UNIVERSITY OF TWENTE.

Sourcing Lifecycle for Software as a Service (SAAS) Implementation

Shell Case

UNRESTRICTED

Master Thesis

Santy

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Den Haag, August 2010

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Management Summary

Software as a Service (SaaS) is one of sourcing models available in the market for companies to outsource its IT services. It has emerged to become an accepted mainstream concept in the last few years. A key benefit of this sourcing model is that, by careful engineering, it is possible to leverage economy of scale to reduce total cost of ownership (TCO) relative to on-premises solutions. Its promises of lower TCO and "plug and play" implementation have tease companies to implement SaaS, replacing on-premises solutions.

Shell also has seen this emerging sourcing model as an opportunity for its IT strategy. Despite all the benefits it promises, SaaS is not applicable to all types of application. Shell does not have a clear definition yet which types of application can be replaced by SaaS and which ones should remain on-premise. More and more application in Shell will be replaced by SaaS, but there is not yet a clear guideline on how to implement SaaS. Shell is looking for a framework that will guide them through the whole cycle of a SaaS service, from the starting phase of before the service has been defined until the ending of the service.

In this thesis, we define a generic sourcing lifecycle that Shell can follow to ensure a successful implementation of SaaS type application in Shell. To this end we conducted an overview of theories and practical literature, designed a Sourcing lifecycle for SaaS implementations, validated this in a real project within HR IT, and fine-tuned the lifecycle so that it fits in the Shell Integrated Support Model.

From the guideline provided through this research, companies (especially Shell) that are interested in implementing SaaS will be guided throughout the whole implementation cycle starting before when they decide to choose SaaS until the stage when they decide to move from SaaS model to another model or when they move to another SaaS company

Recommendations

To ensure a successful implementation of SaaS within Shell, we recommend Shell to enforce these 8 recommendations:

1. *Make sure whether you are really sure you need SaaS.*
   Business should know what they really need strategically, is it something standard in a non-critical process or something unique.
2. *Start change management in the early stage*
   Shell may have tendency to choose gold plated solutions. When implementing SaaS, make sure all stakeholders are aware on the impacts it will bring.
3. *Perform Business Impact Assessment (BIA[1]) before any decision making.*
   The SaaS model is not always the right answer to outsource an application depending on the risk of the application itself. BIA should be part of the input used in the decision making process to go for SaaS or not.

[1] BIA: Standard method to assess the consequences from the loss of availability, integrity, confidentiality and/or regulatory compliance of an information asset.

4. *SaaS Supplier needs to comply with the compliance items defined by Shell*
   Compliance is a really important factor in Shell. Therefore any selected SaaS supplier should comply with the compliance items defined for a typical SaaS application.
5. *Project needs to engage with BAM and IRM in gathering requirements for RFP*
   Both functional and non functional requirement should be incorporated in the RFP, therefore Project, Bam and IRM should collaborate in defining the requirements. This action will ensure that the supplier is qualified from the business perspective and also IT perspective
6. *Execute Threat Vulnerability Assessment (TVA[1]) for the most potential supplier*
   The business needs to choose to accept, transfer or remediate the risk resulted from the TVA. The decision from the business will then drive the decision to choose that certain supplier or not
7. *Ensure that the key clauses for SaaS are included in the contractual agreements.*
   SaaS is a black box model. Shell can only control the supplier through the contract, therefore Shell need to make sure that all the needed clauses are included.
8. *Any enhancement proposal is voiced only through the user community.*
   By proposing the enhancement through the user community, Shell will avoid the possibility to abuse SaaS into an ASP. Also it will get the benefit of getting free additional functionalities, since any enhancements will be already included in the service fee.

Further Research

We see several improvements can be made to the SaaS Sourcing Lifecycle in future.

1. *Conduct quantitative research on the weighing of the criteria in selecting the supplier.*
   The criteria discussed in this thesis are included because there is a need for these criteria, but they have not been prioritized.
2. *Define Key Performance Indicators for SaaS*
   These KPIs are important and therefore need to be incorporated into the Service Level Agreements between customer and the SaaS Supplier.
3. *Research on how to incorporate trust and relationship into the lifecycle.*
   Trust and relationship should be incorporated in the business strategy and supplier selection part, since as we have seen in shell, relationship is really an important thing to be considered when making a strategic decision regarding to supplier. Quantitative research can also be done in order to measure how big the influence of this factor in the decision making is.
4. *Research on the change management of implementing SaaS.*
   In the Shell case we can see that change management would be a high challenge in implementing SaaS since Shell usually can have all of the controls that they want. Implementing SaaS means learning to let go the control to the supplier, so a research on how to do change management for SaaS implementation will be a valuable and interesting research to conduct.

[1] TVA: A process used to assess the likelihood of incidents happening. Combined with the business impacts this determines the risk: RISK = IMPACT * THREAT * VULNERABILITY. Threats are e.g. human errors, natural disasters, and criminal intents from within or outside the company. Vulnerabilities are deficient or missing controls..

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Preface

This thesis is the concluding part for a Master of Science degree in Business Information Technology at the University of Twente. Seven months ago I joined Shell International Global Function IT with the objective to conduct a graduation research with both theoretical and practical relevance. Taking the time to look back and observe all of the results I have achieved and the experience I have gained; I believe I have reached this objective. These seven months indeed is the most exciting and challenging period of my study. During this period of time I need to face the challenge of adapting myself to a work life in a major global company, finding my way to the right topic, managing expectations from my four main stakeholders (from the University and Shell), delivering high quality results for the project within tight schedules, writing my thesis after working hours and last but not least keeping the work life balance. Seeing the thesis that I have completed on time, the good quality project deliverables that I have delivered within the time frame defined, expanding knowledge, skill and experience I have gained, numerous new good friends I have made and lots of fun activities I have joined, I can proudly conclude that I have survived this challenging phase of my life.

This graduation research would have never been successfully completed without the support and feedbacks from the certain people around me. I would like to thank you my university supervisor from the Information System department, Klaas Sikkel, who has guided me all the way from the start and gave me advices and insights to balance the theoretical and practical world and kept me in the right track. His remarkably support and understanding has helped and meant a lot to me to continue this research confidently. I would like to thank Chintan Amrit, my university supervisor from Department of Information System and Change Management, for his valuable feedback on ways of conducting research.

I would also like to thank the people from Shell that has support me throughout my internship. I would like to thank Henk Pelk, for introducing me to the other parts of Shell which leads me to the topic of my research. I would like to thank Albert Krikke, project manager of the project I joined in Shell, for giving me the opportunity to sketch my own deliverables and keeping the rational time frame for the deliverables. I would to thank Robbert Schravendijk, my project team associate, for the valuable discussions and interesting stories he shared. He has shown me that it is not impossible to live both in academic world and also corporate world, something that I would like to do in the future. I would like to thank Bram Schouten, my supervisor in Shell, our discussions have brought me lots of insights on the world of project management. I would also like to thank my mentor in Shell, Jeanne Verkinnes, for giving me the freedom to choose the topic that I would have more in favor of and also for keeping my mind open to other possible options out there. I would also like to thank all the people that made me feel welcome and have supported me during my project, my colleagues and friends from Shell Student Society, many thanks to you all, as I could not have enjoyed my time in Shell as much as I did without you.

My thank you also goes to the Indonesian Ministry of Communication and Information Technology (MCIT Indonesia), my scholarship provider, without whom I might not have experienced this challenging and inspiring study and life abroad.

With a blink of an eye, two years have passed, it might be felt short but indeed it is still a long time. So, last but certainly not least, I would like to express my gratitude to the loved ones I left back home; my family and friends, for their never-ending and heart-warming support during my two-years stay in the Netherlands.

Having nothing more to say, I can only wish you a pleasant reading, and hope you will find this thesis report interesting, useful and will be able to benefit from it. Feel free to contact me if you have any questions, comments or feedbacks on this thesis report.

Best regards,

Santy

Part I

INTRODUCTION
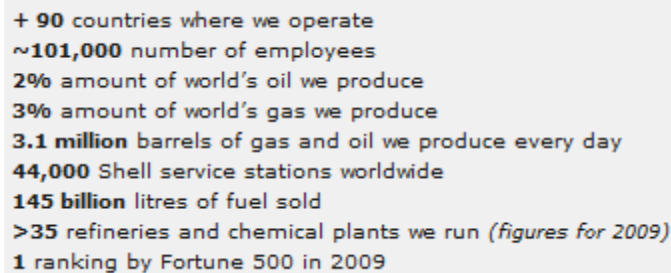
This part describes the context of the research and introduces the reader to the world within Shell. It describes the organization, the research approach and the problem description faced by Shell.

1.Organization

This chapter explains the organization of Shell regarding to the research which will help the reader to get the perspective of the research according to the scope. In the first section we will give an overview of Royal Dutch Shell plc and in the second section we will explore further on the unit where the focus of our research will be.

1.1.   Company Profile – Royal Dutch Shell plc

Shell is a global group of energy and petrochemical companies. The company is active in more than 90 countries and territories and employs 101,000 people worldwide. According to the corporate website, Shell's business strategy is 'more upstream and profitable downstream'. "Upstream, we search for and recover more oil and gas. Downstream, we refine and deliver products to our customers in a profitable and sustainable way" Shell is focusing on delivery and growth, leveraging our strong portfolio (Shell.com 2010).

+ **90** countries where we operate
~**101,000** number of employees
2% amount of world's oil we produce
3% amount of world's gas we produce
3.1 million barrels of gas and oil we produce every day
44,000 Shell service stations worldwide
145 billion litres of fuel sold
>**35** refineries and chemical plants we run *(figures for 2009)*
1 ranking by Fortune 500 in 2009

Figure 1 - Shell by Numbers (Shell, 2010)

Royal Dutch Shell plc is build up from four different businesses and 9 different functions. Because these functions and businesses overlap each other in all sorts of combinations, it is not possible to depict this in one comprehensive figure. The Businesses are:
- Upstream international
- Upstream Americas
- Projects and Technology
- Downstream

And the Functions are the following:
- Finance
- Legal
- Human Resources and Corporate
- Safety and Environment
- CO2
- Contracting and Procurement
- Government Relations
- Information Technology
- Sustainable Development

So, IT is one of the Functions. IT consists of three delivery towers: Business Delivery, Functional Improvement, and Support Functions. Global Functions IT is one of the parts of the first tower and has the responsibility to take care of all IT for the functions as described above.

1.2. Global Functions IT

Global Functions IT (GF IT) aims to provide IT skills, solutions and services to the Global Functions businesses in support of their objectives. GF IT also pursue to bring greater efficiency and effectiveness in the management and provision of IT solutions and services to the businesses.
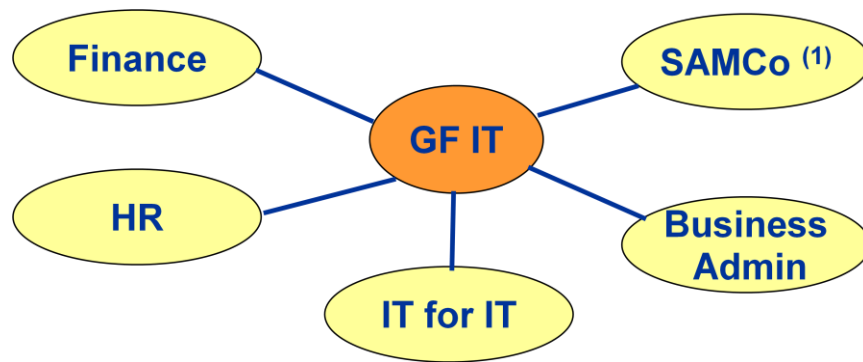
Figure 2 - GF IT and its function business (Shell, 2010)

The organization model of GF IT is depicted in figure 3 below.
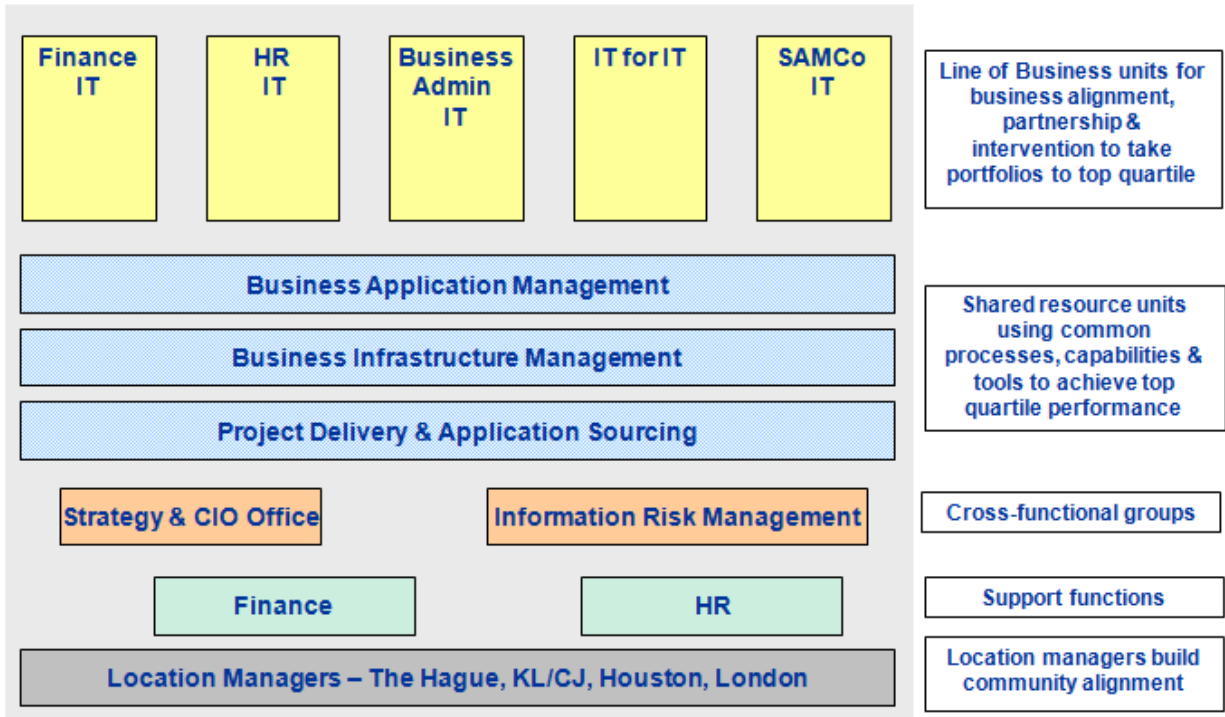
Figure 3 – The Organization Model for GF IT (Shell, 2010)

The first layer of the organization model is the Line of Business (LoB) units, they are accountable and responsible for managing the relationship with the respective GF businesses. LoBs are the face to the business for all IT-related activities and are accountable for managing the demand for IT services from the businesses.

The second layer consists of shared resources units within GF IT :

- Business Application Management (BAM) who is accountable for end-to-end delivery of all application services.
- Business Infrastructure Management (BIM) is the one who ensures that infrastructure services meet business requirements
- Project Delivery and Application Sourcing (PDAS) provides application development resources and project management resources, processes and standardized tools to support project delivery and management.

The third and fourth layers are the cross-functional and support functions that support the GF IT organization. The last layer includes all location managers who build common alignment within one location.

This research will be focusing on the BAM unit. We will see the relation between BAM with its customer, the business (the functions themselves), which are represented by the LoBs. We will highlight the relation between BAM and PDAS in the matter of project and transition of project to delivery and support. In this research we also highlight the relation between BAM and the supplier where the business provide the requirements, needs, complaints to BAM which later on these issues are handled between BAM and the supplier.

2. Research Approach

2.1. Objectives

The overall objective of this research project is to develop a framework of SaaS application implementation in an organization. The scope of the research starts with giving recommendation to the organization in which situation should they implement a SaaS type application as part of the strategy and how the contract management of SaaS implementation can be different with other type of sourcing. The other objective is to see on what are the deliverables that need to be accomplished or exist in a typical SaaS implementation project, and then we also discuss what are the processes to successfully deliver and support a SaaS type application into an organization. Along with this we also discuss the roles and responsibilities that exist during the whole lifecycle.

2.2. Structure
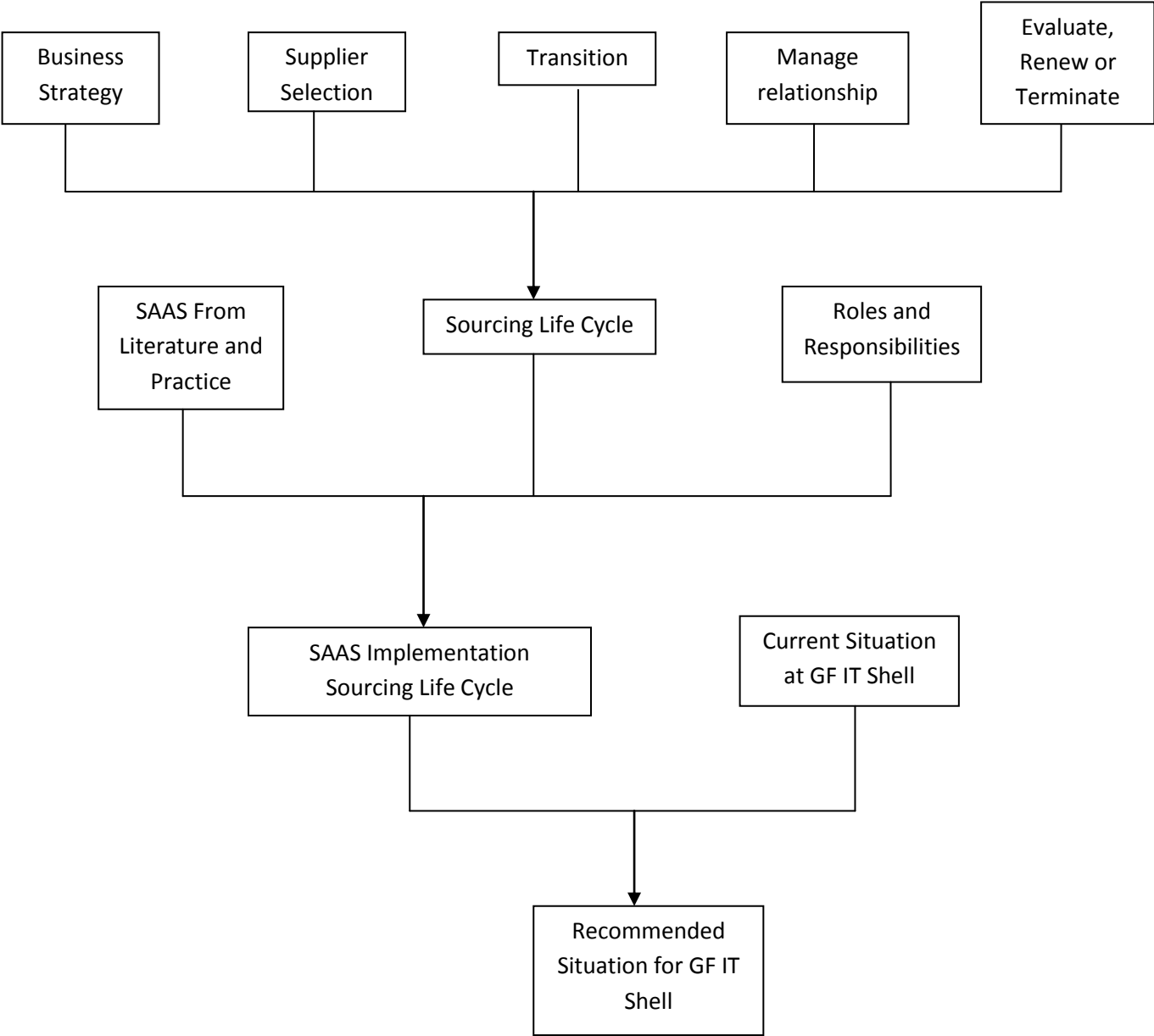
Figure 4 – Research Structure

2.3. Questions

2.3.1. Goal

To build a recommendation for Shell Global Functions IT BAM on the basis of an Sourcing Lifecycle Framework to enable the Software as a Service (SAAS) implementation process in BAM.

2.3.2. Main questions

"What is the generic sourcing lifecycle that Shell GF IT can follow to implement a SaaS type application? "

2.3.3. Sub Questions

1. What are the needs regarding implementation of SaaS type application in Shell?
2. What is SaaS?
   a. What is the definition of SaaS?
   b. What is the difference between SaaS with, Application Service Provider (ASP), and Managed Service?
   c. What are the characteristic of a SaaS type application?
3. What is Sourcing Lifecycle?
4. What is generic sourcing lifecycle for a SaaS implementation?
   a. What are the roles need to exist in the customer organization for a SaaS implementation?
   b. What is the business strategy for SaaS?
   c. What are the criteria in selecting SaaS provider?\
   d. How is the support model for SaaS?
   e. What are the important contracting key clauses for SaaS?
   f. How are the management processes for SaaS?
   g. What is the exit plan for SaaS?
   h. What are the roles and responsibilities for each stage of the SaaS sourcing lifecycle?
5. How does the generic SaaS sourcing lifecycle apply to GF IT?
6. What are the gaps between the generic sourcing lifecycle and the current situation?

2.4. Scope

This research will be conducted according to the following scope :

- We will focus on problems and stakeholders of Shell GF IT BAM and its relation with different parties (LoB, PDAS and Supplier)
- The outsourcing is for an IT support of non-SAP applications.
- We will discuss the lifecycle of a pure SaaS and not a SaaS that later on deviated to an ASP.

