IT Service Management
Transformation to Utility Computing

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Transformation to Utility Computing

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IT Services are currently delivered in very heterogeneous and customized delivery methods to enterprise organizations. IT organizations have tailored processes, contracts and technology. managed by both internal and external suppliers for each service. During the past years multi-sourcing has been growing and most of the IT services are operated by multiple suppliers. Surprisingly only very few of the client organizations are getting planned savings and service quality within multi-supplier environment. Multi-supplier management requires work and governance maturity more than expected.

In the next IT megatrend - utility computing – IT services are highly standardized. Same services are provided for multiple clients simultaneously over the network with same terms and conditions. At the same the amount of suppliers will increase as some suppliers are better in some services than others. The ITSM management changes more to supplier and standardization management.

This change is giving IT organizations two massive concerns. How should organizations choose service delivery model to use and if delivery is mixture of in-house, outsourcing and cloud sourcing services how to clarify the responsibilities, operating model and scorecards between suppliers? What are the requirements to comply when doing the transformation to utility model and what will be the affect for technology, processes and contracts?

The transformation journey from highly tailored service model to highly standardized services requires some careful preparations in order to succeed. This thesis presents a new model for managing multiple suppliers based on ESM and ITSM and presents that processes, technology and contracts needs to be standardized in order organizations to be mature enough to take the benefits of utility computing.

This thesis is summary of two publications, Multi-Supplier Integration Management and Service Standardization to Utility model. These publications are available at the end of the thesis.

Cloud Computing, Multi-sourcing, ITSM, Supplier Management, Standardization

Markus Vuorinen

IT Palvelujohtamisen Toimintamallien Siirtymä Pilvipalveluihin

Perinteisesti IT-palvelut on toimitettu yrityksille hyvin heterogeenisesti ja yritysten tarpeiden mukaisesesti muokattuina. Jokaisella organisaatiolla on omat IT-palveluprosessinsa, -sopimuksensa sekä -teknologiansa, joita operoivat yrityksen sisäiset ja ulkopuoliset toimittajat. Viime vuosien aikana monitoimittajaympäristöt ovat yleistyneet ja monen yrityksen IT-palveluita tuottaa useampi eri toimittaja. Vain harva IT-organisaatio on kuitenkin onnistunut saavuttamaan monitoimittajaympäristössä laadulliset tai taloudelliset tavoitteet.

IT-palveluiden hankinta muuttuu oleellisesti, jos yritykset siirtyvät niin kutsuttuihin pilvipalveluihin. Pilvipalvelut ovat hyvin vakioituja - samaa palvelua toimitetaan useille asiakkaille verkon ylitse identtisenä ja yhtäläisillä ehdoilla. Pilvipalvelujen yleistyessä yritykset hankkivat palveluja yhä useammalta eri toimittajalta, koska toimittajien laatu vaihtelee palvelusta toiseen. IT-palveluiden hallinta muuttuu tuotantoprosessien hallinnasta toimittajien ja standardien hallinnaksi.

Yllä kuvattu muutos aiheuttaa IT-osastoille kaksi suurta kysymystä ja huolenaihetta. Ensiksi yrityksen on päätettävä, miten se valikoi ulkoistettavat palvelut. Jos yritys päättää ostaa sekä perinteisellä että uudella tavalla tuotettuja palveluita, keskeiseksi kysymykseksi nousee, miten vastuut, toimintatavat, mittarit ja sopimukset määritellään osapuolten välille. Toiseksi yrityksen on pohdittava, mitä vaatimuksia palveluiden pitää täyttää, jotta ne voidaan siirtää pilvipalveluiksi ja mikä on niiden vaikutus teknologioihin, prosesseihin sekä sopimuksiin.

Muutos asiakasräätälöidyistä palveluista hyvin standardisoituihin utiliteettipalveluihin vaatii huolellista suunnittelua onnistuakseen. Tämä tutkimus esittelee uuden mallin, jota voi hyödyntää monitoimittajaympäristöjen hallinnassa perustuen ESM- ja ITSM-käytänteisiin. Lisäksi tutkimuksessa todennetaan että yrityksen prosessit, teknologiat ja sopimukset on vakioitava, jotta organisaatio voi hyödyntää pilvipalveluja.

Tämä tutkimus on kooste kahdesta julkaisusta "Multi-Supplier Integration Management" ja "Service Standardization to Utility Model". Nämä julkaisut ovat tutkimuksen lopussa liitteinä.

Pilvipalvelut, Pilvi, Monitoimittaja, ITSM, Toimittajien hallinta, Vakiointi,

Index

1   INTRODUCTION

Over the past few years there has been a new megatrend, cloud computing. Cloud computing will provide organizations with possibility to move their computing to a shared platform and buy applications or infrastructure as a service. This new model is expected to provide organizations with considerable savings and also service flexibility. This trend is making IT to an utility industry same way as water or electricity are also utilities– charges are based on actual usage.

It is anticipated that cloud services will consolidate for few major providers with massive data centers. Customers are expected to have possibility to change their providers to where ever they think they can found best match for price and quality.

Being a shared service for multiple clients the cloud services are not tailored and clients' needs to accept that service functionality and configuration are highly standardized. Within this thesis it's discussed what type of standardization is expected in order to succeed in transformation from in-house services to shared services.

Companies' IT organizations are transforming more into an integrator of IT services provided both by internal and external suppliers. Therefore it becomes crucial that they know the methodology how to integrate different suppliers for e.g. to network, email and CRM services. This methodology to integrate suppliers is known as MSIM – Multi Supplier Integration management.

2   LIST OF PUBLICATIONS

This thesis consists of an introduction for the following two publications, which are referred to [P1]-[P2] in the text:

[P1] – M. Vuorinen, 2011, "MSIM -Multi-Supplier Integration Management"

[P2] – M.Vuorinen, J. Rajamäki, 2011, "Process, Technology and Contracts: Service Standardization to Utility Model"

These papers has been submitted to 7th Conference on Standardization and Information Technology, SIIT 2011, Berlin; Germany 28-30 September 2011. Confirmation of acceptance is expected on 1.7.2011.

3 LIST OF ABBREVATIONS AND ACRONYMS

This chapter is summarizing different abbreviations and acronyms for this thesis. These abbreviations are mostly typical terms in Information Technology Service Management (ITSM) domain.

