IM9.1 Monitor and report on program (solution delivery) performance.	+
IM9.2 Monitor and report on business (benefit/outcome) performance.	-
IM9.3 Monitor and report on operational (service delivery) performance.	+

As per above table, the benefits harvesting stage should tally or exceed the benefits mentioned in the benefits planning stage. In most of the IT projects, the program performance report (Solution delivery) and operational report (Service delivery) were submitted to top management as mentioned in IM9. 1 and IM9.3. On the other hand business benefits report were submitted only in the 33% of cases, which is noted as a gap as illustrated in (IM9.2).

Researcher finds that the previous result shows that there is a degree of structuring in defining and monitor the performance of the IT project as illustrated in (VG5.3, VG5.4).

4.3.9. Stage 9: Reconciliation and Retirement

The systems resulting out of the IT projects are not retired. On the other hand, participants mentioned that there are services about to end as a result of the IT project. Most of the participants mentioned that lessons learned are reviewed, discussed, and shared in meetings. Consideration of replacement or enhancement for future exists in all GEs. This shows that many value management practices exist as illustrated in Table (26):

Table (26)
Exercised and Gaps of Val IT activities for Reconciliation and Retirement stage

Val IT process/ activities	**Exists (+)/ Gap(-)**
VG6 Continuously improves value management practices.	
VG6.1 Implement lessons learned.	+
IM10 Retire the program.	
IM10.1 Retire the program.	NA

As per above table, Most of the participants mentioned that lessons learned are reviewed, discussed, and shared in meetings as illustrated in (VG6. 1). Consideration of replacement or enhancement for future exists in

all GEs. The systems resulting out of the IT projects are not retired. On the other hand, participants mentioned that there are services about to end as a result of the IT project.

4.3.10. Summary of the Results and discussion

The previous section answered the second research question which is "How far the current situation differ from best practice frameworks and tools?" From Val IT activities point of view, results show that there are 46 management activities that were exercised in the selected GEs whereas 20 management activities represented gaps and 18 management activities were not tested directly. Figure (31) shows those Val IT practices in each governance stage. It is clear from the figure that most of the Gaps founded in opportunity qualification stage, benefits planning stage and submission of idea stage, whereas top three value governance stages that exercised the Val IT practices are Reconciliation and retirement stage, Scope definition and Scheduling stages.

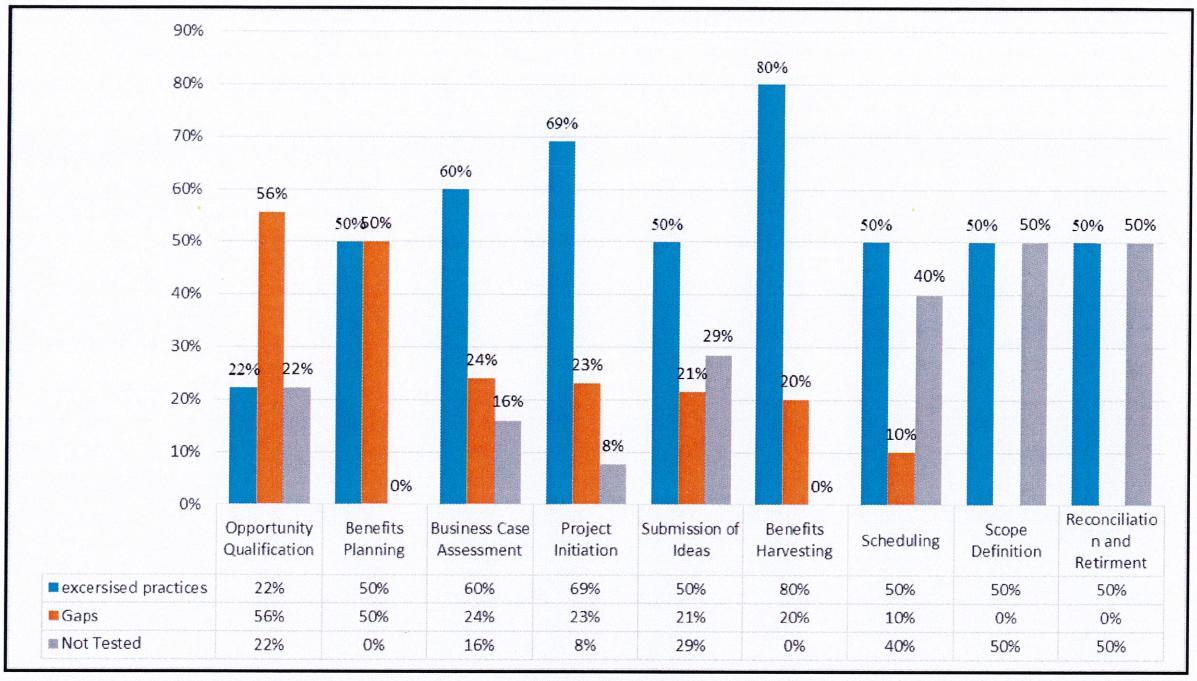


Figure (31)
Gaps and exercised Val IT practices in the selected GEs in each value governance stages.

Results show that using customized framework of Val IT to extract the current situation and challenges/ issues of the IT investment is effective. Customized framework can be used easily by professionals to trace their current situation and challenges so they can avoid them in future IT projects. Value governance body need to analyze the existing gaps to enhance the value realization. This is part of directing and evaluating the use of IT as mentioned by ISO/IEC (2008). They can use the suggested roles and responsibilities from Val IT framework for the value management practices that are limited in the GEs.

The study showed a mapping of Val IT activities where GEs can use to improve their performance in future IT investments. This approach has been used in ING case study from Val IT perspectives (ITGI, 2006a), but this study covered the mapping in a bigger segment and from activities

perspectives. Also, this study differs from ING case study as it included public sector rather than private sector.

Furthermore, value governance stages that were discussed by ITGI (2007b), used highly in this research. It provides the conceptual level information to understand the value governance and its application for the governmental agency, whereas this study provides more details of needed value management practices depending on those value governance stages.

4.4. Issues and challenges for the selected GEs that prevent realization of IT investment value

This section covers the third question that is "What are issues and challenges for the selected GEs to overcome any problem can occur in future projects?" Those challenges are preventing selected GEs from realizing the value of IT investment. Researcher categorized participant responses depending on their type. The themes are: Cultural related, Business Owner related, External Stakeholder related, Organizational related, Top management related, Project related, and National related. All challenges available in Appendix D depending on their category.