2.5. Research Methodology

Research Question	Research Method
1. What are the needs regarding implementation of SaaS type application in Shell?	Shell documents, Interview, Stakeholder analysis

2. What is SaaS?
    a. What is the definition of SaaS?
    b. What is the difference between SaaS with Application Service Provider (ASP) and Managed Service?
    c. What are the characteristic of a SaaS type application?
	Literature research

3. What is Sourcing Lifecycle?	Literature research

4. What is generic sourcing lifecycle for a SaaS implementation?
    a. What are the roles need to exist in the customer organization for a SaaS implementation?
    b. What is the business strategy for SaaS?
    c. What are the criteria in selecting SaaS provider?\
    d. How is the support model for SaaS?
    e. What are the important contracting key clauses for SaaS?
    f. How are the management processes for SaaS?
    g. What is the exit plan for SaaS?
    h. What are the roles and responsibilities for each stage of the SaaS sourcing lifecycle?
	Literature research

5. How does the generic SaaS sourcing lifecycle apply to GF IT?	Shell documents, semi-structured interviews, case study
6. What are the gaps between the generic sourcing lifecycle and the current situation?	Comparison of the SaaS sourcing lifecycle and current situation gathered in question 5

Table 1 - Research Methodology

3.Problem Description

3.1.   Initial Reason for this Research

In the last few years Software as a Service (SaaS) has changed from curiosity generating concept to an accepted mainstream concept. A key benefit of this model is that, by careful engineering, it is possible to leverage economy of scale to reduce total cost of ownership relative to on-premises solutions.

Shell also has seen this emerging delivery concept as an opportunity for its IT strategy. As a company that has a lot experiences with outsourcing, support and management processes is already in place for this strategy but a further study focusing on SaaS approach is needed to investigate what are the deliverables or processes that might be done differently compared to the current situation.

3.2.   Stakeholder Analysis

Mitchell, Agle et al (1997) proposed a classification of stakeholders based on power to influence, the legitimacy of each stakeholder's relationship with the organization, and the urgency of the stakeholder's claim on the organization. Therefore we identify some stakeholders that can influence the problem and have the power to the process of embedding and implementation of the solution. The stakeholders identified are also the people that experience within the sourcing lifecycle itself and they are the ones that have the direct knowledge of the problem based on their experience.

Based on the consideration above, we identify the stakeholders from the existing Enterprise Support Model that can represent or cover all the parts for the whole sourcing lifecycle

We spend an hour to an hour and a half for each interview to firstly introduce the objectives of the research and then run through to the questions. We prepared two sets of questions for the interviewee. The first set is the general questions asked to all interviewee. The second set of questions is list of questions based on the interviewee's current role and responsibilities. These second lists of questions are derived based on Cobit Framework. The questions used in the stakeholder analysis for the problem description are the first set questions (general questions). The second set of questions is used for understanding further the current situation within Shell (Part IV of this research).

The general questions asked for the stakeholder analysis are as followed:

- What is your current role regarding ASP/MS implementation?
- What is your current understanding of SaaS, ASP and Managed Service?
- What is the current situation of outsourcing regarding ownership and governance?
- How will SaaS affect your current role and responsibilities?

- What is your opinion on the advantage and disadvantage of a SaaS or ASP implementation?
- In which area will a SaaS implementation be appropriate within Shell?
- What is top three things that need to be improved before we can implement SaaS?

The detailed question can be found in the appendices.

The result of the interviews are then decoded into a list of answers and then analyzed and used as an input for the Findings section.

3.3. Findings
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3.4. Conclusion – Answers to Question 1

The main problem that Shell face is the unclarity of the roles and responsibilities and there are no specific guidelines that can be used when they want to implement a SaaS type application. It is also important to understand the characteristic of SaaS, what are the pitfalls and benefits and make sure that this understanding reached by all of stakeholders. Everyone has some idea in their head but an awareness of the coming of SaaS for Shell's sourcing strategy should be developed and actualized.

Therefore we argue that a specific sourcing life cycle for SaaS is needed to guide them through starting from the stage of deciding whether or not to implement a SaaS to the delivering and supporting stage and also the decommissioned of the service.

Part II

THEORETICAL BACKGROUND

This section establishes the theoretical background and framework for the research by first exploring the concepts of IT outsourcing and then focusing on the Sourcing Life Cycle.

4.Outsourcing

4.1. Outsourcing in General

Hirschheim (2009) define the notion of outsourcing as making arrangements with an external entity for the provision of goods or services to supplement or replace internal efforts while literally outsourcing is an abbreviation for "outside resource using" (Yang et al, 2007). While Beulen et al (2006) defines outsourcing as "the way in which organizations obtain products and services in exchange for returns while considering the long-term impact on the context, intensity and scopeof their internal and external relationships" (Beulen et al. 2006).

So we can see in the definitions that outsourcing is not always about IT. In the literature, there are some distinction made between IT or IS outsourcing, Business Process Outsourcing and Knowledge Outsourcing.

4.1.1. IT or IS Outsoucing

Firms recognized that the overall production costs of managing their own internal IT operations may well be reduced by outsourcing — due to considerable economies of scale available to large IT suppliers such as IBM. Within a few years, many large firms were jumping on the IT outsourcing bandwagon" (Lacity & Hirschheim, 1993), and the conventional wisdom for general managers now reversed to the notion that "we don't maintain our own power supply, so why should we do the same for IT?" (Venkatraman & Loh, 1994). Since many general managers already perceived their IT spending to be a mere overhead cost (rather than an investment) this prompted them to believe that if IT services could be provided cheaper in the external marketplace. The IT services outsourced are the services such as infrastructure services, desktop services and application management services. These IT services support the business processes.

This research will focus more to the IT service outsourcing where the service provided by supplier is delivered through the internet. We will discuss further on the sourcing lifecycle of an IT service in the next section.

4.1.2. Business Process Outsourcing (BPO)

This is the services that include also non-IT services as part of the total service offering of the IT supplier to the outsourcing company. It is the delegation of one or more IT-intensive business processes to an external provider that in turn owns, administers and manages the selected process based on a defined and measurable performance criterion. It can also be simply defined as devising a contract with an external organization to take primary responsibility for providing a business process (Yang et al, 2007).

4.1.3. Knowledge Outsourcing (KO)

Knowledge outsourcing, unlike business process outsourcing that deals with executing standardized ("back-office") processes, involves higher-end services which require advanced analytical and technical skills. Embracing technology as a driving force, knowledge outsourcing is changing the way businesses conduct themselves in the global marketplace (Vytautas, 2007). Due to its nature that requires more business knowledge compared to BPO, KO requires more tight relationship between the customer and the supplier.

4.2. Sourcing Lifecycle

The outsourcing activities are often grouped to several groups. These grouping come with the form of a lifecycle. Kliem (1999) define the outsourcing lifecycle into seven phases:
1. Determine the business case for or against outsourcing
2. Search for vendors
3. Select a vendor
4. Conduct negotiations
5. Consummate an agreement
6. Manage the agreement
7. Determine the business case to decide whether to renew, renegotiate or terminate a contract.

Another extensive lifecycle defined is from Cullen et al (2005) where they defined 4 sets of phases consisting in total 9 building blocks. These phases and building blocks are:
1. Architect phase, where the foundation of the outsourcing is defind. Cullen later on defined further building blocks for this phase as : Investigate, Target, Strategize, Design. The final outcome of this phase is that the organization understands correctly what it needs so they can publish these needs to the market.
2. Engage phase, in this phase one or more supplier are selected and the deal is negotiated. This phase consist of Select and Negotiate building blocks.
3. Operate phase, in this third phase the deal is put in place, operationalized and managed through its term. The building blocks for this phase are Transition and Manage.
4. Regenerate phase, in this last phase, the next generation options are assessed. This phase only consists of one building block which is Refresh.

In her research, de Jong (2008) defines the outsourcing lifecycle as consisting 5 phases which are :
1. Identify business and its needs. During this phase the business needs and wishes are identified. The main questions are whether or not to outsource and if yes, what to outsource. Another items that need to be clear in this phase is what are the goals of the outsourcing strategy.
2. Select supplier(s). In this phase, the selection of the most appropriate supplier is being done. The examples of the activities included in this phase are the determination of criteria, sending out requests for proposals (RfPs), negotiations and the final selection.
3. Transition. In this phase, the actual transition of work to the customer is being performed. This phase may contain pilots to determine the best way to cooperate together.

4. Manage outsourcing relationship. This phase is about managing the relation between the client organization and the supplier. The phase starts when the supplier actually deliver the service until the expiration of the contract.
5. Evaluate and renew or terminate. In this phase, the client organization decide whether to renew the contract with the supplier or at the contrary, terminate the contract.

While Hirschheim et al (2009) define IT outsourcing life cycle covering the key problem domains along the process of :
1. Making the sourcing decision
2. Arranging the outsourcing relationship
3. Managing the outsourcing relationship
4. Changing or renewing the relationship based on a recurrent evaluation of the outcome of the relationship.

Lastly in their paper, Au et al (2001) define 6 phases of IT outsourcing, which are :
1. Planning
2. Analysis
3. Design
4. Implementation
5. Operations
6. Termination

From these five views of lifecycles we conclude that the sourcing lifecycle consists of 5 phases :
1. Business Strategy
2. Supplier Selection
3. Transition
4. Manage Relationship
5. Evaluate, renew or terminate

Phases	Kliem (1999)	Cullen et al (2005)	De Jong (2008)	Hirschheim et al (2009)	Au et al (2001)
Business strategy	1. Determine the business case for or against outsourcing	1. Investigate 2. Target 3. Strategize	1. Identify business and its needs	1. Making the sourcing decision	1. Initiation of sourcing evaluation 2. Analysis of current systems and changes 3. Identification of objectives 4. Estimation of efforts 5. Identification of core competencies 6. Identification of risks 7. Staff arrangement
Supplier selection	1. Search for vendors 2. Select a vendor	1. Design 2. Select	1. Select supplier(s)	1. Arranging the outsourcing relationship	1. Preparation of request for proposal 2. Identification of potential suppliers 3. Distribution of request for proposal 4. Determination of criteria

Phases	Kliem (1999)	Cullen et al (2005)	De Jong (2008)	Hirschheim et al (2009)	Au et al (2001)
					5. Selection of supplier
Transition	1. Conduct negotiations	1. Negotiate 2. Transition	1. Transition	-	1. Determination of outsourcing relationship 2. Determination of contract type 3. Preparation of contracts 4. Transfer of business logic 5. Transfer of systems, specifications, and documentation
Manage Relationship	1. Consummate an agreement 2. Manage the agreement	1. Manage	1. Manage outsourcing relationship	1. Managing the outsourcing relationship	1. Measurement of compliance to requirements 2. Enforcement of compliance
Evaluate, renew or terminate	1. Determine the business case to decide whether to renew, renegotiate or terminate a contract.	1. Refresh	1. Evaluate and renew or terminate	1. Changing or renewing the relationship	1. Preparation for early termination 2. Evaluation of final software products

Table 2 – Five Views of Sourcing Lifecycle

1. Business Strategy

In this initial phase, the business needs will be identified and requirements based on these needs will be formulated (de Jong,2008; Au et al, 2001). The next step that need to be taken is the identification of risks that can occur by outsourcing the application(Au et al, 2001).Furthermore an evaluation of existing outsourcing options will be performed and a decision on which outsourcing model chosen will be made (Cullen et al, 2005). Therefore it is important for the business to understand the characteristics, pros and cons of the outsourcing options so they can realize what are the cost and benefit that the outsourcing will bring to the organization. In this phase, a business case is build and a demand forecasting is made (Cullen et al, 2005). All of the five authors confirm the need of this initial phase.

2. Supplier Selection

After deciding which type of outsourcing that they will choose, organization needs to explore and decide which supplier that can match with their business needs. The phase started with the determining the criteria for the supplier and sending out requests for proposals (RfP) and then the negotiations and the final selection of the supplier. In this phase, the contract is being prepared. We argue that the Design building block from Cullen (2005) is part of this phase since in this building block, the scorecard, SLA draft, draft price model, draft contract and also when contract management process starts.

The goal of Contract Management is to facilitate contracts throughout all phases of the outsourcing lifecycle (de Jong 2008). Contract Management starts from the phase when the contract is being prepared until the contract itself ends.

3. Transition

Kliem (1999) and Hirschheim (2009) did not discuss about the transition phase in their lifecycle while Au et al (2001), Cullen (2005) and de Jong (2008) has consider the Transition phase as one of the phase in their sourcing lifecycle. We argue that Transition is one of the phases between sourcing lifecycle where this is the phase where the negotiation with the selected supplier being done and also the phase where activities being done between the customer and organization and supplier in preparing the delivery of the service. In this phase, all of the contractual documents and negotiation strategy and items are being prepared (Cullen, 2005). After an effective negotiations have been done. The finalization and contract signature also happen in this phase (Cullen 2005).

Transition is the phase where a project is usually being set up to implement the services. In this phase the integration of the new service with the existing services in the client organization is being done and all plans such as communication, risk, setup and acceptance are being finalized and mobilized (Cullen, 2005). The next steps are the transfer itself (3rd party contracts, works in progress, etc), the knowledge retention and transfer, implement retained organization and contract management and lastly, when all of the transition is finished, an acceptance and post implementation review will be performed (Cullen, 2005)

4. Manage relationship

This is the part of the lifecycle where the service is actually delivered. This is where the daily work happens and therefore lasts until the contract is about to expire (de Jong, 2008).

During this phase, the processes to make sure the delivery and support of the service are being performed. In the manage phase, the management of supplier performance is being done, reports are expected from the supplier to review the performance of the supplier (Au et al, 2001). Cullen also point out regular communication and meeting as one of the building block in manage (Cullen, 2005), we argue that this building block also part of the supplier performance management.

In one of the best practice framework for IT Service Management, Information Technology Infrastructure Library (ITIL), they discussed about the Event, Incident and Problem Management in their Service Operation part (ITIL, 2010; ITIL Roles, 2010). This processes was also included by Cullen in the Manage phase as the building block of manage issues, variation and disputes (Cullen, 2005).

During the delivery of the service, there is a risk that a serious incident occurs that can bring result for a service to stop and of course will bring bad impact for the business. Therefore it is important to identify and mitigate the risks. Cullen identify this need in his "manage risks and plan contingency" building blocks. ITIL support the idea of risk management as IT Service Continuity Management which involves four basic steps : conducting Business Impact Analysis (BIA), performing risk assessment, evaluation the option for recovery, producing the contingency plan and finally testing, reviewing, and revising the plan on a regular basis.

It is important to not only make sure swiftness of the delivery and support of the service, but also the continuous improvement of the service during the contract. Both Cullen and ITIL support this process. Therefore we argue that it is important for the customer to know the actions that need to be taken to improve the service. Lastly, since all of the processes to provide the service are done in the supplier side, customer needs to ensure that the SaaS supplier is performing their processes according to the agreed requirements. This can be done through evaluation and audit to supplier on their controls, performance and compliance (Cullen, 2005; Au et al, 2001)

5. Evaluate, renew or terminate

In this phase the customer organization take the actions to review the contract and the supplier performance as a whole (Cullen, 2005). Customer also take actions in reassessing their requirements and asses another options available in the market to compare with the current supplier (Kleim, 1999; Cullen, 2005; Au et al, 2001). If they consider the current supplier is the best option then they will renew the contract, if not then the termination of the contract will be done and the activities in the Business Strategy phase will be further taken (Kliem 1999; Cullen et al 2005; De Jong 2008; Hirschheim et al 2009; Au et al 2001).

The table below depicts the 5 phases of sourcing lifecycle and the activities that occur within each phase.

Phases	Activities
Business strategy	1. Define business needs 2. Define requirements based on business needs 3. Identification of risk 4. Source services appropriately (sourcing model) 5. Provides input for the demand forecasting to the provider
Supplier selection	1. Preparation of request for proposal 2. Identification of potential suppliers 3. Distribution of request for proposal 4. Determination of criteria 5. Selection of supplier
Transition	1. Preparation of contractual documents. 2. Prepare Negotiation Strategy and Prioritize Negotiation Items 3. Conduct Effective Negotiations 4. Finalize and mobilize all plans (e.g. communication, risk, setup, acceptance) 5. Manage the transfers (3rd party contracts, work-in-progress, etc) 6. Manage the knowledge retention and transfer 7. Finalization and Contract Signature 8. Implement retained organization and contract management 9. Conduct acceptance, closeout and post-implementation review
Manage Relationship	1. Deliver Service reporting 2. Strategic review meeting 3. Tactical review meeting 4. Manage risk, issues, and escalations 5. Plan and effect continuous improvement 6. Evaluate and audit supplier (controls, performance, compliance)
Evaluate, renew or terminate	1. Asses next generation option (back source, retain, handover) 2. Asses contract outcomes and lessons 3. Knowledge refreshment (e.g. market, technology, price, metrics) 4. Re-asses requirements – re-scope, re-bundle and re-design 5. Determine the strategy and business case for each option

Table 3 - Sourcing Lifecycle Phases and Activities

The lifecycle developed in this section answers the question for Question 3

4.3. Roles and Responsibilities

Through the whole lifecycle, a clear and well defined role and responsibilities within the organization is certainly needed. Un-clarity of "Who does what" is often become a root of problem in the management. Therefore we argue that a clear and well defined roles and responsibilities within the organization need to be set up to support the running of the sourcing lifecycle.

We will discuss this separation of responsibilities based on RACI Chart. RACI is an acronym for the four types of interaction used to define responsibilities: Responsible, Accountable, Consulted and Informed (Wende, 2007)

- Responsible: role that is responsible for executing a particular activity. The role accountable determines the degree of responsibility.

- Accountable: role that is ultimately accountable for completing an activity or authorizes a decision.

- Consulted: role that may or must be asked to provide input and support for an activity or decision before it is finished.

- Informed: role that may or must be notified of the completion or output of a decision or activity.

5.Definition of SaaS, ASP and Managed Service

In this section we will dive in to the definition of SaaS, ASP and Managed Service. We will then compare the characteristic of the three sourcing concept so the reader can get a clearer perspective on the nature or characteristics of a SaaS type application. This section answers the question for Question 2

5.1.   Definition of SaaS

Software as a Service (SaaS) or also known as on-demand software is a software delivery model, which provides customers access to business functionality remotely over the internet as a service (Knorr 2010, Summit Strategy Report 2004). Another definition which is from Gartner (2009) which define SaaS as an application owned, delivered and managed remotely by one or more providers, where the provider delivers an application based on a single set of common code and data definitions that are consumed in a one-to-many model by all contracted customers at any time on a pay-for-use basis or as a subscription based on use metrics. So SaaS provides benefits to service customers with no initial cost to purchase software, free of maintenance/updates, accessibility through Internet, high availability, and pay-per-use pricing (Jae et al, 2009).
Instead of software licenses, maintenance and operational costs that occurs in the traditional on-premise model, companies that use SaaS model consume IT-services just like they use any other utility such as water or electricity where they pays only for the usage of the software. In a SaaS model, the supplier delivers the bundle of IT infrastructure, software applications, and services to users through a network.

From the definition above, we derived our definition of SaaS as :
> *"A pay-per-use software delivery model where the supplier delivers the bundle of IT*
> *infrastructure, software applications and IT services through the internet".*

5.2.   Definition of ASP

SaaS (Software as a Service) providers and ASP (Application Service Providers) are two terms that are often used to describe the same thing (the delivery of outsourced software applications via the Internet)   (Menken, 2008). Although both SaaS and ASP are very similar to one another, there are important differences between the two software delivery models. SaaS developed from ASPs and it was ASPs that first created the outsourced software delivery model.

ASP (Application Service Provider) adopted Single-tendency architecture, which each customer application is made to order and the single user application couldn't take into another user's consideration. ASP technology mode uses same database and a virtual catalogue. Customers, who used ASP applications, should pay for software use fees, server managerial expenses and software update costs (Liao et al, 2008)

ASPs, which flourished in 1980s and 1990s, hosted third party client server applications in a data center kind of environment. Since each ASP had many customer-specific applications running, it couldn't provide much expertise in each application. Customers still had to have in-house

expertise to make sure the applications were behaving correctly. Also building and maintaining datacenters was a costly affair for the ASPs and the high cost filtered to the customers (Sun et al, 2009)

In ASP model, the delivery is usually through the internet (Smith et al, 2004) and can be configured by either ASP or client (Bennet et al, 2000)

5.3. Definition of Managed Service

An Managed Service Provider (MSP) deals with the delivery and management of network based services, software applications and equipment. MSPs will usually offer a number of different software services such as telephony services, messaging services, firewall software or even security applications (Menken, 2008).

Managed Service Providers (MSPs) provide similar services to the Application Service Providers, but there are some major differences. With the ASP model a particular software package is put on a group of servers which allows many users to "rent" the software. This is a great option for a small business that wants to host their general ledger, accounts receivable, and accounts payable systems; however there are some negatives to this method. With an APS it is difficult to integrate a third party application or a vertical market solution to your accounting and business management software. This is where a Managed Service Provider is different. (Collins, 2010)

With a Managed Service Provider the client has their own server which is not shared with other ASP customers. No client has access to another client's server. Each server can be customized to meet the needs of the particular customer. The MSP provides all technical support for this server including software updates, backups, hardware, bandwidth, firewall, and other technical issues. The client owns their own software and server and the MSP provides all the IT staff with a variety of skill sets to manage the system at a fraction of the cost required by in-house systems (Collins, 2010). In a Managed Service model, MSP only charges their customers based on the resources and services that they use. A customer will not be charged for a particular service that they don't use.

