

# University Of Plymouth

A New Framework for Strategic Information Systems in Airline  
Industry

by

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## DEDICATION

To the soul of my father and mother,

To my wife *Amal*, my children's *Omar*, *Amenah*, and *Hashim*

To my supervisors: *Dr. Elbetagi & Dr. Mishra*

# **A New Framework for Strategic Information Systems in Aerospace Industry**

## **Abstract**

Stiff competition in the Airline sector mandates airlines to innovate ways to gain a competitive advantage over their rivals; however, without a strong IT the mission to attain this would be arduous. Large airlines do their best to maximise the use of enterprise systems to stream their business processes. Nonetheless, some airlines are not up to date with technology and are left with few choices when attempting to secure their existence in today's harsh market. One option is to implement bleeding edge systems concurrently (which is our focus in this paper) due to the fact that very scant research exists regarding this phenomenon, let alone the airline sector itself.

The aim of this study is explore and investigate the phenomenon of deploying multi enterprise systems concurrently due to its uniqueness and owing to the fact that this approach is not the common practice most airline undertake. We argue here that having multi Airline Solution Providers (ASP) working together concurrently to constitute a homogeneous solution generates many aspects that necessitate a deep understanding in such matters as competitor ASPs and technology leakage. In addition, the study explored various themes that unleash the phenomenon of the concurrent Multi- collaborative Enterprise Systems (MES). The role of cohesion factors that groups the rivals to work under the umbrella of an organisation was also embarked upon in this study. Various aspects contributing to the success of the MES phenomenon have been exposed with regarding ASP's interplay, organisation, and other contextual surrounding MES. Finally, this study drew a strategic frame work for airlines that unleash the MES phenomenon.

A large airline and its collaborative airline solutions provider were taken as the scope of study; the airline had over twenty six thousand employees. Five reputable world class ASPs in the airline industry in various fields were also included. The twenty five participants in this study were professionals in IT and the airline business besides being involved heavily in the phenomenon of deploying concurrent multi enterprise systems. Grounded Theory techniques were used to analyse the large volume of data gathered underpinning this by using state of art software package such as nVivo.

This research has explored the phenomenon under study using grounded theory methodology to build a theoretical model that best presents the MES initiative. In addition, it has offered a well-founded framework that explains the MES phenomenon in details, which is relevant to both practitioners and researchers. This research has clearly explored and demonstrated the inhibitors and enablers in the undertaking of MES. In particular, it has focused on enablers of the organisation that received the MES. Furthermore, it has explored the interrelationship between ASPs and exposed some of the aspects that need more focus between rivals working on the same project.

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## Author's Declaration

At no time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award.

This study was fully financed by the Saudi Arabian Government.

The following activities were undertaken in connection with the program of the study:

Attendance in a number of courses in research subject, in particular, courses on 'nVivo', 'Research Methodology: Quantitative and Qualitative Methods', 'Structural Equation Modelling using LISREL', 'Interviewing Techniques'.

Attended and passed courses in higher education discipline like 'GTA' and 'PGCAP'

Conducted many sessions in 'world of business', 'international business', and 'Introduction to research methodology and philosophy'.

Participated in Plymouth University IT committee to enhance staff and student IT experience in their work.

Attended sequence of courses in management subject such As 'Leadership and Management: Exploring Leadership', 'L & M: Questioning and Listening Techniques', 'L & M: Selection Interviewing', 'L & M: Coaching and Mentoring', 'L & M: Performance Management', 'Careers: The Interview Workshop', and 'TAKE TO THE TREES: Branch into team-building!'

Led and organised various voluntarily activities for the Saudi society in Plymouth.

Conference Presentations:

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Signed

## **1 Chapter 1: Introduction**

## 1.1 Introduction

Information Systems (IS) have become an inevitable choice for most industries in order to endure stiff market competition, especially during economic recession. Every now and then, a new enterprise evolves and another vanishes. To meet the demands of business, companies have to possess tools and mechanisms to enable them to compete in this volatile market. Having these tools is not enough as rivals can have them too. Nevertheless, sustaining a competitive advantage has been an aspiration for many firms and continues to be (Clemons and Row, 1991).

The airline industry is no exception. IS for large airlines are not only mandatory but are also the artery that keeps the industry alive. Millions of transactions are executed daily in different business spectrums. Without a state-of-the-art IS that covers the processes of all key business areas, the existence of any airline company would be questionable.

Airline industry was merely separate oriented software companies that dealt with specific business processes like navigation systems or crew scheduling. Subsequently, large-scale IT enterprises are becoming popular to offer services such as marketing, human resources, maintenance, finance, flight scheduling, crew scheduling, reservation, operation control, ground handling, cargo, catering, navigation, and crew training to airlines.

Although airline solution providers (ASP) offer their best to cover most airline business processes, it is still not possible for any one solution provider to offer a complete airline solution today. As a result, most airlines have adopted various schemes mixing internal and external solutions to cover their business needs (Pearlson and Saunders, 2009). Being responsive to the ever-dynamic business

needs has become the priority for airlines to overcome market challenges and sustain their competitive advantage.

Furthermore, one of the chief obstacles airlines are facing is streamlining business processes to compete in the market. This directs some firms to implement Enterprise Resource Planning (ERP) and adopts its processes as 'best practice' to enhance their business practice (Quiescent *et al.*, 2006). Accepting and implementing enterprise systems such as the ERP system encompasses reengineering of the existing business processes in the organisation to the best business practice in the industry. Enterprise systems are usually established follow standard practices that are embraced by the industry. One foremost advantage of enterprise systems comes from reengineering the organisation's existing approach of doing business. Business process improvement ranked number one on the top priority of IT expenditure in 2009 (Gartner, 2009) which explains the importance of the reengineering business process.

Most studies in the literature review involve innovation technology adoption studies, but there is scant academic or empirical research investigating how simultaneous Multi-collaborative Enterprise Systems (MES) <sup>1</sup> drive business processes to the airline sector.

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**1-MES: Refers to more than one enterprise systems such as ERP that collaborates at the same time to form one complete homogenous solution for an airline. This solution constitutes both the technology part and the business process knowledge part.**

Moreover, enterprise systems, which profoundly shape and influence business process in an organisation, cost an immense amount of money without a reputable success rate to support it. This leads the researcher to explore the MES phenomenon, as this practice-oriented research focus is comparatively unexplored in academic literature for the organisational fit of MES.

Additionally, this research will contribute to the airline industry by exploring the effective combination of aspects that enables ASP's to increase the successful implementation of MES in airlines. In other words, studying how airlines may enhance their business processes in a lead-time through MES. Another objective of this research that it will explore the aspects that constitute the appropriate IT collaboration supporting MES business process acceptance, and the factors that may affect firms' readiness to accept such a change?

## **1.2 Why IT Collaboration?**

Stand-alone IT shops struggle vigorously to meet ever-changing business demands as well as the overwhelming advancement in the technology itself, on top of the high demand of being agile (Moitra and Ganesh, 2005; Cederlund *et al.*, 2007). In view of the fact that a single solution provider cannot cover the diverse airline business processes entirely; collaboration between companies in IT services is essential. At the same time IT collaboration creates a set of complex resources that could generate distinguished assets to be used as a competitive advantage over rivals. Large airline companies represent a clear example of such IT demanding business sector.

However, large airlines have diverse functionalities that make it impossible for any single information system solutions provider cover an airline. Where ERP covers standard sectors in the airlines like human resource, finance, and

maintenance, it does not span the main core of the airline business, which is the operation and marketing. In addition, areas such as ground handling, cargo, catering, and Customer Relationship Management (CRM) do not lie under the umbrella of standard ERP. What complicates the matter further for large airlines is that even a single sector is not covered with a single system. Marketing has more than one main function that is placed underneath it. R & D, ticket pricing, official general schedule for flights, reservation, boarding, and yield management are examples of sectors that require different IT systems for marketing. Likewise, the operation sector involving crew roster, crew management, operation control centre, flight dispatch, and navigation are different prime areas that require different IT systems. Each of those mentioned can have their own systems installed separately. Undoubtedly, covering these broad and diverse functionalities by a single information system provider would be impossible. Nevertheless, this creates a mesh of interdependencies in business process that can be secured by different systems.

Evidently, the complexity of airline business processes adds tremendous burdens on airlines to respond to the dynamic market requirements that can often lead companies in not being innovative. An alternative option for airlines is to accept a multi-collaborative enterprise system with standard business process practice in the industry built in the technology solution.

This leads us to investigate how a redesign of business processes utilising MES armed with good business process practice can be a viable solution. Furthermore, accepting these solutions from information solutions providers necessitates an investigation of the factors that build the foundations of a

successful business deployment of MES taking advantage of business and IT strategy alignment.

### **1.3 Research Aims**

The first aim is that the author is trying to capture the phenomenon of pioneers of ASP when collaborating to form a homogeneous solution and it has the following objectives underneath it:

- Explore the factors influencing such collaboration,
- Expand and enhance the current academics and practitioners' understanding of the phenomenon of MES deployment
- Explore the simultaneous MES phenomenon and its enablers and inhibitors.
- Focus on the firms' enablers to accept such changes based on an empirical study.
- Shed light on the aspects accountable for effective business process improvement through MES.

Another aim is to develop a holistic conceptual framework explaining and detailing the MES phenomenon while indicating the factors that may influence the MES phenomenon.

### **1.4 Research Questions**

- How can concurrent Multi-collaborative Enterprise Systems (MES) deployment be an appropriate solution for airlines seeking improvement in their strategic business process?
- What are the factors influencing the concurrent MES?
- What are the firm's enablers to accept MESs?



- How can an improvement of business processes utilising MES armed with best business process practice be a viable solution?

## 1.5 Research Significance

The current volatile market imposes enormous pressure on firms to innovate and to increase their performance to provide consumers with a better product or service. IT is the weapon in this battle to compete with the rivals, if not, at least to survive the turbulence of the current airline market (Laudon and Laudon, 2009). Such factors made the issue of how responsive IT is to the dynamic business requirement and how fast it materialised, have become an immense concern for airlines' management. It is becoming difficult for stand-alone IT shops to meet the ever-changing needs of business as well as the overwhelming advancement in technology. Furthermore, businesses are pushing IT shops to have a flexible and dynamic IS that respond quickly to business needs (Moitra and Ganesh, 2005). These situations suggest possible collaboration between IT companies; at the same time, they create a complex set of resources that could generate distinguished assets to be used as a competitive advantage over rivals. Besides, the complexity of business processes has added a hefty burden on airlines to respond to the dynamic market requirements that encourage companies to innovate ways to optimise its business processes (Hong and Kim, 2002).

Considering the importance of business process improvement, it is essential to investigate how organisations would enhance their business processes to follow the best practice in MES. Such acts, presumably, would lead to better firm performance in a shorter time compared to traditional business processes improvement. Since airlines have to invest a vast amount of money in information technology awaiting an appreciable return of investment, the

organisational fit of MES business processes requires to be understood and researched further. Moreover, key information system providers such as Sabre, Amadeus, and SAP in the airline industry who have a significant weight at the market will increase the interested audience for this research (senior executives management, IT and business practitioners) from the airline sector.

## **1.6 Research Contribution**

Due to the scarce empirical research in the aerospace industry of this type, this research will add value to those airlines that are willing to enhance the IT role in their business and also to researchers who are interested in this type of study. Simultaneous multi-collaborative enterprise systems and their implications for organisations are barely covered in the literature review, specifically in the airline sector. This research has filled this gap from the empirical side to enrich the knowledge of MES and proposed a theoretical framework elaborating on the relation between MES and the organisation.

Moreover, expounding on the MES phenomenon will provide a deep understanding of such an undertaking as well as it will furnish the road for other airlines to follow an appropriate model and learn from the deliverables and findings of this research. It provides strategic business planners with guidance in assessing the organisation's capability to undertake a business process enhancement through MES. Furthermore, the context of the research engaging large-scale companies and complex MES solutions will enrich information for both academics and businesses.

This research has contributed to the knowledge by exploring the MES phenomenon using grounded theory methodology to build a theoretical model that best presents the MES initiative. In addition, it has offered a well-founded

framework that explains the MES phenomenon in details, which is relevant to both practitioners and researchers.

This research has clearly explored and demonstrated the inhibitors and enablers in the undertaking of MES. In particular, it has focused on enablers of the organisation that received the MES. Furthermore, it has explored the interrelationship between ASPs and exposed some of the aspects that need more focus between rivals working on the same project.

The MES consists of different entities; the research identified the cohesive factors that are responsible for gluing all these diverse entities and these factors are crucial for a similar project intended to be executed in the future. Additionally, the importance of the deployment strategies and their vital role in this study has been highlighted by this research. These strategies are considered break it or make it decisions due to their enormous impact on time, cost, and budget.

This research has distinctly exhibited that business and IT alignment can have a significant impact on the MES project. Without such alignment where both business and IT see the end of the tunnel, this undertaking would be problematic and exceptionally challenging. The author through this research had identified the road map when deploying MES in an organisation and pinpointed the salient issues that need to be taken into consideration. Furthermore, this research has recognised the challenges that may emerge due to the concurrency nature in MES.

## **1.7 Research Methodology**

The goal of the research is to develop a theoretical framework that can explicate the MES phenomenon. The emerged framework should elucidate all

the factors and players in the deployment of MES. Grounded Theory (GT) is the method chosen in this research for the inductive inclination of GT. By and large, GT helps to develop a substantial theory about the MES phenomenon using the data collected.

The researcher started without a preconceived idea or hypothesis but with general ideas in the arena of the title. The framework then emerged upon reflection of the data. This provides a dynamic nature to the research based on the data collected by interviewing participants from various companies involved in the MES. All participants involved in this study have actively participated in the MES phenomenon; this reflects enrichment to the study and provides thorough information to delineate various details about the phenomenon.

## **1.8 Structure of Thesis**

The following section gives a brief description of each chapter.

### **Chapter One - Introduction**

This chapter gives an overview of this thesis. It states the aims of the research to investigate the MES phenomenon. Moreover, it outlines the research methods and methodology underpinning this research for building a framework to explain the MES phenomenon. Furthermore, this chapter will introduce other chapters in the thesis and their structure.

### **Chapter Two - Literature Review**

A literature review of the researched topic will be discussed. Since an inductive research strategy is used, the literature will give an overview of the enterprise systems (ES) within airline industry context. It will depict the effects of ES on an organisation and the strategies used. Furthermore, it will present the success

factors of deploying ES from scholarly reviews. Chapter 2 will also discuss how other researchers handle business processes. The dichotomy of changing business processes of firms between business process improvement and automation to the current process will be elucidated. In addition, this chapter will discuss the adoption of the ES business processes. This kind of literature review is well-suited to the grounded theory which usually has thin literature review (Creswell, 2012).

### **Chapter Three - Methodology**

The methodology chapter will discuss the research philosophy and the most prevailed paradigms and methods. It will explicate the different methods in business studies as well as the tools. Furthermore, it will detail the underpinning methodologies used, why it is chosen and how it has been utilised. The research strategy that fits into the research problem will be discussed. This will be followed by an elaboration of the data source, data type, the data collection process and the analysis. An overview of the collaborative organisation (case study) and some of its characteristics will be stated in Chapter 3. Ethical issues on the data collection phase will also be discussed, followed by in-depth section in introducing GT and its techniques. In addition, it will discuss theoretical sampling to enable the researcher to forecast in finding the data to saturate the emergent categories.

### **Chapter Four – Open Coding and the First Stage of Analysis**

This chapter will present a collaborative organisation study and its participants' reflections. A detailed interpretation will delineate all the experience at the data collection stage. There will be a detailed analysis of the data collected from the semi-structured interviews from the interviewees' perspectives. The first stage

of analysis will report the open coding stage, which is where the researcher does multi passes to the data to derive themes. In this chapter, there will be demonstrating for all possible open codes.

These open codifications follow the grounded theory procedures where the analysis and the data collection progressed concurrently. Various open themes have emerged, which forms the base of the substantive framework. Utilising the theoretical sampling techniques besides the author's sensitivity to the data, the author was able to reduce the categories by subsuming many open coding into others to constitute its properties and dimensions. Furthermore, there will be discussion regarding these themes from the participants while engaging their views with the literature view.

## **Chapter Five – Axial and Selective Coding Final Stage of Analysis**

This chapter exhibits the axial and selective coding stage of analysis according to the GT procedures. It demonstrates how the prime core themes emerge and linked together to construct the final framework for the discussion regarding each core theme. Six main categories are developed. The focus is on developing categories based on their relationships, not their properties and dimensions. The main categories developed through axial and selective coding are as follows: concurrent challenges, deployment strategies, cohesion factors, business / IT alignment, interplay between ASPs and MES Enablers (Recipient's organisation). This chapter unveils the substantive framework of MES as a result of the coding, analysis, and categorisation of data collected from the participants via semi-structured interviews. The final MES framework has emerged as a reflection of the participants at the airline company besides to five of world-class organisations in the aerospace industry.

## **Chapter Six – Conclusion**

The final chapter presents a summary of the thesis. It will also articulate the research implications from an academic and business perspective. The contribution to new knowledge will be the best-practice framework for managing MES within the airline industry. It will offer recommendations and lessons to learn from the MES phenomenon. These recommendations will be categorised as per the prime core theme's structure. Finally, this chapter will discuss research limitations and direction for future research, which could lead to further imminent study.

## 2 Chapter 2: Literature View



## 2.1 Introduction

Various studies in the literature review are involved in innovation technology adoption studies, but there are scant researches in investigating how simultaneous Multi-collaborative Enterprise Systems (MES) drive business processes in the airline sector through MES deployment. Moreover, this practice-oriented research focus is comparatively unexplored in the academic literature for that the research will investigate the organisational fit of MES. In other words, studying how airlines may enhance their business processes at a lead-time through MES.

This chapter will explicate the various IS theories in technology adoption and the most prevalent ones in scholarly works besides how these theories could not explain the MES phenomenon. Since MES profoundly shapes and influences the business process in the airline, the author will depict on the business process part of MES. Further, the enterprise systems value in nowadays business will be discussed from many aspects and views.

### 2.1.1 MES literature review

Due to the lack of studies about MES in the scholarly work, ERP literature review will be employed instead. Though there are various enterprise systems studies in the literature such as CRM, Supply Chain Management (SCM), and ERP; the latter will be used as a representative to ES and MES for abundance of literature and the similarities to MES. Because of the latter notion, the ES and ERP terms will be used interchangeably throughout the study. IT literature is rich of studies related to IT adoption and the following section will depict on the most predominant IS adopting technology theories for the sake of exploring whether or not MES fit with these theories.

## 2.2 IS adoption theories

This section will discuss the most influential theories in the discipline. Further, additional critic will be depicted on why these theories were not chosen to explain this phenomenon in particular. Finally, a possible alternative approach is elucidated for organisation fit of concurrent multi-collaborative information systems in the airline sector.

The prevailing theories that cover IT adoption in particular traverse how organisations adopt innovation technology from several perspectives primarily covering individual perceived usefulness, utilization measurement, IT capabilities measures, diffusion of innovation, social context, and environmental context.

Many of IS literature utilized resource-based view (RBV) theory as a tool when it comes to IT capabilities (Mata *et al.*, 1995; Broadbent *et al.*, 1999). RBV displayed four criteria for a firm to have sustainable competitive advantage. Primarily, a resource need to be a valuable to a firm in a way that it acts as a strategic resource that its existence effect on the organisation positively; rarity of a resource or combination of resources is another criterion, so the higher rarity degree the better outcome.; in-imitable resource only grant a firm sustainable advantage over rivals as long as it is protected against imitation; a non-substitutable resource is a resource which competitors cannot substitute it with another one having the same effect. As long as firms are protecting these resources from rivals, they can sustain their competitive advantage (Barney, 1991).

RBV has been used by IS researchers to examine how the technological, organisational, and environmental resources are deployed to establish the firm's business value; nonetheless their findings were not quite similar (Barua *et al.*, 2004). Generally, IT resources can be split into two parts, one which could be imitative such as hardware and ready software, while the other part which most companies reckon as a competitive factor is the interplay of many assets companies hold like human resource, IS provider, etc. When it comes to large airlines business processes the picture might change as in this research case, in a sense airlines business processes is by far complex and there is no single provider can provide a complete solution; so the processes interrelation is high and that add to the complexity of business process. Part of RBV theory might have a possible use where the multi-collaborative solution providers' combination could generate uniqueness in resources. However, having independent multi-parties solutions have two way standpoint, it will either add value to the IS solution in building up a competitive advantage or it will act as an innovation barrier that will lead to further complexity. As RBV theory covers the resources part such as IT capability, only of this research it will not be sufficient to underpin the whole research or explain the interplay between various external resources. There are other theories used by IS researchers like Technology Acceptance Model and Innovation Diffusion Theory will be briefed next.

Technology Acceptance Model (TAM) by Davis (1989) is based on two aspects Perceived Ease of Use and Perceived Usefulness, which is targeted more into individual level rather than organisational and fit better for the prediction of usage. Perceived Ease of Use is a crucial factor in determining user acceptance and usage behaviour (Venkatesh, 2000; Brown, 2002). It may be a sub-

category of user-friendliness, but contrasted with Perceived Usefulness, in the sense that it is more inclined to the behavioural or hedonistic aspect. It had demonstrated small but significant effects on intentions of the user (Davis *et al.*, 1989) and current and self-predicted future usage (Davis, 1989). It is based on the theoretical foundations of Technology Acceptance Model (Venkatesh, 2000; Karahanna and Straub, 1999; Fenech, 1998). Perceived Usefulness, on the other hand, is also a pivotal factor in user acceptance and behaviour, now in a utilitarian approach, on how useful it is to the user. It is a better indicator for the intentions of the user and usage behaviour. It more strongly influences the people's intentions in using the technology (Davis *et al.*, 1989) and has greater correlations in usage behaviour than Perceived Ease of Use (Davis, 1989). Like Perceived Ease of Use, it is also based on the theoretical foundations of Technology Acceptance Model (Venkatesh, 2000; Karahanna and Straub, 1999; Fenech, 1998). Parbooteah *et al.* (2005) suggested that Davis (1989) theory did not cover the cross national aspect of accepting information system. However, there are political and local cultural issues that influence the technology acceptances that in airlines organisations industry and necessitate further investigating what TAM does not cover.

Though many studies measured technology innovation acceptance through usage of the system, it is not applicable in the context of organisation where the technology is part of the core business, so having the two constructs of TAM deemed inappropriate option since users have no option, but to use the systems due business needs. Many studies came to the surface later discussing TAM; evidently, they added constructs to cover some of the missing part of TAM like the attitude dimension towards technology. However, Legris *et al.* (2003) listed studies from the most prominent journal in the field based on

TAM, such studies have students as participants and with far less complex software compared to the systems that existed in airline fields and particularly in this study. Venkatesh and Davis (2000) applied TAM with subjective norm and task technology fit extension, and they arrived at a better result of TAM standalone. Nonetheless, Dishaw and Strong (1999) had shown that subjective norm did not improve TAM when it was applied on IT-professional participants. By and large, airlines solutions have many diverse systems ranging from exceedingly complex that can be observed in operation sector to less complex in human resource sector; thus, there is still a gap to explain the interplay of solution provider and their effect on business process, which is not covered with TAM nor it covers the environmental and possible organisation issues accompanied large and complex solutions as in this research.

Other theories support organisational adoption like the Innovation Diffusion Theory (IDT) introduced by Rogers (1995). IDT recognised the innovating diffusion process through five stages. First stage starts from an individual who possessed or exposed to the knowledge of an innovation. Then, persuasion stage comes when forming an attitude towards the innovation occurred. After that, comes the decision stage either, to adopt or reject the innovation followed by the implementation stage. Finally, it is the confirmation stage of the decision when innovation is used to its full capacity (Roger, 1985). Although this theory covers most part of the organisation adoption, but certain assumptions do not fit in large structured firms where technology adoption decision is not within individuals control rather it is a decision that is made as 'strategic move' toward firm performance or based on a business demand. Besides, new solutions supplied by IS providers in the airline industry that invested a large amount of resources in building mature airline business processes aligning with

technology that accelerates the persuasion stage by far. Hence, the context of persuasion is not vital to the adoption particularly in large firms where certain technology is imposed strategically rather than personal preference of the technology. Drawing on the latter argument, the sequence suggest in IDT do not apply in such large firms. Roger (1995) argued that there are five innovation attributes that differentiate the rate of adoption of innovation by individuals; namely, relative advantage, compatibility, complexity, trialability, and observability. The latter characteristics are believed to influence the individual decision in the decision stage. Roger (1995) explained that the relative advantage is how many advantages are gained over the previous innovation; compatibility is how much innovation can be absorbed in existing social norms or values; complexity is how easy to use and learn the innovation; trialability is the possibility of experimenting the innovation while adopting it; observability is to what degree the innovation is visible to others. Nowadays, in the airline industry the solutions are complex to a degree that is not possible to try it for a period; instead, a demo or prototype is built for the users where they can recognise the solution potential of delivering the anticipated outcomes. So, trialability is in question in the latter context.

From the adopter perspective, Tornatzky and Fleischer (1990) came with a broad technological innovations adoption framework depending primarily on three factors; namely, Technology, Organisational, and Environment (TOE). Technological factor involves the internal aspect that includes all existing firm technology and the external aspect, which includes outer to firms' resources such as external IT provider. The three prime characteristics of the technology factor that have been dominant in the literature of IT adoption; mainly, are relative advantage, compatibility, and Complexity. Most studies have focused

on the relative advantage as an IT adoption enabler and contribute a significant role in adoption (Cragg and King, 1993, Beatty *et al.*, 2001). Relative advantage is just another side of a coin of perceived usefulness in TAM theory by Davis (1989). Compatibility is concern with the degree of compatibility of existing values, structure, infrastructure where high compatibility means least changes required to adopt the technology (Lee and Kim, 2007). One of IT adoption inhibitors is complexity that refers to the degree of difficulty absorbing the technology (Lee and Kim, 2007). The degree of how organisation perceives complexity is a controversial issue where some firms might predict that using e-mail is complex, others might not even worry about it. Therefore, complexity by its own faces a lot of difficulties to indicate the true degree of measurement without a relative anchor (that also has not been established). Complexity and Perceived Ease of Use in TAM theory are discussing the same dimension. Broadly speaking, TOE model is more comprehensive than TAM in a sense that TOE includes TAM and some of its extensions such as attitude towards technology.

While organisational factor constitutes how much does the firm has of resources, type and size of a business, and firm organisational structure, the environmental factor includes elements that cover interaction with policy maker and government authority, industry sector, and type of rivals. Besides, its wide coverage of adoption concepts there are substantial empirical studies that were underpinned by Tornatzk and Fleischer (1990) theoretical framework such as Zhu *et al.* (2003) which makes it ideal for studies that have adoption nature. Nonetheless, our collaborative organisation as case study involves more issues than the pure adoption problem such as the interplay of concurrent multi-collaborative enterprise system and their influence in the airline business

process and their suitability to influence such change as well as the factors that constitute a successful mix of solution providers.

This was a brief review of most influential theories in adoption in existing scholarly works; nevertheless, organisation fit of information systems is mostly understood by qualitative research methods approach due to issues like diverse business, process complexity, politics, culture, and attitude. All these factors complicate the matter and require a delicate and thorough understanding of this phenomenon. Myers (1997) argued that the focus of most researches in information systems shifted from technology to managerial and organisational issues where qualitative methods become a viable option. The next section will move to depict on the business process, its role of improving business, types of business improvement. Finally, how enterprise systems business process adoption could be thought of as business process improvement.

### **2.3 Business Process**

In this day and age where businesses are often engaged in tough competition against one another, both existing and emerging businesses need to do certain changes within the organisation in order to achieve their foremost goals and aims as an organisation. Short tactic changes do not survive for a long time, what is needed is a sustainable well-studied strategic change for a long period of time. Ramirez *et al.*(2010) contended that organisations interested in performance and efficiency stress on BPR. King (1994) supports the associating of BPR to the business strategic decisions in organisations. For that reason, improving business processes is one of the weighty issues that concern the management in airlines today; evidently, this was shown in Gartner's (2009)



(table 2.1 below) report as it has ranked number one in the IT expenditure priority for 2009.

Top 10 Business Priorities	Ranking	Top 10 Technology Priorities	Ranking
<b>Business process improvement</b>	1	Business intelligence	1
Reducing enterprise costs	2	<b>Enterprise applications (ERP, CRM and others)</b>	2
Improving enterprise workforce effectiveness	3	Servers and storage technologies (virtualization)	3
Attracting and retaining new customers	4	Legacy application modernisation	4
Increasing the use of information/analytics	5	<b>Collaboration technologies</b>	5
Creating new products or services (innovation)	6	Networking, voice and data communications	6
Targeting customers and markets more effectively	7	Technical infrastructure	7
Managing change initiatives	8	Security technologies	8
Expanding current customer relationships	9	Service-oriented applications and architecture	9
Expanding into new markets and geographies	10	Document management	10

**Table 2.1 Gartner Top 10 Business and Technology Expenditure Priorities (Gartner, 2009)**

It is noteworthy to start defining the Business Process (BP) first. Many definitions exist in the literature review the most prevailing ones define BP as follows:

- “A set of logically related tasks performed to achieve a defined business outcome” (Davenport and Short,1990)
- “A series of customer and supplier relationships’ that produces specific results at specific points in time” (Scherr,1993)
- “Activities that take one or more kinds of input and create an output that is of value to the customer” (Hammer and Champy,1993)

With regards to BPR, it was defined by Davenport and Short (1990) as ‘...the analysis and design of work flows and processes within and between organisations’. Three key terms appeared in existing scholarly work, which have

been detailed by MacDonald (1995) as seen in Figure 2.1 below; namely, business process improvement, BPR, and business process reengineering.

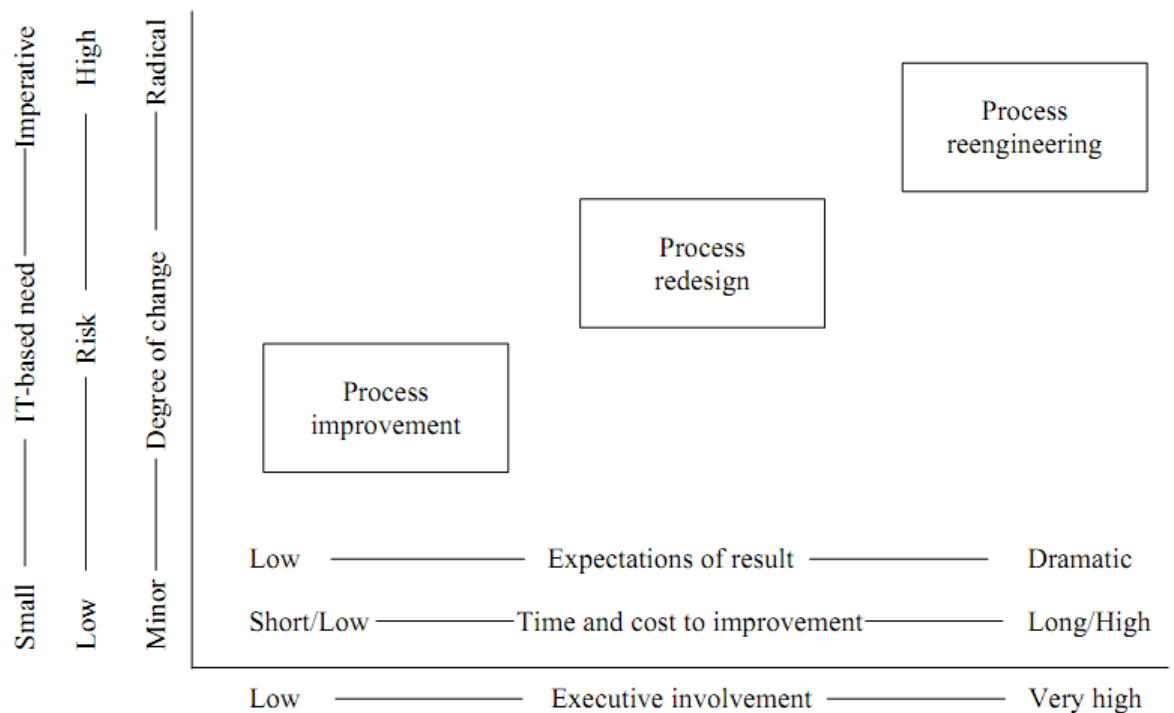
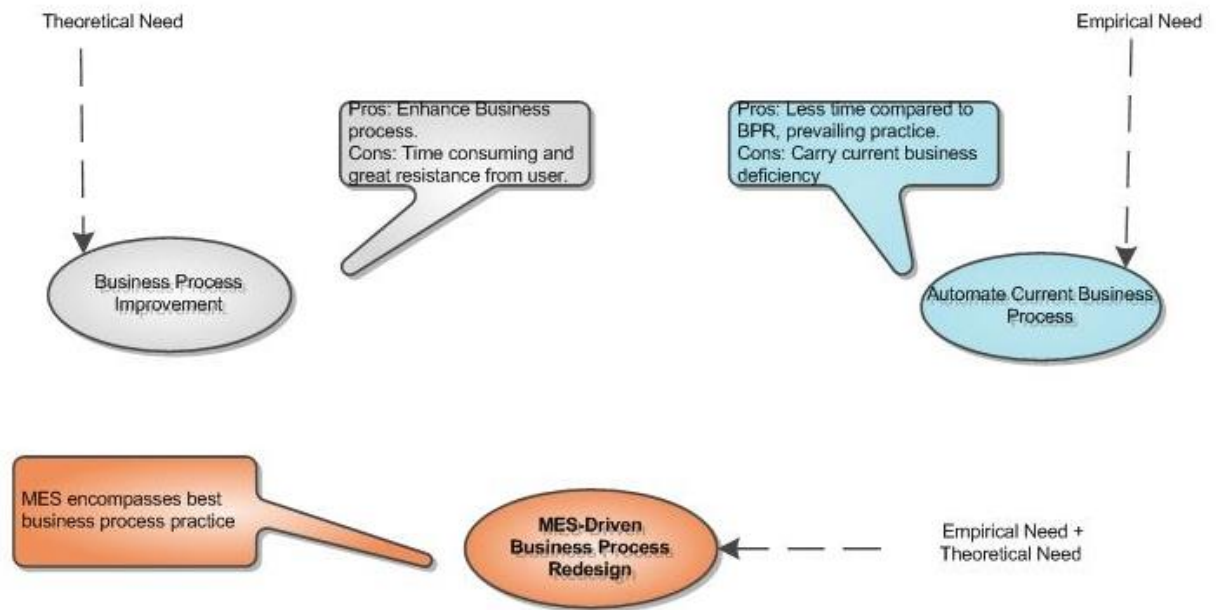


Figure 2.1 Differences between Process Improvement, Redesign and Reengineering from MacDonald (1995, p. 22)

However, Tinnilä (1995) contended that the term redesign and re-engineering of business processes deal with the same phenomenon; as a result, they can be used interchangeably. The author thinks it is not the name rather than the scope of changes that make the difference. There are various approaches to improve business process in organisations. Some scholars categorise these approaches according to the participation level either top-down or bottom-up (Chang, 2006), others categorise them according to IT and strategy involvement (Tinnilä, 1995).



**Figure 2.2 Business Process Enhancement Paths**

Figure 2.2 summarises the overall view of business process enhancement approaches and indicates that there is an organisational need to improve business processes; on the other hand, the empirical technical need leads to different trends and focuses on short win. Broadly, there are a couple of options to improve business processes. We categorised them into three chief categories; namely, high business process changes with or without automation (BPR), high automation with little business process changes (automation of the current process), and MES-driven business process redesign. This research will shed light and investigate on the latter approach as the adoption of business processes in MES ‘as is’ act as a path to improve the business process. The next sections will move on explaining these categories.

### 2.3.1 Business Process Enhancement through BPR

According to Hammer (1990), and Hammer and Champy (2001), there is a concept called business process re-engineering that was introduced mainly in the private sector in order to provide effective techniques on how firms must

design or redesign their specific organisations and achieve significant improvement in the customer service as well as permanently reduce operational expenses that would make the firm increase its profits.

Business process re-engineering is not a novel concept anymore especially since the role of information technology has quite well established in the business environment around the globe (McAfee, 2006). Business process re-engineering involves changing of the organisational structure, and the business processes within the business environment (Mithas and Krishnan, 2009). Application of BPR can entirely change the technological, organisational and human dimensions of the organisation (Ahadi, 2004). BPR is backed up by a major role of information technology as the manual processes are now replaced with office automation. BPR provides flexibility, and the business can be conducted from different locations (Akhavan *et al.*, 2006). It also provides a great deal of flexibility in operations and manufacturing, thereby having a positive influence on the business processes followed by manufacturing (Lee *et al.*, 2009). This includes quick and efficient deliveries to the customer, rapid and effective support systems and paperless transaction environment (Barjis, 2008). On the whole, BPR provides an effective and efficient change in the manner the activities were being performed making most of the business processes from manual to automated (Hackney *et al.*, 2000)..

The role of business process re-engineering in radically changing the way organisation works has been established by quite a lot of academicians. BPR does not intend to preserve the status quo, in fact, it fundamentally, completely and thoroughly changes the business processes adding a great deal of automation in the work, hence is dynamic in itself (Lee *et al.*, 2009). This radical nature of BPR requires the effort of BPR to focus more on the outcomes,

instead of the tasks that are being carried out (McAfee, 2006; Mithas and Krishnan, 2009). The focus on the results rather than the tasks or activities makes the difference between success and failures in the entire change program. BPR uses particularly crucial measures to explicate if the change process was a success or a failure (Rettig, 2007). A focus on the outcome, instead of the task, gives the direction and measurability at each level of re-engineering the processes; be it reduction in cost or headcount, increase in the efficiency and effectiveness, focus on the customer support system or strategically aligning the business processes (Lee *et al.*, 2009).

Benchmarking is one of the supremely powerful tools of business process re-engineering and also proves to be a trigger which starts the BPR process in the first place. The value of benchmarking does not lie in imitating the processes but to determine what the goals were that made the processes as they were (Barjis, 2008). If this is employed well, it cannot only increase efficiency and effectiveness but will also shape up the business strategy possibly identifying a potential competitive strategy (Attaran, 2004).

According to many strategic managers, BPR practitioners, and many empirical researches, it has been established that BPR is a strategic and cross functional activity that is not run in isolation, but integrates all aspects of management in order to provide a positive role and deliver intended benefits to the organisation (Barjis, 2008; Lkavalko and Aaltonen, 2001; Kalling, 2003). The managers of an organisation need fully to understand the ongoing business processes if they need to reap the intended benefits of the organisation. BPR takes in to account the application of IT for utmost improvements in the existing business processes (Barjis, 2008). Hence it could be asserted that BPR plays a significant role in automating the business processes and environment by

focusing on the outcomes and needs of all stakeholders involved (Rikhardsson, and Kræmmergaard, 2006).

The concept of business process re-engineering or simply BPR is also used by most organisations as a means to gain competitive advantage versus their competitors. Hammer and Champy (2001) for instance claimed that BPR is the most effective business technique for most companies nowadays. It was all about understanding the vital processes that transpire within a company with a specific aim of improving the effectiveness and efficiency of the company's key processes. Eardley *et al.* (2008) explored the IS involvement in such firms and described their IS stance as neutral.

Iskanius *et al.* (2009) state that one of the significant improvements among companies nowadays is the continuous development of their information and network systems. Further, business process re-engineering is the key to successful IS in order to reduce costs, improve service speed, enhance the quality of delivery, and establish effective measures of performance. As evidence of its effectiveness, American Airlines was able to rescue itself from bankruptcy caused by a bad debt through the implementation and application of business process re-engineering within the company (Cox, 2010).

Silvestro and Westley (2002) in their study found companies that undertook pure BPR faced problems that have been caused by failing to view IT as an integral part of BPR. Ramirez *et al.* (2010) were consistent with the later view in such that the role of IT is not going to be diminished, and it acts as a key motivator to BPR. Attaran (2000) contended that the IT role is essential in BPR and needs to be involved. In line with a previous notion, Grover *et al.* (1995) also

argued that successful BPR should pay attention to other contextual aspects such as technological competence.

### **2.3.2 Business Process Enhancement through Automation**

Apart from BPR other technological tools may also be of use in order to improve the existing business processes within a firm; for instance the use of automation to automate current business processes which is used widely nowadays. Automation is possibly one of the best technological advancements in the world today that made the work of several businesses simpler, easier and more efficient. By definition, automation refers to the utilisation of an IT-based control system capable of producing a specific output/data without the need for human operators intervening in the process. Defining the role of IT as an automation role for current processes was identified by Venkatraman (1994) and Chan (2000). IT can improve the efficiency of operational processes through automation, or enhance their performance.

Scheerer and Schiavello (2009) in their article entitled specified that most businesses benefit from automation because this technology results in enormous cost reductions and an increase in agility as well as service quality of firms through its highly efficient process. They relate this for two reasons; firstly, automation enables a real-time and dynamic response to the various demands of businesses. Secondly, since it does not allow human intervention, risks and errors are reduced and managed well by the firms.

Moreover, automation also maximises the use of both virtual and physical assets of a company such as its IT employees who are able to focus on other notable roles and tasks with ease and confidence as the automation technology is capable of performing labour-intensive tasks that employees cannot possibly

perform in such a short period of time. Due to its remarkable service delivery capabilities, the automation technology is able to manage the company's resources remarkably well (Scheerer and Schiavello, 2009).

In line with these facts, there is, therefore, no doubt that automation is one of the most effective means of improving a specific business or firm's current business processes. Nevertheless, a major drawback of having automation without having a change in the business processes is that deficiency in the current business processes is propagated into the new system which will hinder both the system and the business process over time. Further, the prevailing exercise of traditional existing firm's IT aligned with the business is to achieve quick wins that would end with automation of current business processes. Short elapsed time for achieving a goal is one of the traps and pitfalls businesses fall into, in theory such practice would not be encouraged; on the other hand, from an empirical point of view this could be a viable option in terms of budget and time. A good example is the flight disruption management systems where the processes are kept unchanged, but the focus was on the automation part (Abdi and Sharma, 2008). The disadvantage of this path is the preservation of current business process malfunctions. However, there are even more effective methods of improving the business processes of a specific company other than the implementation of BPR or the use of automation technologies, which underpin this study. The following section will introduce the answer to more effective way of improving BP.

### **2.3.3 Business Process Enhancement through MES**

According to Dennis *et al.* (2003) most businesses find it decidedly inconvenient to implement BPR because it is exceedingly costly and time-consuming. Most of all, BPR may be effective, but it requires considerable changes in the current



structure of the company which may temporarily paralyse the current operations and systems of the company affecting its quality and service delivery (Mooney *et al.*, 1996).

Given this dilemma, many businesses resort to the use and implementation of ERP solutions or similar airlines' solutions. Unfortunately, ERP covers only portion of the airline business process, which is why airlines have to cover the other business process with other enterprise systems like Sabre Airline Solutions that covers diverse airline business process such as cargo, ground handling, catering, cabin service, crew scheduling, crew training, aircraft scheduling, marketing planning, ticket pricing, etc. The author has chosen ERP as an example of ES for the rich literature around ERP. ERP system is an IT-based technology utilised to perform several prominent business functions like for instance, the execution and management of proper product planning, supplier interaction and transactions, customer service, inventory management and orders tracking (SAP Maintenance Repair Operation (MRO)).

According to Botta-Genoulaz and Millet (2006), ERP is defined as an industry-wide used system, which involves a set of activities intended for the facilitation and management of a particular business. The authors described ERP or other airline ES as an important source of information which provides the visibility of key performance indicators (KPIs) highly-needed to achieve corporate goals and objectives. Botta-Genoulaz and Millet (2006) also add that since ERP is applicable in almost all aspects of the business, it is considered to be a truly useful technological solution to achieve effective facilitation and seamless flow of pertinent information across and among all business functions involved both within and outside the organisation's boundaries of operation. Yeh *et al.*(2010), on the other hand, claim that, more than anything, it is the capacity of the ERP

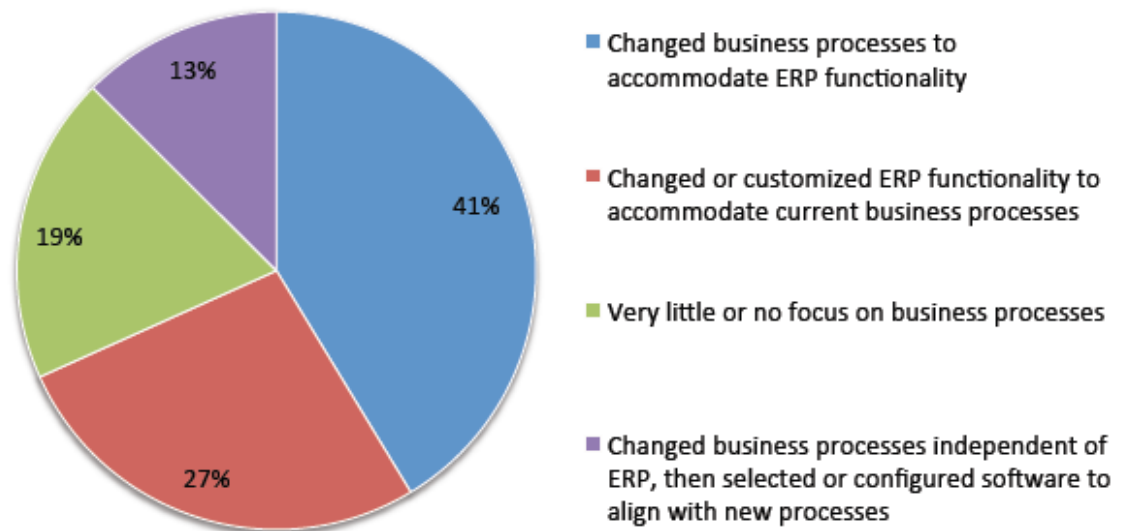
system to integrate all systems and processes which serves as its biggest advantage for the business.

However, Chiasson and Davidson (2005) suggested that each industry has its own ways of implementing and adopting IT solutions. The latter argument support the need for more research in the airline industry where ERP does not cover the core business function of airlines such as marketing and operations which would add a whole new dimension of complexity to overcome integration issues. Taking in consideration that the ultimate goal is unifying organisation solution where one of strongest key points in the use of the homogeneous solutions is the reduction of redundancy occurrences in all data entries. Also, it will improve the efficiency of all individual employees as the collaboration of efforts in running the operations will be more seamless and, therefore, successful.

In a practical context, ERP and similar airline systems can do what the BPR and automation technology can do together but in a much easier and implementable way, which is why most businesses nowadays consider applying ERP systems in order to improve their business processes. Further, Ramirez *et al.* (2010) research also confirms that the mix of both IT and BPR have a positive return for organisation market value. Hanafizadeh *et al.* (2009) were consistent with the latter view relating the recent investment failures in BPR projects due to the non-alignment between business and IT strategies and pointed out that, through acceptance of best strategic practices, process redesign can meet the business strategies. Ettlie *et al.* (2005) discouraged modifying ERP systems and were in favour of accepting business processes 'as is' for two reasons. First, due the high cost of modifying such systems. Second, there is a tendency of maintaining the status quo within a firm keeping the current business processes

as is. In addition, this will profoundly minimise the project complexity and avoid project creep (Umble and Umble, 2003).

When a company decides to introduce an ES in the company for better performance and improve business processes, there are two main options to consider. The company can either opt for a vanilla ERP which is not customised as per the requirements of the company, but the company after employing this ES changes its business processes accordingly so that it conforms with the processes that are defined in the ES application software (Parr & Shanks, 2000). The second option is to go for custom made ES application software that is specifically designed for the use of the specific business (Grossman and Walsh, 2004). There are various pros and cons for both kinds of ES application softwares. Although the vanilla software application could save a lot of costs, but it could be considerably difficult to conform to the business processes defined in it and the employees could have problems adapting to new business processes (Luo and Strong, 2004). On the other hand, the customised software may be comparatively difficult to design and implement as per the system requirements, but it would save a lot of hassles that could be caused by adopting and conforming to vanilla ES application software (Ghosal and Nair-Reichert, 2009).



**Figure 2.3 Business Process Improvement Focus during ERP implementation (PCS, ERP report 2012 :4)**

From figure 2.3 above indicates that ERP predominantly (as 41% per cent) influenced organisations' business process of most ERP implementation. Few percentages of these deployments about 13% have new business process evolved as a result of business process re-engineering accommodated the ES implementation. On the other hand, still there is quite marginal figure of organisation (27%) that tended to customise their ERP package by changing the software to match their local business process. Those processes provide a competitive advantage of certain organisation should be kept as is, as changing them would jeopardise what most of the companies strive to achieve and that works against the strategic objective of the purpose of having ES in the first place.

#### **2.3.3.1 ES and organisation business process**

Enterprise systems are immensely useful phenomenon in the Information technology market place since the recent times. The usefulness and significance for easing the business processes has not been overstated in the previous literature (Zwieg *et al.*, 2006). ES represent a key to a total

restructuring of the organisational structure and processes from manual to automation to achieve integration of the structure, process, systems and information. On a societal level, the ES phenomenon seems to be a total renewal of the IT infrastructure in organisations with potentially positive economic, technical and social consequences (Uwizeyemungu and Raymond, 2009). An ERP implementation in an organisation may lead to a more than 60% reduction in the accounting procedures because of no more duplication of data entry. Similarly, ES lead to consolidation of tasks, which minimises the time and effort consumed to complete various tasks in the organisation (Gupta and Kohli, 2006). In addition to this, strategic analysts have speculated that the widespread adoption of the ES in organisations leads the elimination of wasteful activities which can ultimately lead to a basis for competitive advantage (Gupta and Kohli, 2006).

Due to the many known reasons like richness of the data, other potential and functional uses of the ES and its positive influence to the business processes, it is not surprising the firms around the globe are adopting these systems rapidly (Kremers and van Dissel, 2000). The advent of ES in the organisations reduces the use of mainframe systems and thus system costs also reduce (Newell, et. al, 2003). The organisations implement ES because they feel a strong urge to increase the system capacity so that growth can be increased. Hence the companies are influenced both technically and through the efficient and effective business processes by the proper implementation of ES (Dillard *et al.*, 2005). Succeeding section will discuss the ES within the airline industry context.

## 2.4 ES in Airlines Context

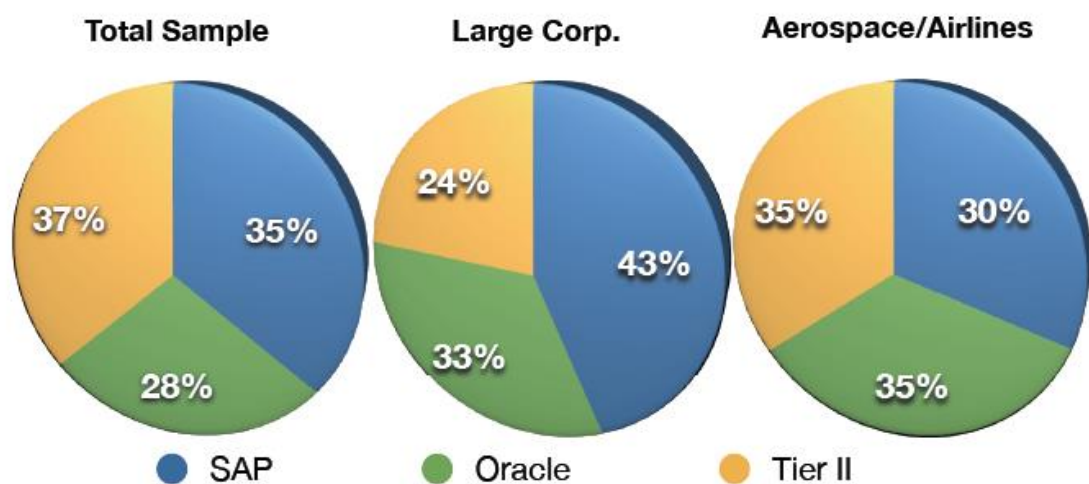
Enterprise systems spread in late 80's and the beginning of the 90's in the manufacturing sector after their ancestor of material requirements planning (MRP). Gartner suggested the first acronym by Wylie (1990) in their article "ERP: A Vision of the Next-Generation MRP II". Nonetheless, this transformation was rather amorphous which led some scholars to suggest changing the name to ES (Davenport, 2000). Therefore, ERP spread in the 90's and did not have glamorous stand in the industry regarding their deployment success rate due to many reasons, which part of this study will shed light on. For that, several studies related to ERP have emerged to investigate ES's implementation success rate reference to the large amount of resources (money, time, and people) spent during ERP initiatives. In this research as, we indicated that ERP and ES will be used interchangeably to refer to the same thing. ERP proliferated in both manufacturing and banking industry.

On the other hand, the nature of the aerospace sector does not resemble the manufacturing in a sense the core platforms of airline such marketing and operation are not a like the manufacturing counterpart which led to significant customisation of ERP in the early versions. In this research, ERP was barely covering HR, finance, Maintenance Repair and Overhaul (MRO) the rest was covered with other enterprise systems, for example, marketing was a split between Amadeus and Sabre systems. Amadeus took most of the marketing core business while Sabre took the market research, flight scheduling, and tentative pricing. Though ERP was thought to be an enterprise system but when referencing a large airline unfortunate there is not one single system that could cover all core business under one umbrella. This was the chief cause for having

IT collaboration that rendered to be the Multi-collaborative Enterprise Systems undertaking.

#### 2.4.1 ERP Tier I Companies

SAP and Oracle surmounted the market share in enterprise systems specifically in large organisation sector where SAP share is 43% of the ERP market while Oracle was at 33%; on the other hand, in the airline sector Oracle had approximately 35% compared to SAP 30%, and all other vendors would share the rest 35% as shown in the below figure 2.4 (PCG, 2009).



**Figure 2.4 Market share of ES in Aerospace in 2009 (PCG, 2009 ERP Report:2)**

Further PCG reported that the average of ERP implementation is a round 19.8 months after excluding exceptionally large multi-national organisation, which would have distorted the result. Nevertheless, the average of ERP implementation in the aerospace sector was 28 month, which indicates the complexity of business process in the airlines as well as their different business process nature, too. Further, the research case is considered as extremely large company with regards to the definition taken by the research of a large company as 500 plus while the case in our study has over 25,000 employee

and over 5 billion of revenue. Such size mostly reveals complications in the deployment, and it adds to the complexity of implementation (more detailed will be in chapter 3).

Customisation level in ERP implementation also varies when dealing within the aerospace sector; however, it tends to have more customisation level compared with large organisation from other sectors as shown in the table 2.2 below.

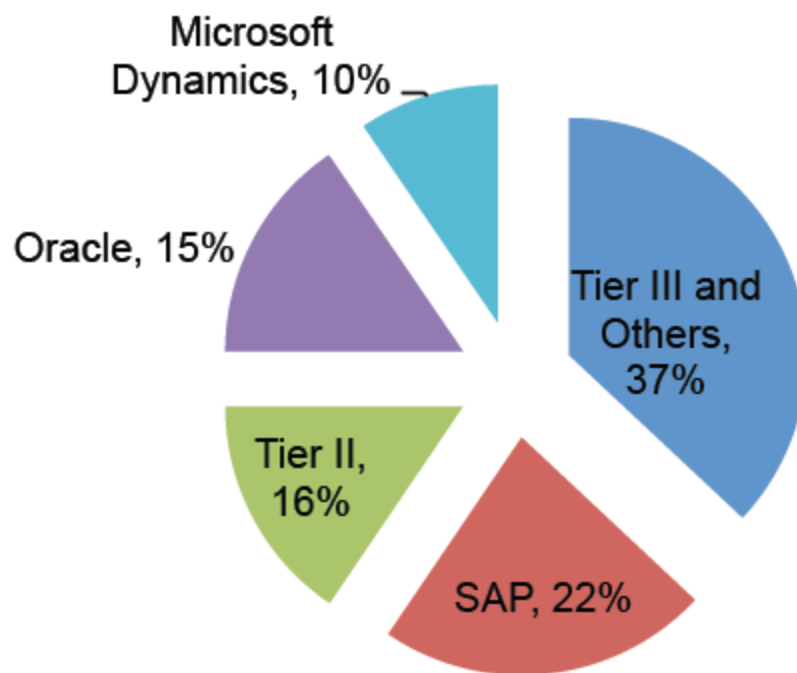
	Vanilla	Mostly Vanilla	Heavily or Completely Customisation
<b>Total Sample</b>	23.0%	42.8%	34.2%
<b>Large Organisations</b>	15.2%	45.0%	39.7%
<b>Aerospace/Airlines</b>	9.1%	63.6%	27.3%

**Table 2.2 : ERP customisation Level (PCG, 2009:3)**

As table 2.2 indicated low percentage in vanilla ERP, it alarms that almost 90% of the airlines divulge a high demand of customisation of ERP mainly not due the a preference factor rather than whatever business processes in ERP do not suit the airline business as well as complex regulation surrounding airline sector, which was clear in the second column. There are many reasons why this percentage was high in mostly vanilla column, which will be discussed further in chapter 5. One of the reasons of accepting a slightly modified ERP in the airlines is that the airlines profit margin is becoming extremely tight; owing to the fact the emerging of low cost carrier and stiff competition between airlines.



Though there are many ERP solutions out there, acquisition strategy from both Oracle and Microsoft Dynamics left three main players in the market in class1 mainly, SAP, Oracle, and Microsoft Dynamics. SAP for its name and popularity still has the greatest market share for 22% while Oracle and Microsoft Dynamics shares are 15% and 10 %, consecutively as shown in the figure 2.5 below.



**Figure 2.5 ERP share in 2012 (PCG, ERP Report 2012:7)**

However, SAP has reached 35% as the top short listed name when an organisation is selecting ERP solution followed by Oracle and Microsoft Dynamics with 24% and 17 % respectively. The interesting part in the actual selection part reflects different game, SAP scored the lowest with 28% and Microsoft Dynamics score 32% after the highest which was Oracle with 34%. The explanation of this would be that Oracle and Microsoft Dynamics provide much better organisation fit solutions for those who were involved in the study sample which was about 2000 respondents from 61 countries. On the other hand, this could have an interpretation that SAP is not offering convincing

solution for these companies. This collaborative organisation in hand has selected SAP for their outstanding reputation of MRO part, though they were less convincing in financial module.

Duration wise the ERP projects tend to encounter difficulty most of the time as 61% of the projects finished late and this involves cost and resources too (PCG, 2012). From the same study, Oracle has shown the lowest performance when comparing schedule vs. actual project time. Both SAP and Microsoft Dynamics have shown equal variation between schedule vs. actual times. Further, SAP scored the worst of ROI within 1, 2, 3 years categories, consecutively as shown in the figure 2.6 below. These types of figures leave the industry speculative about the benefit of ERP and ROI in general. Was it the companies who could not make use of the software or was it the software that could not deliver what companies were expecting.

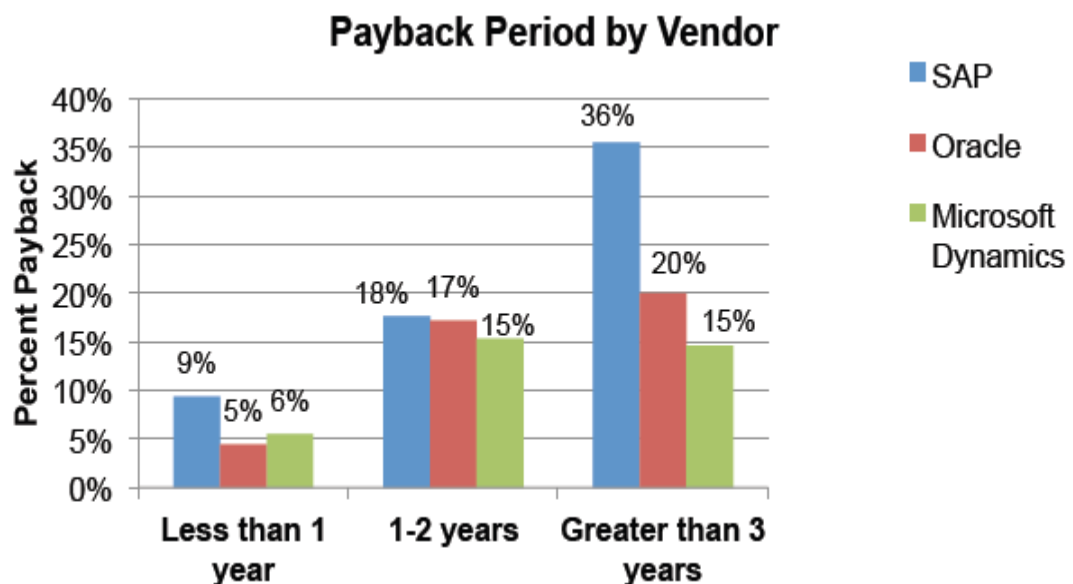


Figure 2.6 ERP ROI for 2012 (PCG, 2012:14)

## 2.5 ES Effects and Strategic Perspectives on Organisations

The Enterprise Systems (ES) are large scale application softwares that integrate the systems of an organisation, are cross functional and contain the information required to make various decisions in the organisation (Gattiker and Goodhue, 2005). The ES provides services to the whole organisation and also to its subunits and departments (Boudreau and Robey, 2005). There are various categories of an enterprise system. These include Document management system (DMS), Customer Relationship Management (CRM), SCM Supply Chain Management (SCM), KMS Knowledge Management Systems (KMS), and Enterprise Resource Planning (ERP) (Dillard *et al.*, 2005). Many companies have capitalized greatly in these systems since the last two decades and are benefitting from these softwares immensely. The global enterprise software market accounted to almost \$ 230 billion and was expected to reach over \$315 billion in the next five years (Gartner 2008).

The present research explicates the enterprise systems in detail as how they have been studied in the previous literature. This literature review entails various papers that brief about the enterprise systems, its influence to the organisation, how they increase the business value, advantages and disadvantages of ES and its influence to the overall business process.

### 2.5.1 Strategic Perspectives of ES towards organisation

The enterprise systems have been noted to impact the strategy and culture of the organisation while having a deep influence on the structure and working of the organisation on the whole (Davenport, 2000). Companies view this integration of the business processes and standardization as a key benefit, which leads to the reduction of the overall business costs by implementing strategies according to the ES. According to Mabert *et al.* (2001), the definition

of an ERP is given as: “ERP is the digital nerve system that connects the processes across the organisation and transmits the impact of an event happening in one part to the rest accurately”. According to Beard and Sumner (2004), the strategic implementation of ES leads to a lot of tangible benefits like lower inventory and maintenance, lesser delivery times, and shorter financial cycles. The indirect benefits like reductions in the workforce or savings in operational costs are not present as the short term effects of the ES (Uwizeyemungu and Raymond, 2009). According to Palaniswamy and Frank (2000), the strategic implementation of an ES does not only lead to a speed up in business processes, but also augment selling opportunities, decrease costs, enhance customer satisfaction and quality, and gauge results continuously.

### **2.5.2 Advantage and disadvantage of ES to organisation**

There are various advantages and disadvantages of enterprise systems to an organisation. According to Botta-Genoulaz and Millet (2005); Davenport (2000); and Uwizeyemungu and Raymond (2009), the advantages of the enterprise systems in an organisation are usually classified into the following categories. These are:

- Richness and reach of information: The ES integrates information from all units and subunits of an organisation, which makes it easy for users to access the previously inaccessible information. This improves the quality of decision making and governance and increases the response times (Hayman, 2000).
- Automation of business processes: The ES automates most of the business processes which results in administrative savings, elimination of wasteful and manual activities, repetition in operational savings and

procedures from more effectual and aligned processes (Huang *et al.*, 2004).

- The maintenance and modification of the pre-existent information systems in the organisation: Since the ES is a central software that integrates all the loose ends of the organisational information centre, so it reduces costs of the organisation to maintain the subunits and departments separately in individual IT systems (Newell, *et. al*, 2003).

However, these advantages come with a few costs to the organisation as well, which can be named as the following disadvantages (Kremers and Van Dissel 2000; Robey *et al.*, 2002):

- Rigidities and misfits in the ES: in spite of the many useful functions of the ES, some built in best practices might not be suitable for the local requirements of the organisational environment it is now being employed in (Newell, *et. al*, 2003; Rettig, 2007).
- Standardized Data and change: Change is always a little difficult to accept and the data standardization and investment on IT for the organisation might be a restraint for the employees of the organisation. Trying to change their vision and the way they think might prove to be an enormous challenge for them (Gupta and Kohli, 2006; Rettig, 2007).
- The size and complexity of the system: The gargantuan size and complexity of and ES software makes it devilishly difficult and time consuming to understand, learn and configure which is possibly one of the disadvantages of the software (Uwizeyemungu and Raymond, 2009; Rettig, 2007).

- Sometimes ES complicates business process further than what the end user is expecting, a simple task might take from three to eight screens to process the task, as well as the ES projects entail higher risk than IS projects (Alshawhi *et al.*, 2004).

### 2.5.3 ES Business Value

The benefits of implementing the enterprise systems have been established well with empirical evidence, and it has been considered as one of the most prestigious progress in the context of the corporate use of technology (Kumar, 2004; Dong and Zhu, 2008). The enterprise systems (ES) are a broad term for all enterprise systems like ERP (enterprise resource planning), CRM (customer relationship management), DMS (Document management system), SCM (Supply Chain Management) and KMS (Knowledge Management Systems) (Kremers and van Dissel, 2000). The effectiveness of these systems is optimum when all the users in the circle are able to access the information in it. Web portal, internet and intranets have been quite efficient to deliver information to the decision makers supporting their decision making, processes of collaborating information so decisions can be made from combined basis (Dillard *et al.*, 2005; Rettig, 2007). Like other small-scale systems, the ES software applications add a lot ease for performing tasks and activities in the organisation along with increased organisational effectiveness and efficiency (Davenport, 2000). Due to their main function of integrating the units and subunits of the organisations, these software applications connect the flow of information and helps managers to make informed decisions using that information as well which was previously inaccessible (Huang *et al.*, 2004). Due to access to the current as well as the historical information through the ES, the managers are able to assess the current situation of the business better, and

quicker decision making could be accomplished (Davenport *et al.*, 2003). The investment of businesses in these ES is enormous, but when the implementation of these ES is successful and results are seen, the massive investment is justified (Kumar, 2004). According to Hackney *et al.* (2000) the return of investment comes from the significant improvement in business processes that are supported by the software application and not just from the progressed information access. It has been noted that the successful implementation of the ES application software has brought marginal improvements in the business performance (Gupta and Kohli, 2006). However, the proper benefits of the system can only be attained through proper usage of the software application, because if the organisations continue to follow the same protocol the performance could get worse instead of improving (Gattiker and Goodhue, 2005). The software can add a lot of value to the business by enabling and supporting new, and improved processes based on informed decision making but the organisation still has to decide which processes to include in the array and commit to them (Robey *et al.*, 2002; Zwieg *et al.*, 2006). The return on this investment can only be gained if the way business was performed in the pre-ES time is radically changed into newer and faster changes that incur lower costs and processes that will now serve the customers of the organisation in a better way (Kremers and van Dissel, 2000; Rikhardsson, and Kræmmergaard, 2006). If this implementation along with its usage goes well, the organisation will be a winner (Dillard *et al.*, 2005).

It is quite well established now that the proper implementation and usage of the ES application software will bring a lot of efficiency and value to the business, but in order to reap the benefits of the investment done on this and to realize the full potential of an Es's application. So, it is vital that there is no

misunderstanding about what the system is (Kumar, 2004), how it will improve the business processes (Lee & Lee, 2000), its usability, its know-how and the most momentous thing is whether or not the organisational users have the technicality and training to handle such type of integrated software to make better, informed decisions using the right amount and quality of information (Gupta and Kohli, 2006).

According to many previous studies (Dong and Zhu, 2008; Gattiker and Goodhue, 2005) the anticipated benefits of the application of the ES application software have been researched. The studies indicate that these ES software applications have been designed to help the management functions by suggesting to utilize the limited organisational resources in the most efficient and effective manner through maximum integration of information (Grossman and Walsh, 2004; Rettig, 2007). The level of integration of the various levels of the organisation are closely related to the expected benefits that the managers aim to reap through the successful implementation and usage of the enterprise system (Huang *et al.*, 2004). According to Jenson and Johnson, (2001) and Nicolaou (2004), the maximum benefits and added value of the implementation of the ES are seen if after adoption, the business performance is improved both in an operational and strategic way.