IT Service Management (ITSM) is a process-based practice intended to align the delivery of IT services with needs of the organization, emphasizing benefits to customers. ITSM involves a shift from managing IT as stacks of individual components to focusing on the delivery of end-to-end services using best practice process model.

CRM	Customer Relationship Management
De Facto	Industry practice based standard
De Jure	Law based standard
ESM	Enterprise Service Management
ITIL	Information Technology Infrastructure Library
ITSM	Information Technology Service Management
MSIM	Multi-Supplier Integration Management
QoS	Quality of Service
RACI	Matrix for Responsible, Accountable, Consulted and Informed
SLA	Service Level Agreement
SLO	Service Level Objective

4   RATIONAL

4.1   What is cloud / utility computing?

The whole anatomy of cloud computing is very much misleading as usually people understand it very differently. There is no single definition of cloud computing of what it is and what it does. The concept of cloud computing is easiest to understand with analogy.

Cloud computing is the phase where innovation has gone through the cycle through bespoke and products to be ready to be delivered as service. By example we can review the CRM systems and how those have gone through the cycle.

1. Innovation step was to use computers for providing data lists. Early adopters of technology
2. Bespoke to create databases for managing customer data to marketing purposes etc.
3. Products were step that organizations bought, supported and configured their own CRM's
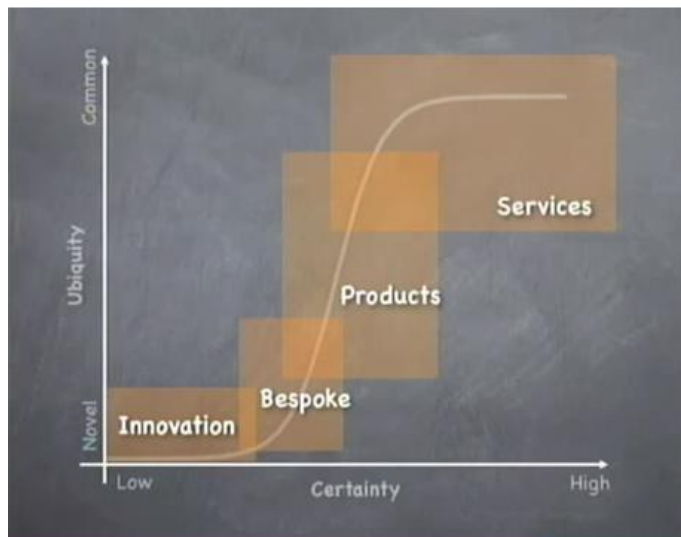4. Services such as Salesforce provide CRM as a service per user per month when required.

Figure 1, Wardley S. (2009)

When looking at the graph we can understand that this is happening in multiple areas. Things that were once innovation and later products can be now delivered over the network as a service. Music is now possible to be retrieved as a service through Spotify or similar and maps through Google Maps for example.

If IT services are mature enough to be commoditized then cloud computing makes it possible to deliver IT services as utilities over the network.

Artifacts that organizations used to build or buy for them are now provided based on usage it's either based on time, listening time, transactions, users or data amounts. This is important difference – organizations are buying service instead owning products. The managerial practices differ greatly if organization is managing just the end result of service instead of the delivery methods for managing product.

4.2   History of Service Management

Traditionally IT services have been insourced or outsourced. The platform and applications have been dedicated for single organization only. Trend is however more and more to buy IT as service instead of owning the devices and applications and having dedicated support groups. This new model is expected to provide organizations with considerable savings and additional flexibility. Customers are expected to have the possibility to change their providers where ever they think they can found best match for price and quality for their requirements. The utility/cloud services are collection of technologies and practices enabling computing to be delivered across multiple computers and capacity is available as needed and billed according to actual usage.

Earlier the organizations had had their own technologies which were partly legacy, custom support methods and processes and also tailored contracts both internally and externally. As controversy - global utility computing service suppliers have thousands of customers from different cultures which have very standard technologies, processes and contracts for their service catalog. In shared service all customers' need to follow service lifecycle the service conditions much more strictly than they are probably use to do earlier. The service provider will provide conditions for the service that customer' needs to accept and follow.

As mentioned the next wave of computing is expected to provide clients with flexibility to have their IT services provided as utility, some providers are stronger on providing other services while some suppliers are stronger providing other services. This means that customers need to be able to integrate multiple suppliers in to their IT service portfolio smoothly.

This thesis presents the methods that organizations should follow in order to comply to use utility services and go with journey of standardized services. Without this knowledge organization could not gain the benefits of utility computing. Additionally is described the model that organization should follow when integrating suppliers to their service catalogue and verify if their practices, methods and requirements are aligned. The first publication will show methods for verifying the supplier compliance from service perspective.

4.3   Research questions

The trend of utility computing makes IT organizations under massive pressure to transform their operating and governance model around. In order IT organization to be flexible, cost efficient and have their business requirements satisfied the organizations need to transform at least some of their applications running as utility service. This change is giving IT organizations two massive concerns

-    How should organizations choose service delivery model and if delivery is mixture of in-house, outsourcing and cloud sourcing services how to clarify the responsibilities, operating model and scorecards between suppliers?
-    What are the requirements to comply when doing the transformation to utility model and what will be the affect for technology, processes and contracts?

The first question is investigated in the first publication where is presented a new model for Multi-Supplier integration management. The second topic is investigated in latter research paper focusing on service standardization in utility model.

5   SCOPE AND STRUCTURE OF THE STUDY

5.1   Scope and objectives

The scope of this thesis is to refer and analyze the two publications and the dependencies of those for cloud computing, service standardization and multi supplier integration management. These papers are based on existing research papers and provides advanced model for optimizing the working methods and standards for ITSM and MSIM areas.

The objective is to propose and prove importance of new model for how IT organizations should transform to work as service integrators, using service standardization and multi-supplier integration management methods and practices.

5.2   Structure

This document is referring the earlier research on Service Standardization and Supplier integration management perspective. First this thesis describes the rationale for the subject and then moving further on describe the research status from service standardization and multi-supplier integration management perspective. After literature review there is discussion and conclusions summarizing the results of both publications. At the end of the document are both publications in full text. First publication is about Multi-supplier integration management and the latter one is about IT Service Standardization to Utility Model.