4.4.1. Challenges that affect the clarity and completion of the IT project requirements

Most of the participants mentioned that they are facing challenges in finalizing their project requirements. The responses are different for participants and with different causes. For example, Alpha participants mentioned that unclear procedures and political issues affect the clarity of the requirements. For Beta case, the participant mentioned that the clarity for IT projects is generally obtained for the planned projects. However, adequate

time / resources are not available for the urgent projects. For Theta case, the participant mentioned that frequent changes in the business function of the business people affect the project time. Gama participant mentioned that the requirements were similar to the manual business processes, thus, it affected the solution delivery. Theta participant mentioned that there should be a role of top management where they see the holistic view of the requirements in order to prevent scope creep. Challenges that affect the clarity and completes of the IT project requirements affect the pre-stages of value governance. This is summarized in Table (27):

Table (27)
Challenges that affect the clarity and completion of the IT project requirements

Category	Challenges that affect the clarity and completion of the IT project requirements
Business owner	Unclear procedures
Business owner	Requirements kept rigid as the manual business processes
Organizational	Changes in the business function of the business people
Project related	The IT project is urgent and time is limited
Top management	Top management decision to finalize the requirement and prevent scope creep is limited

4.4.2. Challenge of resistance:

Participants mentioned that resisting the change affect the project during the planning and harvesting the benefits highly. Alpha_IT, Delta_IT, Zeta_IT participants mentioned that the resistance occurred because concerned business people were not engaged fully during the early stages, which resulted in a lack of the ownership. Business people keep using legacy systems as they don't understand fully the value from the IT project or there is the shortage in resources as mentioned by Gama participant. Alpha participant mentioned that top management doesn't take strict decisions to enforce business people to achieve benefits. Similar observation was mentioned by the Theta_IT participants, where top management was

supportive but not taking the accountability Alpha and Zeta participants mentioned that they don't engage business people as they exaggerate their requirements for requesting new roles, new staff, restructuring, etc... So they, in general, all participants mentioned that top management engagement is needed to overcome the resistance. Challenges that increase the resistance affect the post stages of value governance. This is summarized in Table (28)

Table (28)
Challenges that increase the resistance

Category	Challenge that increase the resistance
Business owner related	Business people not engaged fully in the early stages
Business owner related	Lack of the ownership to the IT investment from business people
Business owner related	Business people keep using legacy systems as they don't feel the resulted value of the IT project
Organizational related	Shortage in resources
Top management related	Top management doesn't take strict decisions to enforce business people to achieve benefits and overcome resistance
Business owner related	Business people exaggerate on the needs as a result (i.e. new roles, new staff, restructuring)

4.4.3. Challenges that affect the performance of the vendor:

In general, the participants mentioned that dependency on the outsourcing is a challenge. Vendor performance was not found to meeting their expectations and there was a delay noted in delivering the solution. Other reasons mentioned by the participants were: vendors don't perform very well as promised with a low capital project and they accept the worst case where they have to pay penalties, which also not a suitable solution for GEs as they will not save time. Another reason is that vendors are forced to use external professionals as they don't find national professionals. Some participants mentioned that they are forced with very few vendors as there

were no competitors. Furthermore changes in the requirements affect the vendor as they need more time to understand and apply the needed change. Challenges that affect the performance of the vendor affect pro and post stages. This is summarized in Table (29)

Table (29)
Challenges that affect the performance of the vendor

Category	Challenges that affect the performance of the vendor
project related	Vendors don't perform very well with low capital project
project related	Vendor accepts the worst case where they have to pay penalties
Organizational related	GEs don't prefer to stop with low vendor performer as they will not save time
Vendor-related	vendors are enforced to use external unprofessional
National related	National professionals are limited
National related	There are no much competitors
Business owner related	Change the requirement affects the vendor as they need more time to understand and apply the needed change.

4.4.4. Challenges that affect the project manager performance:

Alpha participant mentioned that challenges were faced with IT project managers. Firstly, it is not easy to find highly competent IT project managers. Further, long time is spent in following up with the people where they were on vacation. Such delays were difficult to account for project delay. Sometimes, it was noted that some project managers don't accept one day of delay while others may not be impacted by any amount of delay. Zeta and Gama's participant mentioned that due to the shortage in resources they took more than one role where they found themselves overwhelmed. Participants mentioned that the decision for selecting an IT project depending on the capabilities and applicability was not the main objective of the project managers. The project complexity also affected the IT project manager performance especially for projects that have many stakeholders.

Theta participant mentioned that there should be a process for not selecting projects of high risks which can't be afforded. Participants mentioned that challenges were faced to identify and measure intangible benefits, as mentioned by Beta participant. Beta, Delta, and Theta participants mentioned that many difficulties and challenges were noted in managing technical and operational issues. Many participants mentioned that the success was achieved due to the project manager. Participants mentioned that complexity reasons as follows: the project is national wide, dealing with an external vendor, or challenges in the stricter of the organizations. Challenges that affect the project manager performance affect all stages. This is summarized in Table (30):

Table (30)
Challenges that affect the project manager performance

Category	Challenges that affect the project manager performance
External Stakeholder related	cooperation of stakeholder
Project related	the project is national wide
National related	Dealing with external vendor
National related	Not easy to find high competencies for managing IT projects.
Project manager related	Huge time spent for following up people where they are on vacation
Organizational related	Accountability of being delay can't be practiced and that because no enough reasons/ analysis can be directly related to cause of delay
Project manager related	Sense of time is absent for project managers
Organizational related	Shortage in resources they took more than one role and be overwhelmed and segregation of duties can't be maintained
Project related	Selecting an IT project not depend on the capabilities and applicability's
Project related	Project complexity affects the IT project manager performance especially for projects that have many stakeholders
Project related	High-risk projects which include risk that can't be afforded
Project related	difficulties in adopting technical and operational issues

4.4.5. Challenges that affect the use of program concept:

The program would consist of a mixture of several projects in the same portfolio. Typically, the program would be part of the long-term plan where many challenges were faced as it was not attracting top management due to the frequent change happening and long-term sponsorship is needed, as mentioned by Alpha participant. Gama faced a challenge in the release stage where and the requirements had been changed by the stakeholder, although they used the concept of the program. The participants mentioned that IT and business stakeholders do not adequately involve in designing business and IT projects together to achieve the intended value as still there are cases that IT should do everything since it is related to technology (Alpha, Zeta). In contrast, Theta_IT participant referred this issue to the ownership, business people feel they own the business and afraid that they will lose that ownership by the help of IT. Challenges that affect the use of program concept affect all stages. This is summarized in Table (31):

Table (31)
Challenges that affect the use of program concept

Category	Challenges that affect the use of program concept
Organizational	Frequent change happening in top management level
Organizational	Long-term sponsorship is limited
Organizational	Weak relation between IT and business in designing business and IT projects together
Cultural	Business people feel they own the business and afraid that they will lose that ownership by the help of IT
Cultural	IT should do everything since it is related to technology

4.4.6. Challenges that affect the cooperation between GEs and external stakeholder:

External stakeholder cooperation and contribution is highly important and it significantly affects the time of the IT project. The details of this are discussed in the dependencies section. Participants mentioned that the

stakeholders support represents a challenge as many projects are canceled or delayed due to inadequate support. Beta participant mentioned that IT project with higher dependencies on external stakeholders has a high probability to not be completed successfully. The GEs depend on each other for many reasons: authorized approval, service provider, supporter, common business database interface, etc. Such things have a high impact on the IT project time, for example, all the processes of the dependent GE (governor) takes a long time and significantly affect the plan as the concerned GE have different priorities. It may happen that what is important and priority for one GE may be a low priority for other concerned GE whose approval is required. Different roles and responsibilities among the employees were noted by the participants when cross sectional roles were required among GEs which resulted in lack or shortage in concerned competent resources. Inadequate database interfaces affect another project during the benefit harvesting stage as the replaced project or enhancements may hamper the database of the interfacing systems of projects of other concerned GE as mentioned by Beta_IT participants. Challenges that affect the cooperation between GEs and external stakeholder affect all stages. This is summarized in Table (32):

Table (32)
Challenges that affect the cooperation between GEs and external stakeholder

Category	Challenges that affect the cooperation between GEs and external stakeholder
External Stakeholder related	Dependent GE (governor) of other concerned GE takes a long time and affect the project if such delay is not included in the plan
External Stakeholder related	Cooperation and support of the concerned GE can be impacted as what represent for the GE high priority may represent for the dependent GE as low priority
External Stakeholder related	Different roles and responsibilities among the employees in cross-sectional level among GEs
External Stakeholder	lack or shortage of resources

Category	Challenges that affect the cooperation between GEs and external stakeholder
related	
External Stakeholder related	Database interfaces as in case the IT project replaced or enhanced without considering that interface with other GEs.