According to (Sumner, 2000; Huang *et al.*, 2004; Rettig 2007), the greater complexity in the organisation wide system software have more potential in creating value for the organisation and also have many competitive gains, but this complexity brings in a lot of structural rigidities, organisational changes, risks, error escalating effects and the radical change that the employees might be hesitant to accept (Lee & Lee, 2000; Rettig, 2007). In contrast to these large and complex software applications, the domain specific applications are much



easier to implement, have less installation costs but do not promise as wide as benefits as do the ES applications do primarily due to their integrated nature and higher probability of having long-term effects (Mabert *et al.*, 2001; Gattiker and Goodhue, 2005).

Wang and Nah (2001) reported that the enterprise systems hold promise of not only adding value to the business by improving the business processes, but also reducing costs as much as possible. In addition to this latest ES software application have integrated the e-business side as well, which will link the supply chain management and engage the suppliers, distributors and even customers to the e-business and this will slash cycle times and reduce inventory (Robey *et al.*, 2002) because when the complete system is integrated in one application software, the time and effort being consumed will be lesser, much more information will be available to make informed decisions and hence will cause a lot of added value to the business (Hackney *et al.*, 2000).

## **2.6 ES Success Factors**

The Enterprise systems are highly complex systems containing integrated information of the organisation to improve the decision making process to make it more efficient and effective. The investment is done to employ the enterprise systems in organisations around the world is enormous, and the success implementation of these systems demands a lot of time and efforts of corporations. The successful implementation of the enterprise systems leads to improving the organisational processes and decreasing costs (Dillard and Yuthas, 2006). However, the successful implementation of the enterprise systems depends on a number of factors. Some of them have been illustrated below:

### 2.6.1 Composition of the ES team

The successful implementation of the enterprise systems requires a strong team, which should consist of the most competent human capital in the organisation (Rosario, 2000; Wee, 2000). The ES aims to integrate all the departments of the organisation; therefore, one of the most critical challenges is to put up a cross-functional team (Adam *et al.*, 2005). In addition to the internal staff from the organisation, the team also requires some consultants and experts (Akkermans and Helden, 2002). The business knowledge from the internal staff and the technical knowledge from the experts is necessary for the successful implementation of the enterprise system in an organisation (Somers and Nelson, 2001).

The successful implementation of the ES requires the project to be a full priority in the stages of implementation; meanwhile the other workload of the organisation should be manageable. It is prudent that the team members of the ES team should dedicate full time to the implementation (Wee, 2000). Rosario (2000) explains that the compensation and incentives for the ES team will motivate the team members and help in successfully implementing the enterprise system on time. In addition to this, the team should be well aware of the business processes, functions of all departments and the products, or services so that they are familiar with the basic support system and the production cycle of the organisation. In addition, the sharing of the necessary information among the implementation team members is of vital importance and requires the development of trust among the partners. This trust can be developed with regular scheduled meetings where the information can be shared, and partners can manage the work together (Wee, 2000).

### 2.6.2 Support from Top Management

The support from the superiors or the vertex of the management of an organisation is one of the most prudent factors for the successful implementation of the enterprise system in the organisation. This factor has been discussed thoroughly in the previous literature regarding the successful implementation of an enterprise system in an organisation and hence is an exceptionally relevant factor (Somers and Nelson, 2001; Zuckweiler *et al.*, 2003). This support from the top management is of particular importance, and it is a significant prerequisite to implement the enterprise system effectively and successfully (Zhang *et al.*, 2002). The mission of the top management of any organisation is to create a supporting and favourable environment for the transition to take place smoothly so that the desired results can be attained. In some cases, the top management is not only the observer of the implementation process, but also the participant who helps in the process of selecting and implementing the most of enterprise resources application system for the organisation (Zuckweiler *et al.*, 2003). The main role of the top management is to see if the goals of the transition are justified and to be aware of the opportunities and limitations provided by information technology (Somers and Nelson, 2001).

### 2.6.3 Analysing organisation's needs and vision

The company aims to acquire and install the enterprise system software application in their organisation need to know and understand the system requirements fully, which starts with a thorough evaluation of the business processes. This entails rationalizing and reordering them so that the most suitable pathway for the flow of information is recognised. This will not help to assess the information needs of various departments of the organisation, but

will also help in forming the strategy needed for system implementation or computerization accordingly. According to Zuckweiler *et al.* (2003) it is particularly essential to assess the logical and justified system requirements so that it is known that the information system that will be purchased and installed is not wastage of time, effort, cost and other resources. Hence, the detailed analysis of the needs of the organisation as well its vision is extremely significant at the pre-project stage. The lack of careful analysis can lead to the selection and implementation of the system, which does not cater to the demand of the organisation's business process and thus could result in a failure of the project causing a massive liability on the assets of the company (Calogero, 2005). The careful and detailed analysis of the system requirements would result in selection and implementation of the best possible ES solution and which causes minimum modification to the pre-existent business processes in the organisation thus leading the optimum return on investment (Somers & Nelson, 2001).

#### **2.6.4 Training the employees to use the ES effectively and efficiently**

When taken appropriate steps, the ES is successfully implemented in the organisation, now comes the step when the employees who are actually going to use the system come across this (Zhang *et al.*, 2002). The employees are almost always resistant to change, so it is supremely crucial that the employees are taken a step by step to embrace change and be able to use the newly installed system as resourcefully as possible. Academicians have identified two key factors in this regard: training of the prospective employees on how to use to new enterprise system and secondly educating the users to relate to new business processes (Akkermans and Helden, 2002; Hawking *et al.*, 2004). The lack of education and training of the employees towards the newly installed

enterprise system software application, results in a wastage of resources, which ultimately results in the failure of implementation of the ES. The education and training refer to the process in which employees are familiarized with the system and its logic and how is going to be operated. Thus, training helps the employees to go through the change process and thus understand in a better way as to how to use the system resourcefully. The employees should also be trained as to how the system will affect the overall business processes and how their work will be changed due to this new system (Somers and Nelson, 2001).

#### **2.6.5 Reorganising the Business processes**

One of the many known problems in the implementation of the enterprise system is faced often by organisations. It lies in the incompatibility of the business processes already running in the organisation, which have various information provision needs (Somers & Nelson, 2001). This does not cover when completely unsuitable software is selected for the organisation. It is noteworthy that when an enterprise system software application is selected for an organisation, the management must hire specialists that will suggest what is suitable for business processes in the company. However, there is no enterprise system that is universal and will suit the needs of all enterprises around the global, which is why vendors also make customised products (Zuckweiler *et al.*, 2003). This is where the organisation has two choices whether to designed a system that suits the business processes or to reorganise the business processes according to what the software proposes. For some organisations, it is much more suitable to change and reorganise their business processes according to the logic proposed by the enterprise systems. This is because to get a new software developed is sometimes much more expensive (Zhang *et al.*, 2002). The ES software applications contained already

established best practices around the globe, and when an organisation adapts to that, it is only beneficial for the overall business of the company (Somers and Nelson, 2001).

#### **2.6.6 Managing the organisational changes**

An organisational change refers to the fact that an alteration is made to improve outcomes and efficiency in an organisation. This can include changing a single step in an organisation and also changing all the elements of the entire business lifecycle. The implementation of the enterprise system is essentially an alteration in how the organisation is being run already. This change engulfs all the departments of the organisation and a requirement of managing this change arises to a large extent because this change can cause a lot of confusion, opposition, resistance and errors in the work being done (Somers & Nelson, 2001). It has been seen that many implementations of the enterprise systems are not successful because the change incurring is not being managed properly. According to Aladwani (2001), the success of the implementation of an enterprise system software application is dependent on whether or not the organisation is willing to embrace and manage the change as required (Aladwani, 2001).

#### **2.6.7 Defining the project goal clearly**

One of the most well-known and well established success factors of implementation of an ES is having to define clear and SMART (specific, measurable, attainable, realistic, time-bound) goals for the project (Lian, 2001). Every new project has its starting point, and one of the best way to start the project is to define the goals of the project as clearly as possible (Somers & Nelson, 2001). Clear and SMART goals will have many beneficial effects on the health of the project (Akkermans and Helden, 2002). It will assist the project

team to focus on the key issues in the project so that they do not get derailed from the line of action. This would ensure timely completion of the project milestones and thus efficient and effective performance of the team members. Secondly, the success and failure of the project is determined by the fact that the criteria are defined properly and that the organisation evaluates its completed project work and removes any discrepancies against the benchmarks that were predetermined (Somers & Nelson, 2001). The absence of defined measurable goals almost makes it impossible to determine if the project was a success or a failure (Aladwani, 2001). Thus, the goals are also a basis for the assessment of return on investment of the project.

#### **2.6.8 Co-operation among the business units of the organisation**

For any project to be successful, especially one that covers the change of the entire system in the organisational business units requires a lot of cooperation amongst the project's members. Hence, cooperation and communication are two uncommonly critical success factors for the implementation of an ES in an organisation (Somers & Nelson, 2001). The success for implementing the enterprise software application requires a lot of trust and mutual support amongst the members of the organisation. Because an ES is integrated software that amalgamates the flow of information in all the business units of the organisation thus it should be facilitated with open communication and close co-operation amongst the members of the organisation (Zhang *et al.*, 2002; Zuckweiler *et al.*, 2003). On the other hand if the organisation will have a close communication channel, it would not facilitate the flow of information related to the problem and thus the implementation would not be as good as it should be, resulting in the failure of the project (Akkermans and Helden, 2002).

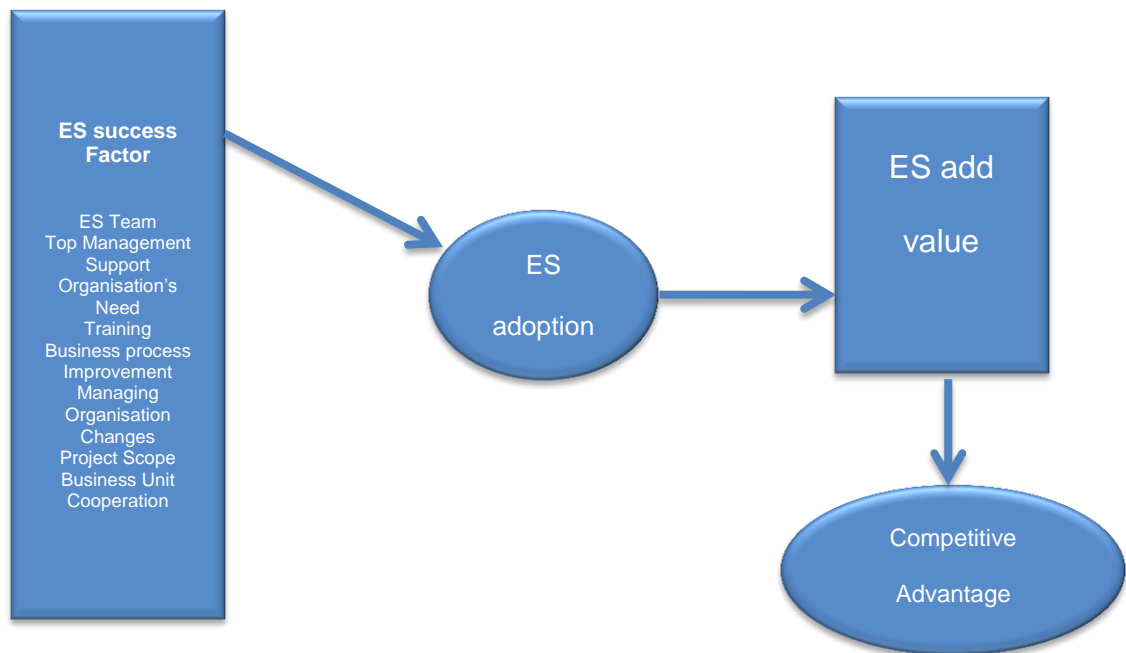
## 2.7 ES adoption leads to competitive advantage

The advent of technology in the business management has brought much ease, efficiency and effectiveness in the way the firms are run (Bell and Harari, 2000). The use of technology is also known to be an element of an organisation competitive advantage in the past three decades (Choi and Whinston, 2000). In this context, the enterprise systems have known to bring about a lot of efficiency and effectiveness in the business processes and have; therefore, been one of the sources for firms for competitive advantage (Schubert, 2007). The use of information technology especially enterprise systems confer gaining competitive advantage because it allows and facilitates the firms to monitor and integrate information related to the levels of the productivity, differentiation, product development, customisation and coordination among the various departments in the firm (Hu and Quan, 2005; Schubert and Williams, 2009).

The strategies for an organisation are devised based on the goals and objectives of the organisation, and the competitive strategy for an organisation mainly is based on a broad formula. It entails how the organisation will achieve those goals, and policies and procedures will be required to help achieving those goals (Porter, 2001). The competitive strategy aims to achieve the competitive advantage for an organisation, which means that gaining an advantage over competitors in terms of cost, quality, efficiency, and speed. In this context, a strategic information system or more precisely an enterprise system tends to help the organisation gain a competitive advantage by contributing to achieve the strategic goals of the organisation because of the ability of the system to increase the efficiency and effectiveness of the organisation significantly (Turban *et al.*, 2004).



In this digitalized economy, it is even more beneficial because of the radical changes in the business structures due to the advent of new technology extremely often make the nature and basis of competition change in an instant (Deise *et al.*, 2000; Afuah and Tucci, 2003). This is why the organisations need to keep their systems updated so they can adapt to the rapidly changing environment. The enterprise systems used by the organisations serve a source for competitive advantage because they maximise the business value, which means that business processes are optimised by using and analysing integrated information that was previously inaccessible (Kalling, 2003). The organisations that are able to gain competitive advantage use their enterprise systems strategically, which means that the implementation of these systems is differentiated from low performers in the industry (Kalling, 2003). The use of these enterprise systems by tailoring the strategic components as the best practices in the industry also help to improve the business processes to a large extent (Ward and Peppard, 2002). Most high level managers now accept that the enterprise systems not only increase efficiency and effectiveness in an organisation, but also serve as a source to gain competitive advantage (Dong and Zhu, 2008; Kalling, 2003). This is why the top executives of various organisations around the globe are investing and committing hugely in these enterprise systems. Enterprise systems when implemented and used properly, can not only lead to high performance in terms of efficient business processes, less time consuming, discovering the new markets and resourcefully using the available information but also help gain sustainable competitive advantage (Scheer and Habermann, 2000).



**Figure 2.7 Tentative conceptual framework for ES from literature view**

In this chapter, the author explored the literature review for other possible theories and options to explain the MES and for the sake of generating a deeper understanding of ES from previous scholarly as well as building a base knowledge for generating questions regarding MES. However, figure 2.7 above shows that, there are no interrelationships between various vendors since there is only one vender of ES, which does not represent the MES. ES success factors did not cover the concurrent challenges nor did it cover the cohesion factors between different vendors or the deployment strategy.

## 2.8 Summary

This chapter discussed the theories about the adoption of ES for the sake of investigating whether the MES fit in their context or not. Since part of MES is the business process influence on organisation, part of this chapter discussed the business process improvement and the prevailing scheme in attaining such.

Briefly, this chapter elaborated on the ES within the airline context, and its effect from a strategic perspective. It also discussed the advantage and disadvantage of deploying enterprise systems within organisation as well as discussing the prospect of having ES as business value generator.

Finally, this chapter listed the most influential success factors of implementing ES besides discussing the opportunity of gaining a competitive advantage from this implementation.

## 3 Chapter 3: Methodology

### **3.1 Introduction**

This chapter discusses the research methodology in general and how essential to set a philosophy stance in the research. It will discuss the philosophy part of the research. Then, it identifies the fit of qualitative research design with the research problem and how research method and research problem match. This chapter depicts the research problem and the nature of the Multi-collaborative Enterprise Systems phenomenon. After that, an emphasis investigating on the grounded theory its techniques and suitability to answer the research question will be also discussed here. More on other philosophical stances in Appendix A.

### **3.2 Research method within MES context**

The prime aim of the research is to identify the nature of the pioneers of ASP when collaborating to form a homogeneous solution for an organisation and the factors influencing such collaboration based on an empirical study. It will also shed light on the aspects accountable for effective information solution provider collaboration as well as the firm factors accountable for successful deployment of MES. This leads to the exploratory and explanatory nature of the research which favours an empirical generating hypothesis over testing them. It is noteworthy that the collaborative organisation (case study) in this context aside of being focused on real life phenomenon it will be regarded as boundary for data selection (Blaikie, 2009; Hammersely, 1992; Stake, 2005) that should not conflict with the Grounded Theory being utilised in the analysis stage.

#### **3.2.1 Philosophical and methodological stance of this research**

From the ontology point of view, the stance of the researcher is that the reality exists within the participant reflection. Generally, questions, which are asked

about the existence of a particular subject, are answered by ontology or ontological metaphysics.

As yet little is known about the nature of MES within airline industry context, the researcher is required to capture the phenomenon of MES from the actors who experience such particular context and who are in a situation to inform the utmost knowledge about the phenomenon. This led that the researcher involved in the research and subjects around the phenomenon while studying the phenomenon. Evidently, the researcher interpretation of the phenomenon is reflected from actors' interpretations of reality. Indeed, the interpretivist paradigm is embraced here due to the suitability of research nature. As the interpretive approach values relativism and ontologically sees all knowledge as a matter of interpretation, and dependant on how people perceive reality. The aim of interpretive researchers would be to understand social life and recognise how people construct meaning in natural settings. Furthermore, the interpretive research approach has an individualistic component involved in it. According to an interpretive approach researcher "a positivists cannot measure all aspects of a social research question because everything cannot be expressed in numbers and formulas". There are various aspects, which have to be measured and experienced in a subjective manner (Ghauri and Gronhaug, 2005). Obviously, interpretive research would seem rather appropriate to fit with qualitative research methods (Huff, 2009), which is adopted in this research.

The decision to undertake qualitative research method is ultimately based on the fact that the nature of the research problem determines the choice of this method that demanded uncovering the MES nature. Second, is the degree of uncertainty around the nature of the research problem and complexity of

problem have established the choice of qualitative research. Therefore, qualitative research is well suited when understanding and uncovering what lies underneath a phenomenon especially when little is yet known (Straus and Corbin, 1990). Next section will move on elaborating the choice of the scope of the study within qualitative methods and will discuss briefly the GT (more about GT will be tackled in section 3.13)

Further, the study will deploy a qualitative research method to expand the meaning of the contextual details. As the research aims to explore the meaning and perceptual experiences of the phenomenon from peoples' personal viewpoints, it will suit more this research as the dominant method especially when capturing the complexity of business and interaction between organisations and human factors within the organisation fit of MES business processes context.

However, to enable the researcher to focus on such phenomenon an in-depth interview with all participants is to be taken to enhance the initial tentative theory or formulate other theories through inductive process in the selected study case. The interpretive approach will be the general underpinning paradigm of this research with an inductive orientation drawing on grounded theory in the analysis.

### **3.2.2 Collaborative Organisation (Case Study of MES)**

In order to assess the suitability of the qualitative method such as case study, it would add value to understand the case study first. Yin (2003) defines a case study as an empirical investigation that explores a contemporary phenomenon within a real-life context to clarify the borders between the phenomenon and its context. He also proposed that a case study is one of several methods of

carrying out business and management research. Moreover, Yin (2003) recommended that case studies are well suited for both the exploratory and explanatory nature of research. Since this study has a case that represent collaborative organisation to represent our study, the author will use the term collaborative organisation and case study interchangeably. It is also noteworthy that the case study does not refer to the method rather than the boundary of the collaborative organisation that represents our research study, the MES phenomenon.

### **3.2.3 Scope of Study**

Due to the availability of a respectable case of multi-national airline company (ABC) and their IT alliances coupled with the previous recommendation (section 3.2.1), a collaborative organisation was chosen to represent the MES phenomenon. Additionally, it is due to the complexity of the problem and the researched business industry that imposes an in-depth study to be conducted to cover details necessitated for the findings. Alas, this was the only collaborative organisation (Case study) that matches the criteria of MES and this was mentioned in the limitation section in chapter 6.

Apparently, the collaborative organisation consisted of a large multi-national airline and its IT alliances. Each of these allies represents an aggregated knowledge in airline industry due the fact that they are solution providers to many airlines and the knowledge they have not only represent single experience knowledge but also demonstrate multiple experience knowledge through entire airline industry. The profiles of these allies have been depicted in (section 3.2.3.1). So the collaborative organisation has reputable justification of



the airline industry due to the fact that partners involved in such initiative have respectable footprint in the airline industry.

The author is trying to capture a phenomenon of how pioneers of ASP would influence airlines from the business processes and structure point of view which is also catered for by qualitative method as there is a high degree of uncertainty surrounding the phenomenon mentioned. These processes are dynamic in nature and require constant interpretation of these activities throughout the study to reach some objectivity (Lee, 1991). In addition, this research would be covering the insight of contextual conditions around phenomenon to reveal the attributes that cover the aim of the research mentioned above. Due to the fact that the methodological point of departure for this method was the lack of literature review and empirical work, which makes hypothesis testing inappropriate. All of these will reinforce the appropriateness of a qualitative study to this research. So primarily the research has inductive inclination underpinned with qualitative method (Grounded Theory) to support the researcher answering the research problem. Further, the qualitative research explores the interpretation of phenomena and attempts to foster a holistic view of the research problem (Creswell, 2009). Finally, the researcher's theoretical assumptions are another imperative factor to exploit qualitative research (Trauth, 2001). Again, it is noteworthy that the case study term used in this context aside of being focused on real life phenomenon it will be regarded as a boundary for data selection (Blaikie, 2009; Hammersely, 1992; Stake, 2005) that should not conflict with the Grounded Theory opted as methodology.

### *3.2.3.1 Suitability of the GT in this research*

Since this research aims at exploring the phenomenon of Multi-collaborative Enterprise Systems and reflects it on theory building approach, Grounded Theory was selected to build a framework that explains the MES phenomenon with all its intricacies. The latter notion is to address MES complexity and dynamic nature in empirical natural setting and to provide a realistic framework. This research chiefly addresses the 'how' and 'why' question and stress on the collaboration of ASP towards creating a homogeneous solution that cover most of the core airline business. Grounded Theory by and large, underpins researches on two main factors; mainly as follows:

- 1- Questioning as salient tool rather than measuring
- 2- Generating hypotheses through coding mechanism (Auerbach and Silverstein, 2003)

Grounded Theory shines when there is dreadfully little known about the phenomena where the both researcher and literature have little information, and they are not in a state to test hypothesis prior to study. Moreover, Grounded Theory fit the exploration studies as our research where there is a need to identify and categorise the element of MES and their connection to the context organisation in hand. Hence, it is a discovery positioned approach that permits for a contextual analysis of pragmatic data and expedites framework creation from it. Thus, the study claims to produce a strategic framework for a large airline (section 3.8.3) that can be generalised into general frameworks to advance the understanding of such a phenomenon and capitalise on the framework for the practitioner deployment.

The recursive trait, analytical procedure, and process-oriented are some of the crucial aspects of Grounded Theory. The analytical procedure underpinned by two main practices: constant comparison and theoretical sampling (Strauss and Corbin, 1998). These operations tightly woven and integrated theories and could be considered as the prime difference between the grounded theory method and other qualitative research methods (Strauss and Corbin, 1998). By and large, GT starts with the definition of a research problem, then advance into the collection of relevant data where these data constitute the bricks that researcher build the conceptual framework via developing provisional categories until reaching an abstract level of explaining the analysed data through the constant comparison. The recursive nature of GT strengthen the emerging of solid conceptual framework as the researcher keep visiting the old and new categories through inductive and deductive process insuring in mind the coding and interpretation until the research reach saturation which steer to an emerged conceptual framework (Creswell, 2002).

Critiques on qualitative mostly concern with lack of generalizability of the finding (Creswell, 2002); however, this drawback was overcome in GT by adopting abstract approach at levels of coding and categorising themes underpinned by both constant comparison and theoretical sampling that permit generalisation of empirical finding to formative theory. Further, postponing the literature review till emerging theory stage while using recursive iterative process against the scholarly existed work, raise the validity of results.

The suitability of Grounded theory emerges from the fact that GT enable research to generate substantive theory that provide a better understanding with rich meaningful guide to action (Strauss and Corbin, 1998). Doubtlessly,

the latter notions fit the research objective of understanding the multi-collaborative enterprise systems and their influence in large organisation. Furthermore, GT is more likely close to reality as it reflects on the data that are generated from substantive area (Strauss and Corbin, 1998:12). As such GT would offer a better understanding for multi-collaborative enterprises systems taking into consideration the immense complexity of deploying such initiative and its critical aspects and how it is shaped within MES context. Thus, GT is presented as a viable option for this research to provide that understanding of the phenomenon in hand with its critical success factor shaped within the MES context.

#### **3.2.4 ABC Airline within the Collaborative Organisation**

The multi-national airline under study (ABC) is going through massive IT transformation to attain a respectable position in the market. The ABC airline situated in the Middle East and covers wide range countries with over 80 cities in Middle East, Asia, Europe, Africa and North America providing service to around 24 million passengers yearly with yearly revenue of \$5 billion. ABC has a large fleet of airplanes around 141 in total to support its network with a plan to purchase 90 more.

The airline spent over £500 million to renovate its entire technological infrastructure and IS ensuring business continuity and supporting airline business growth in the region. To achieve this goal the airline managed to engage with various collaborators from the pioneers of airlines IT solutions providers like SAP, Sabre, Amadeus, and others. The master plan implemented in the airline comprise of 73 projects executed simultaneously while refurbishing the airline and its departments marketing, operations, finance, and human

resources, and maintenance indeed almost every functional division in the airline. All of this was done in parallel of changing the operations almost 5000 offices in 62 countries worldwide. Of course, this all was done while the airline still flying passengers.

The ambitious plan to expand was one of the aims behind this IT transformation. Further, ABC demonstrated an excellent choice to present the MES phenomenon. All of these deemed to make the ABC airline with its partner's remarkably the right choice of a case study to demonstrate the research interest and aim.

#### *3.2.4.1 MES Partners' Profile*

**Sabre:** is the first giant vendor, which is one of the solution providers that participated in this study. Though Sabre started in 1960 in the airline business, they grew up within American Airlines, and they split from them in the middle of March 2000 with 10000 employees and grew up to become world-class solution providers in the aerospace industry (Sabre Holding, 2013). The company also, offers consulting services, e-business tools and software to enhance the operations of around 400 air carriers and airports (["Sabre Holdings Company Overview". Hoover's. 2009. Retrieved 30 March 2013](#)). After the split, the company at that time were already established and had mature airline solutions'. They kept on growing by acquiring other small fragmented companies who offered different functionalities to the Sabre suite. The acquisition of these companies made Sabre one of the largest and close to complete software solutions that cover most airlines' business processes. Sabre has covered large portion of operation platform and other marketing modules in the MES.

**SAP** (IBM implementer): is well known to deploy an enterprise solution covering human resource, finance, and maintenance sectors within airline. SAP was founded in 1972 and until today have a good history of leading ERP in the market. SAP has development location in more than 50 countries, and service around 250,000 customers worldwide ([SAP](#) site). SAP was scheduled to cover three module mentioned above in the MES.

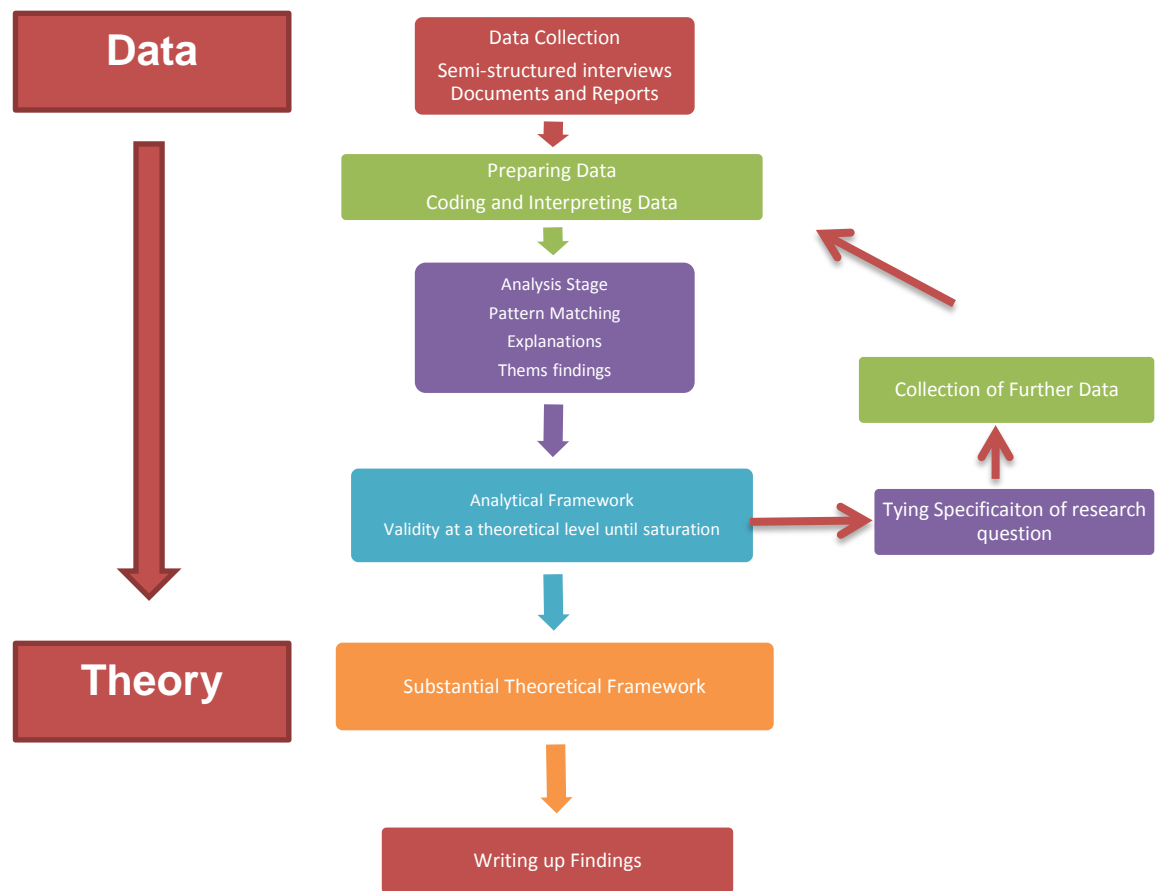
**KPMG**: an international consultancy house operates in 156 countries and have more than 152,000 people worldwide ([KPMG](#) site). KPMG played role in the initial stage of MES to help in selecting the best partner and also during the MES deployment as PMO with help from the airline.

**TCS**: Tata Consultancy Service has workforce over 276,000 of the worldwide in 44 countries providing many IT services ([TCS](#) site). TCS player an exceeding curtail role in MES, which is the overall integrator.

**Wipro**: is a global information technology, consulting and outsourcing company with 145,000 employees serving over 900 clients in 57 countries. The company posted revenues of \$6.9 billion for the financial year ended Mar 31, 2013 ([Wipro](#) site). Wipro deployed the hardware infrastructure of the whole MES project.

**Amadeus**: Amadeus is a leading transaction processor for the global travel and tourism industry. The company acts a provider of a comprehensive portfolio of IT solutions, which automate certain mission-critical business processes, such as reservations, inventory management, and operations for travel providers ([Amadeus](#) site). Amadeus covers most the marketing sector in the airline in the MES initiative.

## Research Design



**Figure 3.1 Research Design**

The research design is constructed as in the above figure 3.1 where first the data will be collected and then a careful analysis to the collaborative organisation. After that, there will be analysis stage including all the phases of GT techniques. Finally, the building the substantial theory or theoretical framework is taken place.

### 3.3 Data Types and Forms

One of the important aspects of research is the identification of data type as early as possible especially in the planning phase to help the researcher manage time and resources better. Most common data types are divided into three groups. First, is the primary data where the researcher is directly involved in collecting the data while the secondary data is the data that have been collected by someone else for the same research purpose or might be for a different purpose. The other type of data will be the tertiary data type, in this case the data are both collected and analysed by someone else (Blaikie, 2009).

This research will depend on the primary data type and this due that MES phenomenon is not yet explored prior to this research. Generally, data will be collected from the field in semi-natural settings taking individuals as informants revealing information such as their beliefs or opinions about certain phenomenon or knowledge and possibly manuals, relevant documents, and reports from the researched company as secondary data. Data forms mainly lies into groups of either words or numbers. However, qualitative research methods will be mainly dependent on words and probably some numbers.

### 3.4 Data Source Selection

Regardless of how the data have been gathered whether it is the whole population that the researcher intended to collect or just a sample of the population, the decision of selection of the source has to be made. Our research is based on GT technique of theoretical sampling where it is used to saturate related categories. The sampling is:

on the basis of concepts that have proven theoretical relevance to the evolving theory. These concepts are deemed significant because (1) they are repeatedly present or notably absent when comparing incident after incident, and (2) through the coding procedures they earn the status of categories. The aim of



theoretical sampling is to sample events, incidents ... those are indicative of categories, their properties and dimensions, so that you can develop and conceptually relate them (Strauss and Corbin, 1990:177).

There are three main categories of theoretical sampling depending on the functionality of each phase of grounded theory. Open sampling is the first stage where researcher is trying to capture as much as possible of relevant categories. In this stage, the researcher would rather go open minded to all possibilities of themes while keeping consistency of developing categories (Strauss and Corbin, 1998). After this step comes the variation sampling which is correlated to axial coding. In this step, the focus is to relate to the “*categories in term of the paradigm conditions, context, action / interaction, and consequences*” (Strauss and Corbin, 1990:185). Final sampling is the discriminating sampling that associates to the axial coding where the stress on the verification of relationships between themes emerged through the analysis besides filling any gap that needs more investigation. The later stage might require the researcher to return to data source again and investigate further to fill the gaps. The three stages will keep occurring in cyclic fashion until we reach saturation in the emerged categories. When there are no more categories emerged from data, the existing categories are already dense, and correlation between categories is established and validated all of these symptoms are considered as an indication of saturation stage (Creswell, 2012).

This research will deploy qualitative research methods, interviews to senior management layer from both IT and business side will be targeted as selected sample of data collection since the nature of the research is inclined to the strategic side. In addition, information solutions provider product and regional managers will be in focus during data collection, this might elongate the time for data collection as they are scattered in different countries. Sample size is  $n = 25$

inclusive of supervision layer which represent a good number when conducting similar studies (Charmaz, 2006, Creswell, 2012). This number could be less or more depending on the saturation status of emerged themes. It is noteworthy that all participants have exhaustively involved in the MES undertaking and this was a requirement one attribute of any participant engaged in this study.

### **3.5 Data Collection**

A cross-sectional study will be conducted in this research. Around four months of time was taken to execute the semi-structured interviews. Evidently, the semi-structured interviews are the main data collection method used in this research to gain more understanding of the phenomenon in hand. Interview will also help in uncover the relationship of the emerged themes; especially, in the open sampling stage by discovering open codes and their properties and dimensions. Not only will the semi-structured facilitate in variation sampling by finding main themes and the relationship between them but also will contribute in determining the validated selected core categories in the discriminated sampling phase (Creswell, 2012). Though the researcher believed that focus group could have enriched the research; however, it was extremely difficult to reach participants with high rank in the organisation as well as other companies, for that reason the research opted that the interview should be enough to cover the phenomenon with the required depth; precisely, knowing those participants have high skill and rich knowledge about the subject gathered from years of experience in many companies related to the aerospace sector.

Having a clear insight about the phenomenon in hand would not be possible without having accessibility to those who are making decisions and those who are managing the phenomenon. Indeed, the executive and director of the

companies' interviews enriched the study and deemed essential for such researches. It was only due to the fact that researcher's influential network made such research exist due to his previous work in the airline. Accessibility to executives is usually difficult as they lack the interest to avail time to researchers, not to mention an hour or maybe more for this research. Many times interviews were cancelled before few hours and sometimes minutes, and this was understandable by researcher owing to how hectic their schedule while deploying and post implementation of the MES. Incessant follows up with executive offices by emails and phone calls make it possible to engage the participant. This took a lot of time and efforts from the researcher.

The time will be invested in setting up these interviews especially because of the participant ranking, the difficulty to approach them on top of their busy schedule and the diverse locations for other partners. In order to have well-designed questions, a cognitive interview is to be carried out with a small sample just to make sure those questions asked reveal the same meaning at the recipient side. Likewise, pilot semi-structured interviews would be considered as trial interviews for the next round of interviews to be performed in the case study that will act as training for the author. Yet, the main purpose is to stress on the main themes and to construct questions around them for the semi-structured interview as it will also act as confidence valve of assuring the validity of questions.

The below table 3.1 indicates companies and interviewees.

Company	Title	No. Of Participants
Airline	IT/Business Manager	8
	General Manager	5
	EVP IT	1
Sabre	Product Manager	2
	Regional Manager	1
SAP	Product Manager	2
Amadeus	Product Manager	1
Tata Consultancy Service	Product Manager	2
KPMG	PMO Director	2
WIPRO	Product Manager	2

**Table 3.1 List of Interviewees**

### **3.5.1 Semi-Structured Interviews**

The researcher has formulated the interview questions over many stages. First stage was the initial primary questions developed by the researcher. There were many stages where these questions evolved as the researcher trying to capture the phenomenon by reading relevant literature and asking experts in the fields. A pilot study has been conducted by the researcher to have an in-depth view of the phenomenon besides including experts view about the interview questions (Creswell, 2012). This study has brought concepts to

research and aligned the research in a proper path for acquiring the knowledge about the phenomenon under the study.

Moreover, the pilot field interviews helped in constructing and formulating questions. These interviews are specifically designed to help in providing a deeper view on the subject and fine-tune the tentative conceptual framework. Once the pilot interviews are coded and analysed another visit to the tentative conceptual work is required to shape it or optimise it. Alternatively, conducting a survey to tackle some of the themes to emphasise their validity and enhance their reliability part would be a viable option. After that, a semi-structured interview has been conducted in the selected case study aiming for a deep understanding of the complex processes implied in the subject research, especially when involving several layers from the company such as senior management from business and IT, and supervision layer.

Semi-structured interview intended to explore the phenomenon of Multi-collaborative Enterprise System by interviewing those who had been in the experience itself. Though the researcher started with a tentative model in mind, but after the simultaneous analysis process this model start to change. From an interview to another, the researcher would incorporate the findings of previous ones and include in the next interview to confirm the findings. Hence, these interviews are accounted for theoretical sampling stages comprising open, variation, and discriminate sampling.

Table 3.3 includes a summary of all categories of participant. The author was keen to include the participants who have an influential role in the initiative of MES. This includes most of the executive and senior management of the airlines as well as the regional director of the vendor participated in the

undertaking. Knowing that some of the vendors are competitors to each other in the market, the researcher was keen to include all of these companies as each one has a different opinion and view of the phenomenon. These companies include world class vendor in their fields such as, SAP, Amadeus, Tata Consultancy Service, KPMG, and WIPRO. There was a bid for each track of business and request for proposal was provided to many companies and those ones were short listed to ones that the researcher has interviewed.

The interview time varies from participant to another depending on different aspects like slot availability, role in the undertaking, and personality. Some tend to be succinct, and others are more elaborative. The longest one took two hours, and a half and shortest one was only about forty five minutes. It took a lot of efforts to arrange these interviews mostly for availability of the participants and also their rank in the organisation. Almost all the participants are categorised as IT professionals, reference to their education level and years of experience in the airline and IT fields.

All of the interviews have been transcribed fully to reflect the experience of all participants who participated in this study. The interviews were not the only source of information researcher relied on; some of side talks with IT professional whether inside the airline or their partners in this initiative. These informal conversations helped understanding the overall picture of MES, and the researcher was able to discuss further concepts that could help the research such as deciding on who are most contributors to MES that should be.

### **3.6 Data Analysis**

Grounded theory will be adopted to analyse the collected data, which includes grounded coding techniques. This approach of data analysis will also evolve the

development of the conceptual frame work. It is commonly accepted that the analysis of qualitative data based on grounded theory has no prescribed best method as people differ on the way they approach their data and manage their intellectual endeavours and creativities (Strauss and Corbin, 1998; Yin, 2003).

### 3.7 Grounded Theory

Grounded theory method is a specific type of method used by researchers mainly in an inductive strategy research where generating theory is the aim of this research. In this method data analysis, data crunching and data sorting is used to develop a new theory or to discover a new theory/hypothesis. Grounded theory method is a counter act of social science based research method. In grounded theory research method, it operates in a reverse method, and researchers begin their research with data collection and then on the basis of evidences generated from the data a research theory is developed.

In a general research study or a social science based research study a hypothesis is first proposed and then on the basis of that hypothesis data is collected from samples. In grounded theory, exactly opposite is done and then different mile stones are created while collecting data for future reference when theory is discovered and proposed. These mile stones and key points are marked as codes in a grounded theory research. Finally these codes are grouped as per their conceptual base, and these codes help generation of a new theory because concepts grouped with codes give rise to categories and categories collectively give rise to a theory (Charmaz, 2006).

Working from a bottom-up strategy is the objective of the grounded theory where theory is to be developed from the data that have been analysed rather

than testing a theory or hypothesis. Strauss and Corbin (1998:15) defined grounded theory as:

A set of well-developed themes that are systematically interrelated through statements of relationship to form a theoretical framework that explains or predicts phenomena.

Other scholar like Glaser (1978:2) define GT, it “is based on the systematic generation of theory from data, that itself is systematically obtained from social research. Thus, the grounded theory method offers a rigorous orderly guide to theory development”

Grounded theory underpins the comparative analysis heavily for generating theory based on categorising techniques (Howell, 2013). Where it offers a rigorous approach in terms of:

- Interactive iterative nature of data collection and analysis
- Comparative methods
- Conceptual analyses through memo writing
- Refinement of emerging ideas through sampling
- Theoretical framework derived from and integrated with both data and theory

(Howell, 2013:136)

Grounded theorists evaluate the fit between their start interest and data collected, so there is no force exerted from preconceived theories on the data itself, rather a salient piece of related data could influence the initial theory (Charmaz, 2006; Patton, 2002). In other words, grounded theory endorses the evolving of ideas and sense without dictating any presumption on the phenomenon under the study (Glaser and Strauss, 1967). The researcher who espouses grounded theory as a tool in the analysis techniques creates his/her data from specific observation or interviewing participants and builds towards general patterns that will constitute an empirical view of the research under study. So the researcher constantly gathers data and compares it to the



emerging categories until he or she reaches a solid theme, embracing this technique is called constant comparative method of data analysis. By and large, the intent of grounded theory is to move beyond the description and to generate or discover a theory (Creswell, 2007).

Often GT build three types of theories as Merriam (1988) indicated:

- Grand theories, which are most often found in the natural sciences
- Middle–range theories which are placed higher than mere working hypotheses but do not have the status of grand theory
- Substantive theories, which are developed within a certain context

Merriam (1988:30)

However, Howell (2004) explained the difference between substantive and grand theory as the latter is originated from a specific area; on the other hand, grand theory is inclined to be more of abstracted level with highly conceptual nature. Howell (2004) contended further that substantive theory is characterised by being easier to identify; nevertheless, difficult to provide a full understanding of phenomenon under study. It was plainly explained by Strauss and Corbin (1990)

Levels and types are sometimes confused... one can have theory about a given phenomenon ... about an organisational or biographical phenomenon... a theory about a phenomenon ... can still be substantive theory ... note that any substantive theory evolves from a study of a phenomenon situated in one particular situation context... A formal theory, on the other hand, emerges from a study of a phenomenon examined under many different types of situations... when developing a formal theory you might study status in several types of situations, say status of persons within families, the status of socialites within a given city, and the status of various professional ranks within academic institutions (P. 174).

### **3.7.1 Grounded Theory variations**

Originally Grounded Theory has been introduced by Glaser and Strauss (1967); however, both of them have developed different strategies to proceed with Grounded theory's philosophy and procedure. Parker and Roffey (1997) have

delineated the significant difference between the two approaches as shown in the next section.

Glaser originated the grounded theory, and he firmly believe that in grounded theory approach is all about data and a continuous comparative method that can be used by the researcher to keep on evolving data collected from first coding and making it sharp, focused, relevant and conceptual in nature. Glaserian method of a research study is not exactly a qualitative research study method, but their claim of everything which is founded by researcher being potential data strongly indicates that Glaser was an advocate of using grounded theory approach for qualitative research studies (Glaser and Strauss, 1967).

However, Strauss and Corbin support the opinion that though grounded theory looks like it is made for qualitative researches, it can be easily used for all types of research studies. Grounded theory approach has the ability to integrate different approaches together in an optimal manner. They were also of the opinion that ground theory method does not have only inductive or deductive approach in it; it contains an abductive reasoning method in which both approaches are combined with each other. According to this theory data analysis in a GT theory based research should be done repetitively until repetition does not change the results. That point of data analysis is the true result of the research study.

While Glaser considers the area under study as an indicator for the research issues to emerge through the research process, Strauss and Corbin considered the research question is a statement that identifies the phenomenon to be studied. Procedures wise, Glaser stress that the problem should emerge and should not be forced by the methodology where categories and their properties

emerge through constant comparison of the incident to incident. By contrast, Strauss and Corbin focused that researcher requires help with the interpretations process: procedures and techniques required to be spelled out and subcategories are linked to categories that denote a set of relationships (i.e., casual conditions, action/interaction strategies, and consequences). When it comes to ease of operations Glaser approach is more difficult than Strauss and Corbin approach as the former requires that the analysis to be less structured while the latter emphasised on more structured analysis such as Open, Axial, Selective coding and paradigm model that is related to several categories (conditions, actions / reactions, consequences) aimed for generation of a substantive theory.

For Glaser theory formulation generates concepts and their relationships to explicate and / or infer disparities in behaviour in the substantive area under research and theory construction also produces a theoretical conceptual hypothesis and the testing part are left for other researchers attracted in such study. On the other hand, Strauss and Corbin believe theory formulation generates an inductively derived theory about a phenomenon comprised of interrelated concepts and theory formulation undertakes continual verification and testing to determine likely validity of concepts and relationships between them. Finally, Glaser thinks that a researcher should not review the literature and start the research with an open mind for anything, so the researcher does get influenced by literature ideas while Strauss and Corbin consider literature review can stimulate theoretical sensitivity and can be a source of data, stimulate questions, direct theoretical sampling that cannot discarded (Parker and Roffey, 1997:220).

Though Glaser approach focus on being open for any emerging theory and thought as the essence of Grounded Theory, Strauss and Corbin, deviate from original GT and stressed more on the validity and operationalize aspects of GT. Glaser thought that emphasising on the structure and operationalize analytic aspect of GT is deviating from the spirit of GT in the first place. In a sense, GT would act as forcing the theory rather than emerging of the theory. Jones and Noble (2007) elucidate the gap between the two approaches further:

Glaser would argue that whereas his approach is essentially neutral and passively executed in order to ensure the emergence of the underlying reality within the data, the Straussian approach results in the forcing of data into pre-determined categories and obstructs the emergence of what the data is really saying. However, the actual difference for the practising grounded theory researcher may be difficult to discern (Jones and Nobel, 2007:92)

In this research, the researcher will adopt the Glaserian approach for its fit, flexibility, and originality of procedure. The author background in the subject of IT and his previous knowledge do not coincide with Glaser's method that assumes the researcher comes with pure open minded without influence of the literature review and its knowledge comes from it. However, the author isolated himself and his views from the participants view by following rigorous procedure entailed in GT. Additionally, Glaserian method is the old classic GT practically oriented for developing a conceptual framework and could handle large volume of data (Parker and Roffey, 1997).

### **3.7.2 Grounded Theory main concepts**

Grounded theory is based on three fundamental pillars for it to accomplish what it was designed for; mainly, simultaneous collection of data, constant comparative method, and coding procedure. Grounded theory approach is used

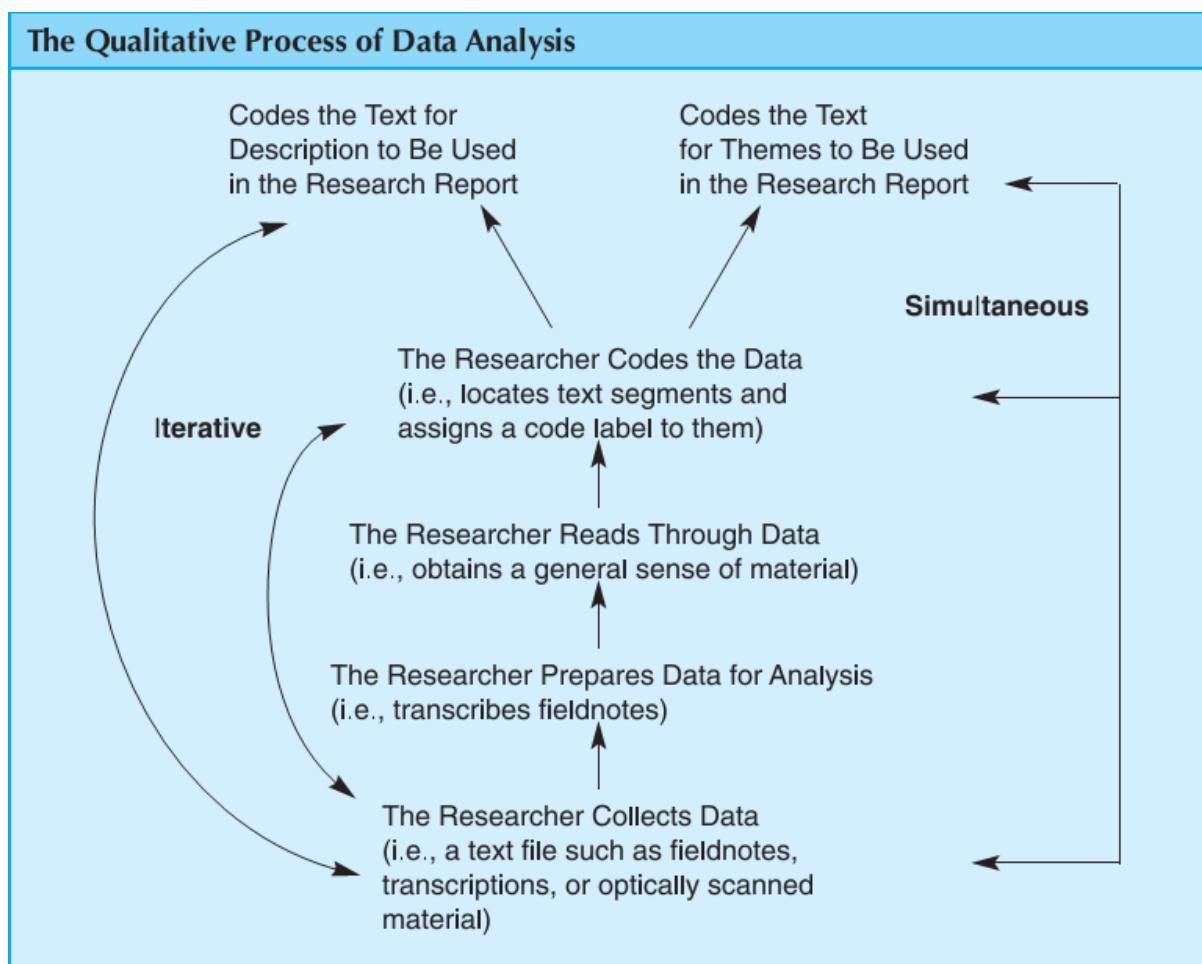
for qualitative studies in an extensive manner. Primary reason behind such development is the ease of fit between a qualitative research study and grounded theory approach. For example in a grounded theory approach abstract subjects, time, people, place etc. are researches, and a qualitative study ideally describes any research study with subjectivity involved in it. Similarly grounded theory approach is not truly accurate in numerical terms, which means final results can vary by a few numbers which can make a humongous difference in a quantitative study. However in a qualitative study subjects are descriptive in nature which means they can incorporate a little numerical inaccuracy in their results. In many research study, numerical measurements are not even considered, such research studies are ideally suitable to be done by grounded theory approach.

A qualitative research study also incorporates measurement of experiences, phenomenon and incidents which happened in the past. For such research subject data already available and researcher can either assume a hypothesis and then collect data or go reverse. With results already known collecting data and then going reverse for theory is more suitable because it reduces the chance of any biases or subjectivity incorporation in a research study (Strauss and Corbin, 1998).

#### ***3.7.2.1 Simultaneous data collection and analysis***

One of the salient principles of conducting a research using GT is to have simultaneous analysis while collecting the data. The prime reason behind it is to expand the knowledge of the research as well as to acquire deep insight of the phenomenon under investigation. Moreover, it will help the researcher to decide on the next step of data collection. These simultaneous activities either

reinforce questions or areas related to the emerging theory or decline these questions and direct the researcher to a different path in his/her data collection. However, Glaser (1992) proposes that the researcher need to transcribed one interview in full, and then do the rest partially. This process was abandoned in practice when the thematic recurring was noted predominately in the data (Goulding, 2002). From here the researcher extract the codes from the data rather than developing all possible codes. After that, codes are clustered together to construct conceptual meaning or abstract concept.



**Figure 3.2 The Qualitative Process of Data Analysis (Creswell, 2012:237)**

Grounded theory stands unique compared to other qualitative theories in the sense that through GT, the researcher starts the analysis while collecting the

data. As the figure 3.2 above indicates how a typical qualitative research would look like. In grounded theory, the researcher collects the data such as field notes, transcriptions, or optically scanned material and analysed it through obtaining broad sense of the material. Afterwards, the researcher codes the data and tries to generate theme that would aggregate to form an abstract concept. This line of activity is done in simultaneous and cyclic manner until final conceptual framework emerged. Below points are explaining the process of general qualitative approach towards data collection and analysis as it has been summarised by Creswell (2012):

- It involves a simultaneous process of analysing while you are also collecting data. In qualitative research, the data collection and analysis (and perhaps the report writing) are simultaneous activities. When you are collecting data, you may also be analysing other information previously collected, looking for major ideas. This procedure differs from traditional approaches in quantitative research, in which data collection occurs first, followed by data analysis.
- The phases are also iterative, meaning you cycle back and forth between data collection and analysis. In qualitative research, you might collect stories from individuals and return for more information to fill in gaps in their stories as your analysis of their stories proceeds.
- Qualitative researchers analyse their data by reading it several times and conducting an analysis each time. Each time you read your database, you develop a deeper understanding about the information supplied by your participants.
- There is no single, accepted approach to analysing qualitative data, although several guidelines exist for this process [...]. It is an eclectic process.
- Qualitative research is “interpretive” research, in which you make a personal assessment as to a description that fits the situation or themes that capture the major categories of information. The interpretation that you make of a transcript, for example, differs from the interpretation that someone else makes. This does not mean that your interpretation is better or more accurate; it simply means that you bring your own perspective to your interpretation.

(Creswell, 2012:237)

### **3.7.2.2 Constant Comparative process**

The scheme of comparing incidents to another in a continuous manner where emerging concept is also compared to other ones, in Grounded theory, is referred to as constant comparative method. This process usually generates an emerging concept with their attributes (Strauss and Corbin, 1990).

Constant comparison entail comparing same themes within the same category to search for emerging themes as Siggle (1994) stated:

Comparison explores differences and similarities across incidents within the data currently collected and provides guidelines for collecting additional data. ... Analysis explicitly compares each incident in the data with other incidents appearing to belong to the same category, exploring their similarities and differences. (Spiggle, 1994: 493–4)

This process is also described below:

Theoretical sampling: Theoretical sampling is sampling directed by the emerging theory. In the initial stages sampling should be open and relatively unfocused. The researcher should go to those people who are likely to provide relevant information. As the data are analysed, the researcher should use the findings to direct the research to further groups and diverse locations which may broaden the interpretation. Theoretical sampling means that the researcher must be flexible and remain open to the full range of possibilities. (Goulding, 2002:170).

This process allows the recognition of concepts. These concepts are merely explaining the relationship between incidents and describing what is happening in the data. A constant comparison across incidents is required to be checked against each other to confirm the interpretation (Strauss and Corbin, 1998). In addition, by comparing where the facts are similar or different, we can generate properties of categories that increase the categories' generality and explanatory powers (Glaser and Strauss, 1968: 24). Reference to Glaser and Strauss (1967), the researcher required to produce conceptual properties and categories from proof. This proof should underpin the generated concept or theoretical framework. The constant comparing process of different and similar



incidents emerge properties and categories that improve the categories explanatory power.

According to Goulding (2002) the process constant comparison should reach saturation stage where researcher “must also ensure that constant comparison is an on-going feature of the process. Theoretical sampling should direct the researcher to more contexts, locations, situations, and individuals and the theory must only be appeared as emerged after all core themes are saturated. Theoretical saturation is achieved through staying in the field until no new evidence emerges which can inform or underpin the development of a theoretical point. There are no clear-cut rules of thumb for when this will occur, but it is vital to saturate the data if the theory is to have substance.” Goulding (2002:72)

### **3.7.2.3 Coding Procedure**

Grounded theory analysis involves making sense of participants and objects that researchers interact with while searching for patterns and integrating the data to build a theme and eventually develop a theory. Coding is a salient tool to the grounded theory research process; mainly, there are three types of coding that are employed in the grounded theory: *Open*, *Axial*, and *Selective* coding (Strauss and Corbin, 1998). Charmaz (2006) elaborated more on coding referring it to categorising segments of data with a short name that simultaneously summarises and accounts for each piece of data and behaves as focal link between collecting data and developing an emergent theory to explain the data. So it acts as a means for selecting, separating, and sorting the data to help the researcher in the analysis stage. The subsequent section will explain the different types of coding further.

### *Open Coding*

Initial coding or open coding is characterised by being open to all possibility of interpretations and explore whatever theoretical possibility that could be detected in the data (Charmaz, 2006); in a sense, the grounded theories search for concepts with an open mind. Inductively new themes are to be recognised and coded to compose a so-called codebook. Moreover, this phase would require the researcher to try to stay open, remain close to the data, keep codes simple and precise, build short codes, preserve actions, and compare data with data (Charmaz, 2006). Nvivo software is found to be helpful in this open coding phase as it organises the researcher's thoughts and helps in the comparative analysis part to build the basis of coding.

Open coding is also known as substantive coding, and it is the first level of abstraction procedure done in a grounded theory research. In this coding, collected data from different fields is conceptualized on a continuous basis. This coding is done for everything which is observed in data collected procedure, and its primary aim is to identify the problem and assess if all the data needed to resolve the problem is available or not. The problem with this type of coding procedure it gives rise to many concepts, and most of these concepts are written on the field margins. A researcher has to conduct continuous comparison between different codes developed by him during the research study and group them continuously into relevant concepts, simultaneously sharpening of the codes, sorting and discarding of redundant codes is done by GT researcher (Goulding, 2002).

### *Axial Coding*

After building the foundations of the coding scheme, comes the grouping of the coded themes into categories and sub-categories in a process called axial coding (Strauss and Corbin, 1998). Creswell (2007) indicated that the main purpose of axial coding is to sort, synthesise, and organise massive amounts of data and rearrange them in a better representation that could easily be identified and categorised. In this phase, the strategy is on how the main categories and sub-categories are to be established to give a systematic approach as much as possible. Occasionally, there will be a theme that will necessitate more attention from the researcher; nonetheless, the selection of these themes has to be based on certain logic that supports the selection; otherwise, it would be difficult to draw a conclusion and solid conceptualisation if the selection is biased. Evidently, the conceptualisation of theory and understanding of the context of the phenomenon under study are materialised in this phase.

Axial coding was proposed by Strauss and Corbin in year 1990. In this procedure codes are once examined and then they are put back in a specific manner after open coding is done. This specific method is for making connections between different categories to which codes belong. Axial coding reduced the effort of a GT researcher to a great extent and also provided theoretical base for development of a model which was later known as paradigm model. Paradigm model or coding paradigm was proposed by Strauss and Corbin in year 1990. This model has four interrelated categories involved with it namely conditions, actions, consequences and reactions). Axial coding and paradigm model are closely connected with each other. According to this model codes, which are directly acting on a subject matter will be categorized in actions category while how subject would react on those cues would be

categorized into reactions. Their impact on the subject and associated environment would be categorized in consequences (Strauss and Corbin, 1997).

### *Selective Coding*

Selective coding is the final stage of coding where categories and sub-categories from previous coding stages are interrelated to compose the emerging theory or model (Creswell, 2007). Strauss and Corbin (1998) expounded that the process of selective coding deploys a codes selection method involving those codes that have a high correlation with the main theme and related to research question to be conceived as highly related codes. Those codes are characterised by high frequency occurrences that will construct the core themes. After applying this process, a theory or model will emerge that best represents the data that have been gathered during the data collection.

Selective coding is the third type of coding which is done at a later stage of GT research approach. In this method core variables of the entire research study are determined first (although they are practically tentative core variables because they can change a bit at a later stage). Then according to these core variables of the research study coding is done so that they naturally enter in their respective categories. Basically, core variables of the research study guide the coding procedure and concepts are practically ignored by the researcher. Using selective coding procedure a researcher can get the results in an exceedingly fast manner and enhances the horizons and scope of the research study. A grounded theory is not highly concerned about the accuracy of data, and it is also easily fit for the situation like abstract studies, time, place and

people related studies etc. theoretical sampling is also a deductive part of selective coding procedure, and it is generally used by abstract research studies. Older notes and records made by a researcher (open codes) are also used by selective coding procedure to go over entire research study in a rapid manner and extract relevance between codes and categories. Theoretical codes are also used by GT researchers because they act as a mode to integrate different concepts, which are broken with each other and give rise to a theory which is seamless, plausible and sensible to every reader.

Research ethics is an extremely salient issue for researchers as it preserves participants' rights as well as those of the researcher. Most researchers are guided by ethical principles from the very early stages of the study. The following section will elaborate on ethical issues in the paper under review.

### **3.8 Ethics**

Ethics in research is a vital factor, not only does it give the authors recognition, it also preserves continuity and sequence of knowledge. Without it, a lot of history would be lost, and chaos of knowledge would be created. Ethical issues need to be considered from the very first stage of research, including the research design and data-collection stage; hence, it is an integral part of the research. Due to the importance of ethics in research, data collection, and trading, many organisations have devoted time and money to it. For example, the Office of Public Sector Information (OPSI) published a detailed policy regarding retrieval, exchanging, use, and processing of information. Furthermore, the Economic and Social Research Council (ESRC) published a research ethics framework; below are listed the six prime ethical issues that ESRC research is mostly subject to:

- Integrity and quality should be integrated part when designing, reviewing and undertaking the research.
- The purpose, methods, and intended possible uses of the research should notify the research staff. Participants should know what risk (if any involved) they will be facing. Some variation is allowed in very specific and exceptional research contexts for which detailed guidance is provided in the policy guidelines.
- Anonymity of respondents as well as the confidentiality of information provided by research participants should be respected.
- Voluntary participation (free from any obligation) is an essential aspect that should be granted to all participants involved in a research.
- Any harm that might reach research subjects should be avoided by all cost.
- Any conflicts of interest should be either fully or partially transparent to all participants and the independence of research must be clear.

(Research Ethics Framework, 2005)

Apparently, there are other principles that are also as crucial as these principles mentioned above, like for instance plagiarism and anonymity. To stress on the ethics issue in this research a letter explaining the research and its purpose will be handed to the participants. Additionally, a letter of informed consent will be filled by the participants after they read their rights. All the names in this study will be anonymous unless something needs to be disclosed. Then permission from the participant is to be extracted. The author will be recording all the interviews unless declined by the participant. Though the research nature (referring to the technology related research rather than organisational or culture research, which demand a depth knowledge about personal details of participants life) does not reflect any harm to its participants; however, the confidentiality was a main issue that was taken fully by the author. The

anonymity of participants work and their identity was respected and was not disclosed to anybody except the researcher. Codes were given to each participant to ensure the ultimate confidentiality.

The author will disclose the research methods used which is qualitative-method; additionally, he will reveal the main source of information, mainly corporate documents and different type of interviews via telephone or face-to-face. This complies with ethics principle for showing what kind of data underpins the research and how it was collected. The study always refers to the specific organisation used in the study as ABC to abide by the anonymity principle unless permission is taken to reveal the name of the case study. Moreover, some scripts might be exposed in the article under general titles like Manager-IT; nonetheless, some of the scripts it could reveal the participant identity especially if he/she is well known to support such ideas; that will be taken in consideration.

### **3.9 Summary**

This chapter discussed the research methodology in general and address the stance of this research to each part of methodology. It also briefly visited research criteria, types, and strategy. Afterward, it moved to discuss philosophical issues such as ontology and epistemology. Next, it explained various methods used in business researches like quantitative and qualitative.

The author has focused on this research's stance from the philosophical stance till the data collection with justification of each selection. Final part, the researcher stressed on the prime methodology used, which was GT and its analysis techniques.

## **4 Chapter 4: Data Analysis of the Open Coding Phase**



## 4.1 Introduction

This chapter reports the first analysis phase in GT, which is the open coding underpinning the data collected from the semi-structured interviews. It is noteworthy to mention that these interviews stress on the uncovering of the phenomenon of MES. The first open coding was done with the help of the software package Nvivo version 9.2 as the data was extremely large and engaging software in this process was inevitable. Nvivo not only helped in organising the data but also facilitated the general understanding of the phenomenon under study. Without it, it would be an arduous task to go over the overwhelming number of words in all the transcriptions.

Open coding can be considered an interpretive process through which data are split during the analysis into parts or categories (Strauss and Corbin, 1990). The prime reason for using open coding is to decompose the data into concepts underpinning the open theoretical sampling and constant comparison procedure. These concepts are compared against each other, and those showing persistent occurrences in the data are selected to the next phase of interpretation. The initial open coding phase indicates more than 80 categories. This high number of codes is a result of the complexity of the phenomenon under study and the various subjects it unleashed due to the participants' rich experience in this area. Nonetheless, the reliability and validity of the coding process was increased by the inter-coding process. To achieve this, the whole transcript was re-coded by the director of the study and the percentage of similarity of coding was high. After this process, the researcher continued his analysis to the next level after ensuring that the process is tackling what the research is supposed to address.

## 4.2 Building the interview questions

The interview questions in this study passed through various development stages. The prime aims of these questions are to explore the phenomenon of multi-collaborative enterprise systems, its employability, contextual factors for its success, and the framework that conceive the phenomenon. These questions were formulated and compiled based on the author's knowledge as well as that of colleagues, the director of study, literature review, and practitioners from the industry. These sources form valuable assets help enrich our understanding of the overall phenomenon. Due to the fact that research of this kind is new to the industry, GT technique offers the freedom and flexibility to explore the phenomenon in more depth; additionally, it suits the research in revealing possible concepts regarding MES (Creswell, 2012).

The first draft was compiled by the researcher and then revised before to be being used in the pilot study. Then these questions were further improved to address the primary research questions. General questions were asked first then followed by specific ones. This strategy was applied to find all possible themes that could emerge from this experience. As this experience is unique, it would be justified to capture all the themes that might possibly be developed. The researcher kept enhancing the questions with colleagues, IT professionals, and the director of the study. Throughout the three months of interviewing, the questions were updated and improved further by augmenting more questions, according to the nature of grounded theory methodology.

Evidently, these questions increased the likelihood of discovering related themes leading to a substantive conceptual framework. The questions evolved due to the complexity and nature of the undertaking; nonetheless, an attempt

was made to include all of the questions in all of the interviews. However, some of the participants did not relate to some questions, so they were not asked. The initial number of questions was around 40, including the probing questions. Some questions were skipped during the interview, i.e. those questions for which the interviewee had no answer, or which the interviewer knew was not relevant to the interviewee. Furthermore, some questions had already been answered previously and those were skipped too. Indeed, the flexibility and freedom in the nature of GT helped the researcher a lot in tailoring the questions to suit the objective of the research constantly (Strauss and Corbin, 1998). Before the analysis is discussed, it might be noteworthy to provide some insight into the pilot study that was executed to help construct the questions and to outline some initial thoughts about the study and the framework that will explain the phenomenon being examined.

### **Pilot Study**

Pilot field interviews were conducted to help construct and formulate research interview questions. These interviews were specifically designed to help provide deeper insight into the subject and fine-tune the tentative conceptual model. In addition, a semi-structured interview was conducted in the selected collaborative organisation ABC, which aimed to thoroughly understand the complex processes implied in the subject research, especially those involving several layers of employees from various companies such as Sabre, SAP, KPMG, and Amadeus in addition to the core airline. The author was keen to involve those who have both strong academic and strong industrial experiences to have rich contribution to the first phase of the study.