5.3   Methods

This thesis has been created following the methods originated by Hevner (2004) for Design Science in Information Systems Research. Hevner's seven criteria's for IS research and their appearance in this study are described below.

1: Design as an Artifact	This thesis will provide a model, an artifact that makes it viable for design science research.
2: Problem Relevance	IT Service management is crucial from technology requirement and business management perspective. This makes this thesis important for the community.
3: Design Evaluation	The evaluation of design is based on academic and IS research on the subject initially by creator and contents will be evaluated by peer review process.
4: Research Contributions	New models are created for MSIM and Service Standardization. New methods are presented for supplier management and utility standards compliance verification.
5: Research Rigor	Research is based on existing and respected research publications. All research material is academically compliant and relevant for IS research.
6: Design as a search process	The design solution is derived from previous research results in the same area.
7: Communication of research	This thesis is presented to wide amount of experts in ITSM domain and the thesis is publicly available in electronic format.

Table 1, IS Research

Outcome artifact of the research thesis is framework that proofs the relevancy of supplier management and standardization. This framework model is important as it helps organizations who are considering utility computing to better understand new service management approach. The parties in service management should understand the requirements and success criteria have in order to succeed using and providing utility computing services effectively.

This artifact, framework, is very relevant for organizations as it is straight forward to use. Model requires as it is input fuel business information and IT service design information and provides as how the supplier management should be done. It is essential for organizations to match quality with their requirements. It will make reduce the surprises, improve quality and schedule for service management.

Model is relevant and functional for defining new IT service delivery methods but it could be used also when evaluating the existing IT services and practices.

Earlier research on subject is narrowed and has been missing more comprehensive study to go through the different aspects of utility computing through in more detail.

Value is provided for both supplier and clients considering the utility computing and how to succeed making successful transformation from earlier practices to new practices.

5.4 Triangulation

Triangulation meaning that same research question is studied in multiple ways to find optimal answer for research question. This triangulation could be multiple research scientists, mixing multiple theories, methods or different research references.

Within this research the triangulation is through evaluation of external researches review from SIIT and Laurea, mixing multiple earlier researches papers and analyzing multiple earlier theories trying to find answer for same research question.

This diverse triangulation assures the quality of research paper.

5.5 Method consideration's

The Multi-Supplier Integration Management is very much based on human behaviors and involves complex collaboration. This thesis is a foundational study to create new framework and further research should focus on evaluating this new framework performance.

The chosen IS research method works for the initial design of creating new framework and it is effective method for creating new frameworks, however the qualitative improvements should be done only after framework is evaluated through Case study research.

5.6 Context of research

This thesis is made for demand of utility computing and ITSM operations. This research is in the crossroads for ITSM and utility computing. Operations of utility computing and IT service management demand support from research. This thesis contributes new frameworks that both research areas can use to support their operations better.

Figure 2 displays in more detailed how this thesis acquires information from earlier research, responds to demands from operations and contributes new IS research to research community.
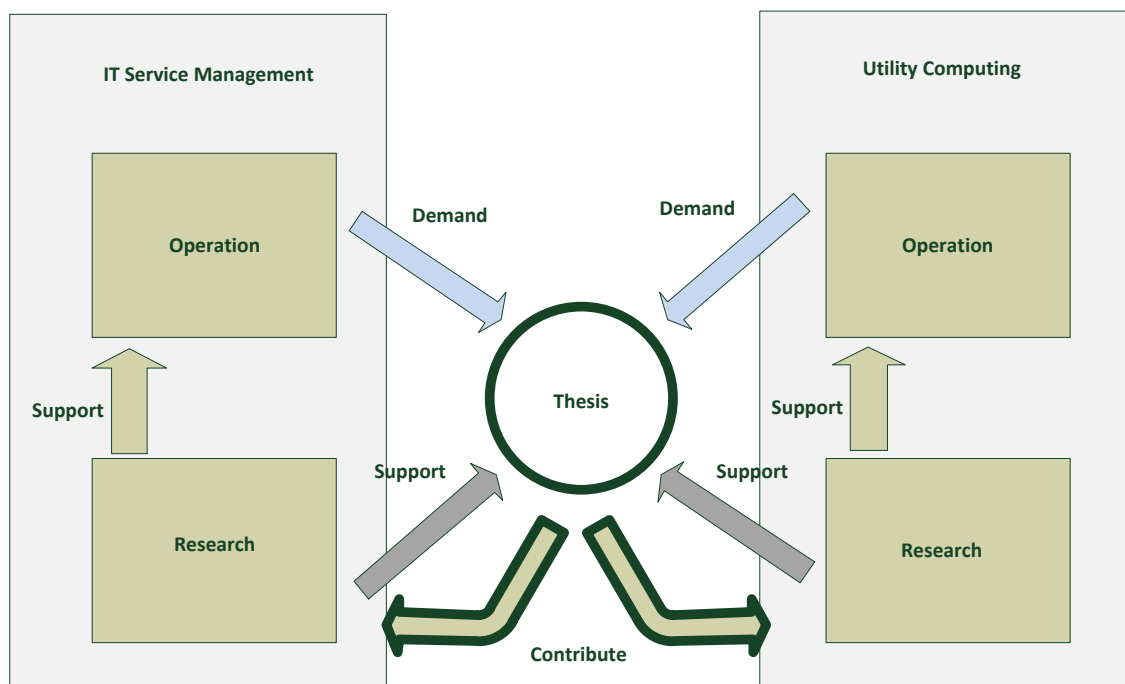
Figure 2, Vuorinen (2011)

6   REVIEW OF LITERATURE

6.1   Multi Supplier Integration Management

In this chapter is summarized briefly the earlier research from MSIM publication [P1].

When talking about IT services there is usually a whole concept of standard ITSM practices that is referred to. There are few different methodologies but in all of those there are similarity in IT service definitions and operations. This research is referring to ITIL, Information Technology Infrastructure Library (IT Service Management based on ITIL V3, 2007, itSMF International) that is describing the whole framework and practices for IT services in general. ITIL version 3 is the latest version and de facto standard for IT services globally.