5.4. Different Characteristic of SaaS, ASP and Managed Service

In this section we listed the different characteristics between SaaS, ASP and Managed Service. These lists are derived from the definitions above.

Items	SaaS	ASP	Managed Service
Delivery Environment	Internet	Client-server application, usually through internet	Either internet or not
IT Support	Inclusive, Included as part of service	Exclusive, internal monitoring, depending on the degree of customization and integration, added maintenance requirements	Exclusive, internal monitoring, depending on the degree of customization and integration, added maintenance requirements
Multi-tenant scalability	Shared (one to many model)	Dedicated (one to one model) and Shared (one to many model)	Dedicated (one to one model)
Application Ownership	Provider	Provider	Provider
Infrastructure Ownership	Provider	Provider	Customer
Management Location	Off premises	Off premises	On premises and Off premises
Payment Type	Usage-based subscription	License / Annual subscription	Usage-based subscription
Operational cost	Low	Moderate	Moderate to high
Degree of customization	Low	Moderate	High

Table 4 – Different Characteristic of SaaS, ASP and Managed Service

Part III

SAAS SOURCING LIFECYCLE

This section will describe the elements of SaaS Sourcing Lifecycle that need to be highlighted or can be different from other type of outsourcing. These elements are described based on literature review and best practices in the market. This description of these elements will be the academic result of this research and will also answer the question 4 of the research questions.

6. Roles in the Organization

In the previous chapter, we have mentioned that throughout the whole lifecycle, a clear and well defined role and responsibilities within the organization is certainly needed. In this chapter we will discuss the roles that lie within the organization. The roles that we will discuss in this chapter are the roles within the customer organization that will come along in the picture in a typical outsourcing in general and in SaaS model spesifically. This is based on the consideration that this research is conducted from a customer perspective.

We identify the roles from the roles discussed by Beulen (2006), de Jong (2006) and also the ones mentioned in ITIL v.3 which are appropriate for this a SaaS implementation.

1. Business Manager
   In his book Beulen defines this role as follow "Business managers carry final responsibility for the execution of business processes" (Beulen et.al, 2006). This role is leader of end users of the service. The requirements from the business managers are the ones that drive the needs for a service in the first place. In ITIL, this role is not specifically mentioned although this role is part of the role that is called IT Steering Group. This group sets the direction and strategy for IT Services. It includes members of senior management from business and IT. ITIL v.3 also defined roles outside the IT organization. One of these roles is called User. Business Manager falls into this group where they are the users of an IT service on the business side. For SaaS model, this role will not have any differences compared to other sourcing strategy. The activity form them will be the same, which is to provide their business needs. The difference is that in SaaS, there is a risk for the Business Manager to fall into a not good deal with the supplier because he/she was too heavily swayed by the business case of the supplier. This will be discussed further in the Business Strategy phase

2. Information Manager
   Beulen.et.al (2006) define Information Managers as the role that are responsible for the IT services and implementation of their company's IS and IT strategies. They serve as contact persons for the company's divisions who must define their information needs. In large companies there may be several information managers, each with responsibility for part of the company. Same as Business Manager, in ITIL v.3 this role is also not

specifically mentioned and we also argue that this role along with the Business Manager is part of the IT Steering Group. Another role in ITIL v.3 that is grouped as roles outside the IT organization is what is called Customer. The Customer of an IT Service Provider is the person who defines and agrees the service level targets. We argue that Information Manager falls into this classification.

For SaaS model, same with other sourcing model, this role will act as a representative for the business to IT department and they still need to define the requirements based on the business needs. The difference is, same with Business Manager that in SaaS there is a risk for the Information Manager to fall into a not good deal with the supplier because he/she was too heavily swayed by the business case of the supplier. This will be discussed further in the Business Strategy phase.

3. Service Manager – Delivery Supervisor
   Beulen (2006) defined a role called Service Delivery Supervisors where their role is to manage external IT providers and, if applicable, the internal IT department. In this book he also describe that service delivery supervisor also manages the contracts and make sure they are aligned with the business's requirements. In ITIL, this role is divided into 2, Service Level Manager and and Service Owner. This separation of roles also taken by de Jong (2008) where she divides the Service delivery supervisor role to Service Manager and Delivery Supervisor. De Jong describe that these two roles as responsible for two different axes within the IT organization.
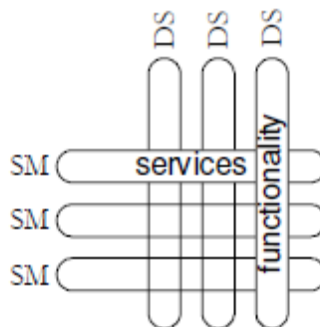
Figure 5 - Service Managers vs. Delivery Managers (de Jong, 2008)

- Service Level Manager / Service Manager
  In ITIL this role is described as the one responsible for negotiation Service Level Agreement and ensuring that these are met. He makes sure that all IT Service Management processes, operational level agreements and underpinning contracts are appropriate for the agreed service level targets. The service level manager also monitors and reports on service levels (ITIL, 2010; ITIL Roles, 2010). The same role with a slightly different name, Service Manager was described by de Jong (2008) as a role that is more looking at the service for the business and making sure that the delivered services are aligned with the business's requirements. The service delivered by a Service manager is a combination of functionalities delivered by different Delivery

supervisors, and the functionalities (the applications) that a Delivery supervisor delivers is input to several services of several Service managers.

In a SaaS model, this role will not have much difference compared with other sourcing model. He / she will be still focusing on how the delivered services are aligned with the business' requirements and also its service levels.

- Service Owner / Delivery Supervisor

    The Service Owner is the role who is responsible for delivering a particular service within the agreed service levels. This role will acts as the counterpart of the Service Level Manager when negotiation Operating Level Agreements (OLAs). Often the Service Owner will lead a team of technical specialists or an internal support unit (ITIL, 2010; ITIL Roles, 2010). De Jong (2008) defined this role as Delivery Supervisor, who manages the external IT providers and the internal IT department. Delivery supervisors put more focus on the functionalities or applications delivered by the supplier. The functionalities (the applications) that a Delivery supervisor delivers is input to several services of several Service managers

    In a SaaS model, this role will be the direct contact person from the customer organization with the supplier. Delivery supervisor will be the one reviewing reports from the supplier regarding service levels and key performance indicators. If usually delivery supervisor will lead a team of technical specialist or an internal support unit, then in SaaS, the internal support unit will be replaced by the support unit from the supplier. Therefore he's not physically leading the team but more just reviewing the results.

4. Technical Specialist

    This role lies as part of the team led by the Delivery Supervisor (ITIL, 2010; ITIL Roles, 2010). This role is the person who poses the knowledge on the technical issue of the application or service and "own" the design and integrity of the applications.. In a SaaS model, this role is will no longer "own" the design and integrity of the applications, all of this will be handled by the supplier. For SaaS implementation, the responsibility for technical specialist is to make sure that the customer organization will still retain the knowledge on the application. This is important when it comes to any integration elements which will relate to customer's own infrastructure. Technical specialist will also take part when customer would like to do an auditing to the supplier.

5. Purchaser

    Purchasers support their IM and the supplier's contract manager in selecting and managing external IT providers and, if applicable, managing the internal IT department. They represent both the IS function's interests and those of the company's divisions (Beulen et.al., 2006). Another name used for the Purchaser is the Contracting and Procurement role, they are responsible for everything that concerns the contractual part of agreements and contracts (de Jong, 2008). ITIL describe this role as Supplier Manager.

    For a SaaS model, the activities for this role will not be different than usual. The different is that certain additional items will need to be included in a typical SaaS contract.

6. Compliance Manager

    This role is discussed in ITIL v.3 as the person who is responsible to ensure that standards and guidelines is followed, or that proper, consistent accounting or other practices are

being employed. Part of this role's responsibility is also to ensure that external legal requirements are fulfilled (ITIL, 2010; ITIL Roles, 2010). Although this role is not discussed by Beulen and de Jong, we include this role in favor of the big risk and attention needed towards compliance issues for SaaS.

For a SaaS model, this role will also play an important role. Since the whole application and support are outsourced and controlled by the provider then the compliance criteria enforced by the service will be decided by the provider. Therefore, it is important for this role to define the control risk that the customer would like to demand to the supplier in order to mitigate the risks and compliance issues for the service.

7. Process Manager

ITIL describe Process Manager as the person who is responsible for planning and coordinating all process management activities (ITIL, 2010; ITIL Roles, 2010). This role is the one who supports all parties involved in managing and improving processes, in particular the Process Owners, e.g. : process manager will support Incident Manager who is the process owner of Incident Management Process). This role was not discussed by Beulen in his book but we argue the importance of this role in the SaaS model.

In a SaaS model, customer will not control on how the provider will run their process, but there is still a need to design the processes of the activities interfacing the customer with the supplier. Therefore we see the importance of including this role in this list.

8. Project Manager

The Project Manager is responsible for planning and coordinating the resources to deploy a major release within the predicted cost, time and quality estimates. This plan is realized in a project, which we will discussed specifically in the transition phase of the outsourcing lifecycle.

In a SaaS model, the role of project manager will not change with the current situation; the only difference is that there will be more relationship with external party, in this case the supplier

7.SaaS Sourcing Lifecycle

In Chapter 3, we have described the findings and needs of the current situation faced by Shell regarding SaaS implementation. We have mapped the needs of Shell regarding SaaS implementation to the sourcing lifecycle phases discussed in chapter 4. The mapping, resulting the picture below, depicted the framework of SaaS Sourcing Lifecyle for Shell which we will develop throughout this research.
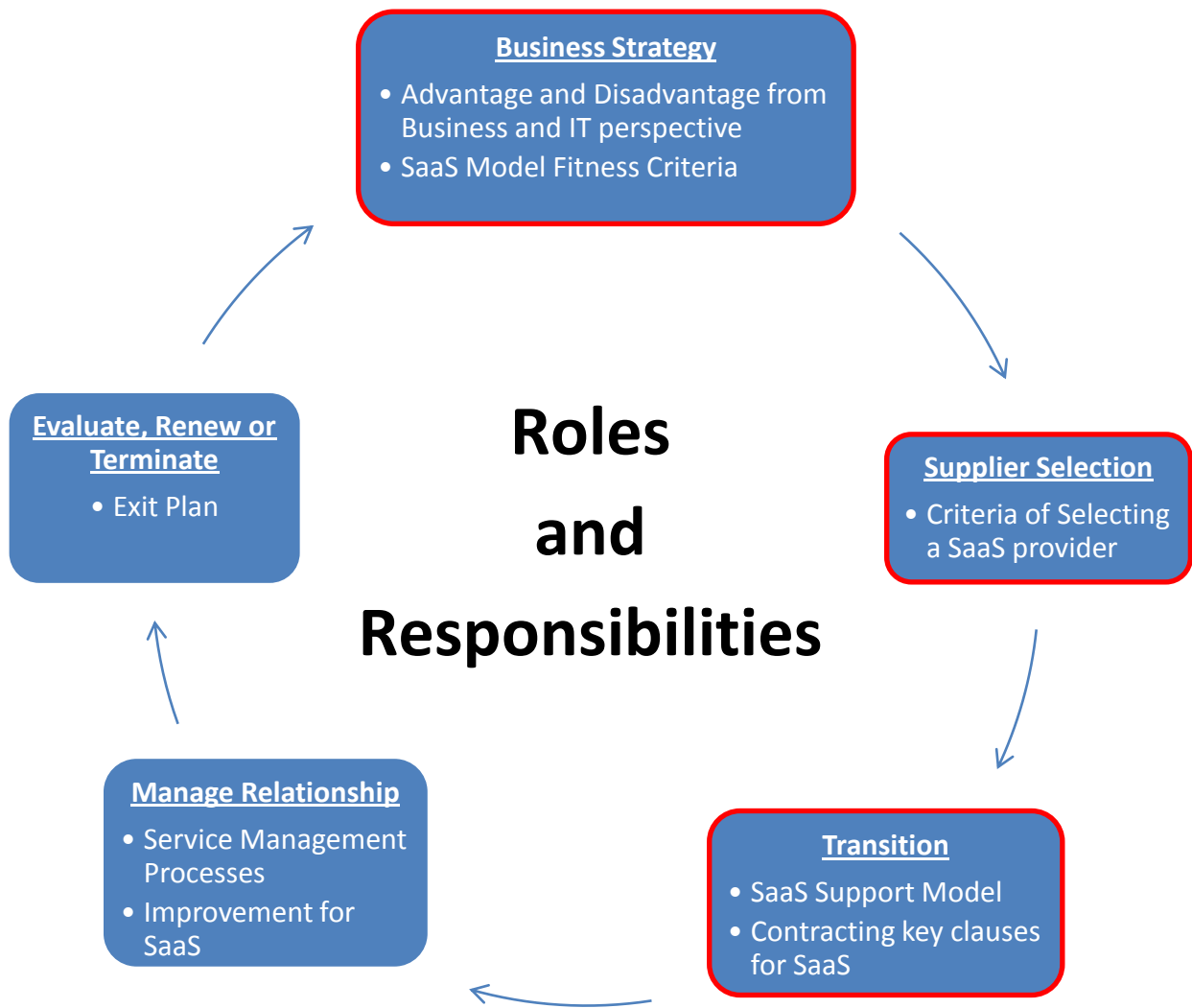
Figure 6 – SaaS Sourcing Life Cycle

The differences of a SaaS Sourcing Life Cycle

Although the phases of SaaS sourcing lifecycle are the same with other type of outsourcing life cycle, there will be more focus needed for some phases.

1. Business Strategy and Supplier Selection
   In other type of outsourcing such as managed service, risks could always be managed within the various sub processes in the latter phases. In situations where application services are delivered via SaaS it is important to note that risks can be managed most effectively at Business Strategy and Supplier Selection phase. The risk mitigation for SaaS delivered application will shifts to the Business Strategy and Supplier Selection phase of the sourcing lifecycle. Therefore we expect the duration for Business Strategy and Supplier Selection Phase in a SaaS Sourcing Life Cycle will be longer than other type of outsourcing.

2. Transition
   A SaaS application is a standard application shared with multiple tenants, therefore there will be no extra work need to be done to build a new application like we may found in other type of outsourcing. These duration of this phase will be mostly used for the integration of the SaaS application with the current application. Therefore the duration of this phase will be expected to be shorter than other type of outsourcing.

We will now discuss the five phases of the SaaS Sourcing Lifecycle along with the detailed items for each phase.

7.1. Business Strategy

In this initial phase, the business identifies its needs and later on evaluates the existing outsourcing options. It is important for the business to understand the characteristics, advantage and disadvantage of the outsourcing options so they can realize what are the cost and benefit that the outsourcing will bring to the organization. In this phase, a business case is also being built to see how the TCO of the sourcing options will varies.

7.1.1. Advantages and Disadvantages of SaaS

SaaS is not a magic solution that comes to solve all problems without any effort. It does not only comes with the benefits that we are more than welcome, but it also comes with the challenges that need to be aware of. Therefore it is important for a company to understand the downside and upside that SaaS will bring to their hands before taking a decision to whether implement SaaS or not. We will discuss these upsides and downsides from the business perspective and IT perspective.

Many authors have discuss the advantage and disadvantage of SaaS, but there is no clear distinction of these items into business perspective and IT perspective. It is important for the decision maker in the organization to understand both the advantage and disadvantage of SaaS from both Business perspective and IT perspective. Business and IT should sit together in making the decision to whether or not implement SaaS type application. Business should not only be aware of the advantage and disadvantage that a SaaS will bring to them business-wise but also the consequences that SaaS will bring to the IT department, while IT department not only need to know the advantage and disadvantage of SaaS in IT-wise but also the business-wise. Therefore

distinct lists of advantage and disadvantage of SaaS based on business and IT perspective are needed.

7.1.1.1.   Advantages and Disadvantages from the Business Perspective

Advantage	Disadvantage
• Limited infrastructure overhead and management • Pay for what you use • Fits in an operational budget • Lower Total Cost of Ownership (TCO) in medium term • Less-expensive implementations • Lower upgrade costs • Lower switching costs	• Lack of competitive differentiation • Business process need to adapt to IT • Longer-term TCO uncertainties • Less ability to negotiate contract • Huge change management needed

Table 5 - SaaS Advantages and Disadvantages Business Perspective

1. Advantages from the Business Perspective

One of the selling points of SaaS is that it helps organizations to avoid capital expenditure and let them focus on their core business instead of support services such as IT infrastructure management, software maintenance etc (Godse & Mulik, 2009). When implementing SaaS, companies will expect to get cost benefits. We will discuss further in this section on how SaaS will bring the financial benefits for the company.

a. *Limited infrastructure overhead and management*
SaaS is cost effective due to the fact that there is no need to purchase additional software applications and hardware devices just to maintain or support the system (Blokdijk, 2008). Acquiring software typically produced the requirements to acquire new infrastructure such as hardware, middleware, networks, etc to enable it. Through a SaaS model, this investment is unnecessary and can be eliminated. Since SaaS is delivered through the internet then what end users need is only a computer with a browser installed on it plus an active internet connection.

b. *Flexible Payment Models*
SaaS provide several models as payment for the service. It can be in a a way of monthly fee, or based on the features that customer use or even be charged based on how much customer used a particular software service (pas-as-you-go model) (Menken, 2008). With the flexibility of the payment models provided for SaaS, customers can choose which model that they prefer. Larger companies might go

for bigger upfront fees to save them money in the long term, while individual users can choose to use the pay-as-you-go model to save them money in short term and avoid paying large amount in front.

c. *Fits in an operational budget*

Since in implementing SaaS companies do not need to do an early investment in the application and infrastructure and also due to the pay-per-use payment method then SaaS can be treated as an operating expenses, enabling departments to keep within their budget authority (Gartner. 2007).

d. *Lower Total Cost of Ownership (TCO) in medium term*

Another benefit of SaaS is that the cost of investing on the software is not that high (Blokdijk, 2008). There is no need for a large sum of money in order to avail the service. Therefore the SaaS concept is really attractive for business customers such as startups and Small Medium Enterprises (SMEs) which do not see IT related activities as a core competence, offering opportunities to reduce the total cost of ownership of IT resources, alleviating companies from running application in-house and commiting to set-up an IT department who administers software and related hardware maintenance and user support. This makes SaaS brings a lower TCO for the customer but maybe for only in medium term. The reason for this is that in on-premise solutions, the TCO is big because it consists of infrastructure and management overhead. In later years, if the on-premise solution does not need a major upgrade then it will probably be cheaper than SaaS. As customer, companies can keep the TCO of the SaaS stay lower compared to the on-premise solution by requesting a yearly increasing discount for the service. This discount can be requested assuming that the SaaS provider yearly increased their efficiency.

e. *Less-expensive implementations*

SaaS model has faster implementation and easier deployment than traditional or on-premise software or solution (Blokdijk, 2008)This can reduce the time it takes to buy the application (which of course makes it less-expensive) because it eliminates the need for capital expenditure sign-off or purchase. Another reason why SaaS has faster implementations are because customers do not have to be concerned with installing the infrastructure, code modifications or extensions to the core software and also due to its nature of having less customization. With a SaaS model, users get what the provider provides them, not the other way around. While with on-premise solution, users can make their wish lists of the functions they want (which often different from one stakeholder to another) which complicating and lengthening the entire implementation and change management process.

f. *Lower upgrade costs*

The Saas model reduces the cost of upgrading from one version of the software to another due to its billing nature where clients pay one service fee that consist the whole package (Gartner, 2007).

g. *Lower switching costs*
When companies spent a lot of money on licensing, implementation, integration, customization, testing, training, maintenance and upgrades, it is harder and more expensive for the company to switch to another supplier. First reason is that if the company has performed heavy customization requests then it is hard to able to locate another service (or product) which can cover the same requirements. The second reason is by spending huge amount of money for the activities mentioned above then the investments values has shunned away the possibility to switch, or even if they do switch then the company need to spend another huge investment to re-do all the activities again. With SaaS, it is easier to switch because initial investment is lower (Blokdijk, 2008), and due to its characteristics like basic functionalities and low-customization then the similar product is more available in the market. With SaaS although there are switching costs in terms of data conversion, reconfiguring and retraining, they are not nearly as significant as with on-premise solutions.