A series of questions were constructed to serve as prime questions in the research. These questions were initiated after been subjected to wide diverse literature review that helped in substantiate the first draft of questions. Firstly, these questions were reviewed by PhD colleagues and consequently some modifications have been applied. In this cycle, the author and his colleagues collaboratively refined the questions to ensure they covered what the research intended to investigate. Secondly, the director of the study reviewed the questions and all his recommendations were applied. Moreover, two cognitive interviews were conducted regarding these questions in the pilot study to fine-tune the questions and to test that they relate to the purpose they were intended for. Appendix B shows five examples of interview questions from the draft version to the final. The first three versions were written before the cognitive interviews and pilot study. The final one was rearranged and edited after the meeting with the director of study.

A number of semi-structured interviews were conducted covering the core case study. The author was careful in the selection of the participants at this stage. It was decided that interviews would begin with the PMO leader who has an overall picture of the project and his experience in this project is deep and thorough. After that, the manager of the strategy, who directly interacts with airline IT strategy, was chosen, because his involvement was deemed essential and fruitful. The author selected one of the platform's managers to give his views from the business side and also selected from the airline operation platform because of the complexity of such a department and their role in the interaction with many other departments. Another business manager from HR, who represents the view of non-core business divisions in the organisation, was selected. On the other hand, the views of partners were immensely beneficial in

this undertaking, as they expressed the other side of the coin. The author selected to meet with one of the managers of the largest airline solution provider. The selection did not exclude the main players in this initiative, which were the consultants. So four participants were selected from the Airline Company and two were selected from different companies, as shown in the table 4.1 below:

<b>Title</b>	<b>Company</b>
<b>PMO Leader</b>	Airline Company
<b>Strategy and Standard Manager</b>	Airline Company
<b>Platform Manager (operation)</b>	Airline Company
<b>Human Resource Business Support Manger</b>	Airline Company
<b>Product Manger</b>	Sabre
<b>IT Consultant</b>	KPMG

**Table 4.1 List of Pilot Study Interviewees**

During the pilot study, the interviews were analysed and interpreted producing initial themes that sustain even after the next round of interviews. These themes mentioned below will be explained in detail in this chapter:

- Slack Resource
- Top Management Support
- Culture Fit
- IT PMO role
- Project Management
- Change Management

#### 4.2.1 Interviewing Strategy

All the key participants were identified by the author through coordination with a consultant. The fact that the author had worked before in the same organisation facilitate the accessibility to the participants. Due to the rigor of GT analysis's technique in isolating the researcher as much as possible from the research, the previous author involvement diminished. This has been demonstrated by being transparent along the analysis in providing all the controversial issues between participants. The author voice was referred clearly in the entire analysis.

For the sake of acquiring most of the MES experience, some of the prominent IT managers and executives were selected after the research questions had been discussed in detail. The conditions for selecting participants were abundantly clear. All participants met the following conditions:

- Direct involvement in the concurrent MES undertaking
- Senior and executive management position
- Professional in the IT field with at least 10 years' experience

The above conditions were set to enrich the study. For example, without being involved in the experience itself, the participant will only be speaking from a hypothetical point of view, rather than an empirical one. Moreover, the study is inclined to the strategic stance rather than the operational stance, which deemed the selection of the senior and executive management positions appropriate. The author was interested in participants' decision-making, as well as their views and visions. As for the last condition, an experienced participant

would add an immense value to this complex study since this initiative is, and an experienced point of view would touch the subject directly.

A tentative schedule was set; however, it was a highly dynamic one that affected the timeline. The nature of the duty of participants and their dynamic change of priorities were a significant barrier in the accomplishment of interviews. This led to taking one to three participants per week to avoid conflict in timing as the executive at any time they could call and change the time even 30 minutes before the meeting. The time for the interview was tentatively calculated to fit within an hour. A mock interview was carried out three times with my colleague in order to fit the questions into one hour. On average, an interview took 75 minutes, however, the length of the interview varied between participants, from 40-180 minutes, depending on several factors such as the time slot, their schedule, and participant nature. Most of the interviews were exceedingly rich owing to the fact that participants were from different companies and have rich experience in ES.

There were a total of eleven participants. One or two senior managers were selected from each ASP in the data sample, the rest of these participants were taken from an Airline case study. Some of the participants were world-class consultants, others were directors or executive directors. These participants enriched the study with an exceptional contribution that serves the purposes of both academics and practitioners alike. After each interview, a preliminary analysis was executed which enlightened the researcher's insight into the subject and substantiated a repetitive review of the questions. Some of the questions were modified to make them easier for the participants to understand, particularly those for whom English is not their first language. Furthermore, the

preliminary analysis was required to get a sense of the theme saturations and act as an early indicator of when to stop interviewing.

### **4.3 First stage of the analysis**

The process of the first stage analysis in GT is to produce open concepts and those open concepts are grouped together to form an abstract concept, which the substantive framework is based on (Strauss and Corbin, 1990). In the form of a pyramid, the base represents the open concepts and then more abstract concepts are introduced as the pyramid narrows, until at the top of the pyramid, a few concepts that explain the phenomenon remain. Surely, these concepts at the top of the pyramid will have attributes and dimensions that verify the existence of the abstract concepts. During the open coding phase analysis, each sentence in the transcript was given a lot of thought, in order to find the open coding that most appropriately represents the data source it was derived from.

Initially, during the data collection phase, the author listened to each interview and executed the preliminary analysis, for the purpose of creating a basis of open coding, emphasising the previous open concepts. In the analysis phase, the transcribed data was loaded into Nvivo, which contributed a lot to the research. A tedious process was carried out, in which the transcribed documents were massaged and re-aligned so that the questions looked identical in all the documents, to take advantage of the auto-coding feature in NVivo 9.2. Apparently, this process was worth carrying out, as along the road later in the process, it made the constant comparison a manageable task. Each question was represented by a node and underneath each node lays all the answers from the entire participants. This arrangement was a key success in



the constant comparative method. It meant that the researcher was able to focus on a narrow subject in which the expressions of each participant could be deduced correctly. In return, this reflected positively on the open concepts. Each open category was given a label that expressed the meaning of these categories. This part of the analysis was accompanied by memo- writing and graphical drawing to enable the visualisation of how these concepts were related, as well as keeping the overall picture of the framework in mind all the time.

#### 4.4 Tools for Analysis

It should be highlighted that IS solutions in this context refers to a complete solution of technology and business process knowledge, gained from the best standard practice prevailing in the airline industry. This standard might not be the best in all cases; however, taking most of the airlines and their practice in the industry over time. Initially, the author was coding the data carefully to generate most the suitable data. The first long round of open coding generated around 66 categories, but some of these categories have subsumed others and some were weakly referenced, so they did not have substantial reason to exist. The author had another coder for the first stage, in order to increase the reliability of the coding and the outcomes as follows in the table 4.2 below:

Theme	Theme
<b>Clear Requirement</b>	<b>Competing Challenges</b>
<b>Organisation Change</b>	<b>MES Business Process Challenges</b>
<b>Strategic Partners</b>	<b>COE Attitude</b>

<b>Technology Leakage</b>	<b>High Risk</b>
<b>Low Employment Retention</b>	<b>Commitment</b>
<b>Multi-vendor Advantage</b>	<b>IT Capability</b>
<b>Homogeneous Agent</b>	<b>Achieving Strategic Business Faster</b>
<b>Knowledge Transfer</b>	<b>Training Needs</b>
<b>Margin for Non-Conformances</b>	<b>Integrations</b>
<b>Trust</b>	<b>Adoption</b>
<b>Disclosing Information</b>	<b>High Interdependency</b>
<b>BPM</b>	<b>IT Capability Internal</b>
<b>CEO Support</b>	<b>SF in Adoption of MES</b>
<b>Concurrent Challenge Budget</b>	<b>Competitive Advantage</b>
<b>Few Vendors</b>	<b>Credibility</b>
<b>Vendor Management Training</b>	<b>Best Business Process Practice (BBPP) vs. Re-engineering</b>
<b>Champions of Change</b>	<b>Best of Breed Vs. Fewer Vendors</b>
<b>Adopt BBPP as is Cons</b>	<b>Objective</b>
<b>Leadership as Enabler</b>	<b>Executive Support</b>
<b>Need for Change</b>	<b>Concurrent Needs</b>
<b>Training with Contract</b>	<b>IT Leading Project</b>
<b>Change Business Process</b>	<b>Big Bang Vs. Sequential</b>
<b>Politics</b>	<b>Project Management</b>
<b>Change Resistance</b>	<b>Change Business Process MES</b>
<b>Capability</b>	<b>ASP vs Each Other</b>
<b>Uniqueness</b>	<b>Slack Resources</b>
<b>Post-Implementation Support</b>	<b>Strategic Partners Traits</b>

<b>Concurrent Challenge Time</b>	<b>Concurrent Challenge</b>
<b>IT and Business Alignment</b>	<b>Culture</b>
<b>Sign of Success</b>	<b>Adopt BBPP as is</b>
<b>Change Management</b>	<b>Governance</b>
<b>Concurrent Challenge Resources</b>	<b>Flexibility</b>
<b>Factor Influencing Selection of People Change Management Strategic Partner</b>	
<b>Technology Influence BP</b>	<b>Communication Challenges</b>

**Table 4.2 Open Codes First Cycle**

Coding is a salient tool in the grounded theory research process. Initial coding or open coding is characterised by being open to all possibilities of interpretations and exploring any theoretical possibility that could be detected in the data (Charmaz, 2006); in a sense, the grounded theories search for concepts with an open mind. Researchers at the beginning tend to give a simple and descriptive code, while later coding tends to be more substantive and abstract (Strauss, 2008). Furthermore, researchers should be aware not to consider the frequency as the ultimate factor on which judgement is based upon. The emergent core theme should be substantiated based on quality too (Saldana, 1997, 2003). Inductively new themes are to be recognised and coded to compose a so-called codebook. NVivo software is helpful in this open coding phase, as it organises the researcher's thoughts and helps to build the basis of coding in the comparative analysis. . After building the foundations of the coding scheme, the next task was to group the coded themes into categories and sub-categories using a process called axial coding (Strauss and Corbin, 1998). Creswell (2007) indicated that the main purposes of axial coding are to sort,

synthesise, and organise enormous amounts of data and to rearrange them in a better representation that can easily be identified and categorised. In this phase, the focus of the strategy is on how the main categories and sub-categories are to be established to give a systematic approach as much as possible. Occasionally there will be one theme that necessitates more attention from the researcher than others; nonetheless, the selection of these themes has to be based on certain logic that supports the selection, otherwise, it would be difficult to draw a conclusion and perform solid conceptualisation if the selection is biased. Evidently, the conceptualisation of the theory and understanding of the context of the phenomenon under study are materialised in this phase. Selective coding is the final stage of coding where categories and sub-categories from previous coding stages are interrelated to compose the emerging theory or model (Creswell, 2007). Strauss and Corbin (1998) expounded that the process of selective coding deploys a code's selection method involving those codes that have a high correlation with the main theme and are related to the research question; then these are conceived as being highly related codes. Such codes are characterised by high frequency occurrences and thus form the basis of the core themes.

Participants' interviews were transcribed and coded using the grounded theory scheme. Transcribed interviews were inter-coded between two researchers to increase the reliability. The amount of data to be analysed were immense, so it was justified to use an electronic package to help in detailing all aspects relating to the phenomenon. NVivo was an enormous help to manage the coding phase. All the transcribed interviews had to be reorganised to cope with the auto coding feature in NVivo, which was a massive help to the researcher. The first question had to be in a standard form, and all of the following questions had to

be in a heading style so that NVivo could recognise them as questions. The questions had to be the same in the entire transcribed interview. For this, the researcher had reformatted all transcribed files, so that the questions appeared the same. As the interviews were of a dynamic nature, some questions emerged later after the first or second interview or were not answered by some participants (left blank). Though this process consumed an immense amount of time, it saved considerable time regarding the analysis. After that process NVivo was able to give all of the answers to certain questions from all the participants in one window, enabling the coder to focus on a certain question and be able to code it separately.

Manipulating large volumes of data is a gargantuan task. Without the software package it would have been a difficult task; however, the author's competency at using this software provided a competitive advantage in the analysis stage. The capabilities of NVivo facilitated and helped in managing the tedious manipulation of themes during the comparative phase. The figure 4.1 below illustrates the first categories that sustain the exhausted continuous comparative analysis and the proposed open categories that were created after rigorous iterations of constant comparative process.



**Figure 4.1 Open Coding Categories**

By and large, avoiding failure in such a complex context would require certain aspects to be studied and investigated in-depth. The ultimate target for such adoption is to capitalise on MES and to improve business processes; therefore, the author would like to explore factors involved in facilitating such a change in business processes. Here are some related factors that help the integration of simultaneous multi-collaboration of ASPs with each other and the organisation to absorb such a change in business processes:

## 4.5 Slack Resources

In this research context, slack resources refer to the extra available budget that could sustain the project until the end. Large projects such as MES involve uncertainties and entail hidden costs due to request changes over the life period of the project, which tends to stretch the budget. As one of the executives in the airline (SAA) expressed, the MES “is challenging, and it put a lot of pressure against our resources, a lot of pressure to higher many consultants to help us.” This indicates that this initiative is deemed to fail if not enough resources are catered for. This sentiment was stressed by one vendor’s management (SPF): “when you plan for any project, you plan and estimate for the resource need but those estimations are not always one hundred percent, so when you get to the bottlenecks, you need a lot of additional resources; human resources and non-human resources.” The complexity of this project may be a prime reason to consider slack resources, as another vendor’s director expressed: “long projects take a long time and I think it should always be available. This is due to the complexity and magnitude of the project.”

Slack resources versus performance has been explored in various literature. Bourgeois (1981) presented it as the cushion that firms could deploy in a discretionary manner when needed. However, Jensen (1986) argued for a negative slack versus performance relationship, by insinuating that managers might misuse slack resources and utilise it inefficiently. This view was also expressed by one vendor’s management (SPE), who argued that such “slack resources are inefficient and indicates a lack of planning. If you plan adequately, there is less need for what we are calling slack resources.” Nohria and Gulati (1996) observed strong correlation between slack resources and innovation, implying that too many slack resources decreases the investment

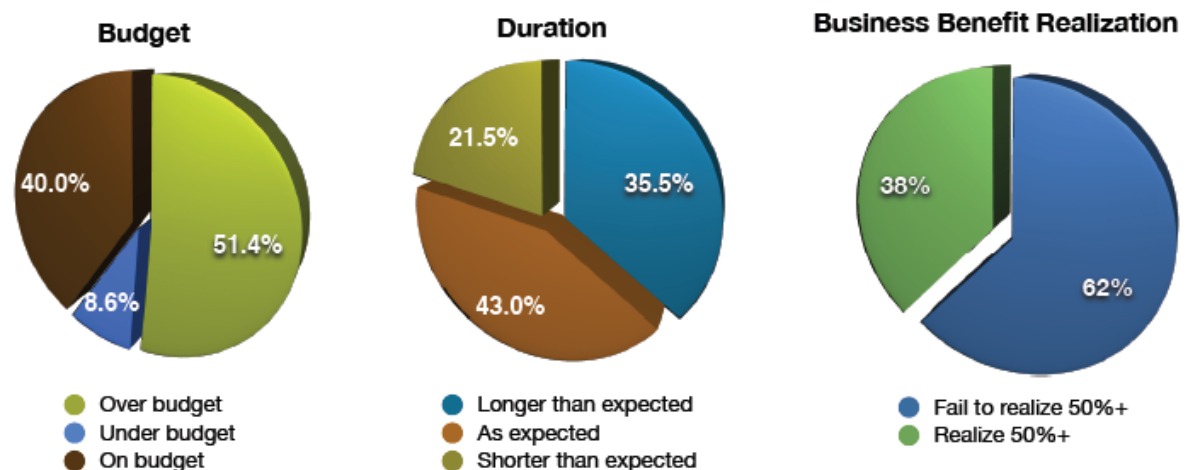
discipline, while too little restrains innovation. This notion is in agreement with one member of the executive management in the airline, who states that: “parallel implementation normally runs through the politics and availing resources; either financial or human resources, because sometimes whatever you do you are going to run short of money or people.” Modi and Mishrab (2011) investigated the diversity of slack resources perception in the literature review in their longitudinal study from 1991-2006. While some scholars support the notion that slack resources tend to be misused and considered superfluous to the need, and needed to be dismissed, others support the view that limited slack resources can lessen companies’ ability to compete in the market and place them in a fragile position. Some of the management in the airline SAB were reluctant to embrace the notion of slack resources: “Slack ...would not count on slack or additional resources. I would say that just enough budget.” Though the budget has been exceeded, some management for various reasons did not want to admit it, as it shows a failure in their performance by admitting it. Although it appears that slack resource is a feature that is needed for the recipient organisation, the vendors are also required to have slack resources. As some of the requirements from the client required substantial budget change if they could not cope with this demand, the project might be at serious risk, especially if these requirements have extensive dependency upon it. One of the senior managers of SAC indicated that this was an issue: “you have to have the proper resources as ASP; as he is the one to help you and also from the company, As a matter of fact, we had a problem with HP as implement of SAP because of the issue of slack resources. Those vendors who do not have slack resources should not have been selected in the first place.” Another one (SAN) endorses the previous statement that slack resources “will give big support to



this large project, and I think it is a must. Sometimes you finish certain activities and staff are released for another job and then you have sudden changes that need to be executed, and it is not easy to recall those staff again as they might have been dispatched to different countries, but again you can depend on these slack resources to help overcome these urgent changes.” Another participant from vendor management (SPE) emphasises: “solution providers should have a resource pool they can draw from in the case of some unknown event that needs to be addressed. Those would not be slack resources. They would be resources that they can manage on a priority basis.”

Slack resources do not only cover the shortage in the budget, but they also cover widely the abnormality that arises during and post-implementation of the undertaking. This has been expressed by one of the participants (SAC): “when there is an abnormality in a project, the ASP can best adopt this by using the slack resources. They can react to the change and keep his contract.” The senior director of one of the vendors (SPA) expressed his views regarding slack resources: “I think that organisations that can draw a program that can have those slack resources available just basically as a backup. It is good planning on their part because it provides project continuity and prevents delay or anything like that but the problem here is that it does increase your costs.” Another senior director (SPD) of one world-class airline vendor remarked that slack resources in his opinion are “almost a must when you have this big engagement. If you are doing a project and you are implementing one solution, I would say maybe you do not need it. But when you have so many providers and you have so many solutions from each provider, it is such a complex undertaking that I would say having a slack is a must.”

Large IT firms acting as IS providers usually invest several resources in the planning stage to reduce risk and budget problems when executing projects. Nonetheless, in reality, a large percentage of these planned projects do not meet the target plan, which makes slack resources a necessity for such firms rather than a luxury notion. Moreover, slack resources provide a latent advantage for firms with more financial resources, as they can meet the expense required to offer IT innovations. One airline senior manager (SAB) expressed the risk of such a project as follows, “These projects are long-term projects. Even if you do have a large enough budget in the beginning, these are big projects; three or four-year projects, and I haven’t heard of a situation where people have enough funds for the entire life cycle of the project when starting the project.”



**Figure 4.2 Risk Factor ERP, 2010 Report (PCG, 2010:10).**

Figure 4.2 indicates that the majority of enterprise systems fail to meet the budget, which is an overwhelming result that necessitates slack resource be taken into consideration when part of an ambitious initiative such as MES. Not only is the budget the main concern in ES but also time and functional delivery

are a concern that could be mitigated by increasing the budget, along with the following notion which was emphasised by one of the airline managers (SAG): “Of course if you have extra money, or extra resources, this is a good thing to have because it may minimise your risk. Sometimes you have a tight schedule, and you may not meet the deadline. You inject more money, you pay overtime, you hire extra resources and you bring better tools to meet the deadline. Extra resources mean a better environment for success.”

RISK FACTOR	2010 AVERAGE	2009 AVERAGE
% Take Longer Than Expected	61.1%	35.5%
% Cost Exceeds Budget	74.1%	51.4%
% Benefits Realization < 50%	48.0%	67.0%

**Table 4.3 Risk Factor of ERP between 2010 and 2009. (PCG, 2010:10)**

The above table 4.3 shows an increase in the projected cost of the project, exceeding the schedule plan. By and large, the figures are in a favour of being optimistic towards ESS; however, benefits realisation provides much better results and anticipates that an organisation still invests in ESS, hoping to reap the benefits of an integrated business process.

## 4.6 IT Capabilities

IT capabilities as defined by King (2002) as the IT-related parts that are integrated coherently to achieve business objectives. The two basic parts of IT capabilities are the human skills element and the technology element as suggested by Melville *et al.* (2004) and Byrd and Turner (2000).

IT capabilities initiate value-added activities, such as lessening the gap between partners and strategically supporting inter-firm collaborations (Lee and Lim, 2005). Rai *et al.* (2006) suggest that IT capabilities can enhance and optimise processes in supply relationships. This research explored both IT capabilities in ASP and firms accepting business process change. ASP IT capabilities are required in the first place; otherwise, it would be difficult to remain in the market. As Melville *et al.* (2004) have indicated, IT capabilities are considered as a source of efficiency and innovation for companies. IT capabilities contribute to the success of such initiatives, as delineated by one vendor manager (SPG): “IT capability is very important and it is definitely an essential factor in the success of the implementation.”

Firms’ IT capabilities, for instance technical skills and management skills, are necessary for firms adopting large systems and investing largely in IT systems. A manager from airline (SAE) noted that “for internal IT we have very well educated IT staff, we have very well educated people. We have dedicated and experienced people that are willing to do so, to implement, willing to help end uses, and in that regard they help those weak vendors and cooperate with the good vendors and they do the bridging between them.” Firms’ IT capabilities are vital as they act like a safety valve for the organisation. In a sense, organisations will place more trust in their IT than anything else and without a firm’s capable IT department, it will be difficult to absorb technology innovations. This is highlighted by an executive in the airline (SAL): “The IT capability is very important as you know ...[the airline] has an IT shop that has been working for the past 30 years or more, maybe closer to 40 years, so we do have good internal IT capabilities demonstrated in implementing this programme.”

Evidently, a firm's IT role will mainly be 'gap bridging' for the organisation as it will facilitate resources needed for the ASP. A consultant (SPB) argued that "typically business is not able to understand the technical side of solutions as they should in the IT department. So, a business relies on the IT counterpart to help guide them in that aspect, so I think it is very critical." Furthermore, it will establish a more productive environment when negotiating and resolving problems with the ASP. Another executive (SAL) stressed the role of IT: "We rely on internal IT capability as the glue between the business and the solution provider, so IT capability is a key factor."

Additionally, it will act as a mediator for knowledge transfer between the adopter's firm and the original firm. Another role for the internal IT shop is facilitating, managing, and coordinating project plans with ASP. One vendor director (SPA) expressed how quickly the project was moving when proper internal IT capabilities were in place: "The airline has a very good IT department that is capable of understanding things quickly, we move the project quickly." Another vendor (SPI) explained how the firms' IT capability was beneficial to the overall success: "Business can tell IT then IT can understand it and action it. With business vision and IT help we could arrive at a better position." As a project management office (PMO) is becoming an essential part of implementing large scale IT projects, without firms' IT capability to run all the complex tasks efficiently, it would be immensely difficult to follow and manage these projects. The research will look into IT capabilities as an attribute that exists in both ASP and firms, ensuring a successful business processes transfer. Karimi *et al.* (2007), consistent with the latter assertion from their empirical study, state that IT capability, and its influence on the success of IT project implementation in the ERP context, are positively related.

Though the firm's IT capability is considered a major enabler for MES undertaking, the vendor IT capability is also considered crucial, which usually is taken for granted. An airliner (SAE) found that this is not the case: "From our experience, we noticed that those vendors are of different types and nature. Some of them are really professional and you are impressed with their work, some of them come and learn here and this is a big problem." This indicates that IT capability is not always guaranteed, although it is always assumed; otherwise it makes no sense that they are in the IT field to begin with, as mentioned by a service provider director (SPA): "Yeah we are service providers. I mean, it goes without saying. You know, airlines will look to you and expect you to know all this. If you came to them and said 'well we don't know how to do this', that is not going to look very good and I as an airline would say 'I am a bit nervous about that, so I am not going to take you as a service provider'." However, another vendor (SPD) attributed responsibility to the client, implying that the organisation should have done some homework when selecting vendors: "The IT capability should not be an issue from the provider's point of view, because if you have done a good job selecting your IT provider, then you would have made sure that you had chosen an established provider so that they would have the IT capability to deliver what you are expecting from them." Not only is IT capability responsible for easing and advancing the deployment process, but also for improving the organisation's performance (Aral and Weill, 2007; Nakata and Kraimer, 2008; Patrakosol and Lee, 2009).

Finally, IT capability is one salient attribute for the success of MES and the interplay between the ASP as it has been stressed by an ASP senior manager (SPG):

“Well, I would say IT capability is very important and it is definitely an essential factor in the success of the implementation.”

#### 4.7 IT Governance

In order to understand IT governance, it might be beneficial to dedicate a brief introduction to the concept of IT governance, as outlined in the literature review. Various definitions of IT governance can be found in the literature. For instance, The Ministry of International Trade and Industry (1999) defines IT governance as 'The organisational capacity to control the formulation and implementation of IT strategy and guide to proper direction for the purpose of achieving competitive advantages for the corporation. The IT Governance Institute (ITGI) (2003), states that “IT Governance is the responsibility of the Board of Directors and executive management. It is an integral part of enterprise governance and consists of leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends the organisation's strategy and objectives.” Van Grembergen (2002) views IT governance as 'the organisational capacity exercised by the Board, executive management and IT management to control the formulation and implementation of IT strategy and in this way ensure the fusion of business and IT'. It is worth noting that linkage between business and IT is the prime focus of these definitions.

Since this undertaking was an IT project, IT governance emerged as a salient and effective tool between various ASPs who have different backgrounds, methodologies and governance models.. Evidently, IT governance is an integral part of corporate governance and the organisations, which utilised IT governance, reaped the advantages of its deployment. Having a high representation of IT in an organisation will enable better alignment with

business; this in turn will yield a better understanding of the value of IT (Weill and Ross, 2004). This was articulated by one of the airline's executives (SAA) who stated that IT is represented in "the steering committee and cooperate steering committee headed by a CEO and is represented by all executives from the business and these issues have been discussed. Probably we met so frequently at the time of implementation and we got the support from top management, which made a tremendous difference. Now we meet every two months."

However, like any information technology-related principle, IT governance has the potential of serving tremendous benefits to a particular firm; yet for its success to be reflected in an organisation, this wholly depends on the execution and implementation of this principle. Broadbent and Weill (1998) expressed that such could originate from the executives' attitudes as well as the lack of direction in business strategy and changes to strategic intent. As has been communicated by a senior manager (SAB) in the airline: "The important thing is not to just have governance, but governance which is effective and efficient in this kind of large implementation." The emphasis on the proper IT governance was great in this project as it has been conveyed by an airline's manager (SAD): "Having a governance respected by the IT department themselves, by the community of users in the corporation and by the management of that corporation, is the success factor for that change." In order to validate the given assumption, this study included the top seniors in ABC Airlines and their ASP partners, which allowed another senior airline manager (SAB) to confirm this:

Governance is like a music maestro in a music band. It controls the movement of everything during the project life cycle, how to deal with it and even does so afterwards. If it is good governance then you will know what is going to happen after you implement those applications.



An ASP participant (SPA) also shared his knowledge about the benefit of IT governance:

It establishes the communications level. When we are talking about technical communication, communications between a project team or something like that, it sets not so much the boundaries, but the flow of information.

Another senior manager (SPD) of ASP reflected on how important the IT governance truly was:

It is extremely important and probably the part that can make or break because, especially in a multi-enterprise setting, the governance model or the governance body is like the glue that brings everybody together.” Further in agreement with this, another airline senior manager stated: “if the governance is not clear there will be many problems because of the relationship between the vendor and IT and the vendor and user. It is very important to have clear governance.

So, IT governance requires firm executive support, as projects of this nature are huge and many obstacles evolve naturally, due to excessive complexity. IT Governance might be a luxurious item when implementing either solo projects or internal ones; however, projects of such magnitude are deemed to fail without proper IT governance. It is due to the fact that such undertakings have heterogeneous vendors, where they not only differ in location but also in methodology, culture, and in IT governance itself. It was clearly broached by an airline’s manager (SAE) that “governance communicates with the other partners. Otherwise, one partner will work with their governance without considering the other. So we need to communicate just for cooperation purposes.”

Presenting the same argument, an airline executive (SAF) added: “...bringing in multiple cultures as you are bringing in multiple ways of doing work, methodologies, the trend, priorities, competing priorities within the vendors themselves. So managing all these is not easy, no matter how much effort is put

into it.” Abiding to one IT governance is a key factor to the success of MES, otherwise a chaotic situation results, as the “IT governance should cover all the projects at the same time and all vendors should be obligated by the rules of IT governance, this includes the commitment from the steering committee” (SAI). Additionally, the governance model has to be agreed: “The vendor IT governance and [airline’s] IT governance should be integrated and agreed to have one uniform IT governance. When we agreed with those vendors they showed us their governance and part of the contract was to have one agreed IT governance” (airline manager, SAJ). With this governance everyone knows his specific share and role, and where they do shake the hand with each other’s as they should complement each other. *As has been voiced by an airline’s executive (SAK):* “during the negotiation and reviewing the proposals [...] so they knew that we would be working with other people and other companies and providers, we explained to them that we put certain boundaries between them so that they can work together.”

Although IT governance works mostly well within one organisation; nonetheless, it tends to be challenging when it is spread over multiple organisations, as clearly stated by an executive airliner (SAM): “Governance works beautifully inside an institution but once you start extending your arms then it starts to face some difficulties.” One of the vendors (SPA) affirmed that they “don’t have direct contact with the other vendors. They have to be managed through the airline, unless the airline wants us to talk directly to the other person about a specific function. That we would do, but it is not for us to go in the background and come to you and deal with you directly.” Doing this is the only control mechanism that could handle such an overwhelming number of tasks. To understand the relationship between the vendors and the airline is salient, as

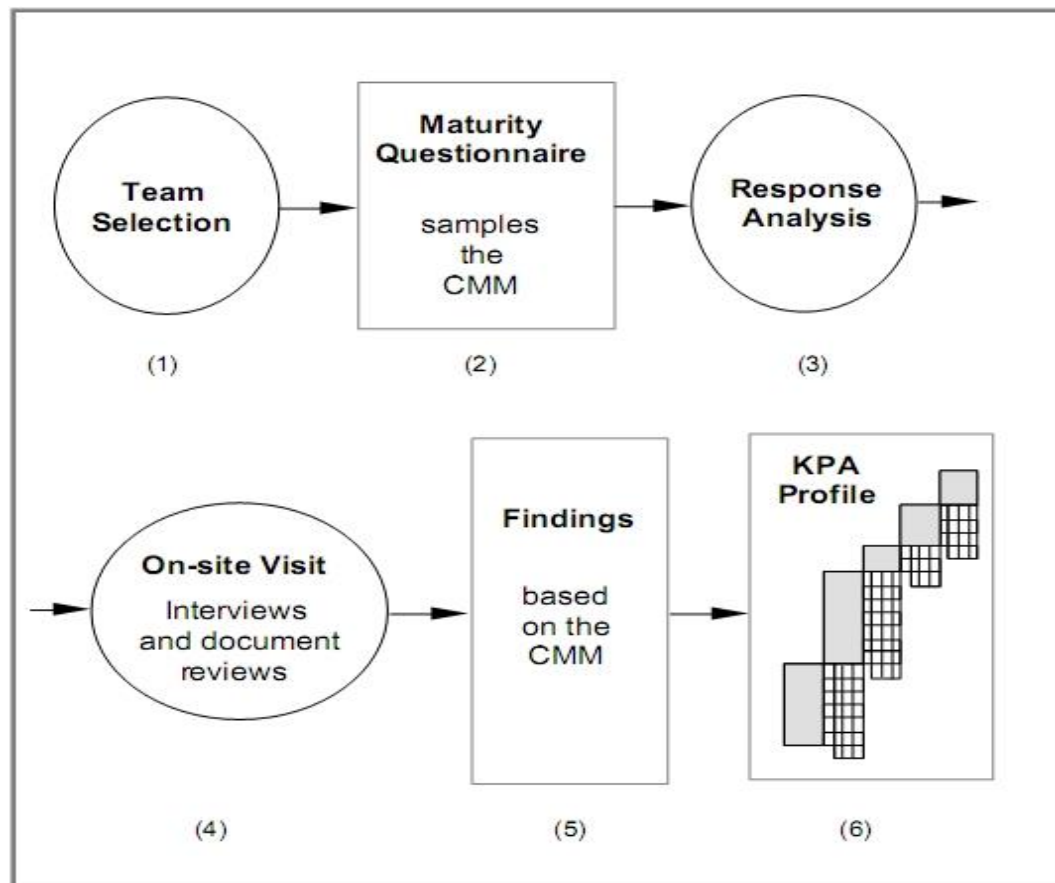
one vendor director (SPA) expressed: "...the airline solution providers and the airline must have an understanding as part of the governance model, and managing the relationship is very important."

Another consultant (SPD) emphasised that the main issue here is not how to do the job, but rather: "the governance body needs to think about, in my opinion, not just how to make sure that you do your job and he does his job. "How do we bring, you know, these constituents together and make them align with each other for the end goal, which is the benefit of the customer." One of the reasons for having an effective governance is because vendors admitted that: "I tend to concentrate on my project and I will concentrate even on the external factors that have an impact on my project. So for those dependencies I have on others, I will be chasing them; I will be chasing [vendor A] for things I need from them, I will be chasing [vendor B] or other providers. If they need something from me, it is not going to be on my radar. I am not going to be thinking proactively about that" (Airline Vendor, SPD). Because every vendor has completed his contract separately with the airline, they tend not to know the details of these contracts, so commercial issues do arise as do other challenges. The governance body is the agent that brings all the parties together. The airline stressed the governance factor by bringing a vendor to handle all governance activity, which was a big help, besides the help from the consulting house KPMG, which also helped tremendously. However, one of the vendor's senior management (SPE) believes that "vendors need to be held accountable for their own governance, rather than being required to conform to governance that is not part of the long process."

#### 4.8 Key Process Area Profile (Business Processes Coverage)

Business coverage refers to how many of the business functions the ASP covers from total business functions that constitute the overall business in the organisation. If a firm would like to buy an automation solution and is interested in measuring how much the solution covers from a firm business process, they would need to identify their current business processes and match them to the new automated system to calculate the percentage of business coverage.

Paulk *et al.* (1993) detailed all aspects needed to be undertaken while selecting a software system in their Capability Maturity Model (CMM), which identifies and quantifies processes possessed by a software provider. CMM expands on more than one aspect. This research will only be interested in software process assessment capability evaluation methods of the CMM.



**Figure 4.3 Common Steps in Software Process Assessments and Software Capability Evaluations (Paulk *et al.*, 1993:45)**

Figure 4.3 above, shows the steps required to be accomplished to achieve a final key process area (KPA) profile for the ASP that includes the areas where the firm has, and has not, met the objectives of the key process areas (Paulk *et al.*, 1993; Khan, *et al.*, 2011). Furthermore, Cooper and Fisher (2002) published a technical report 'Software Acquisition Capability Maturity Model' based on CMM, specifying all the details required to achieve such a task, incorporating acquisition risk-management and project management.

The KPA profile factor has precedent significance due to the fact that firms would like to eliminate business process gaps as much as possible. Having these gaps only means unmanaged budget, resources, and time. In addition, not only will this constrain decision making but also on developing high-risk situations.

While admittedly, most companies recognise the vital role that information technology plays in the organisation, the fact of the matter is that not all firms provide wide business coverage for the IS to delve into. Hence, in line with this dilemma, this study will explore the assumption of this notion, acting to enable firms to accept change to their business processes. From that perspective, the author would like to shed light on the effect of this factor on ASP partnership.

#### 4.9 Executive Support

Noticeably executives' support adds an enormous value for all IT projects, their participation, and support associated with the success of various IS implementation and large-scale firms' adoption (Lederer and Mendelow, 1988; Merali, *et al.*, 2012). An executive from the airline elaborated on the issue of executive support saying: "Without executive support, nothing can be achieved. You can do whatever you want, you can build the best system, the best application, the best theory and the best processes, but if executives do not adopt them, its just like a building in the desert. Nobody is going to utilise it." Indeed, it helps to deciding on some critical points in a project that might require either extension in resources, budget, or time. Moreover, Ramamurthy *et al.* (1999) and Wang *et al.* (2008) highlighted the critical role of executive involvement in IT projects, realising the risk in budget, time, and resources. Another executive (SAC) affirmed the notion of CEO support:

The ultimate of all the successes [is to have] the DG himself to steer the board of change. Usually the top executives handle these changes and not the CEO but there is a difference in such. It is important to have the CEO to sponsor the change and be on top of it, as this change will not only affect IT, but also change the business and how we do business. So his involvement is highly essential. In addition, there are conflicting business processes and his involvement to settle any issues is crucial.

This latter notion that the CEO plays a vital role in supporting the project from a resources point of view is important, as has been delineated by an airline's executive (SAI): "If he were not behind the change, implementing this massive technology, providing the required budget, and to do such huge multi-enterprise system, we could not have achieved all of this. Even when the business asked for an extra reasonable change, he would approve the budget and support it." Such projects as MES will be a viable option only when organisations have a CEO who believes in the IT as a real business enabler. The CEO must believe that not having IT will affect the industry standards and that without IT, the corporation cannot compete, and their strategic plan cannot be achieved.

Large-scale projects like MES in large companies are also quite challenging and demanding; without incessant sponsoring of the project from executives it would only elevate the risk of failure. An executive (SAG) stated in regards to the fundamentals of business executive support: "We suffered a lot to implement a multi-enterprise system but one of the good or maybe one of the excellent factors that has helped us a lot in forcing implementation is the top management support. Without it, I think this project or this programme was prone to fail. I think that H.E. Director General and VP's level were both major roles in making this type of implementation a success." Another senior manager from airline (SAG) contended that executive support "can make or break the project because these huge projects come with challenges and you would look always to the support of the executives to pave the way. He also would smooth out what is known of the rejections and resistance and his support would be needed to improve your organisational structure and make some strong decisions. If you have weak support or lack of support from the executive the project will fail." Research in management IS emphasises that success in

deploying new systems is improbable without executive influence and managerial support (Ives and Olson, 1984; Trkman, 2010).

Other studies in the literature have emphasised the executives' support from a different perspective, such as the characteristics of the CEO in view of their attitude towards technology and their influence regarding innovations. The CEO's attitude might be the most influential factor of all "he is probably the number one factor that makes this happen, because he believes in technology and he used it and he went through changing systems in his previous job in the telecommunication sector" (Airline's executive, SAA). This was contended by another executive (SAB):

If the CEO doesn't believe in technology, they are not going to approve, see the value of, or understand any IT initiatives. IT will be another overhead that they will have to look at. Again I'm saying attitude not knowledge. The CEO doesn't have to be an IT person, he can be from any line of business, but he has to trust IT, believe in IT, support IT and be able to see the best opportunities and the best fit from that perspective.

The CEO's attitude towards technology alone is not enough, it is the "patience and forbearance to implement best business processes 'as is'. The best business process practice won't happen unless we have strong support from the CEO" where the importance of such viable because essential decisions are being made at that level, the strategic decisions and the major IT transformation project may not be feasible, if the top people do not see the value behind it. In the airline under study, the director general (CEO) of the company, is actually heading the IT master plan which is the implementation of all these systems and if they do not attain his support, the project is doomed and prone to failure. Besides the CEO's attitude towards technology, he also has salient functions like "demanding that other executives accept certain things just to keep the



wheel moving” to support this huge change, as has been expressed by a senior manager (SAE) from airline.

Thong and Yap (1995) argued for a positive relationship between the CEO attitude of innovation and the likelihood of adopting new technologies. A vendor director (SPD) asserted that it is critical that we “have a CEO that wants to be at the cutting edge of technology, who wants to embrace technology because he knows that technology is going to bring in the revenue, reduce the cost, and improve the efficiency of the airline.. Having faith in technological innovation from the CEO’s perspective will provide the adoption project with the required resources” (Rai and Patnayakuni, 1996; Jeyaraj *et al.*,2006).

Having to implement IS solutions simultaneously with their business processes may involve a massive organisational structure change, a major change in the existing business processes or a hefty amount of investment. As a result, executive support is clearly manifested when there is an active involvement from top executives in the decision-making process of any IT initiative.

Notably, executive support adds an enormous value for all IT projects; their participation and support are associated with the success of various IS implementations and large-scale firms’ adoption (Lederer and Mendelow, 1988; Silva and Hirschheim, 2007). Indeed, it helps in deciding on some critical turns in projects that might require either extension in resources, budget, or time. One of ASP’s (SPI) participants expressed that:

We need the executive support to pave the way in front of us to make it easy and to solve obstacles, as you will meet obstacles. You need an executive sponsor that has the power and ability and the willingness that adds up to your success.

Moreover, Ramamurthy *et al.*(1999) highlighted the vital role of executive involvement in IT projects in realising the risk in budget, time and resources. Large-scale projects like MES in large companies are quite challenging and demanding; absence of incessant support of the project from executives would only elevate the risk of failure. The latter issue was emphasised by one member of ASP senior management (SPD): “When you have these magnitude projects it is even more imperative that you have executive champions.”

Ives and Olson (1984) found during research into management IS stress, that success in implementing new systems is improbable without executive influence and management support. An ASP senior (SPE) confirmed this:

Executive support is actually the key to this initiative. Without it there would be very little chance of success. The executive support for this particular initiative has been very clear and it has been well defined.

But executive support is not the only significant aspect in promoting the success of MES and interaction between ASPs. Commitment between ASPs also plays a pivotal role due to the high interdependency effect of such a large and complex project.

#### **4.10 Credibility**

ASP credibility is considered an influential factor in selecting IT partners, as the process of adapting business processes that cover the entire organisation is complex, lengthy, and dynamic. It involves such radical changes, which require ASP’s credibility to secure and maintain the firm’s assets and resources. Generally, a marketing team is energetic and would cross boundaries such as ‘unattainable promises’ to reach their goal(s). An airline manager (SAN) expounded on this issue: “I thought that if we saw these systems live and we tried them before we bought them it would be better. I am saying this because

credibility was not as we expected in some cases.” Without the credibility of the ASP that constitutes a secure valve, an immense gap would occur between the marketing and implementation teams, endangering the whole process of successful adoption. Due to the importance of the latter, research has investigated how credibility could influence ASP partnership. One airline executive (SAD) stated:

Credibility is very important because in this kind of industry, i.e. IT industry, you are not buying live stock for example, or an aircraft or car; most of the time you are buying services and services come with expectations. Now, if the ASP devised an expectation model for you; basically, your requirements, and these requirements are not met or you have been misled, or promises were given and not fulfilled, then this is very risky for the success of the whole project. If you have strategic change like that and you have many vendors, if one vendor out of all of these vendors is having difficulty with his credibility, he will affect the others, he will be the weakest link in the whole spectrum. So credibility is very important, especially in IT industry.

Credibility is built on a fine reputation of continuous commitment with partners or clients, where commitment reflects the degree of credibility. As expressed by an airline manager (SAE): “Credibility is a major thing. I don’t want to get a vendor today and another day he disappears, or he has financial trouble, or I heard from other customer that they are sloppy.” Another ASP director (SPD) articulated, “I think that credibility is very important, especially when you are going with the multi-enterprise, you don’t want to take a risk in the selection of your provider. You want to make sure that you select credible trustworthy providers because it is a big plan now and your plan is as strong as or as weak as your weakest provider or as your weakest constituent in the big plan.” Furthermore, he added:

So obviously you want to make sure that you don’t take too much risk and select the best and the most credible provider and check their credit ratings and their reference ability in the market place ...[...]. This is obviously, a source of concern because of the dependencies among the different providers, so it is an important factor but you may not be able to

do anything about it if you ask the provider. You want to make sure that you don't take too much risk and select the best and the most credible provider and check their credit ratings and their reference ability in the market place.

Anderson and Weitz (1992) defined the commitment in the manufacturer-distributor context as 'the adoption of a long-term orientation toward the relationship,' where mutual commitment would result in an increase in profitability beyond that which either of the partners would achieve alone. Similarly, credibility refers to the belief that a partner will expect his counter partners to complete the job efficiently and reliably (Ganesan, 1994). Airline's executive (SAL) affirmed that:

Credibility comes with the solution providers demonstrating their capabilities as if they have been in the market for a while, they have a good market share, and they know the region. That ensures their ability and builds their capability, so that credibility is a given when we do selection criteria or evaluation criteria. Usually one of the major elements in the evaluation criteria is credibility.

Ba and Pavlou (2002) further explained credibility as the belief that the counterpart party is honest, reliable, and competent. This latter issue has been addressed by an executive (SAJ) in the organisation: "of course if the ASP does not have credibility, we will not select him as a strategic partner. It is a trust, as they say; if there is no trust, there is no business. This also applies to ASP, and it all comes with trust, just like Wipro and TATA are working together, IBM and SAP are also working together."

Anderson and Weitz (1992) argued that the more committed partner is open to opportunism by the other partner; moreover, in a partnership relationship the partner with less commitment has a tendency to abandon the partnership. By and large, the less committed party do not think of the relationship as a long fruitful relationship, rather, they think of it as a short term tactical move. In the client's tentative theoretical framework in this research, the client's partners

would need to test the commitment of the ASP through a benchmark; a pilot contract, or referral mechanism. The latter attribute is mostly common in the airline sector where airline allies take advantage of each other, as experienced in the IS field. Testing the other view would be from the ASP perspective, where a careful study of the client resources, capabilities and commitment should be done before becoming involved in such a partnership.

On the contrary, Petter and Solli-Seather (2005) contend that according to social exchange theory, commitment is increased over time when both parties have an on-going relationship with positive economic and social outcomes. The notion of commitment is viewed as an effect of economic and social benefits, while the former view implies that commitment is the cause that leads to an intimate partnership, creating a productive environment and in return increases economic outcome. An executive (SAL) in alignment with Petter and Solli-Seethe (2005) expresses: "Everybody was not sure how to deal with others the first time they all came together under one umbrella, but after a while they saw each other's credibility. Credibility grows so they now have respect for each other."

Evidently, mutual commitment from both partners is essential to sustain a healthy relationship where any of the partners might undergo small sacrifices for the sake of keeping the relationship positive (Dwyer *et al.*, 1987; Rai *et.al.*, 2012). As one of the vendors (SPB) articulated: "You want the vendor to be someone who sure can deliver and can handle the skill of the implementation and they have the resources, absolutely. This of course, including the commitment of what priority they have." Another Vendor director (SPB) consenting with the latter views states: "If you are embarking on major

interaction and major projects, the credibility of the vendor is very important in terms of their references earlier on in other projects and how successful they have been in these projects”

Committed parties have a tendency to invest in the exchange of valuable assets to show a willingness to preserve the relationship (Anderson and Weitz 1992; Rai *et al.*,2012). Such sacrifices are applicable to ASP and organisation contexts, as some of the non-core requirement that takes a monumental effort to implement could be disregarded by the client; in return, the ASP would cover some of the details that were not mentioned in the contract. These sacrifices are also implemented in the flexibility attribute, which is one of the research concerns when building MES framework.

#### 4.11 Flexibility

Flexibility plays a prominent role in ASP and firms at the contracts stage and afterwards it will eventually lead to constructive partnership. In this research context, flexibility is considered an attribute that allows ASP's and organisations to absorb minor conflicts and reach a state of agreement in an accommodating manner. Flexibility has influence in large and complex projects, as a matter of fact, flexibility is “one of the most important factors. If the vendor is not flexible enough, this can make things very complicated. Although we have official channels for introducing changes agreed with all the vendors, sometimes there are minor changes that would not require the entire cycle of change. Then, if the vendor started to complicate things, it might be a good factor to consider when selecting a vendor. The issue of flexibility might affect the success of multi-enterprise systems” as suggested by a senior airline manager (SAI). In addition, flexibility is required in more than one stage as follows:

There are different stages of flexibility; there is flexibility during project realisation, then evaluation after that, flexibility during the implementation, and then flexibility during the operation and the sustenance of the solution. During the negotiation and evaluation, and so on the business needs to have a lot of flexibility, the vendor needs to have another level of flexibility and IT also needs to have a lot of flexibility, but without crossing the red line. (Airline's executive SAD).

The attribute of flexibility has evoked controversial views within the literature; some rely on flexibility and trust, while others rely on specifying all terms and conditions in their relationship. As explained by an airline executive (SAA): "For example, when they [vendor A] were ready to implement some software, we were not ready. They understood that we were moving into a period of massive change, so they were understanding. Also we were flexible in terms of some customisation needed for a certain functionality on the operation or commercial platform. The business was flexible if it was not delivered by a certain date and then got delayed until another date." Concurring with the latter view, an ASP director (SPD) believes in detailing issues, tasks, and responsibility in a contract rather than being flexible while deploying, "because I think the details help everybody. You know the more details that are put into a contract, the less chance of conflicts later on." However, another airline's executive (SAD) thought both ASP and IT "need to be flexible during the implementation, regarding what they can do if they face trouble getting things as they are supposed to be. They need to be flexible about what other options they can adopt if the original intended design is not working, looking at what alternatives they have. ASP and IT need to work cooperatively to realise the solution, and then comes flexibility after the implementation and during operation and sustenance." Maybe another ASP director (SPG) added stronger emphasis regarding the flexibility issue:

Well I think flexibility, you cannot succeed. You never succeed in a major project without being flexible. And when I say being flexible, being flexible on the vendor's side and being flexible from the organisation's

side ..[.]. You will find situations where the customer has missed something probably unintentionally and you need to give a hand to help in order to continue with the project. And the only other way round you would find is that the vendor has missed something unintentionally and the customer has to give a hand and move forward ..[.]. If everyone sticks to his position nobody is going to move and nothing is going to happen and I am telling you, it is a guaranteed failure. No flexibility means a guaranteed failure.

Additionally, the flexibility attribute influences MES, as it has been stressed by airline executive (SAL): “The best or the most important attribute that we look for is flexibility. I can say that many of these programmes generate massive inter-dependencies, so if we do not have good partners who are dependable and very flexible and really believe in this mission, integration will fall apart.”

However, Saunder *et al.* (1997) and Ettlie *et al.* (2005) were in favour of detailing clearly all the requirements and costs in a better contract type. One executive (SAB) preferred this style: “Personally I would prefer to use flexibility as a factor in the whole equation. I opt to go for less flexibility as much as possible. Because flexibility in this scenario comes with a price, and I’ll end up paying more for the flexibility part than you would pay for the original contract. Minimise grey areas which need flexibility.” Parkhe (1993) and Faems *et al.* (2008) consent with the latter view that contracts should have what is called completeness: where the contract should be as complete as possible, leading to a better contract. In a sense, there is less chance for potential opportunism from the vendor; additionally, a lesser likelihood of cost change when renegotiations of certain services occur. The latter contract attributes are favourable to all parties since it determines the kind of relationship between the contracts and stakeholders. This kind of flexibility was affirmed by airlines executive (SAG) who related it to business culture: “We found that American and Indian companies have more flexibility when dealing with us compared to the



European companies. The Europeans sometimes, even if you have a clear statement in the 'statement of work' that support your requirement, would say 'no we need more money to do it'. The Americans and the Indians are more understanding of the nature of the business in the [region] and you can find that they are more flexible and more understanding than the Europeans." Another example of the influence of flexibility in MES follows: "CEO was flexible when it came to money and funding but when it came to the delivery, date and functionality, he was not flexible. Flexibility is needed when closing gaps between the vendor and the airline where the time frame does not allow" (Airline senior manager, SAJ). He further added: "This project is large and complex and we do not have the luxury of time to argue with a rigid partner. I need somebody to walk with as a real partner."

However, this kind of contract and relationship sometimes widens the gap between the ASP and the firms resulting in delays, risk, and project failure. Practically, no matter how specific the stakeholders of a contract required it to be, it is almost impossible to list the details of all the combinations of requirements with such large scale projects. The ASPs "had a different plan and now they are required to implement a different plan. So they were elastic. They were able to move with our objectives. To me that is a number one attribute without which we would fail, so flexibility is a key." The airline executive (SAL) further added "I personally favour a flexible partner because there are so many unknown changes ...[...]. When you work on large projects, you make a lot of assumptions. When you want to start real implementation, you are faced with reality and then there is a difference between assumptions and I mean good indicator assumptions are very close to reality." On the other hand, an ASP director (SPA) contended that flexibility is anticipated from both parties:

Having said that, there are limitations as to what we as an organisation can do in a time frame, so it is flexibility from the airline that is required. It is important to understand as well as just outright saying, 'no, I am not going to accept that from you, you have to provide me with this, you have to give me that.' So you know, it is mutual, the understanding and flexibility of both... We expect the airline to be as flexible about the same demand from the other party as they would be with us, as long as the other party do their part... Personally, I think it is good to be flexible but detail is just as equally important. Be detailed as the contract is signed. Be detailed and make sure there is no ambiguity.

The massive number of activities and services involved in the contract make it difficult to cater for all the details in all aspects. Willcocks and Fitzgerald (1994) in their study found out that only 26% of contracts were highly specific. The majority of the contracts were not specific (did not include every detail). That leads to the conclusion that there has to be space for flexibility to enable the business to continue and the contract to succeed. An ASP senior manager (SPC) concurred with that sentiment: "In 2009, something would take 5 years to fully implement, but requirements might change and your product will change. There could be a better way of contracting. Flexibility is the right word, the ability to move and change the scope without a great expense to either side." Umble *et al.* (2003) also signified that enterprise deployment teams should not only possess skill, reputation, and decision making but also be flexible. The director of an ASP (SPD) acquiesced the latter notion:

When you have multi-enterprise engagements, the contracts are also much more complex and you are absolutely right. It is almost impossible to cover everything in a contract. Things would come up that are not in the contract and obviously you can't go to a lawyer or to court every time something comes up. So I think flexibility is important to success, but flexibility needs to be exercised on all sides. So it cannot be just one way. Meaning that we expect [the airline] to be flexible all the time or we expect this provider to be flexible all the time, but you know, another provider is always strict.

Indeed, flexibility is required to overcome the non-detailed requirements that were not covered in the contract and the interest of a successful business-

partner relationship should be placed first. This leads to a fair deal in the context of contracts, where both parties have or expect a fair return. Having said that, it is imperative that all parties should not disregard the detailed contract and they should exert all effort possible to make everything detailed, as it will help future implementation and post-deployment.

Generally, squeezing the vendor might appear to be a positive aspect sometimes from the client's point of view; however, this might not be the case all the time. So called opportunism sometimes emerges as a result of the latter case, where the vendor tries to win back through the details that have not been discussed, which is highly likely to occur (Kern *et al.*, 2002). Therefore, the balanced contract that has a margin of flexibility and fairness for stakeholders might be a better option for a long strategic partner relationship. An alternative view to the above would be flexible service level agreement (SLA). Sometimes "you should accept half-baked things just to get the business moving" as it has been highlighted by an airline's executive (SAD).

Flexibility is not only between the airline and its partners, but also between ASP's. "If they see benefits of working together, especially if they are competitors in the same industry. For example, Sabre and Amadeus: this was the first time to work with each other." (Airline's senior manager, SAJ). Furthermore, he added: "This project is large and complex and we do not have the luxury time to argue with a rigid partner. I need somebody to walk with as a real partner."

Evidently, the complexity of the IT service has brought many researchers into this arena to investigate what might be the best options for the vendor and client. The demand for such research grows more and becomes inevitable

when discussing dynamic market business, such as the airline business where it is controlled by many factors. Benaroch *et al.* (2010) contend that reversal flexibility could lead the client to revoke the contract and search for an alternative, which will negatively affect the partner's relationship. So flexibility is needed from both to sail the journey safely to the shore. Although the majority of literature covers flexibility from the contract point of view, there is another view of flexibility, which will be covered in the next section on culture fit. This view reflects flexibility after the contract and particularly in the implementation phase..

#### 4.12 Culture Fit

Considering the culture fit factor when thinking about ASPs as a strategic partner is vital. The duration of such large projects, necessitate a prolonged period of interaction between the ASPs and the personal organisation. Anthropologists and cultural scholars have extensively explored culture from many aspects; this research tackles the associated theories and research.

Hall (1959) regards culture primarily as communication and built his theories and study around this concept, while Schwartz (1996) defines culture as a collection of attributes and impeded principles that act as guiding values for the identification of a culture. Hofstede (2004) analysed culture and categorised it according to five measure indices, namely: Power Distance Index, Individualism, Masculinity, Uncertainty Avoidance Index, and Long-Term Orientation. Much marketing and accounting research was based on these dimensions to understand more about a specific culture. The dimensions are as listed (Hofstede, 2004):

- Power Distance Index measures how power is distributed in a certain culture, where a higher number indicates that there are more non-powerful members of organisations who believe that power is distributed equally.
- Individualism refers to the level of integration of an individual in forming groups. Higher individualism indicates that the relation that ties individuals is loose, where each individual cares about him/herself and his/her immediate family.
- Masculinity alludes to masculine dominance where the male attitude prevails. Hofstede (2004) contends that men's values tend to be assertive and competitive, while women's values are considered as being modest and caring. So the assertive trait is labelled masculine and the modest and caring trait is feminine.
- Uncertainty Avoidance Index (UAI) refers to the degree of tolerance for the uncertain and ambiguous among societies. Alternatively, it evaluates to what extent the culture influences its people to deal with uncertainty and ambiguity and their effect with regards to feeling comfort.
- Long-Term Orientation (LTO) indicates a society related to thrift and perseverance, while Short-Term Orientation is associated with protecting one's 'face', fulfilling social obligation, and tradition.

Another scholar of culture, Edward Hall, proposed the 'silent language' in 1959 and addressed cultural anthropology. While Hofstede's research was conducted by quantitative methods, Hall used his observation to study culture. Contrary to general anthropologists who usually study a single culture, he focused on the interaction of people from different cultures. Hall attributed culture to communication and vice versa. He viewed communication as the main pillar in the constitution of culture. Relating some cultures on the basis of space and time was also tackled by Hall, where the space tolerance between society members differs from one culture to another, as well as the time respect. Hall

(1976) revealed his theoretical perspective regarding differentiating culture with regards to 'high' and 'low' context. According to Hall (1976), high context cultures tend to have less written information and explicit communication. Additionally, they tend to have long-term relationships and decisions are based on central authority, usually represented by a person. By contrast, low context cultures are rule-oriented with short-term interpersonal connection and activities and decisions concentrate on what is needed, accompanied by distributed authority.

However, Hofstede faced many criticisms from culture scholars regarding his indices and his research was not recommended.. Baskerville (2003) contended that Hofstede equated nation and culture with an existing limitation of his research through understanding the culture, using quantification as well as being an outside observer. So the deep understanding of culture was apparent in his research. In addition, in the world at the time of Hofstede's study, there were two poles of power: Soviet Union and U.S. and there was no European Union at that time, which makes his indices weaker. Another issue regarding the indices is that he considered all Arabs to be one culture, which is not truly accurate. One can easily differentiate between the Arab Bedouins and the Egyptians for example.

Hofstede's Long-Term Orientation index and the Uncertainty Avoidance Index are more related to this research context, since they explain more about the contract and collaboration perspectives within organisation. For example, the LTO of China is high, with medium UAI (Hofstede,1993) which makes it a viable option for collaboration. The latter view consents with Hall's view regarding the traits of high-context culture. This has been affirmed by airlines' executive

(SAD) “I have noticed that westerners think and decide slowly while Asian and Middle Eastern people tend to think and decide fast, but sometime do not reach mature decisions. You need to mix both to get the optimised formula.” Another senior manager (SAG) observed “European Consultancy Companies ..[.]. are very strict and sometimes unfair when they do business. They try to milk you out when they deal with you. They don’t want to show it is a win-win situation. Flexibility, financial viability, and understanding of the culture are all good tools of course.” However, different cultures could act as a barrier when “bringing in multiple cultures, as you are bringing in multiple ways of doing work, methodologies, , priorities, competing priorities within the vendors themselves. So managing all these is not easy, no matter how much effort is put into it ..[.]. both sides need to understand the culture of each other, otherwise just like any other relationship even in life, things in partnership will not work if that understanding is not reached quickly” (Airline executive, SAF).

Furthermore, the research focus will be on the interaction between partners in IT collaborations. That explains why the ASP vendors manage to bring program directors from the same region that they will be working in, which is why they are “trying to bring people who are familiar with culture, like Sabre. They brought the director which was originally [from the same region] the person” as it has been asserted by an airline’s executive (SAA). Airline’s manager (SAN) added “this is a very serious factor and I think Sabre were good at this, they brought employees that share the same ethnics because they will know our cultural way of thinking much better than the others.” However, mixing companies from a different culture in one large undertaking such as MES could generate some risk, such as: “if you take a vendor from the east with their own culture and one from the west with their own culture with a different set of rules

or values, this is a risk area..[.]. Culture may mean you sign the death certificate of your contract being accepted, even before the project starts. I'll give you one example: we had a project and the person who came here thought he couldn't understand the culture of the people here. When he went back he made some allegations against the specific nation here. So what [vendor's director] did was to fire this guy and he brought in another guy because he knew what was going to happen. This other person was better at understanding the culture and he aligned himself with the CEO's views and I think the relationship was better than ever. [...] I believe culture plays a big role in this kind of relationship" as supported by airline executive (SAB). On the other hand, another airline executive (SAC) lessens the effect of culture in such circumstances, stating: "the airline industry is like a community so this culture bit is not much of an issue as opposed to you implementing the government sector, because airlines have one community under IATA. They exchange information on an annual basis and they influence the factors of the aviation industry." The latter notion believes that culture has less effect on the industry. In addition, the vendor manager (SPE) claimed: "From a cultural stand point, it was more of an adjustment here than what I have seen on the other continents. I don't think that it was a huge problem but sometimes like the flexibility, capability was underestimated."

A modest voice from another executive (SAD) stated:

Of course now we are in an open work. When you have a project we get different people from different parts of the world and they speak a different language. Sometime a word in certain backgrounds means something else in other backgrounds, for example 'yes' sometimes means not a complete 'yes'. Sometimes a body gesture is not the same in the other part of the world. These kind of challenges happen at the beginning of the project but over time they disappear, once people sit with each other and understand each other these things disappeared by



the time..[For that reason..] Most of these ASP have a mix of cultures, they bring different people from different backgrounds and this helps to make sure the decision is taken fast and well thought through.

According to Walker (2003) Asian companies show more flexibility when compared to Europeans. This kind of flexibility was shown during the contract between the airline and their partners. While the Indian company Wipro showed the most flexibility, the German Lufthansa demonstrated less. In addition, a considerable flexibility was shown by the American multinational enterprise Sabre. The effect of culture on the flexibility attribute was shown clearly during the implementation phase and post implementation. These Partners exhibit flexibility one way or another, the better the flexibility, the more sustainable the relationship between them. Nonetheless, it is necessary to discuss the kinds of partnership to have a clear view of the effect of the culture fit attribute on partners. For example, “we had one of the project managers in one of the projects without name. After a while we had to replace him because he was not able to understand the culture of this programme..[.].I believe in learning each other’s culture, but differences in culture means I don’t have to be European to deal with a European company or the company doesn’t have to be Middle Eastern to deal with the Middle East” (Airline’s senior manager, SAL). Nonetheless, an airline has to understand the vendors too, it will “definitely help a lot when the airline understands the culture of the company and you know what one thing to think about. It is not just the culture in the sense of how people think or behave or act. It is also the business culture, the company’s culture which is what is important for the company right?” (Vendor executive, SPD).

The literature examined the types of partnership and distinguished between them. Kedia and Lahiri (2007) have categorized the partnership into three main

ones; mainly, tactic, strategic, and transformational partnership, where the tactic is the shortest and the transformational is the longest. The latter partnership has not only long-term partnership, but is also based on the value rather than the cost, with strategic implication as well as strategic partnership. For the sake of this research, the second long-term strategic partnership will be considered, as it expresses more clearly the researched case study.

Since human interactions are one of the bases of long-term partnerships, understanding culture fit becomes necessary. Sometimes this factor is ignored, as it has been asserted by an airline's senior manager (SAG): "It is a strong factor that most of the time is ignored. I don't think this is true if you want to change the culture, now this is important. If you want to change the culture, maybe you go with a company which has a better culture so that it would inject some discipline into your culture ...[...]. Culture fit is not only important for the customers but it is also important for vendors because they are going to invest money, resources and reputation." Existing literature on organisational culture difference has investigated how culture distance may negatively impact the relationship between partners in the domain of technology transfer, cross border knowledge, and alliance performance (Bhagat *et al.*, 2002; Sirmon and Lane, 2004). By and large, the latter argument exhibits that the difference originated because workers in different organisations with dissimilar cultures tend to have different attitudes towards technology assimilation, values and norms. Gurung and Prater (2006) coincide with the latter view and noted the influence of cultural distance as being important when selecting strategic partners.

Apparently, the effect of dissimilarity in culture between organisations will tend to be less over a short period. However, long-term basis partnership is inclined

to have a stronger effect as these type of relationships involve a greater degree of interaction over a longer time period. Therefore, the fewer cultural differences that exist between partners, the better chance that the relationship will last longer. Continuous assessment of the partnerships becomes vital as it resolves any accumulative negative results from the cooperation between the partners (Mudambi *et al.*, 2004)

Evidently, coordination of problems and handling complex communication might be one of the key challenges in a large partnership. Consequently, a thorough understanding of culture fit would allow both to communicate better, taking into consideration cultural view from the ASP side. Those ASPs who possess the understanding of their client's culture sustain better during the deployment of MES. Differences such as business ethics, customs, traditions, and languages will accrue to constitute potential conflict between the two organisations. Willcocks and Fitzgerald (1994b) were consistent with the previous view that IT outsourcing interdependent decisions involving more than one organisation with dissimilar cultures might become problematic.

Narayanaswamy and Henry (2005) in their study considered culture as a principal factor affecting the choice of partners in outsourced projects that have different cultures. Phene *et al.* (2006) discussed the cultural fit issue in relation to international alliances, stating that it will be unlikely to yield innovative results if culture distance is in place. Furthermore, some scholars have examined culture fit from the implementation point of view of IS, such as ERP. Hong and Kim (2002) consider the organisation as a factor related to ERP successful implementation. Davidson (2002) also stressed the cultural misfit issue and considered it as an inhibitor in ERP implementation. To summarise, there is

evidence of the influence of “culture fit” with regard to partnership, which has also been verified in this research.

#### **4.13 Change Management**

Implementing large systems such as simultaneous MES would be a large concern to an organisation undertaking MES business process changes. With such massive changes across the whole organisation, a system is needed to accommodate the employee’s reaction towards these alterations. Therefore, the research will focus on people change management rather than project change management. People change management identified in the literature view in a large system implementation like ERP where desirable employee traits such as flexibility and adaptability are required within the organisation. “But always we have also type of staff that resisted the change and act as stumbling blocks. We were trying to mitigate this through discussion and showing the benefit of new changes which helped a lot,” said an airline executive (SAM) explaining how change management could cause friction when implemented.

Since ERP or similar large implementations usually do not follow the same path due to their enormous size and activities, different assumptions about the nature of changes need to be studied (Roeby *et al.* 2002). This is true for all large deployments because, as the project increases in size, activities and tasks are also increased. Moreover, when engaging more than one vendor the complexity does not increase in a linear fashion but in an exponential manner. “From a deployment point of view, the main difference comes in terms of skill and interaction or the interfaces between the systems so when you are deploying single systems or a series of systems it is a much smaller project. When you talk about platforms or even multiple platforms, then the engagement

is much broader and obviously, the complexity increases several fold it does not even increase in a linear fashion but increases exponentially” (Vendor Director) (SPD).