Figure 3, itSMF (2007)

Hewlett-Packard has created their own ESM framework (Figure 4) which describes the governance model between the suppliers in multi-supplier environment. The supplier management framework has basic principle that IT organizations will work as integrators between the suppliers and the service consumers – from the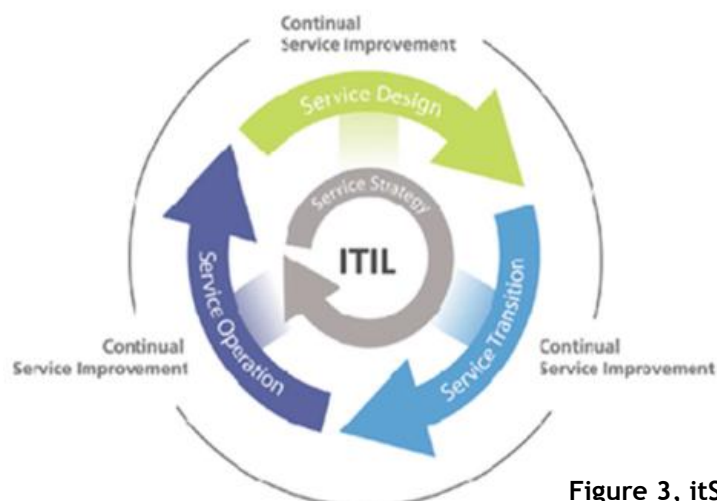 end users perspective it should not matter who is the supplier for which service, technology or processes. The service providers are invisible behind the corporate IT ESM framework interface. Ultimately if the service consumers are satisfied with the service quality provided through multiple suppliers the model is working fine.
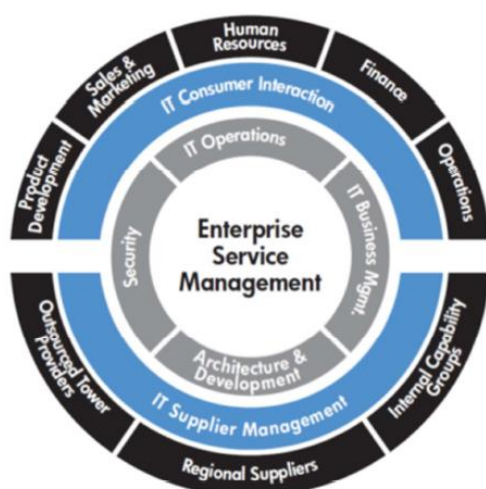
 Figure 4, Hewlett-Packard

The decision making of how and what IT services to deliver is hard for all organizations. La City & al (1996) have created two simple models that describes what services should be delivered as utility or outsourced service and which IT services should be eliminated or insourced. The principles are based on the matrix idea where is compared the service importance and advantages in the market against the volume and managerial practices around it. This model helps organizations in a simple way to understand the preferred delivery model for all services. It simplifies the organizatinons to understand why they are doing the sourcing decisions that they've done.

Ramakrishnan & al (2008) have studied the importance of responsibilities in service management. This is important subject for IT environments which are operated by various parties. Within their study are presented the models and methods how organizations could improve the arguing between the suppliers with basic RACI model definitions. Using RACI Matrix to define the clear responsibilities between suppliers is key factor to succeed in supplier management. In multi-supplier environment the roles of suppliers might be similar but responsi-

bility might differ. Therefore it is crucial to understand clearly and document the roles between suppliers and customers.

Debusmann and Keller (2003) in their thesis "SLA-Driven management of distributed systems using the common information model" are explaining the benefits of optimizing the service levels for all services based on their impact to business (Figure 4). It is possible to find optimal cost for the service based on possible unavailability or capacity impact for business processes. A weak IT service has the advantages of having low running cost but may generate high business losses - caused from low availability and customer defections due to high response times. A service with much better availability and lower response times will possibly generate lower business losses but have usually much higher running costs.
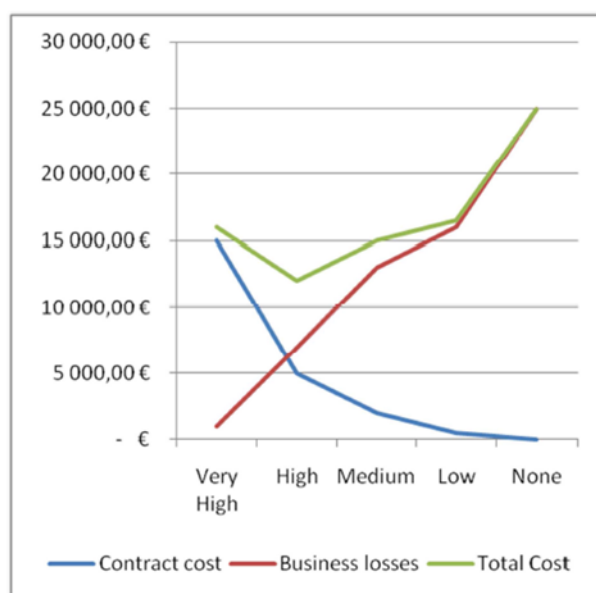
Figure 5, Vuorinen (2011)

6.2   Service Standardization to Utility Model publication

In this chapter is summarized briefly the earlier research from Service Standardization to Utility Model publication [P2].

Ross has studied several various types of outsourcing arrangements and based on the research has made some conclusions how organizations can achieve better outsourcing agreements. Ross expects that in future organizations will continue outsourcing as part of utility computing. Smaller organization will more likely make a partnership with one-supplier where larger organizations are more likely to use selective sourcing with a network of suppliers. It is noted that organizations are likely moving more and more their services to cloud as it is strategically more feasible to use resources when they are needed.

Buyya & al, 2008 have presented a new model where are computing capacity providers prov-
ing the capacity same models as today in electricity exchange. In today's electricity exchange
the market prices are changing based on the demand and supply. Similar model could work in
IT domain where holders of computing capacity could sell their capacity for market price and
those requiring it could buy it for the best price. Within this model there are brokers who buy
and sell capacity (computing, storage e.g.) and enterprises who can buy this capacity where
they can get it for cheapest and run their services on top of it.