4.4.7. Challenges that affect the project plan:

Participants mentioned many challenges related to IT project plans. Alpha participant mentioned that top management doesn't trust IT plans. IT is very optimistic and not considering the delay resulted from the resistance. The participant mentioned that it is difficult to breakdown IT project plans compared to other projects. Furthermore, unplanned IT projects highly affect the planned one, for example, Alpha participant mentioned that delaying one month cause a delay of three to four months. Alpha participant mentioned that there is a difficulty in considering the impact of any risk in the plans (example: resistance). Challenges that affect the project plan affect Pro stages. This is summarized in Table (33):

Table (33)
Challenges that affect the project plan

Category	Challenges that affect the project plan
Project manager related	IT plans is very optimistic
Top management related	Top management doesn't trust IT plans as resistance or readiness in the plans
Project related	Breakdown IT project plans compared to other projects is difficult
Project related	Unplanned IT projects highly affect the planned one (1 month of delay = 3 months)
Project related	Difficulties in considering the impact of any risk in the plans (example: resistance).
National related	change in the regulation

4.4.8. Challenges that affect the use of project management frameworks:

Many participants don't believe of the need of structuring in managing the projects. Alpha and Zeta participants mentioned that the size of their GE is small, and the concerned beneficiaries' size is also small. Therefore, they

mentioned the difficulty in adopting the project management framework due to the shortage of resources and top management don't have time to read IT issues, they prefer more discussions. Gama participant develops reports even if it's not needed by the top management. Challenges that affect the use of project management frameworks affect all stages of value governance. This is summarized in Table (34):

Table (34)
Challenges that affect the use of project management frameworks

Category	Challenges that affect the use of project management frameworks
Organizational related	Size of the GE is small
Cultural related	Not believing in the need of structuring in managing the projects
Organizational related	Staff and segmented beneficiaries are small
Organizational related	shortage in resources
Top management related	Top management doesn't have time to read IT issues, they preferred discussions

4.4.9. Challenges that affect IT initiatives where they remain as ideas:

There are different reasons where IT initiatives remain as ideas, although there is confidence on its business value. Participants mentioned there are cases where the IT department reject IT initiatives, as well as there, are cases where senior management reject IT initiatives. The participant mentioned typical reasons such as not the right time where readiness for adopting the IT initiatives is needed, lack of resources (Human, others), not aligned to the business strategy, cost exceed the current system cost, value not justified enough, inapplicable where risk of being delayed is rejected, less priority, lack of stakeholder cooperation, out of the IT strategy plan. Challenges that affect IT initiatives where they remain ideas affect the Pre stages of value governance. This is summarized in Table (35):

Table (35)
Challenges that affect IT initiatives where they remain as ideas

Category	Challenges that affect IT initiatives where they remain ideas
Project related	Not the right time where readiness for adopting the IT initiatives is needed
Organizational related	Lack of resources (Human, Non-Human)
Organizational related	Not aligned to the business strategy
Project related	Cost exceed the current system cost
Project related	Value is not justified enough
Project related	inapplicable where the risk of being delayed is rejected
Project related	Out of the IT strategy plan.
Organizational related	less priority
External Stakeholder related	lack of external stakeholders cooperation

4.4.10. Challenges that affect the transparency of cost and benefits

There are different challenges that related to the transparency of cost and benefits of the IT projects. First of all, although the project meets the project plan deadlines, etc. but various challenges can be faced during the project release or benefits realization. Several other challenges are faced when internal resources are used during project or changes in the division where the project will be implemented, etc. Second related to the cost where internal resources not considered as part of the project cost, also there is a limitation in planes that should be implemented on the affected division as there are many divisions roles decreased or nearly disappeared. The researcher also noted challenge in calculating the recurrent cost or full economic life cycle cost. Challenges affect the transparency of cost and benefits affect pre and pro stages. This is summarized in Table (36):

Table (36)
Challenges that affect the transparency of cost and benefits

Category	Challenges affect the transparency of cost and benefits
Project related	Final solution not released
Project related	No consideration of the internal resources (human and non-human) used for the executing the IT project
Project related	Recurrent cost as it didn't include the full economic life cycle cost
Organizational related	Keep the impacted division cost

4.4.11. Summary of the Results and discussion

This section answers the third questions which are issues/ challenges for the selected GEs. The total number of challenges are 60, figure (32) shows the percentage of these challenges depending on what is related to. most of the challenges are project related (32%), second-most are organizational related (25%), third are business owner related (13%), then external stakeholder related (10%), then National related (8%), then top management related (7%) and the least are culturally related (5%).

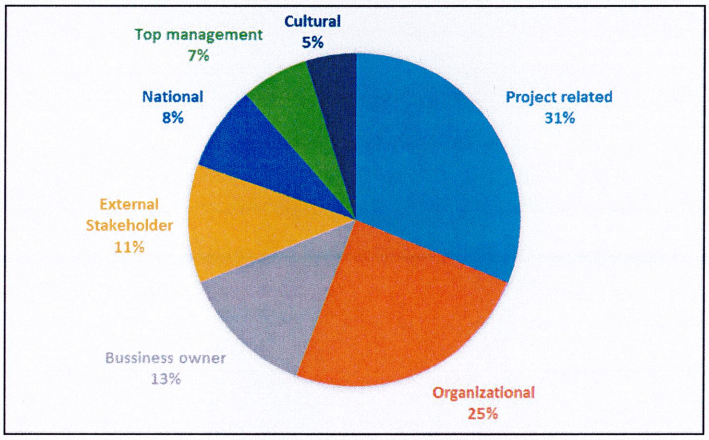


Figure (32)
Percentage of challenges under each category

Figure (33) shows the percentage impact of the challenges for each category. Most of the project-related challenges affect the project manager

performance and impacted IT initiatives where they remain as ideas. Organizational challenges impact

Mostly the usage of proper project management framework and impacted IT initiatives to remain as ideas. Challenges related to business owner affect mostly the resistance. Challenges related to external stakeholder affect mostly the relation between them and the GE. National wide challenges affect mostly vendor Performance and project manager performance. Challenges related to top management affect evenly the quality of the requirements, resistance, plans reliability and adopting the proper project management framework. Cultural challenges affect mostly the usage of program concept.

The following paragraphs represent a discussion of the results of the third research question. It represents mainly needed efforts by GEs to overcome the challenges and issues. It also relates results to the previous studies findings.

According to the results of the third question, GEs need to study the impact of the IT project manager challenges in deep, so they will be able to overcome them in future IT projects. There are many matches between challenges that Bahraini IT project manager have to the challenges mentioned by Doraiswamy & Shiv (2012) and ITGI (2008a).

Results of this section show that there are many similarities between this research findings and Júnior & Chaves (2015) findings. First similarities from the results perspective. Although this study is more details categorization and consider new perspectives that IT project manager care

about, such as challenges that affect the transparency, and challenges that related to national wide.