Al-Mashari and Zairi (1999), with their holistic view of the success factors regarding implementing large systems such as ERP and CRM, agreed with the latter view in highlighting the importance of change management to sustain the success of these systems implementation. The importance of change management is also realised by an airline’s executive (SAD): “Most challenging of the whole broad-spectrum is people, because people are critical to change, you can change system, process, and technology but you need to make a clear cut plan on the people perspective...[...].At the end you want your people to interact successfully with what is coming, otherwise, things could go wrong easily because when you have people who are going to adapt for a change, the change is not managed very well the risk of failure is very high.” Failing to assert that efficient implementation of large systems such as ERP necessitates creating change management strategy for the infusion of the newly ERP business processes, would only mean a higher rate of failure (Al-Mashari and Zairi 2000). Change management became a necessary step after confirming the to partners by an airline manager: “Now if you have selected the solution and process then you need to change the organisation and people.” Another executive (SAF) added: “From an airline perspective or recipient perspective it is a disruptive experience from the time the plan starts or the implementation starts to the time it ends it does take its toll on the airline...[and in future projects similar to MES he would have implemented]... a stronger change management team and a proper communication mechanism to deal with the change of stuff,

better training in negotiation with vendors, better forecasting in business process management.”

A successful change management program means a smooth transition with the least resistance to the new business processes and structures introduced (Cooke and Peterson, 1998; Gattiker and Goodhue, 2002). An airline executive (SAF) established some steps towards a change management programme:

What you need to do is talk, until people believe you. Once they believe you success will drag each other, and start building from inside. It's a continuous process of redesign, evaluation, learning, and updating your process. Update your staff training, get them up to date, and satisfy them. Make sure they are up to your expectations and that of the customer. The only way to do this is to be as transparent as possible to them, even if you want to fire someone or move them, they have to understand and everyone should know. Don't leave them in the dark or people will be scared. People are a first player in any change, if you don't change people you don't change. Remember when we talk about culture.. [another executive added].. Then you also monitor and control on the adoption of these solutions on the ground by these people. Develop your own pace of how to deal with non-conformity during the implementation by the people. After all the system will be used by the people who are using it be it in the airport, sale, office, and everywhere, so it's the people..[.]. If you have many oppositions within your organisation to that change, better trying bring them on board, try to win their trust, otherwise you are putting that change at risk..[.]. Also, proper training in areas like negotiation, change management, also the idea of change management that we should have executives in the airline assigned as change officers where they are given the capabilities and the authority to campaign for the change, sit and plan the change and explain the change to the staff, changing the organisational structures sometimes to fit the new system and processes.

Jesitus (1997) asserted that change management was not only to facilitate the incorporation of newly implemented structures, processes, and systems into an organisation, but also to deal with the resistance that accompanied the change. Another definition of change management is as a tool to manage changes to the organisation from culture, structure, performance measure, and management style (Carr, 1993; Cooper and Markus, 1995; Al-Mashari and Zairi, 2000). “If [change management] is not in the plan properly you won't have

integration, you would have chaos because of change in the process at the same time and the people factor is very important...If you don't focus on the human forget all these IT enablers and all the others...because the people are the source of big influence of resistance, the more you have of a very well thought about plan of change management the better you can implement these systems successfully...We should always focus on people, especially the change management" (Airline's executive) (SAC).

Cooke and Peterson (1998) reported that 54 per cent of organisations implemented change management programs prior to enterprise systems while 78 per cent think that change management should take place before the implementation. Agreeing with the latter view that change management should be communicated to all employees was affirmed by an airline manager (SAJ): "We faced challenges in two parts: 1- the big challenge is in understanding and applying this strategy at all levels of staff, a challenge that also faced from the stakeholder as some of them they were pulling us back. 2- There is no overview from the airline employees regarding the objective [...]. I think the biggest challenge was from the two sides (management and employee) in managing change and it was left for the staff to adapt the changes."

Stressing the technical side while implementing an enterprise technology, might increase the risk of failure of these projects. Both the technical and organisational culture changes should be taken into consideration, as the employees are the building blocks of the organisation (Al-Mashari and Zairi, 2000). Jesitus (1997) agreed with the former view that the less attention paid to change management for the sake of the technical side has proved to be a great source of failure. This has been asserted by airline executive (SAK): "People

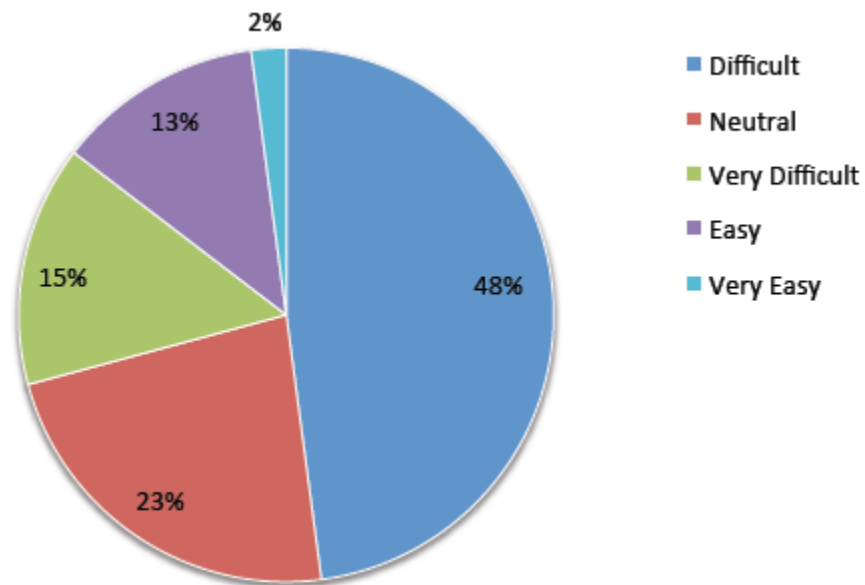
are in their comfort zones and they don't want to change and they see these industry standard changes as a threat to their knowledge and probably to their careers and so on and so forth. So again you have a lot of change management that you need to do.” There is no question that robust change management will reduce the occurrence of friction due to change of business process as well as organisation structure.

Alessio *et al.* (1995) and Ahmad *et al.* (2007) suggested that a pilot project should be undertaken to investigate the criticality of managing the pace of change. The pilot project helps employees understand the need for change and provides a chance for the implementing team to learn from pitfalls and to set the right targets. The implementation team, during and after the pilot project, would be looking at all the details and skills needed for the enterprise project. Additionally, a pilot contract would provide a better insight and deeper exploration of what the organisation will be facing.

Change management is often miscalculated by organisations and undervalued during ES implementation. As it has been indicated by an airline executive (SAA): “The problem was not adopting the systems but the problem was adopting the business processes which took a bit of time to change; this was the problem of change management..[.].The adaptation time took us more than we had expected in the beginning. We envision things will go as planned and probably plus or minus a buffer zone, but because of the change of business process and the adaptation of people, this is where we found out probably the main factor slowing down the implementation process.” Another (SAC) expounded on this issue: “IT change is easy. Process change is difficult but it is not impossible.”



Further, when companies are faced by budgets issues, often change management and training are the first to be affected by budgets cuts. This will certainly reflect negatively on ES implementation, as recognising the essence of problems early in project planning stages will enable the organisation to accept the changes smoothly. Management might engage the employees as part of that success, and reduce the fear among employees by increasing communication. It is only when change is accompanied by staff reduction, shifting responsibilities and new organisation structure that change will seem to be arduous. "Some of them are because people are in their comfort zones and they don't want to change and they see these industry standard changes as a threat to their knowledge and probably to their careers and so on and so forth. So again you have a lot of change management that you need to do" (Airline executive SAK). Airline business manager (SAN) added: "In the crewing area you will find resistance from almost every crew, maybe because something was communicated to the staff wrongly. I believe statements like 'the system is going to reduce manpower' generate great resistance."



**Figure 4.4 Process and Organisation Change, (Panorama Consulting Solutions , 2012:6)**

Figure 4.4 demonstrates that most of the organisations found it difficult to change and accommodate a new business process. Almost 63 per cent of the companies struggled with change as they thought it either difficult or exceedingly difficult. This indicates that the change management factor should be emphasised in such initiatives for implementing enterprise systems let alone implementing multi enterprise systems. “It is so difficult to change the people, it is so difficult to change the process and it is a critical success factor so it does have a very high impact on the project” (Airline manager) (SAH). The project team need to stress a proactive strategy towards firm change with the support of executives. There is no doubt that organisations should engage change management programs as early as possible to reduce the negative aspects of such endeavours. ASP manager (SPE) contended that resistance could arise because of poorly executed people change management:

In other areas, where they have a choice, we’ve seen the tendency to go back to old systems, use the technology they invested in. Significant resistance to change to this initiative seems to come from the top rather

than the bottom so there was not a lot of buying while there were directives, that these are the systems, this is what we are going to do. So from a service provider perspective, we struggled tremendously getting these business units to utilise the systems the way they should be. We found a lot of resistant to change in general. They wanted the systems to mimic what they previously had. There was consulting studies down, there was business consulting training, best process training, it was not literally received so that created some problems

“That is why we had to go through change management, business processes change management where we had to educate and train people that the way they do business now should be different. So implementing best practices was complemented by change management” (ASP director) (SPF). He further added: “the most challenging one is again changing management; we have gone through that because that involves changing the mentality of the employees or the staff on how to use the system.”

However, not involving a change program in the early stages might create reactionary decisions that influence the undertaking negatively. With regards to Figure 4 that shows 63 percent faced the challenge in addressing issues such as organisational and business process change. This was affirmed by ASP director (SPA) “In a multi-enterprise, as far as people are concerned, they are not concerned about the other part. They are concerned about their own enterprise but it is fundamental. It is a very important to be able to have your people change their way of thinking.” Companies should be proactive in raising such concerns in the early stages of a project in order to avoid project creep symptoms. This is why “in any big initiative change management is one of the things you need to implement carefully, and with IT governance and PMO it should be very strong with good support from the business. If that is not there it will not function properly.” (Vendor director)(SPH). An essential factor of change

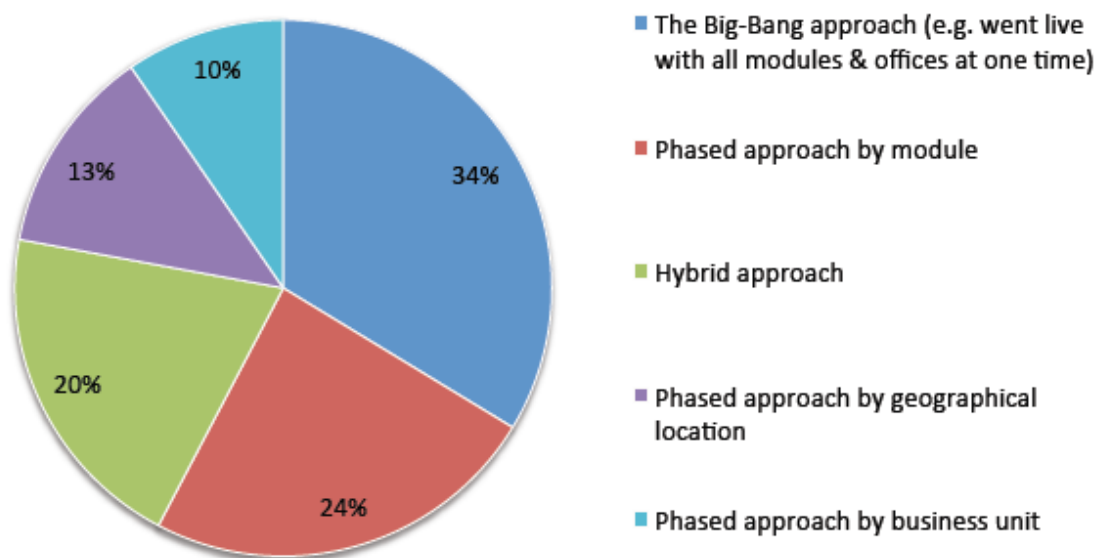
management is to engage the top executive management (SPD) as they are the anchor of a change:

[people change management] is more challenging, definitely, and it requires a lot more effort from everybody and a lot more awareness and support at the top because with every project you will have, especially when you change a system or a process or you change a project, your method or a way of conducting business, no matter how much you prepare an organisation...[...]. So you have to prepare everybody from the top especially the CEO senior executive, look we are bringing these new complex systems but we are going to take a hit for a short period of time, it could be days or weeks or a couple of weeks but obviously, things will recover and start to take off. The business benefits will start to materialise...[...]. It has to be people within the airline who know the history, understand the culture, understand even the players, understand the politics and know also how to navigate all that, so bringing many people on board. Because you will have people on board, people that are excited about it and have people that are not or neutral and you will have people that are working against you, right !, so how do you manage all of that? And I think the airline if it is going to succeed in a multi-enterprise needs to be aware of these factors, needs to have a plan for them.

#### **4.14 Big Bang vs. Sequential Deployment Strategy**

One of the main concerns facing management in IT and business is the strategy they should follow when deploying large software, such as enterprise, systems. What are the strategic methods of implementation? Looking back at these parameters in this study it is clearly a controversial issue. Is it going to be the sequential or the big bang strategy? For example, ERP has many components such as human resource, finance, and maintenance; implementing all of them together considered as a 'big bang' while implement them in phases is considered sequential. The 'big bang' approach is a strategy to deploy all modules simultaneously and this approach could entail more risk; on the other hand, those who are in favour of a sequential (phased approach) are going for that option for the sake of minimising the risk. "It really introduces a lot of risks if you do, you know, if you try and do all these projects at the same time. If one starts to lag behind for whatever reason, it will drag the others back as well, you

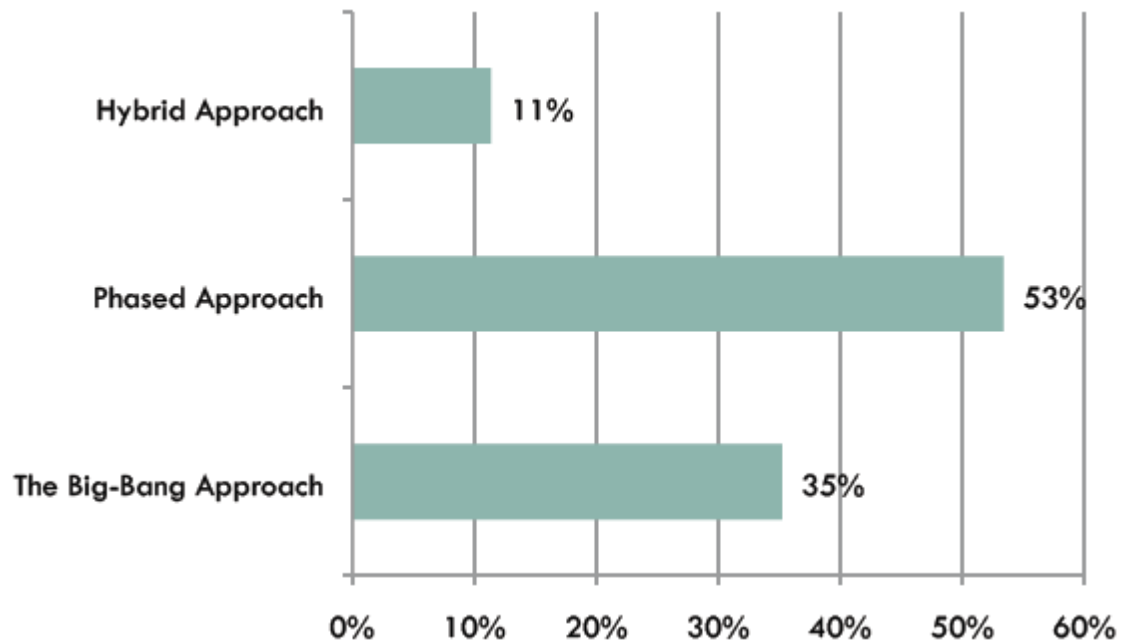
know, because they become multi-dependent. So that if you do it in the multi-system, you are trying to do it at the same time, you are going to risk that if anyone of those streams is forced to lag behind, it will drag the others behind. It is not necessarily the fault of the other one but it is just the way that the whole project is” (ASP director) (SPA).



**Figure 4.5 ERP Implementation Approach (PCG, ERP Report 2012:8)**

According to Figure 4.5 above, the big-bang approach scored 34 percent compared to the aggregated phased (by module, geographical location, or business unit). From the figure, the survey indicated that phased methodology is dominating most industries in their deploying strategies. This approach minimises business disruption and usually addresses change management more than the ‘big bang’ approach. The third approach is the hybrid approach which is mixing both and involves deploying some modules, locations, functional businesses in a phased manner while using the ‘big bang’ for others as the context necessitates. The latter approach achieved 20 percent that indicates it is not popular compared to the other two approaches. However, by

comparing the figure 4.6 below for the year 2011 with the figure 4.5 above for 2012, it could noticed that there is an increase in the hybrid approach due to the pressure of business to achieve objectives in a shorter time.



**Figure 4.6 ERP Implementation Roll-out (PCG ERP Report, 2011:9)**

However, IT professionals and businesses which are in favour of getting a competitive advantage with new IT systems and maximising the benefit of business functionally in a lead time usually prefer the 'big bang'. This was clearly stated by an airline executive (SAA): "This is because we want to catch-up very soon. Because the competitors will not wait for us to go with the long sequential process at the same time interfaces that are needed with old technology and legacy systems and you want to bring new systems which are not compatible with old ones and need a lot of integration in case we need to do it in phases. That's why we put our effort to do it all at the same time to avoid the cost of creating many interfaces with legacy systems." Another (SAB) added

not only the need to catch up with the market but also “one of the strategic goals is to go for sky alliance. If you go separately you would never achieve it, you would wait twenty years to implement all the systems, or it would take so much time modifying the legacy applications to adopt the sky alliance changes.” Another (SAD) confirms this: “One of the most important things to reap the benefits of these enterprise systems is that airlines should be in alliance because this way they will get the benefits fast and easy and they will go the extra mile in terms of the system helping the business to excel.” The creation of interim interfaces caused concern in airline management (SAI) and has been expressed thus: “We go with the concurrent, this will give a lot of benefits to the company be it time, be it cost. If you go sequential, it means that you will build a lot of interfaces and bridges with current systems.”

The latter notion was not different from what was found in the IT literature; however, all the IT literature review focused on whether they implement a single ERP as sequential phases or a ‘big bang’. They mainly referred to one-enterprise systems rather than the multi-enterprise setting. To catch the bandwagon of the technology and business was an objective of the airline: “It will be a nightmare for this airline to integrate. You can understand that the airline business is interrelated and sometimes the passengers fly with at least two or three airlines to reach their destination. And this is the reason that alliances were established because there is a benefit both for the airline and to the user, for the passenger himself because this way things will be easier” (airline executive) (SAD). Conversely, most scholars favoured the phased strategy over the ‘big bang’ for the single enterprise system. This option was chosen “because of the people’s mind-set, the culture is slow, people think of government decree” (ASP consultant) (SPC). Another (SPH) added

“Sequentially is much better it will improve the whole process, it will be accurate and perfect and you will get more support”; in addition, ASP director (SPI) believes that sequential implementation will help staff to absorb technology: “Sequential might be better as it will give people a chance to absorb and learn as they go.” Although we have both views from participants, the majority favoured the ‘big bang’ option mainly because of the interim solution cost and time from new systems and old legacy system.

The ‘big bang’ is the ES implementation which gives a radical changeover, where everybody shifts over to the new functional system on a given date in the whole organisation (Ghosal and Nair-Reichert, 2009). The installation of the new system brings in the change suddenly and this implies that everyone in the organisation starts using the whole system all at once and the old system is no longer used (Newell, *et al.*, 2003). This type of adoption is very risky in comparison with the other types because this sudden and radical change may not be well accepted by the employees (Lkavalko and Aaltonen, 2001). It is also more risky because by default there are fewer learning opportunities which may lead to uneasiness in the employees and they become uncomfortable in their work environment (Kalling, 2003; Kremers and van Dissel, 2000). However, if the software is to be implemented on a single site, the ‘big bang’ adoption strategy would be the most apt as less hassle would be required (Robey, *et al.* 2002).

Nicolaou (2004) in his study found the ‘big bang’ approach has a number of positive aspects, as there is no necessity to integrate both the legacy and new systems. An airline executive confirms this: “We needed to start so we needed these systems in the house as soon as possible that is why we actually got this



concurrent approach which is much faster and much easier than doing... Not easier but much faster than doing them in sequence.” However, when implementing systems in the sequential mode concurrent support to both systems can be a burden on IT and business, costing a lot to bridge the gap. Another issue of concern with sequential methods that they require large resources in a remarkably short time to take care of the new and old systems simultaneously, leading to an increased risk of having total failure in the system (O’Leary, 2000).

On the other hand, Nicolaou (2004) argued that a phased approach was deemed more viable as it would require fewer resources and fewer issues for the company, which is implementing and the company, which is deploying, as limited tasks are spread between the team and this could be planned better for every phase of the implementation plan. Additionally, the learning prospects are greater for each module and could be assimilated easily by the business, taking into consideration the amount of new business processes introduced. Phased implementation facilitates more opportunities to formalise informed decisions regarding cost, risk, and return on investment during the deployment (Nicolaou, 2004).

Conversely, Mornar *et al.* (2010) reported that SAP was in a favour of the ‘big bang’ approach for the sake of simplifying integration without having to mess with the old and new systems. The ‘big bang’ requires a large initial investment in projects, especially enterprise systems so organisations should have enough resources and always be ready to deal with the high risk involved (Zhang *et al.*, 2011). This is in contrast to the incremental phase project, which requires fewer resources and apparently incur lower risk. From a cost point of view, an

executive asserted: "From a purely financial outlook and the outlook that would be presented to investors, the 'big bang' is the way to do it, right? Because it gives you a definite time-line, it shows a definite beginning and definite end and within that stand, you have managed to transform the entire company."

The 'big bang' biased group is in favour of adopting all new business processes encapsulated in enterprise systems without changes (Cotteleer and Bendoly, 2006). One of allies of the 'big bang' in an airline (SAM) affirmed that

"the sequential model would really complicate the matter that you would need to do a lot of integration; for example, if you bring one then you would need to integrate a lot to legacy application before you complete the whole picture. So the sequential model will require to do a lot of plumbing and temporary plumbing and then undo it with the new application that also created complexity. One bang would be good if you managed to get everything; meaning that everything that needs to be changed will be changed. So time all application and do not leave ones behind. I think it is best if you doing complete overhauling. Big bang would require meticulous planning; meaning understating exactly what you want to put in the new architecture."

Another ASP director (SPD) refers to achieving competitive advantage doing MES: "I am replacing everything right? This is, all the old stuff is going to go. This is the direction where we are going, rally the troops, rally everybody to go in that direction. You know you are kind of taking the fastest path to get the best systems in place so you will be ahead of everybody else because everybody else or most airlines try to go the gradual approach."

The author agrees with the latter notion as many changes to enterprise systems could jeopardise the whole implementation, especially in such MES settings where there is high interdependency between systems and modifying one could affect others. Moreover, it is very difficult to test these systems as they belong to different companies and have diverse locations, making the testing environment arduous.

Equally, financial risks could arise in such a complex undertaking with large interdependence of software components involved; nonetheless, this will result in maximising the benefit of processes integration (Beretta, 2002). In addition, simultaneous deployment of all modules will relieve the deployment team from having to be involved in both legacy and new systems with a dramatic impact on resources in the implementation periods. "If you are going parallel, that means you would have a better time to market and you would be able to reap the benefits of your implementation faster but if you go in a sequential manner, take for example SAP implementation, normally this takes in a big enterprise like [this airline], normally it takes like three to four years to implement and then you need two to three years to rationalise the streamline, prove your processes before you get the full benefits of the SAP implementation. We had to face this implementation in two years; our operation indicators are all improving. This is, I think is much related to the multi enterprise system implementation which was going in parallel" (Airline executive) (SAG). In addition, the objective of the airline is the ultimate driver for choosing a 'big bang' deployment strategy. "In our case, it was essential for us and we needed to do a complete replacement of our applications landscape and upgrade our infrastructure within a very short period of time. And we had the objective need for speed and we had the objective of upgrading business processes and we had the need to totally get rid of all legacy applications at the same time" (airline executive) (SAL).

Other views fall in between those suggested by the airline executive: "The real answer is somewhere probably in between. It is neither to the complete left where we say we will do all the projects sequentially nor is just probably to get complete the other extreme to say even though 'big bang' somewhere in between because there are other factors to take into account for instance

interoperability of these systems may not be possible because of different legacy platforms.” An ASP senior manager contended: “Selectively concurrent, this means selecting some of the models or some of the applications. Some of the systems we rely on the previous implementation of other system, so this has to come in a sequential mode.”

Parallel adoption is another strategy for implementing the ES in an office where transfer to a new system from an old is required. This type of adoption is not done all of a sudden but gradually in steps because it reduces the risk of non-acceptance by the employees (Kalling, 2003). In addition, since the old and new systems run simultaneously, the working of the new system can be assessed accordingly and if it meets the criteria, the old system will be disabled (Ghosal and Nair-Reichert, 2009). However, the process requires careful understanding for the new program to be installed and replace the old one (Lkavalko and Aaltonen, 2001). One of the strengths of this type of adoption is the careful planning which requires increased costs and increased labour hours, thus increasing investment from the company management. But one of the supremely beneficial points in this type of adoption is that since the new and the old systems are running in parallel so users can get used to the new system while carrying out their routine work on the old system, and the new system can kick in fully once all employees are trained to use it (Mabert *et al.*, 2001).

The next type of adoption is the phased or sequential adoption which means adoption would happen in several different phases and so after each phase or sequence, the company is close to adopting to the full system (Mabert *et al.*, 2001). This requires organisations to transfer gradually to the new system in different phases or sequential steps (Mabert *et al.*, 2001). The most noteworthy

advantage of this is that there is much less risk involved because the gradual change is in hand of the employees themselves (Ghosal and Nair-Reichert, 2009). However, there is a chance of disruption, which could take a lot more cost, effort, and time for the new system to install. This type of adoption is very useful for multiple business units because other types of adoption might not be so apt (Luo and Strong, 2004).

#### **4.15 Best Business Process Practice (Vanilla) vs. Customisation**

Aerospace industry management is concerned with business process improvement because of the high impact on the cost and performance especially in large airlines, as every business process improvement could be translated into millions of saving. Furthermore, streamlining business processes to compete in the market is one of the chief challenges airlines are facing, and this has directed some firms to implement Enterprise Resource Planning (ERP) and to adopt its processes as 'best practice' to enhance their business practice (Quiescent *et al.*, 2006). Accepting and implementing enterprise systems such as ERP encompasses re-engineering existing business processes into best business practice. As expressed by an ASP vendor (SPE): "The goal here is adopting the business process, the best practice rather than adopting the systems. The systems are for most parts commodities. They are designed with best practices in mind, and any deviation from that begins to create problems. It creates integration problems with other systems; it creates the opportunity to allow bad business practices to creep into the organisation. The higher level of customisation needed to suit the business needs in the case that they are further away from the best practices in the organisation stand point." Enterprise systems are usually constructed following the standard practices embraced by the industry. An airline manager (SAI) further expressed the direction of the

airline: “I believe you do not have to start from scratch, you have to go with improved business process with systems. We had direction from top level that we do not customise the systems to meet the current systems business process; instead, we should adopt the new business processes that come with the system. As we are not buying the application systems, we are buying the business process. Also changes to these systems will impact future revisions and releases as you will stick with a very unique application that is difficult to upgrade.”

One foremost advantage of enterprise systems comes from re-engineering the organisation’s existing approach to doing business. Another executive (SAH) emphasised the adopting of business process entailed in the new systems. “Without having these business processes changed, then more or less it is going to be useless if we are going to continue adapting the current business processes because the point is really not to change the system. The point is to change the way you do business in alignment with these new generation systems. From my point of view, business process re-engineering, as in the early 1990s, have died, nobody would come now and scratch everything and then look again, into what he has. It had its times. It was pop for a couple of years but it has proven to be a failure. What is left as a legacy from the business processing engineering is the focus on business processes. So I believe that to shorten the implementation time, sometimes you just take whatever is available and you just build on it.”

Business process improvement ranked number one on the top priority of IT expenditure in 2009 (Gartner, 2009) which explains the importance of re-engineering business process. This explains the inclination for companies to

embrace best business process practice as an ASP vendor explained (SPG):

“These companies have put into the systems whatever they have learned from different organisations doing the same thing. So I don’t believe in re-inventing the wheel. You have to start from where others have ended and it doesn’t make sense to start from where others have done already. So make use of the experience of others, which is built into the best practice, and then build on it your own practice from your own experiences. Therefore, this makes you have one-step further among others. It would take a long, long time really, to really study the business process and revamp the whole thing, if you have a system like SAP or others that has the best practice; this is basically a quicker way of re-aligning your business processes. It is another way of doing that but you are doing that fitting some sort of a system. So although the initial one is probably more optimised, but it takes longer, I think it is more expensive.”

On the other hand, customising ES through BPR would sometimes impact the airline negatively, especially if the customisation would minimise the chance of addressing the industry standard in the aerospace industry leaving the airline as an odd case with special requirements at every step of ES deployment as well as a future upgrade. The latter notion has been stressed by an airline senior (SAL):

We brought best business practices into the business to wipe out this fragmented view of how to do business. So these new practices that are coming follow the best practices and we insisted into the best practices that none of the changes would be customised to any one’s need. It is the other way round. The business would adopt the practices that come with the business solution, when we brought in an alternative, I mean these large systems okay completely integrated systems, many business processes that were existing before do not exist today. They are gone because of the high automation that was brought in. Actually of all of our programmes that were brought in, were business programmes. We did not call them IT programmes and step number one we did the BPR business programme redesign where the business consultant from the

solution provider coming study the existing processes and benchmark with industry's best practices and identify the gaps and put in recommendations that affect the organisation and the business processes.

According to Dennis *et al.* (2003), most businesses found it highly inconvenient to implement BPR because it is exceedingly costly and time-consuming. Most of all, BPR may be effective, but it requires radical changes in the current structure of the company which may temporarily paralyse the current operations and systems affecting its quality and service delivery (Mooney *et al.*, 1996). An airline executive (SAG) expounded this: "From my point of view, business processing re-engineering, you need it as was put in the early 1990s have died, nobody would come now and you know scratch everything and then look again into what he has. It had its times. It was pop for a couple of years, but it has proven to be a failure. What is left as a legacy from the business processing engineering is the focus on business processes. So I believe that to shorten the implementation time, sometimes you just take whatever is available and you just build on it." Those who believe in customisation to reduce the resistance to adoption and enhance the value of the ES and maximise the advantages of ES's, say it would also generate high implementation costs without foreseeing real gain at the end.

On the other hand, an ASP director (SPA) believes in a combination of both the system business practice and process re-engineering. "You know the systems are really designed with a lot of services, a lot of action in there but you must be able to fully use that system in your processes and device your processes around what these full capabilities are. If you bring in a new tool, it is very important to go through a re-engineering, process re-engineering exercise. As service providers, we can only provide engineering processes. For example if



we have multiple customers so each customer has his own process that he has to do their own thing. So we can guide generally the processes that are used in the aviation industry but we cannot tell you that this is how you should do it because that depends very much on your market. So absolutely, I think the process engineering with the new tool once you have a full understanding of that so it is a must.” Another director (SPC) expounded: “Business processes came with the products, however, business processes involved human beings, who should have been included for instance.”

Given this dilemma, many businesses resort to using and implementing ERP solutions or similar. In a practical context, ERP and similar airline systems can do what the BPR and automation technology can do together but in a much easier way, which is why most businesses nowadays consider applying ERP systems to improve their business processes. This is observed clearly in MES as affirmed by an airline executive (SAD). “Your business process could be your own specific proprietary business process or that business that is developed by the consultants or can be a mix of both. I mean your specific required business process align with the industry business process. Once you select a system or a solution then you have selected the business process behind and hence you need to take it as a whole don’t try to change it because it will be one of a kind. So you will be faced with the dilemma of upgrade and integration, refresh, new versions, new releases it will be a nightmare. So you take that solution, you take also business process model behind it and try to match it with your existing business model. The winner should always be the solution business process model that you have bought not your business process model. I think for the airline to get the benefit for the enterprise solution is to keep refuelling their

business process, I mean if the business process is design for this year is not necessary this business process will be good for the next three years.”

Ramirez *et al*'s (2010) research also confirms that the mix of both IT and BPR have a positive return for organisation market value. Hanafizadeh *et al.* (2009) were consistent with the latter view relating recent investment failures in BPR projects as being due to the non-alignment between business and IT strategies and pointing out that through acceptance of best strategic practices, process redesign can meet the business strategies. Ettlie *et al.* (2005) discouraged modifying ERP systems and were in favour of accepting business processes 'as is' for two reasons. First, the high cost of modifying such systems. Second, there is a tendency to maintain the status quo within a firm keeping the current business processes as it is. In addition, this will profoundly minimise the project complexity and avoid project creep (Umple and Umble, 2003).

When a company decides to introduce an ES in the company for better performance and to improve business processes there are two main options to consider. The company can opt for a vanilla ERP which is not customised as per the requirements of the company, where after employing this ES, changes to business processes so that it conforms to the processes defined in the ES application software (Parr and Shanks, 2000). The second option is to go for custom made ES application software that is specifically designed for the use of that business (Grossman and Walsh, 2004). There are various pros and cons for both kinds of ES application software. Although the vanilla software application could save a lot of cost, it could be difficult to conform to the business processes defined in it and the employees could have problems adapting to new business processes (Luo and Strong, 2004). On the other

hand, the customised software may be comparatively difficult to design and implement as per the system requirements, but it would save a lot of hassle that could be caused by adopting and conforming to vanilla ES application software (Ghosal and Nair-Reichert, 2009).

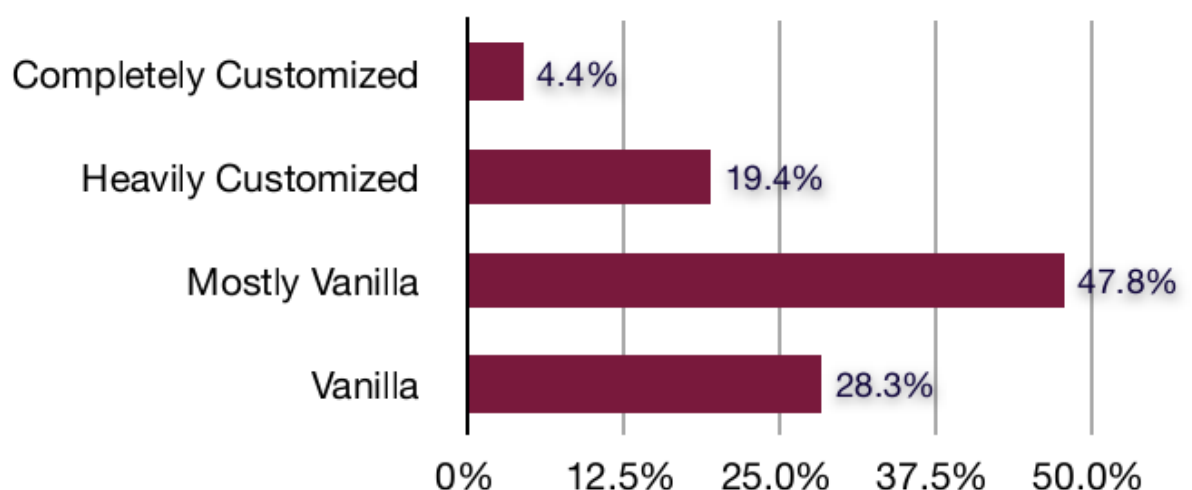
#### **4.15.1.1 Customisation vs. Vanilla Package**

	2010 %	2011%
<b>Completely Customised</b>	4.4	3
<b>Heavily Customised</b>	19.4	4
<b>Mostly Vanilla</b>	47.8	78
<b>Vanilla</b>	28.3	15

**Table 4.4 Customisation of ES VS Vanilla ERP Implementation (PCS, ERP Report (2010, 2011))**

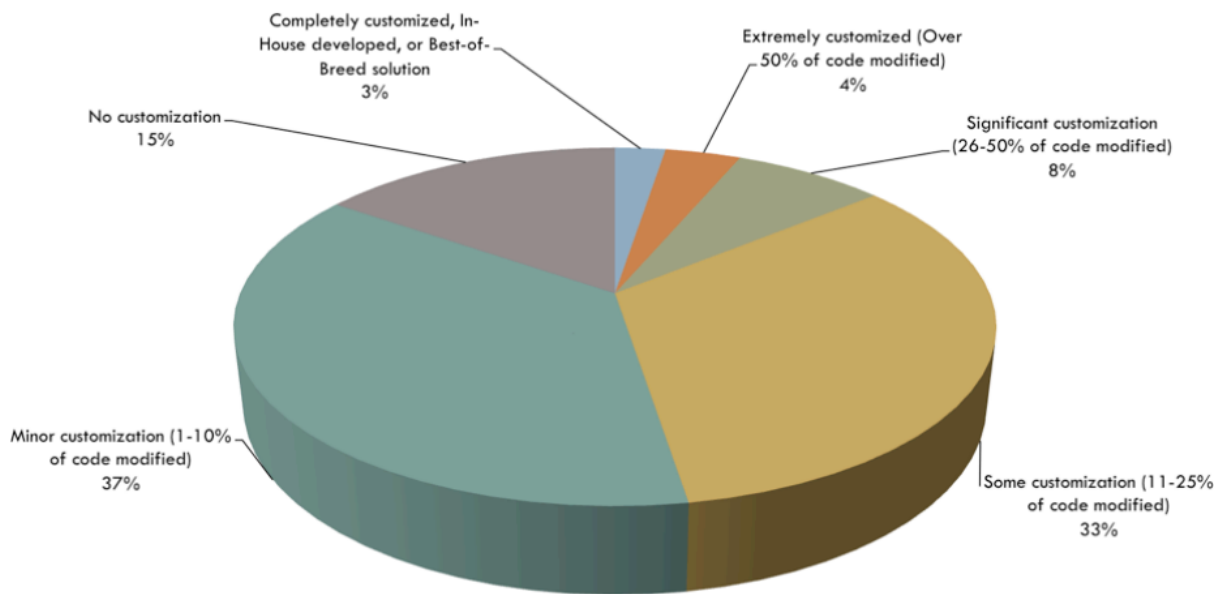
Table 4.4 above shows some trends regarding customisation of ERP. Fewer companies have the inclination to exercise a completely customised approach while imposing popularity has a tendency to stick as much as possible to Vanilla version. The majority of the companies in 2011 preferred to customise the ES while keeping the spirit of the vanilla version. By contrast, 2010 has fewer organisations interested in a mostly vanilla approach than year 2011 while keeping the pure vanilla version more than year 2011, 28 and 15 percent respectively. As emphasised by an airline executive (SAD): “If you follow it intelligently, I mean if that business process is aligned with your business objectives, with your strategic plans, with your line of business then it should be ok, but if this best business practices contradict your main line of business in some areas or it is affecting badly your strategic or it is dramatically affecting your ability to compete then you need to change I mean you don’t go out of it totally, but you change to adapt to your need.” ASP director (SPD) stated: “You

know you try to bring in maybe 80 per cent of the industry standard practice and allow room for your unique cultural or things that set you apart from the rest of the industry. So I think overall, also you don't want to be too different from everybody else because airline organisations exist at different levels whether it's in IATA or ICAO or even when you take the Sabre community. Indeed, the most challenging part is adopting the business practices to the new practices that are supported by the new solutions. Now when you bring so many systems together, you can't always get these systems to interact with each other. This impact how department interact with each other. We want not just implementation of new systems we want also business process redesign or re-engineering because you want a change in your process to adapt to the new systems. Obviously, these systems are community based systems. They are used by a large number of airlines. So they do conform to standard practices and to do it this way is much better that obviously to do it the other way where you let the business go on their own and then you build a custom solution for them."



**Figure 4.7 Business Process Improvement Focus during ERP Implementation**  
(PCS ERP Report, 2010:7)

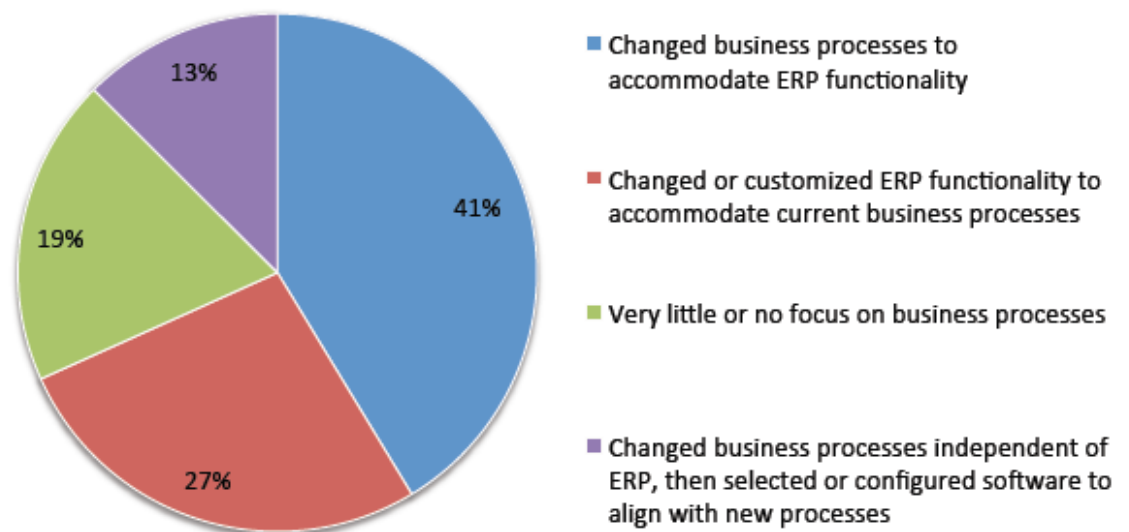
Figure 4.7 above shows that as few as 25 percent of the organisations have opted to completely or heavily customise the ES package. Nonetheless, most of the companies have the tendency to opt for some customisation and try their best to be close to the vanilla package. Roughly half of the companies categorise under mostly vanilla. An airline executive (SAA) affirmed: “We did a mix of both because the customisation in terms of our business process, and took Amadeus as best practice for the passenger management system and we look how it will fit into our business process and we did our own customisation for the local issues like implementing SADDAD payment systems and integrating it with our systems.” Almost a third (28.3 percent) of the firms opted to deploy ERP with no customisation. The low percentage of companies with heavy customisation is due to the fact that ES systems are inherently expensive and complicated when it comes to customisation, not just because this is very complex, but also tend to delay the overall deployment periods. Since no package can meet all the requirement of companies out of the box, customisation is becoming inevitable; what is more significant is, how much customisation is needed. Many companies understand the influence of customisation on the ES deployment as being attached to risk. The figure reported that the majority of companies tried to avoid such a risk at all cost. “Of the shelf products whether it is a business product or application will never fit your requirements as you define it now. But you might want to sacrifice 20 or 10 percent of your business process or objectives if you think that off the shelf practices are suitable for your core requirements” (airline executive) (SAB).



**Figure 4.8 Business Process Improvement Focus during ERP Implementation (PCS ERP Report, 2011:11)**

From the figure 4.8 above, 15 percent of companies have opted for a vanilla package as compared 2009 (28.3 percent) which indicates that more companies are choosing the customisation approach. Almost all (85 percent) the firms have chosen to customise the ES product with two thirds of them opting to customise between 0-25 percent. Although customisation has always been a prime reason for delaying projects and extending budgets, the pure vanilla version was clearly not the desired option for most of the companies participating in this survey. An ASP director (SPG) provides some insight with regards to the vanilla ES that it is the “disadvantage which I believe is not a major thing because the disadvantage into this is that you would have to put some time into tweaking or into change management activities that needs to be done on your organisation to fit the best practice.” Another executive (SAD) added, “So you will be faced with the dilemma of upgrade and integration, refresh, new versions, new releases it will be a nightmare. So you take that solution, you take also business process model behind it and try to match it with

your existing business model. The winner should always be the solution business process model that you have bought not your business process model. I think for the airline to get the benefit for the enterprise solution is to keep refuelling their business process, I mean if the business process is design for this year is not necessary this business process will be beneficial for the next three years.



**Figure 4.9 Business Process Improvement Focus during ERP Implementation (PCS, ERP Report, 2012 :4)**

Figure 4.9 above indicates that ERP predominantly (41 percent) influenced organisations' business process, which indicates the strategy and expected advantages reaped by this approach as conceived by industry. Few deployments (about 13 percent) have new business processes as a result of

business process re-engineering accommodating the ES implementation. On the other hand, there a marginal figure for organisations that tended to customise their ERP package by changing the software to match their local business process. Those processes which provide a competitive advantage should be kept as they are, as changing them would jeopardise what most companies strive to achieve and would work against the strategic objective of the purpose of having ES in the first place.

One reason companies opt to customise is to reduce change resistance when adopting ES packages and to please the staff more. A downside of customisation might be including an unnecessary, inefficient business process which might need re-engineering. Another is customisation being different from the industry standard; however, customisation might be necessary if it fell within the core of business of the company and provided a competitive advantage over rivals. An airline executive (SAB) commented on the software package and core business process: "Is it going to give me the core module or I'm going to lose on the core side. If I will lose on the core side I will step back, if I am losing from the boundaries, a few functionalities I can work around then I would go for off the shelf."

#### **4.15.1.2      *ES and Organisation Business Process***

Enterprise systems have been very useful in the information technology market place recently and their usefulness and significance in easing the business processes has not been overstated in the previous literature (Zwieg, *et al.* 2006). ES represent a key to a total restructuring of the organisational structure and processes from manual to automation to achieve integration of the structure, process, systems and information. This was confirmed by airline



executive (SAA): "In order for us to utilise fully the new systems you need to adopt the new business processes and the policy and procedure. You are training people to use the system and the same time to change the way they have been doing business for a long time. This is not an easy thing to do, it is a challenging, and we face problems." Another executive (SAC) commented, "This is important so when there is an enterprise change it could help you accomplish your objectives faster which is really moving the people (the user department) in the departments to a new platform. Like I said you are not only bringing in a new IT but you are bringing also a new process." On a societal level, the ES phenomenon seems to be a total renewal of the IT infrastructure in organisations with potentially positive economic, technical and social consequences (Uwizeyemungu and Raymond, 2009). An ERP implementation in an organisation may lead to a more than 60 per cent reduction in accounting procedures because of no more duplication of data entry. Similarly, ES leads to consolidation of tasks, which minimises the time and effort consumed to complete various tasks in the organisation (Gupta and Kohli, 2006). In addition to this, strategic analysts have speculated that the widespread adoption of ES in organisations leads to the elimination of wasteful activities which can ultimately lead to a basis for competitive advantage (Gupta and Kohli, 2006).

Due to the many known reasons like richness of the data, other potential and functional uses of the ES and its positive influence to the business processes, it is not surprising that firms around the globe are adopting these systems rapidly (Kremers and van Dissel, 2000). The advent of ES in organisations reduces the use of mainframe systems and thus system costs (Newell, *et al.*, 2003). Organisations implement ES because they feel a strong urge to increase the system capacity so that growth can be increased. Hence the companies are

influenced both technically and through the efficient and effective business processes by the proper implementation of ES (Dillard, *et al.* 2005). This is supported by airline executive (SAD). “Now if we look at the other hand with the enterprise systems or let’s say shared platforms and the reservations, the inventory and departure control and operations also and if we look into this model, first of all it has been built with the experience of the company or the vendor who own that that platform plus the participation of many airlines and consultancy houses. So they will be carrying the industry best practices in terms of business processes. And that one is a good thing about it I mean when you contract or buy that kind of industry platform, you are also buying with it the industry best practices and it will be easier for you to adopt and change your business practices accordingly because you will be following their best practices and adhering to. The other thing is that it will be easy for you to interact with the other partners and your alliance also and easier for you to expand in terms of scalability, refresh cycle, maintenance. You will elevate so many worries.”

#### **4.16 Project Management**

Project management is recognised as a specialised form of management where it is used to attain a series of business work tasks, strategies and goals encapsulated in outlined schedules, budget, and time. Its essence is to facilitate achieving companies’ strategic goal to be competitive in the market. Obviously, project management is an axiomatic tool used when executing any IT project regardless of its size. This study will focus on project management (PM) related to change management and some planning at stream level (level of implementing certain components of a larger system such as implementing crew management system in a Sabre enterprise system). Confirming the latter, a senior airline manager (SAG) stated: “Your project is a failure as simple as

that without proper project change management, because for any change, you can change the process, you can change the technology you need to change the people.”

For this study, a senior executive (SAF) affirmed the undertaking: “It is definitely disruptive. I mean no matter how well it is planned and how well it is executed, it is disruptive. You are bringing in multiple cultures as you are bringing in multiple ways of doing work, methodologies, the trend, priorities, competing priorities within the vendors themselves so managing all these is not easy no matter how much effort is putting to it.” Various literature reviews have indicated the importance of PM in enterprise systems especially ERP where many have included PM as a critical success factor in enterprise systems deployment (Davenport, 2000). The project manager role emerged as salient and can have a serious aggregated effect on overall MES undertakings. The critical success factor in enterprise implementation mentioned in most of the studies related to ERP was project management capability. Furthermore, some scholars have considered the project manager’s knowledge and experience of enterprise systems such as ERP to be the most important factor affecting the success of enterprise implementation (Trepper, 1999; Nah *et al.*, 2001; Ngai *et al.*, 2008).

Project management underpinned by skills and knowledge in managing efficiently and effectively all the resources available before, during, and after the deployment besides the coordinating and scheduling skills, surely have a appreciable effect on MES. Due to the immense complexity involved in MES initiatives and the high interdependencies generated from the overwhelming number of tasks, an effective project management emerged to be absolute necessity. “A lot of different elements within a project or which are concurrently

happening as opposed to in a linear way, then you really need to be very careful but the core thing is that there will be a lot of more risks identified which have to be very close monitored and very closely dealt with as they become issues” (Vendor director) (SPA).

Nonetheless, without having skilled project managers such projects would fail as they are the people who endorse organisational support by shaping the implementation process. Project management capabilities encompass leadership to plan and govern project tasks, schedules and responsibilities (Sumner, 2006; Ngai *et al.*, 2008; Snider *et al.*, 2009). Furthermore, Srivannaboon and Milosevic (2006) contended that project management was not only important in any implementation but also affected business and IT alignment. They focused on various project management elements such as organisation, process, tools and metrics which in return help in blending the IT and business together. Kumar (2003) also emphasised that project management that related project success with built in key performance indicators such as reduction in the work force or increase in performance had more success.

Project size does reflect massively on the success of any project, and large scale projects become difficult to manage; however, applying project management in enterprise system projects is regarded as being even harder (Alleman, 2002). Kumar (2003) argued that wide implementation of enterprise systems and the high risk associated with heavy commitment of resources made the project management far more complex than any other software packages. By no means would single enterprise compared with multi enterprise systems deployment in this study; especially, with such a magnitude and extra

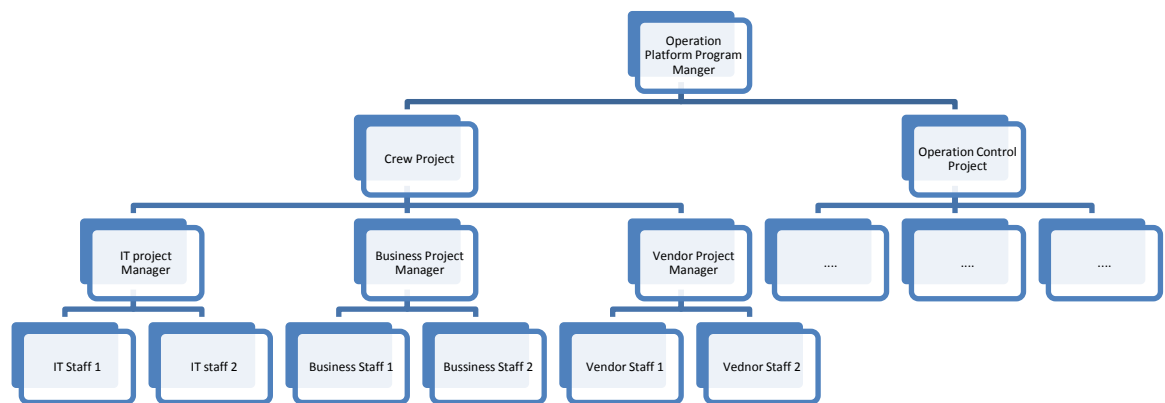
interdependency generated from the nature of MES. This was expounded by ASP vendor (SPA): "It really introduces a lot of risks if you do, you know, if you try and do all these projects at the same time. So it is really a lot of, I think the key point is it introduces a lot more risks which leads to very close monitoring and management." Airline executive (SAM) upheld that "[b]ig bang would require meticulous planning; meaning understating exactly what you want to put in the new architecture, taking your time in doing that." Vendor director (SPD) further added: "The main disadvantage is the risk of it [the MES undertaking], because if everything is not planned out carefully, the impact on the business could be severe or can be prolonged."

Project management in multi-enterprise implementation should offer adaptability and agility to sustain the ever-changing tasks and cope with a large number of processes, supported by a project management office and effective IT governance. Nonetheless, Alleman (2002) contended that having responsive project management methods will give better stakeholder participation, increase in business value, and improved returns on assets.

Project managers and teams influence the success of the overall endeavour and their indispensable role has been revealed in research regarding enterprise project management. This was confirmed by Snider *et al.*, (2009) in their study on the influence of project managers it was found that successful cases were devoted to program manager capability and skills. They also suggested that the project manager role was more successful if handled by an external consultant. However, Dezdar and Ainin (2011) not only related the project manager role to the success of ERP projects but also his team. Ara and Al-mudimigh (2011) agreed and regarded the project manager as one of the prime principles for

ensuring success of ERP implementation, suggesting he should have traits such being flexible, decisive, a quick learner, popular, and disciplined, with business and technical experience and political influence. Furthermore, they identified that the project manager should focus on fostering the success of the enterprise project. A senior ASP manager (SPF) contended that MES initiative “comes down to the programme management, to the project management to the project teams and that is from both parties from the vendors and the airlines. If you have good project managers, if you have good programme manager, if those guys can talk to each other properly, if the chemistry between these guys really works, I don’t see any problems.” Project manager should emphasise on the following areas defining the scope, interfacing issues, identifying gaps, project scheduling, and progress monitoring (Trepper, 1999).

Moreover, the success of such enterprise projects depends heavily on the project team members as the enterprise systems covers a wide spectrum of business processes, thus requiring a multi-skilled implementation team (Davenport, 2000; Kumar, 2003). The constitution of the team varies from one organisation to another; in this study, the teams were formed on the basis of three categories: first was the IT representative, second was the business representative, and finally the vendor representative. “As you may know for each of the initiatives we had a project manager for that initiative and the project manager was made a sort of the owner of the project and he would coordinate with the vendors” as it has been explained by an airline executive (SAK). Every stream is guided by the three project managers who have their own team as in the figure below:



**Figure 4.10 A Sample of Organisation Structure for a Platform**

Figure 4.10 above shows an example of an operation platform with many projects running at the same time. These platforms are headed by two program managers one from IT and the other from business. The final say always tends to be the business manager in all cases and they decide whether a certain project is to go a live or not. On the other hand, IT is holding a co-pilot and co-share position to make sure that alignment at all levels is happening, bounded by the organisation's strategy and business goals. Therefore, each platform is managed by two program managers and there will be many projects under each platform. Each of these projects teams consists of three project managers whose prime role is to manage the project collaboratively. All issues are raised with program managers which in return report to PMO. A senior airline manager (SAG) confirmed: "The areas where the IT guy was weak and let the business lead and you can check that, all of these projects have failed and projects that have very strong IT project manager and was leading the business making the business in the lead but he was leading from behind, these are the areas where

IT had the best successful factor or the big success right. We think it is an important factor but it shouldn't be the only factor so in some of the cases we have people who have good knowledge of the business but zero project management.”

Changing the scope of the project might be one of the most cumbersome parts when handling enterprise systems project management. Modifying the scope during project implementation is becoming an inevitable process for the wide business process spectrum the enterprise systems covers. It is challenging to manage these changes especially when many separate projects are run by different (project managers, companies, locations) are executed in parallel and have dependencies on each other. Nah *et al.* (2006) emphasise defining the scope of the project in ERP projects and other authors considered this vital also; however, as enterprise systems run in parallel, defining scope seemed impossible knowing the number of tasks and activities required. It is always a debate between clear scope definition and time allowed for the task. In this study, the question arises of how much time is required to calculate and plan for the scope; considering the size of such an undertaking it is likely that a new version will arrive before defining the scope. In such situations, it is always a compromise between time and plan.

Evidently, in such projects, the challenge is not to come with the best scope plan but how to handle the changes in the scope most effectively. The vast number of parties included in MES makes coordinating tasks across different enterprise implementation an arduous task. Various collaborations have to be facilitated with internal and external stakeholders to ensure a delivery of homogeneous solution to the vast majority of end users in the organisation.



Umble and Umble (2003) elaborated on excellence in project management in ERP as having a clear objective, plan and enough resources to avoid “scope creep” that jeopardises the overall project progress and obscure the implementation.

Zhang *et al.* (2005) proposed five prime factors that should be taken into consideration when executing ERP projects: a formal implementation plan, a realistic time-frame, periodic project status meetings, an effective project leader who is also a champion, and project team members who are stakeholders. So the project manager has to plan by having in mind clear objectives and realistic project deliverables and milestones, as well as enforcing a measuring scheme for the result beside KPI for the project. Reference to the five factors constitutes a solid practice that should be followed in exercising project management for enterprise systems as well as MES.

Sarkis and Sundarraaj (2003), in their empirical study, emphasised factors that promote project management such as periodical meetings between solution provider CEOs with IT and business leaders, other participants from different companies who had similar implementation, and key people from business in implementation teams, besides the supervision of executives on these teams. On the other hand, Parker and Skitmore (2005) argued that one of the most devastating factors in project management is the ‘turn over side effect’. The results of their study suggest that turnover happens mainly during the execution phase of the project life cycle for many reasons such as personal development, career, and dissatisfaction with current job. They also confirmed that turnover interrupts and emerge negative symptoms on the project life cycle and the performance of the project team and possibly negate the competitive advantage

of the company deploying the project. These negative signs are due to the project manager role discontinuity which could delay the project. This issue has been an agony to some streams of MES as the vendor project manager kept changing. The problem did not arise from the change itself but rather from the handing over to the new project manager. The procedure of handing over to only covered current issues and tasks, leaving the history of issues and experience of resolving problems off the new project manager's radar. This syndrome became a plague on very long projects as they have low employee retention particularly of project managers. A project manager who leaves the organisation takes the project knowledge and information with him. Since MES is an exceptionally long project, turn over tends to be high in some areas which affects the business.

No doubt, the project management tool is not robust enough to handle such initiatives if not coordinated with other tools such PMO, IT governance, executive empowerment to project team and change management process, IT capability, and slack resources. The argument for these factors and their coexistence value will be discussed in the concluding chapter 6.

#### **4.17 IT / Business Alignment**

It is known that achieving competitive advantage in a stiff market towards increasing business performance and effectiveness, jointly with innovative software, has raised the consciousness of both business and IT managers in regards to their strategic management and planning. The benefit of these fruitful ambitious aims would not be feasible without suitable alignment between business and IT. An airline executive explained IT / Business alignment as “If

we go one step back saying your strategic goals will be achieved if you have them aligned with your business goals and IT applications.” In broad terms, IT and business alignment refers to the harmonising, supporting, and preserving coherence of both goals and strategies of business and IT. In fact, the whole project of MES was a set of visions of senior executives aligned with IT to accomplish an increase in business performance and to attain competitiveness in the current market. Additionally, a complete harmonisation between business and IT could lead to an increase in financial return from IT capital investment, which also leads to a reduction in conflict between them, eventually achieving competitive advantage (Papp, 1999). Another executive (SAG) affirmed the enthusiastic support they are getting from business and circumstances they had with MES “unfortunately the window for opportunity was short. We had big support from the high economic committee which is headed by the king and they have a plan to privatise the airline and we have the full support you know, the money, new director general so you have a certain window and they have certain expectations within a specific time frame so it is mandated that the change has to take place in parallel”

Knowing that IT and business alignment is one of the top concerns of both business and IT executives as it leads to stronger performance and reaps more benefits of IT (Luftman *et al.*, 2005, Chan *et al.*, 2006), it was necessary to have such alignment before engaging in such a large and extremely complex project such as MES. This was stated by vendor director (SPD): “an inter-multi-enterprise project cannot be just IT driven no way it will succeed if it is only driven by IT, it needs to embrace IT. At the end of the day, IT is the facilitator right? You know just make things happen for the business, the ultimate is the end user of the business and they need to embrace, they need to feel that I

have something at that stake.” Another airline manager (SAJ) stressed that “[i]f we leave it for the IT, IT might build something that will not suit the business. It is not the IT does not know the business it just because that is not his specialisation.” Various studies have investigated the nature of this alignment and built up models like the Strategic Alignment Model by Henderson and Venkatraman (1993). It was found that IT and business alignment are related to the nature of the industry (Khaiata and Zualkernan, 2009). Luftman (2004) proceeded further in proposing the Strategy Alignment Maturity Model to enable businesses to show how mature their alignment with IT strategic planning is. In addition, Avison *et al.* (2004) altered the Strategic Alignment Model (SAM) and offered detailed steps of how to assess the company alignment based on their executive feedback. Likewise, others like Bergeron *et al.* (2004) have recognised 29 elements to assess IT strategy and its alignment.

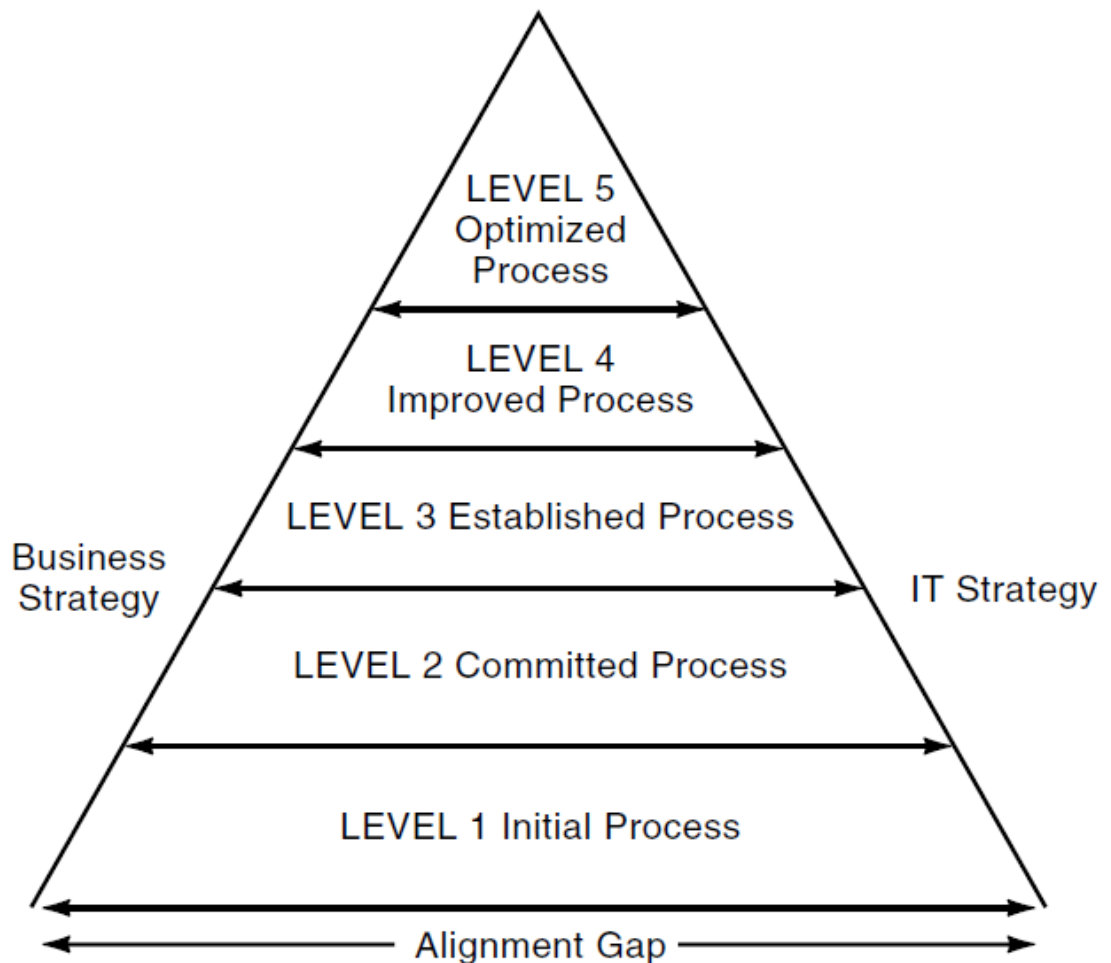
However, the model suggested earlier by Henderson and Venkatraman (1993) has prevailed in most cases, but criticised cases where the strategy had been planned ahead or developed only by CEO and CIO executives (Shpliberg *et al.*, 2007). Nonetheless, Shpliberg *et al.* (2007) show also in their study that three quarters of the respondents firms believed that IT capability was not highly aligned and ineffective. Many scholars have identified the need for such alignment and its measurement (Henderson and Venkatraman, 1993; Luftman and Brier, 1999; Silva and Hirschheim, 2007). SAMM offers that IT business alignment can be measured according to the six areas of maturity:

- Communication maturity
- Competency / Value measurement maturity
- Governance maturity
- Partnership maturity
- Scope and architecture maturity

- Skills maturity

Source: Luftman (2003: 5-6)

For each of these topics, this maturity model categorises the alignment between business and IT into five levels, as shown in Figure 4.11 below.



**Figure 4.11 Five Levels of IT-Business Alignment (Luftman, 2003: 6)**

The first level is the Initial/Ad hoc Process where IT and business are not aligned. After that, the Committed Process is where the business declares the commitment to become IT aligned. Next is the Established/Focused Process where the focus on the business objectives comes with alignment between IT and business. Afterwards, the level of the Improved or the Managed Process is the point where IT is becoming a valued central feature of the business, instead

of merely supporting it. Finally, is the Optimised Process, also known as the Co-adoptive Stage, where IT and business strategic planning is integrated. This is also been detailed in Figure 4.12 below.