Salle (2004) presents the history of IT management from "dark '70's" until the beginning of
21st century. It is described how the IT domain is starting to work in more structured way and
how same practices have spread around the world for IT service management. ITIL based IT
Service management principles has become de facto for IT domain. Same IT service manage-
ment frameworks being used; also core IT processes are looking similar in most of the compa-
nies. Salle describes also how the role of company's IT manager is changing from technical IT
expert to organization's strategic business partner managing the services based on the busi-
ness requirements.
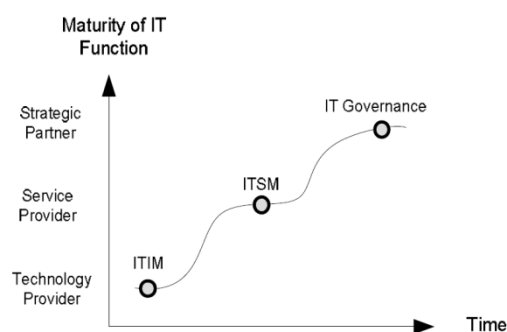
Figure 6, Salle (2004)

7 CONTRIBUTION OF THE AUTHOR

7.1 Multi-Supplier integration management

The thesis proposes a new framework for operating model in multi-supplier sourcing. This new model is combination of smart sourcing, usage of RACI matrixes and ongoing SLA management. This is a toolkit for ESM and makes the companies compliant with service requirement. When correctly applied model will improve the service quality, supplier collaboration and cost efficiency of IT services. The proposed framework provides organizations with sourcing method aligned with corporate ITIL practices.
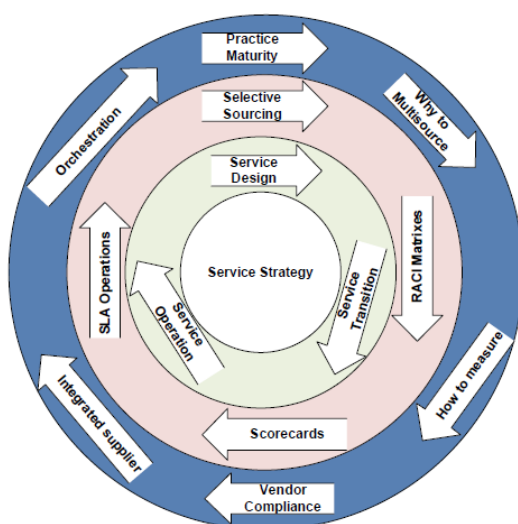
Figure 7, Vuorinen (2011)

If the multi-supplier governance on service strategy is done based on described practices there can be gained several benefits. The ITIL service strategy is divided into three phases, design, transition and operation. In this chapter the benefits are described for each phase. The decision about what and how to source is done in design phase. Using this framework gives organizations the right sourcing solution from the start. The ESM practice also guides to answer why that is being done.

In the service transition phase the RACI matrix usage will clarify in clear documented form the responsibilities between the client and suppliers. If this RACI matrix is done prior service operation phase a lot of problems during the operation can be avoided when all gaps and responsibilities are defined in advance. Based on the responsibilities defined in service transition can be designed initial SLA measures for contract.

Prior going to service operation phase the service compliance must be verified that suppliers are compliant with corporate service and policy requirements and assign correlating score-cards. During this phase the service is reviewed and performance evaluated if there are requirements to change the SLA levels. The benefit of adjusting SLA measures and levels at this stage is to have service levels responding to the business requirements.

In brief the model will allow multi-supplier governance deliverables to be well defined, measurable, aligned, sourced best way and service levels to be adjustable based on requirements. This model also provides organizations with answers why they are multi sourcing certain activities, are they compliant with their service requirements and if the targets are achieved.

7.2   Service Standardization

The state of current IT services is very heterogeneous as the services are usually tailored for each customer's requirements. Clients have had their own customized technologies, processes and contracts for each supplier.

As the IT services are coming utility services the tailoring of services is vanishing. Services can be provided efficiently for multiple customers with same technology, terms and conditions and processes. Cloud computing provides the benefits of massive scale. Services are provided over the network almost fully automated and charged based on actual usage. For most clients it is strategically more feasible to use resources when they are needed.

In order clients and suppliers to get the best benefits out of their IT services they need to focus on de facto standardization of their IT services.

- Organizations should focus how to standardize their technology and architecture to be technically compliant with utility services. All tailored non-strategic solutions should be planned for retirement or migration.
- Organization needs to assure that they are mature with global ITSM methodologies. ITIL framework is industry standard to be followed. To effectively work with IT suppliers with ITIL processes must be followed.
- Organizations are required to validate their maturity with contracts. Gentleman agreements should be moved to standard contracts. Terms of SLA's and QoS must be agreed with supplier in order to assure service quality and make service transferable.

	Standardized	*Non-Standardized*
Process	Ability to operate with practically any supplier. Capabilities to manage changes and problems between the companies not only between people.	Based on people relationships, no roles. Does not scale to support large business models.
Technology	Operations can be automated. Commodity, cost effective to run, transferrable from supplier to another. No special knowledge required.	Tailored and heterogeneous. No automation, a lot of manual work and client specific special knowledge.
Contracts	Predefined Service Levels and penalties, formal papers and agreements.	Based on gentleman agreements, no official warranties or penalties.

Table 2, Standardization, Vuorinen (2011)

8   DISCUSSION AND CONCLUSIONS

There is consensus in IT domain that utility computing will be revolutionary change to IT services and will change the methods in IT service management. This change will affect people, processes, technology, practices and all the service management principles we know of. Most of the enterprises are heading to cloud to make technology transformation and save costs at the same time.

The hardest part of cloud computing is journey to get there. Companies with existing governance, contracts and practices have to redesign the whole operating model of their IT. The benefits are obvious in many cases but the change for Enterprise organization does not happen overnight. IT services are complex systems which are maintained by multiple suppliers and dependent of several applications.

We can expect that organizations will transfer some of their IT services more towards utility model whenever they are redesigning the service. However matching responsibilities between utility providers and making service level agreements aligned with business requirements can be time consuming. There could be legal issues with storing data in another country or integrating systems between the clouds – only very few has migrated to another cloud or off the cloud.

It could be that cloud computing can resolve most of the current challenges related to costs, capacity and technology but at the same time it can create a bunch of new challenges to be

sorted. Organizations should validate their own maturity with utility computing before rushing after cloud service hype.