Val IT framework provides many value management practices to overcome those challenges. All challenges affect the either the accuracy of cost, time, the accuracy of risk, or the intended value to be created from IT investments. The following paragraphs show discussion of the challenges depending what they are related to, and the related value management practice:

Challenges related to business owner

According to the challenges that are related to the business owner. Business people should be aware of their role within the IT project. Value governance body should ensure the degree of agreement of the business owner on the value they will achieve in the early stage, this enhances the ownership as well as the accountability. Needed changes in the business functions should be planned in the early stages. Also business owners need to be aware of the impact of the low performance of their responsibility. This is broadly discussed in IM5 (Develop the detailed candidate program business case) and in PM3 (Manage the availability of human resources).

Challenges related to Culture

There is a need to change the traditional view of IT projects where IT should do everything. The business owner should be aware the role of IT to enable the business value not to own it. the need of following a proper management framework ease the governance processes, knowing its value is very important because even if there is a good structure, it will not be

valuable if people not following it. This is broadly discussed in IM5 (Develop the detailed candidate program business case) and in VG2 (Define and implement processes).

Challenges related to External Stakeholder

External stakeholder should be aware and consulted of the role they have and how they will contribute to the intended value. Not only during the project time but also in post project. They should be aware of the impact their low performance. This is broadly discussed in VG2.7 (Establish and maintain an optimal coordination, communication, and liaison structure between the IT function and other stakeholders) and in IM4.3 (Perform appropriate reviews and obtain sign-offs of the full economic life cycle cost).

Challenges related to National wide

On national wide, there is a need to consider the risk of high dependencies on vendors where alternatives are limited. There should be a strategy for enhancing National professional and National vendors. Furthermore, there should be a defined career path for project/ program manager. Value governance body should ensure including needed performance measures continuously monitored and improved. Change in regulation should include the impact on existing and future IT projects. This is broadly discussed in VG3.3 (Develop and communicate evaluation criteria) and in IM5.2 (Assign clear accountability and ownership).

Challenges related to Organizational structure

On the organizational level, including the impact on existing and future IT projects should be considered when a change happened in the business function. Researcher finds this, better than depending on probabilities and

expected risk. Furthermore, Value governance body need to decide what decision should be taken with no financial penalties. This is discussed in PM3.5 (Monitor, review and adjust business function allocation and staffing) and in VG4 (Align and integrate value management with enterprise financial planning).

It is important to have a proper management framework to realize the value from IT investments. Also, adopting suitable framework for managing projects can overcome accountability and resource usage challenges. This is discussed in VG2 (Define and implement processes) and in IM5.2 (Assign clear accountability and ownership).

Frequent changes on top management and sponsorship will not affect adopting the program concept that includes IT projects if there is a baseline direction of the business strategy and IT strategy. Also, the leadership role is important, as CIO should enhance forums for increasing the IT supporters. This is discussed in VG1 (Establish informed and committed leadership).

On the organizational level, what make value for the GEs, should be communicated among staff. This will overcome many challenges that make IT initiatives remains as ideas. This is discussed in VG1. 4 Define value for the enterprise.

Value governance body should decide in advance with proper plans with the impacted business divisions as the change of IT happened. Acceptable cost should be considered when deciding to continue running the impacted business divisions. This is discussed in PM3.5 (Monitor, review and adjust business function allocation and staffing).

Challenges related to Project nature

Project characteristics affect many decisions and impact the intended business value. To begin with, the urgent projects exist in any organization, but the occurrences of existence is an issue should be governed with acceptable risk. Project complexity,

Value governance body should make a balanced selection of IT projects depending on the IT projects characteristics (national wide projects, enough capabilities, many stakeholders, unmitigated risks). This is discussed in PM1.3 (Define an appropriate investment mix) and in PM4.1 (Evaluate and assign relative scores to program business cases).

Value governance body should consider factors that affect the reliability of plans related to IT project. The remedial decisions out of the progress report that includes deviation overcome this challenges.

Value governance body need to study project related challenges in depth and in turn update the evaluation criteria and governance processes. As discussed in VG2 (Define and implement processes).

Challenges related to Top management

Top management decision is needed to prevent any scope creep during the project stage. Any needed change should be validated where more value will be added rather the planned one. Issues should be raised during the progress report and remedial action should be taken by top management.

There are two forces: the one from IT where they mention that top management support is limited to achieve the value, the other from top management where they mention that IT are very optimistic and don't calculate the time for readiness and resistance. This should be planned separately in the early stages where readiness and the ability to accept the

change should be tested first. This kind of risk should be considered in the evaluation and selection the project.

The size of the GE affect the monitoring tools used. As this challenge show that, top management prefers discussion more than formal reports. This should be agreed on during designing the governance process. As mentioned before this can be offered as a service especially for final reports where lessons learned should be achieved.