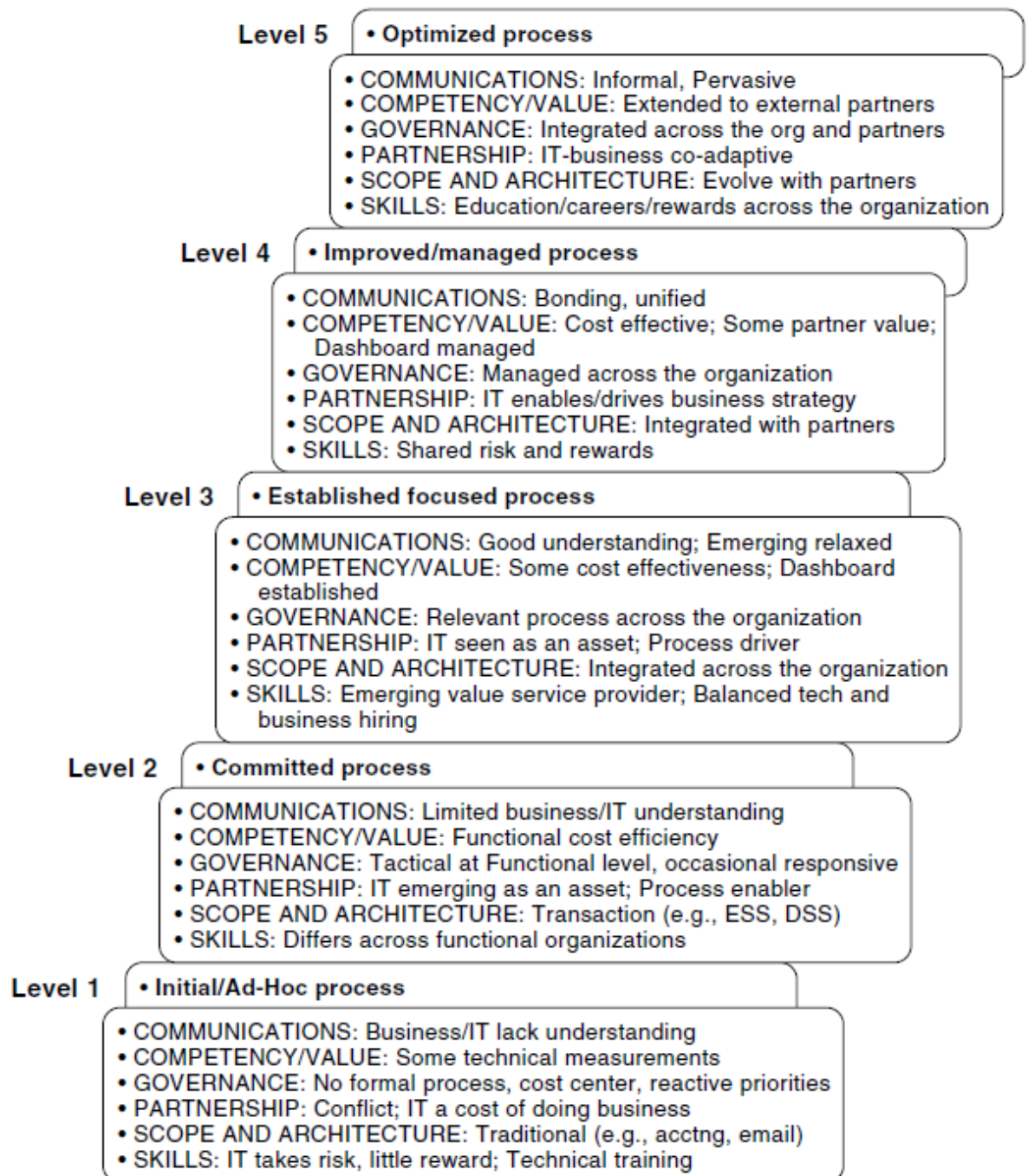
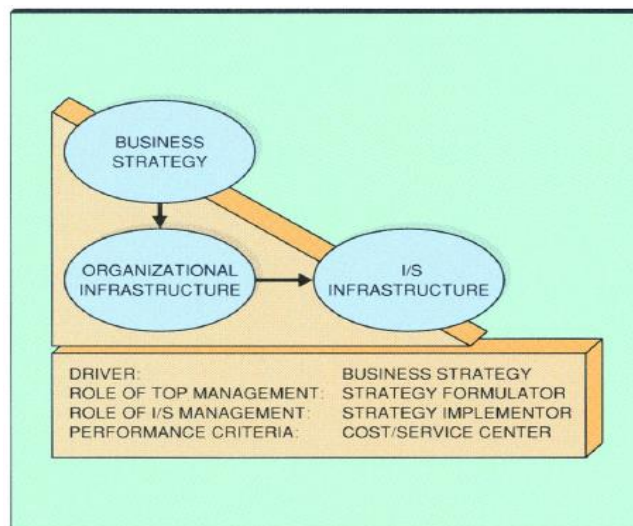


Figure 4.12 Strategic Alignment Maturity Detailed Steps (Luftman, 2003: 20)

Henderson and Venkatraman (1993) elaborated on the interaction between business and IT in regards with alignment and depicted the engagement of IT in each level. An ASP director (SPH) expounded on this interaction “you see how capable you are there are a lot of dependency on the [airline] business, [airline] IT, interaction collaboration between them. How hard the capable manager tries to glue them together it is a great big challenge here..[.]. The business understanding is the major thing and then the interaction between IT and business is a major thing.” Figure 4.13 below refers to the classical view of IT engagement into business and organisation.

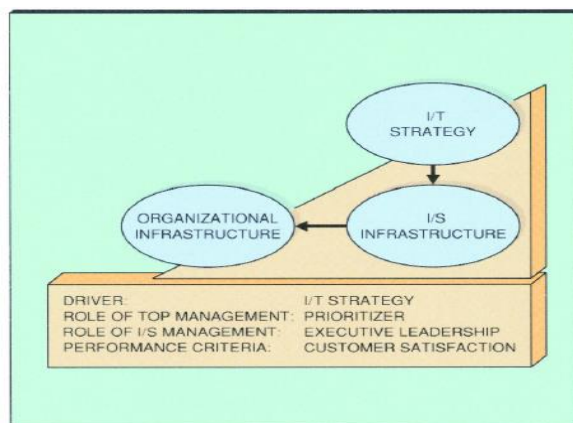


**Figure 4.13 Classical View of IT and Business (Henderson and Venkatraman,1993: 477)**

According to Henderson and Venkatraman (1993), the alignment is categorised into four stages as below:

1. Strategy Execution: this stage refers to the perspective of the classical view of strategic management as it assumes that business strategy is the driver and source of strategic decision and that IT is only a strategy implementer.

2. Technology Potential: the business is also considered as the driver here. However, they provide the vision for the IT strategy and the role for IT here would be the design of such vision to be consistent with business strategy
3. Competitive Potential: utilisation of emerging IT capabilities are indicated, as well as their influence on the business. Doing this allows IT strategy to modify the business strategy according to the emerging IT capability. For example, nowadays it is possible to use smartphones as purchasing terminals, so businesses could underpin this facility in their business strategy.
4. Service Level: as shown in figure 4.14 below signifies the focus on IT and views it as a central point in business strategy. Even though the role of business strategy is imperative, it is not sufficient enough to drive the IT strategy and achieve the best utilisation of IT resources.



**Figure 4.14 IT and Business Alignment at Service level (Henderson and Venkatraman, 1993: 478)**



Alignment Perspectives	Perspective 1: strategy execution	Perspective 2: technology potential	Perspective 3: competitive potential	Perspective 4: service level
Domains				
<b>Domain anchor</b> (i.e. the driver of change)	Business strategy	Business strategy	IT strategy	IT strategy
<b>Domain pivot</b> (i.e. the area that has the problem or opportunity that is being addressed)	Organizational infrastructure	IT strategy	Business strategy	IS infrastructure
<b>Impact domain</b> (i.e. the area that is being affected by the change)	IS infrastructure	IS infrastructure	Organizational infrastructure	Organizational infrastructure
<b>Empirical evidence of alignment in:</b>	Designer enterprises and builder enterprises	Designer enterprises	Designer enterprises and builder enterprises	Builder enterprises
<b>Performance criterion</b> (or the management orientation)	Cost/Service centre	Technology leadership	Business leadership	Customer satisfaction

**Table 4.5 Summary of Evaluation of Strategic Alignment for Medium-sized Designer and Builder Enterprises (Hua, 2007: 167)**

Table 4.5 above summarises the four alignment perspectives vs. domains in order to delineate empirical evidence of alignment and indicate the performance criterion. In reference to our MES study, it matched the service level as the IT took the lead, supported by business. This was the vision of the CEO as his attitude towards IT influenced the whole MES project.

On the other hand, Rathnam *et al.* (2004) argued that having an improved business strategy and vision have enormous potential for improving alignment between IT and business strategy alignment. They also found out two elements that influence the alignment greatly: (a) to develop robust business architecture, and (b) to launch a detached and centralised IT department. Nonetheless, it was suggested that applying a mix of mature IT governance practices clearly improves business IT alignment (De Haes and Van Grembergen, 2009). However, those which indicated high alignment only achieved this by embracing IT governance years ago and respecting a so called IT governance culture as a day to day activity (De Haes and Van Grembergen, 2009). Chan *et al.* (2006) added that alignment between IT and business is also governed by shared

domain knowledge and prior IS success. In addition, they also supported the expected result of alignment support organisation performance.

Table 4.6 below summarises studies that reflect IT/Business alignment and factors that influence the success of such alignment:

Reference	Rationale of assessment	Antecedents of alignment factors	Related factor(s) in alignment maturity model
<b>Reich and Benbasat (2000)</b>	Analyse the social factors of alignment	1. Shared domain knowledge 2. IT implementation success 3. Communication between IT and business executives 4. Connections between IT and business planning process	Communication Partnership Communication  Governance
<b>Hussin <i>et al.</i> (2002)</b>	Analyse alignment for SMEs	1. IT sophistication 2. CEO commitment to IT 3. External IT expertise	Governance Comm./Gov./Part. Not related
<b>Chan <i>et al.</i> (2006)</b>	Analyse factors affecting alignment across organisational types and strategies	1. Shared domain knowledge 2. Planning sophistication 3. Prior IS success (IS department track record) 4. Organisational size 5. Environmental uncertainty	Communication Governance Partnership  Not related Not related

**Table 4.6 Antecedents of Factors Affecting Alignment (Gutierrez *et al.*, 2009)**

#### **4.18 Partners Criterion**

Selecting a partner in MES is extremely crucial as it actively determines the success of the whole deployment. A less credited and committed partner would slow the implementation and adoption processes down as this initiative is tremendously complex and requires partners who are very committed in all types of resources, time, and budget. Executive airliner (SAB) stated that it is

essential to have a capable partner, otherwise it can jeopardise reputations. He said that seeing strategic directions is also imperative. He gave the example of IBM, saying that although they were the best in the hardware provider market, as well a major partner, their strategic direction shifted in the 90s, and they opted to go for solutions.

Failure to find a credible partner would only lead to failure of MES undertaking. The high interdependencies between partners in MES request partners not only to be flexible and committed, but also to be capable of executing the job. Airline manager (SAE) confirmed this by stating that the following should be taken into consideration when choosing partners: the vendor commitment and name, their reputation in the market, their experience, how strong their financial status is, what type of product they have, history of their development, what their future plan for development is, what their strategy to implement changes is, their commitment, their training, and success of their previous deployments. ASP's manager (SPG) expanded on the importance of commitment from his point of view, explaining that a partner needs to be loyal as well as committed, as projects can meet difficulties along the way and the partner needs to get through the ups and the downs. He also pointed out that if you are embarking into major interaction and major projects, the credibility of the vendor is very important, as well as their reputation and success from earlier projects. I would say credibility is a major factor, it is important but it is not like it is left for credibility. If you don't put the right controls and the vendors are credible this might not work.

In addition, MES is a hugely costly endeavour and involves hefty financial investment; this risk should be lessened as much as possible by carefully

selecting partners that would work together smoothly. Many IT management and businesses take great care when it comes to selecting partners, especially when these partners will be considered as strategic partners that they will work together with for years.

ASP's director (SPI) stated that flexibility is a plus for long-term strategic partnerships, as well as the mutual desire for each other to succeed.

This could result in making decisions that are based on inaccurate or dated information, which leads to mistakes turning into gigantic costs for the organisations. Hence, this is where an updated enterprise system is required for the organisation. Once the decision for implementing an enterprise system is taken, the question of which enterprise system to implement arises. Numerous vendors of these systems are available for companies to choose from (Nach and Lejeune, 2008). These vendors provide many solutions, which have competing claims, and selecting from the available alternatives can be a very time consuming, challenging, and costly job. However, there are a number of factors that the companies base their selection of an ES on (Olhager and Selldin, 2003).

The department in an organisation which is most affected by an outdated system is the finance department, given the fact that they need to handle large quantities of the transactions; therefore, they will have to manage the charge that will be needed for the change to take place (Nach and Lejeune, 2008). Since an ES will integrate the information in the organisation, it is crucial that a representative from all departments should take part in the decision making of buying the most apt ES for the company (Hawking *et al.*, 2004). Hence, the members from operations also contribute so they can justify the need for better

information in the production department as well. Other departments in the organisation like procurement, marketing and HR also tend to pitch in their needs and requirements. (Loh and Koh, 2004). Hence a team is developed to represent each department and hence will contribute accordingly in buying the best choice of enterprise system software application for the company (Rosario, 2000).

After the team is selected, the first thing that companies need to consider is analysing and determining their needs (Olhager and Selldin, 2003). Once the business processes are clearly understood, the manager needs to know how to implement a system that would integrate the existing business processes and give the best possible results.

The starting point of selecting the best vendor is to understand the critical success factors for the proper selection and implementation of the enterprise system software package. The critical success factors are the steps that need to be taken in order for the process of implementation to be successful (Boudreau and Robey, 2005). Anything that does not directly follow the critical success factors can be dropped from the process. (Olhager and Selldin, 2003). The success of selecting the right ES for the company is also be determined by the fact that it should create a lot of money for the company by streamlining the operations, increasing revenues, and ultimately increasing the market share, which leads to the high profitability for the company (Dillard and Yuthas, 2006). A previous airline executive asserted that having the largest market share proves that a business is successful, but it should be considered that these organisations, service providers and infrastructure tend to get weaker and older

with time. Future perspectives also need to be kept in mind, such as agility, scalability, and other factors that could affect their presence in years to come.

The presence of the vendor locally adds credibility as an effective partner. Questions arise as to whether the vendor is locally known, whether they have portfolios of work they have done for similar businesses, and whether they can provide links to customers. Sometimes the vendor is excellent, but if not around it can be very difficult to get support, especially with the time difference and different weekends in different countries. However, another executive (SAD) contended that the ASP should be not only recognised locally but also internationally as providing a greatly successful tool that has a wider implementation base. He continued to say that another factor to be considered is culture fit, explaining that out of three equally achieving companies, he would show a preference for Indian and American companies, finding them more supportive, fair and flexible, as well as less strict than European counterparts.

The management looks at the many available vendors of the enterprise systems in the market and identifies which would be the best suitable solution for the company (Dillard and Yuthas, 2006). In spite of the most suitable enterprise system for the company being selected, there would be possible changes that would need to be addressed during the implementation phase of the enterprise system. These might include changes in the organisational units and responsibilities, which could be difficult for employees to accept (Rosario, 2000).

It is also prudent for the management to understand the on-going support for the software implementation; the license and the renewal fee of the software; and the cost of updating software and hardware. These updating costs might be

unusually high and management needs to have these tentative estimations so that they know that the system has affordable maintenance costs (Dillard and Yuthas, 2006).

There are various modules in an enterprise system software application that the vendor recommends. The management also needs to decide if their organisation system needs all the modules the vendor is offering or whether to drop a few which are not as useful for the organisational business processes (Olhager and Selldin, 2003). In addition to this, the management could also see if they might require a few modifications in some or all of the modules.

Innovation is also a very important positive aspect to look for in a vendor. Innovation has created market leaders in businesses and the market leaders are the first in the market to achieve the return on investment in terms of a significant profit (Boudreau and Robey, 2005). Since the organisation will also need to work with the vendor of the ES in the future, innovation and passion are something that should be looked for in a vendor. The vendor that is finally selected should also have a very good customer retention track record because this is a proof that the vendor satisfies their client. After all these considerations, the management is likely to select the most appropriate vendor to buy the ES from (Dillard and Yuthas, 2006). However, the work does not stop here, as skills and careful methodology are required for proper and successful implementation of the system, so that the resources, financial strength and advanced technological infrastructure can be enhanced. If the company acquires an enterprise system software application that does not fit their company structure, they could end up with project failure and lose a lot of resources (Rosario, 2000).

The process of MES is tedious and it involves lengthy working hours so working with the right partner cannot be overstressed, as it will have a significant effect on the shape of the organisational business. The complexity of these systems renders the selection process of partners complicated. Partner selection is tiresome and resource and time consuming due to the existence of the high number criteria in the selection process (Asl *et al.*, 2012).

Tsai *et al.* (2012) proposed some of the most influential criteria involved in selecting partners such as:

- 1- Their position within the industry market. In alignment with the previous statement an airline executive (SAI) affirmed of “how strong their financial status, what type of product they have, history of their development, what is their future plan for development, how is their strategy to implement changes, their commitment, their training, and how successful their previous deployment”
- 2- Credibility and reputation in the field.
- 3- Amount of training partners are able to contribute to an organisation.
- 4- Strong financial status in the market. This would be a given if a well-established large player is selected because they will have financial strength and regional presence. (ASP director)(SPD).
- 5- Technical support for their solution, taking consideration the leap of heavy deployment and the immense detailed work involved in the implementations.
- 6- Post deployment support is very important since these solutions are valid for years and partners’ involvement has great influence in adopting solutions. Airline’s executive (SAM) explained post deployment support by saying that ASP could sell you the best tools in the world, but what comes after is the most important.
- 7- Consultants’ suggestions, since consultants usually have more experience in specific fields and have more knowledge than the organisation so their suggestions carry a lot of weight. Furthermore, the complexities of the MES process lead most of the firms to choose to hire



consultants in the phase of selecting vendors because of in-depth knowledge they have. ). Enterprise system implementation remains arduous for a firm without taking advantage of external resources such as consultants (Robey *et al.*, 2002). Therefore, competent consultants are necessary during the whole deployment of enterprise system (Somers and Nelson, 2001).

- 8- Flexibility from the partners in amending requirements according to business demands. This was confirmed by airline executive (SAL), who said that the most important attribute required is flexibility, as many of these programmes generate huge inter-dependencies and if partners are not dependable and very flexible, integration would fall apart.
- 9- Ability to demonstrate exemplary mechanism for risk management and security control.
- 10-Capability of integrating various platforms and data. Since MES is far greater than single enterprise there was a stream by itself devoted for the integration and there were a complete. Open systems are required that are capable of expanding into the future, as well as being able to integrate with other systems. airline's executive (SAK).
- 11-The fit between enterprise systems and business processes and ranking of their solution in the industry. "I think one of the major factors that you really need to look at prove of concept; successful stories. Other big users have successful stories and airline X, Y and Z have adopted that process and these succeeded with this percentage. That would help in making a decision" as it has been delineated by an airline's manager (SAH).
- 12- The vendor should have enough resources in order to convince businesses that it is the right solution for them. airline's executive (SAN)

The above were most influential criteria from the literature review that were relevant to this research. Some of the above criteria have been included in MES. By and large, it is vital to select a partner, who provides a system that complies with the industrial standard, covers most of the core functional business process, and includes the flexibility to cater for future airline industry expandability. How long such partners have been in the market is also

important. Long experience in the airline industry means they have a good record of success good recommendations from other airlines (airline executive (SAC)). For that, it is also important to accommodate the fit between the enterprises solution and the organisation that would result in the least amount of changes resulting in minimising potential risk and increase the realisation of enterprise business process value. Moreover, it could shape the whole organisation resulting in radically boosting the market performance and company competitiveness in the future.

Karsak and Ozogul (2009) believed that there is an increasing consensus between ERP system adopters that one of the major factors for implementation failure is the selection of appropriate solutions that fit organisations in term of business process. They added that in the last 20 years software selection has been an active research area due to the fact that the nature of such research is convoluted and has imprecise characteristics. Kumar and Kumar (2002) stressed that selection of deployment partners is very significant in that sense that they contribute to implementation and adoption of these enterprise systems. However, Cebeci (2009) argued this step should be the first step in the whole experience while Umble and Umble (2003) regarded the vision of the organisation as the first step. The author is keen to agree with the latter notion, as it appeared from this study that the motivation for the MES venture was a vision. Furthermore, Umble and Umble (2003) detailed some of steps of selecting partners and the ERP systems as follows:

1. Create the vision. Define the corporate mission, objectives, and strategy. Use cross-functional teams and executive-level input to identify, examine, and rethink existing business processes. This helps to ensure the necessary buy-in of both executive management and the process

owners. Clearly define why the ERP system is to be implemented. If multiple plants are involved, the process must include participants from all plants. Once the vision is approved by top management, it is necessary to share the vision with the entire company.

2. Create a feature/function list. A team composed of respected individuals who are familiar with the various software packages, company processes, and the industry should be responsible for identifying the features and functions required for the software to effectively support each functional area as well as the overall company vision. Business unit managers must be able to document their current business processes to the project team and to map those processes to the new best practices model from the ERP application.

3. Create a software candidate list. The field may be narrowed based on criteria such as the size of the enterprise or industry type. Select only ERP providers that are right for your business. Talk to existing users, particularly those in your industry, about what they like and dislike about their ERP systems.

4. Narrow the field to four to six serious candidates. This can be accomplished by a preliminary analysis of the strengths and weaknesses of each supplier and the “goodness of fit” of the software.

5. Create the request for proposal (RFP). The RFP typically contains the feature and function list, which describes how the company wants each department or function to operate and the “outer wrapper”, consisting of instructions to the supplier, terms and conditions, supplier response forms, and so forth.

6. Review the proposals. Consider strengths, weaknesses, areas that require more clarification, and areas of doubt for each supplier. Ask for additional information where appropriate.

7. Select two or three finalists.

8. Have the finalists demonstrate their packages. In order to provide a thorough critique, all key members of the selection team should be present for all demonstrations.

9. Select the winner. When companies select their system, price is frequently a major factor. But it is critical not to underemphasize other relevant criteria such as supplier support, ease of implementation, closeness of fit to the company's business, flexibility when the company's business changes, technological risk, and value (total implemented cost versus total value to the company).

10. Justify the investment. Based on the specific ERP software that has been selected, the potential tangible and intangible benefits of the implementation can be compared to the costs. Tangible benefits might include better visibility of future requirements, improved material control, reduced costs, increased productivity, increased on-time deliveries, improved customer service, and the elimination of redundant and contradictory data bases. Intangible benefits might include improved communications, substantially reduced chaos and confusion, and higher morale. Make a formal go or no-go decision on the software; keep the option of choosing "none of the above."

11. Negotiate the contract. The company's negotiating position may be influenced by the analysis performed in step 10.

12. Run a pre-implementation pilot. The purpose of a pre-implementation pilot is to uncover major surprises, both good and bad, about software as quickly as possible so as to facilitate the overall implementation.

13. Validate the justification. Using all information collected to this point, make a final go, no-go decision on the implementation. In extreme cases, if necessary, reverse the decision to implement ERP, change vendors, or renegotiate the contract.

Source: Umble and Umbl (2003)

#### 4.19 IT Leading Project

Whether the whole multi-enterprise undertaking is considered as IT implementation or business solution, a strategic move has to be determined from the beginning. Boonstra (2006) contended that IT has dominant part in such initiative, so it was quite obvious that IT should take the lead in the deployment process. In our study, though IT had the leading part of MES deployment, the strategy embraced was to have business side by side. The reason for this is that business should be responsible for all the decisions of acceptance of the entire project underneath MES and IT should be involved in all the technical parts besides, acting as an advisor to the business. Every stream had one project manager from IT and one from business, plus one from the vendor side. The three of them made up the project management and their responsibility was to lead their stream to success.

Where IT is leading project seems to be encouraged in the organisation as a lead executive (SAA) affirmed on this issue: “So the IT was really leading all these changes and also pushing for business process change to some extent it helped me as I came from the business side, it helped me to oversee the IT, it helped to understand the business and how important is the business. So we understand our customer and we are trying to meet their requirement...I believe to some extent they were successful in term of understanding of the business requirement and trying to work with the vendor to meet the user requirement.” Another executive (SAB) commented:

Business is another resource, just another vendor. If you leave it to business and you are implementing IT, they will go for their own particulars in their areas and they will leave out applications that are not up to your

expectations and it will leave you in a mess. Leading a project does not mean influencing it with your own vision and views. You'll always run it with a view to the business objectives. And you will have to adapt the business objectives all the time. Managing work from an IT side is always looking at it from a global perspective; you are always conducting your work on a project kind of angle even when fixing a problem you are looking at it from the project angle. Whereas when you are in operations or marketing you are basically chasing your strategies, IT should take the lead and utilise the business knowledge and capabilities IT have.

The alignment with IT and business is also accommodated here: "It is necessary that IT work hand in hand with the business to make that change the business will be at the beginning. Any change will bring a challenge with it, the challenge with business that they have been doing their work for a long time, now you are coming with a new model and old timers will always tend to stay where they are, in their circle of comfort. It will be a challenge to take that business from that comfort zone to discomfort for them, even though something that is necessary for them but after all the change itself has its own panic and suffering. You need somebody who is idle who is outside the box, an outsider to look at it, this is the reasons around the world for bringing consultants. Having said this, IT as an outsider to the business with that gigantic size of the change when they take the front seat they can make things happen and they can look into things more independently from existing people, challenges. Of course IT without support from the higher management in that corporation they will face a lot of challenges; it is a challenge after all" (Airline's executive) (SAD). However, another airline executive (SAF) remarked, "I think given, one thing I would have liked to see a little different would have been for IT to actually have more

authority in the process which I think may not have been the case in some instances”

Emphasising the point that IT should be leading such initiatives is confirmed by another airline executive (SAG) “we did not let the business you know go wild with the projects because they do not have experience but then at the end of the day these are IT projects although it is named in business terms but in reality they were IT projects so we had a project manager from the business, project manager from the IT and project manager from the vendor so it was led by three guys. The areas where the IT guy were weak in and let the business lead and you can check that, all of these projects have failed and projects that have very strong IT project manager and was leading the business making the business in the lead but he was leading from behind, these are the areas where IT had the best successful factor or the big success right.” A business manager (SAN) stressed that “IT should be leading. It is good to have the IT to lead such project but the business should have the say to accept or reject any system. Because the business know what they need, even things will be changed like business processes let the vendor talk to the business and settle how they want to approach it.” An suggested by ASP director (SPB): “I think from my experience, IT is always led. Such projects, and if it is done rightly I think it is the way to do it.” Another vendor (SPE) added, “I think IT leading this may have been appropriate in this situation because of the size and nature of the project. Today, in most of the world, that’s the model we operate under it. The IT has the expertise of the systems, but from a business perspective, only the business knows what needs to happen in order to make the business successful.” This also been elaborated on by ASP director (SPF) “you can look at it again from two angles. The first angle is the responsibility, the second angle is the

ownership, and I believe the best way to succeed is actually to give both; that is ownership and responsibility to IT staff. Now contractually speaking, you need to leave the responsibility at the vendor's side. Therefore, when you sign contracts, the responsibility should be at the vendor's side. Why because he is the vendor, he is delivering he is responsible but internally, in your organisation, within IT, the IT staff should feel that they are responsible and they should feel that they own those projects, it becomes their babies. That is why when they have that feeling and you have that balance between the responsibilities and authorities, business is of course very important but they have to spell out their requirements, they have to test the systems, they have to sign off the system, they have to use the system so you need to make sure that their requirements are well captured, are well analysed and well implemented and also business need to later on be trained so that they can capitalize on the use of the system."

On the other hand, airline's executive (SAI) mentioned that "Even though the whole transformation is called IT master plan, we got a lot of blames that IT is leading. You should not let your business that IT have the full control, without business participation without engage them in your team a lot of fail could be anticipated." Another airline's manager (SAJ) agreed that "[t]he project was led by IT, I think we should not have led this project and this affect the project negatively, in a sense, that you cook for a customer food and you asked him to eat, on the other, you ask the customer what do you need and then you cook for him, and that's a big difference. If we leave it for the IT, IT might build something that will not suit the business. It is not the IT does not know the business it just because that is not his specialisation. IT should not lead this project, but they should have influence on some of these systems and the business should justify the cost of these systems. The vendor should lead the



solution, business verify the solution and IT verify the technology and PMO should manage it from project management.” Vendor manager (SPC) commented: “I think business should lead these are business systems not IT systems. IT should give support to the business. Everything in this project is controlled by IT and it should not be..[another vendor (SPH) support the same notion].. Actually all the products will be a success if it is a business driven. IT is not the driving factor here. IT is only supporting function normal anywhere. IT should be only a support or sharing function which supports business needs but now IT is trying to impose something which IT is saying that this is what you need, business is saying this is not what I need.” So the issue of IT-led projects is still controversial, but the majority of professionals are in support of them.

Nevertheless, there is another group who held opinions which support both two parties: “IT has to acquire if it is not already there, has to acquire this middle men, middle entities between business and IT. If they do have this, then they can really lead this type of projects. If they don’t, I think they can take part but it would be better if they have middle entity to business interaction because this is how they would be able to communicate better with the business and at the end of the day you are delivering something to the business” (Vendor director) (SPG). This view is consistent with that of an airline’s executive (SAD): “It is necessary that IT work hand in hand with the business to make that change the business will be at the beginning. Any change will bring a challenge with it, the challenge with business that they have been doing their work for a long time, now you are coming with a new model and old timers will always tend to stay where they are, in their circle of comfort. It will be a challenge to take that business from that comfort zone to discomfort for them, even though something that is necessary for them but after all the change itself has its own panic and

suffering. “Then you should have good collaboration, good support and good backing from the business on the initiative that IT was taking forward...Then, taking from there without taking the business along with them and with a lot of political aspects IT started running the whole thing together. I think it is actually clear the friction between business and IT.”

Lack of ownership from the business side might be a recipe for failure and could jeopardise the entire MES project. For that executive in IT and business chaired by CEO insisted the buy-in of business seniors as salient stakeholders. The key driver here is deemed to be the CEO, who has a positive attitude towards IT and clearly understands how IT can enable the business to gain a competitive advantage. Without these parameters surrounding this large undertaking it would be cumbersome and arduous to deploy and adopt this huge change. ....“So then somebody needs to stand up and then say who should do the changes. So that integration part is a really big challenge in taking on the ownership of the process. You need to have a clear process well defined process before implementing the changes because when doing it, along with it if you are trying to bring another process, it will lead to a lot of changes in the process” (Vendor director) (SPH).

This issue of who should be leading the MES was controversial between the participants. In this case study, IT was chosen to lead due to their capabilities and the nature of the projects. In addition, the project was designed to involve the business in the decision and the signing off of the projects. By doing it that way, business was forced to be heavily involved in the projects while IT played the overall orchestrator of the project (please refer to Figure 4.10 in Section 4.16).

#### 4.20 Best Of Breed Vs. Few Vendors

Best of breed versus few vendors was another controversial issue. There were those who favoured best of breed solutions while others preferred few vendors. It has been indicated previously that having a single vendor is not possible when it comes to airline solutions and for that reason few vendor instead of best of breed was selected. Themistocleous *et al.* (2011) surveyed around 50 ERP specialists and personnel involved in ERP implementation in their companies where the majority were from US and Europe. Seventy-two per cent favoured the enterprise solution of having one vendor while the rest thought best of breed was a better option. Though the mainstream were in favour of ERP and a single vendor, 72% still believed that that ERP solution does not cover IT business and other solutions are needed. It is even worse when it comes to airlines as the core business, which is most important to airlines such as marketing and operation platform. As reported by Themistocleous *et al.* (2011), 42% of the companies required other solutions from different vendors to complete their business requirements. Fridgen and Mueller (2011) argued that the strategy for having solution providers is either vague or unknown as a result of the evaluation process that is neither documented nor detailed.

Nonetheless, there are still some obstacles to overcome in adopting multi-enterprise system deployment strategies because strategies in that field have not been researched enough as a result of a lack of such a phenomenon in the industry. An airline executive explained, "There are some vendors who are excellent in certain functionality or certain services and not good in others. [A vendor] is the best product when it comes to PMS no question about it; while they are not good for the operation platform as a matter of fact they do not provide such service for sale. However, I prefer best in class in every way,

because the integration process between these systems relatively easy.” This view of integration was expressed in comparison to other complexities executives are facing, such as change in management within the project and in the organisation. Nevertheless, ASP director (SPG) elaborated on the integration part within the same context “Best of breed is wonderful provided you can take care of the integration part. The integration part is a nightmare.” This was in alignment with another airline executive (SAM) director “if all application comes from single vendor you eliminate certain hassle in the area of integrations and also the less number of issues when you have less number of vendors.”

A senior airline manager (SAB) expressed his views about the notion of fewer vendors for less complexity: “I don’t go for lessening the number of vendors. Actually, based on my own knowledge and the experience we have you will undergo more problems if you go with one vendor thinking of it as integrated whereas it is not. So going with one vendor just because we want to have fewer headaches and more integration, it is an illusion.” An airline manager (SPF) consent with the previous statement, “I definitely would go with the best of the breed products regardless of if I am having ten or twenty or five vendors in my suppliers list. I personally hate to be monopolised by any vendor and I like to have many options to choose what fits my business more.” Nevertheless, this view was shared by all participants as another executive (SAF) expressed that “handling gets more difficult as the number of vendors increases. So keeping it to a small number that we can manage I think might be a better option to go with. I think keeping the core vendor team and to say this is my vendor and trying to get more systems from one vendor to some extent a vendor block that

will bring in but it has to be a trade-off. Two, three vendors or you keep a bit more than that.”

There are various views about how the implementation of ES should be done, deciding whether one vendor or the best of breed (such as finance from Oracle, HR from SAP, Marketing from Soft people etc.) should be selected from various vendors. Companies around the globe select both as per their requirements. It is essential to understand what the requirements of the company are and then the managers should see if their software can meet all the requirements, and whether or not it caters to the best of all business processes (Mabert *et al.*, 2001). A senior manager (SAG) in the airline explained this, “going for the best of breed means that you would get the best application and the best processes and it is the most suitable for that department. However, you would then face the challenge of integration and the problem of maintaining the integration between those different worlds or those different islands and you have to manage four or five vendors instead of managing one vendor and five maintenance contracts. If you go with one vendor, you would have to make sure that it is someone you know to ensure better integration, and it would therefore be easier to maintain and upgrade. This does also come with the risk of all your systems being with one company which could weaken your position of negotiation.” Buying from one vendor would also be more beneficial because they would have designed the whole system keeping in mind the various integrations required for all departments. However, it is also possible that one company provides the best HR software but its financial situation is not that impressive, so the company can also opt for selecting the best breed available in the market (Luo and Strong, 2004; Rikhardsson, and Kræmmergaard, 2006).

Therewith, Sauer *et al.* (2007) argues that projects with better risk management and which are executed with good planning that incorporates achievable goals such as the size of the project, attain better results. However, overlooking risk is usually a result of the fact that risk estimation is prone to error and demands huge resources, whether it be budget or time (Fridgen and Mueller, 2011). Therefore, the high interdependency and tasks between the solution providers working concurrently in our study deemed risk assessment and management incomprehensible and extended the complexity of the project. In addition, Bapna *et al.* (2010) contended that there is insufficient research in this rise of complexity in multi-vendor projects. Those who favoured few vendors were underpinning the risk as major criteria and did not involve the best of breed option. In addition, minimising the high interdependency between vendors and massively reducing interfaces and integration are some of the favourite traits of having fewer vendors. An ASP director (SPH) expressed that “Having less vendors has its advantages, because I have to spread myself through all these vendors. Complexity is the driving force here. If the number of vendors is limited I have more control of what goes in or out.” Furthermore, another director (SPI) “would go fewer that is the second part because I don’t need to go for a best in technology as long as you are abreast with the systems you are running with it is giving you enough efficiency with profitability enough for marking in your business.” Mann (2002) reported that aviation enterprises differ from those built on manufacturing-based ERP solutions, which are not flexible enough to cater for the airline business. On the other hand, there were other views from the participants, such as spreading risks through choosing more than one vendor as to not putting all eggs in one basket could leverage the risk and spread it among ASP. “it is easier to be able to receive the key benefits that

organisations gives so I think there are pros and cons but if you are multifaceted, that in itself is advantageous and your risk is spread across a lot of companies” (ASP senior manager)(SPB).

Evidently, solution providers would have to rely on each other’s performance to attain the required deliverables for the customer. Some IT professionals within airline companies still believe that dealing with fewer vendors may avoid inescapable agitation and decrease communication channels. Of course vendors themselves who favoured to be with fewer vendors when executing multi-enterprise systems to increase their income from one side and to decrease their interaction with other vendors from the other side. Last notion was also pointed earlier under competitors working together that led to some negative aspect such as point fingering.

On the other hand, Oshri *et al.* (2009) suggests that multi-vendors evolve as an efficient strategy, which will increase the return of investment in IT projects. Long-term risk mitigation could be better controlled by involving a multi-vendor strategy as suggested by Currie and Willcocks (1998). This will improve performance, and add more in the flexibility of bargaining at the contract stage, and post deployment (Lee *et al.*, 2009). In other words, having the best of breeds to untighten the customer from being single or few vendors’ hands, which could result in taking advantage of the customer sometimes. Though there is pre-work that has to be executed by the airline itself before selecting vendors, but still solutions provider have many team, which hinder judging these vendors such have an excellent marketing team, which could present a false impression about the solution provider, which is not true. Therefore, having the best of breed, vendors would be a viable option to deploy a client IT strategy

efficiently (Bapna *et al.* 2010). Broadly, the end users are interested in quality and functionality for most desired business processes in any solution even if it includes many obstacles from an IT point of view that virtually cannot be achieved. This situation demands that IT personal have to balance between the number of vendors versus functionality.

Moreover, the integration of technology between vendors expedites the collaboration of several solution providers (Moitra and Ganesh, 2005). It is also believed that the best of breed is favoured by IT management for providing broad strategic advantages, as it is based on the strongest of industry standards with the best of development solution providers (Kauffman and Tsai, 2009). Many in IT and business management preferred the best of breed over fewer vendors as it was found that these same vendors do not have a seamless integrated solution as was claimed in the initial stages. For example, an enterprising solution provider has many functions such as marketing and operations., though it is the same vendor but integration was not established from the beginning it was acquisition and merger integration methods, which might not have strong integration, as it would appear. Because of that, some senior managers opt for best of breed, as they would have to go for integration as an important step of the MES deployment. Furthermore, there is a company that will act as a mediator between all islands of software packages whereby they would build an enterprise bus system to integrate all software. It was decided in this project that one solution provider would integrate their different software package through the enterprise bus system if the integration between his software is not strong enough.



The core functions of an organisation which provide a competitive advantage should be covered by the best of breed while others need to be covered by less vendors if possible. This views are expressed by an ASP director (SPG): “in my opinion, you need to have some sort of a well-integrated system covering most of the norms that any organisation has. This should cover may be 70-80 % of what you are doing in a one-stop integrated system, so you wouldn’t even care about doing the best accounting in the world because you are not an accounting company.” Another view (SAI) given in alignment with the previous statement: “if you want to go with the best of class depends on how critical this business is. Sometimes you might opt to go with less than the best of class because you thought your business or airline could not fit with class due to staff, culture or various business processes. .”

#### **4.21 Competitive Cooperative Partners**

The old school belief was of less cooperation between competitors, where rivals had to have a competitive advantage to stay in the market. Yet many scholars have very different theories about retaining sustainability (Barney 1991; Conner 1991). The belief has been that significant profitability comes from the overcoming of rivals, where the dominant win and competitors are just enemies according to this notion of rivalry (Kotler and Singh, 1981; Luo *et al.*, 2007). “Before these competitors reach your premises, they will be competition and some finger pointing even. I believe from experience, once you have them on your premises then these things will disappear, because their staff feel that they are part of this organisation one way or another” (Airline’s executive) (SAD).

Nonetheless, the current market reveals that the notion of rivalry is not the only idea that explains the behaviour of firms. Alliances between competitive

corporations sometimes are inevitable (Luo *et al.*, 2007). Combining cooperation and competition is paradoxical by its very nature; however, in the supply chain arena it is not an odd belief, especially if deployed for profitability and cost reduction (Sepehri, 2011). The need for all vendors to work under one umbrella is explicitly written in the statement of work: “Any of the solution providers when they received the RFP knew that they would work under this stringent programme and that they were going to work with competitors. They need to cooperate for [the] airlines to achieve its objectives” (airline executive) (SAL). At the same time there are cross boundaries between ASPs “The second thing is that this area of overlap between the provider and the vendor requires me as the 3rd party to put the best resources in this area because I can lose a major contract because I have one or two bad apples in the area of communication..[.]. Contacting the others ASPs where there is an area of friction, if you leave it to them, you could end up in finger pointing. Then not only the technical side but also in management, you need sweet talkers or doers.” An airline business manager (SAN) explained another side effect of having competitors working together: “we face difficulties just to set up a conference call between Sabre and Amadeus; it is very tough to have things done without official agreement. I believe if something in the contract forces these vendors to sit together it will be easier to ask them to sit around the table.”

Eventually these boundaries have to be drawn up to help the success of MES “One important factor or tool that we use during the project is to have a PMO dedicated to manage all these projects and to manage the relationships amongst the different providers. So of course part of the evaluation during the negotiation and the reviewing of proposals and they are made aware of the fact that we would be working with other people, companies and providers. We also

explain to them that we have put certain boundaries between them so that they can work together” (Airline’s Executive) (SAK). ASP’s senior manager (SPD) added, “This is common in the airline industry because everybody is working towards producing a value or a benefit to the airline but we cannot work in isolation, silence or work in silos. We have to work together and I think the governance body can play a key role in making everybody together and play together because this is only natural.”

The friction between the ASPs could generate a negative atmosphere, which has been expressed by airline executive (SAC) “The climate of finger pointing could arise here. This will come to the contract; customer has to put all of these situations in the contract.” Without an effective governance body and IT PMO, managing the MES could be arduous.

The choice of two competitors not work together was also researched. The client, an airline, selected the best ASP according to their potential competence in serving a specific platform such as marketing, operation and finance. Due to an extraordinarily limited ASP in the functionality of the airline sector, an overlap is an expected phenomenon. ASP1 could have a certain marketing platform and operation, and ASP2 may have a similar platform. Apparently, the competitiveness is drawn from the fact that they both serve similar platforms; if the client chooses marketing from ASP1 and operation from ASP2 then they both have to cooperate for the client, yet at the same time they stand as competitors. As contended by one senior manager (SAD) in the airline:

Now, during the integration, you will be faced with challenges because you are bringing some rivals together. Everybody will try to promote the system that you have not selected, and will try to show the other party that they are not up to the standard that the customer requires. It is not necessary for them to tell the customer that the other party has this deficiency; they should leave it for the customer to decide and this is

luckily what is going on. But a risk enters, from time to time, that these issues will pop up and the parties will compete in a way that is not productive.

Another implication emerging from such a theme is that competitors have concerns about disclosing their techniques when needed, especially if they are to integrate with each other. The latter argument was emphasised by a senior manager (SAL) who claimed that

“Of course they were concerned about disclosing their information and techniques to each other and that is normal between competitors.”

Some ASP consultants (SPB) expressed the inclination to form alliances in such situations:

“It makes sense for vendors to have partnership arrangements and understandings worked out which make things much easier from, in this case, the airline perspective, based on the relationship that has already formed.”

At the end of the day this ASP alliance will be difficult to avoid if a homogeneous solution for the airline is to be built; otherwise, this merger will be a recipe for failure. On the other hand, an ASP senior manager (ASP) recognised the fact that they are still competitors:

“We don’t do that. We are competitors, and we will set up what we call a non-disclosure agreement with the airline and the vendors.”

A non-disclosure agreement is one of the options that airlines have opted for to ensure their collaboration. Another measure that has been taken to ensure competitor collaboration is to have a well-defined governance body that defines the roles and responsibilities of all vendors.

## 4.22 IT PMO

The PMO is categorised as an advanced project management integrating a wide variety of project management competence to attain business objectives (Hill, 2005). MES is a complex and large undertaking and “will require good ITPMO that is fully supported and reports to top management. All ASPs are required to be compliant and submit all their time lines and plans punctually as delaying could affect others due the interdependency will require good ITPMO fully supported and report to the highest top management. To ensure that all ASPs submit all their time lines and plans and comply with it as delaying one could impact others due to the interdependencies” (Airline’s executive) (SAI). Another executive (SAK) praised the role of ITPMO: “One important factor or tool that we use during the project is to have a PMO dedicated to manage all these projects and to manage the relationships amongst the different providers. They would also be included as part of the evaluation, negotiation and reviewal of the proposals. As a result of this, the providers would be made aware that we would be working with other companies and providers and that certain boundaries would be explained to them so that they can work together.”

ITPMO is about controlling the activities of these projects as explained by an airline’s executive (SAM) “The airline is controlling all of these through ITPMO to help get on top of things. Also having dedicated staff at the airline helps in dealing with these difficulties. There were some steps up front that the airline took to make this easier. Bringing in a vendor to coordinate the integration of the work..[.].was a big hell as well as bringing in another vendor from an ITPMO perspective, helped tremendously.” Nowadays various firms have employed PMO as an organisational entity to acquire a project management oversight, support, alignment, and control (Hill, 2005). Parth (2001) was in

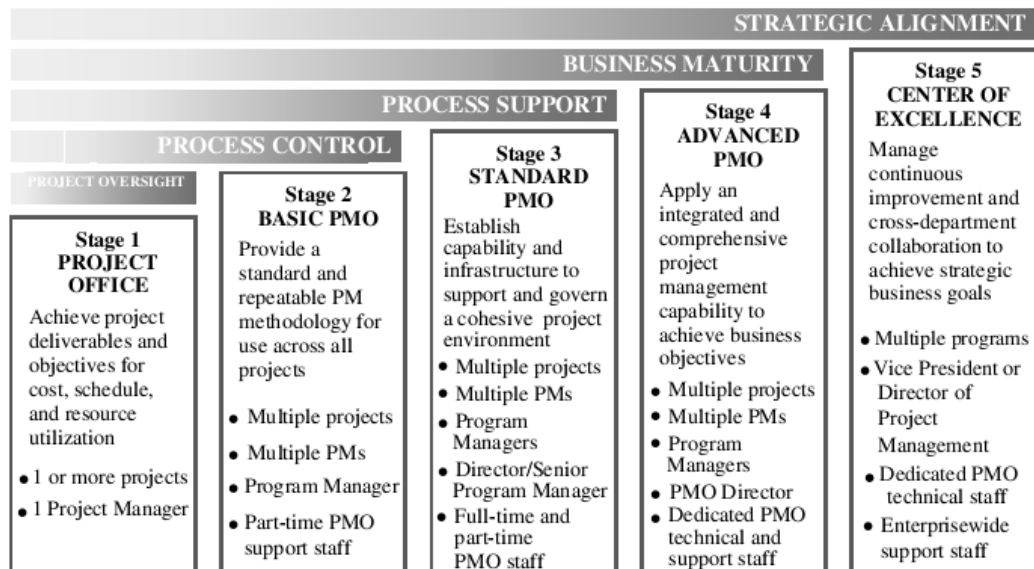
agreement with Hill (2005) regarding enterprise project management and providing a set of benefits for the high end PMO as follows:

- Broad consistency with better coordination across all enterprise projects
- Unify standards and methodologies for all projects .
- Execute an audit for the quality of the project
- Enable executives to focus on the project that supports strategic business goals.
- Better resource management
- Offer an excellent knowledge management tool and acts as a knowledge repository base for all the projects

Furthermore, PMO is considered as an organisational innovation due to its recent emergence and importance (Hobbs *et al.*, 2008). Nonetheless, it is not surprising that PMO influences the deployment of MES, which is considered a large and complex project. Implementers with different methodologies would be very difficult to work in harmony with, without an efficient PMO that has control over the overwhelming tasks and activities to run such a large-scale project. Without a competent PMO chaotic situations could have emerged out of these projects; besides that, almost every enterprise system has a large variety of tracks. For example, Enterprise System from Sabre covers a broad area from the platform of marketing to operations, The operations platform has at least five large project tracks such as crewing, navigation, electronic flight bag, air operation, and crew roster. Within each track, there are an immense number of tasks to be implemented. With such magnitude, the use of a PMO has become inescapable. Hobbs *et al.* (2008) argue that deploying a PMO or reconfiguring an existing PMO is a salient change and this change is usually involved in a wider organisational change. These changes to a PMO are originated from political forces; however, necessity ultimately, is the driver here, especially

when the success or failure of such a large budget project is what the organisation is dealing with. An ASP director (SPF) stated that:

“The IT PMO department was established using the company KPMG to lead the programme ,and to ensure that enough co-ordination and collaboration is taking place between the vendors and the projects. It now comes down to the programme management, to the project management to the project teams and that is from both parties’ from the vendors and from the airlines. If you have good project and programme managers who can communicate then there should be no problems, It should be, this is the role of the programme management which was there actually. We had the ITPMO which run the whole programme to such an extent the project managers. We have also adopted and modified the ITPM policies and procedures to fit into our type of project. ”



**Figure 4.15 Overview of PMO Capabilities across the PMO Competency Continuum (Hill, 2005:46)**

Figure 4.15 depicts the PMO stages starting with the Basic Stages and concluding with the Centre of Excellence as described by Hill (2005). This study ascertained that the MES could suffer a great deficiency and a low rate of success if the PMO was not in its Centre of Excellence. The latter stage of the PMO was clear in the MES deployment where the COE itself steers the overall project with the vice-presidents and directors of the project from all streams

meet to resolve any problems. In addition, a dedicated PMO that is managed by the airline and a world-class consultant company were in place to make sure that everything was aligned with the airline's strategic business goals and fulfilling the business targets that have been set for those enterprise systems. One of the senior executive (SAG) elaborates on the importance of PMO:

"These three elements were very crucial and I wish that we had looked at it very seriously before embarking into a multi- enterprise concurrent system especially PMO vendor management and change management."

Another senior airline manager (SAK) expressed the role of PMO in MES deployment:

"One important factor or tool that we use during the project is to have a PMO dedicated to manage all these projects and to manage the relationships among the different providers "

Moreover, Chen *et al.* (2009) emphasised on a good PMO in a managing enterprise system like ERP, otherwise sequences such as scope creep, insufficient allocation of resources and poor vendor management would certainly be an undesirable side effect of deploying enterprise system. The latter notion has been stressed from one of the programme directors (SPD) of ASP:

"So this fact puts additional burdens on IT PMO and the governance body is required to be more pro-active in terms of trying to bring harmony between the different players.

Having different vendors working with various project management frameworks makes running IT PMO a saddle to align all ASPs in one methodology and here it shines the leading role of IT PMO in harmonising the tremendous number of tasks and activities involved in deploying concurrent MES. Some large airlines could run their IT without IT PMO conversely when applying MES, IT PMO was



an inescapable necessity that MES could not work without due to the huge diversity of this undertaking.

#### 4.23 Communication

Effective communication is salient and crucial for the deployment of MES especially with a gigantic number of interrelated tasks that demand an efficient type of communication. In this context, the communication refers to the delivering of message, information, knowledge, opinion amongst various people, functions, or levels. Communication in that sense becomes the base for other factors to build on as well as it being used as a conflict resolution tool. Knowing that MES involves a tremendous amount of communication amongst various and diverse parties in locations, timing and culture, a careful and well-planned communication plan has to be laid in advance to promote the success of MES deployment. An airline executive (SAD) contended, “the most difficult part is the communication between all of those.” Gillard (2005) stressed that communication is more valued in a project where people group together from many diverse cultures and different companies that require effective communication that acts as a common language. In addition, PMI (2004) clearly directs teams to define a communication charter that most members of the team are acquainted with. Kumar *et al.* (2002) agreed with the latter view that a communication plan is compulsory for open communication to take effect in an entire organisation. Scholars in literature view have focused on communication issue for its significant roles it plays during and after large implementation.

Effective communication is the prime element of any project; nonetheless, it should begin with building a communication plan that assists direct and frequent exchanges (Françoise *et al.*, 2009). Amoako-Gyampah and Salam (2004)

Dezdar and Ainin (2011) also contended effective communication as being an influential aspect that impacts the adoption of enterprise systems such as ERP while Ngai *et al.* (2008) argued that communication is not only exchanging information and knowledge but also the promotion of enterprise projects. Criticality of communication originated from the fact that it influences the success of enterprise systems, so it mandated that it should be practised from the initial stages of MES until the acceptance phase. Initial stages usually pave the road for further stages and act as a base for other phases to stand upon. So not having a clear communication plan from the start could negatively influence the success of MES. Willcocks (2007) indicated that strong inter-departmental communication in the organisation during enterprise deployment should be considered as being critical especially in the early stages of the project lifecycle. Additionally, he underlined the communication requirement increased even further in the case of an international vendor. This was affirmed by an airline's senior manager (SAJ): "engage the employee to be part of that success, and reduce the fear between the employees by increasing the communication." Esteves-Sousa and Pastor-Collado (2000) identified that both internal communication between team members in an enterprise system project such as ERP and outward communication to all organisation staff are particularly crucial to the success of such implementation. Nah *et al.* (2007) concurred with the previous notion and commented that it is imperative that staff should be informed in advance about the objectives, activities, updates and scope to compel efficient deployment of ERP. Sedera and Dey (2006) added that all stakeholders should also be included in the communication circle which is the case of ASPs in the MES undertake. Furthermore, involving all staff from

different levels will enforce the buying of MES and spread the responsibility and inclusion of success to the staff .

Communication has been highlighted in many studies related to enterprise systems such as ERP as a critical success factor (Grant, 2003; Mandal and Gunasekaran, 2003). Al Mudimigh *et al.* (2001) and Al-Mashari *et al.* (2003) contend with the latter view; however, they also emphasised on maintaining the client (airline) acquainted with their project. This requires a communication plan (Kumar *et al.*, 2002) to ensure that open communication occurs within the entire organisation. MES was no exception as communication was also identified as a critical factor and played a pivotal role in promoting success in this gigantic project. The value of effective communication was confirmed by participants in the study. An executive (SAK) stated that “normally people reject changes that are natural and that is why you really need to manage these people and also make some sort of communication .” ASP senior (SPC) explained that “the main challenge is the training, information, coordination, and communication.” Moreover, the MES in hand has many obstacles when it comes to communication for the varied vendors, locations, culture, and time zones which were referred to previously. This was confirmed by airline executive (SAB) “overlapping between the provider and the vendor requires me as the 3rd party to put my best resources in this area because I can lose a major contract because I have one or 2 bad apples in the area of communication..[.]. Although we have global companies with branches everywhere, the cultural differences and language barriers are still there.”

By and large, communication among different firms (inter-firm) is characterised by how frequently communication occurs, its direction either unidirectional or

bidirectional, its type either structured (in-depth) or unstructured (general), and its coerciveness (Mohr *et al.*, 1996). Rai *et al.* (2012) delineated on the communication aspect further, focusing on Inter-Firm communication in the logistics industry, which simulate the type of communication happening in concurrent MES where we have multi- firms required to communicate with each other. In their study, they found that both communication and IT capability either individually or jointly enhance the relational value between firms. In addition, the empirical indication from the practice insinuates that IT capabilities and communication between collaborators are essential to create value from inter-firm business processes. Moreover, not only is effective communication imperative in leveraging business development between various partners firms but also it helps in resolving current interdependencies and possibly identifies future ones (Klein *et al.* 2007).

Communication also depends on organisation culture and how the organisation spreads information or knowledge. Organisation culture and how they usually disseminate information have a great impact on the MES deployment. MES requires having a decent communication management in place to enable the organisation sustaining this hardship implementation. To succeed, MES staff require “[t]raining in vendor negotiation, vendor or change management or communication management. All of these are important factors that must be considered when you are implementing a huge multi -enterprise system” (Airline senior manager) (SAG).

Davenport and Prusak (1998) indicated that communication among partners and collaboration with other companies without a suitable cultural climate between them acknowledged that the transfer would be arduous. On the other

hand, Hofstede (1980) contended that an organisation's culture is subsumed within a national culture. Consequently, national culture would influence organisational behaviour and staff practices. Hill (2007) recognised two modes for exchanging information that affect organisational learning either by company's experience or through partners sharing experience, which is the case of MES partners. Powell and Dent (2009) argued that there are six potential complementary resources to achieve competitive advantage, and one of them was open communications. Besides, they found a correlation with culture and open communications as Zuboff (1988) contended that IT benefits reside in their capacity to merge IT with communication among users, managers and IT personnel.

#### **4.24 Champion of Change**

The earlier times of business process re-engineering recognised the value and benefits of a champion of change or project champion. The presence of project champion in this context refers to a person who has a persistent constructive influence on the project itself. This person could be of any level in the organisation as long as his/her influence propagates to others. In general, ES's deployment is a complex undertaking and has been researched extensively and a plausible critical success factor was reached. ASP director (SPD) emphasised that a project champion has to be from the airline itself and he said: "the most important thing in my opinion is having the champions' change within the airline. So usually, when you go for a big bang like that I mean it is somebody's vision at the top, right? Any provider can be the champion of change and the champion of change has to be the airline itself." A project champion was identified as one of the critical success factors for ERP implementation from empirical evidence (Parr *et al.*, 2000; Shanks *et al.*, 2000; Sumner, 2006).

However, Shanks *et al.* (2000) found that a Chinese champion is considered a challenge to the authority and higher management, so cultural influence is also considered in this factor . As was the opposite in Australia, which reflected the importance of project, champion and change management in the same study. By and large, it is highly recommended to charge someone being a champion during the course of ERP implementation (Shanks *et al.*, 2000) due to the fact that ERP projects tend to be exhausting and stressful for all employees, This could affect employee morale and the need for such a champion to boost the employees self-esteem is mandated (Nah *et al.*, 2009). ASP director (SPD) highlighted the cultural factor “It has to be people within the airline who know the history, understand the culture, the players, and the politics and also know how to navigate all that, so bringing many people on board. Because you will have people on board, people that are excited about it , people that are not or are neutral and then you will have people that are working against you , so how do you manage all of that? I think the airline, if it is going to succeed as a multi-enterprise, needs to be aware of these factors and needs to have a plan for them.”

IT and business personnel are alike in having to work for long tedious hours to enable them to match the speed of deployment and comprehend the immense tasks and activities involved in MES. Thus, a project champion in each track of the project should leverage the morale of employees around him/her whether colleagues or subordinates. This boost is exceedingly vital in long and large projects, as staff require a push to their self-esteem from time to time.

Somers *et al.* (2004) explored the players in the ERP project life cycle and pointed out a project champion as a key player in the ERP implementation. As

such, a project champion is essential and deemed to be a critical enabler for the MES initiative. A project champion role became shining in technology adoption; however, it has a less effect after the acceptance stage (Somers *et al.*, 2004). Additionally, Akkermans and Van Helden (2002) studied the interrelations between critical success factors in the ERP implementation found a decrease in performance caused by significant changes in the involved stakeholders of the project and the project champion was one of them. This also reflects the importance of a project champion during the initial stages and the influence of their attitude on complex undertakings such as MES. Beath (1991) pointed out that the presence of a champion who achieves powerful functions of transformational leadership is often linked to the success of technological innovations. Nonetheless, McKersie and Walton (1991) and Rogers (1995) classified this person as one senior management level and a powerful individual especially in large and radical project such as enterprise system. Willcocks and Sykes (2000) and Sumner (2006) agreed with the latter notion and looked to CIO (VP IT) or CEO to represent the project champion. This phenomenon under study has a similar situation to one Willcocks and Sykes (2000) investigated where the CEO acts as an overall project champion. As in the previous section we elaborated on his involvement and role. Somers and Nelson (2001) added that a project champion should be conscious about the business strategic issues as well as the technological sides of the projects. These business strategic goals were considered as pivotal of the whole project change such as MES. Not having strategic business goals in a picture of this large undertaking would jeopardise the overall success of the project and it would result in a catastrophic situation where the business ending up having processes and goals other than what they had planned and intended. Additionally, a project

champion plays an important role in aligning these business strategic goals with technology and re-emphasises this issue again in all project milestones. Françoise *et al.* (2009) not only recognised the project champion from top management level but also contended that it is obligatory to have him/her from senior management to provide the project with suitable support. Françoise *et al.* (2009: 386) suggest the following actions related to a project champion(s):

- Involve the champion(s) in conflict resolution.
- Appoint a champion(s).
- Ensure that the champion(s) is a (are) member(s) of top management. Ensure that the champion(s) is available.
- Formally define the champion's (or champions') level of authority. Involve the champion(s) in every stage of the project.
- Train the champion(s) beforehand on the impacts and objectives of the implementation.
- Ensure that the champion(s) will promote the project throughout the organisation.

However, from this study it is believed that a project champion could be any person as long as he/she advocates proactively the technology and MES adoption and have an influence on others. It would be more advantageous if the project champion is from top senior management but being from team leader level is also as important because they are doing the actual work and have a direct influence on the staff and are mostly accepted by the workers. This kind of champion is effective while the support from top management for the whole project still exist. Evidently, the higher the position the greater the influence is factual knowledge and it has been noticed in the MES. In the case of MES,



deployment there was with more than one champion beside the CEO to support the complete undertaking. As MES is a multi-track project, a champion is required in every track to sustain the success of technology acceptance within the overall picture in the organisation. Another interesting study by Nah *et al.* (2009) where they surveyed the Fortune 1000 companies' CIOs on their view regarding the critical success factors influencing the ERP implementation, the project champion was one of the five most critical factors affecting the success of ERP deployment. They further contended that the project champion is more important than any other factors especially with ERP implementation.

#### 4.25 Politics

Politics was shown as a weak theme, and did not have sufficient literature review to match the context, which was changing the priority of implementation according to a more powerful influential user. A senior manager (SAB) for the airline commented: "Politics fills the air as they say, my implementation is more important than anybody else's implementation, so I want mine to be implemented." This kind of behaviour did not have a strong influence since IT PMO and CEO would not approve any change in the plan if it will delay or hinder the deployment in any track of MES. Another senior manager (SAN) refers to the cause of politics as resistance to change which can be taken under change management "The political issue will not be here if people accept the change. Once the people accept and put the airline first then political issues will not be there."

#### 4.26 Training

MES are very complex systems and it requires a great deal of training due to the fact that almost all systems around the user are changing at the same time

including business processes, so a careful training programme has to be planned ahead for all these activities. Good training facilitates good assimilation of the new systems and business processes, and thus ease the adoption of these systems as well as it resulting in the reduction of user resistance to change. Training plans should be tailored and sensitive to every employee's level including the necessity of top management having an overview, such as executive management systems. Whilst operations users might need to have an in-depth view of the systems to enable them to carry out daily tasks. "You need to train people so that they can utilise the systems in the best way, These systems have many functions, powerful tools and sophisticated reports. Staff would be trained so that their contribution to and comprehension of the project would be improved. This training would probably allow them to be in a much better position of understanding so as not to be deceived sometimes, by the vendors. " (Vendor director) (SPF).

While training has been recognised by many researchers, some have focused on user training (Robey *et al.*, 2002; Trimmer *et al.*, 2002; Mandal and Gunasekaran, 2003) whilst others have stressed on training as a requirement for project teams (Kumar *et al.*, 2002). Another important consideration is to plan for the training (Siriginidi, 2000). An airline executive (SAA) confirms this: "first of all they have to transfer the technology and they have to train our people, we did that with all of our vendors like train the trainer. It works fine and then our training department took it over and starting writing the training materials which are most likely the vendor material but the customisation of business process." The training is needed for MES success," we need to update your staff training and make sure they are up to your expectations and that of the customer" (airline's manager) (SAB). Another executive added, "the human

factor is very important as far as training and getting the people ready.” However, even training the trainer is sometimes not a viable solution especially if skilled staff do not believe that they are good trainers, “ the main challenge is the training, information, coordination, and communication. The company should see what the vendor says, like training the trainers, there is a need to check if the trainer can train others. Cascading training is not guaranteed in this way” (ASP vendor)(SPC).

Sufficient training and education will ensure that the user will use the system efficiently and effectively consequently contributing to better adoption of the systems (Zhang *et al.*, 2005; Bradley, 2008; Dezdar and Ainin, 2011). Training and education has been recognised as one of the critical success factors in several previous studies (Al-Mashari *et al.*, 2003; Bandara *et al.*, 2005; Karim *et al.*, 2007). This was stressed by an airline’s executive “So you need to focus on training, and more than just training you need to explain the concepts and establish a buy-in which is very important. If you don’t focus on the human factor forget all these IT enablers and all the others. Training comes before the change.” Nah *et al.* (2003) stated that sufficient training can increase the probability of ERP system implementation success, while the lack of appropriate training can hinder the implementation. Another executive (SAF) contended with previous comments “If my workforce is not trained and not educated to understand this concept, I cannot just train them on the system and say this is how you use the system because this will not give the results.”

Further, Dezdar and Ainin (2011) contended that training and education based on knowledge transfer principles would enhance the users’ level of knowledge and proficiency, subsequently increasing individual performance and thus firm

performance as well as building a positive attitude towards the new software. Furthermore, it could assist enterprise systems user such as ERP to accustom the change to the firm by deployment of these systems. "The most challenging of the whole broad-spectrum are people, because people are critical to change, you can change system, process, and technology, but you need to make a clear cut plan on the people perspective. That is. you need to create a good training programme and make sure an assessment of whatever you make out of this programme..[.]. Now if you have selected the solution and process then you need to change the organisation and people. you need to check your people's skill, and are these skills enough to meet the demand for that change. Skills could be soft or technical skills and if they need to improve these skills then they need to be trained." (Airline's executive) (SAD). Moreover, Bradely (2008) agreed with the latter view that formal training and education boost the use and reduced user resistance, thus improve the probability of enterprise systems use and success. However, situated learning relies on learning by interaction where new users learn by listening and mimicking a more advanced user as learning by example. This method is shown to be effective as in passing knowledge where tremendous training is required (Robey and Boudreau, 2002).

The training programme has to cover all the employees including the top management to take the full advantage of enterprise systems, which will help employees to assimilate the logic and general concept of the system besides taking full advantage of the system's competences (Dezdar and Ainin, 2011). They stressed on top managers training so they know how the system is incorporated in the whole organisation. This kind of continuous training and education should start with project teams and proliferate to all levels until the final end user. This was confirmed by airline senior manager (SAG) "Proper

training in project management for the project leaders, all these are important factors that we suffer because of the absence of these factors.” The training programme should include effective training that is suitable for the end user and airline staff “If they are able to succeed in using these new business processes and solutions, then they need to be kept trained and utilised and make a success out of all this” (Airline’s executive) (SAD). Airline business senior manager (SAN) focused on contract training specifics as the MES contain a large number of contracts “Our issues were not listing our requirements before and during the implementation, but our problem is that we do not have the experience in listing our requirements post implementation especially in the contract. So pay attention to penalties to fulfil the airline’s needs. Loyalty and if people have been educated correctly and trained well, will be in a better position to accept change rather than have old fashioned people that want to continue with the old processes and systems. Also more training will help immensely in contracts and other issues.”

Not only is the training for the systems sufficient but also training for the vendor’s management is needed as it has been delineated by one of the vendors management (SPE) “So I would say that the business unit could be better prepared and advanced for a large initiative like this. We spend a lot of time defining ambiguities of the contract. We spend more time defining and negotiating what occurrences in our path have slowed us down.”

Additionally, Allen (2008) stressed on improving the chances of having successful change such as enterprise systems if it was complemented with effective training. However, Robey and Boudreau (2002) contended that knowledge barriers are a huge concern to overcome, even when proper training

is in place, which could have end users experiencing difficulties absorbing the required knowledge needed to use ERP efficiently. Boudreau and Robey (2001) added that end users might devise and improvise the work and that affects the business process negatively. This phenomenon of improvising work mostly affects operation users and it may have long run sequences like adopting the work as the norm and later changing the system to match the work around a process which will deem the new systems less effective. The importance of training has also been stated by ASP director (SPA) "A good combination of people across the board from the airline have a good understanding of the current processes and have a good uptake of the training. They have learned the new techniques, so the combination of good access to the old processes and combining them with good knowledge of the new system is a key combination. The training, their perception, understanding, keenness, eagerness, ability, and coming back to the word flexibility are fundamental to the success of that."

Law *et al.* (2010) argued that training is not the only critical factor during the implementation of ERP but also salient to the success of deployment in post-implementation activities. Furthermore, they contend that training should be adapted explicitly to the business processes; additionally, user manual and training materials quality profoundly influence an in-house development for maintaining the enterprise systems. However, Somers *et al.* (2004) argued that training implied a moderate role during the latter phases of enterprise implementation.

Unfortunately, when project's run over budget training and education are the first to be cut, which affects the way employees, understand the functional

business process (Nah, 2009). Moreover, Robey and Boudreau (2002) observed that several organisations spend very little time in training and education. However, Allen (2008) investigated the negative aspects of the lack of training that could result in having a reversal effect on the overall changes after enterprise systems implementation and recommended an extended training in the post implementation phase to sustain the success and usability of the system. Sumner (2006) in his article about the critical success factors of ERP implementation identifies effective training as one of the critical success factors, and monitored over five years the change in the perspective of organisations towards training and education. In his first visit the organisation under study initially invested in retraining the end user to prepare them for using the new technology, while 5 years later the same organisation started to employ the strategy of depending on software vendors to offer training to super-users (Robey and Boudreau, 2002) on specific business track which in return provides training to his colleagues. Training the super-users by vendors was used in MES extensively to ensure that enough training been provided.

Somers *et al.* (2004) pointed out that failure to recognise how enterprise systems work and lack of training and education seem to be accountable for many failures and problems. Taking into consideration the complexity of enterprise systems, training is salient throughout the project. Given the complexity of ERP systems, training is essential through the acceptance stage. Training takes on a moderately important role during the latter stages; however, training on a continuous basis is required to meet the changing needs of the business and enhance employee skills.

On the contrary of concurrent MES deployment strategies Robey and Boudreau (2002) contended that enterprise systems should be deployed at a slow pace and using an incremental approach, having user training and education side by side. In addition, they added that training must have a value otherwise completing training courses is not the target as shown in their study.