The management and integration of multiple delivery methods can be rewarding. However having metrics, service levels, processes, responsibilities and standards aligned and enforced to all suppliers is required to succeed. It must be taken into account that vendor management can be very resource consuming - it has been found out that multi-supplier management will usually pay off only in large companies. When planning to go for Multi-Supplier service model the cost of managing multiple suppliers must be calculated also.

8.1   Quality analysis and comparison of results

The research process for creating this thesis and related papers have been purely research of earlier methods and frameworks. Target of the thesis was to find a best possible combination of earlier frameworks and create a new way to use those together an aligned. Earlier frameworks have been researching the same research question from different angles. The end result of thesis has not identified that any of the earlier frameworks would have been inefficient or badly designed but they are all important and valid. During the research process there was not found any conflict between earlier frameworks. Studying of multiple of frameworks has improved the quality through triangulation process.

These new frameworks presented in publications are made to provide a more comprehensive framework that is combing the best practices of earlier research publications. This approach is expected to provide high quality. As analogy this research is answering to question "How to drive a car" whereas earlier researches have been answering "How to change gear" or "How to steer a wheel". Based on the following analogy we can identify that this study is not so much conflicting with earlier research but further research should be done with preferably case study methods to study the effectiveness of new more comprehensive framework.

9   OVERVIEW OF PAPER AND ITS EVALUATION

9.1   Evaluation

This thesis has been the summarizing the papers around Multi-Supplier Integration management and Service Standardization to Utility Model. These two papers alone do not cover all the ITSM practices that will be affected when utility computing comes popular. These papers cover an only very small portion of the different ITSM practices that will be affected by the utility computing – for supplier integration and service standardization.

This thesis is derived from world-class research papers and frameworks with mature methods and evaluated by research society. Therefore it is expected that frameworks are working and includes the right aspects from theory perspective. As noted in the Method chapters these frameworks have not been evaluated in a case study and no real life experiments have not been done.

As such the framework is valuable to IS research community only as new framework to be evaluated further before organizations are applying it in their daily operations.

9.2   Towards Future

The frameworks are done with theory triangulation only. It could be that not all framework affecting theories are taken into account. The next step of framework evaluation and triangulation is to test it with real life experiments and make modifications to framework based on the research results.

This thesis and papers describes only the where to transformation should end and why it is important. The transformation journey how the transformation should be done is yet one area to be further studied and where further research is very important.

As a summary this thesis this is important milestone for evaluating the transformation to utility computing. It helps research community to continue studying the effect of utility computing to organizations. Further research is expected to evaluate the framework in real-life studies and study how the transformation should be done.

10   FURTHER RESEARCH

Each organization has unique requirements for IT services. When external suppliers are providing IT services there might be inflexibility in standard services in multitenant service base. Supplier standard services might not respond to client requirements. The ways how organizations could manage the gaps between the supplier's standard services and clients requirements is vital to understand and study. Synergies and/or conflicts between the IT services need to be studied multi-supplier service base.

When companies gather their business requirements for service levels and functionality they usually can't find full match from market offerings. The comparison of suppliers with different types of services is challenging. There would be required a framework to compare need-to-have versus nice-to-have services to make services better comparable.

Most of the frameworks presented in this study are created for traditional outsourcing agreements. The different methodology of cloud-sourcing could however require that those frameworks are evaluated how they match to new possibilities and challenges. Only after these frameworks are reviewed to be cloud computing compatible those should be used for evaluating ITSM practices in utility computing.

This thesis has provided a new model for Multi-Supplier Integration model but this model has not been evaluated in real life scenario. Case study research should be done to evaluate the model performance for Multi-Supplier integration management.

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LIST OF TABLES AND FIGURES

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MSIM - Multi-Supplier Integration Management

Markus Vuorinen

Abstract— **Cloudsourcing and multisourcing are growing rapidly and are success criteria's for today's IT departments. IT services are often operated by multiple suppliers but only very few of the client organizations are getting planned savings and service quality within multi-supplier environment. ITIL, SLA Management, Enterprise Service Management, RACI Matrix and Selective Sourcing practices have been created to respond to this problem but never aligned to be jointly used during service lifecycle. Here is presented a model how multi-supplier environments should be managed. New method presents how existing frameworks should be aligned from service management point of view. This new aligned model is described also graphically and the achieved benefits are described in detail.**

Index Terms — **IT Governance, IT Outsourcing, Multi-supplier management, Service Management**

I. INTRODUCTION

IT departments are struggling with same problems about sourcing methods around the world. Organization's IT services requires several suppliers to run – usually different suppliers to operate e.g. software, hardware and network – and as the suppliers are usually competitors to each other there is hardly any collaboration between them unless strongly supervised by client. Industry is lacking of framework to manage multi-supplier IT service sourcing. Several companies are specialized to only certain areas; some companies are very effective at proving utility services, some at traditional outsourcing and some IT services are most effective when insourced. Ways to use and manage IT services are extremely diverted. IT-Governance methodologies have not been developed to respond for such a challenge. IT- governance has been lacking of a single framework to use for choosing sourcing strategy and is causing that suppliers are not collaborating enough and clients are facing problems with managing multiple service providers – both internal and external. At the same time organizations are not aware if their current practices are mature enough for multi-supplier management, why they should use multi sourcing and how to measure if it is successful. Within this paper is presented the new The Information Technology Infrastructure Library (ITIL) based framework which helps organizations to use effective methodologies for smart sourcing, responsibility definitions, clear service levels agreements, assuring that

services are responding to IT service strategy requirements and aligned to corporate IT services structure.

II. RATIONALE

There are wide differences in the operation frameworks applied to outsourcing; the vast majority of outsourcing disciplines assumes a one-to-one relationship between the client and the service supplier [3]. However the IT service management is usually complex and only very seldom the whole IT-service base is managed by single supplier. The everyday principles have been designed for operating with single supplier where as in real-life the IT services are managed by several authorities.

This paper will discuss the problem about the frameworks and practices originally created for one-to-one client-supplier services when working in complex multi-supplier environment.

"By 2006, 80 percent of Type A enterprises (leading-edge technology adopters) will externally source at least 60 percent of their IT-related services (0.7 probability)" [7]. Based on this information all organization needs to be able to manage their IT-suppliers and services in order to stay competitive. Supplier management has become a success criterion for all organizations. Many of the organizations are using multiple service providers but only very few of those are achieving the targeted expectations with multi-supplier sourcing model. [12]

Multi-supplier management is complex and important area for companies. Essential frameworks and practices are described in this document to improve organizations success in their sourcing strategies.