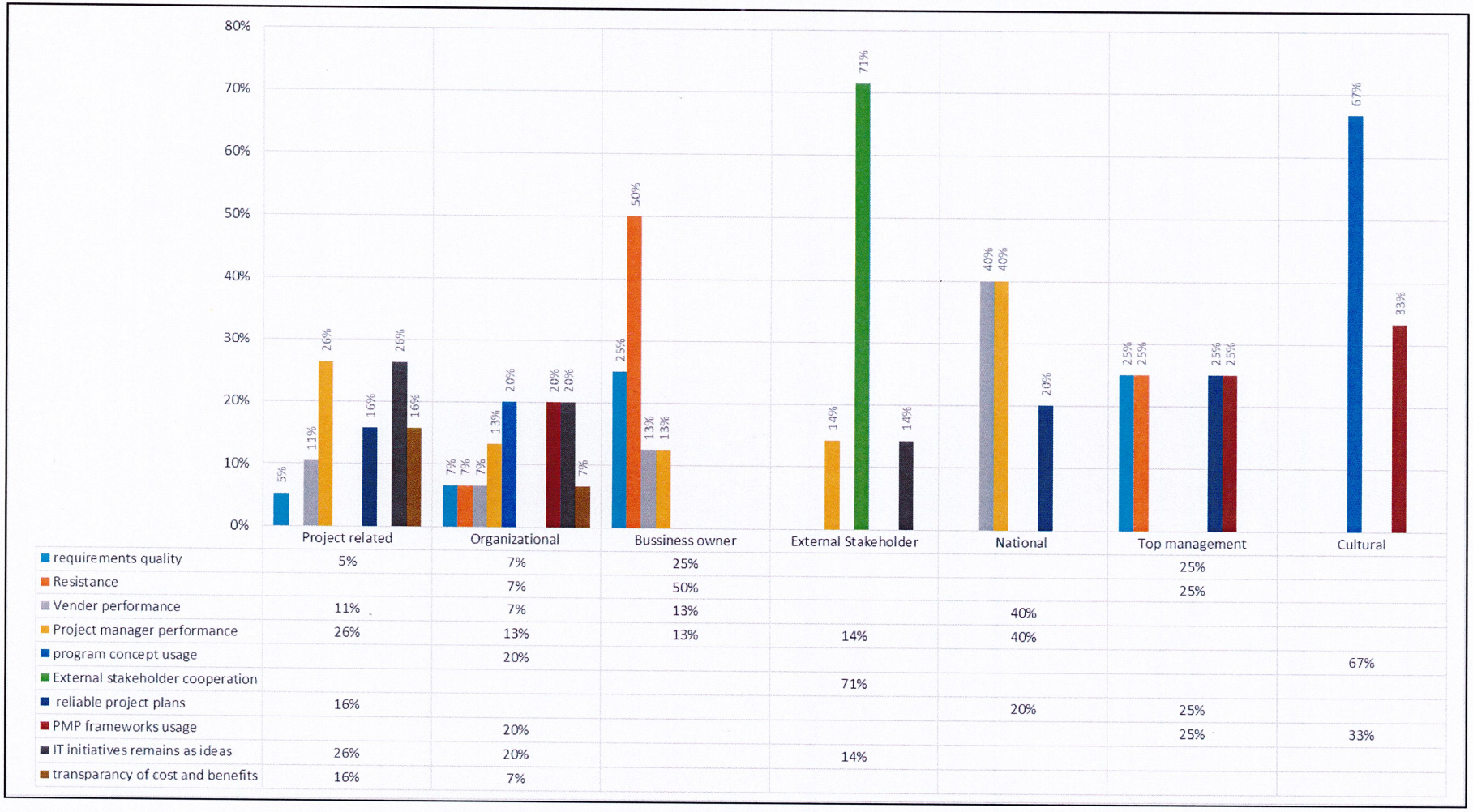


Figure (33)
Percentage of challenges impact for each category

4.5. Chapter Summary and Recommendation

This chapter answered the three research questions. The first section showed that there are many good practices as well as opportunities for improvements. This is also shown more clearly when comparing the result to the best practice framework (Val IT). Results show that challenges have a specific theme according to its causes and impact. All questions results showed why IT managers are not able to realize the value of IT investments.

All critical cases as required by the methodology were covered too. The results show that there are three different styles of GEs for managing the IT project: IT department is responsible for managing the project and achieving the business value, IT department is responsible only for managing the IT project, IT department not responsible for managing the IT project or achieving the business value.

The research also shows that the role of below eight GEs are very important when it comes to IT investments. Those GEs are: Ministry of Finance (MOF), E-Government Authority (EGA), Central Informatics Organization (CIO), Civil Service Bureau (CSB), Ministry of Social (MoS), Tamkeen, and National Audit Office (NAO). However, their role is different for different GEs as some play as a supporter, some as governor, and some as a service provider.

There is high percentage spent on the IT projects in the study compared to the total IT projects expenses. GEs highly depend on vendors where 83% of the IT systems resulting from the IT projects are outsourced and their average lifetime is seven years. There is a huge difference between the

planned and actual duration of the IT projects which reach 51% of a difference in average.

For measuring the intangible benefits, there are many methodologies can be used, Westerlind and VMM methodologies are examples, where GEs can use.

Many good value management practices are practiced by the selected GEs and there are many opportunities to enhance them. This would assure optimal business value from IT investments. The following recommendations are based on the pain points of each stage, they are summarized as follows:

- It is important to review and optimize the relations between GEs to clarify and communicate the value behind the IT project definition, scheduling, execution, and benefits realization; especially for the high value canceled or postponed IT projects. It is also important that clear and adequate role is defined for such GEs / entities and it is continually reviewed for adequate enhancement.

- Adequate segregation should be defined as mentioned by Craig & Tinaikar (2006) of the different roles that IT can hold. For example, IT department can be responsible for management and completion of IT projects and concerned business owners / stakeholders are made responsible for justifying and achieving business value.

- For submission of idea stage, a self-assessment process should be implemented for ensuring greater clarity on its objectives and alignment with the related portion of business strategy adequate. Also appropriate

commitment from IT, business and top management (formal approval and historical behavior should be considered) should be enforced.

- To enhance the opportunity qualification stage, researcher finds that value governance body is needed to make sure that IT initiatives exists within a balanced portfolio of IT investment and adequately challenged / qualified through the assessment process. The researcher recommends adding gate question: only qualified business cases move to assessment stage under specific portfolio.

- To enhance the business case assessment stage, Researcher suggests addition or improvement in the criteria for selecting IT project that best serve business GEs outcome. The criteria can be decided by the weights added by individuals, as it represents valuable data over the years, that would help decision makers redirect the IT strategy and selecting proper competencies. Further, it could be a challenge where value governance body should select proper individuals for scoring/ evaluating process. The researcher also suggests that the committee's role should be analyzed and validated as there are dependencies and interventions between IT function and other committees.

- To enhance the scheduling stage, Researcher finds that value governance body need to govern this gate by securing the availability of funds depending on the value created by the performance of the last project. The researcher suggests also that there should be a review on what prevent the value from being created (restructure or enhancement may be needed) when the proposed stage gate condition is not met.

- To enhance the project initiation stage, the researcher recommends that value governance body should add a governance gate to control the allowable percentage change of the business case. It is also important that complex projects identify and carefully select the project manager to make it succeed (For example, data mining techniques can be used to associate the project manager performance with the project complexity.) Furthermore, Researcher recommends creation / improvisation of the progress reports highlighting the risk and impacts of various issues or facts and such reports to be submitted to concerned stakeholders / management to take possible actions and control the overall loss of time, resources, and funds.

- To enhance the scope definition stage, researcher finds that there should be a gate added at this stage, so whenever a change is happening there should be an evaluation made whether there will be more justifiable benefits/ values gained comparing to the cost.

- To enhance the benefits planning stage, Researcher recommends to extend it until the end of project execution stage so that the plan can be altered based on the benefits obtained from the parallel run of existing solution versus the benefits that can be realized when the new solution be implemented.

- To enhance the benefit harvesting stage, the researcher recommends a continuous comparison with the benefits planning document and the number of mismatches or some benefits haven't been realized. Further, the adequate support and contribution are required from the concerned stakeholders to harvest benefits from the implemented solution. Adequate

KGIs or KPIs to be reassessed at the gate of this stage and the results should be recorded for future project selection.

- To enhance the Retirement stage, researcher suggests that this stage should be gated with the number of issues / challenges identified in the IT projects and the value governance body should set a solution for each issue / challenge and translate it into working templates and practices.

For challenges that affected the value of IT investments, value governance body should consider them where remedial actions should be taken. Until those challenges get resolved, there should be an acceptable risk and cost. The researcher noticed that the result of this study, from gaps, and challenges can be used as an input for VG2 (Define and implement processes), VG5 (Establish effective governance monitoring), and VG6 (Continuously improve value management practices) processes for continual improvement.

CHAPTER 5: CONCLUSION AND FUTURE WORK

5.1 Conclusion

5.2 Future Work

CHAPTER 5: CONCLUSION AND FUTURE WORK

This chapter includes the contributions of the study and proposes areas into which further studies are required.

5.1. Conclusion

The objectives of the study have been covered where the answer of "why many IT managers of Government Entities (GE) are not realizing the value of IT investments" get answered. There are many good value management practices are practiced by the selected GEs as well as there are many opportunities to enhance them. Results about the current situation of GEs showed that most of the good value management practices are in stages of Business case assessment, Submission of Idea, and Benefits Harvesting were having. Also After comparing the findings to Val IT management practices, results shows that most of the gaps are in stages of Opportunity Qualification, Benefits Planning, and Business case assessment. Furthermore, the study showed that there are different categories of challenges and they have different impacts. Project related challenges affect most the project manager performance, where challenges related to organizational level affect mostly using the program concept, using project management framework, and IT initiatives remains as ideas.

The study revealed the needed efforts from Bahrain GEs to achieve the business value from IT investments, which in turn part of EGIT enhancements. The study findings can be an effective input for risk management as it includes many needed activities for IT and business functions risks.