#### 4.27 Summary

The most frequent themes emerged from the first stage of analysis in the open coding phase has been discussed in the light of existing scholarly work. Highlights have been provided on the GT techniques and the author's approach regarding these methods. Nvivo has proven to be of great value in the analysis stage especially in handling large volume of text and without it, the whole processes of analysis would be almost impossible. During this stage, inter-coding took place to increase the reliability and validity of the research. This chapter addresses the following main open categories:

- Slack Resources
- IT Capabilities
- IT Governance
- Key Process Area Profile (Business Processes Coverage)
- Executive Support
- Credibility
- Flexibility
- Culture Fit
- Change Management
- Big Bang vs. Sequential
- Best Business Process Practice (Vanilla) vs. customisation
- Project Management
- IT / Business Alignment
- Partners Criteria's
- IT leading Project



- Best Of Breed Vs. Few Vendors
- Competitive Cooperative Partners
- IT PMO
- Communication
- Champion of Change
- Politics
- Training

Chapter 5 will deal with all of the above open themes aiming to substantiate the emerged framework the research is aiming to build that explicate the phenomenon of MES in much deeper detail. In this chapter a high abstracted theme will be discussed where these abstract themes will constitute the final substantiated theoretical framework. In addition, it will relate the open code categories to each other under preceded abstracted themes that eventually will provide insights into the MES phenomenon. Exploiting the exhaustive comparative analysis GT's coding technique (axial and selective coding) will underpin the processes of reaching the final framework that the researcher is aiming for.

## **5 Chapter 5: Final Analysis phase (selective coding) and Discussion.**

## 5.1 Introduction

This chapter exhibits the axial and selective coding analysis phase in GT, which is the final stage that unleashes the framework study intended to uncover. After building the foundations of the coding scheme in the first stage where themes are coded into categories and subcategories (Strauss and Corbin, 1998), the advent stage is to construct themes that would substantiate the theoretical framework in this study. Occasionally, there will be a theme that will necessitate more attention from the researcher; nonetheless, the selection of these themes has to be based on certain logic that supports the selection, otherwise it would be difficult to draw a conclusion and solid conceptualisation if the selection were biased. Evidently, the conceptualisation of the theory and understanding of the context of the phenomenon under study are materialised in this phase. As Creswell (2007) contended, this coding is the final stage of coding where categories and subcategories from previous coding stages are interrelated to compose the emerging theory or model. Strauss and Corbin (1998) expounded that the process of selective coding deploys a code selection method involving those codes that have a high correlation with the main theme and are related to the research question to be conceived as highly related codes. Those codes are characterised by high-frequency occurrences that will construct the core themes. After applying this process, a theory or model will emerge that best represents the data that have been gathered. In this method, core variables of the entire research study are determined (although they are in practice tentative core variables because they can change a bit at a later stage). Then, according to these core variables of the research study, coding is done so that they naturally present in their respective categories. Using a selective coding procedure a researcher can get the results in an exceedingly fast manner,

thereby enhancing the horizons and scope of the research study. A GT is not highly concerned about the accuracy of data, and it is also applied to for the situation like abstract studies, time, place and people-related studies. Theoretical sampling is also a deductive part of the selective coding procedure, and it is generally used by abstract research studies. Older notes and records made by a researcher (open codes) are also used by the selective coding's procedure to go over the entire research study in a rapid manner and extract relevance between codes and categories. Theoretical codes are also used by the GT's researchers because they act as a mode to integrate different concepts, which are detached from each other, and to give rise to a theory in a technique that is seamless, plausible and sensible to every reader.

## 5.2 Chapter Layout

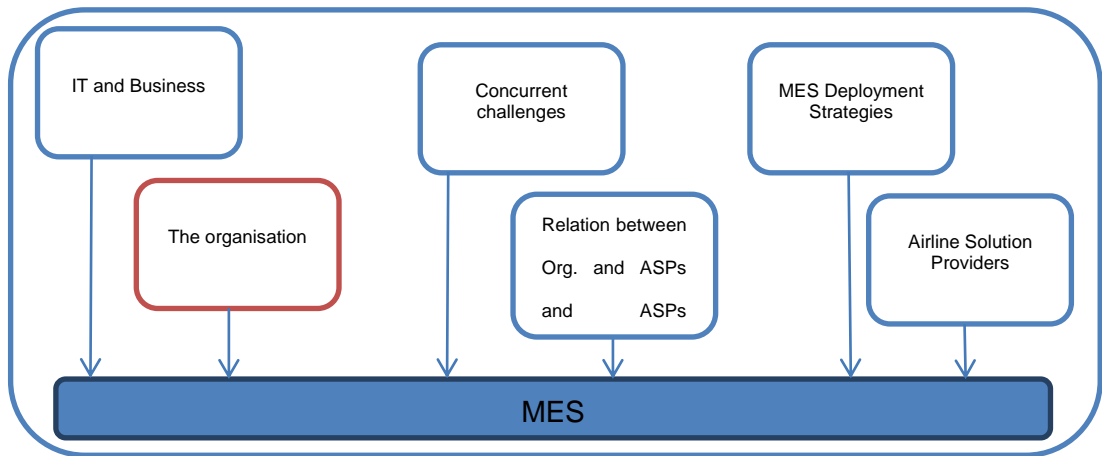
The author will endeavour to discuss the overall factors that influence the MES phenomenon and relate all of the open themes that emerged from the previous chapter into the realisation of the final framework for the MES phenomenon. First, the author will discuss the main players in MES where those players have a significant impact on the MES initiative. As with most GT advocate coding line by line at the sentence level (Charmaz, 2006), the author examined the text in a meticulous manner to find the emerged themes. The analysis was conducted in a multi-pass scheme, and each line was examined carefully to generate a theme. As the author has become more sensitive about the data, more abstract categories started to emerge that will be discussed in this chapter (please read chapter 3 for more explanation on the analysis process).

The second section in this chapter will examine the overall detailed view of all the aspects that comprise the theoretical framework. This view will contain a list of almost all the details about the phenomenon where the core themes and their

properties and dimensions will be viewed. This is particularly valuable guidance to enhance the readability throughout the chapter. The third part will be devoted to discussing the details of all the attributes encompassed in the MES phenomenon. Most of the attributes had already emerged in the open coding phase, and they will be referenced back to chapter 4. A few others will be explained here in this chapter. The final section will discuss the final emerged framework that describes the MES phenomenon based on the analysis of the data collected in this study.

### 5.3 Main Core themes in MES

The author capitalises on the previous coding categories and relates all the notes as well as the incessant constant comparison to construct the final framework. In this chapter, we will depict the construction of the theoretical framework from the base categories. After the analysis, it became apparent that the phenomenon ingredients consist of six islands (themes) of abstract concepts as shown in the figure 5.1 below.



**Figure 5.1 Six main categories that play role in MES**

The first island is the cause or motivation for undertaking such a challenge. Apparently, this is a prime IT endeavour where almost all of the technology in

the airline was revamped. During the analysis stage, it was clear that participants from the IT side recognised the need of the business side as well as their strategies in the market. This alignment undeniably helped the whole initiative of MES to proceed forward. Without a clear shared aim between IT and business, this undertaking would be extremely difficult. The core players in this initiative are the organisation and its partners. The organisation in this study is the recipient of MES, the behaviour of the organisation towards this change and how to lead such change are critical success factors. Further, various participants explicated on the role of the organisation decisions and its impact on the whole project.

Evidently, without deep insight of the interplay between all the partners including the organisation, apprehending the MES phenomenon would be rather strenuous. Participants during the interviews revealed their experience with the organisation and their co-partners before, during and post the deployment of MES. Various open codes emerged during the analysis of this experience from participants. These open codes were all related either to the organisation or to the interplay between the solution providers.

After that comes, the concurrent challenges as these are at the heart of this study where there is a need to investigate the phenomenon of having multi solution providers' working with each other at the same time. This phenomenon had not been investigated before, which is why an emphasis was placed on this issue throughout the study. Most of the participants in the MES talked about their experience in these challenges and obstacles that rose throughout the endeavour. Having the concurrency part added significantly to the complexity and risk of the project, and due to the concurrent nature of MES more attention

was given to encompassing as much of the participants' experience as possible in this study.

Finally, there are various deployment options to be chosen from when implementing such an immense undertaking. These options created controversial opinions between participants regarding the decisions. The participants enlightened the study with their experience regarding these options and addressed their pros and cons and why each option was selected. The study has investigated all the options that were available for deploying an IT project and which deployment strategy was chosen for the MES and why it was chosen. Owing to the fact that deployment decisions affect massively the project timeline and its resources, as well as the emerged themes regarding these decisions, both contributed collectively to constructing an abstract core theme (deployment strategies) to cover this imperative part of the MES phenomenon.

After exhaustive analysis of the open codes, the author has arrived that there are four categories that explain or influence some of the main core themes. These categories represent the circle of influence underneath them. Moreover, these sets of categories will provide a neat and uniform approach to the structure of the themes. So under each core theme the themes will be grouped according to their influence type within the core theme. To further details this we will explain each of these types as follows:

- 1- Contextual: A contextual influence trait refers to the factors that influence the subject due to their contextual existence; for example, because MES has a concurrency nature it will have some factors that exist because of that nature around the concurrency issues under the contextual category.

- 2- External: any factors that exist outside the theme (from the point of view of the core theme) and influence the theme will be considered as external, such as the government body, which influences the organisation and considers external influence.
- 3- Organisational: refers to issues that influence MES and is related to the organisation or has emerged from the organisation, such as IT capability and employing IT PMO .., etc.
- 4- Technical: those factors that influence the MES and insinuate the technical element in them will be under this group, like the integration part between solutions or the technical knowledge such as project management.

This chapter will visit some of the open coding that was discussed in earlier chapters briefly for the sake of linking the ideas for the reader and providing an overall view of the theoretical framework.

Before unleashing the main categories, it might be worth shedding light on the reason behind the MES, and how the airline decided on it.

### **5.3.1 Deciding on MES**

To survive today's turbulent market, the airline in question embraced a new strategic business goal that demanded high cutting-edge technology to lead it into a new era full of challenges. To be part of strategic airline business alliances would be cumbersome without having these technologies in place, especially in the airline sector. A decision was made to have the best class of ASP to equip the airline with the right weapon for its new strategic business goals. A collaboration of elite ASPs was chosen for this task. An airline executive (SAG) highlighted the issue: "Most of the leading companies their



requirements cannot be met normally by one vendor, so it is a natural result that you would have multi enterprise system from multiple vendors, so this is a major factor.” The main problem was the complexity of the solution and path of having concurrent MES, which required extraordinary management in all aspects in order to succeed in such initiative. A senior consultant (SPB) described the initiative:

You are bringing in multiple cultures as you are bringing in multiple ways of doing work, methodologies, trends, priorities, competing priorities within the vendors themselves, so managing all these is not easy, no matter how much effort is put into it.

Another senior manager (SAB) from the airline commented on the experience of having MES:

It was very difficult. It was a challenge. It was a crazy idea by itself. Managing it was difficult. Even thinking about managing it was difficult. However, we understand that circumstances dictated this kind of scenario. It was inevitable, and it had to be run that way.

The complexity was a key issue due to the fact that interrelations between the ASPs increase massively. As one of the directors (SPD) of ASP put it:

When you talk about platforms or even multiple platforms then the engagement is much broader, and obviously the complexity increases several fold. It does not even increase in a linear fashion but increases exponentially.

Another ASP senior (SPB) similarly stated:

Concurrent MES is much more complex. The difficulty is almost quadratically higher, [the rise is] on a quadratic scale [rather] than on a linear scale. If I am working with one system and I know my challenges are going to be this much, and I’m bringing the second system at the same time, my challenges are not double; it is more than that; it has a quadratic effect. The second thing, most of the big companies, they don’t, their requirements cannot be met normally by one vendor, so it is a natural result that you would have multi enterprise system from multiple vendors, so this is a major factor.

## 5.4 MES Outlook

By and large, the MES undertaking is complex and extensively large as well as spanning over years of deployments. All of these factors contribute to the difficulty level of the study. The researcher has to investigate all aspects about the MES in attempting to unleash realisation about this phenomenon. To start with, the overall outlook of MES is relatively complex owing to the fact that there are many aspects that necessitate an in-depth investigation so it can be uncovered and understood.

As previously mentioned in section 5.3 and in figure 5.2 below, there are six main categories that influence the MES where each category is subjected to the impact of four types of stimulus: contextual, organisational, external and technical. Under each stimulus, there will be zero or more dimensions that explain each stimulus, which further explains the core theme. In GT terminology, the main category will be called *prime core themes* and the types that explain these prime core themes will be referred to as *properties*; additionally, the final level that describes the properties will be termed *dimensions*.

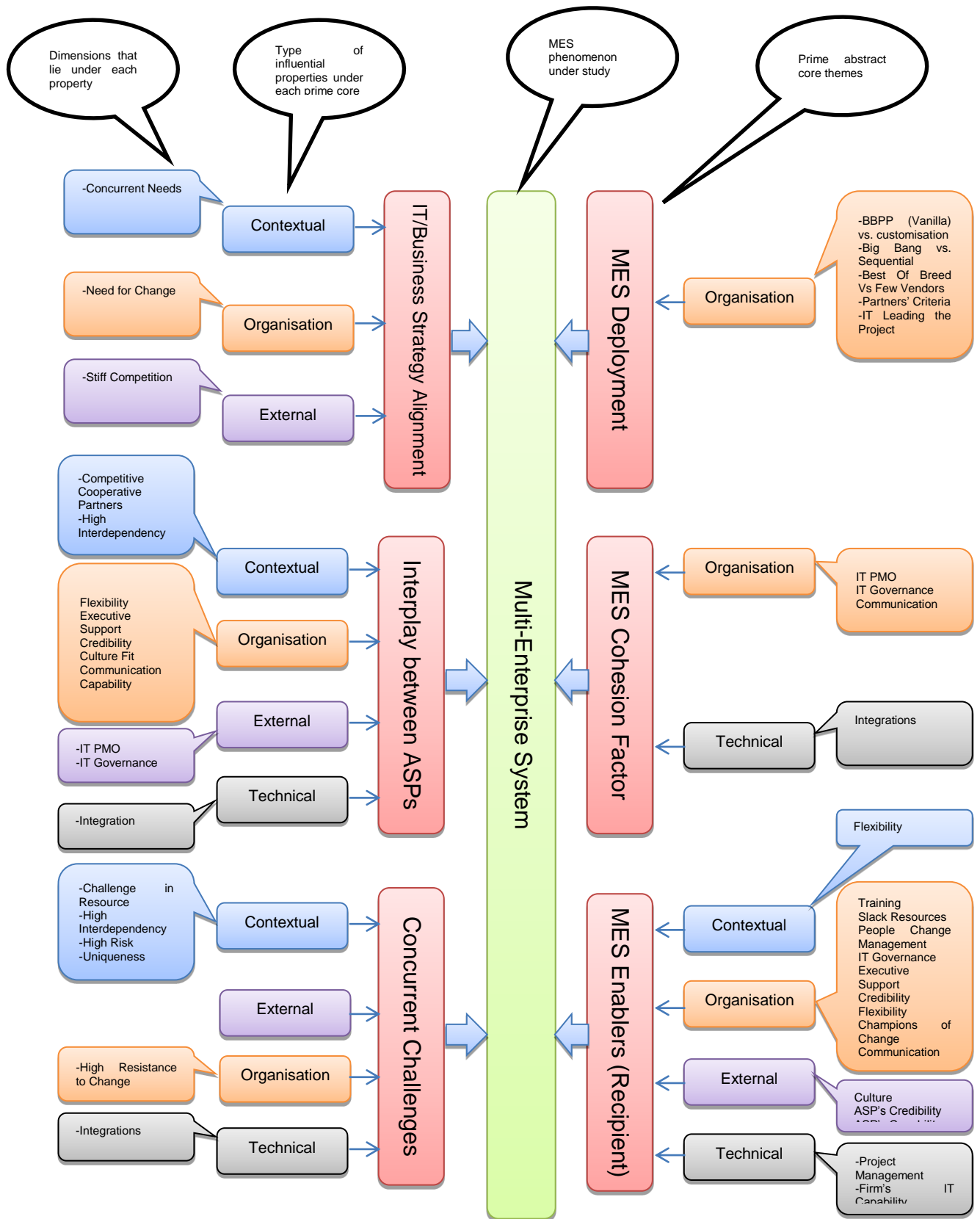
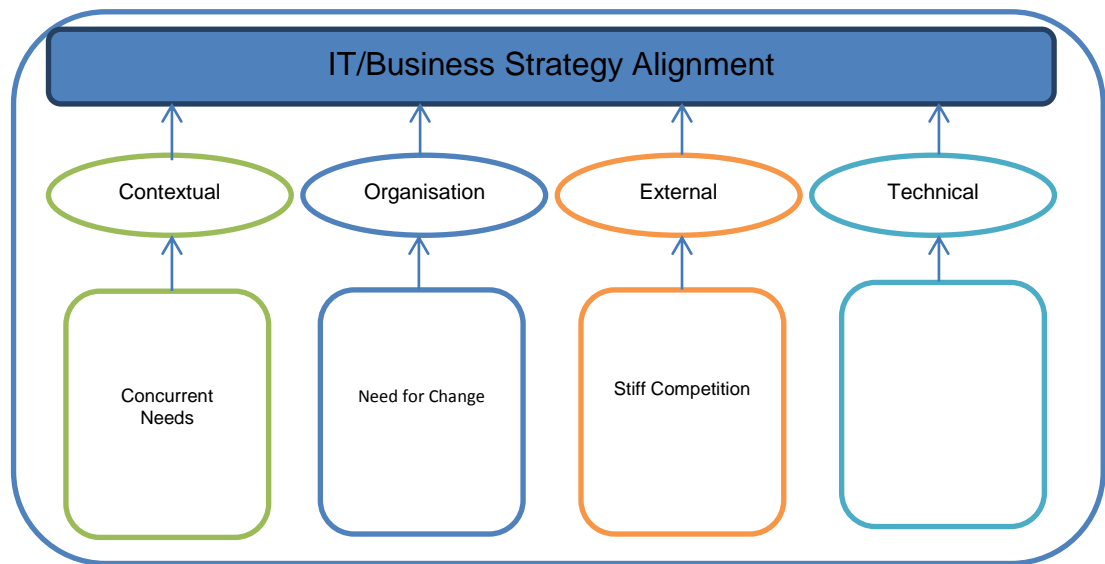


Figure 5.2 An overview of MES in airline industry

In this chapter, the author will tackle each core theme as the main section and will discuss its properties and dimension if these have not been discussed already in chapter 4. The next section will depict in the third part of the chapter where it will elaborate on the elements that constitute the MES framework.

## 5.5 IT/Business Strategy Alignment

The first core theme would relate to the MES and how business and IT aligned their objective to decide on the MES, which is the IT/business strategy alignment. The latter notion was the first thing the participants usually talked about when they introduced their experience in this undertaking – why they did it and what options they chose. The figure 5.3 below illustrates the translation of the participations into academic abstract thinking keeping the four main properties underneath the first core to systematise the process of conducting the coding. As can be seen, there were no dimensions under the technical property, but we still show it as we mention creating a uniform procedure to build the substantive model as much as possible as well as ease the flow of reading and understanding. Under the contextual property of IT/business strategy alignment, there are the *concurrent needs* (which were laid because of the concurrency), is an issue that exist only within the concurrent implementation of all the ES's, as was done in the MES. Why the organisation has executed such a change falls next. After that, during the analysis it appears that there is an external element that drove the airline to make this change, which is the stiff competition.



**Figure 5.3: IT/Business Strategy Alignment**

Reaping fruitful and ambitious aims would not be feasible without suitable strategy alignment between business and IT. An airline executive expounded on IT/business strategy alignment: “If we go one step back, saying your strategic goals will be achieved only if you have them aligned with your business goals and IT applications.” Broadly, IT and business alignment refers to the harmonising, espousing and preserving the coherence of both goals and strategies of business and IT. As a matter of fact, the whole MES project was a set of visions of senior executives aligned with IT aimed at accomplishing an increase in business performance and attaining competitiveness in today’s market. Additionally, a complete harmonisation between business and IT could lead to an increase in the financial return from IT capital investment, which also leads to a reduction in conflicts between them, eventually realising competitive advantage (Papp, 1999).

Knowing that IT and business alignment is one of the top concerns of both business and IT executives, as it leads to stronger performance and reaping more value from IT (Luftman *et al.*, 2005, Chan *et al.*, 2006), it was necessary to

have such alignment before engaging in such a large and extremely complex project as MES. This was stated by a vendor's director: "An inter-multi-enterprise project cannot be just IT driven; no way will it succeed if it is only driven by IT, it needs to embrace IT. At the end of the day, IT is the facilitator, right? You know, it just makes things happen for the business. The ultimate is the end-user of the business and they need to embrace, they need to feel that I have something at that project." Further, the airline's manager (SAJ) stressed: "If we leave it for the IT expert, they might build something that will not suit the business. It is not that the IT does not know the business, it's just because that is not his specialisation." Various studies have investigated the nature of this alignment and built up models like the strategic alignment model by Henderson and Venkatraman (1993). It was found that IT and business alignment are related to the nature of the industry (Khaiata, M. and Zualkernan, I., 2009).

### **5.5.1 Contextual**

The need for concurrency to deploy multi-enterprise systems are contextual in the nature of MES, which is why it has been categorised under the contextual property. As a matter of fact, the whole study is about the concurrency feature of this undertaking that deemed the project unique in the aerospace industry.

#### **5.5.1.1 Concurrent Needs**

The most prominent advantage of having a concurrent model and taking the high risk that is attached to it is the elapsed time for deploying the solution. For that an airline's executive (SAA) justifying the MES "the airline want to catch up very soon. Because the competitors will not wait for us to go with the long sequential process at the same time interfaces that are needed with old technology and legacy systems, and you want to bring new systems that are not compatible with old ones and need a lot of integration in case we need to do it

in phases... [Besides these softwares are] outdated and costly to maintain and it is not up to the standards that the user is asking.” Another executive (SAE) added: “We have a limited time span to implement these systems, and if we do them in parallel is much better than doing them in sequence. Because the sequence will take time, we should do them concurrently, that will save time. We will also allow the end-user to get the benefits of the systems as early as possible. That’s the strategy we are going with and I agree with that.”

Achieving strategic goals faster might be another reason why it was legitimate to opt for the concurrent model. “The way that we did it would achieve the strategic goals faster. Probably you would think you achieve one goal and fail with the other goals, e.g. one of the strategic goals is to go for a sky alliance. If you go separately, you would never achieve it; you would wait twenty years to implement all the systems or it would take so much time modifying the legacy applications to adopt the sky alliance changes. It’s not achievable” (airline executive) (SAB).

The strategy and goals predetermined that the airline is interested in a change not only to the technology but also the business processes attached to it, so “what happens in bringing the system and your business process will not be changed. So if you are changing some way or another then you need to change everywhere...[...]...You need to do all of this at the same time. It is a challenge but necessary. Failing this would be a very huge risk for that change and might have dramatic consequences” (airline executive)(SAD).

Not going with the concurrent model will only make the airline lag behind the technology wagon and delay the benefits of the new systems. “The sequential model would really complicate the matter and you would need to do a lot of

integration; for example, if you bring one then you would need to integrate a lot systems to legacy application before you complete the whole picture” (airline executive)(SAM).

### **5.5.2 Organisational**

From an organisational point of view, the demand from the business units to renovate technology and business processes through aligning with IT to achieve these aims was a pillar of this initiative that substantially supports its success. The genuine need for change is the heartbeat of triumph in such a complex project as MES. Not having a clear vision of what is required from the beginning of such a project will only establish obstacles and lead to sailing away from the shore of success.

#### **5.5.2.1 Need for Change**

Earlier in this study the author tackled why the MES was chosen and how the airline have gone about executing their strategy, as one of the executives (SAJ) expounded on the need for such change: “Unfortunately the window of opportunity was short. We had big support from the high economic committee which is headed by the king and they have a plan to privatise the airline and we have their full support – you know, the money, new director general – so you have a certain window and they have certain expectations within a specific time frame, so it is mandated that the change has to take place in parallel.”

However, that was not the only vital factor implied in implementing the MES. Being competitive in the market and resilient to market changes, including joining other alliances and not being left alone, have become necessary for the airline to exist. Achieving the last target would not be possible without having a common level of technology to integrate these alliances. “One of the strategic



goals is to go for a sky alliance. If you go separately you would never achieve it, you would wait twenty years to implement all the systems or it would take so much time modifying the legacy applications to adopt the sky alliance changes. It's not achievable" (airline executive)(SAB). The airline executive (SAD) confirmed the same argument. "One of most important things to reap the benefits of these enterprise systems is that airlines should be in alliance." Another (SAD) added: "You can understand that the airline business is interrelated and sometimes the passengers may have to fly at least two or three airlines to reach their destination. And this is the reason that alliances were established, because theirs is a benefit both for the airline and to the user, for the passenger himself, because this way things will be easier."

In addition, the factor that forced the airline to change is the fact that legacy systems are becoming hugely expensive to maintain, and resources are scarce as the systems in place such as MVS and CICS are not taught in the universities. The initiative "stemmed mainly from the business needs, but keeping in mind that legacy systems were difficult to support by all means from all kinds of resources, human and others as well, to find the right staff really to work. Even for the new college graduate, it was difficult to put him in a backward situations", as the airline executive (SAM) stated.

Changing the whole business practice and aligning the airline with the best industry practice would require such an undertaking, as was asserted by an airline executive (SAD): "So they will be carrying the industry best practices in terms of business processes. And that is a good thing about it; I mean, when you contract or buy that kind of industry platform, you are also buying with it the industry best practices. And it will be easier for you to adopt and change your business practices accordingly because you will be following their best practices

and adhering to what?. The other thing is that it will be easy for you to interact with the other partners and your alliance also, and easier for you to expand in terms of scalability, refresh cycle, maintenance. You will alleviate so many worries.”

### 5.5.3 External

The external factor that influenced the commencement of MES was mainly the stiffness of the competition. Not only was the competition part sole driver of MES but also the matter of the existence of the airline itself in the market.

#### 5.5.3.1 *Stiff Competition*

Having cutting-edge technology might be one of the best ways to compete in the market; however, not having the right technology would carry the risk of continuing “with the outdated system because you will not survive with the other competitors who have already moved ahead and made themselves available in so many different ways to the customers who are now more educated and they are also open and IT informed and are also looking for more and more online services and to do all these really will be very difficult” (airline executive)(SAD).

Further, he explained the competition factor:

For sure, I mean starting from the year 2000 many of the airlines in the industry have had to change, otherwise it is not a matter of competition, it is a matter of existence. It is a risk to continue with the outdated system because you will not survive with the other competitors who have already moved ahead and provided themselves in so many different ways to the customers who are now more educated and they are also open and IT informed and are also looking for more and more online services and to do all these really will be very difficult. It is not a matter of competition in my opinion; it is a matter of existing, but of course when you do that, I mean when you make that leap of change from legacy to new platform, you will be in the same competition with your rivals, your other competitors who are now competing with you to the same limit.

“The company that would accept the change is the company that wants to stay in business; I believe that if they don’t change they would no longer exist after a

few years. They would be wiped out by the competition” (airline executive)(SAL). This confirms that existence in this stiff market would only mean changing the systems and coping with technology. Finally, an ASP director (SPC) expresses his views regarding this initiative, saying that it “will keep the airline up to speed with competitors or its partners since [the airline] is joining the sky alliance. [The airline] needs to keep up with the speed of technology, and [the airline] does not have all these, the problem is people have no capacity to make it happen.”

The next prime category is the relation between the ASPs themselves. While the author was investigating the MES phenomenon, it was obvious that all the ASPs have a relation between them and the organisation; however, in the context of MES those ASPs have to work together and interrelate with each other on many occasions, such as when building integration and planning issues as well as when they all depend on each other to construct a homogenous solution for the airline.

## **5.6 Interplay between ASPs**

Through deploying the MES solution, the ASPs will depend on each other highly, and that will raise the interaction level between them. For that reason, it was a prime category that needed to be investigated as it has a substantial influence on the MES success. As a matter of fact, some themes in this category were unique to the context of MES, such as the collaborative competitor phenomenon where the rivals need to cooperate concurrently with each other to build a solution for the airline.

Various participants responded in regard to their experience in MES and mentioned the interplay between these ASPs' relations. Since the ASPs are an

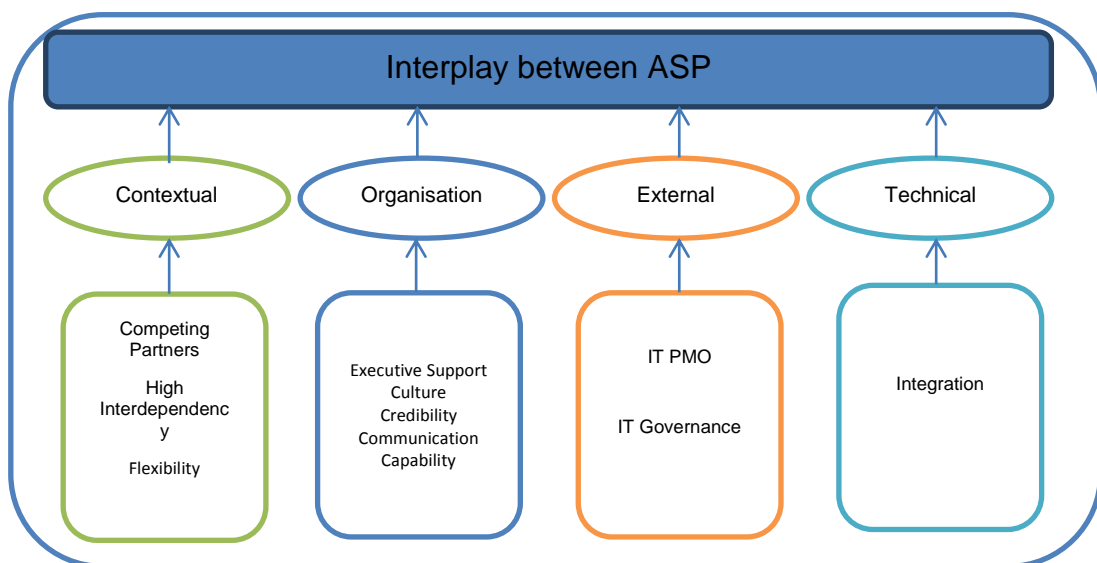
organisation by themselves they have common traits with the MES's recipient organisation. So there are a couple of open themes that apply to both the ASP and MES's recipient company. For example, executive support is critical when dealing with other ASPs or when dealing with the recipient organisation for that we will see the same themes repeated where applicable but with form point of view of either the ASPs or the recipient firm.

It was only recently that pioneering providers of airline IS solutions like Boeing, Sabre and Lufthansa systems reached a level of maturity high enough to cover most airline business processes. Before this, there were merely oriented software companies that dealt with specific business processes like navigation systems and crew scheduling. Subsequently, large-scale IT enterprises have been growing in popularity in offering services to airlines such as marketing, human resources, maintenance, finance, flight scheduling, crew scheduling, reservation, operation control, ground handling, cargo, catering, navigation and crew training. For that, the airlines had to select more than an ES solutions to satisfy their needs, which implies an investigation when they work with each other. As a result of this interaction between the ASPs, there will be overlapping of business processes.

However, there are boundaries that have to be laid between the ASPs by the airlines' to smooth the overall project flow. Eventually, these boundaries have to be drawn to help the success of MES. "One important factor or tool that we use during the project is to have a PMO dedicated to manage all these projects and to manage the relationships among the different providers, so of course, to take part during the evaluation for these projects or during the negotiation and the reviewing of the proposals. So they knew that we would be working with other people and other companies and other providers and we explain to them that

we put certain boundaries between them so that they can work together” (airline executive) (SAK). ASP’s senior manager (SPD) added: “Everybody is working towards producing a value or a benefit to the airline but we cannot work in isolation and work in silence or work in silos. We have to work together, and I think the governance body can play a key role in making everybody work together and play together because this is only natural.”

This section presents a literary overview of aspects found related to enablers of IT collaboration between ASPs. After that it discusses the findings from the data analysis and then suggests the salient aspects required to be taken into consideration when forming MES as a strategic decision to what could be a competitive advantage in the market from the point of view of the relationship between the ASPs.



**Figure 5.4 Interplay between ASP categories**

The figure 5.4 above shows that under contextual properties, competing partners appears as a strong theme as it was majorly contextual to the MES phenomenon specifically. The second theme was the High Interdependency theme. The latter theme was axiomatic in the sense that MES is so complex

and has abundant interrelated tasks, which support this theme. Under the second property, a couple of themes emerged and those usually have a dual relation. The first relation is applicable to the relation between the ASPs themselves and the second relation is between the ASPs and the organisation (the airline). The ASPs had two main external influences on their success and to boost their work, which is the airline centralised IT PMO and the overall project IT governance. Finally, the integration itself emerged under the technical properties of the interplay between ASP themes. The next section will present more detail of all the properties under this theme starting with the contextual.

### **5.6.1 Contextual**

It might be paradoxical that rivals have to cooperate to achieve a product but having them work for a client to achieve one goal might explain their existence together. Though it might appear that it is a negative point, the scarcity of vendors in the aerospace rendered this choice inescapable. Technology leakage and finger pointing might be serious cons as side effects of this paradox; however, this mix of the best of the breed can generate unique assets worth the risk for some organisations.

#### **5.6.1.1 Competitive Cooperative Partners**

This theme appeared in chapter 4 as it was clear that there are rivals in MES and the nature of concurrency has set them to work with each other shoulder to shoulder to build a homogenous solution for the airline. However, it is believed that in the old days there was less collaboration between rivals, as they all competed to remain in the market. However, this view has changed over time and in MES it was declared in SOW that ASPs would need to work with their rivals in the market. “Before these competitors reach your premises, there will be competition and even some finger pointing. I believe from experience that

once you have them on your premises these things will disappear because their staff feel they are part of this organisation one way or another” (airline executive)(SAD) (please refer to section 4.2.1). Nonetheless, a non-disclosure agreement is one of the options that airlines have chosen to ensure their collaboration. Another measure that has been taken by the airline to ensure competitors’ collaboration is to have a well-defined governance body (such as IT PMO) that defines the roles and responsibilities of all vendors. The next theme in the contextual property under the *interplay between ASPs* core theme is the high generated interdependencies.

#### **5.6.1.2 High Interdependency**

Gathering large players of airline solution providers concurrently to work with each other in one scenario will only lead to excessive interdependency between them that necessitates meticulous planning and execution of the tasks in order to succeed. A severe consequence could arise if one of those ASPs did not deliver on time, which would undoubtedly affect the risk, time and cost of the entire project.

One airline executive (SAD) explained this interdependency: “If you have strategic change like that and you have many vendors, if one vendor out of all of these vendors is having difficulty with his credibility he will affect the others; he will be the weakest link in the whole spectrum.” Another one (SAF) added: “These people are not able to finalise their processes because they are dependent on something from this system and that takes time, so the challenge is, of course, the simultaneous changes.” With regard to the risk issue, one ASP director (SPA) said: “A lot of different elements within a project or which are concurrently happening as opposed to in a linear way, then you really need to be very careful, but the core thing is that there will be a lot more risks identified

that have to be very closely monitored and very closely dealt with as they become issues...[...]... So that if you do it in the multi-system, you are trying to do it at the same time, you are going to risk that if any one of those streams is forced to lag behind, it will drag the others behind. It is not necessarily the fault of the other one but it is just the way that the whole project is.”

The existence of high interdependency caused the risk of deployment to increase. “If one starts to lag behind for whatever reason, it will drag the others back as well, you know, because they become multi-dependent, whereas if on a linear system if you have for example, we had SAP, which was like 85 – 90 % done by the time..[ He further expounded that the surge of complexity in this project was due to the fact that a lot of interdependencies were created due to the nature of concurrency]. I think one of the key things that we suffered from with the project is that one of the fundamental things was that all projects were happening at the same time and they had interdependencies, but they ran in parallel so that really complicated matters and it complicated matters for [the airline] themselves” (ASP director) (SPA). A business manager (SAN) contended that MES extensively exhausted many resources: “When you need to implement everything at once you need many resources, too much effort to be done, and you need to have so many commitments from so many vendors at the same time and you cannot guarantee this. In addition, these vendors are so different, in contract, in location and in commitment.” An ASP director (SPH) asserted the impact of delaying any process as “it will have a direct impact on another vendor as well as the organisation and it is getting multiplied in all angles and these are the major challenges”.



### 5.6.1.3 Flexibility

Flexibility plays a pivotal role between ASPs and firms at the contracts stage and afterwards that will eventually furnish the road for constructive partnership. In this research context, flexibility is considered to be an attribute that allows ASPs and organisations as well as the ASPs between themselves to absorb minor conflicts and reach a state of agreement in a flexible manner. Flexibility has an influence on large and complex projects; as a matter of fact, flexibility is “one of the most influential factors. If the vendor is not flexible enough, this can make things very complicated. We even have official channels for introducing changes agreed with all the vendors. But sometimes there are minor changes that would not require all the cycle of change; so, if the vendor starts to complicate things it might be a good factor to consider when selecting a vendor. The flexibility issue might affect the success of multi-enterprise systems,” as desalinated from a senior airline manager (SAI).

Indeed, flexibility is required to overcome the non-detailed requirements that were not covered in the contract and place the interest of a successful business partner relationship first. This leads to fair deals in the contract context where both parties have or expect a fair return. Having said that, it is imperative that all parties should not disregard the detailed contract and they should put all effort possible into making everything as detailed as possible as this will help future implementation and post-deployment. Benaroch *et al.* (2010) contend that reversal flexibility could lead the client to revoke the contract and search for an alternative that will negatively affect the partner’s relationship. So flexibility is needed from both to sail the journey safely to the shore (please refer to 4.11).

### 5.6.2 Organisational

Each organisation has its own traits that usually differentiate it from others. This characteristic of an organisation can influence either the success or failure of such projects. In our study, we investigated this dimension between the ASPs themselves. Obviously, some of these traits are applicable to the airline itself. The participants delineated many aspects related either to ASPs or the airline company. The author has drawn together various themes that are related to both that affect the relationship among the ASPs. Under this category, the study investigated each theme as follows:

- Executive Support
- Culture
- Credibility
- Communication
- Capability

#### 5.6.2.1 *Executive Support*

Having to implement simultaneous IS solutions with their business processes may involve a vast organisational structure change, a major change in the existing business processes or a substantial amount of cost investment. As a result, executive support is clearly manifested when there is an active involvement from top executives in the decision-making process of any IT initiative.

Indeed, it helps in deciding on some critical turns in projects that might require extension in either resources, budget or time. Moreover, Ramamurthy *et al.* (1999) highlighted the vital role of the executive involvement in IT projects, realising the risk in terms of budget, time, and resources. One of the ASP (SPI) participants said: “We need the executive support to pave the way in front of us

to make it easy and to solve obstacles, as you will meet obstacles. You need an executive sponsor that has the power and ability and the willingness that adds up to your success.” Having to implement simultaneous IS solutions with their business processes may involve a huge organisational structure change, a major change in the existing business processes or a sizeable amount of cost investment. As a result, executive support is clearly manifested when there is an active involvement from top executives in the decision-making process of any IT initiative. Noticeably executives’ support adds enormous value to all IT projects, their participation and support being associated with the success of various IS implementations and large-scale adoption by firms (Lederer and Mendelow, 1988; Merali *et al.*, 2012) (please refer to 4.9).

#### **5.6.2.2 Credibility**

Without credibility from the ASPs that constitutes a secure valve for the airline, there are some occasions when an enormous gap would occur between the marketing team and implementation team endangering the whole process of successful adoption. So, due to the importance of the latter, research has investigated how credibility could influence an ASP partnership, as an ASP director (SPD) articulated: “I think credibility is very important, especially when you are going with the multi enterprise: you don’t want to take risks in the selection of your provider. You want to make sure that you select credible trustworthy providers because it is a big plan now and your plan is as strong as or as weak as your weakest provider or as your weakest constituent in the big plan.”

Therefore, the credibility of ASPs is considered as an influential factor in selecting IT partners, as the road of adaptation of such considerable changes in business processes covering the entire organisation is complex, lengthy and

dynamic, which requires ASP's credibility to be secure and maintain the firm's assets and resources. Credibility is built on a fine reputation of continuous commitment with partners or clients where commitment reflects the degree of credibility. Evidently, mutual commitment from both partners is essential to sustain a proper relationship, where any of the partners might undergo short sacrifices for the sake of keeping the relationship positive (Dwyer *et al.*, 1987; Rai *et al.*, 2012). Committed parties have a tendency to invest in exchange of valuable assets to show a willingness to preserve the relationship (Anderson and Weitz, 1992). An ASP senior manager (SPG), in regard to commitments, said: "I need someone who is committed to stand by me because any project in the world has got difficulties and will come across ups and downs" (please refer to 4.10).

#### **5.6.2.3 Culture fit between ASPs**

MES is a large and complex project involving companies who differ in location, language, culture, technology and methodology. Having all of them underneath one umbrella will complicate the deployment of any project; however, taking into consideration issues such as culture when preparing for such a project will lessen the advent of the side effects of these elements.

Considering the culture fit factor when thinking about ASPs as a strategic partner is vital and needs to be studied as the duration of such a large project necessitates prolonged periods of interaction between the ASPs themselves and the organisation's personnel. This has been affirmed by one of the airlines' executive: "I have noticed that Westerners think and decide slowly while Asian and Middle Eastern people tend to think and decide fast, but sometimes do not make mature decisions. You need to mix both to get the optimum formula." A senior manager (SAD) observed: "European consultancy companies are very

strict and sometimes unfair when they do business. They try to milk you when they deal with you. They don't want to show it is a win-win situation. Flexibility, financial viability and understanding of the culture are good tools, of course." However, a different culture could act as a barrier when "bringing in multiple cultures as you are bringing in multiple ways of doing work, methodologies, the trend, priorities, competing priorities within the vendors themselves, so managing all these is not easy no matter how much effort is put into it ...[...]. both sides understanding the culture of each other has to take place otherwise just like any other partnership relationship even in life things in partnerships will not work if that understanding is not reached quickly" (airline executive) (SAF).

Further research focus will be on the interaction between partners in IT collaborations. That is why one of the vendors brought programme director from the same region that they will be working in, which is why they are "trying to bring people who are familiar with the culture like Sabre; they brought the director that was originally person [from the same region]", as was asserted by an airline's executive (SAA). One airline manager (SAN) added: "This is a very serious factor and I think Sabre was good at this; they brought employees that share the same ethnicity because they will know our culture mind-set and think much better than the others." Phene *et al.* (2006) discussed the cultural fit issue in relation to international alliance that it will unlikely to yield innovative results if there was a culture distance in place. Furthermore, some scholars covered the culture fit from the implementation point of view of IS such as ERP. Hong and Kim (2002) considered the organisation as a factor related to successful ERP implementation. Davidson (2002) also stressed the cultural misfit issue and considered it as an inhibitor in ERP implementation. Generally, there is

evidence of the influence of culture fit with regard to partnership, which was also verified in this research (please see 4.12).

#### **5.6.2.4 Communication**

Communication in this context refers to the delivering of messages, information, knowledge or opinions among various people, functions or levels. Due to the influence of communication on the deployment of MES, especially with the gigantic number of interrelated tasks that demand an efficient type of communication, an effective communication has to be in place for MES to be deployed smoothly. Communication in that sense becomes the base for other factors to build on; it is also used as a conflict resolution tool.

Knowing that MES involves a tremendous amount of communication among various and diverse parties in locations, timing and culture, a careful and well-planned communication plan has to be laid in advance to promote the success of MES deployment. An airline executive (SAD) contended: “The most difficult part is communication between all of those.” Gillard (2005) stressed that communication is more valued in projects where many people group together from diverse cultures and from different companies, which requires effective communication that acts as a common language. Rai *et al.* (2012) delineated on the communication aspect further focusing on inter-firm communication in the logistics industry, which simulates the type of communication happening in concurrent MES where we have multi firms required to communicate with each other. In their study, they found that communication and IT capability both or individually and jointly enhance the relational value between firms. In addition, the empirical indication from the practice insinuates that IT capabilities and communication between collaborators are essential for creating value from inter-firm business processes (please see 4.23).

#### 5.6.2.5 Capability

This research explored both IT capabilities in ASP's and firms accepting business process change. ASP IT capabilities are required in the first place, otherwise it would be difficult to remain in the market as Melville *et al.* (2004) indicated that IT capabilities are considered as a source of efficiency and innovation for companies. IT capabilities contribute to the success of such initiatives, as delineated by a vendor manager (SPG): "IT capability is very important and it is definitely an essential factor in the success of the implementation." IT capabilities as defined by King (2002) are the IT-related parts that are integrated coherently to achieve business objectives. The two basic elements of IT capabilities are the human skills element and the technology element, as suggested by Melville *et al.* (2004) and Byrd and Turner (2000).

Though the firm's IT capability is considered as a major enabler for MES undertaking, the vendor's IT capability is also considered crucial, which is usually taken for granted. One airliner (SAE) found that this is not the case, saying: "From our experience, we noticed that those vendors are of different types and nature. Some of them are truly professional and you are impressed with their work, some of them come and learn here and this is a big problem." This indicates that IT capability is not always guaranteed, though it was always assumed, otherwise it makes no sense that they are in the IT field to begin with, as was mentioned by a service provider director (SPA): "Yeah, we are service providers. I mean, it goes without saying. You know, airlines will look to you and expect you to know all this. If you came to them and said, well, we don't know how to do this, that is not going to look very good, and I as an airline would say I am a bit nervous about that so I am not going to take you as a service provider."

However, another vendor (SPD) put the ball in the client's court that the organisation should have done some homework when selecting vendors as "the IT capability is not an issue on the provider side because if you have done a good job selecting your IT provider then this is a factor that you would have made sure that if it is an established provider then they would have the IT capability to deliver what you are expecting from them". IT capability is not only responsible for easing and advancing the deployment process, but also for improving the organisation's performance (Aral and Weill, 2007; Nakata and Kraimer, 2008; Patrakosol and Lee, 2009) (please see 4.6).

### 5.6.3 External

IT PMO and IT governance exerted by the airline on the ASPs are considered to have an external influence on them. It was particularly necessary to employ such factors on the ASPs to impose overall harmony between the project stakeholders; in other words, they would act as a maestro for the whole initiative. These factors and others are highly salient for the success of the project and emerged as a theme that will be discussed later on in this chapter.

#### 5.6.3.1 IT PMO

The function of IT PMO is like the maestro for the whole MES undertaking. MES is a complex and large undertaking that "will require good IT PMO fully supported and report to the highest top management. To ensure that all ASPs submit all their timelines and plans and comply with them as delaying one could impact many others due to the interdependencies will require good IT PMO fully supported and report to the highest top management" (airline executive) (SAI). One of the definitions of PMO is that it is an advanced project management integrating a wide variety of project management competence to attain business objectives (Hill, 2005). IT PMO will also "ensure that all ASPs submit all their



timelines and plans and comply with them as delaying one could impact others due to the interdependencies” (airline executive) (SAI).

For the important role that PMO plays in MES, a dedicated PMO managed by the airline and world-class consultant company were in place to make sure everything was aligned with airline strategic business goals and fulfilled the business targets that had been set for those enterprise systems. One of the senior executives (SAG) elaborated on the importance of PMO: “These three elements were very crucial and I wish that we had looked at it very seriously before embarking into multi enterprise concurrent systems, especially PMO, vendor management and change management.”

Indeed, having different vendors working with various project management frameworks makes running IT PMO a saddle to align all ASPs in one methodology, and here the leading role of IT PMO shines in harmonising the tremendous number of tasks and activities involved in deploying concurrent MES. Some large airlines would run their IT without IT PMO; conversely, when applying MES, IT PMO was inescapable and a necessity that MES would not work without due to the huge diversity of this undertaking (please see 4.22).

#### **5.6.3.2 IT Governance**

Since this undertaking was an IT project, IT governance emerged as a salient and effective tool between various ASPs who have different backgrounds, methodologies, governance models, etc. Evidently, IT governance is an integral part of corporate governance and those organisations that utilised IT governance reaped the benefits of its deployment. Having a high representation of IT in an organisation will enable better alignment with business; this in turn will yield a better understanding of the value of IT (Weill and Ross, 2004). It was

articulated by one of the airline executives (SAA) that IT is represented in “the steering committee and cooperate steering committee headed by the CEO is representative of all executives from the business and this issue has been discussed, and probably we met so frequently at the time of implementation and we got the support from top management, which made a big difference, and now we meet every two months”.

While IT government mostly works well within one organisation, it tends to be challenging when it is spread over several organisations, as is clearly stated by one executive airliner (SAM): “Governance works beautifully inside an institution but once you start extending your arms then it starts to face some difficulties.” One of the vendors (SPA) affirmed that they “don’t have direct contact with the other vendors. They have to be managed through the airline unless the airline on a specific function wants us to talk directly to the other person. That we would do, but it is not for us to go into the background and come to you and deal with you directly.” Doing this is the only control mechanism that could handle such an overwhelming number of tasks, and understanding the relationship between the vendors and the airline is salient, as one vendor director (SPA) explained: “The airline solution providers and the airline, this understanding as part of the governance model as well as managing the relationship is very important.” Many of the details regarding the role of IT governance in MES can be found in section 4.7.

#### **5.6.4 Technical**

Without doubt, the technical aspect rose to the surface due to the fact that the whole project related heavily to technology. Isolated islands of technology need to communicate with each other to build an effective and efficient system; this communication is referred to as integration between those islands. Under the

technical property *integration* was the only identified theme that is related to the ASPs' relationship with each other. The following section will discuss the integration part and the context around it.

#### **5.6.4.1 Integration**

Integration in a large project such as MES demands a thorough integration between different solution systems, not to mention the need to integrate modules within the same solution. The integration complexity was a factor that influenced certain decisions concerning the deployment strategies. An airline executive expounded that the concurrent solution was chosen to escape from the interim integration between solutions. This was clearly stated by the airline executive (SAA): "This is because we want to catch up very soon. Because the competitors will not wait for us to go with the long sequential process at the same time interfaces needed with old technology and legacy systems. You want to bring in new systems that are not compatible with old ones and need a lot of integration in case we need to do it in phases. That's why we put our effort into doing it all at the same time to avoid the cost of creating many interfaces with legacy systems."

Conversely, Mornar et al. (2010) reported that SAP was in favour of the big-bang approach for the sake of simplifying the integration part. Doing that from business point of view is to guarantee a smooth cut over without having to mess the old and new systems. One (SAM) of the allies of the big bang in the airline affirmed: "The sequential model would really complicate the matter and you would need to do a lot of integration; for example, if you bring one then you would need to integrate a lot into legacy application before you complete the whole picture. So the sequential model will require doing a lot of plumbing and temporary plumbing and then undoing it with the new application that also

created complexity. One bang would be good if you managed to get everything, meaning that everything that needs to be changed will be changed. So time all applications and do not leave any behind. I think it is best if you do a complete overhaul. Big bang would require meticulous planning, meaning understanding exactly what you want to put in the new architecture.” Another ASP director (SPD) refers to achieving competitive advantage doing MES: “I am replacing everything, right? All the old stuff is going to go. This is the direction where we are going,; rally the troops, rally everybody to go in that direction. You know you are kind of taking the fastest path to get the best systems in place so you will be ahead of everybody else because everybody else or most airlines try to take the gradual approach.”

Most businesses nowadays consider applying ERP systems in order to improve their business processes. This is seen clearly in MES, as affirmed by one airline executive (SAD): “Your business process could be your own specific proprietary business process or that business that is developed by the consultants, or can be a mix of both. I mean your specific required business process aligns with the industry business process. Once you select a system or a solution then you have selected the business process behind it and hence you need to take it as a whole; don’t try to change it because it will be one of a kind. So you will be faced with the dilemma of upgrading and integration, refreshing, new versions, new releases; it will be a nightmare. So you take that solution, and you also take the business process model behind it and try to match it with your existing business model. The winner should always be the solution’s business process model that you have brought in, not your business process model. I think for the airline to get the benefit of the enterprise solution it needs to keep refuelling its business process; I mean, if the business process is designed for this year is

not necessarily mean that business process will be good for the next three years.”

The ability to integrate various platforms is without doubt one of the secrets of the success of MES. Since MES is far greater than a single enterprise there were a complete stream by itself devoted to the integration. “What we were looking for is basically the open systems and with the ability to expand into the future, the ability to be able to integrate them with other systems. From a business point of view, of course, we were looking for those systems that we knew could serve the business strategies”, as was explained by an airline executive (SAK).

Lack of ownership from the business side might be a recipe for failure and could jeopardise the entire MES project as the loss of ownership would complicate the integration part by far. Without these parameters surrounding this large undertaking, it would be cumbersome and arduous to deploy and adopt this gigantic change. “So then somebody needs to stand up and say who should do the changes. Therefore, that integration part is a really big challenge in taking on the ownership of the process. You need to have a clear well-defined process before implementing the changes, because when doing it, if you are trying to bring in another process, it will lead to a lot of changes in the process” (Vendor director) (SPH).

Nonetheless, having a multi-enterprise system deployment strategy still has some obstacles to overcome due to the fact that strategies in that field have not been sufficiently researched as a result of a lack of such a phenomenon in the industry. An executive in airline (SAA) expounded: “There are some vendors who are excellent in certain functionalities or certain services and not good in

others. [A vendor] is the best product when it comes to PMS, no question about it, while they are no good for the operation platform; as a matter of fact, they do not provide such a service for sale. However, I prefer best in class in every way because the integration process between these systems is relatively easy.” This view of integration was expressed in comparison to the other complexities executives are facing such as change management within the project and in the organisation. Nevertheless, an ASP director (SPG) elaborated on the integration part within the same context: “Best of the breed is wonderful provided you can take care of the integration part. The integration part is a nightmare.” This was in alignment with another airline executive director, who said: “If all applications come from a single vendor you eliminate certain hassles in the area of integration and also there are fewer issues when you have fewer vendors.”

In fact, a senior airline manager (SAB) expressed his views on the notion of fewer vendors for less complexity: “I don’t go for lessening the number of vendors. Actually, based on my own knowledge and the experience we had you will undergo more problems if you go with one vendor thinking of it as integrated while it is not. So going with one vendor just because we want to have fewer headaches and more integration is an illusion.” One ASP director (SPF) agreed with the previous notion: “I would definitely go with the best of the breed products regardless of if I am having ten or twenty or five vendors in my suppliers’ list. I personally hate being monopolised by any vendor and I like to have many options to choose what fits my business more.” Nevertheless, this view was not shared by all participants, as another executive (SAF) expressed: “Handling gets more difficult as the number of vendors increases. So keeping it to a small number of vendors that we can manage I think might be a better

option to go with. I think keeping the core vendor team and saying 'this is my vendor' and trying to get more systems from one vendor, to some extent a vendor block, but it has to be a trade-off. Two, three vendors or you keep a bit more than that."

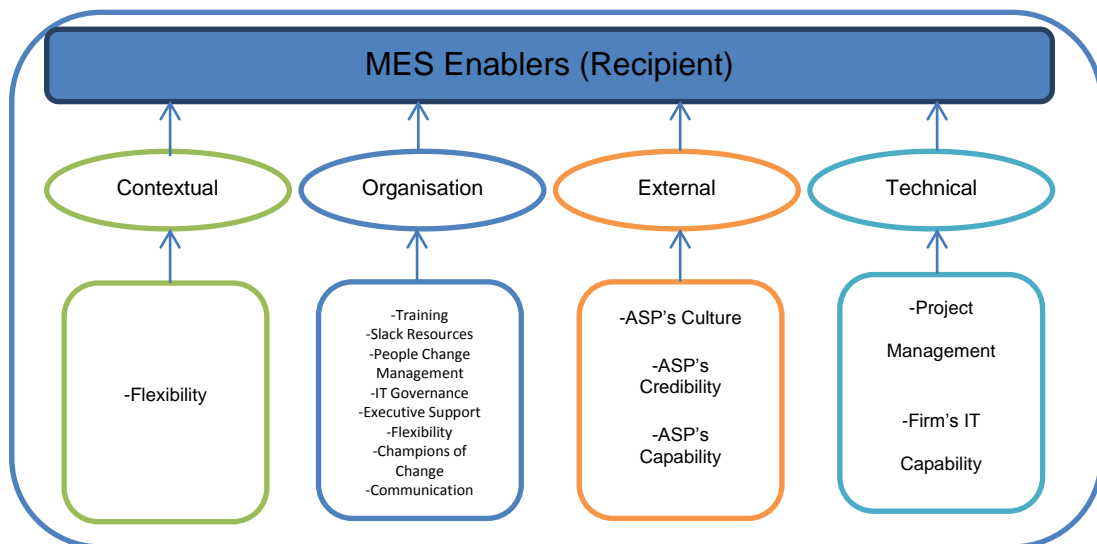
There are various views about whether the implementation of ES should be done by one vendor or whether best of breed (such as finance from Oracle, HR from SAP, marketing from People Soft etc.) should be selected from various vendors. Companies around the globe select both as per their requirements. It is essential to understand what the requirements of the company are and then the managers should see if one of the software is enough to meet all the requirements, whether or not it caters for the best of all business processes (Mabert *et al.*, 2001). One senior manager in the airline (SAG) explained that when "going for best of breed that means that you would get the best application and the best processes and it is the most suitable for that department, but you would then face the challenge of integration, and the problem of maintaining the integration between those different worlds or those different islands and you have to manage four or five vendors instead of managing one vendor and five maintenance contracts. If you go with one vendor, it would have better integration, be easier to maintain, easier to upgrade, easier to manage the relationship with the vendor, but it has the risk that it is maybe not the best tool for all the modules, so maybe it is excellent in one dimension, but it is not in another. But also there is a substantial risk that you are locked into one vendor so it is as if you are tightening the rope around your neck and the relationship between you and the vendor would be in his favour because all of your systems are within his hands, so when you negotiate, you are negotiating from a weak position because most of your resources are

blocked into his, so everyone has advantages and disadvantages.” Buying from one vendor would also be more beneficial because one vendor would have designed the whole system keeping in mind the various integrations required for all departments. But it is also possible that one company provides the best HR software, but its finance side is not that impressive, so the company can also opt for selecting the best breed available on the market (Luo and Strong, 2004; Rikhardsson and Kræmmergaard, 2006).

### **5.7 MES Enablers (Recipient's Organisation)**

Apparently, the main player in this phenomenon is the airline, which is the recipient's organisation; it was no surprise that there should be a theme exploring the success aspects that influence the whole deployment process. The majority of participants are from the airline, and they reflected on the employing of MES by the airline. There are various factors that impacted on the airline and these factors are categorised in a very similar way to the four types of influence, as has been discussed earlier. Because the airline and their partners in the MES are all organisations, they tend to share some of the aspects that influence them. In another words, there are some themes that influence both. For example, the IT capability of one ASP influences the other ASPs as well as the airline, and at the same time the firm's IT capability influences the ASP's dealing with the airline. So the theme of IT capability is applicable here (MES enablers for the organisation) and in the ASP interplay.





**Figure 5.5 MES enablers (Recipient Organisation)**

### 5.7.1 Contextual

The contextual part under the organisation umbrella is the concurrency needs that we addressed previously in this chapter (section 5.5.1.1). Another contextual factor that arose here is the flexibility, which explains the importance of flexibility in such a complex multi-vendor environment. Due to the fact that MES is far complex, and its detail is not known in advance, there were grey areas where all parties have set assumption to fill these gaps such as the integration part. Although this practice of making assumptions is not new to project management, the amount of it clearly needs support from other factors such as the flexibility of your partners. This was clearly stated by one of the ASP executives (SPG): “Well, I think flexibility, you cannot succeed, you never succeed in a major project without being flexible, and when I say being flexible, being flexible on the vendor’s side and being flexible from the organisation side ...[...]... You will find situations where the customer has missed something probably unintentionally and you need to give a hand to help in order to continue with the project. And the other way round you would find that the vendor has missed something unintentionally and the customer has to give a hand and move forward...[...]... If everyone sticks to his position nobody is going

to move and nothing is going to happen, and I am telling you, it is a guaranteed failure. No flexibility means a guaranteed failure.”

#### **5.7.1.1 Flexibility**

Flexibility in this research context is the trait that allows ASPs and organisations to absorb minor conflicts and reach an agreement in a flexible manner. This trait is applicable to all parties involved in the MES, which is why it was mentioned in 5.6.1.3 under the *ASP interplay* theme. Flexibility has an influence on large and complex projects. In fact, flexibility is “one of the most important factors. If the vendor is not flexible enough it can make things very complicated. We even have official channels for introducing changes agreed with all the vendors. But sometimes there are minor changes that would not require the whole cycle of change; then if the vendor starts to complicate things it might be a good factor to consider when selecting a vendor” (airline senior manager) (SAD).

Undeniably, flexibility is required to overcome the non-detailed requirements that were not covered in the contract and place the interest of a successful business partner relationship first. This attribute had controversial views in the literature: some rely on flexibility and trust while others rely only on a detail contract by specifying all the terms and conditions in their relationship. This issue was discussed previously in chapter 4 section 4.11.

#### **5.7.2 Organisational**

Under this theme, various themes have surfaced that influence the MES phenomenon from the organisational perspective, as shown in the figure 5.5 above. Many participants shared their experience regarding their company knowing that the majority of participants were from the airline itself. These themes emerged from the participants’ experience in the MES.

The first theme is the importance of training the staff as an essential enabler for MES adoption success. Next is the availability of abundant resources in terms of budget, time and human resources. Since the MES is extremely large project spanning a long period as well as entailing high risk, all of those things made the slack resources inevitable. After this theme, people change management rose as the ultimate factor with the highest frequency that influences the success of deploying MES in the airline. Without having proper people change management the adoption of MES by the airline was doomed to fail. The next theme will move on to the governance body of the project, which is headed by the organisation and emerged as a salient theme influencing the success of MES. The 'break it or make it' influencing factor from the organisation's success factor appeared to be the *executive support* and in particular the CEO. The credibility issue from the firm's point of view emerged as a theme where the commitment of the ASP emerged as a result of having a high interdependency theme in this project that deemed the commitment to the plan as critical.

Further, a highly committed partner is entailed in the credibility of each ASP. After that, the firm's IT capability plays a leading role in this undertaking as the whole project was an IT project, so the advent of such a theme was expected. However, committed partners role were immense in running and facilitating the overall show. Another theme was the champion of change, which means having a specific staff member who has immense influence to advance the project and take the lead in spreading a positive atmosphere in each team they represent. Before the two final themes, the communication theme materialised as a significant theme influencing the MES within the organisation as the existing inefficient communication would only result in failure across wide spectrum of the project. Finally, the two deploying strategies themes that transpired were the

decision to follow the best business practice and the IT taking the lead of this project. Nonetheless, there are some controversial opinions on the latter notion that have already been highlighted in the previous chapter in section 4.19.

#### **5.7.2.1 Training**

The training theme was recognised as a weighty theme owing to the fact that MES is an extraordinarily complex system, and it requires a great deal of training due to the fact that almost all systems around the user are changing at the same time, including the business process, so a careful training programme has to be planned ahead for all these activities. Training plans should be tailored and sensitive to every employee's level as top management necessity of having an overview such as executive management systems while operations users might need to have an in-depth view of the systems to enable them to carry out the daily tasks. One of the ASP participants (SPF) expounded on the training issue:

You need to train people so that they can use the best of the systems. The systems have a lot of functionalities, a lot of very powerful tools, many sophisticated reports, we can do a lot. I would train my staff first because we have done training after so I would train my staff first so that their contribution to the project would be much better, their comprehension of what is going on in the project would be much better, and maybe, probably, they would be in a much better position not to be deceived sometimes by the vendors, because when you don't know what the other party is talking about you have to take it for granted that he is telling the truth, but if you are an expert in the field, in the system that the other party is talking about, then you can tell if he is telling the truth or not and you can also tell if there is a better way of doing it.

One airline executive (SAA) added: "First of all they have to transfer the technology and they have to train our people; we did that with all of our vendors like training the trainer. It works fine and then our training department took over that and started writing the training material, which is most likely the vendor

material but with customisation of business process.” The training is needed for MES success, as was discussed in the previous chapter in section 4.26.

#### **5.7.2.2 Slack Resources**

Large projects such as MES involve uncertainties and entail hidden costs due to request changes over the life period of the project, which tends to stretch the budget. In this research context, slack resources referred to the extra available budget that could sustain the project till the end. This was confirmed by an ASP director (SPI): “Large projects take a long time and I think slack resources should always be available; this is due to the complexity and magnitude of the project.” One airline executive (SAA) said that the MES “is challenging, and it puts a lot of pressure on our resources, a lot of pressure to hire many consultants to help us”. The indication here is that this initiative is deemed to have failed if not enough resources are catered for, which was stressed by a vendor’s manager (SPF): “When you plan for any project, you plan and estimate for the resources you need but always those estimations are not a hundred per cent, so when you get to the bottlenecks, you need a lot of additional resources: human resources and non-human resources.”

One of the senior managers (SAC) pointed out the slack resources issue: “You have to have the proper resources like ASP, as he is the one to help you and also you need a slack resources from the company; as a matter of fact, we had a problem with HP as implementer of SAP because of the issue of slack resources. Those vendors who do not have slack resources should not have been selected in the first place.” One ASP director (SPH) asserted that slack resources are necessary for “both sides; all should have good support from the executive, with all that support from them in terms of the slack resources

holding, in terms of showing flexibility, in terms of the value.” Consequently, slack resources appeared to be a legitimate theme in this study, and this was discussed in more detail in chapter 4 section 4.5.

### **5.7.2.3 People Change Management**

With such massive changes across the whole organisation, careful consideration is needed to exist to accommodate the employees’ reaction towards these alterations. In this context, the research will focus on people change management rather than project change management. People change management is identified in literature in large system implementation like ERP where adorable employee traits such as flexibility and adaptability are required within the organisation. “But we always also have staff that resist the change and act as stumbling blocks. We tried to mitigate this through discussion and showing the benefit of new changes, which helped a lot,” said one airline executive (SAM) when describing how change management could facilitate friction when implemented.

Since ERP or similar large implementations do not usually follow the same path due to their enormous size and activities, there are different assumptions about the nature of changes required to be studied (Roeby *et al.*, 2002). This is true for all large deployment. As the project increases in size, activities and tasks also increase, and when more than one vendor is engaged the complexity does not increase in a linear fashion but exponentially. “From the deployment point of view, the main difference comes in terms of skill and interaction or the interfaces between the systems, so when you are deploying single systems or a series of systems it is a much smaller project, right? When you talk about platforms or even multiple platforms, then the engagement is much broader and

obviously the complexity increases several fold; it does not even increase in a linear fashion, it increases exponentially” (vendor director) (SPD).

By and large, change management is misjudged and underestimated by organisations during ES implementation, as was pointed out by one airline executive (SAA): “Having the systems and the problem of having the business processes, which took it a bit of time to change, this was the problem of change management...[...]...The adaptation time took us longer than what we expected in the beginning. We envisioned things would go as planned and probably a plus or minus buffer zone, but because of the change of business process and the adaptation of people, this is where we found out probably the main factor slowing down the implementation process.” Further details are given in section 4.13.

#### **5.7.2.4 IT Governance**

IT governance was mentioned in section 5.6.3.2 as an *external* influence from the ASP’s point of view; however, it was mentioned here under *organisational* as it is the airline that controls the IT governance of MES not the vendors. This was explained by one of the ASP managers (SPA), who affirmed that they “don’t have direct contact with the other vendors. They have to be managed through the airline unless the airline on a specific function wants us to talk directly to the other person. That we would do, but it is not for us to go into the background and come to you and deal with you directly.” Many of the details regarding the role of IT governance in MES can also be found in section 4.7.

#### **5.7.2.5 Executive Support**

Again this theme was discussed in section 5.6.2.2, and it appeared here as it is a shared theme between the ASPs and the airline, as both need the executive

support; in particular, here is the CEO of the airline and his vital role in supporting the project from the resources point of view. This latter notion was pointed out by one airline executive (SAI): “If he had not been behind the change and implementation of this massive technology, providing the required budget, and to do such a huge multi-enterprise system, we could not have achieved all of this. Even when their business asked for an extra reasonable change, he would approve the budget and support it.” However, executive support is not the only significant aspect in promoting the success of MES and interaction between ASPs. Credibility between ASPs also plays a crucial role due to the high interdependency effect of such a large and complex project.

#### ***5.7.2.6 Credibility***

From the organisation’s point of view, ASP credibility is considered as an influential factor in selecting IT partners, as the road of adaptation of such considerable changes in business processes covering the entire organisation is complex, lengthy and dynamic, which requires ASP’s credibility to secure and maintain the firm’s assets and resources. Nonetheless, organisation credibility is also of concern to the ASPs. Generally, both of the parties needed to be credible with each other. Please refer to 5.6.2.3 and to 4.10 for further detail.