Earlier researches show that utility based computing, smart sourcing and RACI (Responsible, Accountable, Consulted, and Informed) matrixes are effective tools in supplier governance [1]. This research proves that these can be combined to support ITIL based service design. It is suggested that all these guidelines should occur in different phases of service lifecycle management. Together with Enterprise Service Management (ESM) framework this provides organizations with toolkit for successful sourcing strategy.

The purpose of this research is to study how organizations should operate within multi-supplier service base and create framework responding to this problem.

III.   REVIEW OF LITERATURE

A.   *ITIL - Continuous Service Improvement*

The Information Technology Infrastructure Library (ITIL) offers framework to delivery of IT services. It is not only the best practice framework but also a philosophy shared with people who work with IT service practice [6].

The fundamental service principle of ITIL is based on five phases of IT service lifecycle; Service Strategy, Service design, Service transition, Service operation and continuous service improvement [6]. These five phases and the relationships are described in Figure 1.
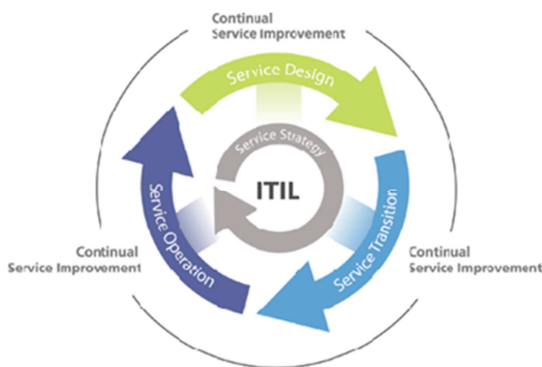

Figure 1 - Service Design [5]

Service strategy is the core axle in center of design, transition and operation phases and continuous service improvements including the projects, learning and programs which improve the inner circles performance and quality. [6]

B.   *RACI Model*

The RACI matrix is used to define role and responsibilities between the organizations. This RACI matrix captures cross supplier dependencies, roles and responsibilities for all suppliers in multi-supplier enterprise. Following are the definitions of each of the roles: "Responsible" the party authorized to execute the activity, "Accountable" the party that owns the "bottom-line" for the activity, "Consulted" the party involved in providing inputs to the activity and "Informed" the party informed on the outcome of the activity. [3]

Using RACI Matrix to define the clear responsibilities between suppliers is key factor to succeed in supplier management. In multi-supplier environment the roles of suppliers might be similar but responsibility might differ. [3] Therefore it is crucial to understand clearly and document the roles between suppliers and customers. Figure 2 is an example where is described the different activities in rows and the parties with corresponding roles in columns.

Function A=Accountable, R=Responsible, C=Consulted, I=Informed	Helpdesk (Vendor A)	Insfrastructure (Vendor B)
Incident Management Tool/Application Maintenance	I	I
System Monitoring & Alerts		A/R
Application Monitoring and Alerts		C
Incident Logging: Assign Severity, Priority, Application	A/R	I
Incident Escalation	A/R	I
Incident Response	I	A/R (If System)
Incident Closure	A/R	
Permanent Fix/Followup Activity	I	I
Applications Incident Reporting: SLA, Root Cause, Permanent Fix		I
Infrastructure Incident Reporting: SLA, Root Cause, Permanent Fix		A/R

Figure 2 - RACI example [1]

Suppliers in multi sourcing engagements which are individually accountable for their Service Level Agreements (SLA) are not usually accountable to each other. Here rules provide a framework for collaboration and co-ordination among suppliers. Development roadmap involves creation of supplier dependencies between the suppliers and determination of gaps in their management.

The process of creating these rules needs to be done by a core group which includes authorized supplier representatives and the client organization. The client company's role is important providing oversight responsibilities for implementation.

Unlike in traditional sourcing where a single supplier is given well defined work units and accountability, in multi-sourcing none of the suppliers is accountable for the entire scope of work. Scattered accountability makes supplier coordination and collaboration difficult for the client. Supplier governance through effective implementation of RACI matrix can help the client organization extract the most value from its supplier network.

C.   *Enterprise Service Management ESM*

Hewlett-Packard has published a framework [12] for organizations to manage with multiple suppliers. This framework is describing the key points what are the benefits and challenges for multi-sourcing. How can be defined if such is required and basic measurements to say if it's effective or not.

Most of the organizations who are doing multi sourcing are facing regular challenges and only very few has been able to achieve their expected targets [12]. Multiple governances, processes, different reporting's and support tools are killing the benefits of multiple suppliers and actually making it less effective than operations with single supplier in most of the cases.

In order to make multi sourcing possible and right way it must meet four criteria's: (1) Transforming organization processes, governance and policies to support multi-supplier operations it must make aggressive transformation plan which usually requires at least two years' time and approximately 5 % increase in IT operations spending. The transformation plan must be supported by the company executives. (2) Organizations must define why they are looking for multi-supplier possibilities. Are the reasons, money, service quality, speed adjustment or what? These reasons must be tangible and

measurable. (3) Companies must evaluate their current IT practices and evaluate which of those are mature enough with multi-supplier practices or those need further development. (4) When companies have defined the areas and objectives they should prefer a phased approach towards multi-supplier model rather than Big Bang approach. [12]

In ESM model the IT supply and IT demand organizations are separated. The ESM framework makes the IT services as single interface towards the users of IT services. Users could request any service from the corporate service catalogue or be working in any division or any country and they all would have single interface for requesting the IT services. The service providers are invisible behind the corporate IT ESM framework interface. Ultimately if the users are satisfied with the service quality provided through multiple suppliers the model is working fine.
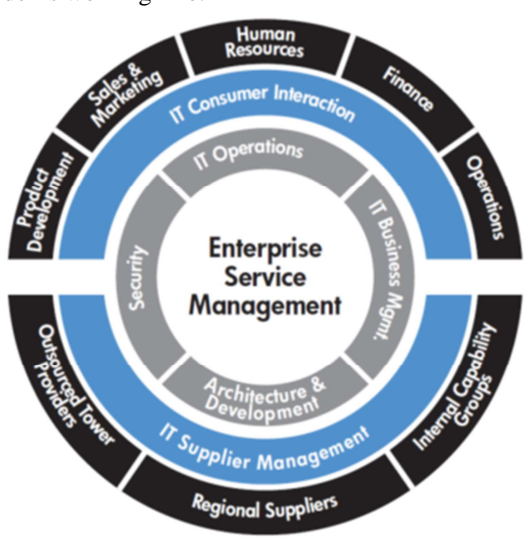

Figure 3 ESM Graph [12]

The challenge with ESM model is for the IT organizations to have all suppliers aligned with corporate IT Operation, Security and architecture policies and practices while still constantly developing those through business demand management. The requirements for the suppliers must be aligned for the policies and services provided to the end users. If any of the suppliers is not compliant with company requirements for IT suppliers they should not be used. Non-compliant service providers would make corporate services weak if some of the providers can't commit to tools, SLA's or processes required.