The study increased the existing knowledge base of best practices and standards. Furthermore, the study showed an initial customized framework for Bahrain GEs. Each stage can be governed by a gate as detailed in the recommendation where GEs shouldn't move to the next stage until they make sure that they satisfied the governance gate condition. For example, GEs shouldn't move to the opportunity of qualification stage unless appropriate commitment from IT, business and top management (formal approval and historical behavior should be considered) should be enforced.

The study showed the usefulness of using a comprehensive framework (Val IT) to test the value management practices and achieve the goal of this study in a holistic view. As per the comparison among other best practice, Val IT was the most suitable testing tool. Furthermore, the study tested many value management practices using Val IT processes, activities, and metrics on different GEs, covering different domains. That variety of tested management practices showed not only the theme of GEs efforts to realize the business value from IT investments. But also shows how GEs can continually enhance those practices depending on the lessons learned from the challenges, gaps and issues. Recommendations for the existing challenges are taken from the framework where any GE can apply depending on its business nature, size and priority.

This research represents a contribution to studies that are related to value management of IT investments in the public sector. As it provides the challenges that any GE should consider and also provide an approach on how to overcome them in a continuous manner. For that this study filled the gap that was mentioned in many studies (Cook, 2007; Toomey, 2009; De

Haes et al., 2011). They mentioned studies on value management practices and related approaches in the public sector are limited.

5.2. Future Work

For future studies, this study can be replicated in other organizations using a quantitative approach where generalization can take a place. The tested value management practices can be used/ enhanced, testing the reliabilities and correlations between the value governance stages.

Organizations can be from private sectors where a comparison can be accomplished and learning from real practices. Future studies can include business manager's perspective on IT investments.

The study resulted lots of conclusions where more investigation is needed to study the quality of those value management practices need to be tested. Findings of this research (gabs, issues, and challenges), can be can be a good input for studies that related to risk management either in business or IT.

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APPENDINCES

Appendix A: Interview Questions

General Question		
1.	**Government Entity (Organization name)**	
2.	**Interviewee**	
3.	**IT project (IT system)**	
4.	**Objectives**	
5.	**Year of Kickoff**	
6.	**Expense percentage of the IT project at that year**	
7.	**Priority of the IT project at that year**	**O High O Medium O Low**
8.	**The IT project is for which department or division?**	
9.	**What is the duration of the IT project execution?**	
10.	**What is the lifetime of the IT system(s) resulting out of the IT project?**	
11.	**Organization structure**	
12.	**Size of IT (Staff in IT department/ overall staff)**	
13.	**How do you evaluate the success of the IT project execution?**	O Successful O Failed O up to some extent successful O I don't know **Do you refer the success of the IT project more to the organization structure or to the project manager?** **go to-[1]**
14.	**How do you evaluate the target (business outcome) of the IT project?**	O Achieved O Un-Achieved O Partially achieved O I don't know
15.	**How do you evaluate the improvement of**	O Improved as expected O not Improved as expected

	the KPIs of the IT project?	O I don't know justify: .....
Submission of idea (SOI)		
1.	Is the IT project aligned to the IT strategy	O Aligned O not aligned O Partially aligned O I don't know
2.	Is the IT strategy aligned to the business strategy	O Aligned O not aligned O Partially aligned O I don't know
3.	Span duration or gap between development of IT strategy and business strategy	
4.	Describe how do the top management look at IT department?	
5.	Do the executives have any difficulties in understanding or contributing in IT strategy? [capabilities and limitation]	
6. **	[1] [select from the list if the organization structure have:] ☐ [Are there clear accountabilities and responsibilities for each role] ☐ [Any gaps found in them] ☐ [Do you have a current and future planning of funds, HR, resources] ☐ [Are they monitored, remedial actions are taken]	
7.	Who requested (or initiate the need of) the IT Project : O IT department O Others?	**If IT department, identify :** – Source of opportunity (IT strategy / business strategy/ patent / others): ..... . – Rewarding mechanism: ..... .
8. **	Whether initial business case is accomplished? Who took the responsibilities of making the initial business case? Check from following list if included in the **initial business case**: ☐ Alignment to the business strategy (business outcome) ☐ Benefits at high level ☐ Cost at high level ☐ Risks at high level ☐ Resources at high level **Did you make any further details of the business case? How many versions? How the detailed business case defers from the initial?**	
9.	Did the IT department initiate an opportunity and it has been rejected?	
10.	**Who** did the approval (Sign off) of the initial business case that has been accomplished? Frequency? [also	

	will consider the detailed one] Answer:	
Opportunity Qualification		
1.	Business strategy is broad and many opportunities exist. Why the IT project has been chosen to be accomplished why not other? Whether the IT project selected not only because it is needed but also there is an ability to do it.	
2. **	If the time goes back (as well as for future) will you be able to enhance the IT strategy in terms: ☐ Better alignment to business (less time and more efficient IT projects) [if not aligned] ☐ Better grouping of IT project to enhance the balancing ☐ Will you select this IT project	
3.	Whether the IT system resulting out of the IT project is grouped to any portfolio or group of IT systems that are responsible for satisfying particular business service or outcome? For example, whether the IT system due to the IT project is linked with the group of IT systems responsible for customer service part of business? Do you have a portfolio of IT projects? **O There are types O Categories O Evaluation criteria O Weighting**	
4. **	In case there is an initial business case has been accomplished, Do you fully/partially participate on qualifying it?	**If yes/ May be identify:** Check on the qualification area (whether it has been considered in the score): ☐ Stakeholder needs will be satisfied ☐ KPIs are identified ☐ Alternative course of action ☐ Expected outcome ☐ Changes on business processes identified ☐ Duplication / rearrangement identified Others: .....
5.	Have you ever reject a received opportunity?	**If yes/ May be identify:** Reasons behind rejection (not aligned to current business / inapplicable/ shortage in resources / others):
Business case assessment		
1.	**How do you describe the relation between IT manager and organization leadership (meetings, contribution)?**	
2.	**For the IT project did you identify metrics, targets and benchmark**	

3.	**Do you have a view on the all related/dependent projects?**	
4. **	**Please select component of business case:** ☐ an executive summary ☐ a description of the purpose ☐ objectives ☐ approach and scope ☐ dependencies ☐ risks ☐ milestones ☐ organizational change impact ☐ Program plan ☐ value assessment	**If some are not selected justify or identify challenges:** …… ……
5. **	**Please select component of program plan:** ☐ component project plans ☐ a benefits realization plan (baseline and target performance) ☐ the approach to risk and change management ☐ the program governance structure ☐ Controls (cost, interdependency, ownership) Others …… .	**If some are not selected justify or identify challenges:** …… ……
6. **	**Please select from the list, There is a clear and explicit assignment of personnel for:** ☐ Investment decision making ……1 ☐ Program sponsorship……... . . 2 ☐ Program management…… . ……3 ☐ Project management…….. . 4 ☐ Service delivery…… . ……5 ☐ Business benefits achievement …… 6 ☐ Expenditures control…… . 7 ☐ Associated support roles…… 8 Others …… .	**If some are not selected justify or identify challenges:** …… …… For the selected roles, please select from the following whether they have the right **authority** to/ have : ☐ act ☐ requisite competence (Suitable competencies) ☐ commensurate resources (required resources) ☐ clear lines of accountability ☐ an understanding of rights and obligations ☐ Relevant performance measures **(Specify the number that have issued if exists)**
7.	Please select from the list, whether the following committees: **Exist** : √ Exists X Doesn't Exist O I don't Know **Have role within IT project**: √ Have X Doesn't have O I don't know	

committees	**Existence**	**Role within IT**	**Comments**

			project	
**	Board member			
	Compliance, audit, risk and security (CARS) – Auditor			
	Investment and services board (ISB) – portfolio owner			
	IT steering committee			
	IT risk and security committee			
	Head of human resources (HR)			
	Program management office (PgMO)			
	Project management office (PMO)			
	Value management office (VMO)			