#### ***5.7.2.7 Champions of Change***

The presence of a project champion in this context refers to a person who has a persistent constructive influence on the project itself. According to this study, the project champion could be from any level of the organisation as long as his/her influence propagates to others. In general, ESs are complex undertakings and have been researched extensively to reach a stage of being plausible critical success factors. One ASP director (SPD) emphasised that a project champion has to be from the airline itself: “The most important thing in



my opinion is having the champions of change within the airline. So usually when you go for a big bang like that, I mean it is somebody's vision at the top, right? Any provider can be the champion of change and the champion of change has to be the airline itself." Indeed, this study confirms that the champion of change influences the success of MES. Please refer to 4.24 for extra points regarding this subject.

#### **5.7.2.8 Communication**

Effective communication is salient and crucial for the deployment of MES, especially with the gigantic number of interrelated tasks that demand an efficient type of communication. As a result, it has emerged as a theme that is also shared between all the parties in the MES initiative; so it has been mentioned under the *interplay between ASP* core theme in section 5.6.2.4, and for further detail, please refer to 4.23.

#### **5.7.3 External**

Three themes emerged as external influences from the perspective of the airline. These are identified as external and as a result of that the airline has no control over them, which is why they were classified as external. The first is that the culture of the ASPs influenced the organisation as each ASP has its own culture and values towards executing business. The second theme was the credibility of those ASPs towards their contract and towards the organisation. Finally, the ASPs' capability and their ability to execute what has been asked of them, as the marketing team has more ambitious goals to sell while the execution team is lagging behind, not being able to reach these ambitious goals.

### **5.7.3.1 ASP's Culture**

The culture fit factor when thinking about ASPs as strategic partners is vital and needs to be studied as the duration of such large projects necessitates prolonged periods of interaction between the ASPs and the organisation personnel.

Since human interactions are one of the bases of long-term partnership, realising culture fit becomes necessary. Sometimes this factor is ignored, as was asserted by the airline's senior manager (SAG): "It is a strong factor that most of the time is being ignored. I do not think this is if you want to change the culture, now this is important. If you want to change the culture, maybe you go with a company that has a better culture so that it would inject some discipline into your culture ...[...]... culture fit is not only important for the customers but it is also important for vendors because they are going to invest money, resources and reputation" (please consult section 4.12 for more information regarding the role of culture in MES deployment).

### **5.7.3.2 ASP's Credibility**

The credibility of ASPs is supremely beneficial because in this kind of industry, which is an IT industry, "you are not buying livestock, for example, or an aircraft or car, most of the time you are buying services and services come with expectation; basically, if your requirements and this requirement are not met, or you have been misled, or promises were given and not fulfilled, then this is very risky for the success of the whole project. If you have strategic change like that and you have many vendors, if one vendor out of all of these vendors is having difficulty with his credibility he will affect the others, he will be the weakest link in the whole spectrum, so credibility is very important, especially in the IT industry" (airline executive) (SAD). One airline manager (SAE) said: "Credibility is a major

thing. I don't want to get a vendor today and another day he disappears or he has financial trouble or I hear from another customer that they are sloppy." Another ASP director (SPD) articulated: "I think credibility is very important, especially when you are going with the multi enterprise, you don't want to take risks in the selection of your provider. You want to make sure that you select credible trustworthy providers because it is a big plan now and your plan is as strong as or as weak as your weakest provider or as your weakest constituent in the big plan." This theme is detailed further in section 4.10.

#### **5.7.3.3 ASP's Capability**

By and large, IT capabilities are required in the first place, otherwise it would be difficult to remain in the market as an ASP. The vendor's IT capability is considered necessary and is usually taken for granted. One airliner found that this was not the case, saying: "From our experience, we noticed that those vendors are of different types and nature. Some of them are really professional and you are impressed with their work, some of them come and learn here and this is a big problem." This indicates that IT capability is not always guaranteed, though it was always assumed. More points relating to capability are discussed in section 4.6.

#### **5.7.4 Technical**

Under the technical property, project management emerged as a need for the airline to manage their product lines in an efficient manner. The next theme that emerged was the internal IT capability (firm's IT capability), where the IT staff should have the skills that are required to transfer the knowledge from the ASPs to the organisation as they act as mediators of technology transfer from the ASPs to the firm.

#### **5.7.4.1 Project Management**

Obviously, project management is an axiomatic tool used when executing any IT project regardless of its size. In this context, the focus will be on the project management (PM) that is related to change management and some of the planning at the track level (level of implementing certain components of a larger system such as implementing a crew management system in the Sabre enterprise system). Confirming the latter views from a senior airline's manager (SAG) stated, "Your project is a failure, as simple as that, without proper project change management, because for any change, you can change the process, you can change the technology, you need to change the people." The technical knowledge of project management was essential to be able to manage the resources effectively. This was confirmed by a senior airline manager (SAG), who said: "The projects that have a very strong IT project manager and was leading the business but he was leading from behind, these are the areas where IT had the best successful factor or the biggest success, right?" Further details are outlined in section 4.16.

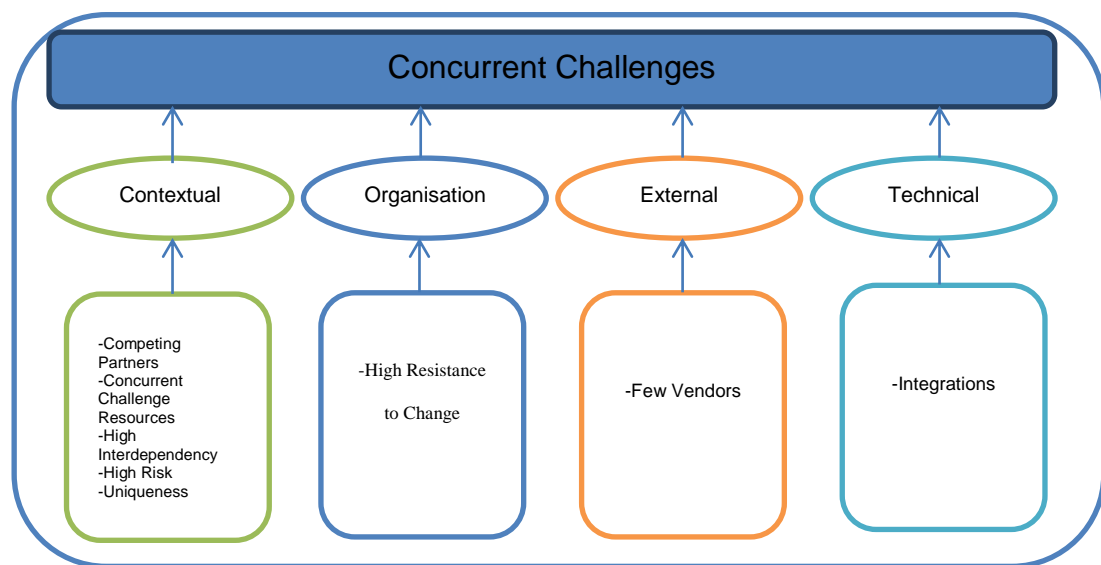
#### **5.7.4.2 Firm's IT Capability**

Having good IT capabilities, like for instance technical skills and management skills, is essential for firms when adopting large systems and investing chiefly in IT systems. One airline manager (SAE) said: "For internal IT we have very good and well-educated IT staff, we have very well-educated people. We have dedicated and experienced people that are willing to implement, willing to help end-users and in that regard they help those weak vendors and cooperate with the good vendors and they do the bridging between them." Having good IT capabilities is imperative for firms as they represent a safety valve for the organisation, in a sense; organisations will place more trust on their IT rather

than others, and without a firm's IT capability it will be difficult to absorb technology innovation. "The IT capability is very important as you know ...[the airline] has an IT shop that has been working for the past more than 30, more than even close to 40 years, so we do have good internal IT capabilities demonstrated in implementing this programme," said one airline executive (SAL) (please refer to section 4.6 for more detail).

## 5.8 Concurrent Challenges

The author isolated the concurrent deployment itself as a theme to address a deeper insight of it as it is decidedly contextual to this study and needed to be explored further. Some of the issues here have been discussed before (see figure 5.6 below) under different dimensions of a core theme such as *high*



**Figure 5.6 Concurrent Challenges**

*interdependency*; however, here it appears to consolidate all the concurrent challenges and put the focus on this theme to distinguish this phenomenon from single-enterprise deployment. The first dimensions in contextual property would be the challenges on resources, whether budget, time or human resources; the

demand for resources was an immense concern for the management and the whole phenomenon. Besides the resources challenges, the high interdependency arose as a side effect of MES. Another concern was the high risk entailed with this initiative, as was expected, but some of the business advantages include risk and this risk is inevitable in this case. Finally, the management of the organisation prefers to see some successful cases that have gone down the same road to increase the comfort zone for them; however, this phenomenon is considered unique in the airline industry and this uniqueness might create an advantage for the airline at the same time as the increased risk of the project.

The external influence category has a *few providers* in the airline industry, and this is due to the fact that the airline business process is complex and needs an enormous budget to reach close to what the airline companies are anticipating. As far as large airlines are concerned, mostly they tend to have their own large IT capability (such as in our study case) to satisfy their airline needs.

Equally, with regard to the adoption of large projects, MES is having difficulties with adoption. Indeed, MES would have bigger resistance from staff due to the fact that most of the systems are changed at one time, so the learning curve would be difficult as well as the *resistance to change*. Next is the technical part, which has the integration dimension as a salient player in this theme because it is all about integration when it comes to IT projects from different players. How these players integrate with each other is a critical issue in MES.

### 5.8.1 Contextual

Most of this core theme is contextual, owing to the fact that the concurrency issue is contextual to MES. In the contextual property under the concurrent

challenges theme, we have five dimensions that arose to unleash the detail of the main challenges that companies are faced with when deploying multiple enterprise systems at the same time.

#### ***5.8.1.1 Competing Partners***

This dimension is already covered in detail in section 4.21. Nonetheless, it is here to support the essence of having concurrent players working together at the same time.

#### ***5.8.1.2 Concurrent Challenge Resources***

The resources here cover the budget, time and human resources. MES is resource-hungry knowing some of the MES features with regard to the complexity and duration. What has aggravated the situation here is that the airline has run its business while renovating the systems, “so the challenge is that you have to maintain the legacy ones until the new ones come into the picture. Not only that, the new ones also have to integrate with new systems and this is where the complexity arises. Now you have to worry about old applications and new applications that to be integrated” (airline executive) (SAM). With regard to the cost side, one of the executives (SAA) in the airline expounded: “It is challenging to put a lot of pressure on our resources, a lot of pressure to hire many consultants to help us in this matter.” Another (SAC) added on the same subject: “You have to have the proper resources like ASP, as he is the one to help you and also from the company; as a matter of fact, we had a problem with HP as implementer by SAP because of the issue of slack resources. Those vendors who do not have slack resources should not have been selected in the first place.” A business manager (SAN) also commented on the issue of resources: “As I have seen, some of the persons in IT have a huge load because of the number of projects they are handling; they try their

best, but sometimes they could not cope with number of tasks they should be doing, every human being has his limit.”

Previously the author addressed the resources issue under slack resources, and these resources include time, as was pointed out by one airline executive (SAD): “However, if you do it in the big bang it will be a load on your human capital because they work more and they will work faster and they will be pressured to achieve earlier than expected...[While he continued that time is also the sole motivator of the big bang]...Should we do them concurrently, that will save time, and will also allow the end-user to get the benefits of the systems as early as possible. That’s the strategy we are going with and I agree with that.” Another senior airline manager (SAJ) said: “The time frame, let me give you an example: it took BA 10 years to move from BA to Amadeus; that’s the marketing system only, the reservation, ticketing and dispatch control system. [the airline] On the other hand, with all the changes in all the platforms, modules around 28 structures in three years’ time. The plan was too tight, too tough, too frustrating...[...].so the biggest challenge is the time frame, which is too short, and the volume is too big running many projects at the same time.” This was also confirmed by an airline executive (SAL): “The business objectives are clear. We need to meet these challenges immediately within 2 to 3 years, so that we can become capable of meeting these challenges, so we had no choice. We had to do a big bang change.”

#### **5.8.1.3 High Interdependency**

The larger the project the higher the interdependency that resulted, and these large projects have to have meticulous planning. “If it is not planned properly you won’t have integration; you would have chaos because of the change in the process at the same time, and the people factor is very important” (airline



executive) (SAC). The process of deployment is also dependent on each other in the sense that “people have not been able to finalise their processes because they are dependent on something from this system, and that takes time, so the challenge is, of course, the simultaneous changes do not allow. One airline executive expounded on this issue that implementing several systems at the same time requires an enormous amount of coordination and generates many dependencies, as in this case. There is a gargantuan dependency on the commitment from solution providers to work with us to test their systems, to prepare their systems, to make a link to their systems, so a lot of work was required from each and every one of the solution providers because they had made a commitment with the airline and they were committed to this programme, so the commitment between all these parties was very important and with a set programme they were all committed to this programme, so I do agree with that statement” (ASP vendor) (SPB). Other readings can be found in section 5.6.1.2.

#### **5.8.1.4 High Risk**

Without doubt, the MES undertaking is classified as a high-risk project, which is why it was abandoned as a practice within the industry. The risk is highly interrelated with the nature of MES; various reasons influence the risk as per the study, starting with the high interdependency, resource demands, multiple vendors, multiple methodologies, high complexity, high change resistance, credibility and the need for extensive integration.

One airline executive (SAD) commented on the risk issue regarding the adoption issue: “In the end you want your people to interact successfully with what is coming, otherwise things could easily go wrong because when you have people who are going to adapt to a change, and the change is not managed

very well, the risk of failure is very high.” Further, he expounded on the risk of not having a credible ASP: “Credibility is very important because in this kind of industry, which is an IT industry, you are not buying livestock, for example, or an aircraft or car, most of the time you are buying services and services come with expectation; basically, if your requirements are not met, or you have been misled, or promises were given and not fulfilled, then this is very risky for the success of the whole project.” Another risk is related to employing rivals to cooperate with each other where the competitor partners working without a proper governance body could generate a risk. “Well, obviously you don’t want to pick two vendors who are competitors in the marketplace, right? If you are picking two vendors who have had adverse level with an interest, you ought to know that is not going to work. It is a recipe for disaster” (airline executive) (SAF).

Moreover, effective communication is also a risk if it has not been practised through the entire project, where “a monthly meeting has to be executed to follow all the vendors and ensure a good communication with these vendors with each other. Without these good communications you put the whole implementation at risk,” expounded one airline executive (SAI). Further, risk is involved due to the fact that the demand for many resources at the same time could elevate the degree of risk as ASPs and organisations cannot manage to avail themselves of such resources all the time, especially because “when you need to implement everything at once you need many resources, too much effort to be made, and you need to have so many commitments from so many vendors at the same time and you cannot guarantee this” (airline business manager) (SAN).

The nature of a large and complex project such as MES would raise the risk and one such ASP (SPA) elaborated his experience of MES: “I think the multifaceted nature of the project itself is a very high risk. A lot of different elements within a project or which are concurrently happening as opposed to in a linear way then you really need to be very careful, but the core thing is that there will be a lot of risks identified, which have to be very closely monitored and very closely dealt with as they become issues. So that if you do it in the multi-system, you are trying to do it at the same time, you are going to risk that if any one of those streams is forced to lag behind, it will drag the others behind; it is not necessarily the fault of the other one but it is just the way that the whole project is. I think it is a big risk to take all the system, all the suppliers, at the same time to make them work at the same time. I think it is a big risk from the IT perspective.” Another ASP director (SPD) agreed with the latter view: “I can tell you not many airlines try this very broad, replacing everything all at once. It is a very risky proposition. I think from my experience, what I see are airlines preferred to go at a more gradual or sequential pace. They might accelerate the pace to try to reach the target faster and to go for everything all at once; you know, all at once, I think, is risky. The main disadvantage is the risk of it, because if everything is not planned out carefully, the impact on the business could be severe and can be prolonged. I think [the airline] took a big risk, you know. With the IT master plan, I think it was a bold move, but I understand, you know, that it needed to happen, maybe there was no other way to change at the pace that was desired.”

#### **5.8.1.5 Uniqueness**

Being unique in the market today is a good indication of being in a state of competitive advantage for business; although not in the business of IT. Being

unique in to conduct this IT experiment means that other rivals will have the benefit of your experiment where the first who does the experiment will draw the road map for others to follow. Having said that, the risk being taken will provide the airline with a lead time until others catch them. One ASP consultant (SPB) expressed his view regarding this issue when he was asked about his MES experience: "Ohm! Not on this scale; I should admit this is definitely a very unique experience for me...[...]...Between ourselves my colleagues and I have been talking about it but most of us seem to have the same impression, but to that scale which we are especially talking about [the airline] at which it was implemented may be quite a unique case, yeah! Realistically speaking, it is doable". Another business manager (SAN) explained: "Even during my communication with other airlines, no airlines implemented such systems at the same time. The changes are big, especially if you have a huge airline and big operation." One ASP manager (SPC) stated that he "worked for major airlines for 30 years in BA. Never seen a situation where they introduce all these systems all at once. I think it is an ambitious project based on the experience level here within [the airline]. It was a huge undertaking. In general, it is really remarkable what's been accomplished here with the number of vendors, the number of integration points in this overall coordination." No airline has done this before was another comment from an ASP director (SPH): "When I came here, I could see that the environment was not very heated then because of multiple factors because it is a multi-vendor environment and so ABC Air was aiming to implement a huge initiative, implement a huge project, *which actually no airline has done before.*"

## 5.8.2 Organisational

In this property, the author will attempt to highlight the emerged dimension that represents the influence from the organisation with regard to the concurrent challenges. Clearly, most of the projects face the problem of people resisting change, but in MES the author would like to transfer the experience of MES to reflect the amount of resistance that usually arises with deploying MES. Since MES not only changes the technology but also changes business processes, this is sometimes reflected in the organisation's structure.

### 5.8.2.1 *High Resistance to Change*

The concurrent challenge from the organisation's view was the adoption issue or change resistance. The adoption might be an issue on most large project deployments; however, it reaches higher degrees when regarding the MES adoption. MES adoption is harder and more complex because of different reasons due to the fact that MES almost changes everything around the end-users. There is no gradual shift in MES as all things are changing concurrently. This should put a tremendous burden on the airline management to overcome this obstacle. Implementing a proper *people change management* might help reduce the effect of this obstacle besides effective communication where both have been argued before. The airline has assigned an adoption manager to all the product lines they have installed to take care of all issues of adoption in a step that reflects how valuable and difficult the adoption to the airline is.

One airline executive (SAA) asserted: "The adaptation time took us longer than what we expected in the beginning. We envisioned things would go as planned and probably plus or minus a buffer zone, but because of the change of business process and the adaptation of people, this is where we found out probably the main factor slowing down the implementation process." Another

(SAB) emphasised that the human factor more than the technology is essential, and he explained: "The failure point is the people, not the system. Some of them are smart, they learn, but guess what, they still want to do it the old way." The adoption as difficult as it has been stated by this manager (SAH) "people to adopt it; Call it paradigm Shift or mentality shift was the challenge. That was a big challenge. You know...[...]... I mean change the people, the way they do business now, you want them to do it in another way." And this is "because, as you know, the projects were not only to introduce new hardware and software to the company but rather there are many procedures or business processes that have been impacted by these new systems. The human factor is very important as far as training and getting the people ready is concerned" (airline executive) (SAK). However, one ASP director (SPI) was not in favour of MES because of the adoption issue: "Sequential might be better as it will give people a chance to absorb and learn as they go."

One airline executive emphasised that the quality of partners also influences the adoption issue: "The number one challenge that we face is business adoption, that is, business accepting these new practices. We had resistance. Number two, resources, business and IT resources, were overwhelmed with this measure of massive change, so without good partners who would work with you to implement you would be doomed to failure." One of the ASP directors stressed the people adoption: "It is down to people again. It is down to people. I mean people's understanding of new systems. People's acceptance of the new system, because one of the fundamental problems the airlines have is that the people have served 20 to 30 years in their own way." Another (SPD) extended this view by elaborating on the adoption of these solutions: "They adopt similar practices and 80 something per cent adopt what is known as the standard

practice and leave 20 per cent as maybe room for you to be unique. The most challenging part really is to adopt the business practices to the new practices that are supported by the new solutions.” The latter notion reveals that people change is rather difficult, not the deploying of the technology itself.

Focusing on best business practice might create an issue in adoption, which is the vanilla vs. customisation topic that was discussed earlier. “The other piece of it is the adoption levels. How much can one airline consume at any given point in time, how much change can they manage? I think that has been the biggest challenge...[...]...The goal here is adopting the business process, the best practice rather than adopting the systems. The systems are for the most part commodities. They are designed with best practices in mind, and any deviation from that begins to create problems. It creates intergradation problems with other systems; it creates the opportunity to allow bad business practices to creep into the organisation. The higher level of customisation is needed to suit the business need in the case that they are further away from the best practices from the standpoint of the organisation”(ASP vendor) (SPE).

### **5.8.3 External**

From the participants’ experience with the MES, it was discovered that there are some aspects requiring more attention that are associated with concurrency challenges, particularly in the aerospace industry. These issues are connected to the number of vendors in this industry not being sufficient to have a broad selection and options for the client (the airline).

#### **5.8.3.1 Few Vendors**

One external factor that underlies the concurrent challenges core theme is having few vendors in the arena, which led to the existence of the phenomenon

of cooperative competitors that has been discussed previously. Due to the fact that airline business is complex and demanding, no software company can handle such business by itself. The vendors have to have massive resources to start, and it will be an exceptionally long time before they surface as prominent solution providers that airlines would opt to have. (please refer to their profile in 3.8.3.1)

**Sabre:** is the first giant vendor, which is one of the solution providers that participated in this study. They kept on growing by acquiring other small fragmented companies who offered different functionalities to the Sabre suite. The acquisition of these companies made Sabre one of the largest and close to complete software solutions that cover most airlines' business processes.

However, one of the issue about Sabre company that it grown by many acquisitions. However, these acquisitions created an integration problem for Sabre as those participants involved in this study who were opposed to the few vendors' deployment strategy over the best of breed stand on the point of view that even one vendor who claims flawless integration between their solution modules might not always be right.

**Boeing:** which was the other vendor who offered promising solutions. Boeing started in 2008 to acquire some best of breed companies to form an airline solution such as Jeppesen and Carmen systems. Though both companies have prominent softwares in airline industry, they were not selected in the bidding stage, which was in the same year of acquisition. That explains why they were not ready to engage in a huge contract as such the airline was asking because of Carmen's resources.



**Lufthansa Systems:** is the last giant vendor is Lufthansa Systems, which is part of the Lufthansa airline; they mainly cover the most needed parts from the airline business such as operation and marketing business processes. Sabre won the bid for most lines except for the marketing platform and obviously all platforms (HR, FIN, MRO) that are under the umbrella of SAP.

One airline executive (SAK) made it clear that a *few vendors* is a limitation to the airline business: “Again I want to emphasise the big shortage of vendors in the airline business.” He further expounded on the same issue: “There are very few of them out there, so for example, when you put an RFQ out there, or an RFI, request for information or request for quotation, or RFP, request for proposal, chances are you would not get many respondents, unlike if you are looking, for example, for a construction project...[...]... There are very few well-known providers and the other companies have been using them, so it is just a matter of looking a little bit closer into their technologies and whether these technologies meet our expectations or not, but they are, of course, very reputable companies.”

#### 5.8.4 Technical

Providing a homogeneous solution from vendors that differ in their methodology, project management and technology would be an arduous task, and without a state-of-the-art strategy to integrate all of these the whole MES experience would be tedious and prone to failure.

##### 5.8.4.1 Integration

Again integration surfaced under the concurrent challenge as one of the dimensions in this property. It was axiomatic that integration would be an issue,

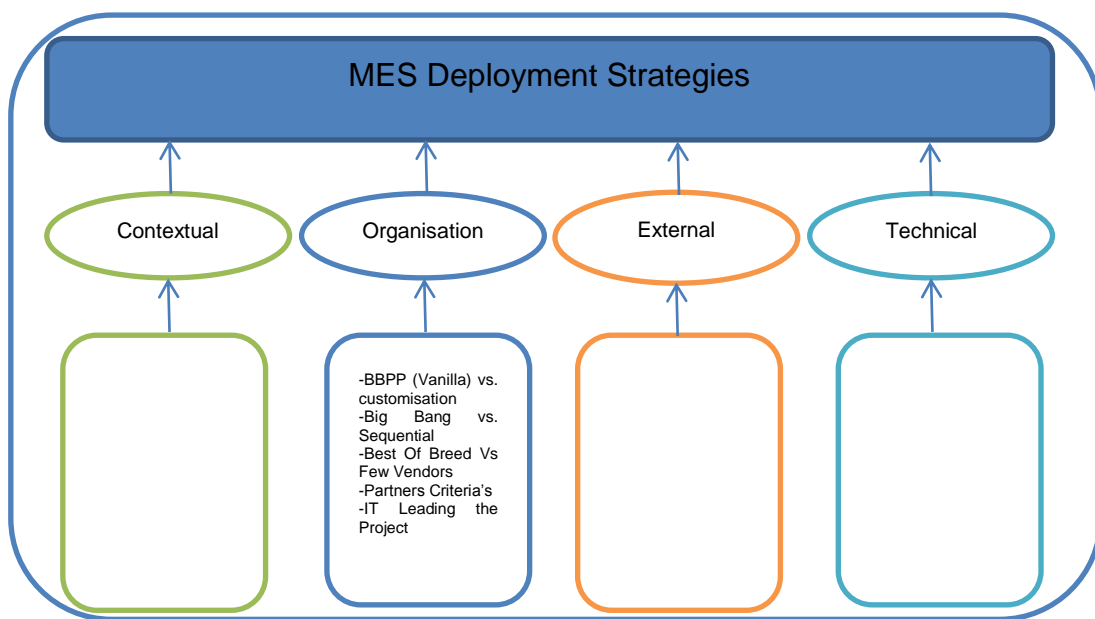
and it was inevitable owing to the fact that all these solutions come from different providers and they are not expected to work in harmony from the first day. This is why the airline deploys an independent vendor just to handle all integration issues and the author believes this is one of the most influential factors that make MES a viable and doable solution. These solutions were brought in to be harmonised, and in the airline's case it was heterogeneous, the gap was closed by an overall system integrator. A world-class logistics vendor was made responsible for integrating all these software silos. "One of the major advantages of doing the second one, which is building your integration platform within your premises or within your control, is that it will be losing that monopoly for your future selection. I mean, if you want to disconnect from any of these and have your own integration," explained one airline manager (SAD).

Further, one airline executive (SAG) explained: "The responsibility of the system integrator is to make sure that the second layer of vendors cooperate with each other and hand shake system; hand shake with each other in the best way that is good for the interest of the company. Sometimes when you allow two vendors to talk to each other they will do it in a way that is for their own benefit." Before embarking on MES, the airline was aware of the difficulties they would be facing due to the integration factor. "When we went off the concurrent strategy we studied all the integration with all other systems to be implemented at the same time, which is why we have taken a lot of caution and put in so much planning so whenever one of the applications is ready it will just be in a plug and play manner. We have implemented the Enterprise Service Bus (ESB) from TCS where their prime job is to develop and to secure all interfaces. The main role of TCS is to ensure the integration, interfaces, whatever requirements of other vendors in terms of knowing what to expect and what to deliver regarding

interfaces, to ensure the integration even of business processes, and they control the whole IT master Plan” (airline executive) (SAI). From a contract point of view, one airline executive (SAL) elaborated further: “We had to segment providers into classes, like we call class one and class two vendors and class three vendors. Class one was the overall integrator who played a massive role in managing this kind of inter-dependency and integrates and provides the integration we needed.” Basically, the overall integrator is acting as middleware. “The homogeneous solution comes from the fact that we have the middleware that integrates everything together as these solutions are not homogeneous in themselves” (airline executive) (SAM).

The challenge is even greater when deploying concurrent systems and at the same time trying to integrate them. “Now it is an even bigger challenge to try to implement multiple products and at the same time try to integrate them” (airline executive) (SAK). This has raised the challenge on the integration aspect where an immense amount of work is necessary to enable these systems to work in harmony. On the other hand, there are some optimistic participants, like one of the ASP’s senior managers (SPE): “Well, I think vendor integration has been pretty good on this project and that’s really due to some of the work that TCS has done.” The previous senior manager was referring to the fact that the overall integrator strategy to integrate these systems has done well, especially when the airline approved the ESB structure, which worked in the airline’s favour. Using ESB enables the airline to replace any functionality provided by any vendor with another one just like the plug and play concept, as long as all parties commit to the ESB standard set by the overall integrator when interfacing with each other.

## 5.9 MES Deployment Strategies



**Figure 5.7 MES Deployment Strategies**

The organisation faced various and critical decisions to be taken, and those decisions have an immense impact on the success of MES, as all of those choices associated with the organisation itself led to the emergent of all the dimensions under this prime core (as shown in figure 5.7) to be underneath the organisational property. The author through this theme would like to stress the deployment strategies for such an ambitious undertaking. All of these strategies were a controversial subject within participants' experience, which enriches the study in hand.

### 5.9.1 Organisational

Broadly, IT projects have various decisions to be taken when embarking on large undertakings such as MES. Enterprise systems are not only technology-based software, they are structured around best business practice in the industry. Hence, ES packages enforce the business processes entailed in them. The first choice an airline needs to make is whether they accept the business processes as they are or customise them according to airline needs. In the case

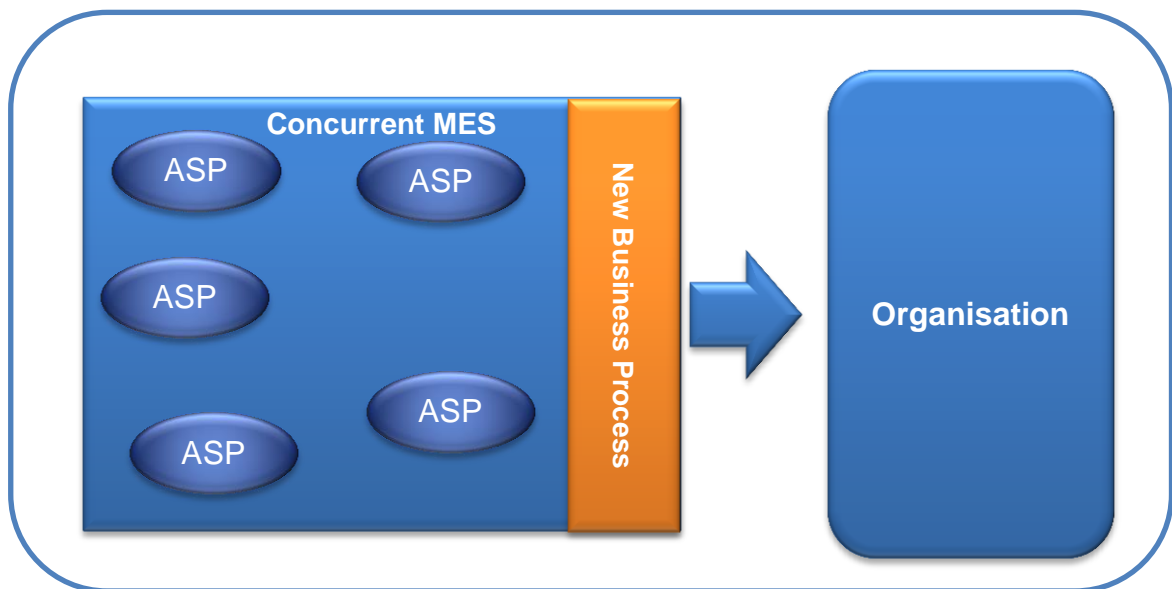
of MES, the decision has to be made whether to go with fewer vendors or best of breed. Another deployment strategy would be whether the airline opted to go for big bang or sequential deployment. Another decision to be made is: should the IT lead the project or business? Finally, what are the factors the airline should base their decision upon when selecting their partners? This is an exceptionally critical core theme that necessitates a careful decision and extremely meticulous planning. All of these dimensions are under the organisational property within the concurrent challenges core theme.

#### ***5.9.1.1 Best Business Process Practice (Vanilla vs. Customisation)***

The argument as to whether the airline should choose the so-called 'vanilla package' or have the MES customise was set as a strategic decision by the airline. The decision was to take the vanilla path whenever possible unless there are obstacles that would force the vendor to change the package. For example, in the HR package from SAP it was anticipated that the crew payroll has to change to cope with the salary package the airline is offering, which is decidedly local to each airline. By and large, accepting and implementing enterprise systems such as the ERP system encompasses re-engineering the existing business processes to the so-called best business practice. As expressed by an ASP vendor (SPE), "the goal here is adopting the business process, the best practice, rather than adopting the systems. The systems are for the most part commodities. They are designed with best practices in mind, and any deviation from that begins to create problems. It creates intergradation problems with other systems; it creates the opportunity to allow bad business practices to creep into the organisation. The higher level of customisation is needed to suit the business need in the case that they are further away from the

best practices from the organisation's standpoint." Further detail about this issue is discussed in section 4.15.

#### 5.9.1.1.1 Organisation Business Process Improvement Through MES



**Figure 5.8: Business Process Improvement Through MES**

Employing enterprise systems to improve business processes is a short cut for a large organisation seeking to enhance the way they do their business. A side from the traditional methods discussed in section 2.2, the theme discussed here is the business process improvement through MES. Since MES encapsulates ready business processes within the technology itself, it was clear from the participants that the intention of the airline is not to change the technology but to embrace the business processes that are attached to it, as shown in the figure 5.8 above. In addition, the objective of the airline is to accept the best business processes practice in MES “we needed to do a complete replacement of our applications landscape and upgrade our infrastructure within a very short period of time. And we had the objective of a need for speed and we had the objective of upgrading business processes and we had the need to totally get rid of all legacy applications at the same time” (airline executive) (SAL). This was also

reinforced by another airline manager (SAI), who explained the direction of the airline: “I believe you do not have to start from scratch, you have to go with an improved business process within the systems. We had direction from the top level that we do not customise the systems to meet the current systems business process; instead, we should adopt the new business processes that come with the system, as we are not buying the application systems, we are buying the business process. Also, changes to these systems will impact future revisions and releases as you will stick with a very unique application that is difficult to upgrade.”

MES represents a key to a total restructuring of the organisational structure and processes from semi-automated to fully automate to achieve integration of the structure, process, systems and information. This was confirmed by one airline executive (SAA): “In order for us to utilise fully the new systems you need to adopt the new business processes and the policy and procedure. You are training people to use the system and at the same time changing the way they have been doing business for a long time. This is not an easy thing to do, it is challenging and we face problems.” As shown in the figure above explains that the airline instead of going on BPR it took the business process improvement through MES where they adopted the newly introduced business process entailed in MES. Another executive (SAC) commented on that: “This is important so when there is an enterprise change it could help you accomplish your objectives faster, which is really moving the people (the user department) in the departments to a new platform. Like I said, you are not only bringing in a new IT, but you are also bringing a new process.” On an organisational level, the MES phenomenon seems to be a total renewal of the IT infrastructure in the organisations with potentially positive economic and technical ramifications.

Due to the many known reasons like the richness of data, other potential and functional uses of the ES or MES in general and its positive influence on business processes, it is not surprising that firms around the globe are adopting these systems rapidly (Kremers and van Dissel, 2000). Organisations implement MES or ES because they feel a strong urge to increase the system capacity so that growth can be increased. Hence, companies are influenced both technically and through the efficient and effective business processes by the proper implementation of ES (Dillard *et al.*, 2005). This is supported by one airline executive (SAD), who said: “Now, if we look at the enterprise systems, or let’s say shared platforms, and the reservations, the inventory and departure control and operations also, and if we look into this model, first of all it has been built with the experience of the company or the vendor who owns that platform plus the participation of many airlines and consultancy houses. So they will be carrying the industry best practices in terms of business processes. And that is a good thing about it; I mean, when you contract or buy that kind of industry platform, you are also buying with it the industry best practices and it will be easier for you to adopt and change your business practices accordingly because you will be following their best practices and adhering to them. The other thing is that it will be easy for you to interact with the other partners and your alliance also and easier for you to expand in terms of scalability, refresh cycle, maintenance. You will alleviate so many worries.”

#### **5.9.1.2 Big Bang vs. Sequential**

Deploying large software strategies such as enterprise systems is one of the main concerns facing management in IT and business. One of these concerns is: how would they implement the software package? Would it be in one ‘big bang’ shot or through sequential or hybrid implementation? All of these



decisions were discussed earlier; for further discussion please refer to section 4.14.

#### ***5.9.1.3 Best Of Breed Vs Few Vendors***

The choice of either having best of breed or a few vendors was another decision the airline had to make as MES entails more than one provider. Though it was believed that a single vendor would have his solution as a fully integrated package, this was not the case as was discussed previously in section 4.20. Each decision has its own merits and disadvantages as reviewed previously.

#### ***5.9.1.4 Partners' Selection Criteria***

Embarking on such a large initiative would require exceptionally cautious selection of partners owing to the fact that these projects span over a long period and entail a large number of complex tasks. These selection criteria were a concern for the airline that led them to employ a consultancy house to help them in this task due to the vital role this step plays in the overall success of MES. Additional points regarding partners' selection criteria were investigated in section 4.18.

#### ***5.9.1.5 IT Leading the Project***

Who should be leading such an ambitious project, IT or a business or hybrid model? As the entire multi-enterprise project is seen as an IT implementation and at the same time considered as a business solution, this controversial issue was also debated in section 4.19.

## 5.10 MES Cohesion Factor

The final core theme that the author would like to focus on is the MES cohesion factor. It was necessary to initiate this theme as building a homogenous system for the airline of different vendors, locations, methodologies and cultures would be a recipe for failure. However, with the existence of the cohesion factors discussed under this core theme, the view of failure is reverted. The fragmented silos of software require a gluing factor, so they run and act as homogenous software. Starting with the IT, PMO is a good to have tool, especially in a medium to large IT house; however, in this study, it has been found that it is extremely necessary, and without it the whole project is under a high risk of failure. The next gluing factor in this study was the effective IT governance, which has been proven to have a strong influence on the success of MES. Effective communication is necessary for such a large, interrelated, complex undertaking. These dimensions mentioned were all under the organisational property within the *MES cohesion factors* core theme as shown in the figure below. Finally, without a state-of-the-art integration scheme such as the enterprise system bus (ESB) it would be difficult to manage such an arduous task, which requires agile well-designed integration middleware.

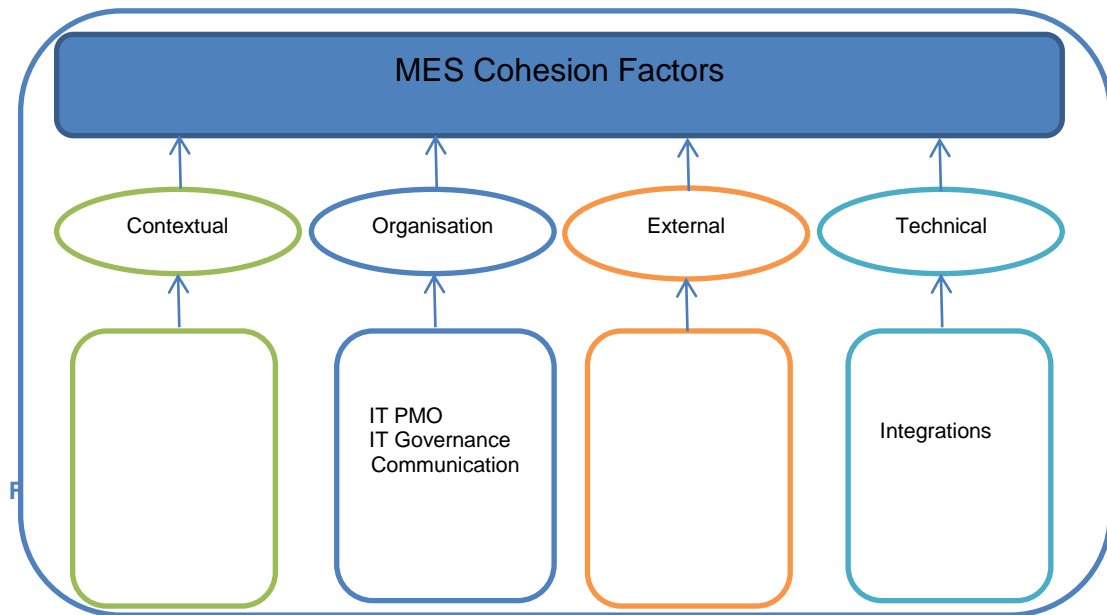


Figure 5.9 MES Cohesion factors

### 5.10.1 Organisational

All of the emerged cohesion dimensions were from the organisation shown in figure 5.9 except the *integration* dimension, which is under the technical category since it has a more technical inclination. The airline made sure that these aspects such as IT PMO, IT governance and communication coexist within MES, knowing that without those aspects, the undertaking would fail. All of these dimensions have been discussed before, and they emerged from participants' experience during the interview.

#### 5.10.1.1 IT PMO

A dedicated PMO that is managed by the airline and world-class consultant company were in place to make sure everything was aligned with the airline's strategic business goals and fulfilled the business targets that have been set for those enterprise systems. One of the senior executives (SAG) elaborated on the importance of PMO: "These three elements were very crucial and I wish that we had looked at them very seriously before embarking into multi-enterprise

concurrent systems, especially IT PMO, vendor management and change management.” More about IT PMO was discussed in 4.22.

#### **5.10.1.2 IT Governance**

Abiding to one IT governance is a key factor in the success of MES, otherwise the situation can be chaotic as the “IT governance should cover all the projects at the same time and all vendors should be obligated by the rules of IT governance; this includes the commitment from the steering committee.” And these governance models have to be agreed on: “Vendor IT governance and [airline] IT governance should be integrated and agreed to have one IT governance. When we agreed with those vendors they showed us their governance and part under contract to have one agreed IT governance” (airline executive) (SAI). Further details were discussed in section 4.7.

#### **5.10.1.3 Communication**

Not only is effective communication crucial in leveraging business development between diverse partners’ firms, but also it helps with settling interdependencies. The value of effective communication was confirmed by participants in this study. One ASP senior (SPC) expounded that he “think[s] the main challenge is the training, information, coordination and communication”. Additional discussion on effective communication and its role in MES has been mentioned already in section 4.23.

#### **5.10.2 Technical**

The last dimension under the cohesion factor is the integration issue, which influenced the MES massively as it is at the heart of language that those systems speak to each other. The airline recruited an overall integrator as tier

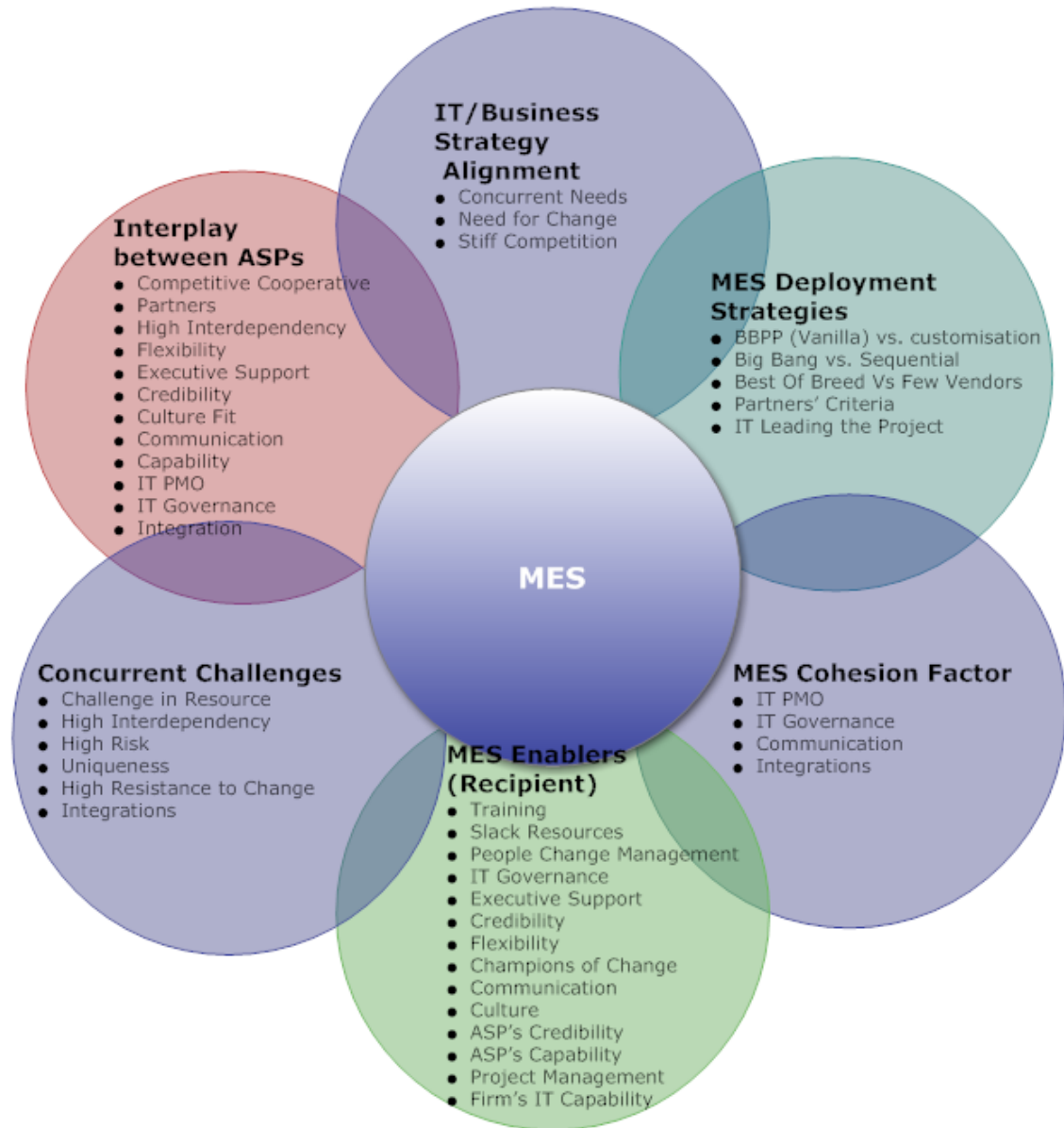
one vendor to cater for all the integration aspects due to the salient role that integration plays in MES.

#### **5.10.2.1      *Integration***

In reference to the above discussion of the overall integrator, one airline executive (SAG) asserted: “The responsibility of the system integrator is to make sure that the second layer of vendors cooperate with each other, and hand shake system; hand shake with each other in the best way that are good in the interest of the company. Sometimes when you allow two vendors to talk to each other, they will do it in a way that is for their own benefit.” More on the integration issue in section 5.8.4.1.

## 5.11 Building MES framework

Building the MES would be underpinned by all the core themes that have been discussed previously in this chapter.



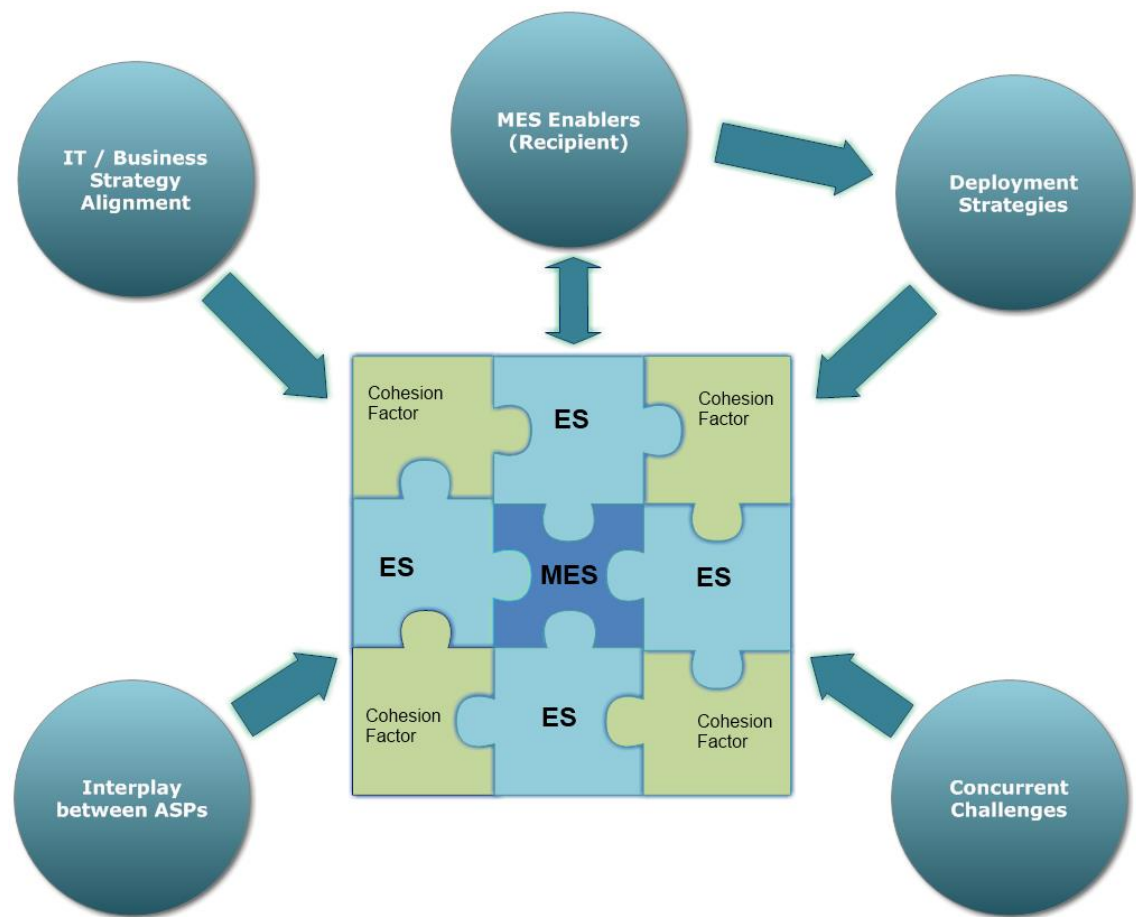
**Figure 5.11 What Influences MES Phenomenon in airline industry?**

The figure 5.11 above elucidates the influential elements that impact on the MES. To start with, the *IT/Business alignment* has substantial influence as mentioned above, and due to that business and IT share the same aims and objectives. Otherwise, it would be chaos to have such an undertaking while the

business and IT are shattered and not aligned. Starting with a common aim is the essence of any successful project, and MES is no exception. Secondly, how these ASPs interact with each other (*Interplay between ASPs*) influences MES massively as they would constitute a homogenous solution for the airline. Without harmonising their activities to enable the airline to cater for its function as an airline would be difficult.

As a contextual core theme, *the concurrent challenges* emerged to imply those contextual challenges around MES. This core theme reflects the unique features of the MES in this study. Another crucial core theme is the *deployment strategies of how MES* will be implemented as there are various weighty decisions involved in shaping the success of MES. Obviously, there are some factors required to regulate how the MES would be deployed as homogeneous rather than originally heterogeneous as emerged under the *cohesion factors* core theme. Finally, the bidirectional relationship between *the recipient organisation* (the airline) and the MES both have reversal influence on each other.

Since the recipient organisation is the one that is making decisions about deployment strategies, a relation is drawn from the organisation to the deployment strategies to reflect this influence of the organisation on the decision over deployment strategies. The cohesion factors are responsible for gluing isolated software companies; therefore, it will be more appropriate to include these gluing factors between the ESs within the MES as shown in the figure 5.12 below.



**Figure 5.12 MES's framework showing the relation between MES's core themes**

The next section will summarise the emergence of each core theme and their influence on MES.

#### **5.11.1 IT/Business Strategy Alignment**

Participants from both the business and IT reflected on their experience in MES by first mentioning why they have chosen the MES path and what was the necessity to acquire such. This was evidence that IT/business are clear about what they are after, especially from a strategy point of view. Departing from this point the author has substantiated the importance and relevance of this core theme. *The concurrent needs* theme under the contextual property of the IT/business strategy alignment emerged because of the existence of the



concurrency issue that usually occurs within concurrent implementation of all ESs. The *need for change* is the theme that answered why the organisation had undertaken such an ambitious project. Finally, during the analysis it appeared that there was an external element that drove the airline to carry out such a change. This was the *stiff competition* theme. Gaining profitable and ambitious aims would not be viable without an appropriate strategy alignment between business and IT. One airline executive (SAB) said about the IT/business strategy alignment: "If we go one step back saying your strategic goals will be achieved if you have them aligned with your business goals and IT applications."

#### 5.11.2 Interplay between ASPs

As the author was examining the MES phenomenon, it was evident that all the ASPs had a relation between the airline and themselves. Nonetheless, through the context of MES, those ASPs have to perform together and interrelate with each other in several instances such as during the integration stage (section 5.6.4.1) and planning of tasks; they all depend on each other to establish a harmonised solution for the airline.

Since employing the MES solution requires that ASPs depend on each other heavily, this will raise the interaction level between them. This theme emerged as a reflection of the need for interdependency as well as to provide a deeper insight into such relations. Actually, some themes in this group were unique within the context of MES such as a cooperative competitor phenomenon where the rivals are required to cooperate concurrently with each other to construct a solution for the organisation.

Since these ASPs have to interact with each other and depend on each other, there have to be certain boundaries between the ASPs laid by the organisation to level the overall project flow. Ultimately, these boundaries have to be drawn to help the success of MES: “One important factor or tool that we use during the project is to have a PMO dedicated to managing all these projects and to managing the relationships among the different providers, so of course, to take part during the evaluation for these projects or during the negotiation and the reviewing of the proposals. So they knew that we would be working with other people and other companies and other providers, and we explained to them that we put certain boundaries between them so that they can work together” (airline executive) (SAK).

#### **5.11.3 MES Enablers (Recipient’s Organisation)**

The airline (the recipient’s organisation) is the focal player in MES since it is the one that actually initiated the whole phenomenon; as such, the emergence of such a theme that explores all the enablers and inhibitor within the organisation was necessary to be investigated for understanding the overall phenomenon of MES . The evolving of such a theme exploring the success factors that influence the whole deployment process was not surprising. In addition, the mainstreams of participants were from the airline, and they reflected on the employing of the MES experience by the airline. There are many aspects that influenced the airline, and these aspects varied in nature and they were categorised in a similar way to four types of influence, as was discussed earlier (section 5.7).

#### **5.11.4 Concurrent Challenges**

This theme emerged as a reflection of a deeper investigation that isolated the concurrent deployment itself and addressed a richer insight into the contextual

nature of MES. The themes that are related to this core theme are exceedingly contextual to the concurrency attribute and without that attribute, this phenomenon would not exist. A theme such as *high interdependency* appears as one of the dimensions under the contextual property to consolidate all the concurrent challenges and put the focus on this theme to distinguish this phenomenon from single-enterprise deployment. The *challenges on resources*, whether budget, time or human, were an immense concern for the management and whole phenomenon. Moreover, another concern was the *high risk* involved in this initiative that was anticipated, but some of the business advantages include risk and this risk is inevitable in the MES case. This phenomenon is believed to be unique to the aerospace industry, and the same uniqueness would create a competitive advantage for the airline at the same time increased risk of the project (please see section 5.8). A *few providers*, which emerged as an external influence, existed within the aerospace industry due to the fact that airlines' business processes are multifaceted and require an enormous financial plan to stretch near to what the airline companies are expecting.

#### 5.11.5 MES Deployment Strategies

When it comes to the successes of MES, it is all about decisions and actions that ultimately influence the whole deployment. The deployment strategies became a controversial issue between participants, directing into various themes that emerged in this regard. All of these decisions are associated with the organisation itself that led all the dimensions under the *MES deployment strategies'* prime core to be beneath the organisational property. The author through this core theme is aiming to shed light on the various deployment strategies that underpinned this ambitious undertaking.

#### 5.11.6 MES Cohesion Factor

Different vendors with different solutions come with a fragmented package and reside in different silos. This situation has caused enormous concern for the airline's management; various schemes have been adopted by the airline to overcome this issue. An overall integrator was assigned to undertake all the integration issues. The author would like to focus on those themes that helped the airline to glue all these solutions as well as to reflect on the participants' experience in this regard. This theme was essential to exist, as constructing a homogeneous system for the organisation of different vendors, locations, methodologies and cultures would increase the risk and deem the project prone to failure. Nonetheless, with the presence of the cohesion factors discussed under this core theme, the view of failure is reverted. The disjointed silos of software necessitated a gluing factor, so they run and act as harmonised software. The emerging fact that IT PMO is not an axiomatic tool that can be dispensed with when not needed, particularly in cases of medium to large projects. It was not the case with MES. IT PMO stands as a critical factor and through the participant reflection believed that it was so vital to a degree that the airline invested a large amount of money to seek help from a consultancy company to work hand in hand with the airline to run IT PMO. Without an effective IT PMO, this project would be under a high risk of failure. The next gluing factor in this study was the effective IT governance, which has been proven to have a strong influence on the success of MES. IT governance was an essential gluing factor that kept all the IT tasks synchronised under one umbrella. Furthermore, having effective communication is necessary for such a large, interrelated, complex undertaking. Many times the participants stressed the importance of disseminating information to staff and communicating all

issues between all the players in MES. Finally, without a state-of-the-art *integration* system such as the enterprise system bus (ESB) it would be difficult to manage such an arduous initiative, which requires agile well-designed integration middleware.

#### **5.11.7 Validity, Reliability, and Generalizability within the Research**

Qualitative research is sometimes criticised for yielding unsystematic findings. This has been attributed to the more open and flexible approach to analysing data. Moreover, additional questions about the issues associated with validity, reliability, generalization emerge.

Qualitative methods are known of its strong validity due to the naturalistic approach of research's data gathering; however, it suffers from reliability or replication difficulties. Since qualitative methods do not rely on definite and rigid methods that can be repeated to achieve the same result, as they depend on researcher characteristics that might lead to different views of the findings from person to person. Nonetheless, during our research we relied on the GT rigor iterative deductive techniques in reaching saturation status of each core theme was developed. In addition, the reliability and validity of the coding process was increased by the inter-coding process. To achieve this, the whole transcript was re-coded by the director of the study and the percentage of similarity of coding was high. Further, the author was transparent in including all the views of participants and their reflection of MES that lead to better research reliability.

Though it seems that generalisation is an issue in this study, the existence of broad diversity of professionals from world-class companies means that not only are these participants highly experience in their fields, but they have also accumulated this experience through working with many other world-class

airlines. Each participant from ASP companies represents his experience through working with many airlines, which deems his views to be an aggregate of multiple experiences gained in this industry. Basically, the quality of participants' knowledge provided the study with exceptional value, since they represent the elite professionals in both the business and IT fields. Having such prominent participants added a value to the finding and enhanced the generalizability of the research.

### 5.12 Summary

This chapter discussed the MES framework and its main concepts that drive the whole MES. Through the chapter, the author has demonstrated all the dimensions that are related and influence the MES phenomenon. The interrelation between these themes has been discussed under each core theme to furnish the road for the final emerged framework. It has been found that there are six leading role players, mainly: IT/Business Alignment, Interplay between ASPs, MES Enablers (Recipient), Concurrent Challenges, MES Deployment Strategies and MES Cohesion Factors. Through all these players, the MES phenomenon has been unleashed and explored in every detail.

By and large, the participants have enriched this study with their views and they made many aspects regarding the phenomenon clear. The MES initiative is multifaceted and significantly large and it stretches over a long period of implementation when compared to regular projects. All of these aspects interject with the obscurity level of the study. The researcher in this endeavour aimed to unleash realisation of the MES phenomenon. Various discussions and controversial issues that appeared in this chapter enriched the study and desalinated many aspects attached with the complexity of the MES.

Through the axial and selective coding of the GT the author built the final theoretical framework that explained the MES phenomenon. All of these *dimensions* mentioned throughout this chapter are to support its *properties*, which support the *core themes*.

The next chapter will conclude all aspects of this study as well as discussing future researches, implications and the limitations of this study.

## 6 Chapter 6: Conclusion



## Introduction

Meeting the unmatched demand for business has become a growing challenge for many IT shops. The aerospace sector is serviced by a limited amount of vendors , and it is even more arduous to manoeuvre around the difficult and complex business processes. Airlines have managed to build many of their business processes through either their internal or external IT or both. Large airlines execute millions of transactions every day, and without having state-of-the-art systems, the existence of these airlines is questionable.

Giant software vendors such as Boeing, Sabre and Lufthansa Systems, who specialise in the airline business, have exerted a considerable amount of effort to build mature software systems that other airlines can depend on. Due to the complex diversity of business processes in airlines, building mature airline software products has proved to be extraordinarily challenging. Though ASPs have tried their best to develop a software package that could cover the airline business; alas, still till today none has succeeded. In addition, streamlining airline business processes is of foremost concern to the management, which is why some airlines adopt ERP business processes to improve their business processes (Quiescent *et al.*, 2006). The latter is the departure point of this study which discusses the concurrent MES and its influence on organisations.

The aim of the research is to investigate the organisational fit of simultaneous MES business processes and the firms' readiness to accept such a change based on an empirical study. This leads to the exploratory and explanatory nature of the research, which favours an empirical generating hypothesis over testing them. It is noteworthy that the case study in this context, apart from focusing on a real-life phenomenon, will be regarded as a boundary for data

selection (Hammersely, 1992; Stake, 2005; Blaikie, 2009) that should not conflict with the grounded theory being utilised in the analysis stage.

Prior to this research, the phenomenon of MES was unknown, and there was some speculation about how it would be like if it would be a real case. The author captured the phenomenon of how pioneers of ASP would influence airlines from the viewpoint of business processes. These processes are dynamic and require constant interpretation of these activities throughout the study to reach objectivity (Lee, 1991). The research is catered by a case study, as there is a high degree of uncertainty surrounding the phenomenon mentioned. Since this research aims to explore the phenomenon of multi-collaborative enterprise systems and reflects it on a theory-building approach, grounded theory was selected to build a framework that explains the MES phenomenon with all its intricacies. The latter notion is to address the complexity and dynamic nature of MES in an empirical natural setting and to provide a realistic framework. This research chiefly addresses the 'how' and 'why' questions and stresses the collaboration of ASP towards creating a homogeneous solution that covers most of the core airline business. Grounded Theory, by and large, underpins research on two main factors:

- Questioning, rather than measuring, as a salient tool
- Generating hypotheses through a coding mechanism (Auerbach and Silverstein, 2003)

Grounded Theory shines when there is remarkably little known about this phenomena, where both researcher and literature have little information, and they are not in a state to test the hypotheses prior to the study. Moreover, Grounded Theory fits exploratory studies in this research where there is a need

to identify and categorise the element of MES and its connection to the context organisation in hand. Hence, it is a discovery-positioned approach that permits a contextual analysis of pragmatic data and expedites a framework created from it. Thus, the study produced a strategic framework for a large airline that could be generalised into frameworks to advance the understanding of such a phenomenon and to capitalise on the framework for the practitioner deployment.

The recursive trait, analytical procedure and process-orientation are some of the crucial aspects of GT. The analytical procedure is underpinned by two main practices: constant comparison and theoretical sampling (Strauss and Corbin, 1998). These operations are tightly woven and integrated theories and could be considered as the prime difference between the GT method and other qualitative research methods (Strauss and Corbin, 1998). By and large, GT starts with a definition of a research problem, then advances into the collection of relevant data. This data help to build the conceptual framework via developing provisional categories until reaching an abstract level of explaining the analysed data through constant comparisons. The recursive nature of GT strengthens the emergence of a solid conceptual framework. The researcher revisiting the old and new categories through inductive and deductive processes, thus ensuring the coding and interpretation until the research reaches saturation. This then steers to the emergence of a conceptual framework (Creswell, 2002).

The multinational airline under study (ABC) is going through massive IT transformation to attain a respectable position in the market. The airline spent over £500 million on renovating its entire technological infrastructure and IS, ensuring business continuity and supporting airline business growth in the region. To achieve this goal the airline managed to engage with various

collaborators from the pioneers of airline IT solutions providers like SAP, Sabre, Amadeus and others. This makes it an exceptionally good choice for a case study to demonstrate the interest and aim of the research.

With regards to this, a qualitative research method will be utilised to cover the aspects of the problem, and to develop the initial conceptual framework. The study will deploy a qualitative research method to expand the meaning of the contextual details. It aims to explore the meaning and perceptual experiences of this phenomenon from a person's point of view. This method will be more suitable for this research, especially when capturing the complexity of this type of business as well as the interaction between the organisation and the human factor within the organisation fit of the MES business process. However, to enable the researcher to focus on this phenomenon, an in-depth interview with all participants was conducted to enhance the initial tentative theory or formulate other theories through the inductive process in the selected study case. The interpretive approach will be the general underpinning paradigm of this research, with inductive orientation drawing on the grounded theory in the analysis. A pilot field interview will be conducted first to help with constructing and formulating questions. These interviews are specifically designed to help provide an in-depth view on the subject and to "fine-tune" the tentative conceptual framework. Once the pilot interview is coded and analysed, another visit to the tentative conceptual work is conducted to shape or optimise it according to the new information available from the analysis. After that, semi-structured interviews are conducted in the selected case study aiming for a deep understanding of the complex processes implied in the subject research, especially if it involves management from different divisions within the company, such as business and IT as well as project management.

## 6.1 Summary of the Emergent Framework

The main question in this study has been addressed in this thesis:

Why are some organisations able to successfully deploy MES?

This research started by looking at the importance of MES in aerospace and the surpassing advantages of it in having a short elapse in time compared to the sequential model. Although enterprise systems such as ERP were investigated thoroughly by researchers because of their exceedingly high impact on organisations and the high cost mostly attached to it, the MES phenomenon were merely mentioned in the literature review. Because MES is not a common practice in the aerospace sector, the size of such enterprise systems and the context they are deployed in, are taken into consideration. For that reason, the MES needed to be investigated and explored to provide a solid understanding of this phenomenon.

After the pilot study on the MES phenomenon, the picture of MES started to take better shape in the author's mind. This study was required to "fine-tune" the questions, besides understanding the basic foundation of MES. The early stage of analysis started with the first interview in the pilot study where the author over time, became more sensitive towards the data and generated improved mature themes. As the interviews progressed, the author became more skilful in extracting knowledge from the participants by asking precise probing questions. Further, it was imperative that the interviewer was resilient to the dynamic nature of these interviews, which can be both stimulating and prolific. After each interview, a preliminary analysis of each interview would be conducted by the author to gain new knowledge that could lead to a new course of action in the next interview.

The next phase was preparing all the data collected for the analysis stage. At this point, some views were already emerging from the previous stage. However, after invoking the nVivo package in the project it had an immense advantage for the analysis stage, especially the auto-coding feature. The amount of data to be analysed was enormous and doing the analysis manually would be an extremely difficult task that would not be feasible within the duration of the interviews. At the first stage, the author was particularly keen to extract all the possible themes out of each text, as the aim was to explore the whole MES phenomenon. The first round of analysis ended up with nearly eighty open themes; afterwards the author executed many revisits over the transcribed interviews to validate each theme and substantiate its existence. The more reading over the text, the more sensitive the author became to the data. This resulted in subsuming several open themes under other super themes.

Finally, in the axial and selective coding stage, the author had six core themes. Some of these themes, such as *business/IT alignment*, carried on from the first stage; the others were abstract core themes that reflected all of the subthemes underneath them. The author conducted an extremely diverse literature review for all the themes that were researched by scholars and discussed the contextual existence of those themes within the literature review.

As all outstanding work started with a legitimate reason, MES started with aggressive needs to improve the airline business and to find a place in a highly competitive market in the aerospace industry. This was abundantly apparent in the first core theme, IT/ business alignment, which had the reflections of the participants towards, what they believe, is the essence of the whole change. During the analysis, there was a manifestation of the interplay that exists

between the ASPs themselves. This manifestation led to the emergence of the core theme that explicated and investigated all the enablers who flourish in the relationship between the ASPs. Various aspects appeared under this core theme such as the so-called 'finger pointing', technology leakage, and collaboration between rivals.

Furthermore, the airline, as the main player in the MES phenomenon, took the decision to risk deploying MES in favour of shortening the overall time. Various participants reflected on their experience in the MES deployment of their organisation, which would furnish the road to a successful implementation of such a large undertaking. Many themes emerged under this core theme to manifest the critical role of the airline in acting as the central pillar for the MES.