2. Disadvantages from the Business Perspective

a. *Lack of competitive differentiation*
One of SaaS characteristic is that it will provide all the clients with the same functionality and only low customization can be done (Gartner, 2007). This characteristic does not provide companies a competitive advantage for their business, therefore it is not suitable for those core applications that a company needs to differentiate from its competitors.

b. *Business process need to adapt to IT*
In the SaaS model, the business processes need to adapt to the functionality provided by the service, not the other way around since no heavy customization can be requested to the supplier. You get what you are offered, not necessarily what you want or need. So companies may also found that the service only can provide 90% of what they need (or what they think they need), but if the company consciously decides that this 90% is good enough then the SaaS service will work for them. That is why SaaS is better for the non business critical area (see point a above) such as Payroll.

c. *Longer-term TCO uncertainties*
In the benefit part we argue that SaaS model will bring a lower TCO in medium term, but for a longer term this is might not be the case (Gartner, 2007). In on-premise solution, the initial investment become high because it includes the infrastructure overhead, while in SaaS this overhead is included in the reoccurring fees. Therefore, in on-premise solution the TCO will be getting lower in the later years, where in SaaS the fee will the same which makes a possibility that the on-premise solution will cheaper than SaaS in later years. The more-costly elements of SaaS are including integration with other applications and business processes, which is why SaaS is better used for singular siloed business applications.

d. *Less ability to negotiate contract*
Contracts in the ASP or Managed Service model are regularly negotiated for each customer, in some cases even significantly. Unfortunately this is not the case for SaaS. Due to the one-to-many tenancy characteristic, the contract will be standard for all clients and less varied than the contract for ASP or Managed Service (Gartner, 2007). Once again, it tends to be the case that you get what you are offered, not what you want. The perfect situation will be if what the company wishes match with the service provided by the supplier.

e. *Huge change management needed*
The change management is important processes for a SaaS model especially for the business side. In a SaaS model, customers cannot come up with unique wish lists that they want to fulfill. Customer does not necessarily get want they want, instead it is more important to get what they really need. Therefore a change of mindset of people is really important when they are making the requirements for the software. Instead of asking themselves "Do I want this functionality?", they have to ask themselves "Do I need this functionality?". Customer should be willing to make themselves standards or not unique, since the functionality that provider offers are the same from one customer to another.

7.1.1.2. Advantages and Disadvantages from the IT Perspective

Upside	Downside
- Faster implementation - Simplified application integration - Reduced operational (run and maintain) management requirements	- Security vulnerabilities - Weakened IT management control - Compliance requirements - Release management dictated by provider - Supplier management is more difficult - Integration with existing application

Table 6 - SaaS Advantages and Disadvantages from IT Perspective

1. **Advantages from the IT Perspective**

   a. *Faster implementation*
   In a SaaS model, the whole functional management, application management and technical management is handled by the supplier so companies do not need to spend time in such activities like acquiring the infrastructure, code modification of the software, etc so the implementation process can be accelerated (Gartner, 2007). But one activity that will need to take extra time compared to ASP and Managed Service is the supplier management. This will be discussed later in the downside section.

   b. *Simplified application integration*
   With its nature of being delivered through the internet, SaaS is built on open standards and web services standards. This characteristic make inter-SaaS application integration is considerably easier than the integration of propriety applications (Gartner, 2007). Although at the other hand, the integration between the on-premise applications and on-demand application (SaaS) is still a challenge. When seen as a whole, the integration resources needed is considerably reduced through SaaS.

   c. *Reduced operational (run and maintain) management requirements*
   In the SaaS model, the operational aspects of running the application and the supporting infrastructure are passed on to the supplier side (Gartner, 2007). By loosed up from this responsibility, companies can focus more on higher-value-added and more mission critical task. The number of resources needed for run and support the application is also been reduced or we can say almost eliminated.

2. **Disadvantages from the IT Perspective**

   a. *Security vulnerabilities*
   In SaaS model, the main security related threat to SaaS suppliers, comes from the fact that software services are made publicly available over a virtualized world, the internet (Menken, 2008). This means a greater exposure to potential external threats to the services and even worse, the data related to these software services (the customer's data).

   b. *Weakened IT management control*
   SaaS model somehow encourage the business to build relationship with the supplier without the intervention of experienced IT management (Gartner, 2007). This may lead to a desired situation where companies may be end up buying the wrong software for the wrong price in the wrong way and storing up considerable challenges (in terms of availability, security, fit within corporate architectures, policies and processes). The business might not be aware of very important risks in exposing or losing business critical data to SaaS providers and potentially losing control of

data exchanges to third-parties End users buying SaaS may not aware of this challenges but IT managers will be held responsible if these problems do become manifest and probably be forced to re-intervene if integration is required at a later date.

c. *Compliance requirements*
Each company has their own compliance requirements. With an ASP or Managed Service model, customers can demand the provider to run the processes according to the compliance requirements. This is not how it is done with a SaaS model. SaaS model is treated like a black box, customers get the final result which is a service without knowing the backend processes that happen to produce the service. This means customers cannot enforce the complete compliance requirements that they have to the SaaS provider (Gartner, 2007). Customer needs to sort the compliance control items, which one that needs to exist and which one is optional, which one that need to keep in-house and which one that can be brought externally. Later on this compliance control requirements then matched with the compliance that the SaaS provider provides. If a match is found then SaaS is a good option, if not then customer needs to consider to not choose the SaaS model.

d. *Release management dictated by provider*
In a SaaS model, the release management is dictated by the provider, which means SaaS provider can immediately update their software solutions. Customer needs to prepare themselves for the changes that provider will do.

e. *Supplier management is more difficult*
In a SaaS model, strong contracts, governance structures, attention to process integration between SaaS and other delivery/sourcing models, and ongoing supplier management are required to ensure the SaaS supplier does what it is contracted to do(Gartner, 2007). Many IT managers find dealing with suppliers more challenging than managing an entirely internal IT department. New skills and experience may be required to manage an increasingly virtualized IT environment.

f. *Integration with existing application*
With its nature that cannot be heavily customized, SaaS model face a challenge when it needs to deal with integration with existing applications(Gartner, 2007). Although SaaS provider of course provide certain functionality of processes to integrate their application with existing application, but it is limited compared to other sourcing models like with ASP and Managed Service because in SaaS, no heavy code modification will be done. Therefore it is advised that customers use a SaaS model for a standalone application with low level of integration.

7.1.2. SaaS Model Fitness Criteria

SaaS model is not the model that is perfect for every situation, certain criteria from the situation and condition of the company needs to be inspected to see whether SaaS model is the right decision or not. Enterprises cannot repose all of their applications on SaaS indiscriminately (Lu and Sun, 2009). Below we will discuss the criteria where SaaS will fit with the need and current situation of the customer's enterprise.

a. The company does not want to own the infrastructure
   If companies do not want to be burdened by the responsibilities to maintain the IT infrastructure by themselves then SaaS will be one of the options that should be considered (Gartner, 2006b).

b. Standard and non competitive advantage application
   A SaaS model provides the same functionality to all of its customers. There is no such situation where certain functionality is offered only for certain customers. Therefore, customers must evaluate their processes and needs whether they need something really unique or just standard requirements. If what they need is something standardized then SaaS can provide a highly matching solution. If the customer need something really unique and can reflect the competitiveness of the business or posses of some specific functions, the SaaS model is not the right model to adopt (Lu and Sun, 2009)

c. The business complexity should be moderate.
   SaaS is difficult to achieve desired result for too complex business because it only provides standard functionalities to its customers. And there is no need to lavish money on too easy business (Lu and Sun, 2009)

d. The application is delivered by internet
   Due to the nature of its delivery through the internet, SaaS is more suitable for the applications based on the internet (Lu and Sun, 2009). With the internet, information can be reached anytime and anywhere through SaaS.

e. Non-core applications
   SaaS applications are delivered through the internet therefore there is a constraint of performance of the network which will influence the delivery performance of the applications. This risk will bring to the situation where low instantaneity, delay and malfunctions are accepted. Network performance is not certain, so SaaS is not a good choice for high-performance applications, such as production control systems (Lu and Sun, 2009)

f. Low security requirement
   The infrastructure for SaaS applications are shared among its tenant or customers. Therefore there is a risk of the customers' data being exposed on the public server. With this potential security problem, companies should not implement SaaS for important or hard-core application. Lu and Sun (2009) argue that in many case, SaaS is deemed to be a perfect solution for supporting applications, including

human resource management and equipment management, but not for decision support and financial management.

g. Standalone application

SaaS application provides standard functionality to integrate its application with the existing application of the customers (Gartner, 2006b). This integration functionality is standard and cannot be highly customized due to the SaaS characteristic that all the functionality should be shareable to all the customers. Therefore if the application has a complex integration system will other applications, then SaaS would not be a good choice. It is preferable if the application which will implement SaaS is a standalone application or the only integration needed with other application is the transfer of data needed as the input.

h. Providing external access application

More and more companies are providing some services or functionalities of their business process to its Joint Venture or Partners. As example, multinational companies would like to provide some learning courses to its joint ventures and partners. A SaaS type application will fit well in this kind of situation (Gartner, 2006b) because it allows the joint ventures or partners to access the processes of the company without needed to enter the non-public environment of the company's network. The process will be more complex if the partners and joint ventures first need to access the company's network to access certain functionalities.

i. Best of breed (Numerous suppliers available)

One of the risks of outsourcing is vendor lock in (Blockdijk, 2008). SaaS type of outsourcing of course also has this risk; therefore companies should carefully select to implement SaaS for their applications if the number of suppliers available in the market for that type of application is more than 2. The numerous of suppliers available also show that the SaaS application for that certain type is already mature, where we expect the application with include more functionalities compared to the SaaS applications that are not mature yet in the market.

Below, we develop a decision tree model which will help the decision maker to explore the possibilities whether to implement Business Process Outsourcing, Managed Service, ASP or SaaS according to their need and current situation. This model is developed based on the characteristics of BPO, Managed Service, ASP and SaaS and the fitness model criteria discussed above.

Notes
BLUE : Decisions that will need to be taken by the Business
PURPLE : Decisions that will need to be taken by IT
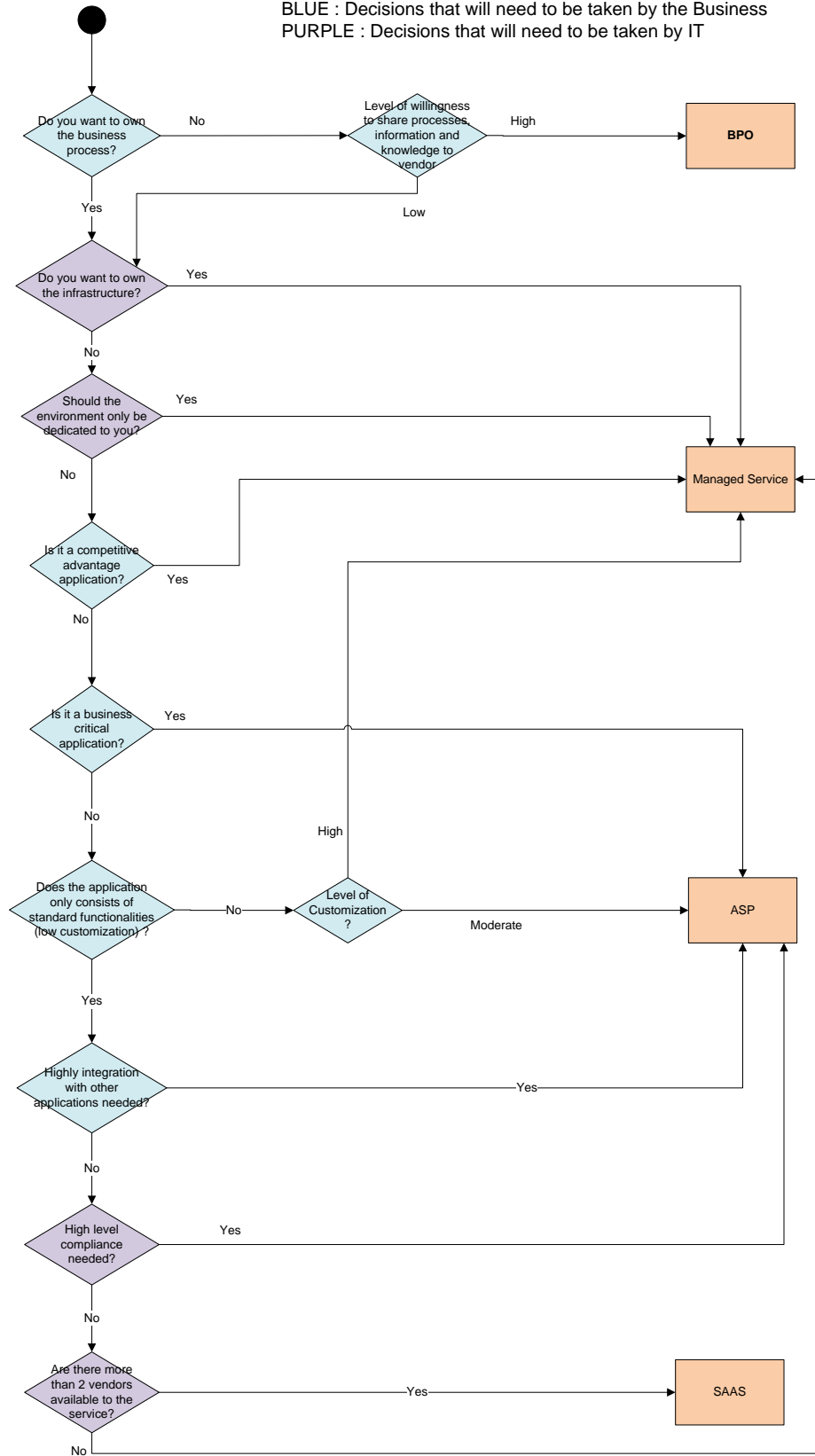
Figure 7 - SaaS/ASP/Managed Service/BPO Decision Tree

7.1.3. Roles and Responsibilities for Business Strategy Phase

As have been discussed in the previous section, one of the disadvantages of SaaS from IT perspective is the weakened IT management control. SaaS gives the simplicity image that encourages the business to choose SaaS as the sourcing strategy and then build relationship with the supplier without the intervention of experienced IT management. This may lead to a desired situation where companies may be end up buying the wrong software for the wrong price in the wrong way and storing up considerable challenges (in terms of availability, security, fit within corporate architectures, policies and processes).

Without any active guidance from IT, business units can rush into SaaS deployments that work well for specific functions but require large IT investment to integrate with other existing applications. Instead, spearhead the due diligence required to find a solution that addresses business needs without neglecting IT concerns (Jaques, 2010). Therefore it is important for the IT to come along in the picture from the first stage of decision making. This will assure that the chosen solution is implementable, supportable, maintainable, and scalable

Below we define the roles and responsibilities for this phase. The reasoning on how we define the responsibilities has been discussed previously in Chapter 4 (section 4.2).

Responsibilities	Business Manager	Information Manager	Service Manager	Purchaser	Compliance Manager
Define business needs	A/R	I			
Define requirements based on business needs	C	A/R	I		
Identify Risk	C	C	I		A/R
Source services appropriately (sourcing strategy)	I	A/R	R		
Provides input for the demand forecasting to the provider			A/R	I	

R = Responsible; A= Accountable; C=Consulted; I=Informed

Table 7 – Roles and Responsibilities for Business Strategy Phase

The flow of the activities started when Business Manager identify business needs within their division which later on informed to the Information Manager. The team of the Information Manager will then translate the business needs to requirement list. The Information Manager will be accountable and responsible in performing these activities (Beulen et. al, 2006) The requirement list will then forwarded to the Service Manager as a form of demand to the Service Manager to provide solution that can answer these requirements.

These requirements then discussed between the Information Manager and the Service Manager along with the strategy from the Business and also IT to decide which sourcing strategy is appropriate for the solution (whether it is BPO, Managed Service, ASP or ASP). The Service Manager is in posses of the knowledge on IT portfolio of the applications within the company so he/she is capable in giving advice to Information Manager on current and past experience of solution implementation, the strategy within IT itself and also the existing relationship with providers (Beulen et. al, 2006). The decision tree discussed earlier in this chapter can also be used as a tool to help the decision making of the sourcing strategy. The deviation of this ideal situation that often happen is the Information Manager does not contact IT department in an early phase but only until when a contract has been sign with the provider. Compliance manager will perform risk assessment with the help from business manager and information manager to see the risk that might occur when outsourcing the solution application needed.

When the decision of the sourcing strategy has been reached it is now the service manager's to make a demand and necessary engagement to the purchaser in order to continue to the next step of the sourcing lifecycle which is Provider Selection.

7.2. Supplier Selection

The steps of supplier selection for SaaS does not differ with the common supplier selection phase, such as phase for compiling a list of possible supplier, writing a Request For Proposal (RFP), distribution of RFP, proposal evaluation based on criteria determined, negotiation and lastly contracting. The difference is more on the criteria that would like to be required from the supplier and need to be incorporated in the RFP, and also the important items that need to be included within the contract.

7.2.1. Criteria of Selecting a SaaS Provider

When IT Management is ready to receive supplier proposals, a formal request for proposal (RFP) letter is sent to all possible candidates. The RFP defines the format of the proposal ensuring that a responding supplier can be evaluated and compared easily with others. The RFP should cover the following items (Wallace & Webber 2009) :

1. Type of applications to be outsourced
2. Minimum performance requirements and evaluation criteria
3. Reliability level required
4. Level of integration with other systems required
5. Any required reporting capabilities
6. Service volume expandability
7. Vendor contact person
8. IT contact person
9. Vendor maintenance, training and operation support
10. Current users of the SaaS vendor's system.

In this section we will discuss the evaluation criteria in selection the SaaS service which should be included in the RFP. In their research, Godse & Mulik (2009) propose several group factors for SaaS selection, such as : Functionality, Architecture, Usability, Supplier Reputation and Cost.

While Gartner (2006) in their research propose three types of issues and questions that customer must address with SaaS supplier, which Functionality, Operations and Cost. Wallace and Webber (2009) in their book also discuss the criteria required in the RFP. We will use these three researches as base of this paragraph.

1. **Functionality**

In their research, Godse & Mulik (2009), listed some functionality criteria such as Contact and activity management, Opportunity management, Sales performance management, and Sales analysis. We will not include these criteria since these criteria are typically functional modules of the Sales Force Automation that they use as a case study. We will not focus not certain solution but seeing the SaaS model as general.

a. Ease of Evaluation
SaaS functionality should be accessible and easy to evaluate (Gartner, 2006a). The nature of SaaS is what supplier provide is what the clients get, therefore the supplier should provide clear and detailed documentation on the solution so customer can ensure that the functionality of the solution matches with the requirement (as example : required application data model, process flow or user interface). Gartner also propose that the supplier should provide the client with a free trial of the solution. Despite that from the three researches, only Gartner discussed this item, we still include this criterion since we see that this item is still relevant in deciding which SaaS solution to implement.

b. Configurability
Customer must document the functionality of the solution that they would like to configure. The proposal from the supplier must provide an effective way (such as using online self-configuration tools) for customer to implement required configuration changes across all potential administration roles (Gartner, 2006a)

c. Customization
Supplier should clearly identify how they will implement required customizations and the cost for doing so (Gartner, 2006a). Some basic customization requirement that most-likely needed are to extend the data model, add calculated fields and create new user interfaces. Although customization is really limited with SaaS model, some level of customization is still possible; therefore we still include this item as one of the criteria.

d. Pre-Production Testing and Staging Environment
If any configuration or customization done to the SaaS solution, it is often necessary to have a fully functioning pre-production testing and staging pilot environment. This environment must include the ability to test integration with on-premise data sources and applications. Determine whether the SaaS provides this environment and at what cost (Gartner, 2006a). Although this criterion is only discussed by Gartner and not by the other 2 researches, we argue that this criteria is important as one of the service provided by the supplier to make sure that the SaaS application will work well.

e. Integration
As discussed in the previous chapters, a major disadvantage for SaaS is the low level of integration with other applications. Due to its characteristic of being hosted off

premise, SaaS can be perceived as difficult to integrated with the on-premise legacy systems (Godse & Mulik, 2009). Therefore customers should document which integration capabilities that they require and require the supplier to provide information on the integration options that they have (such as batch file transfer, web services, etc) (Gartner, 2006a).

f. Reporting and Analysis
    Provide the supplier the information on what kind of reporting and analysis that the customer required (as example: number of orders processed). (Gartner, 2006a)

2. Operations

a. Infrastructure
    SaaS model is a black box model where the process and infrastructure within the supplier is invisible for the client. Despite of this characteristic of SaaS,an information on the platform and architecture of the infrastructure used by the supplier is needed to help in ensuring that a SaaS supplier is well prepared to deploy the solution in a timely and cost-effective manner (Gartner, 2006a). Gartner differs these items into platform & architecture and data centre. We see that these two items can be merged as one item, infrastructure.

b. Provisioning
    In Section 7.1.3 (SaaS Fitness Model Criteria), we have discussed that SaaS will be a good solution when an organization would like to provide an external access to the system for their Joint Ventures and Partners. In this type of situation, there is a high possibility that there will be a lot of new end users coming to use the service. Therefore it is important to know how the SaaS suppliers provisions new users and how much time will they need to do this. Another better option is whether or not the SaaS supplier enable users to provision themselves (Gartner, 2006a).

c. Scalability
    Scalability refers to the SaaS product's ability to maintain reasonable response time for users even during peak load (Godse & Mulik, 2009). Therefore it is important for the customer to make sure that the SaaS provide can deliver the service according to the performance requirements in the current peak processing and user demand and also the situation in the future. Customer should also has an estimation on how fast will the number of users will grow within certain period of time in the future. SaaS provider should provide the customer with the sufficient evidence that its platform will scale to meet the current (and future) peak of application processing and user demand (Gartner 2006a, Wallace & Webber 2009).

d. Reliability
    Reliability refers to the SaaS provider's ability to maintain the service to remain available for the users for given time windows (Godse & Mulik, 2009). SaaS provider should provide evidence of the reliability level of the application to the customer (Wallace & Webber 2009).