8.	Whether all stakeholders are consulted and their agreement on the costs and benefits for which they will accept responsibility is obtained.
Scheduling	
1.	Describe the interface between IT and finance department? Did they consider the cost reduction/ benefits of the IT-enabled investment?
2. **	**Please select component(s) of the value assessment for the project:** ☐ full economic life-cycle costs and benefits, both financial and non-financial ☐ the value to be created and the envisaged rate of return; ☐ strategic alignment ☐ delivery and benefits risks ☐ program relative score as assessed by the business sponsor ☐ Key assumptions **Did you use the result of value assessment to make a decision whether to select this project or another? [opportunity qualification]**
	If some are not selected justify or identify challenges: …… …… ***Note**: The full economic lifecycle means the cost of the project from its start till completion added with go live till the IT system retirement. Also, the full economic lifecycle cost should include the cost required for human resources, IT systems, infrastructure, licenses, maintenance contract, operational cost, etc.*

3.	**Do you have a balance between the financial planning to value management practices?**	
4.	**Do you track records of all funds/budget and their movements**	
5.	**Please select whether the benefit(s) of the IT project:** ☐ Specific (goal) ☐ Measurable (number) ** ☐ Achievable (how can be accomplished) ☐ Relevant (right goal and right person/source) ⊟ Time-bound (when)	**If some are not selected justify or identify challenges:** …… …… **Identify examples of intangible benefit(s) that can't be quantified** …… …… **Does the benefit(s) has/have an identified owner:** O Yes O May be O No O I don't know
Program launch and management		
1.	**Please select from the list if any changes occurred on:** Cost, Risks, Benefits, Others …… ……	**If any changes occurred what was the cause of the change:** (business strategy changes, enterprise functions changes, external environment changes, others) **Did any change on the business case occur?** O Yes O May be O No O I don't know **Whether Approval from business sponsor on the updated business case has been considered.** O Yes O May be O No O I don't know
2.	**During project execution are there any updates made on the IT portfolios** O Yes O May be O No O I don't know	**If yes please select whether updates made on:** portfolios of IT projects, portfolio of IT services, portfolio of IT services, Portfolio of IT applications, Portfolio of IT assets, Portfolio of IT resources. Others …… ……
3.	**Are there any reports submitted to identify the progress of the IT project?** O Yes O May be O No O I don't know	**If yes/Maybe please select whether the progress report contains:** ☐ Needed funding for the next stage gate ☐ Identification of deviations ☐ Needed Remedial actions ☐ Performance against scope, schedule, quality,

**	**Are those kind of reports continue after the project execution?** O Yes O May be O No O I don't know	benefits realization, costs and risks, benefits owner, user satisfaction and capabilities. Others ....
4.	**Degree of similarities of business case compared to real execution** O 0 % O 25% O 50% O 100% O I don't know	**please justify reasons (examples: It is not easy to compute the resources spent and actual benefits, many deviations occurred)** .... Differences on which part of the business case : cost, benefits, plan …
5.	**If the project cost has exceeded the original budget cost then how was the additional cost adjusted / funded for completion of the IT project? (Postponed other projects/ extra budget from other projects etc.)**	
6.	**How many human resources were used for the IT project?**	**IT people (Fulltime): ..... Business users: ..... 3rd party: .....** **How the critical resources of this particular project are managed and made available when required? Please explain in brief the mechanism followed for this stage**
Scope definition		
1.	**Did you have any scope creep during the project? Did you evaluate the needed change before doing it?**	
2.	**During the IT project execution, any significant deviation has been identified?** O Many O Little O rarely O Non	**If Many, little, please identify** The time lag between the identification of deviation and its Rectification: ....
Benefit Planning - Project execution (This stage is parallel to the two previous stage)		
1.	**Strategic contribution of the IT project was easily identified**	**If yes/ May be please select if any of the listed below was done:**

**		☐ Strategic outcomes mapped to the IT project ☐ Complementary initiatives was needed to be identified to achieve any strategic outcome (i. e. change business process, restructure the organization). ☐ benefit value mentioned in the business case included yearly benefit value till the retirement of the IT system due to the IT project
Benefit Harvesting		
2. **	**Do you fully/partially participate in submitting/discussing final report on program performance (solution delivery)?**	**If yes/ may be please identify to whom it has been submitted/ frequency:** …… …… **check from the following if they were mentioned in the reports:** ☐ Schedule ☐ Funding ☐ completeness ☐ quality of functionality ☐ user satisfaction ☐ the status of business and IT function internal controls (including the continuing acceptance of accountabilities for delivering capabilities) **Whether the IT project was not key to the overall business strategy of the project?** O Yes O May be O No O I don't know
3. **	**Do you fully/partially participate in submitting final Report on business performance (benefit/outcome)?**	**If yes/ may be please identify to whom it has been submitted/ frequency:** …… …… **check from the list if the report include:** ☐ Business changes being implemented ☐ Benefits realization against the benefits realization plan as documented in the benefits register, ☐ Status of internal controls for benefits realization. **If No/ I don't know justify**: …… ……
4.	**Do you fully/partially participate in submitting final Report on operational performance**	**If yes/ may be please identify to whom it has been submitted/ frequency:**

**	**(service delivery)?**	…… …… **check from the list if the report include:** ☐ Focus on sustained service delivery ☐ Contribution to value ☐ Status of business and IT function internal controls for delivering capabilities effectively and efficiently.
Retirement		
1.	**Whether there were formal closure approval of retirement**	**If yes/ May be please select if any of the listed below was done:** ☐ Closure done by the ISB and the business sponsor. ☐ Lessons learned reviewed and documented. ☐ Program has been removed from the active investment portfolio. ☐ Resources has been reassigned **Whether the research and development team or business people think in advance about the IT systems that will be replacing the IT systems that are about to retire? Please provide brief about this stage in the comments section.**

Appendix C: Overall percentages of tested practices

	Number of tested practices	weight of the tested practices	Good practices		opportunities for improvement		issues where more informati		
			inner	overall	inner	overall	inner	overall	
Submission of Ideas	18	0.16	70%	11%	9%	1%	21%	3%	16%
Opportunity Qualification	9	0.08	58%	5%	42%	3%	0	0%	8%
Business Case Assessment	44	0.38	82%	31%	17%	6%	1%	0%	38%
Scheduling	12	0.10	38%	4%	62%	6%	0	0%	10%
Project Initiation	8	0.07	73%	5%	12%	1%	15%	1%	7%
Scope Definition	3	0.03	67%	2%	0%	0%	34%	1%	3%
Benefits Planning	4	0.03	71%	2%	29%	1%	0%	0%	3%
Benefits Harvesting	14	0.12	68%	8%	32%	4%	0%	0%	12%
Reconciliation and Retirment	3	0.03	100%	3%	0%	0%	0%	0%	3%
	115	1.0	Grand %	71%		23%		6%	100%

Appendix D: Challenges Theme[4]

		Unclear requirements	Resistance	Vender performance	Project manager performance	program concept usage	External stakeholder cooperation	reliable project plans	project management frameworks	IT initiatives remains as ideas	transparency of cost and benefits
Business owner	Unclear procedures	X									
	Requirements kept rigid as the manual business processes	X									
	Business people not engaged fully in the early stages		X								
	Lack of the ownership from business people		X								
	Business people keep using legacy systems as they don't feel the resulted value of the IT project		X								
	Business people exaggerate on the needs as a result (i.e. new roles, new staff, restructuring)		X								
	Change the requirement affect the vendor as they need more time to understand and apply the needed change.			X							
	Huge time spent for following up people where they are in vacation				X						
Cultural	Business people feel they own the business and afraid that they will lose					X					

[4] **Note**: Result of challenges has been accumulated from qualitative questions that respondents gave.