Due to the fact that the research focuses on the concurrent attributes of the deployment, the core theme of *concurrent challenges* has emerged to shed light on the MES-specific aspect of the concurrency. This will provide explicit details regarding this phenomenon that made this phenomenon unique. The importance of the *deployment strategies* in reference to their immense impact on the MES has emerged as a core theme that reflected the criticality of these strategies. Though there were various arguments regarding these choices, this research investigated each decision to offer breadth to the study in hand. Finally, the *cohesion factors* deliver the mechanism of gluing all the ASPs together to present a homogeneous solution for the airline. The silos of the ASPs defaulted into fragmented solutions and without the cohesion factors these silos would represent a crucial barrier to the MES success. Identifying these factors and their role in furnishing the road for successful MES deployment will help practitioners as well as academics.

## 6.2 Research Limitations and Future Research

This study has covered almost all aspects of MES and offered insight into the aspects surrounding the phenomenon under study. However, due to the fact that the MES phenomenon is not common in most industries, particularly in the aerospace sector, and the high risk entailed in this undertaking, these have limited the chance of applying the same initiative to another airline. Furthermore, this was due to the significant impact such an undertaking will have on an organisation that deploys it. Though it seems that generalisation is an issue in this study, the broad diversity of professionals from world-class companies means that not only are these participants highly experienced in their fields, but they have also accumulated this experience through working with many other world-class airlines. Each participant from ASP companies represents his experience through working with many airlines, which deems his views to be an aggregate of multiple experiences gained in this industry. Basically, the quality of participants' knowledge provided the study with exceptional value since they represent the elite professionals in both the business and IT fields.

## 6.3 Contribution to Knowledge

Due to scant academic and empirical research in the airline industry of this type, this research will add value to those airlines that can afford to invest heavily in IT and seek competitive position in the marketplace. Furthermore, it will add to the knowledge of scholars who are interested in this type of studies. Simultaneous multi-collaborative enterprise systems and their implications on organisations, specifically in the aerospace sector, are scarcely covered in the literature review. This research attempts to fill this gap from the empirical side to enrich the knowledge of MES and to propose a theoretical framework



elaborating on the relation between MES and organisation. Additionally, it will offer a holistic view of MES for other airlines to follow an appropriate model and learn from the deliverables and findings of this research. This research also helps provide strategic business planners with guidance in assessing an organisation's capability to undertake a business process enhancement through MES. Furthermore, the context of the research gearing large-scale and complex MES solutions will enrich both academic and business knowledge.

The research presented here contributes to the knowledge by:

- Offering a well-founded framework that explains the MES phenomenon in details, which is relevant to both practitioners and researchers (Figure 5.12);
- Clearly demonstrating the inhibitors and enablers in MES undertaking (Figure 5.11);
- Exploring the interrelationship among ASPs and showing that there are aspects that need more focus such as rivals working at the same project;
- Identifying cohesion factors that are responsible for gluing all the diverse systems for vendors (Figure 5.11);
- Indicating the importance of deployment strategies and their vital role in an ambitious initiative as in this study;
- Distinctly exhibiting that business and IT alignment have a significant impact on the MES project; and
- Identifying the road map for deploying MES in an organisation.

- Recognising the challenges due to the concurrency nature in MES (Figure 5.11).

## 6.4 Implications

Businesses are pushing IT shops to have a flexible and dynamic IS that responds quickly to business needs (Moitra and Ganesh, 2005). These reasons have made collaboration between companies in IT services essential. At the same time, they have created a complex set of resources that could generate distinguishable assets to be used as a competitive advantage over rivals. In addition, the complexity of the airlines business processes added a tremendous burden on airlines to respond to the dynamic market requirements that led companies to innovative ways to optimise their business processes (Hong and Kim, 2002).

Considering the importance for the improvement of business processes, it has become indispensable to investigate how organisations would enhance these processes to follow the best practice in MES. Such acts, presumably, would lead to better performance in companies in a shorter time period compared to the traditional business process. Aligning with latter views, airlines confidently invested a large amount of money in information technology hoping for an appreciable return on investment. Therefore, the organisational fit of MES business processes in this research will have a crucial impact on the aerospace industry. Furthermore, the leading information system providers in the airlines industry such as Sabre, Amadeus and SAP who carry substantial weight in the market will increase their interested audience (senior executive management, IT and business practitioners) from the aerospace industry.

The research has uncovered the enablers for organisations to adopt when deploying MES, which are deemed necessary for successful implementation. Therefore, airlines who need to step forward following our case study will unquestionably find these enablers of immense value.

This research has stressed that practitioners who have an interest in taking such a project to have their IT and business strategy aligned. This alignment has to have a genuine cause that drives the whole initiative from the start and remains sustainable till the end. Furthermore, awareness of the collaborative competitor occurrence in the MES has been raised by this research. This awareness has paved the road for others, by making them aware of the pitfalls of ASP collaboration in the MES. Stressing on the flexibility between the ASPs would offer a better work environment in the MES.

Another implication of this research is exposing the kind of concurrent challenges that would face the organisation who is planning to deploy a similar project. Likewise, the author has explored the deployment strategies and discussed its pros and cons, and their implications on the MES initiative. Following these deployment strategies would provide other practitioners great value and prevent unnecessary loss.

Revealing the gluing factors that bring together all the diverse entities involved in the MES would be of an exceeding benefit to other airlines hoping to implement such an undertaking. Finally, the research has explored the MES phenomenon and unveiled many aspects that should be of great value to most industries which have similar large projects, especially after the inclusion of world-class companies in this research.

## 6.5 Recommendations

MES is an immensely rich phenomenon entailing many details that will enhance the knowledge of the academics as well as increase the experience of the practitioner. In this section, the author will discuss the recommendations according to the six main core themes. Under each theme, the research will discuss the recommendation that emerged from each of the core themes. The recommendations will include the opinion of the participants as well as the understanding of the author.

### 6.5.1 IT/Business Strategy Alignment

- Without an appropriate strategy alignment, gaining fruitful and ambitious aims from the MES phenomenon would not be feasible. The organisation should be aware of and aligned to a clear vision. The beginning of such an undertaking should have a legitimate necessary cause and a clear projection into the future of the organisation. The assimilation of this message should be made clear to all the staff to pave the way for such a complex initiative.
- The genuine need for change is the heartbeat of triumph in such a complex project as MES. Not having a clear vision of what is required from the beginning of such a project will only establish obstacles and sail away from the shore of success.
- The concurrent deployment model is essential to achieve the strategic goals more rapidly. Since the strategy and goal predetermine that the airline is interested in a change not only to the technology but also the business processes attached to it. Not going with the concurrent model

will lead to lagging behind the technology wagon and delaying the benefits of the new systems.

- Being competitive in the market and resilient to market changes, such as joining other alliances has become a necessity for the airline to exist. It would not be possible to achieve the last target without having a universal level of technology to integrate these alliances.
- The factor that forces the airline to change is that legacy systems are becoming hugely expensive to maintain, and resources are scarce, as these systems in place, such as MVS and CICS, are not taught in the universities.
- In summary, the alignment of IT and business has to be clear and based on a truly legitimate need that stands during the elapsed time of this project.

### 6.5.2 Interplay between ASPs

The whole MES phenomenon is based on the diverse ASPs where there exist many interactions between them. There should be a thorough plan on how to manage these ASPs, especially in the existence of rivals within the team of the ASPs as in the case of MES.

- Collaborative competitors occurred in the MES where the rivals need to cooperate concurrently with each other in order to build a solution for the airline, raises a decidedly cautious concern about the different ASPs in the MES. “Finger- pointing” is a side effect of this occurrence where each ASP tries to reflect the negative side of their opponent’s solution. Another downside of this occurrence is the technology leakage that augments the

concern when dealing with various parties in the undertaking of MES. The remedy to this problem would need to be mitigated in the statement of work (SOW). The SOW requires a section that discusses this particular subject to avoid any issues regarding technology leakage and ASP collaboration in that regard.

- Since the airline had to select more than an ES solution to satisfy its needs, this resulted in an interaction between the ASPs leading to overlapped business processes. A strong governance body needs to be set up to enable the ASPs to work with each other without crossing boundaries. Not only should the organisation put a lot of effort into defining these boundaries but it also needs to work hand in hand with these ASPs to make it happen. Effective IT governance and IT PMO are necessary elements to sustain the success of such an undertaking and to overcome the problem of high interdependency. Due to the essential role of this governance, it might be worth investing in engaging a professional company to take this role to ensure that all obstacles and barriers are taken care of.
- Flexibility plays a critical role between the ASP and the organisation at the contract stage and ultimately this will pave the way to a fruitful partnership. MES is an extremely large initiative and has an immense number of tasks, and a grey area after the blueprint stage is inevitable. Without flexibility, it would be an arduous task to absorb minor conflicts and reach an agreement. Though flexibility between participants was a controversial issue in this study, it is essential to overcome the non-detailed requirements that were not covered in the contract and place the interest of a successful business partner relationship first.

- Executive support for an ASP is an essential part as the MES may involve a vast amount of cost investment. As a result, executive support is clearly manifested when there is an active involvement from top executives in the decision-making process of any IT initiative. Indeed, it helps in deciding on some critical turns in projects that might require an extension in either resources, budget or time.
- Credibility between ASPs is considered as an influential factor in selecting IT partners, as the road of adaptation of such considerable changes in business processes covering the entire organisation is complex, lengthy, and dynamic, which requires ASP credibility that secures and maintains the firm's assets and resources. Credibility is built on a fine reputation of continuous commitment with partners or clients where commitment reflects the degree of credibility.
- The culture fit between ASPs is required due to the fact that MES is a large and complex project involving companies that differ in location, language, culture, technology and methodology. Having all of them underneath one umbrella will complicate the deployment of any project. However, taking into consideration issues such as culture when preparing for such a project will lessen the advent of the side effects of these elements.
- MES has a gigantic number of interrelated tasks that demand an efficient type of communication. For that, an effective communication has to be in place for MES to be deployed smoothly. Communication in that sense becomes the base for other factors to build on, and it is also used as a conflict-resolution tool. Knowing that MES involves a tremendous amount

of communication amongst diverse parties in locations, timing and culture, a careful and well-planned communication plan has to be prepared in advance to promote the success of MES deployment.

- IT PMO is like the maestro for the whole MES undertaking. For the important role that PMO plays in MES, a dedicated PMO managed by the airline and a world-class consultant company were in place to ensure that everything was aligned with the airline strategic business goals and fulfilled the business targets that had been set for the enterprise systems. Indeed, having different vendors working with various project management frameworks makes running IT PMO a saddle to align all ASPs in one methodology, and here the leading role of IT PMO shines in harmonising the tremendous number of tasks and activities involved in deploying concurrent MES.
- IT governance is a salient and effective tool between various ASPs, which have different backgrounds, methodologies and governance models. Evidently, IT governance is an integral part of corporate governance and those organisations that utilised IT governance reaped the advantages of its deployment. While IT governance works mostly well within one organisation, it tends to be challenging when it is widespread .
- The integration complexity was a factor that influenced certain decisions concerning the deployment strategies. As a matter of fact, the big bang was implemented primarily because of the elapsed time and to escape from the interim integration between solutions. The ability to integrate various platforms is one of the secrets of the success of MES. Since



MES is far greater than a single enterprise, there was a stream by itself devoted to the integration.

### 6.5.3 MES Enablers (Recipient's Organisation)

Obviously, the prime player in this phenomenon is the airline, and there are various recommendations that are related to the organisation that would hope to construct a positive guideline for practitioners as well as enhance the knowledge of the academic.

- We have already discussed the flexibility in the interplay between ASPs; nonetheless, flexibility is equally beneficial between the organisation and the ASPs. As a matter of fact, it became a highly salient tool among all parties in MES, as has been identified before. The project would face many obstacles without resilient partners and could have become extraordinarily complicated. Undeniably, flexibility is required to overcome the non-detailed requirements that were not covered in the contract and place the interest of a successful business partners relationship first.
- A great deal of training is required due to the fact that almost all systems around the user have changed at the same time, including the business processes. Therefore a careful training programme has to be planned ahead for all these activities. Training plans should be sensitive and tailored to every employee's need, as top management requires an overview of executive management systems while the operation's users might require an in-depth view of the systems to enable them to carry out the daily tasks.

- The extra available budget that could sustain the project until the end, or what is called 'slack resources', is mandated due to the fact that MES involves uncertainties and entails hidden costs due to change requests over the life period of the project, which tends to stretch the budget.
- The prime factor that should be seriously considered by the organisation's management is that people change management. Evidently, large deployment has a significant number of activities and tasks that increase the complexity, and when engaging more than one vendor this does not increase in a linear fashion but exponentially. Therefore careful consideration is required to accommodate the employees' reactions towards these adjustments. Mostly, change management is misjudged and underestimated by organisations during the ES implementation, and this, unfortunately, could lessen the budget of change management.
- Executive support from the point of view of the organisation is a 'make or break' factor. MES is not only a large and complex project but also a project entailing many critical downturns that necessitate courageous and fast decisions to be made with regard to resources. Without the effective interference of the executives in MES deployment, MES might be another grave that the organisation might be buried in.
- The credibility of ASP is considered to be an influential factor in selecting IT partners in which credibility is built on an exceptional reputation of continuous commitment with partners and clients where commitment reflects on a degree of credibility. The airline participants stated that some of the vendors were changed due to their lack of credibility; so a

careful study on selecting these partners has to be carried out before embarking on a massive project such as MES.

- In the MES, a champion of change is an extremely necessary catalyst to promote the change and the adaptation of the newly introduced business process. It was shown in the MES that champions of change worked well in the areas where they exist.
- Effective communication is a significant and crucial tool for the deployment of MES, especially with the immense number of interrelated tasks that demand an efficient type of communication. Many forms of effective communication should exist as this will impact positively in enhancing IT PMO, IT governance and project management.
- Since human interactions are one of the bases of long-term partnership, accommodating the partner's culture in MES is valuable and requires to be studied as the duration of such a large project necessitates a prolonged period of interaction between the ASPs and the organisation personnel.
- ASPs' IT capability is a pivotal aspect in the MES, and a weak ASP could create weak links that jeopardise the whole project. In general, IT capabilities are necessary in the first place; otherwise, it would be difficult to remain in the market as an ASP. Equally important, the capability of an organisation's IT will mainly be 'gap bridging' for them as it will facilitate resources needed for the ASP. A company's IT capabilities, for instance, technical and management skills, are a necessity for firms adopting large systems and investing largely in IT systems. Additionally, they will act as a mediator for transferring information to the adopter's firm. Not only is

the internal IT capabilities useful for facilitating, managing and coordinating project plans with ASP, but also for acting as a secure valve that an organisation trusts in all phases of MES deployment.

- Perceptibly, project management is an axiomatic tool used when executing any IT project regardless of its size. In this context, the focus will be on the project managements (PM) that are related to changing management and some of the planning at the track level (level of implementing certain components of a larger system such as applying a crew management system in the Sabre enterprise system). Project managers have to be firm and organised to avoid project scooping, that is, those tracks that have slipped out of their schedule, did not have a skilled project manager from the organisation.

#### **6.5.4 Concurrent Challenges**

The recommendations under concurrent challenges would result in the solutions that emerged from the analysis phase in Chapters 4 and 5.

- MES is a resource-hungry, knowing that some of the MES features with regards to their complexity and duration. What has aggravated the situation is that the airline has run its business while renovating the systems. Having a CEO that has a positive attitude towards technology provided an advantage for the MES as he was willing to invest largely in technology to reap its benefits. Securing enough budget in addition to the contingency budget helped the airline immensely .
- The other challenge is the high interdependencies in the MES: engaging IT governance and IT PMO as well as effective communication to lessen

the effect of the high interdependencies. The IT capabilities of each partner in the MES offers a professional and effective environment to deal with all interrelated tasks. In the MES, there were two vendors that influenced the success of MES and overcame many barriers regarding the high interdependencies, and these were the overall integrator and the governance body represented by a consultant company.

- Without doubt, the MES undertaking is classified as a high-risk project, which is why the practice was abandoned within the industry. The risk is highly interrelated with the nature of MES; various reasons influence the risk as per the study, starting with the high interdependency, resource demands, multiple vendors, multiple methodologies, high complexity, high change resistance, credibility and the extensive integration needed. To mitigate the high risk entailed in this project full support from the executive is essential, organising third parties to support planning and scheduling tasks, employing effective communication, and adopting ESB as a mechanism to integrate all solutions.. Using ESB enables the airline to replace any functionality, provided by whichever vendor, with another concept like 'plug and play' as long as all parties commit to the ESB standard set by the overall integrator when interfacing with each other. These factors were discussed in detail in Chapters 4 and 5.
- As the adoption of large projects is facing difficulties, MES is no exception. Indeed, MES would have greater resistance from staff due to the fact that most of the systems are changed at one time, so the learning curve would be difficult as well as the resistance to change. Implementing an effective people change management and augmenting it with effective training reduces the resistance to adopting MES.

Focusing on best business practice might create an issue in adoption, whether to opt the vanilla option or the customised. In this case, the organisation has to invest more in training to offer a good base for the adoption of these systems.

#### 6.5.5 MES Deployment Strategies

The deployment of the MES, which is an extraordinarily large undertaking, faced various and critical decisions that had to be taken, and those decisions had an immense impact on the success of MES. Though these decisions were controversial, as has been discussed earlier, this section will present the recommended decisions.

- Best business process practice (Vanilla) vs. Customisation was the first decision to be made, and fortunately, the airline chose to adopt BBPP, which contributed to the success of MES. Adopting BBPP was a strategic decision taken by the organisation for three main reasons. First, the airline would like to adopt the industry practice entailed in these solutions by changing its business process after these solutions; second, the airline did not want the vendors to ignore updates of the solutions; finally, the customisation of these solutions usually takes place over a long period, and that negates the whole purpose of concurrent deployment of ESs.
- Whether the deployment is executed as a big bang or through a sequential mode, it is a crucial decision to be made. The airline has chosen to renovate all of its systems at the same time (big bang). The latter option was elected for the following reasons: first, to significantly shorten the time of implementation and abandon the costly interim

solutions. This decision was backed by having a state-of-the-art integration scheme as well as having a strong governance body for running all the tasks and activities.

- Would the airline choose the best of breed or opt to select a few vendors? In the MES initiative, the airline has chosen to mix both trends. They have decided to go with the choice of using fewer vendors unless the other vendor has a superior solution that is considered as prime core business. For example, the Sabre Company has the majority of the airline's business solutions, including the marketing system, which includes the reservation system. Nonetheless, the airline has chosen to go with the Amadeus's marketing system, which was far superior in that field. However, some participants regretted that they have chosen this path, and suggested that they have an extremely strong integration methodology and underpinning their solution with best of breed might be more beneficial, especially after learning that even one vendor solution is not seamlessly integrated due to the acquisition practice.
- Who should be leading such an ambitious project? Should IT lead such a project.? The MES was primarily led by IT and business. Each project track has three project managers from IT, business and vendor. However, IT had the upper hand in managing and planning the MES while the business was signing off the project. IT personnel were elected to lead each project track. This decision might not be the most suitable decision for other organisations as it was chosen for this airline because the IT culture commitment compared to other business departments was higher. In addition, this also refers to the maturity and knowledge of technical and business that IT staff hold.

#### 6.5.6 MES Cohesion Factors

The final core theme that helped to build a homogenous system for the airline from different vendors, locations, methodologies and cultures is the cohesion of MES factors.

The fragmented silos of software require a cohesive factor, so that they can run and act as homogenous software. Starting with the IT PMO, which is an important tool, especially in medium to large IT houses; however, in this study, it was found that it is a necessity, and without it the whole project is under a high risk of failure. The next gluing factor in this study was the effective IT governance, which has been proven to have a strong influence on the success of MES. Effective communication is necessary for such a large, interrelated, complex undertaking. Finally, without a state-of-the-art integration scheme such as the enterprise system bus (ESB) it would be difficult to manage such an arduous task that requires agile well-designed integration middleware.



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## **Appendices**

### **Appendix A**

#### **I. Research Criteria**

Bryman (2008) asserts reliability, replication, and validity as the most prominent criteria of social research. Reliability concerns the extent to which measurement is consistent. Reliability consists of three aspects, namely, stability of measurement over time, internal reliability of findings related to the indicators, and conflicts between related indicators and their score. Thirdly, inter-observer consistency concerns those cases in which more than one observer is involved in the research.

With regard to replication, in this context reference to the procedure and detail of the research process has to be written in detail so others who are interested in replicating the research will be able to follow the same methodology to generate findings that may be compared to different times and social settings.

The hallmarks of scientific research, according to Sekaran (1984), include the sense of replicability, testability, accuracy, objectivity, rigour, generalisability, parsimony, and purpose. Scientific research is reliant on empirical research and the concepts of a theory. Further, scientific research may first start with testing a theory or hypothesis. This is widely recognised as a deductive approach. By contrast, inductive research involves collecting new information and data for the purposes of generating a new theory or hypothesis.

#### **II. Research Types**

Kumar (2005) distinguishes between pure scientific research that involve developing and testing theories, and hypotheses that are intellectually

challenging to the researcher but may or may not have any applicable fields. On the other hand, applied research that most of social research fall into, is about gathering of information about various situations, issues, problems, and phenomena so that collected information and findings can be utilised to answer questions or resolve problems. Moreover, Van De Ven (2007) outlines more types of research in more detail as follows:

- Informed basic research consists of describing the characteristics of social phenomena. In this context, the researcher is detached from the social system that she/he is trying to study.
- Collaborative basic research by contrast involves greater involvement of the researchers sharing activities and power among them to tackle more complex project.
- Design and evaluation research helps to evaluate policies, as well as models to resolve certain practical problems in a particular profession. Investigators conducting such research keep themselves at a distance from all the policies and regulation involved in the research, and should maintain objectivity through all the research.
- Action/intervention research requires the researcher to be involved in a specific client social setting to find a solution to a certain problem.

Somekh and Noffke (2005) add that the action research directly addresses the problem of the division between theory and practice, and integrates both the development of practice with the construction of research knowledge in a repeated process. Furthermore, researchers operate as an insider (as opposed to a detached observer) to that social setting.

### III. Research Strategy

Deciding on the research strategy is considered the most salient and prime decision the researcher has to take as it will dramatically affect the entire research. Therefore, a careful thinking has to incorporate this decision with regards to research suitability. Broadly, researcher should verify the fit of research and strategy underpins the research taking into consideration the research problem.

Indeed, the selection of research strategy has an immense impact on the research as it will dictate the methods and also the philosophy assumption towards the research itself. Blaikie (2009) has categorised research strategies based on a combination of ontological and epistemological assumptions. Two of the mostly used strategies are the inductive and deductive strategies. The inductive strategy underpins theory building and generalisation while the deductive strategy supports theory testing (Blaikie, 2009). The research strategy should reflect the overall philosophical stance in this research from the ontological and epistemological premises. In addition, the techniques underpinned the research are markedly affected by choice of research strategy.

Since these research questions are more dominant on the 'how' and 'what' question categories and the objective of this research type is exploratory and explanatory, it will be more suitable to employ the inductive strategy (Bryman, 2008). As the inductive strategy has a good fit in explaining deeply more complex phenomenon and generating propositions and theories to explain the phenomenon.

## IV. Research Philosophy

### i. Ontology and Epistemology

There is a research philosophy related to how we classify our understanding of the phenomena around us, and how we gain and develop knowledge (Lee and Lings, 2008). Before discussing different philosophical perspectives characterising the ways in which we develop knowledge, it is first necessary to consider key philosophical terms relating to the philosophy of knowledge. Comprehending philosophical assumptions revolve around the stance of researchers towards nature (*ontology*), how the researcher knows what she/he knows (*epistemology*), the implication of values in the research (*axiology*), the language of the research (*rhetoric*), and the mechanism needed to extract the knowledge (*method*) (Creswell, 2009).

#### a. Ontology

Lee and Lings (2008) refer to ontology as being the study of the nature of reality. It is also a cumulative set of beliefs about the world we are trying to study. Furthermore, ontology deals with questions concerning what entities exist or are supposed to exist, and how such entities can be grouped, related within a hierarchy, and subdivided according to similarities and differences (Bryman, 2008). Another concept of knowledge generation is epistemology, which concerns how we can know about reality, as well as our beliefs about reality (Lee and Lings, 2008).

Thus, ontology can be explained as a part of the research methodology which can determine the existence of an entity and define which groups and sub groups it would be related to in a hierarchical manner. Different entities can be either grouped or their existence can be determined on the basis of similarity

and differences between entities. Ontology is intrinsically a part of philosophy, which is analytical in nature, and it determines the fundamental nature of an entity. Generally, questions, which are asked about the existence of a particular subject, are answered by ontology or ontological metaphysics. For example if a researcher is asking questions about the existence of a particular subject, phenomenon or entity then basically he is asking an ontological question. Ontological questions are fundamentally inherent in nature, and those questions enable the researcher not only to determine the existence, but also defines which category this existence should be kept into.

#### ***b. Epistemology***

Epistemology can be determined as a branch of philosophy concerned with the knowledge development, its development and the way knowledge is gathered by a researcher. In epistemology, a researcher tries to find what is truth and what is false and also they ensure that there is an identification mechanism in place which can determine if the researcher has successfully identified the truth and knows how to get retained to it. Epistemology is a systemic manner through which it can be determined if something is good or bad.

Ontology and epistemology are truly closely related to each other as well. Epistemology is inherently extending the information provided by the ontology of a research question by assessing what it means if the information is proved to be true. For example if a researcher is trying to find if “nuclear energy will be replacing fossil fuel in next 25 years and its impact on the global economy”. If a research is able to prove successfully that this phenomenon will take place then epistemology will determine the impact of this truth on entire global economy. Boundaries between epistemology and ontology are truly loosely demarcated and occasionally it becomes exceedingly difficult for a researcher to determine



which factor will be governing the research study in a dominating manner. It is also attempted by many researchers that they can identify and study ontology and epistemology separately, but in the end they have to study both aspects together because they have to be used collectively (Hesse-Biber and Leavy, 2010).

*c.      Ontological and Epistemological stance importance*

Why is it necessary for researchers to understand their ontological and epistemological positions? In reference to the latter, the philosophical outlook (epistemological stance) about the nature of how knowledge will influence the choice of applied methodologies. In addition, it has become rather common to have either ontological or epistemological starting points, and it would be an intriguing contribution to conversations from a researcher using a less familiar framework. Philosophical foundations are expected from most scientific researchers. Having a thorough understanding of the philosophical foundations of the research helps shape the knowledge which a researcher is attempting to reveal in his/her paper, helps shape a clear stance in terms of his/her position regarding the research, and influences the type of research strategy he/she chooses. Further, decisions concerning the kind of research strategy to be used and the type of research methods to be adopted are based on the ontological and epistemological stance of the researcher, awareness of which eventually leads to a more consistent scientific approach (Lee and Lings, 2008). The approach from epistemological or ontological orientation varies, but the concentration will be on the main stances held by most scholars, namely, positivism and interpretivism.

## ii. **Positivism and Interpretivism**

Positivism is the approach of the natural sciences that emphasises the discovery of the causal laws of human behaviour, through empirical observation, measurement and analysis (Neuman, 2003). There is a lot of debate on what positivism is, as it can entail using a deductive and inductive approach. Bryman (2008) also adds that it is a common mistake to treat positivism as synonymous with natural science and scientific methods. Indeed, whilst positivist researchers apply quantitative methods, such methods, are nevertheless, applied to social science settings.

On the other hand, the interpretive approach values relativism and ontologically, sees all knowledge as a matter of interpretation, and dependant on how people perceive reality. The aim of interpretive researchers would be to understand social life and recognise how people construct meaning in natural settings. Evidently, interpretive research would seem rather appropriate to fit with qualitative research methods (Huff, 2009). Having discussed the philosophical perspectives underpinning our beliefs about the social world, and how knowledge is developed; the following sections will discuss the application of quantitative and qualitative research methods.

A positivist is primarily concerned about social facts and aspects which cannot be determined through a scientific formula or equation. For example, presence of god and its impact on human psychology is a research study which has to be positive in nature. A positivist's research approach generally uses quantitative data, which can be numerically measured and reported.

Primarily there are two research methods to extract knowledge; namely, quantitative and qualitative research methods. However, for selecting the

appropriate method that fits the research it worthwhile to elucidate the fundamental difference of quantitative and qualitative research. The subsequent sections will present a brief introduction about the two research methods, as well as a mix of both followed by a collaborative organisation study which will underpin this research.

## **V. Research methods**

The ultimate aim of the research methods is to find out hidden answers of the undiscovered questions by applying scientific procedures. There are two main research methods namely Qualitative and Quantitative Research. In order to select the appropriate research, various facts are to be considered i.e. what are the problems need to be addressed, available resources, Researcher's skills and who the addressees are.

### **i. Quantitative Research Methods**

Quantitative research involves the collection, quantification and statistical analysis of numeric data related to facts, incidents, events, or occurrences. Devising theories and testing them through hypotheses and building models to encapsulate the findings, are key features of quantitative research. Curwin and Slater (2008) explain that quantitative methods involve more than collecting numbers and generating statistics relating to social settings. Rather, these statistics would not have any value unless they create the picture the researcher required to deliver a framework that explains the context. In other words, the context that will give meaning to the relative importance of numerical information. Analysis of the collected data is needed to further breakdown the problem or question that the researcher is trying to answer.

Since numbers are recognised as a universal language, it became naturally that wide range of problems can be understood and described through the collection and manipulation of numerical data. Evidently, some problems such as budget related issues could be described mostly in numerical terms and in a way that is more appropriate. Moreover, the quantitative approach will describe and resolve problems using numbers, and it is necessary to give attention to the collection of numerical data, where measurement is seen as an important factor. Nevertheless, illustrative measures (such as attitudes and perceptions) cannot always easily be measured (Curwin and Slater, 2008). In quantitative research data is measured and analysed accurately where both the independent and dependent variables are studied in details as well as it is widely used in hypotheses testing of the experiments.

This research method is purely based on the numbers and can be used to identify problems, by testing a hypothesis. It is also based on the idea that things will work only if the process was properly observed and counted. The major objective of the study is to develop various models, which involves mathematical tools that can be in the form of percentage statistics. As this research holds under large population so the chances of getting error becomes less. Quantitative research followed various approaches such as experimental, descriptive, correlation and causal comparison. There are three types of quantitative methods: surveys, experiments, quasi-experiments. In the first one, the random assignment is used and analysed. In the second one except non-randomised assignments almost all the features of experimental designs used and in the last one cross section and longitudinal studies are used which include Questionnaire and interview (Saunders, Lewis and Thornhill, 2007).

Bryman (2008) observes that quantitative research undergoes several steps. The first step involves starting with a theory. Once we have a theory, a hypothesis is deduced from it. Following this, it is then necessary to select a research design, followed by the right measurement that matches the concept of the research. Next will be the selection of research site(s) and subjects/respondents. Administration of research instrument(s)/collecting data will then take place. For example, in experimental research, there is a need to manipulate the independent variable for the experimental group and post-testing of respondents. Processing and analysing data come next, where the researcher prepares the data to be quantified, and later assess the relationship between variables. Upon the latter step, findings and conclusions need to be drawn. The final step involves documenting the findings and the entire research process. Figure 3.1 below summarises the steps of conducting quantitative research. Quantitative research is not without its criticisms, and these considerations are addressed in the following section.

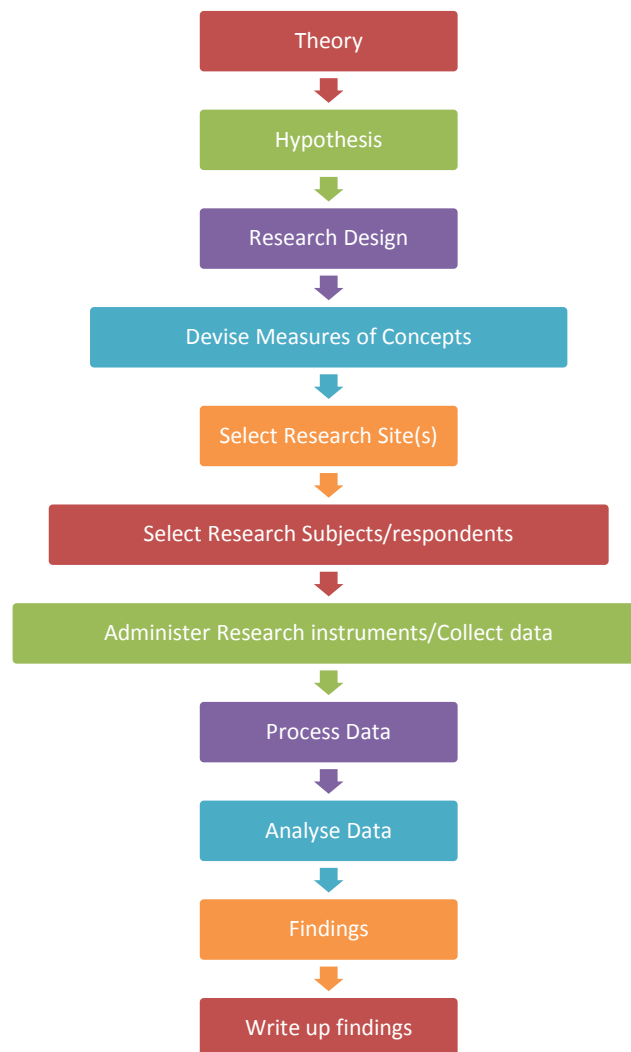


Figure 0.1 The process of quantitative research (Bryman, 2008:141)

## ii. Critiques of quantitative research

Critics argue that quantitative research does not distinguish between the social and the natural world. This implies that quantitative research techniques cannot capture certain aspects of human experience. Additionally, the measurement process entails an artificial and spurious sense of precision and accuracy where it can be argued that the relation between the measures developed by social scientists and the concepts they are supposed to be revealing, is assumed rather than real (Bryman and Bell, 2003). The reliance on instruments and procedures, which hinders the connection between research and everyday life, is another criticism. Furthermore, according to Bryman and Bell (2006: p.86),

“quantitative research is seen as carrying an objective ontology that reifies the social world”. In other words, the analysis of relationships between variables creates a static view of social life that is independent of people’s lives as well as its chief disadvantage of that it requires a created field (artificial), as it cannot be studied in normal (natural) settings.

### **iii. Qualitative research methods**

Qualitative research strongly emphasises the need to address the ‘why’ and ‘how’ questions. The focus of qualitative research is on the understanding of the social world, using a naturalistic approach that seeks to understand phenomena in context-specific "real world settings [where] the researcher does not attempt to manipulate the phenomenon of interest" (Patton, 2001, p. 39). Qualitative research, broadly defined, means, "any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification" (Strauss and Corbin, 1990, p. 17). Unlike quantitative researchers who seek causal explanation, prediction, and generalisation of findings, qualitative researchers instead, seek illumination, understanding, and extrapolation to similar situations (Hoepfl, 1997). Qualitative study is helpful for the researcher in the starting phase of the study when he is unaware about the exact facts. Further, the study does not require any specific design and can be easily disclose when needed and provided detail as well as more condensed data.

Denzin (2008) defined the qualitative research as:

A situated activity that locates the observer in the world. Qualitative research consists of a set of interpretive material practices that make the world visible. These practices transform the world. They turn the world into a series of representations, including field notes, interviews, conversations, photographs, to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meaning people bring to them (Denzin, 2008:311-312).

This research method is based on the qualitative phenomenon. It includes information regarding human behaviour, emotion, personality, needs, desires which is crucial in designing a tailor made products. There are three types of Qualitative methods: Case Studies, Ethnographic Studies and Phenomenological Studies. In the case study persons, records were followed by looking at the various units ie. Social events, programmes, at a particular time period. In Ethnographic Studies specific groups was observed over a specific time period in a normal setting (specific group are the group where individuals sharing their common locality, experiences and characteristics) and at last in the third type, human experiences are observed. Instead of performing the statistical analysis, various trends were followed which in terns helps to develop product, taking business decisions and plan marketing strategies. As this research is purely based on quality and cannot be reduced in number so it can be used through programming.

Gubrium and Holstein (1997) outline four traditional qualitative research approaches namely, naturalism, Ethnomethodology, emotionalism and post-modernism. *Naturalism* refers to the understanding of the social world as it is, without sorting any parameter to change the natural reality of people. *Ethnomethodology* allows for the understanding of how the social order exists having through talk and interaction as a naturalistic tool. *Emotionalism* refers to *peoples'* feelings and inner realities of individual. Finally, *post-modernism* refers to the different ways social reality can be developed.

Qualitative research aims to explore the meaning and perceptual experiences of phenomena from peoples' personal viewpoints. Like quantitative research, qualitative research also has its own path of execution. Firstly, a research question(s) needs to be posed. Then, the possible participants and their



settings need to be selected. Following this, it is then necessary to pose the research question(s) to the selected participants. Once all the data is collected then an interpretation of the data will follow. After that, a need for conceptual and theoretical work needs to take place for the researcher to analyse his or her findings. It may be the case that initial analysis may raise further questions for application to the original setting. In this case, further data will need to be collected for interpretation and then used to develop and refine initial concepts. This circular approach is iterative in nature as seen in the figure 3.2 below. Finally, all conclusions and are to be written and documented (Bryman, 2008).

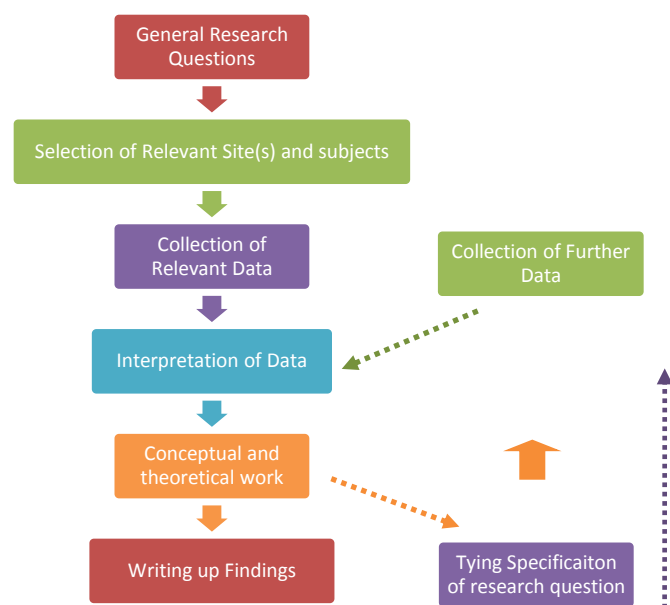


Figure 0.2 an outline of the main steps of qualitative research (Bryman, 2008 p. 370)

#### **iv. Critiques of qualitative research**

Qualitative research is often criticised for yielding unsystematic findings. This has been attributed to the more open and flexible approach to analysing data. Moreover, additional questions about the issues associated with replication, generalization, and transparency emerge.

Replication difficulties: qualitative methods do not rely on definite and rigid methods that can be repeated to achieve the same result, since they depend on researcher characteristics that might lead to different views of the findings from person to person.

Problems with generalization: it is the case that qualitative methods are limited to small sample sizes - usually less than a hundred people. Some scholars therefore, argue that it is difficult for findings to be generalized to the wider population or sizable segments within the larger population.

Lack of transparency is another critique, where occasionally it seems hard to know what the researcher did in terms what he or she observed or how he or she arrived at particular conclusions. In addition, due to its involvement in the process it always gives biased as well as data can be easily skewed; not to mention that it requires a long process which requires a lot of time.

#### **v. Quantitative versus qualitative research**

While the qualitative research method tends to emphasise the explanation of life experiences and interpretations and why things are happening, quantitative research concentrates on the inference from samples and uncovering social laws that offer future predictions. Qualitative research is characterised by the investigation of human experiences through several different methods, such as focus groups, interviews, case studies, and participant and non-participant

observation. However, quantitative research depends heavily on statistical regression analysis, structural equation modelling, simulation, and trend analysis over time. Qualitative research would be ideal for rich descriptions, qualifying an argument, making connections, and context specific descriptions. By contrast, quantitative research is ideal for objectivity, neutrality, abstractions, precision, and rigour. There are several critiques of each method. Qualitative research tends to be subjective, and the researcher is involved in all representations, oversimplification, and unacknowledged subjectivity of definitions and procedures. Indeed, researchers could adopt a mixed methods approach that will result in making quantitative results more understandable and qualitative findings have a broader applicability, through being supported by quantitative findings (Huff, 2009). Cooper and Schindler (2003) added that theory and data are separate in a quantitative approach. On the contrary, theory and data are used in the quantitative approach. Quantitative method relies on a statistical analysis while qualitative relies on semantic analysis. The table 3.1 below summarise the difference between the two.

<b>Quantitative</b>	<b>Qualitative</b>
<b>Objective</b>	Subjective
<b>Number of the reporting cases is less in this study</b>	Number of the reporting cases is more in this study
<b>It gives shallow information</b>	It gives in-depth information
<b>Text based</b>	Number based
<b>The responses given by the respondents are fixed</b>	The responses given by the respondents are either unstructured or semi structured

<b>There is statistical test</b>	There is no statistical test
<b>Depend on measurement device and instruments used</b>	Depend on skill and rigor of the researcher
<b>Easy to generalise</b>	Difficult to generalise
<b>Most has problem with validity</b>	Most has a problem with reliability

Table 0.1 Difference between Quantitative and Qualitative Methods

The idea of deciding which is better is nothing but a theoretical approach as both provides valuable insights. Most of the time the decisions were impacted by the limitation in cost, then in that case the researcher needs to identify the following questions i.e. “How many--?” “What percentage....?” “Which segments of the population...?” if the researcher succeeded to answer then he should use the quantitative research methods but if research questions revolve around “Why...?” then he should use qualitative research (Gomm, 2004).

## VI. Mixed Methods

As the social science evolved so the research methods, researchers face more challenges regarding complex social and health problems that entail involvement of more variety of research methods such as combining both of quantitative and qualitative methods (Creswell, 2009). Combining both research methods adds strength to research. For example, when adding the qualitative method to the quantitative, it will elaborate on the quantitative data and makes it more understandable while the quantitative to the qualitative it will expand the applicability of small-sample of qualitative findings (Huff, 2009). The latter combination refers to *triangulation* that entails using different measurement for the same purpose to cover the weakness of each method and increase confidence in the research result (Singleton, Straits and Straits, 1993).

Mixed methods are used to employ the qualitative and quantitative research by changing the forms of data. In most of the cases, qualitative data is converted into quantitative. In order to collect these data two key terminologies are used i.e. Qual (Qualitative component) and Quan (Quantitative Component) which are often referred as strands. In these methods, data is collected meticulously and framed theoretically. There are five categories which fall at different ends of the mixed methods design spectrum. The first one is a Concurrent Design in which the data is collected in a concurrent manner. The second one is Explanatory Sequential Design in which quantitative results were read and it is complex in nature. The third one is Exploratory Sequential Design, in which the QUAL strand is examined and followed by testing and verification, and the last one is Embedded Design in which secondary strand is concurrent. These combination help in developing research by increasing validity, complementarities, and the emergence of fresh perspectives are generated by creating new lines of thinking and Barriers to integration includes philosophical differences, cost, inadequate training and publication bias. Qualitative research is used to identify the aspects that can affect the areas, which come under enquiry, then that information will be used to formulate quantitative research, which evaluates the aspects affecting user preferences (Grix, 2001).

Finally, what makes reputable research is not the method, but the researcher and gathered data, research methods merely a tool that if it was used effectively will produce respected research. This issue has been stressed by Bouchard (1976:402) who states that 'the key to good research lies not in choosing the right method, but rather in asking the right question and picking the most powerful method for answering that particular question'.

## Appendix B

### Questions and Consent Letter Version A

Dear Participant,

I am a research student in Management Information Systems at University of Plymouth and I am conducting a study of enterprise systems in relation to large companies in airline sector. The objective of this research project is to attempt to explore the feasibility of deploying multi-collaborative enterprise systems in airline. Through your participation, I eventually hope to understand how best to understand the enablers of enterprise systems in airlines and the enablers of airline solutions provider.

The interview will take approximately one hour. With such help provided by you many great researched have seen the light which could help the academic and business together. Your participation is voluntary and there is no penalty if you do not participate. The information collected may not benefit you directly, but what I learn from this study should provide general benefits to companies, and researchers.

Your responses will not be identified with you personally, nor will anyone be able to determine which company you work for. Nothing you say on the interview will in any way influence your present or future employment with your company.

I confirm that I have read and understand the above information and have had the opportunity to ask questions. I understand that my participation is voluntary and I agree to take part in the above study.

Sincerely,

A. Aljefri

Research Student

Department of Information & Knowledge Management

Plymouth Business School

University of Plymouth

[Abdulrahman.aljefri@plymouth.ac.uk](mailto:Abdulrahman.aljefri@plymouth.ac.uk)

## Draft Questions

Please provide name (optional)

Title

Company

email

Background on the experience

*Questions that support question 1 (How can MES be an appropriate solution for airlines seeking improvement in their strategic business process?)*

### **Business Process**

Airline business is very demanding from customers and technology innovation perspective, to what degree do you agree with this?

To what extent do you think technology innovation can influence the airline business process?

How strategically do you preview business process enhancement?

What is your experience in dealing with BPR? What are the problems/successes faced?

Do you support adopting best business process practice as is? Why? Pros and Cons?

What are the challenges in having MES driven process?

How much value can MES add to the firm? Can it give a competitive advantage over rivals? How?

How strategically do you preview business process enhancement utilising MES?

To what extent do you think deploying MES approach attain strategic goals faster?

*Questions that support question 2 (What are the MES and firm enablers to achieve the targeted firms' strategic goal?)*

### **MES enablers**

#### Slack Resources

How do most companies make use of their slack resources?

#### IT Governance

What do you think about the followings:

IT Governance contributes to the success Organisational Acceptance of IS business process. Could you elaborate?

IT governance lessens the gap between IT and business, allowing business to take more roles in IT decision-making related to IT strategies. Could you elaborate?

IT governance extends IT value to attain more business investment in technology innovations. Could you elaborate?

#### Key Process Area Profile (Business coverage)

What do you think about the followings:

Business process coverage has a significant relationship with Organisational Acceptance of IS business process, Could you elaborate?

Less business process coverage leads to higher risk during acceptance of IS business processes. Could you elaborate?

The factor of business process coverage is important and influences the ISP partnership. Could you elaborate?

#### **Executive Support**

What do you think about the followings:

Executive Support has a significant relationship with Organisational Acceptance of IS business process. Could you elaborate?

Executives support is important in adoption of IS business process. Could you elaborate?

Information systems solutions are more likely to be successfully adopted if CEO has positive attitude towards technology. Could you elaborate?

#### **General Question to expand on our study**

Do you think of any other factor(S) that would support MES?

Do you think of any other factor(S) that would enable firms to accept change to best business process practice?

Do you have further insights that you would like to add?



## Questions and Consent Letter Version B

Dear Participant,

I am a researcher in Management Information Systems at University of Plymouth and I am conducting a study of enterprise systems in relation to large companies in airline sector. The objective of this research project is to attempt to explore the feasibility of deploying multi-collaborative enterprise systems in airline. Through your participation, I eventually hope to understand how best to assess the enablers of enterprise systems in airlines and the enablers of airline solutions provider.

The interview will take approximately one hour. Without your help, many great researches would not have been possible in helping both the business and academic. Your participation is voluntary and there is no penalty if you do not participate. The information collected may not benefit you directly, but what I learn from this study should provide general benefits to the Airline Company, Airline Solutions Provider and researchers.

The anonymity aspect will be maintained, so your responses will not be identified with you personally, nor will anyone be able to determine which company you work for. Nothing you say on the interview will in any way influence your present or future employment with your company.

I confirm that I have read and understand the above information and have had the opportunity to ask questions. I understand that my participation is voluntary and I agree to take part in the above study.

Participant Signature: .....

Sincerely,

A. Aljefri

Department of Information & Knowledge Management

Plymouth Business School

University of Plymouth

[abdulrahman.aljefri@plymouth.ac.uk](mailto:abdulrahman.aljefri@plymouth.ac.uk)

## Draft Questions

Please provide name (optional):

Title:

Company:

eMail:

Background on the experience:

*Questions that support question 1* (How can Multi-collaborative Enterprise Systems be an appropriate solution for airlines seeking improvement in their strategic business process?)

### ***Business Process***

- To what extent do you think technology innovation can influence business process?
- Have you participated in a (business process enhancement /BPR)? What are the problems/successes faced??
- Do you support adopting best business process practice as is? Why? Pros, Cons?
- What are the challenges in (having or deploying) MES driven process?
- How MES defer from deploying single Enterprise Systems?
- To what extent do you think deploying MES approach attain strategic business goals faster?
- Can MES give a competitive advantage over rivals? How?

*Questions that support question 2 (What are the MES and firm enablers to achieve the targeted firms' strategic goal?)*

### **MES enablers**

#### **Slack Resources**

What do you think about the followings:

Slack Resources expand the ability to absorb abnormality during and after adoption of MES driven business process. Could you elaborate?

Airline Solution Provider (ASP) Slack Resources broaden the chance of (meeting the Schedule or absorb abnormality) between other ASP and the adopter's company. Could you elaborate?

#### **IT Capabilities**

What do you think about the followings:

Internal IT capabilities from the adopter perspective act as a security valve for firms to absorb the innovation of new MES driven business processes. Could you elaborate?

Airlines Solution Provider (ASP) IT capabilities add more comfort and confidence to their partners which lead in a better firm adoption of (standardised business process or best business practice) by the Airline. Could you elaborate?

#### **IT Governance**

What do you think about the followings:

IT governance contributes to the success organisational acceptance of MES business process. Could you elaborate?

IT governance provides control and alignment among ASP and organisation which lessen the gap between the IT and the business. Could you elaborate?

#### **Key Process Area Profile (Business coverage)**

What do you think about the followings:

Business process coverage has a significant relationship with organisational acceptance of MES driven business process, Could you elaborate?

The factor of business process coverage is important and influences the ASP partnership with adaptor company success. Could you elaborate?

#### **Executive Support**

What do you think about the followings:

Executive Support has a significant relationship with organisational acceptance of MES driven business process. Could you elaborate?

MES are more likely to be successfully adopted if CEO has positive attitude towards technology. Could you elaborate?

**General Question to expand on our study**

Do you think of any other factor(S) that would support MES?

Do you think of any other factor(S) that would enable firms to accept change to best business process practice within MES?

Do you have further insights that you would like to add?

## Questions and Consent Letter Version C

Dear Participant,

I am a researcher in Management Information Systems at University of Plymouth and I am conducting a study of enterprise systems in relation to large companies in airline sector. The objective of this research project is to attempt to explore the feasibility of deploying multi-collaborative enterprise systems in airline. Through your participation, I eventually hope to understand how best to assess the enablers of enterprise systems in airlines and the enablers of airline solutions provider.

The interview will take approximately one hour. Without your help, many great researches would not have been possible in helping both the business and academic. Your participation is voluntary and there is no penalty if you do not participate. The information collected may not benefit you directly, but what I learn from this study should provide general benefits to the Airline Company, Airline Solutions Provider and researchers.

The anonymity aspect will be maintained, so your responses will not be identified with you personally, nor will anyone be able to determine which company you work for. Nothing you say on the interview will in any way influence your present or future employment with your company.

I confirm that I have read and understand the above information and have had the opportunity to ask questions. I understand that my participation is voluntary and I agree to take part in the above study.

Participant Signature: ..... ?

Sincerely,

A. Aljefri

Department of Information & Knowledge Management

Plymouth Business School

University of Plymouth

[abdulrahman.aljefri@plymouth.ac.uk](mailto:abdulrahman.aljefri@plymouth.ac.uk)

## Draft Questions

Please provide name (optional):

Title:

Company:

eMail:

Background on the experience:

### *Questions that support question 1*

How can Multi-collaborative Enterprise Systems be an appropriate solution for airlines seeking improvement in their strategic business process?

### ***Business Process***

- To what extent do you think technology innovation can influence the airline business process?
- Have you participated in business process enhancement, ( if yes) how strategically do you preview the value of (business process enhancement /BPR)? (If applicable) What are the problems/successes faced during implementation?
- Have you participated in a (business process enhancement /BPR)? (If Yes) What are the problems/successes faced during business process enhancement implementation?
- Generally, do you support the strategy of adopting best business process practice (reference to the standard practice in the airline industry) as is? Why? Pros, Cons?
- From business process point of view what are the challenges in deploying concurrent MES driven process?
- From a deployment point of view, how concurrent MES defer from single Enterprise Systems?
- To what extent do you think deploying concurrent MES approach vs. Single ES attain strategic goals faster?
- Can concurrent MES give a competitive advantage over rivals? How?

### *Questions that support question 2*

What are the enablers of MES and firm to achieve the targeted firms' strategic goals?

#### **MES and firm enablers**

What kind of factor(S) that would enable MES from the ASP point of view?

What are the attributes that constitute best ASP strategic partners in MES from the organisation perspective?

Do you think of any factor(S) that would enable firms to accept change to best business process practice within MES?

#### **Slack Resources**

What do you think about the followings:

Slack Resources expand the ability to absorb abnormality during and after adoption of MES driven business process. Could you elaborate?

Airline Solution Provider (ASP) Slack Resources broaden the chance of (meeting the Schedule or absorb abnormality) between other ASP and the adopter's company. Could you elaborate?

#### **IT Capabilities**

What do you think about the followings:

Internal IT capabilities from the adopter perspective act as a security valve for firms to absorb the innovation of new MES driven business processes. Could you elaborate?

Airlines Solution Provider (ASP) IT capabilities add more comfort and confidence to their partners which lead in a better firm adoption of (standardised business process or best business practice) by the Airline. Could you elaborate?

#### **IT Governance**

What do you think about the followings:

IT governance contributes to the success organisational acceptance of MES business process. Could you elaborate?

IT governance provides control and alignment among ASP and organisation which lessen the gap between the IT and the business. Could you elaborate?

#### **Key Process Area Profile (Business coverage)**

What do you think about the followings:

Business process coverage has a significant relationship with organisational acceptance of MES driven business process, Could you elaborate?

The factor of business process coverage is important and influences the ASP partnership with adaptor company success. Could you elaborate?

### **Executive Support**

What do you think about the followings:

Executive Support has a significant relationship with organisational acceptance of MES driven business process. Could you elaborate?

MES are more likely to be successfully adopted if CEO has positive attitude towards technology. Could you elaborate?

### **General Question to expand on our study**

Do you have further insights that you would like to add?



## Questions and Consent Letter Version D

Dear Participant,

I am a researcher in Management Information Systems at University of Plymouth and I am conducting a study of enterprise systems in relation to large companies in airline sector. The objective of this research project is to attempt to explore the feasibility of deploying multi-collaborative enterprise systems in airline. Through your participation, I eventually hope to understand how best to assess the enablers of enterprise systems in airlines and the enablers of airline solutions provider.

The interview will take approximately one hour. Without your help, many great researches would not have been possible in helping both the business and academic. Your participation is voluntary and there is no penalty if you do not participate. The information collected may not benefit you directly, but what I learn from this study should provide general benefits to the Airline Companies, Airline Solutions Provider and researchers.

The anonymity aspect will be maintained, so your responses will not be identified with you personally, nor will anyone be able to determine which company you work for. Nothing you say on the interview will in any way influence your present or future employment with your company.

I confirm that I have read and understand the above information and have had the opportunity to ask questions. I understand that my participation is voluntary and I agree to take part in the above study. □

Sincerely,

A. Aljefri

Department of Information & Knowledge Management

Plymouth Business School

University of Plymouth

[abdulrahman.aljefri@plymouth.ac.uk](mailto:abdulrahman.aljefri@plymouth.ac.uk)

## Draft Questions

Please provide name (optional):

Title:

Company:

eMail:

### *Questions that support prime question 1*

How can Multi-collaborative Enterprise Systems be an appropriate solution for airlines seeking an improvement in their strategic business process?

- To what extent do you think technology innovation can influence airline's business process?
- Have you participated in business process enhancement, (if yes) how strategically do you preview the value of (business process enhancement /BPR)? (If applicable) What are the problems/successes faced during implementation?
- Generally, do you support the strategy of adopting best business process practice (reference to the standard practice in the airline industry) as is? Why? Pros and Cons?
- From business process point of view what are the challenges in deploying concurrent MES driven process?
- From a deployment point of view, how concurrent MES defer from single Enterprise Systems?
- To what extent do you think deploying concurrent MES approach vs. Single ES attain company business strategic goals faster?
- Can concurrent MES give a competitive advantage over rivals? How?

### *Questions that support prime question 2*

What are the enablers of MES and firm to achieve the targeted firms' strategic goals?

#### **MES and firm enablers**

What are the factors that would enable MES from the ASP point of view?

What are the attributes that constitute best ASP strategic partners in MES from the organisation perspective?

Do you think of any factor(S) that would enable firms to accept change to best business process practice within MES?

#### **Slack Resources**

What do you think about the followings:

Slack Resources expand the ability to absorb abnormality during and after adoption of MES driven business process. Could you elaborate?

Airline Solution Provider (ASP) Slack Resources broaden the chance of (meeting the Schedule or absorb abnormality) between other ASP and the adopter's company. Could you elaborate?

#### **IT Capabilities**

What do you think about the followings:

Internal IT capabilities from the adopter perspective act as a security valve for firms to absorb the innovation of new MES driven business processes. Could you elaborate?

Airlines Solution Provider (ASP) IT capabilities add more comfort and confidence to their partners which lead in a better firm adoption of (standardised business process or best business practice) by the Airline. Could you elaborate?

#### **IT Governance**

What do you think about the followings:

IT governance contributes to the success organisational acceptance of MES business process. Could you elaborate?

IT governance provides control and alignment among ASP and organisation which lessen the gap between the IT and the business. Could you elaborate?

#### **Key Process Area Profile (Business coverage)**

What do you think about the followings:

Business process coverage has a significant relationship with organisational acceptance of MES driven business process, Could you elaborate? (Increase unity and integration of business process)

The factor of business process coverage is important and influences the ASP partnership with adaptor company success. Could you elaborate?

### **Executive Support**

What do you think about the followings:

Executive Support has a significant relationship with organisational acceptance of MES driven business process. Could you elaborate?

MES are more likely to be successfully adopted if CEO has positive attitude towards technology. Could you elaborate?

### **Credibility**

What do you think about the following:

ASP credibility is considered as an influential factor in selecting IT partners. Could you elaborate?

Mutual commitment from both partners is essential to sustain a good relationship. Could you elaborate?

### **Flexibility**

What do you think about the following:

Flexibility plays an important role between ASP and firms in contracts stage and afterwards (deployment and post implementation). Could you elaborate?

For long strategically partner relationship; Are you in favour of a flexible partner or detailed contract? Why?

### **Culture Fit**

What do you think about the following:

The less cultural difference exist between partners the better chance that the relation will be fruitful. Could you elaborate?

ASP that exhibit culture flexibility sustains their partnership longer. Could you elaborate?

### **Change Management**

To what extent do you think people change management could influence the success of deploying MES.

### **General Question to expand on our study**

Do you have further insights that you would like to add?

## Questions and Consent Letter Version E

Dear Participant,

I am a researcher in Management Information Systems at University of Plymouth and I am conducting a study of enterprise systems in relation to large companies in airline sector. The objective of this research project is to attempt to explore the feasibility of deploying multi-collaborative enterprise systems in airline. Through your participation, I eventually hope to understand how best to assess the enablers of enterprise systems in airlines and the enablers of airline solutions providers.

The interview will take approximately one hour. Without your help, many great researches would not have been possible in helping both the business and academic. Your participation is voluntary and there is no penalty if you do not participate. The information collected may not benefit you directly, but what I learn from this study should provide general benefits to the Airline Companies, Airline Solutions Provider and researchers.

The anonymity aspect will be maintained, so your responses will not be identified with you personally, nor will anyone be able to determine which company you work for. Nothing you say on the interview will in any way influence your present or future employment with your company.

I confirm that I have read and understand the above information and have had the opportunity to ask questions. I understand that my participation is voluntary and I agree to take part in the above study. □

Sincerely,

A. Aljefri

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## Draft Questions

Please provide name (optional):

Title:

Company:

eMail:

### *Questions that support prime question 1*

How can concurrent Multi-collaborative Enterprise Systems (MES) deployment be an appropriate solution for airlines seeking an improvement in their strategic business process?

- From a deployment point of view, how concurrent MES differ from single Enterprise Systems?
- To what extent do you think deploying concurrent MES approach vs. Single ES attain company business strategic goals faster?
- Can concurrent MES give a competitive advantage over rivals? How?
- Generally, do you support the strategy of adopting best business process practice (reference to the standard practice in the airline industry)'as is'? Why? Pros and Cons?
- To what extent do you think technology innovation can influence airline's business process?
- Have you participated in business process enhancement, (if yes) how strategically do you preview the value of (business process enhancement /BPR)? (If applicable) What are the problems/successes faced during implementation?
- From business process point of view what are the challenges in deploying concurrent MES driven process?

### *Questions that support prime question 2*

What are the enablers of concurrent MES and firm to achieve the targeted firms' strategic business goals?

#### **MES and firm enablers**

What are the attributes that constitute best ASP strategic partners in MES from the organisation perspective?

Do you think of any factor(S) that would enable firms to accept a change to best business process practice within MES?

What are the successful factors among the ASP's that would make MES feasible?

#### **IT Capabilities**

In what way do you think IT capabilities affect the MES from both ASP and adopter's firm view?

What do you think about the following:

Internal IT capabilities from the adopter perspective act as a security valve for firms to absorb the innovation of new MES driven business processes. Could you elaborate?

Airlines Solution Provider (ASP) IT capabilities add more comfort and confidence to their partners which lead to a better firm adoption of (standardised business process or best business practice) by the Airline. Could you elaborate?

#### **IT Governance**

What do you think about IT Governance impact on the success of organisational acceptance of MES business process?

What do you think about the following:

IT governance provides control and alignment among ASP and organisation which lessen the gap between the IT and the business. Could you elaborate?

#### **Credibility**

In what way do you think ASP credibility influence the selection of IT strategic partners?

What do you think about the following:

Mutual commitment from both partners is essential to sustain a good relationship. Could you elaborate?

#### **Flexibility**

What do you think of flexibility factor between ASP and the airline in contracts stage and afterwards (deployment and post implementation)?

For long strategically partner relationship; are you in favour of a flexible partner or detailed contract? Why?

### **Culture Fit**

In what way do you think culture fit affect partnership between ASP's and Airline Company?

What do you think about the following:

ASP that exhibit culture flexibility sustains their partnership longer. Could you elaborate?

The less cultural difference exist between partners the better chance that the relation will be fruitful. Could you elaborate?

### **Change Management**

To what extent do you think people change management could influence the success of deploying MES.

### **Key Process Area Profile (Business coverage)**

Could you elaborate on the significance of Business process coverage in terms of successful organisation acceptance of MES driven business process?

What do you think about the following:

The factor of business process coverage is important and influences the ASP partnership with adaptor company success. Could you elaborate?

### **Slack Resources**

What do you think about slack resources influence during and after adoption of MES driven business process. Could you elaborate?

What do you think about the followings:

Firm Slack Resources expand the ability to absorb abnormality in such projects. Could you elaborate?

Airline Solution Provider (ASP) Slack Resources broaden the chance of (meeting the Schedule or absorb abnormality) between other ASP and the adopter's company. Could you elaborate?

### **Executive Support**

Could you elaborate on the significance of executive support in organisational acceptance of MES driven business process?

What do you think about the following:

MES driven business process are more likely to be successfully adopted if CEO has positive attitude towards technology. Could you elaborate?

### **General Question to expand on our study**

Do you have further insights that you would like to add?



## Questions and Consent Letter Version F

Dear Participant,

I am a researcher in Management Information Systems at University of Plymouth and I am conducting a study of enterprise systems in relation to large companies in airline sector. The objective of this research project is to attempt to explore the feasibility of deploying multi-collaborative enterprise systems in airline. Through your participation, I eventually hope to understand how best to assess the enablers of enterprise systems in airlines and the enablers of airline solutions providers.

The interview will take approximately one hour. Without your help, many great researches would not have been possible in helping both the business and academic. Your participation is voluntary and there is no penalty if you do not participate. The information collected may not benefit you directly, but what I learn from this study should provide general benefits to the Airline Companies, Airline Solutions Provider and researchers.

The anonymity aspect will be maintained, so your responses will not be identified with you personally, nor will anyone be able to determine which company you work for. Nothing you say on the interview will in any way influence your present or future employment with your company.

I confirm that I have read and understand the above information and have had the opportunity to ask questions. I understand that my participation is voluntary and I agree to take part in the above study. □

Sincerely,

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### *Questions that support prime question 1*

How can concurrent Multi-collaborative Enterprise Systems (MES) deployment be an appropriate solution for airlines seeking an improvement in their strategic business process?

- What do you think about the experience of having (Multi Enterprise Systems) these systems (SAP, Sabre, Amadeus, etc.) at once, why this initiative started, how it was deployed?
- From a deployment point of view, how concurrent MES differ from single Enterprise Systems?
- Achieving company business strategic goals. To what extent do you think deploying concurrent MES approach vs. Single sequential ES attain these goals faster?
- Do you think concurrent MES can give a competitive advantage over rivals? How?
- Generally, do you support the strategy of adopting best business process practice (reference to the standard practice in the airline industry) 'as is'? Why? Pros and Cons?
- From business process point of view what are the challenges in deploying concurrent MES?
- Do you support having best of Breed or Fewer vendors as possible? Why?
- To what extent do you think technology innovation can influence airline's business process?
- What do you think about adopting business process that comes with these solutions VS. Business process re-engineering? Why? Pros, Cons?
- What are the attributes that constitute best ASP strategic partners in MES from the organisation perspective? Why these airline solution providers were selected?

### *Questions that support prime question 2*

What are the enablers of concurrent MES and firm to achieve the targeted firms' strategic business goals?

#### **MES and firm enablers**

Do you think of any factor(S) that would enable firms to accept a change to best business process practice within MES? Problems faced the company to adopt the new business process?

What are the successful factors among the ASP's that would make MES feasible? or what are the attributes that makes ideal partner(s) when deploying MES from airline solution provider point of view? How the airline is governing all of this?

What are the problems usually airline solution providers face when working concurrently?

#### **IT Capabilities**

In what way do you think IT capabilities affect the MES from both ASP and adopter's firm view?

Does strong Internal IT capabilities from the company perspective help the company to absorb the innovation of new business processes entails in MES?. Could you elaborate?

Does Airlines Solution Provider (ASP) strong IT capabilities add more comfort and confidence to their partners and help firm adoption of (standardised business process or best business practice) by the Airline?. Could you elaborate?

#### **IT Governance**

What do you think about IT Governance impact on the success of organisational acceptance of MES business process? What about among the ASPs?

Does it help to lessen the gap between the IT and the business?

What do you think of IT leading this initiative hand in hand with business?

#### **Credibility**

In what way do you think ASP credibility influence the selection of IT strategic partners? Between the ASPs?

#### **Flexibility**

What do you think of flexibility factor between ASP and the airline in contracts stage and afterwards (deployment and post implementation)?

For long strategically partner relationship in such large Multi Enterprise setting; are you in favour of a flexible partner or detailed contract? Why? Does the magnitude of the project influence your answer?

### **Culture Fit**

In what way do you think culture fit affect partnership between ASP's and Airline Company?

When ASP exhibits culture flexibility, does it sustains their partnership longer?. Could you elaborate?

What do you think?: The less cultural difference exist between partners the better chance that the relation will be fruitful. Could you elaborate?

### **Change Management**

To what extent do you think people change management could influence the success of deploying MES.

Could you elaborate on the significance of Business process coverage in the success of acceptance of newly business process introduced by MES?

### **Slack Resources**

What do you think about slack resources influence during and after adoption of newly MES's business process. Could you elaborate?

Could you elaborate that company Slack Resources expand the ability to absorb abnormality in such projects?

Could you elaborate that Airline Solution Provider (ASP) Slack Resources broaden the chance of (meeting the Schedule or absorb abnormality) between other ASP and the adopter's company.?

### **Executive Support**

Could you elaborate on the significance of executive support in organisational acceptance of the newly MES's business process? What about the ASPs?

Does CEO positive attitude towards technology affect the success of the adoption of MES business process,. Could you elaborate?

### **General Questions**

Do you have further insights that you would like to add?

If we reverse time what things you would have done (like to see) differently than what was executed?