e. Security
    Security is considered to be the major concern for SaaS products (Godse & Mulik, 2009). As discussed in section 7.1.1.2, due to its nature of being delivered over a virtualized world, the internet, it will bring a greater exposure to potential external threats to the services and especially the customer's data of the service. Therefore customer should require supplier having certification such as ISO 27000 to help

ensuring that security actions has been adopted for handling of customer data (Godse & Mulik, 2009). Several questions related to security can be asked to the SaaS provider, such as : Has the software underlying the SaaS been tested for vulnerabilities? Does the SaaS provider has effectively address key security dimensions, including privacy, integrity, authentication and authorization? (Gartner, 2006a, Wallace & Webber 2009).

f. Impact of Cascaded External Suppliers
It is quite common in the world of outsourcing if our supplier also outsource some part of their service to another provider. Customer must ensure to the main provider that they are the one who will manage all the external suppliers they have and make sure that if the services of the External Suppliers goes down it will not affect the SaaS's supplier functionality (Gartner, 2006a).

g. Compliance and Risk Management
Besides security, this is another major challenge when a company would like to implement SaaS. Each company has their own compliance regulation and requirement. For a SaaS model, companies cannot enforce its entire compliance requirements to the supplier, since they don't have the power to control the process behind the solution. Therefore it is important for customer to check in advance whether the SaaS provider is compliant with applicable governance (such as HIPAA, Sarbanes Oxley or SAS 70 certification) (Gartner, 2006a; Wallace & Webber 2009).

h. Backup and Disaster Recovery Plan
Gartner discuss this item only as Disaster Recovery Plan, we add the Backup part since we see in SaaS model it is important for customer to get an assurance that the service will be always available and will not vanish due to certain failure. Disaster can happen anytime; therefore it is important for customer to make sure that the SaaS supplier is well prepared for disaster site failover and recovery (Gartner, 2006a). SaaS provider will need to provide details of its disaster recovery plan, including specific recovery time objectives. These plan is not only should exist but also tested. "I have seen a lot of cases where it is said that the data is successfully backup but was not able to be restored" (Schravendijk, 2010).

i. Business Continuity Plan
Continuing the previous criteria, backup and disaster recovery plan, a business continuity plan is also an important criterion that need to be required from the Supplier. Gartner consider this item as the same criteria as Disaster Recovery Plan, but we argue that Business Continuity Plan is not the same with Disaster Recovery Plan. Wallace & Webber (2009) also include BCP in their criteria list. A disaster recovery planning is primarily a reactive approach (corrective control) and not a comprehensive plan for risk management. In contrast, a business continuity plan (BCP) seeks to eliminate or reduce the impact of a disaster condition before the condition occurs (Cerullo & Cerullo, 2004). The same with Backup and Disaster Recovery Plan, BCP also need to be tested and customer should require provider for

the prove.

j. Availability and quality of support.
   Both Gartner (2006a) and Wallace & Webber (2009) include the importance availability of support as one of the criteria of a SaaS solution. The supplier should have a good reputation for its support and able to provide the availability level required by the customer. Availability of the support, escalation procedures, and detailed process to address requests for changes are part of the items of Service Level Agreement that we will discuss in the next lifecycle phase. Supplier must also provide prove of a good quality of support (such as credential of staff and average length of service) (Wallace & Webber, 2009)

k. User-training and implementation resources available
   Wallace & Webber (2009) is the only one from the three researches who include user-training and implementation resources available as a criterion for the RFI. We agree to them since we see user-training will be highly needed especially when customer is switching from a non SaaS solution to a SaaS solution.

l. Documentation clarity and completeness
   Supplier need to ensure that the documentation, publications and aids relevant to any Service or Product are current and the process for delivering this documentation is clearly defined (Wallace & Webber, 2009)

3. **Usability**
Same with functionality, there are two criteria (Support for mobile devices and offile support) discussed by Godse & Mulik (2009) that we will not include in this research since we see the two criteria is only related to Sales Force Automation that they use as a case study.
   a. User Interface
      User interface includes facets such as intuitiveness, ease-of-use for frequently required tasks and aesthetic nature of graphical elements (Godse & Mulik, 2009)
   b. Help
      This criteria refers to availability of easy-to-use user manuals, eLearning modules, and context-sensitive help (Godse & Mulik, 2009)

4. **Supplier Reputation**

Selecting a well known SaaS provider with a good reputation will give customer a peace of mind. Customer should always try to find out as much background information as they can about their SaaS supplier before signing any contracts to ensure that SaaS supplier is a good, honest and reliable company (Menken & Blokdijk, 2009).

   a. Number of clients/users
      This criteria is important for the customer to get the information on level of usage of the SaaS solution. This information will help to roughly indicates whether the product is fairly new entry or is well-established one (Godse & Mulik, 2009)
   b. Brand value
      In their research, Godse & Mulik (2009) argue that supplier is also important, as sometimes a new product from well-known supplier may be preferred over a product

having vast customer base but being provided by not-so-well-known supplier. This also related to the financial condition of the supplier itself. A supplier who has a strong financial situation will be highly preferred in supplier selection to ensure the continuity of the service.

    c. Former and current customer references
Current and former customers should be contacted to discuss their experiences with the supplier (Wallace & Webber 2009)

5. Cost

Both Gartner (2006a) and Godse & Mulik (2009) include the cost criteria as one of the information required from the Supplier. There are two cost needed to implement a SaaS solution :

    a. Recurring cost.
Godse & Mulik (2009), discus this recurring cost as annual cost where this annual subscription covers the cost of hardware, software and support personnel. We change this to recurring cost since although this cost might be paid yearly but this is not a fixed per-year cost but it is calculated per-transaction, per-user or other unit basis of the service (Gartner, 2006a).

    b. One time implementation cost
Initial consulting, configuration efforts, etc is covered under one-time implementation cost (Godse & Mulik, 2009).

6. Property and Licensing

    a. Intellectual Property
Although the ability to customize the solution is really low, there is still a possibility for the customer to request a customization from a SaaS provider. Clarity on who is the owner of the intellectual property associated with customizations implemented to meet customer unique functional requirements will need to be discussed upfront (Gartner, 2006a). If the customer will own this functionality then supplier should provide a way to pull out and reuse this functionality. If customizations are implemented at the customer's cost to meet customer's requirement, the supplier should ensure that these customizations are isolated from other user that might be a competitor of the customer (Gartner, 2006a).

    b. SaaS / Software Swap Ability
There is a possibility that one day customer would like to reverse the SaaS sourcing decision and bring the application functionality back in-house. This is due to the major use increase or customer would like to implement extensive customizations to functionality (Gartner, 2006a). Therefore customer should ask SaaS provider whether they will give the customer option to license its SaaS functionality as licensed software and if yes, how to do so. (Gartner, 2006a).

Table 8 below summarize the criteria discussed :

Key Area	Criteria
Functionality	- Ease of Evaluation - Configurability - Customization - Pre-Production Testing and Staging Environment - Integration - Reporting and Analysis
Operations	- Infrastructure - Provisioning - Scalability - Reliability - Security - Impact of Cascaded External Suppliers - Compliance and Risk Management - Backup and Disaster Recovery Plan - Business Continuity Plan - Availability and quality of support - User-training and implementation resources available - Documentation clarity and completeness
Usability	- User Interface - Help
Supplier Reputation	- Number of clients/users - Brand Value - Former and current customer references
Cost	- Recurring cost. - One time implementation cost
Property and Licensing	- Intellectual Property - SaaS / Software Swap Ability

Table 8 – Evaluation Criteria of SaaS Provider

7.2.2. Roles and Responsibilities for Supplier Selection Phase

This is the phase in the sourcing lifecycle where Purchaser will take more responsibilities of the actions covered in this phase. This is also the phase where the Project which is represented by Project Manager comes into the whole big picture.

Responsibilities	Business Manager	Information Manager	Service Manager	Purchaser	Project Manager
Preparation of request for proposal		I	C	A/R	C
Identification of potential suppliers		I	C	A/R	C
Distribution of request for proposal		I	I	A/R	I
Determination of criteria		A/R	R	I	
Selection of supplier		A/R	R	C	I

R = Responsible; A= Accountable; C=Consulted; I=Informed

Table 9 – Roles and Responsibilities for Supplier Selection Phase

The responsibilities for this phase have been discussed in chapter 4 (section 4.2) and we will discuss the distribution to the roles in this section.

As have been discussed in chapter 6, the Purchaser's role is to support Information Manager and Service Manager in selecting external IT providers (Beulen et.al., 2006). Therefore Purchaser is the one responsible and accountable for preparing request of proposal with the help from Service Manager and Project. Service Manager will give consultation to the Purchaser by giving the list of items need to be included in the RFP from the IT perspective, while Project will list out the functional requirement gained from the business need. Since the Purchaser will have a list of suppliers, Purchaser will also be accountable and responsible for identification of potential suppliers. The purchaser will be also the one distributing the RFP. As for the determination of criteria it will be the responsibility of information manager and service manager because the criteria will be highly influenced on the Business strategy and IT strategy of the company. Selection of supplier is part of Information Manager's final responsibility (Beulen et.al., 2006) supported by the Service Manager and Purchaser will be consulted. The Project will be informed about the final selection since it will influence the direction of the project itself.

7.3. Transition

7.3.1. SaaS Support Model
Most of the time when a company implements SaaS, it is the SaaS supplier that deals with support-related issues. The company still needs to understand what level of support their SaaS

supplier will provide them with, what level of support they will have to provide themselves and how much support-related issues will cost them (Menken & Blokdijk, 2009).
The support model that we will discuss in this research will be the model used for incident management for a SaaS application. The purpose of Incident Management is to restore service operations to normal conditions are quickly as possible and to minimize the impact of interruptions on the business, where the normal conditions are defined by the Service Level Agreements (Menken & Blokdijk, 2009)

Incident management process can be divided into several steps (Guo & Wang, 2009):
1. Incident detection and tracking
2. Classification and initial support
3. Investigation and diagnosis
4. Resolution and recovery
5. Closure
6. Tracking

In a company, a typical IT Support organization is structured as a network of support groups, each comprising a set of technicians. These technicians have a definite work schedule, often depending on geographical residence. Support groups are divided into group support level (first line, second line, third line) with lower level groups dealing with generic issues and higher level groups handling technical and time-consuming tasks (Guo & Wang, 2009).
Incidents beyond the capabilities of the Help Desk (1st Line Support) are assigned to a specialist support group to be resolved quickly (this is the 2nd and 3rd Line Support). Incidents end when a resolution or a work around to the problem is in place (Menken & Blokdijk, 2009)

Guo and Wang (2009) in their paper described the incident management for SaaS which consisted of 3 roles:
1. Customer's Service Desk
   As the first-line support of incident process the Service Desk's members are trained by SaaS training team which involves the technicians from SaaS Provider. Usually the Service Desk is responsible for logging, categorizing and prioritizing incidents, taking initial support for end-user and deciding whether to escalate incident level.
2. Customer's *SaaS Technique Support*
   SaaS Technique Support as second-line support has more professional skills than Service Desk.
3. *SaaS Provider*
   SaaS Provider as third-line support is in charge of the escalation of incidents from customer which
   are involved with product issues that can't be solved by the SaaS Technique Support team of organization. They have the responsibilities to recovery the business capability against organization rapidly and timely within the SLA context.

We draw up the description of SaaS incident management from Guo and Wang in the picture below:
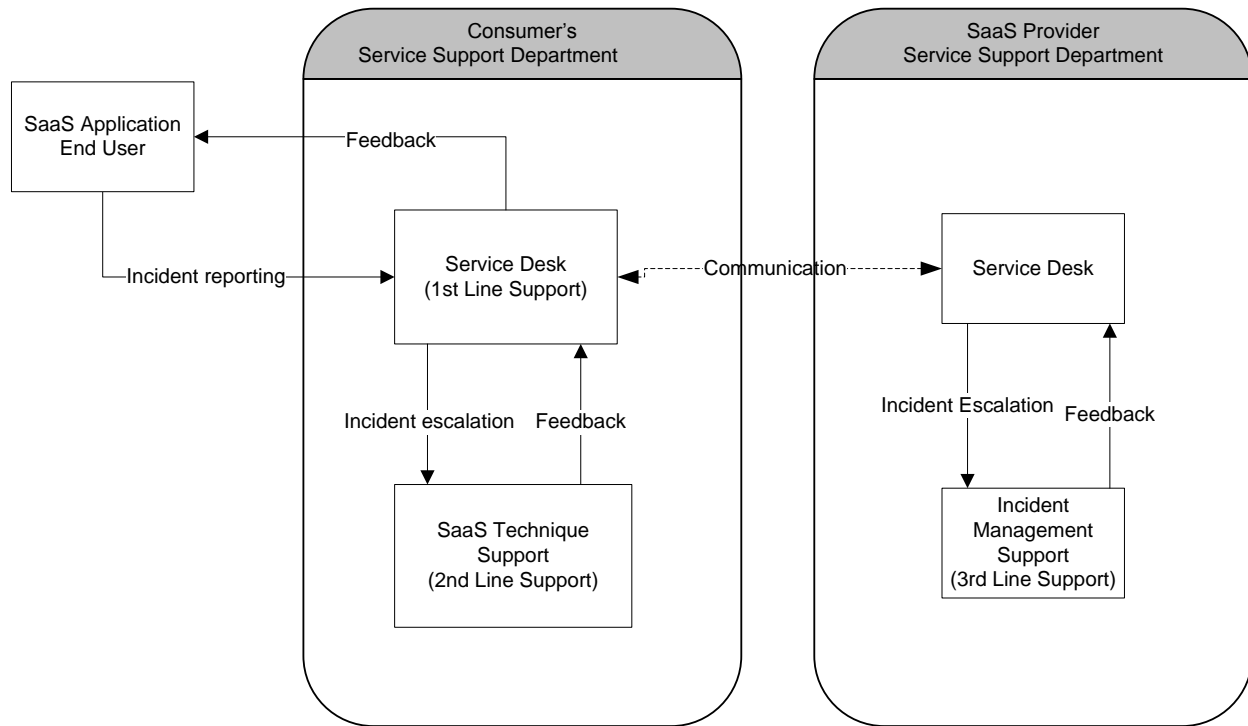
Figure 8 - SaaS Incident Management Model from Guo and Wang (2009)

While Menken and Blokdijk (2009) in their book argue that there are several possibilities in the range of support offered by the provider :
1. Technical support will be offered by the SaaS supplier
2. If the SaaS supplier does not the offer the technical support or even if they do, some companies may decide to develop their own internal technical support team. The advantage is that the company does not have to always contact the SaaS supplier whenever they face a problem but the disadvantage of this strategy is that the company will need to bring in a new set of IT support professionals which are often expensive.

We see that the second possibility from Menken & Blokdijk (2009) fits with the description from Guo and Wang (2009). We have also depicted the first possibility from Menken & Blokdijk in the picture below :
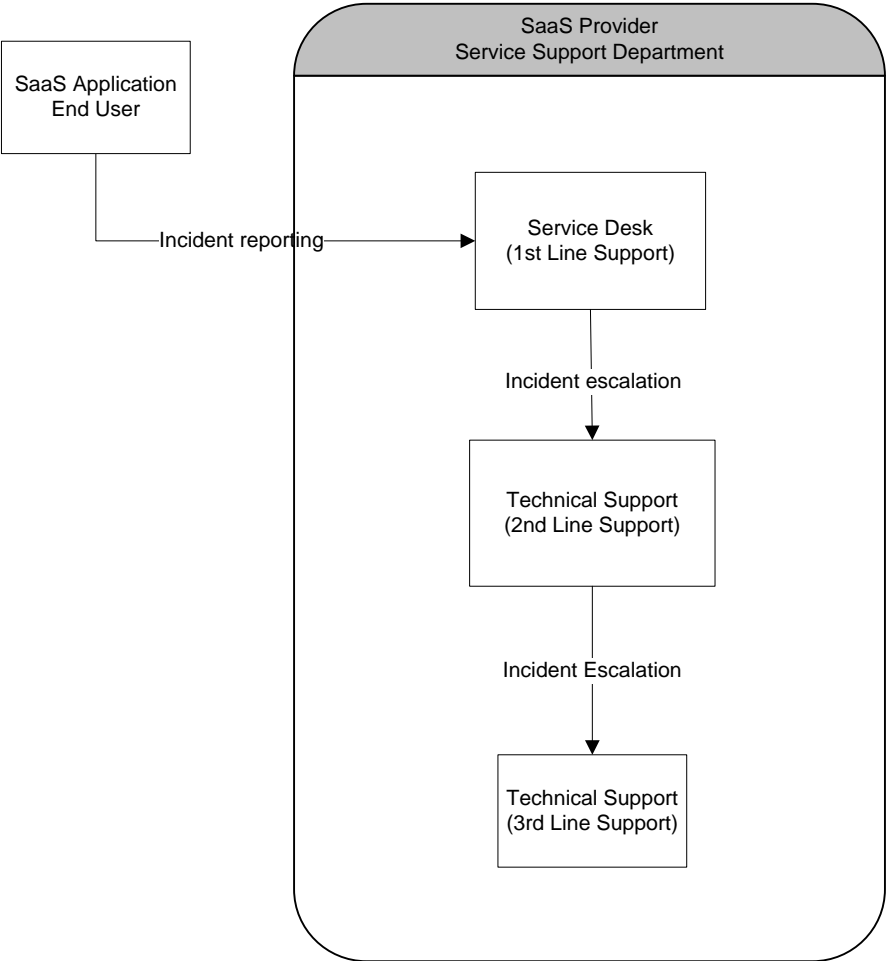
Figure 9 - SaaS Incident Management Model from Menken & Blokdijk (2009)

From these 2 models, we see that there are variations of support that can be provided by the supplier and also customer has the freedom to choose their own support model.

We argue that there are 3 variation of support model for SaaS implementation.

1. All the support (1st line, 2nd line, 3rd line) resides in the SaaS provider side.
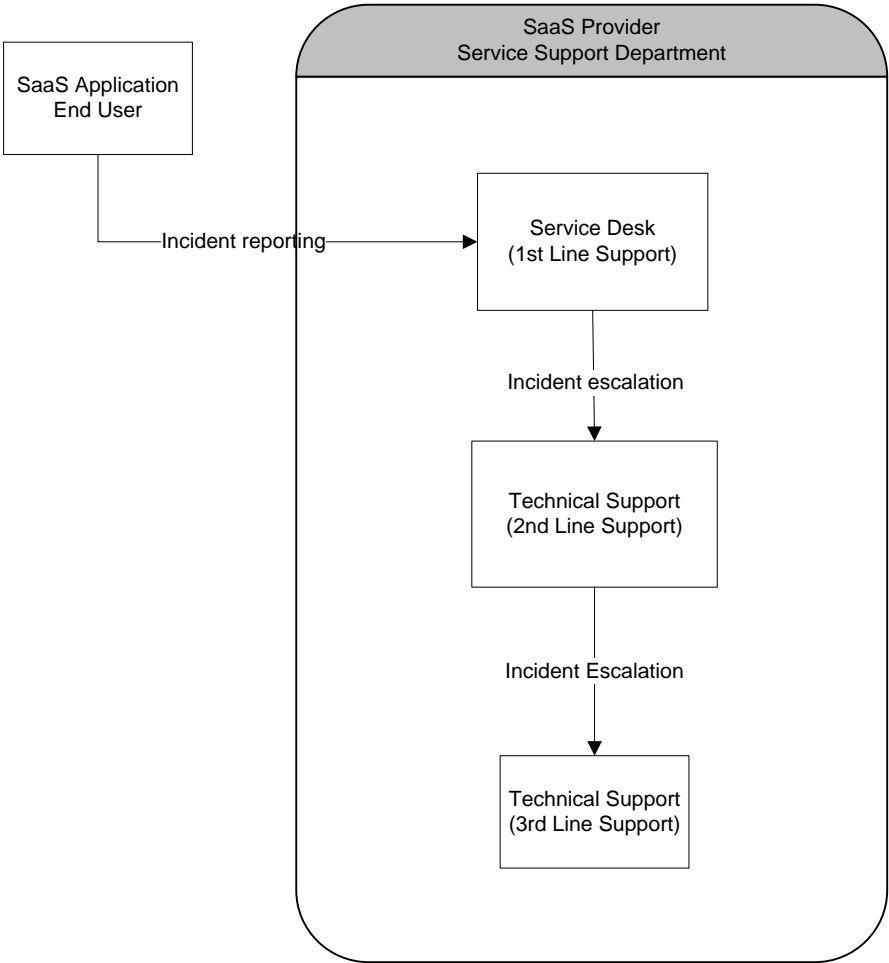
Figure 10 – Incident Management with all support resides in SaaS Provider