		Unclear requirements	Resistance	Vender performance	Project manager performance	program concept usage	External stakeholder cooperation	reliable project plans	project management frameworks	IT initiatives remains as ideas	transparency of cost and benefits
	that ownership by the help of IT										
	IT should do everything since it is related to technology					X					
	Not believing on the need of structuring in managing the projects								X		
External Stakeholder	Dependent GE (governor) take long time and it has high affect if it is not included in the plan						X				
	Cooperation is low because what represent for the GE high priority represent for the dependent as low priority						X				
	Different roles and responsibilities among the employees in cross sectional level among GEs						X				
	lack or shortage in resources						X				
	Database interfaces as in case the IT project replaced or enhanced without considering that interface with other GEs.						X				
	lack of external stakeholders cooperation				X					X	
National	National professionals are limited where vendors are enforced to use external unprofessional			X							

		Unclear requirements	Resistance	Vender performance	Project manager performance	program concept usage	External stakeholder cooperation	reliable project plans	project management frameworks	IT initiatives remains as ideas	transparency of cost and benefits
	There are no much competitors			X							
	not easy to find high competencies for managing IT projects as sense of time is absent for project managers				X						
	Dealing with external vendor				X						
	change in the regulation							X			
Organizational	Changes in the business function of the business people	X									
	Shortage in resources		X								
	GEs don't prefer to stop with low vendor performer as they will not save time			X							
	Accountability of being delay can't be practiced and that because No enough reasons/ analysis can directly related to cause of delay				X						
	Shortage in resources they took more than one role and be overwhelmed and segregation of duties can't be maintained				X						
	Frequent change happening in top management level					X					
	Long-term sponsorship is limited					X					

		Unclear requirements	Resistance	Vender performance	Project manager performance	program concept usage	External stakeholder cooperation	reliable project plans	project management frameworks	IT initiatives remains as ideas	transparency of cost and benefits
	Weak relation between IT and business in designing business and IT projects together					X					
	Size of the GE is small								X		
	Staff and segmented beneficiaries is small								X		
	shortage in resources								X		
	Lack of resources (Human, Non-Human)									X	
	Not aligned to the business strategy									X	
	less priority									X	
	keep the impacted division cost										X
Project related	The IT project is urgent and time is limited	X									
	the project is national wide				X						
	Selecting an IT project not depend on the capabilities and applicability's				X						
	Project complexity affect the IT project manager performance especially for projects that have many stakeholders				X						
	High risk projects which include risk that can't be afforded				X						
	difficulties in adopting technical and operational issues				X						

		Unclear requirements	Resistance	Vender performance	Project manager performance	program concept usage	External stakeholder cooperation	reliable project plans	project management frameworks	IT initiatives remains as ideas	transparency of cost and benefits
	Breakdown IT project plans compared to other projects is difficult							X			
	Unplanned IT projects highly affect the planned one (1 month of delay = 3 month)							X			
	Difficulties in considering the impact of any risk in the plans (example: resistance).							X			
	Not the right time where readiness for adopting the IT initiatives is needed. IT plans is very optimistic									X	
	Cost exceed the current system cost									X	
	Value not justified enough									X	
	inapplicable where risk of being delayed is rejected									X	
	Out of the IT strategy plan.									X	
	final solution not released										X
	no consideration of the internal resources (human and non-human) used for the executing the IT project										X
	recurrent cost as it didn't include the full economic life cycle cost										X
	Vendors don't perform very well with low capital project			X							

		Unclear requirements	Resistance	Vender performance	Project manager performance	program concept usage	External stakeholder cooperation	reliable project plans	project management frameworks	IT initiatives remains as ideas	transparency of cost and benefits
	Vendor accept the worst case where they have to pay penalties			X							
Top management	Top management decision to finalize the requirement and prevent scope creep is limited	X									
	Top management don't take strict decisions to enforce business people to achieve benefits and overcome resistance		X								
	Top management don't trust IT plans as resistance or readiness in the plans							X			
	Top management don't have time to read IT issues, they preferred discussions								X		

الملخص

اليوم، لم تعد تكنولوجيا المعلومات تعتمد فقط على الحلول التقنية، بل تعتبر أداة رئيسة لتمكين التغيير في قطاع الأعمال سواء في القطاع الخاص أوالحكومي. لا يمكن إدراك القيمة المرجوة من الاستثمار في مشاريع تقنية المعلومات دون اشراف كل من رؤساء مجالس الادارة والمدراء التنفيذيون في المؤسسات، وهو ما ينسجم مع أهداف حوكمة تقنية المعلومات.

تهدف هذه الدراسة لتحديد الاسباب التي تمنع مدراء مشاريع تقنية المعلومات من إدراك قيمة الاستثمار من مشاريع تقنية المعلومات. وقد تم ذلك عن طريق دراسة الوضع الحالي لممارسات ادارة القيمة المتبعة لدى مجموعة من مؤسسات القطاع العام في مملكة البحرين بهدف إدراك قيمة مشاريع تقنية المعلومات ومن ثم مقارنتها مع أفضل الممارسات، والخروج بمجموعة من التحديات والقضايا والتوصيات اللازم اتباعها في أي مشاريع مستقبلية. توجد العديد من الأمثلة لأفضل الممارسات التي تهدف لحوكمة القيمة المرجوة من المشاريع التقنية، لتغطية أهداف هذه الدراسة تم استخدام اطار فال اي تي (Val IT) كأداة لاختبار ممارسات إدارة القيمة للعينة المختارة. حيث تم استخدام المنهج النوعي عن طريق دراسة حالة لخمس مؤسسات من القطاع العام، وقد تم التوصل للتعميم المنطقي باختيار العينات الحرجة.

أظهرت نتائج الدراسة إلى وجود العديد من الممارسات الجيدة في المؤسسات الحكومية في مملكة البحرين، حيث أظهرت الدراسة أنه بناء على نتائج دراسة الوضع الحالي، تتركز الممارسات الجيدة في كل من المراحل التالية: مرحلة تقييم مستند الأعمال ومرحلة تقديم الفكرة ومرحلة تحصيل الفوائد. وبعد أن تمت مقارنة الوصع الحالي للممارسات ادارة القيمة مع أفضل الممارسات، وجد أن أغلب الفجوات توجد في كل من المراحل التالية: مرحلة كفاءة الفرص ومرحلة التخطيط للفوائد ومرحلة تقييم مستند الأعمال. علاوة على ذلك، أظهرت الدراسة وجود أنواع مختلفة للتحديات التي تؤثر على مشاريع التقنية وعلى القيمة المرجوة منها.

جامعة البحرين

كلية تقنية المعلومات



إدراك قيمة الاستثمار لمشاريع تقنية المعلومات في القطاع العام للمملكة البحرين

مخطط بحث لاستكمال متطلبات الحصول على درجة الماجستير في تقنية المعلومات

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يونيو، 2016