2. Customer company still owning a service desk (1st line support) which will communicate with the service desk of the SaaS provider side which will later on escalate the incident to 2nd line and 3rd line support.
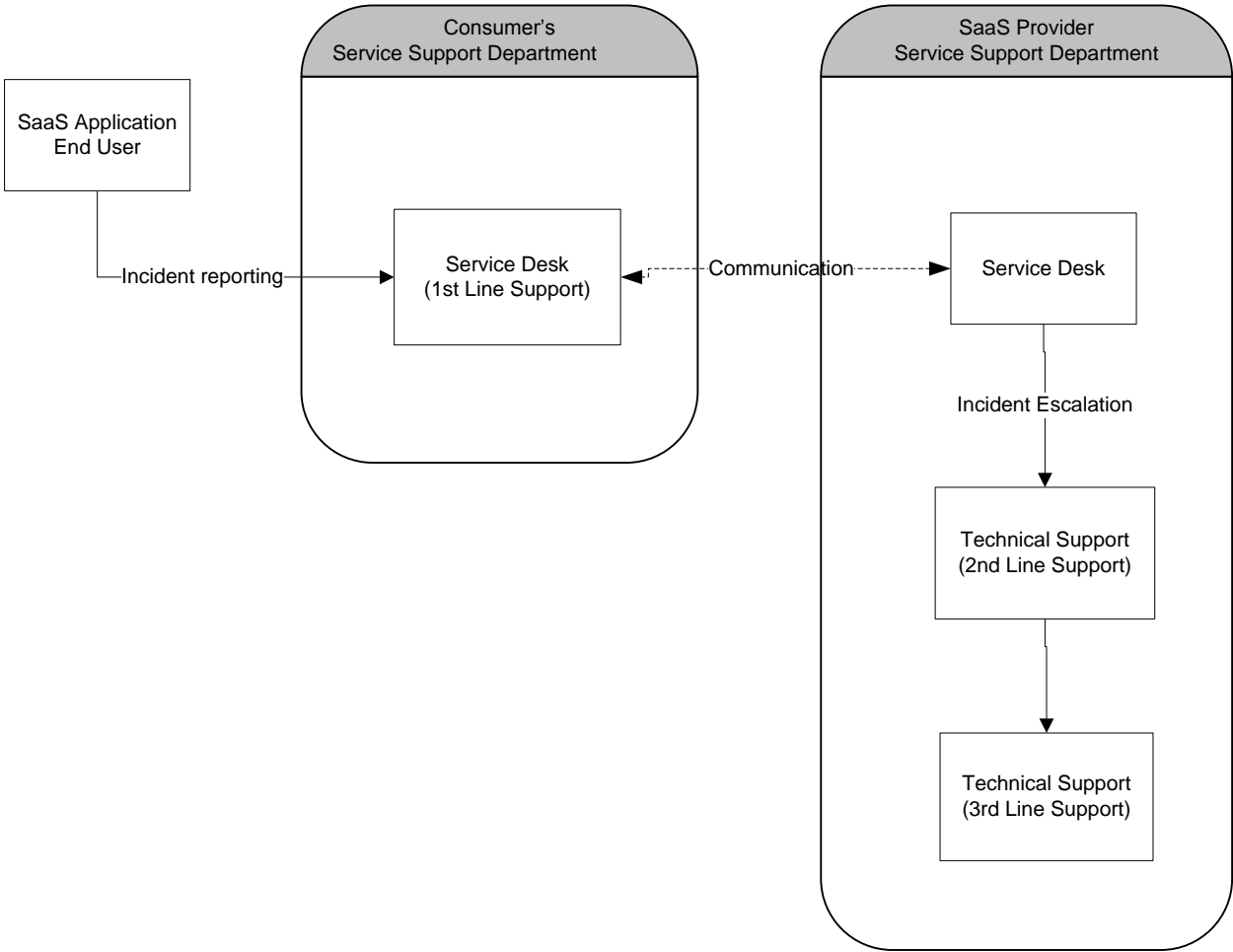
Figure 11 – Incident Management with 2nd and 3rd line support resides in SaaS Provider

3. Customer Company still owning a service desk (1st line support) and 2nd line technical support and the incident will only be escalated to the SaaS provider technical support (3rd line support) if it is involved with product issues that can be solved by the customer's 2nd line support.
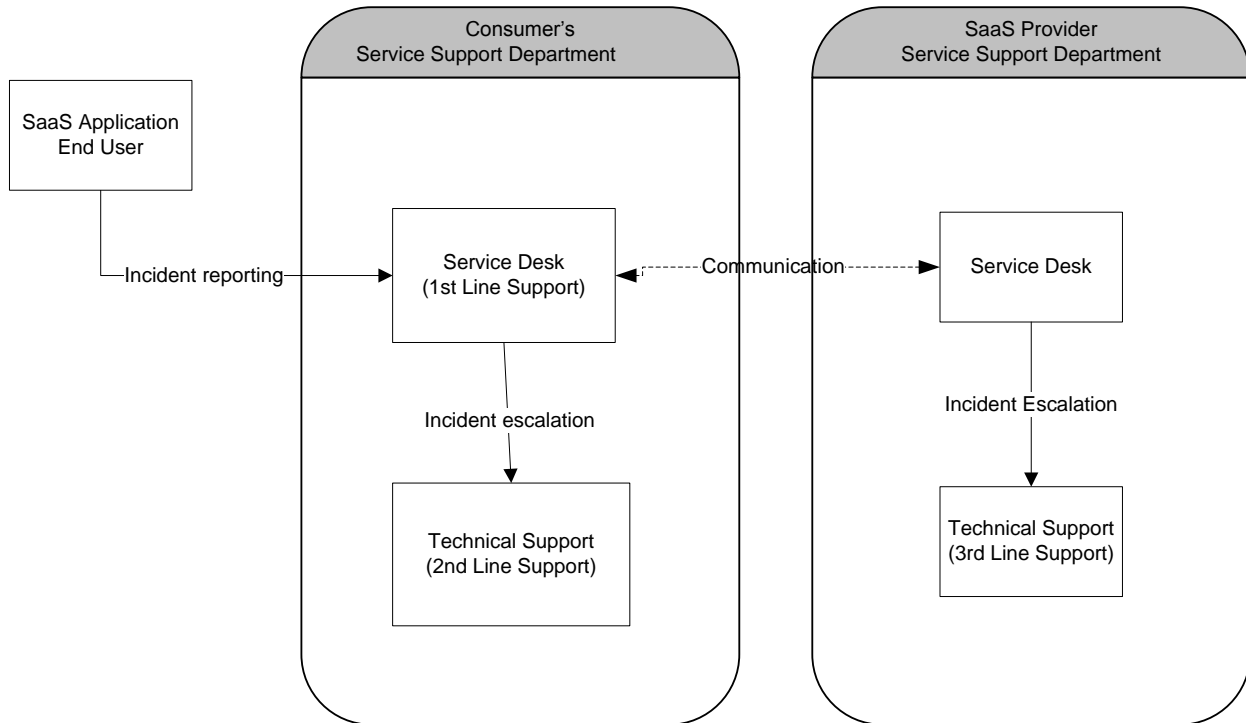
Figure 12 – Incident Management with 3rd line support resides in SaaS Provider

Which model to choose will depend on (Menken & Blokdijk, 2009) :
1. Level of support provided by the SaaS provider.
2. Level of support that the customer company would like to retain within their own company.
3. How much will support related issues cost

7.3.2. Contracting Key Clauses for SaaS

Contract and legal agreements have always existed between software suppliers and their clients, based around the software applications that the software supplier sells such as the contract terms how the software application can be used and are not being illegally duplicated and used (Menken 2008; Menken & Blokdijk, 2009). For a SaaS based software delivery model, software applications are in control of the software supplier rather than the customer but this does not mean that contract and legal agreements no longer exist between a software supplier and their clients. Instead, these contract and legal terms are modified, taking account the differences of the SaaS based software delivery model.

In this section we will discuss the 22 items that should be included in SaaS agreement between the customer and the SaaS provider. The figure below will summarize the 22 items of contracting key clauses for SaaS. These items are discussed by Menken (2008), Blokdijk (2008) and Menken& Blokdijk (2009), and Gartner (2008) in their research.

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22 Contracting Key Clauses for SaaS

1. Cost
   a. Setup Costs
   b. Customization Costs
   c. Training Fees
   d. Integration Fees
   e. Fees for Non-corporate Use
   f. Documenting What Is Included in the Fee
   g. Locked-In or Escalating Discounts for Incremental Spending
   h. Termination Fees
2. Pilot Periods
3. Subscription Types
4. Minimum Subscription Lengths
5. Term of the Licenses
6. Term of the Agreement
7. Number of Users
8. Use-Based Pricing
9. Test and Development Capabilities ("Sandboxing")
10. Service Level Agreement (SLA)
11. Data Storage Terms
12. Maintenance and Support Services
13. Penalties
14. Audits of SLA Compliance
15. Escalation Clauses
16. Data Ownership
17. Business Continuity Data Security and SAS 70 Type 2 Audits
18. Disaster Recovery
19. Data Privacy Conditions
20. Suspension of Service
21. Configuration and Customization
22. Exit Strategy

Figure 13 - 22 Contracting Key Clauses for SaaS

1. Cost
   Customer need to ensure that there is no hidden cost in the SaaS contract (Menken & Blokdijk, 2009). Therefore a clear statement on the cost related issues should be included in the contract.
   a. Setup Costs
      Avoid set up and additional services costs like database or software installation or data uploads, because, in the SaaS model, the software should already be installed at the supplier's site, and data upload should be part of the service (Gartner, 2008)
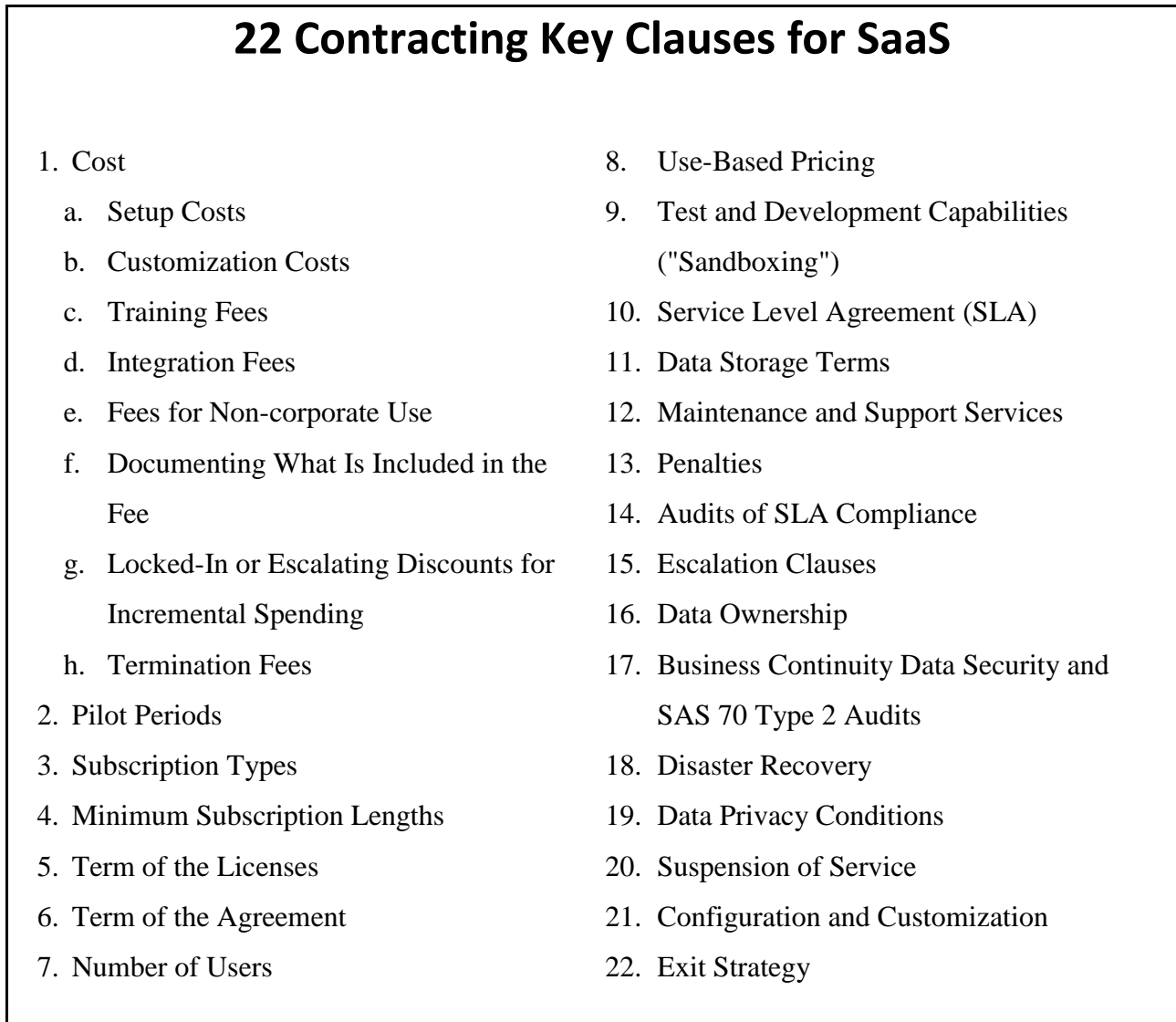   b. Customization Costs
      For customization costs SaaS suppliers' rates need to be compared and contrasted with ESP rates for doing the equivalent work. Lock in discounted consulting rates for the duration of your contract to cover legitimate consulting work (Gartner, 2008)
   c. Training Fees
      End-user training on general use and new features should be done online, and users should be clearly notified of this training before new features are activated. Some SaaS suppliers offer basic training for users included in the monthly fee (Gartner, 2008)
   d. Integration Fees
      Understand if additional license fees are required for integrated applications, or if the integration is a one-time service fee (Gartner, 2008)
   e. Fees for Non-corporate Use
      a per-user model does not work well if the application has too many unpredictable and unidentifiable users (Gartner, 2008).
   f. Documenting What Is Included in the Fee
      Be clear at the outset what is included in the fees, and which functionality or services are charged extra and the relative costs. When defining the products, don't contract for product names; rather, include generic descriptions of the functions and services in the contract (Gartner, 2008).
   g. Locked-In or Escalating Discounts for Incremental Spending
      Lock in prices and discounts for the duration of your contract, or ensure that these volume discounting bands are included in the contract and that you are entitled to reduced pricing if your aggregate usage would put you into a new band (Gartner, 2008)
   h. Termination Fees
      Companies should ensure that they can get out of a contract in any given month without financial penalty (Gartner, 2008)..

2. Pilot Periods
   Company can ask for pilot the SaaS application without charge (apart from professional service fees if required). Prior to undertaking any pilot, organizations should negotiate all contract terms and minimum discounts that would be due if the pilot is successful, on the basis that there will be little leverage if the pilot is successful (Gartner, 2008)

3. Subscription Types
   This refers to the type of subscription model or pricing metrics that a SaaS provider will offer. For example, will they offer a monthly subscription service or will they offer an on-demand pay-as-you-go type payment model to their customers (Menken 2008; Menken & Blokdijk 2009; Gartner 2008)

4. Minimum Subscription Lengths

   If a company chooses a pay-as-you-go subscription model to pay for their software services, then they do not have to worry about minimum contract terms or subscription lengths because they will only be charged for what they use and are free to cancel their subscription whenever they wish. However, if a client chooses to pay for their services via a monthly subscription, then they should check and confirm whether the provider has any minimum subscription terms or not. If the provider has the minimum subscription term, then the customer cannot cancel their subscription until after their minimum contract term has expired (Menken 2008; Menken & Blokdijk 2009)

5. Term of the Licenses

   It is imperative to negotiate price lock-ins for the duration of the initial contract, if the contract is for more than one year, so the price cannot increase during this period. Thereafter, there should be price caps tied to an index, such as the Customer Price Index, or a pre-negotiated percentage (Gartner, 2008).

6. Term of the Agreement

   For increased leverage, ensure that the renewal after the minimum term is not automatic (Gartner, 2008). All the terms used in the agreement should be clearly defined as well (Menken & Blokdijk, 2009). As example, the term business hours may differ between customer's and SaaS provider's perspective due to geographical differences. The customer's perspective on the length of the business hours itself may also differ from the SaaS provider's perspective. Therefore any important term should be clearly defined in the agreement.

7. Number of Users

   The number of users allowed to access the software should be made clear in the terms and conditions of the contract (Menken 2008, Menken & Blokdijk 2009)

8. Use-Based Pricing

   Try to negotiate the ability to reduce the license quantities after 90 days without cancellation penalties. If you can't negotiate this, don't over commit to subscriptions. Negotiate volume bands that allow you to buy incrementally at lower prices when you reach higher volumes (Gartner, 2008).

9. Test and Development Capabilities ("Sandboxing")

   Organizations with more than 200 users should try to reduce sandboxing fees by leveraging more-favorable policies from competing suppliers, or try to only pay for those users who are doing the sandboxing work (Gartner, 2008).

10. Service Level Agreement (SLA)

    This is a formal written agreement that is made between a supplier and their customer. It is used to make clear the standards that will be used, to help measure the performance of services and their delivery (Menken 2008; Menken & Blokdijk 2009; Gartner 2008). Service Level Agreements will have a set of guarantees or promises made by a supplier to their customers. If a supplier does not meet these guarantees set out in the SLA, then they will

usually reimburse their customers in some way.

11. Data Storage Terms
In a SaaS model, all of users data used for the service will be stored in the SaaS provider's data centre, therefore the SaaS suppliers will usually provide a certain amount of data storage with their SaaS subscription level for free (Menken 2008; Menken & Blokdijk 2009; Gartner 2008). It is important for the customer to understand their SaaS supplier's storage terms, so that they can avoid paying additional unnecessary cost.
Since the customer's data will be kept outside the company, it is important for the customer to make sure that the SaaS provider will keep their data secure. This should be included in the data storage terms and conditions along with the statement about the penalties that they will need to pay to the customer if this data is breached (Menken 2008; Menken & Blokdijk 2009; Gartner 2008). This term also include the assurance that SaaS provider will back up the data and a clear statement on what will they do when something goes wrong. To ensure that their data is well looked after, a business must ensure that their supplier writes down exactly how their clients data will be secured in their Service Level Agreement contract (Menken & Blokdijk, 2009).

12. Maintenance and Support Services
Ensure that updates and upgrades are guaranteed as part of the monthly fee and are not installed at the supplier's discretion. Support entitlements (for example, response time, time to repair problems or number of permitted contacts) should be spelled out in the contract. Ensure that the maintenance entitlements cannot diminish on annual contract renewal, for the amount of money paid. Create clear escalation processes in case a problem needs to be dealt with by the software supplier's development team (Gartner, 2008). Customer should also make clear on whether or not customer support remain free or will it be charged after a certain number of support tickets have been used up (if a ticket-based support system is used) (Menken & Blokdijk, 2009).

13. Penalties
If service levels are not met, negotiate penalties and escalation clauses. Penalties, if they are offered, often take the form of credits, rather than refunds (Gartner 2008; Blokdijk 2008).

14. Audits of SLA Compliance
It is very important that customers are allowed to audit the SaaS supplier's books, records, and measurement and monitoring tools to ensure adherence to the SLA and the correct payment of any penalties (Gartner, 2008).

15. Escalation Clauses
Escalation clauses should ultimately oblige a senior member of the SaaS supplier to update a senior person within the user organization twice a day (Gartner, 2008).

16. Data Ownership
Ensure that data is owned by the company and can be transferred or migrated without fee if the customer requires the data for analysis, or backup for compliance reasons, or if the deal is terminated. Ensure that you can decide on the data transfer mechanism (batch, real time) and the format (flat file, relational database management system, spreadsheet, ASCII, XML,

original format or current application service provider format). Also ensure that the SaaS supplier is obliged to deliver you the data at the end of the contract (Gartner, 2008).

17. Business Continuity Data Security and SAS 70 Type 2 Audits
There should be a clause in the contract regarding security and audits (a minimum of SAS 70 Type 2 audit should be conducted) (Gartner, 2008) such as for identity management (for example, termination of the supplier's employee accounts within a limited time period), breach notification and availability. Some organizations may also want to require background checks and drug testing for SaaS supplier's employees who have access to confidential information (Gartner 2008; Menken & Blokdijk 2009). The audit is important to ensure that the SaaS supplier is compliant with the minimum compliance regulation of the customer.

18. Disaster Recovery
Ensure that the SaaS supplier has arrangements for disaster recovery and is obliged to conduct disaster recovery testing. Be clear that there will be no additional cost to process at other sites if there's a disaster and the primary location is shut down. This cost should be borne by the SaaS supplier as part of the monthly fee (Gartner 2008; Menken & Blokdijk 2009).

19. Data Privacy Conditions
Supplier is responsible for security, data protection and compliance with local laws (Gartner, 2008).

20. Suspension of Service
There should be a clause that payments in current legitimate dispute should not lead to a suspension of service (Gartner, 2008).

21. Configuration and Customization
Make sure to differentiate in the contract between configuration and customization. The configuration should be free and part of the service while customization will usually provided by the supplier with additional fee. This fee calculation should be stated upfront in the contract (Blokdijk, 2008).

22. Exit Strategy
In the case of the customer wants to quit their subscription to the service or would like to move to another SaaS supplier, an exit strategy should be stated in the contract where the SaaS supplier should provide a form of transition support to enable the customer to move from current SaaS to the next strategy chosen. Any cost that might occur for this support should be stated in the contract (Blokdijk 2008; Menken & Blokdijk 2009).

7.3.3. Roles and Responsibilities for Transition Phase

Transition is the phase where the outsourcing relationship is established between the organization and the supplier (Au et al, 2001). All parties need to begin planning the transition as soon as it is reasonable to believe the deal may go ahead. Transition phase ends when both parties sign a transition acceptance form that all aspects of the arrangement are fully operational (Cullen et al, 2005).

Responsibilities	Business Manager	Information Manager	Project	Service Manager	Purchaser	Delivery Supervisor	Compliance Manager	Process Manager	Technical Specialist	Supplier
Preparation of contractual documents.			C	R	A/R	C	C	I		
Prepare Negotiation Strategy and Prioritize Negotiation Items			C	C	A/R		C			
Conduct Effective Negotiations				C	A/R					R
Finalize and mobilize all plans (e.g. communication, risk, setup, acceptance)	I	I	A/R	I						I
Manage the transfers (3rd party contracts, work-in-progress, etc)			C	C	A/R	R				I
Manage the knowledge retention and transfer				I		A/R			R	R
Finalization and Contract Signature	I	I	I	C	R	A/R				R
Implement retained organization and contract management		I		I		A/R				R
Conduct acceptance, closeout and post-implementation review	C	C	A/R	I		I		I		I

R = Responsible; A= Accountable; C=Consulted; I=Informed

Table 10 – Roles and Responsibilities for Transition Phase

The responsibilities for this phase have been discussed in chapter 4 (section 4.2) and we will discuss the distribution to the roles in this section.

In this phase, the activities related to negotiation and contract is being performed, starting from preparing the contract related documents, negotiation itself to the finalization of the contract. These entire contract related activities lies within the accountability and responsibility of the purchaser while getting information needed from different parties like Project, Service manager, Delivery supervisor and compliance manager (Beulen et.al., 2006).

Meanwhile, a transition project is usually being rolled to finalize and mobilize all plans such as for communication, risk, setup and acceptance. Delivery supervisor as the role who will manage the contract in the next phase will also need to start manage the transfer of the contract, work in progress, etc. Delivery supervisor will also need to manage the knowledge retention within the customer company. The SaaS supplier will need to transfer the knowledge that need to be retained by the customer to its representative, which is Technical Specialist. Delivery supervisor holds both final and executive responsibility for finalization and contract signature with the supplier along with the support by the Purchaser. The service manager may be consulted. Delivery supervisor is also the one who implement retained organization and contract management. We draw up the role of the supplier here to show the interfaces of the activities that will touch directly with the supplier (Beulen et.al., 2006).

7.4. Manage

In the traditional software implementation, a lot of time and money is spent by the customer on the deployment management and updating of their software applications. SaaS eliminate this on the customer's side because it is now the SaaS supplier who deals with these issues, allowing the customer to concentrate more on their business aims. The main of SaaS is to take the management strains of software maintenance, deployment and support from customers, while at the same time putting control of software services back into the hands of the SaaS suppliers (Menken, 2008).

7.4.1. Service Management Processes

There are a number of service management processes from the ITIL framework that can play a role in SaaS support and delivery (Menken & Blokdijk, 2009). In their book, Menken & Blokdijk (2009) discussed these processes from a SaaS supplier perspective; while in a research by Wu & Chua (2008), these processes are discussed from the customer perspective. We will discuss the processes and use the two researches above as a base of our research. Nonetheless since this research is purposed to help a company to implement SaaS, therefore we will see the processes from the customer perspective.

1. Service Level Management

The ability for customer to easily manage and monitor the performance level of their SaaS service is an important factor. It allows the customer to determine whether performance related problems are caused by them or whether these problems are caused by the SaaS supplier (in which case customer should invoke the penalty clause in their Service Level Agreement) (Menken& Blokdijk, 2009). Wu & Chua (2008) agree with this perspective that customer can manage the performance of their SaaS suppliers by having a Service Level

Agreement signed. Monitoring of the service level itself will be in the form of monthly report from the supplier to customer where a monthly meeting should also held between the customer and supplier to go through this report. The content of the report should be around the Key Performance Indicator that shows the performance of the supplier in fulfilling the requirement of the customer.

2. Capacity Management

The goal of the Capacity Management process is to ensure that cost justifiable IT capacity in all areas of IT always exists and is matched to the current and future agreed needs of the business, in a timely manner (Menken & Blokdijk, 2009). When the supplier does not proactively forecast and manage the capacity requirements for a software service, it will run the risk that customers will be unhappy with the services. The application might be too slow, time out or even drop out; or maybe customers might need to wait hours on the line when contacting the helpdesk. Therefore, from a customer perspective, customer needs to make sure that supplier has a capacity plan (including the capacity needs for the disaster recovery site) in place and regular meetings should be held to make sure that customer inform the number of future demand to the supplier so supplier is aware of what will come to them and be prepared to handle this capacity (Menken & Blokdijk, 2009; Wu & Chua, 2008).

3. IT Service Continuity Management (ITSCM)

The goal of ITSCM is to support the overall Business Continuity Management process by ensuring that the required IT technical and service facilities (including computer systems, networks, applications, data repositories, telecommunications, environment, technical support and Service Desk) can be resumed within required, and agreed, business timescales (Menken& Blokdijk, 2009). A lifecycle approach should be adopted to the setting up and operation of an ITSCM process. ITSCM is a cyclic process through the lifecycle to ensure that once service continuity and recovery plans have been developed they are kept aligned with the Business Continuity Plans (BCPs) and business priorities (Menken& Blokdijk, 2009).

For SaaS model, in a case of situation happened, customer must be given the courtesy of proactive communication from the supplier to let customer know what is happening and how long it is going to repair. The only way customer can ensure this can be achieved is by having assurance and evidence from the supplier that testing of the procedures is being done on a regular basis (Menken & Blokdijk, 2009; Wu & Chua, 2008)

4. Availability Management

The goal of Availability Management process is to ensure that the level of service availability delivered in all services is matched to or even exceeds the current and future agreed needs of the business, in a cost-effective manner (Menken & Blokdijk, 2009)

Availability for SaaS model require a clarity on the measurement, since the nature of the service delivery environment is through the internet. When user encounters slow response on the application or application cannot be accessed, it does not automatically means the service from the SaaS supplier is not available, there is always a factor or possibility that the problem occurs in the customer's connection to the internet. Therefore in the availability management, all definitions, terminology and understanding need to be clarified to make sure everybody is on the same page (Menken & Blokdijk, 2009). Any planned downtime for backups, upgrades etc should also be communicated to the customer (Wu & Chua, 2008).

5. Financial Management for IT Services

IT Financial Management enables an organization to fully account for the amount spent on IT Services (Menken & Blokdijk, 2009). Supplier need to provide customers with a pricelist that already includes all variable costs for maintenance and unplanned events and any other cost, the pricelist will also enable the customer in building internal budgeting and operational calculation (Menken & Blokdijk, 2009; Wu & Chua, 2008).

6. Information Security Management

Information Security Management is needed to align IT security with business security and ensure that information security is effectively managed in all service (Menken & Blokdijk, 2009). This is a very important for SaaS delivery, not only the systems need to be secure to ensure the guaranteed availability of the service, but the SaaS supplier has the responsibility for the content, the information of the clients. So supplier need to ensure the data centers, systems and software secure enough to be able to guarantee this. This includes physical security at the data center or server room, it also includes organizational and procedural security measures (Menken & Blokdijk, 2009). Customer needs to ensure there is a periodic security audit and vulnerability scan being done and customer will also request an external audit according to their compliance items that they would like to check from the supplier (Menken & Blokdijk, 2009; Wu & Chua, 2008).

7. Knowledge Management

The ITIL process of Knowledge Management plays an important role in the capturing and utilization of data, information and knowledge about systems, solutions, services, processes and resources (including people). This process helps to understand how the various IT components work together to deliver the solution or software as a service.
The knowledge extends beyond the software application and covers all support and maintenance issues (Menken & Blokdijk, 2009). SaaS supplier should create a knowledgebase such as user guide of the application and FAQ (frequently asked questions) document

(Menken, 2008). These documents will help customer in solving small problems that can be solved with an easy fix and also enable customer to retain the knowledge of the application itself.

8. Incident Management

We have discussed incident management for SaaS more detail in chapter 7 when discussing the SaaS Support Model.

We argue that there are 3 variation of support model for SaaS implementation.

1. All the support (1st line, 2nd line, 3rd line) resides in the SaaS supplier side.
2. Customer company still owning a service desk (1st line support) which will communicate with the service desk of the SaaS supplier side which will later on escalate the incident to 2nd line and 3rd line support.
3. Customer Company still owning a service desk (1st line support) and 2nd line technical support and the incident will only be escalated to the SaaS supplier technical support (3rd line support) if it is involved with product issues that can be solved by the customer's 2nd line support.

Which model to choose will depend on (Menken & Blokdijk, 2009) :
1. Level of support provided by the SaaS supplier.
2. Level of support that the customer company would like to retain within their own company.
3. How much will support related issues cost

9. Change Management

Change Management is needed to ensure all changes are assessed, approved, implemented and reviewed in a controlled manner (Menken & Blokdijk, 2009).

Changes arise for a number of reasons (Menken & Blokdijk, 2009), including:
1. Requests of the business or customers, seeking to improve services, reduce costs or increasing ease and effectiveness of delivery and support
2. From internal IT groups looking to proactively improve services or to resolve errors and correct service disruption.

The process of Change Management typically exists in order to (Menken & Blokdijk, 2009):
1. Optimize risk exposure (defined from both business and IT perspectives)
2. Minimize the severity of any impact and disruption
3. Deliver successful changes at the first attempt.

Change management in a SaaS model should be managed by the supplier with a global audience in mind since the customer for a certain application can be located all around the world. Certainly customer does not want to have an unavailable service during its peak hours

because of supplier wants to roll out some changes. For example, a supplier based in Europe might roll out their changes and releases over night, not taking into consideration that overnight in Europe is during business hours in Australia. The Change Management process doesn˟t only cover changes to the source code of the application, but also to critical documents like SLAs, Disaster Recovery Plans, and the Service Catalogue. The process also covers changes to the delivery process as this may impact the user experience.
In a conclusion, customer needs to have assurance from the supplier that they will be consulted by the supplier to assess the risk to service continuity and to assess the impact of the changes on customer when the change is going ahead (Menken & Blokdijk, 2009; Wu & Chua, 2008).

10. Release and Deployment Management

The purpose of Release and Deployment Management is to deliver, distribute and track one or more changes in a release into the live environment. In conjunction with Change Management, Release and Deployment will enhance an organization's capabilities to develop, compile, reuse, distribute and rollback releases in accordance with defined policies that improve efficiency and reduce business disruption (Menken & Blokdijk, 2009).

For SaaS, the same with traditional software implementation, new patches, emergency releases, security fixes or major upgrades will have to be implemented. But most important for the success of this process is communication. The same with change management, in this release and deployment management customers need to get assurance that supplier will let them know what is going to happen and when it is going to take place(Menken & Blokdijk, 2009). For a major application release, user retraining must be provided for the customer; while for any major upgrades, a user acceptance test (UAT) should be planned for customer (Wu & Chua, 2008).

11. Configuration Management

Configuration Management is a process that tracks all individual Configuration Items (CI) in a system (Menken & Blokdijk, 2009). For SaaS model, sometimes SaaS supplier provides some self-configuration functionality to the end user. Customer need to be clear on what are the items available for them to configure.

12. Problem Management and Service Desk Management

Service desk management is the process of handling incident and requests while Problem Management is when a process which takes over the unresolved incidents and then identify the root cause of the problem and find a resolution to prevent it from recurring ((Menken & Blokdijk, 2009).
Both Problem Management and Service Desk Management will be a black box processes where customer will only be contacted when SaaS supplier will need to get further information from customer to resolve the problem. Customer just need to reassure by getting the information on how fast will supplier response to the incident and solve the problem, this measurement is managed through Service Level Management process.

All of the processes discussed above are owned by the SaaS supplier which means that SaaS supplier is the one responsible to perform and manage these processes. How will SaaS supplier perform these processes is seen as the black box since customer does not have full control on how will the supplier perform all of their processes. But what customer should do is to ensure that they are communicated properly by the SaaS supplier and SaaS supplier achieved the service level required and fulfill all the requirements from the customer according to the agreements signed between them.

7.4.2. Improvement for SaaS

Any improvement to the service usually initiated from the SaaS supplier. SaaS suppliers usually does not provide improvement/enhancement request for the customers, but they do provide something called User Group Community (Menken, 2008). User group community is a community which consists of the customers of the SaaS supplier. Through this community, a representative of the customer's company can suggest improvement in the functionality, support level or any other changes that they would like in order to improve their business. The more number of company in the user company who demand a certain improvement request, the higher possibility that the SaaS supplier will fulfill this request.

7.4.3. Roles and Responsibilities for Manage Phase

This is the part of the lifecycle where the service is actually delivered and all of the activities needed to ensure that customer get the service accordingly are being performed.

As you may already notice in the responsibility list below, there is none mentioned about the activities related to the service delivery itself such as service desk, incident management, etc. The reason for this is, as we have discussed in the previous section on service management processes, in SaaS model all of the service management processes are now become the responsibility of the SaaS supplier. Therefore the activities for the customer in the manage phase is minimum and just to ensure that the SaaS supplier is delivering the service accordingly.

Responsibilities	Information Manager	Service Manager	Delivery Supervisor	Technical Specialist	Supplier	Compliance Manager
Deliver Service reporting	I	A	R	I	R	
Strategic review meeting	C	A/R	R	C	R	
Tactical review meeting	I	A	R	C	R	
Manage risk, issues, and escalations	C	A/R	R	C	R	
Plan and effect continuous improvement	C	A/R	R	C	R	
Evaluate and audit supplier (controls, performance, compliance)		A/R	R	C	C	R

R = Responsible; A= Accountable; C=Consulted; I=Informed

Table 11 – Roles and Responsibilities for Manage Phase

The responsibilities for this phase have been discussed in chapter 4 (section 4.2) and we will discuss the distribution to the roles in this section. Overall, the Service Manager is the one accountable and responsible for all of the contract management activities (Beulen et al, 2006). Beulen did not make a distinction between a service manager and delivery supervisor, but as have we discussed in the earlier chapter, we have made a distinction between these two. Therefore, in performing the activities in this phase, the service manager will share the responsibility with the delivery supervisor. Delivery supervisor will have a full responsibility in non strategic activities such as monitoring service reporting (usually monthly) and tactical review meeting. Supplier will also be responsible in all of the activities, except for the evaluation and audit where they are now the object to be evaluated therefore their role here is only consulted. As someone who retain the knowledge on the application in the customer side, technical specialist should be consulted in all activities except for report delivery where this role is only informed. In the manage phase, little contribution will be done from the business related side, therefore information manager here is only consulted in few activities. Lastly when performing the audit and evaluation to the supplier, compliance manager will be responsible as well in helping with the audit since this role is the owner of the compliance list of the customer's company.

7.5. Evaluate, Review or Terminate

When the customer almost reaches the ending of the contract, they will do a review on the contract and the relationship with the Supplier itself. When the customer see that they are satisfied with the performance of the supplier then they will extend the contract without any big actions needed except the renegotiation of the contract. If they are not satisfied with the performance or see another supplier which is better than the current one then an exit plan need to be executed.

Companies that are implementing SaaS should always have a second or third choice SaaS supplier in their mind. This important since when changes affect their SaaS supplier, it will also affect them. The SaaS software market is still maturing and it is very likely that a SaaS supplier could merge with another company or even be taken over (Menken & Blokdijk, 2009). By having a second or third SaaS suppliers in the wings, business are ready to shift suppliers if any changes do occurs or if their existing SaaS supplier can no longer deliver the software services.

7.5.1. Exit Plan

In this phase, an exit plan will be executed. Exit plan will help customers to achieve continuity in service while they are changing suppliers or bringing a service back in-house (Joint et.al., 2009). For SaaS, the property of the company that needs to returned by the supplier is the data, but uncertainty as to any data location within a cloud-sourcing arrangement may prohibit exit plan from effectively working. Another risk that might happen is that the technical formats which cloud-sourcing suppliers use to store data offer services are not typically compatible between suppliers (Joint et.al., 2009). Therefore customers need to ensure that the agreements with the SaaS supplier include the necessary provisions to ensure that their data is not "locked" into a supplier's service. The first step in the exit plan is that customer need to get the data back from the current supplier and the current supplier should give support and help as well in the transition phase of the current service to the new service used.

7.5.2. Roles and Responsibilities for Evaluate, Review or Terminate Phase

The objective of the activities within this phase is to assess other options available and see whether customer would like to extend the contract or not with the current SaaS supplier. Therefore the roles who are participating in the activities are similar with the activities in the Business Strategy phase. The responsibilities listed below have been discussed in Chapter 4 (section 4.2) and we will discuss the division of these responsibilities between the roles.

Responsibilities	Business Manager	Information Manager	Service Manager	Delivery Supervisor
Asses next generation option (back source, retain, handover)	I	A/R	R	C
Asses contract outcomes and lessons		I	A/R	C
Knowledge refreshment (e.g. market, technology, price, metrics)	I	A/R	R	
Re-asses requirements – re-scope, re-bundle and re-design	C	A/R	I	
Determine the strategy and business case for each option	I	A/R	R	
If customer decides not to extend the contract then continue with activities in Business Strategy and Supplier Selection Phase				

R = Responsible; A= Accountable; C=Consulted; I=Informed

Table 12 – Roles and Responsibilities for Evaluate, Review or Terminate Phase

Information Manager will be generally accountable for all of the activities except for the contract outcomes assessment since Service Manager is the one accountable for the service management. Service Manager will share the responsibility with the Information Manager in assessing next generation option, knowledge refreshment and building the business cases since Service Manager own the knowledge on the suppliers (the pricing, performance, etc) and also can give input on any issues from a IT perspective. Delivery supervisor will be consulted since this role is the one communicating most regularly with the supplier. Business manager will mostly only inform except when reassessing the requirements, then they are going to be consulted since business managers are the owner of the business needs which drives the requirements.
If a decision of extending the contract has been made then the next activities will only regarding the contractual agreements and pricing negotiations. The other hand, if it is decided not to extend the contract, the exit plan will be invoked to enable the current supplier to do knowledge and data transfer to the customer or to the new supplier. Exit plan is important to ensure a smooth handover and transition between the current supplier to the new supplier. By not extending the contract, that means the cycle will roll again and return to the Business Strategy phase and then to Supplier Selection phase and so on.

Part IV

PRACTICE

With the elements described in Part III, we will discuss the practical part of the research in this part. We will start with the analysis result of the current situation within GF IT BAM and defines the gap of the current situation with the recommended situation. Later on the validity of the SaaS sourcing lifecycle will be shown. As the last part, we will end this part by giving the recommendation and conclusion of the research. Chapter 8 will answer question 5 of the research questions and Chapter 9 will answer question 6 of the research questions.

8. Current Situation

8.1. Current Project Within GF IT
Confidential

8.2. Roles

This section describes the roles which currently exist in Shell GF IT related to application implementation and support.

Confidential

8.3. Current Outsourcing Strategy
In this section we will describe the current situation in Shell where we gathered the information from Shell documents, stakeholder interviews, and experiences of some projects and also by using a real project as a case study where we participated and gave direct input to the project.

8.3.1. Business Strategy
Confidential

8.3.2. Supplier Selection
Confidential

8.3.3. Transition

Confidential

8.3.4. Manage

Confidential

8.3.5. Evaluate, Renew or Terminate

Confidential

9. Recommended Situation

In this chapter we will discuss the gap between the current situation in Global Function IT Shell with the one proposed from this research.

9.1. Roles

Confidential

9.2. Business Strategy

Confidential.

9.3. Supplier Selection

Confidential

9.4. Transition

Confidential

9.5. Manage

Confidential

9.6. Evaluate, Renew or Terminate

Confidential

9.7. Roles and Responsibilities for Shell

Confidential

10.   Validation of the SaaS Sourcing Lifecycle

We see the importance of the validation for SaaS Sourcing Lifecycle to ensure its usability when it is implemented.

We will discuss the validity of the SaaS Sourcing Lifecycle based on three major aspects of rigor (Merriam, 1995) :

1. Internal validity
2. Reliability
3. External validity (generalizibility)

10.1. Internal Validity

Internal validity asks the questions: How congruent are one's findings with reality?. There are several strategies can be employed to strengthen the internal validity of a qualitative study (Merriam, 1995):

1. Triangulation, the user of multiple investigators, multiple sources of data, or multiple methods to confirm the emerging findings
2. Member checks, taking data collected from study participants, and the tentative interpretation of these data, back to the people from whom they were derived and asking if the interpretations are plausible.
3. Peer / colleague examination, asking peers or colleagues to examine the data and to comment on the plausibility of the emerging findings
4. Statement of researcher's experiences, assumptions, biases presenting the orientation, biases, and so on, of the researcher at the outset of the study
5. Submersion/engagement in the research situation, collecting data over a long enough period of time to ensure an in-depth understanding of the phenomenon.

In this research, we sought information from multiple sources such as document reviews and interviews. The findings found are also seen taking place in the case study itself. Therefore we are confident that the "reality" of the situation is being conveyed as "truth-fully as possible". This shows that this research has executed the first strategy, triangulation.
After conducting the interviews, we interpreted and summarize the findings and sent it back to the interviewers to get confirmation of the interview result, this shows that this research has execute the second strategy, member checks.
The result of this research, SaaS Sourcing Lifecycle, has been reviewed by the project members of the project in GF IT BAM and also approved by the project committee which shows that this research has also execute the third strategy, peer examination.
We argue that this research has also perform the fourth strategy since in this report I share my experience within the case studyitself, and share the perceptions that I got from the case study.
Lastly we also argue that we have concluded the fifth strategy by joining the project until the project ends which gave me the sufficient time to collect information.

Based on these evidences of performing all the five strategies to strengthen internal validity of the research, we argue that the SaaS Sourcing Lifecycle is internally valid.

10.2. Reliability

Reliability is concerned with the question of the extent to which one's findings will be found again (Merriam, 1995). We argue that we have fulfilled this requirement by creating the questions guide used during the interviews. Therefore we believe if another interview rounds are conducted to different people with same role in GF IT then the findings will be the same.

10.3. External Validity

The extent to which the findings of a study can be applied to other situations refers to the question of external validity, or generalizability (Merriam, 1995).

In their book, Huberman and Miles (2002) define two aspects of generalizability :

1. Internal generalizability, generalizing within the community, group, or institution studied to persons, events, and settings that were not directly observed or interviewed.
2. External generalizability, generalizing to other communities, groups or institutions.

The case study for this research is a project within a subset of HR IT, but we argue that the SaaS Sourcing Lifecycle is applicable for any other future SaaS implementation greater such as the whole HR IT and even Global Function IT. Communication sessions regarding the SaaS Sourcing Lifecycle are currently being prepared to communicate the result of this research (as part of the GF IT BAM deliverables) to the Global Function IT level therefore we see the generalizability of this research result for Global Function IT level. We also argue that the SaaS Sourcing Lifecycle can be strategically applicable Downstream, Upstream and Project and Technologies, in a conclusion, Shell enterprise level. This argument is based on the fact that the SaaS Sourcing Lifecycle has been part of the GF IT BAM project's deliverables, where this deliverables are reviewed and approved by the project committee which consists of the lead of Shell's organization which responsible to design Shell's common / enterprise sourcing strategy. From the facts discussed above, we argue that the SaaS Sourcing Lifecycle has a valid internal generalizability.

As for external generalizability, case studies outside Shell need to be done. Since in this research there is no case studies have been performed outside Shell, SaaS Sourcing Lifecycle is not yet valid on the external generalizability part.

11. Recommendation

In this section we will give some recommendations both to the SaaS Sourcing Lifecycle itself and also for Shell.

11.1. For SaaS Sourcing Lifecycle

In the validation process of the SaaS Sourcing Lifecycle, we see that trust and relationship has been an important consideration in making the decision regarding the supplier, therefore this will need to be incorporated in the SaaS Sourcing Lifecycle.

Another item is that in the decision tree when deciding a go-no go decision for SaaS, we have not considered a consideration for SAP as a choice when deciding a type of application, so the strategy within Shell is to also consider SAP as one of the option strategy. Another input we get is that in the SaaS Sourcing Lifecycle we also have not give real form on change management guidelines which is something important within Shell.

The SaaS Sourcing Lifecycle has been tested only in one case, therefore we recommend Shell to use the lifecycle in another projects starting from the very early phase and the re-evaluate and improve the lifecycle.

All of these recommendation are coming from a Shell perspective, therefore its generality need to be validated before integrated to the SaaS Sourcing Lifecycle.

11.2. Recommendation for Shell

We see there are 8 items that needs to be followed by Shell to successfully implement a SaaS model:

1. Make sure that you really know whether or not you want SaaS.
   When building the business needs, business should understand their own business strategy, what they are aiming for in the coming years. They should understand strategically whether they will need a service with unique functionalities because it will bring strategic business added value, or they just need something standard because the application will not support something that will bring strategic added values.

2. Start change management in the early stage
   Simplification is something that needs to be kept inside every body´s head. Without having this way of thinking, Shell will have tendency to go to the gold plated solutions which of course leads to higher price. Awareness of how the decision of choosing SaaS will impact the users or any part of Shell will need to be communicated so their expectations can be managed.

3. Perform Business Impact Assessment (BIA[1]) before any decision making.
   As we have discussed before, SaaS model is not always the right answer to outsource an

[1] BIA: Standard method to assess the consequences from the loss of availability, integrity, confidentiality and/or regulatory compliance of an information asset.

application.

Therefore BIA should always be done to know what the impacts are, or risks faced by the business related to information security. The information resulted from the BIA should be part of the input used in the decision making process to go for SaaS or not.

4. SaaS Supplier needs to comply with the compliance items defined by Shell

   Compliance is a really important factor in Shell. Therefore any selected SaaS supplier should comply with the compliance items defined for a typical SaaS application.

5. Project needs to engage with BAM and IRM in gathering requirements for RFP

   Both BAM and IRM is the owner of non functional requirements for a solution. Projects need to engage with BAM and IRM to gather the requirements regarding service level, information security, compliance, supportability and other non functional requirements. The requirements gathered from BAM and IRM then need to be merged with the functional requirements into the request for proposal that is going to be sent to potential suppliers. This action will ensure that the supplier is qualified from the business perspective and also IT perspective

6. Execute Threat Vulnerability Assessment (TVA[1]) for most potential supplier

   Once there is a most preferred supplier has come into the picture, a TVA will need to be done to this supplier to ensure awareness of the business on the vulnerabilities of the service provided by the SaaS supplier. The business may choose to accept, transfer or remediate the risk. The decision from the business will then drive the decision to choose that certain supplier or not.

7. Ensure that the key clauses for SaaS are included in the contractual agreements.

   Shell need to have a minimum checklist of the key clauses that they would like to have in the contractual agreements with the SaaS supplier. This is due to the reason that the contractual agreements for SaaS service are usually provided from the SaaS supplier to the customer and not from the customer (in this case Shell) to the SaaS supplier. The contracting key clauses list resulted in this research is sufficient to be used as the checklist.

8. Any enhancement proposal is voiced only through the user community.

   The business should not directly have a contact with the Supplier and request any enhancement, since with the size of Shell as a company, will bring a high possibility of turning a SaaS into an ASP. Shell representatives should only voice their enhancement requests through the user community. The decision making to realize this request or not will still lies to the SaaS supplier, since any enhancement in the solution will also apply to other customer. For any enhancements in a SaaS model, there will be no extra fee charged to the customer since any enhancements are included in the service fee.

[1] TVA: A process used to assess the likelihood of incidents happening. Combined with the business impacts this determines the risk: RISK = IMPACT * THREAT * VULNERABILITY. Threats are e.g. human errors, natural disasters, criminal intents from within or outside the company. Vulnerabilities are deficient or missing controls.

12. Conclusion

In this section we will discuss the conclusion of the project research, implication of the project research both for the academic and practical side, limitation of the research and also suggestion for further research that can be conducted on SaaS Sourcing Lifecycle.

12.1. Conclusion of the project research

The main objective of this project research is to come up with a generic sourcing lifecycle that Shell can follow to ensure a successful implementation of SaaS type application in Shell. The main objectives are supported by the answers of the sub questions. We believe by addressing this research questions, and seeing the applicability in the case study, the main objective of the research has been met. We conducted a thorough overview of theories and practical literature to build the SaaS Sourcing lifecycle for SaaS implementation which then validated in a real case situation which is a project within HR IT. The description and guidelines described in this report form sufficient information to guide Shell in implementing a SaaS.

We will summarize the research questions from chapter 2.3 and explain how we addressed each of these research questions.

1. *What are the needs regarding implementation of SaaS type application in Shell?*

    The answer to question 1 is addressed in chapter 3 – Problem Description . We gather the information needed by conducting interviews of the main stakeholders identified within a typical sourcing implementation in GF IT. From the interviews conducted we drew out a list of findings which we later on transformed into a list of needs of GF IT regarding a SaaS implementation. These needs can be seen in table 2 – Needs concluded from findings.

2. *What is SaaS?*
    a. *What is the definition of SaaS? Section 5.1*
    b. *What is the difference between SaaS with, Application Service Provider (ASP), and Managed Service? Section 5.2 (ASP), section 5.3 (Managed Service), 5.4 (Characteristics)*
    c. *What are the characteristic of a SaaS type application? Section 5.4*

    Question 2 is addressed in Chapter 5, where first we answer question 2.a. by exploring the definition of SaaS from the literature and describe it in section 5.1. To answer question 2b, we explore the definitions of ASP and Managed service which we describe in section 5.2 and 5.3. Based on the definitions we have gathered for SaaS, ASP and Managed Service, we define a table that shows the characteristics of each sourcing models. This characteristics table can be found in section 5.4.

3. *What is Sourcing Lifecycle?*

To answer question 3, in section 4.1 we firstly explore the concept of outsourcing in general and also the types of outsourcing such as IT Outsourcing, Business Process Outsourcing and Knowledge Outsourcing. In section 4.2 then we explore the concepts of the sourcing lifecycle itself. From the literature study, we explore the sourcing lifecycle from 5 different authors and derive a sourcing lifecycle with 5 phases, which are : Business strategy; Supplier selection; Transition, Manage relationship; Evaluate, renew or terminate. For each phases we also derived the responsibilities that need to be performed.

4. *What is generic sourcing lifecycle for a SaaS implementation?*
   a. *What are the roles need to exist in the customer organization for a SaaS implementation?*
   b. *What is the business strategy for SaaS?*
   c. *What are the criteria in selecting SaaS provider?*
   d. *How is the support model for SaaS?*
   e. *What are the important contracting key clauses for SaaS?*
   f. *How are the management processes for SaaS?*
   g. *What is the exit plan for SaaS?*
   h. *What are the roles and responsibilities for each stage of the SaaS sourcing lifecycle?*

Answers for question 4 are addressed in chapter 6 and 7. In chapter 6, we discussed the roles that need to exist in customer organization for SaaS which will answer question 4.a., while chapter 7 is dedicated to answer the rest of question 4. We firstly depict the SaaS Sourcing Lifecycle itself, the phases along with the detailed items needed for each phase, gathered from the needs discussed in chapter 3. Along that we also discuss the difference of the SaaS sourcing lifecycle compared with other sourcing lifecycle where we argue the focus point of the whole lifecycle for SaaS will be in the Business strategy, Supplier selection and Transition phase.

Answer for question 4.a. is addressed in section 7.1 Business Strategy where we describe the advantages and disadvantages or SaaS based on both IT and Business perspective. It is important for business to understand the advantages and disadvantages that a SaaS model will bring to them and also how it will impact IT department, vice versa. Another item discussed in this section is SaaS fitness criteria where we build the decision tree to help business and IT to decide whether they really want to go for SaaS or not.

Question 4.c. is addressed by discussing the detailed items needed for the Supplier Selection phase, which are the criteria in selecting a good SaaS provider.

Answers to questions 4.d. and 4.e. are addressed in the detailed items for Transition phase which are the support model and important key clauses for SaaS. These items are discussed in section 7.2.

Answers for question 4.f. addressed the management processes of the Manage Relationship phase of the lifecycle. We discussed these processes in section 7.4 where the processes are mainly handled or managed by the SaaS supplier and the customer only participate in the touch point activities or just being informed. In this section we also discuss the mechanism for proposing enhancement in a SaaS model.

Answer for question 4.g is addressed in section 7.5 where we describe the actions for consumer to ensure the smoothness in performing the exit plan.

Lastly answer for question 4.h. are described in the last section of each section 7.1, 7.2, 7.3, 7.4 and 7.5 where we discuss the division of the responsible defined in section 4.2 to the roles defined in chapter 6 (answer of question 4.a).

5. *How does the generic SaaS sourcing lifecycle apply to GF IT?*

The answer for question 5 is addressed in chapter 8. We start by describing the the project in GF IT BAM where we joined as a project member, and also another project in HR IT where we also joined as a project member by giving contribution with the deliverables resulted from the GF IT BAM project. Later on we describe the current roles   exist in Shell related to sourcing model implementation and also the current outsourcing strategy of GF IT. The information for this current strategy are gathered through Shell documents, semi-structured interviews, observation of several case studies and also a real case study of the HR IT where we actively involved in it. We discussed the current outsourcing strategy based on the five phases of the outsourcing lifecycle. The information gathered here will be used as a base to answer question 6.

6. *What are the gaps between the generic sourcing lifecycle and the current situation?*

Answer to question 6 is addressed in Chapter 9, where we first start by defining the roles within GF IT that will still exist in a typical SaaS model and how will their responsibility be different with the current responsibilities they have, and we also define the roles that will disappear in a SaaS model. This will give Shell an idea on how much work effort that they will need for a SaaS implementation. We then continue to discuss the result of the information gathered in chapter 8 and how should it be done according to the SaaS Sourcing Lifecycle built in chapter 7. We end chapter 9 by mapping the roles and responsibilities described in chapter 7 into Shell specific roles.

12.2. Implication

12.2.1. Implication for theory

Through this research, we gather information on literature theory, arrange and build it into one consecutive framework which explains the SaaS implementation cycle starting from the steps of taking the decision in business strategy itself until the end phase of the SaaS implementation itself. This will help to see the academic perspective of a SaaS as a whole instead of some partial parts.

Through the case study, we also get another point of implication for theory, which is Trust and Relationship factor. In evaluation criteria for selecting supplier, these two factor were not discusses in the theories or best practices reviewed within this research.

12.2.2. Implication for practice

From the guideline provided through this research, companies that are interested in implementing SaaS will be guided throughout the whole implementation cycle starting before when they decide to choose SaaS until the stage when they decide to move from SaaS model to another model or when they move to another SaaS company.

The result of this project research will:

1. Help companies in making better IT investments by choosing the right sourcing model.
2. Guide them in getting the capable and competent supplier when they do decide to go for SaaS
3. Guide them to ensure all of required legal items for a SaaS model are included into the agreement with the supplier.
4. Build stronger relationship with Supplier by making a clear role and responsibilities between customer and Supplier.
5. Give them an idea on how to manage the SaaS implementation (indirectly) and how much effort needed for it. This will enable them to do the calculation on the workforce needed within their company.
6. Guide them on what to do when they decide to move to another supplier or to another outsourcing model

12.3. Limitation

There are several items that we see as limitation of this research. First this research is based only on situation and requirements within Shell and is validated only in one case study in Shell, although it has been an input to several projects. Second, the action research performed did not start from the early phase of the lifecycle, since I joined Shell in the middle of the project, so the implementation only covers the mid to end part of the sourcing lifecycle. The last limitation we see is the items discussed within the sourcing lifecycle is not researched in most detail, as example we discuss the criteria to choose the supplier but we did not discuss the weighting of this criteria. These limitations can be cooperated in the future research suggestion.

12.4. Further Research

We see several improvements can be done to the SaaS Sourcing Lifecycle as future research. The first one will be to research on what are the Key Performance Indicators that should be applicable for SaaS, these KPIs are an important items that need to be incorporated into the Service Level Agreements between customer and the SaaS Supplier.

The second possibility for future research is to do a quantitative research on the weighting of the criteria in selecting the supplier. The criteria discussed in this research are only based on the need of these criteria to be included but not the prioritization of these criteria.

The third suggestion will be the research on how to incorporate trust and relationship into the lifecycle especially in the business strategy and supplier selection part, since as we have seen in shell, relationship is really an important thing to be considered when making a strategic decision regarding to supplier. A quantitative research can also be done in measuring how big the influence of this factor in the decision making is.

Our last suggestion for further research would be on the change management of implementing SaaS itself. In the Shell case we can see change management would be a high challenge in implementing SaaS since Shell usually can have all of the controls that they want. Implementing SaaS means learning to let go the control to the supplier, so change management is important to convince the stakeholders and help to ensure a smooth run and maintain condition during the contract.

References

Au, W., Leung, H., Chan, K.& Li, M., 2001, "Outsourcing Tools for IT" (2001). AMCIS 2001 Proceedings. Paper 357.

Bennett, C. and Timbrell, G. T, 2000, "Application Service Providers: Will They Succeed?". *Information Systems Frontiers* 2, 2 (Aug. 2000), 195-211

Beulen, E., Ribbers, P., and Roos, J, 2006, "Managing IT Outsourcing, Governance in global Partnerships". Routledge, Abingdon, UK.

Blokdijk, G., 2008, "SaaS 100 Success Secrets - How companies successfully buy, manage, host and deliver software as a service (SaaS)", Emereo Pty Ltd

Cerullo, V. & Cerullo, M., 2004, "Business Continuity Planning : A Comprehensive Approach", Information Systems Management (21:3), 70-78.

Collins, 2010, http://www.accountingsoftwarenews.com/advanced_solutions/asp_hosting/asp5.html

Cullen, S., Seddon, P., and Willcocks, L, 2005, "Managing Outsourcing: The Life Cycle Imperative," *MIS Quarterly Executive* (4:1), March 2005, 229-246.

Dan, Ma, 2007, "The Business Model of "Software-As-A-Service". *IEEE Internation Conference,* 701-702

De Jong, F., 2008, "The Right Governance Framework for Managing an Offshore IT Outsourcing Relationship", *University of Twente.*

Gartner, 2006a, "Evaluating Software-as-a-Service Providers: Questions to Ask Potential SaaS Providers".

Gartner, 2006b, "Software as a Service: Understanding Whether It's Right for You"

Gartner, 2007, The Cost and Benefits of SaaS vs. On-Premise Deployment".

Gartner, 2009, "Essential SaaS Overview and 2009 Guide to SaaS Research".

Godse, M. & Mulik, S., 2009, "An Approach for Selecting Software-as-a-Service (SaaS) Product," *2009 IEEE International Conference on Cloud Computing*, 155-158

Guo, W.& Wang, Y., 2009, "An Incident Management Model for SaaS Application in the IT Organization", 2009 International Conference on Research Challenges in Computer Science, 137-140

Hirschheim, R., Heinzl, A., Dibbern, J., 2009. "Information Systems Outsourcing: Enduring Themes, Global Challenges, and Process Opportunities", Springer

Huberman, M. & Miles, M.B., 2002, "The Qualitative Researcher's Companion", Sage Publications, London, UK.

ITIL, 2010, "Roles within ITIL V.3"
http://wiki.en.it-processmaps.com/index.php/Roles_within_ITIL_V3

ITIL Role, 2010, "ITIL Roles Descriptions"
http://www.itsmcommunity.org/downloads/ITIL_Role_Descriptions.pdf

Jae Yoo Lee, Jung Woo Lee, Du Wan Cheun, Soo Dong Kim, 2009, "A Quality Model for Evaluating Software-as-a-Service in Cloud Computing", *2009 Seventh ACIS International Conference on Software Engineering Research, Management and Applications,* 261-266

Jaques, R., 2010, "Every Cloud Has a Silver Lining"
http://www.accountingnet.ie/business_finance/Every_Cloud_Has_a_Silver_Lining.php

Joint, A., et.al., 2009, "Hey, you, get off that cloud?", Computer Law and Security Review (25:3), 270-274.

Kliem, Ralph L., 1999, "Managing the Risks of Outsourcing Agreements", *Information Systems Management*, 16: 3, 91 — 93

Knorr, E, 2010, "Software as a Service: The Next Big Thing",
http://www.infoworld.com/article/06/03/20/76103_12FEsaas_1.html

Lacity, M., Hirschheim, R., 1993, "Information Systems Outsourcing: Myths, Metaphors and Realities", Wiley, Chichester.

Liao, H. and Tao, C, 2008, "An Anatomy to SaaS Business Mode Based on Internet". In *Proceedings of the 2008 international Conference on Management of E-Commerce and E-Government* (October 17 - 19, 2008). ICMECG. IEEE Computer Society, Washington, DC, 215-220

Lu, Y., Sun, B., 2009, "The Fitness Evaluation Model of SAAS for Enterprise Information System," *2009 IEEE International Conference on e-Business Engineering*, pp. 507-511, , 2009

Menken, I. 2008, "SaaS - the Complete Cornerstone Guide to Software as a Service Best Practices Concepts, Terms, and Techniques for Successfully Planning, Implementing and Managing SaaS Solutions". Emereo Pty Ltd.

Menken, I. & Blokdijk, G., 2009, "SaaS and Web Applications Specialist Level Complete Certification Kit - Software as a Service Study Guide Book and Online Course", Emereo Pty Ltd

Merriam, S. B. , 1995, "What can you tell from an N of 1?: Issues of validity and reliability in qualitative research", *Journal of Lifelong Learning v4*, 51-60.
Mitchell, R. K., B. R. Agle, and D.J. Wood. (1997). "Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of Who and What really Counts." in: *Academy of Management Review* 22(4): 853 - 888.

Shell, 2010, accessed from Shell World (internal page of Shell)

Smith, M. A. and Kumar, R. L, 2004, "A theory of application service provider (ASP) use from a client perspective". *Inf. Manage.* 41, 8 (Nov. 2004), 977-1002

Summit Strategy Report, 2004, "The Future of Software as Service-And the Partners ISVs will Need to Get There"

Sun, W., Zhang, K., Chen, S.-K., Zhang, X., and Liang, H., 2009, "Software as a service: An integration perspective". 558-569.

Vytautas, S & Aura, D., 2007, The Role of Knowledge Process Outsourcing in Creating National Competitiveness in Global Economy, Engineering Economics (3:53), 35-41

Voser, P, Shell CEO, 2010

Wallace, M.& Webber, L., 2009, "IT Governance Policies and Procedures 2009". Aspen Publishers.

Wende, K., 2007, "A Model for Data Governance – Organizing Accountabilities for Data Quality Management", 18th Australasian Conference of Information Systems A Model for Data Governance (December 5-7, 2007)

Yang, D.-H., Kim, S., Nam, C., and Min, J.-W, 2007, "Developing a decision model for business process outsourcing," *Computers & Operations Research* (34:12), 3769-3778.

Appendix

Appendix 1- Detailed question of the gap analysis interviews
Confidential