D. Utility Based Computing

The traditional outsourcing business is emerging with new business models. The applications are merging more and more Web-based which enables new type of "Software as a Service" (SaaS) model. Other trend is virtualization which is driving capacity based datacenter usage a bit further, known also as Infrastructure as a service (IaaS). Tomorrow's IT is more and more based on services provided over the network as a utility services similar to water or electricity. [2]

Organizations are moving from Outsourcing to Cloud sourcing. For the client the management of utility based IT infrastructure where mailboxes are charged per mailbox monthly rather than buying servers, licenses and performing the installations have a big difference. The cloud services are doing the same revolution for IT that industrial revolution brought to manufacturing. The provisioning of services is consolidating to fewer suppliers and with automation and large volumes the unit prices are going down. [10] Client does not any more need to know the technical details of how much memory server holds but his requirements.

There are risks to capitalize on the potential benefits of utility computing, client firms will rely more heavily on the technical — and perhaps business process — capabilities of suppliers. This reliance will reshape the risks associated with outsourcing. [2]

One of the challenging questions behind the utility computing is if strategic processes require certain IT- services to be available - what happens if supplier for any reason is not able or willing to provide that service? The risk with associated costs can lead to bankruptcy in the worst case. On the other side the price difference could be essential to be competitive on the market. [2]

Partly due to the risks and the ongoing revolution of utility based services the enterprise environment is in situation where the services are delivered in hybrid mode. The environment consists of both utility based services and traditional self-maintained and developed IT services. To manage IT consisting of various utility, outsourced and insourced services requires advanced frameworks for IT-governance to be effective. Governance model should be flexible enough to support the service strategy for both utility services and traditional IT services provided from both internal and external organizations

E. Selective Sourcing

The consequences when companies outsource only certain parts of their IT environment compared to alternatives outsourcing everything or nothing if known as selective sourcing or also as smart sourcing. A model where is defined key areas to be kept in-house. [13] These key-areas provide additional value when hold in internal organization, and less key areas that can be outsourced. This matrix is shown in figure 3.
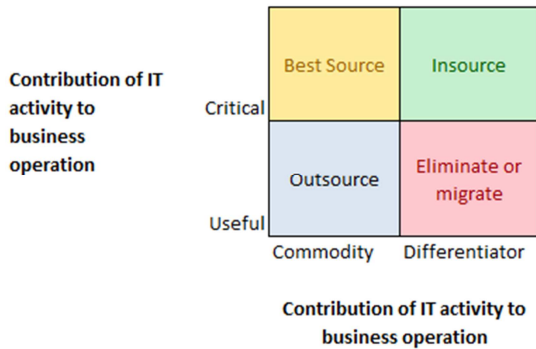
Figure 4 - Selective sourcing [13]

Figure 5 - Supplier offerings vs. in-house capability [13]

Areas that should be kept in-house are critical differentiators, services that are critical to business and also help to distinguish business from competitors. Nearly always these are critical differentiators are tailored business applications which competitors don't have.

 Critical commodities are group which are required to run the business but they don't provide additional value to business. A type of critical commodity is example is system that is used only to fulfill legal requirements. As these could be standard commodity systems that customers are using usually the best sourcing option for these systems is suitable if there are high-quality suppliers available. [13]

Useful commodities are standard services that could be example email or accounting. These are standard services which support the business. This group is likely to have lower costs through external suppliers outsourcing through standardization and volume. Standard and often high-volume services could be often provided as utility services most effectively.

The last group is useful differentiators. The problem of differentiators is that they are always costly to maintain. They are usually tailor made and require more management than standard systems. Outsourcing of useful differentiators does not help to run the costs down. These systems should be migrated or eliminated as they provide more costs than benefits.

Companies should use this matrix to categorize their services regularly in which group they are. For some companies there could be plenty of useful differentiators which are costly to maintain and provides only a little business value. Correct usage of the matrix helps organizations to focus on value adding IT services and eliminating or outsourcing non-value adding IT services.

In some cases the outsourcing versus in sourcing is not financially as justified as one might expect. If client is large enough they could critical mass to provide same service as the supplier would. The difference is that external suppliers are also looking for a profitable margin for themselves. In such case that client has critical mass and client has managerial practices developed it can be cheaper to insource than outsource due to the fact that internal IT organization don't need to be profitable. The aspects of volume and management skills are described in Figure 5.
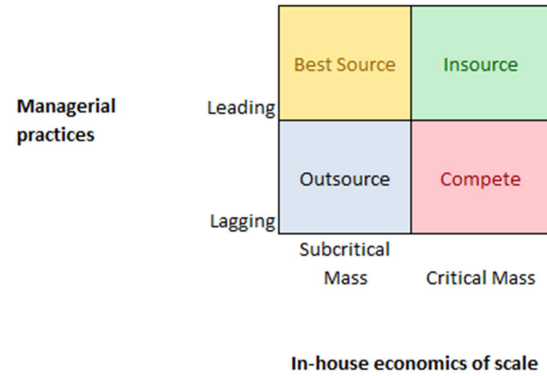
F. SLA based management

A Service Level Agreement (SLA) is defined as a formal written agreement developed jointly between a client and a supplier that specifies a product or service to be provided at a certain level in order to meet objectives. SLA helps to clarify responsibilities, improve communication, reduce conflicts, and build trust between the companies [14], [9].

The service level management requires that there must be defined metrics to measure the service. The controlling of service is built on controlling the effectiveness of certain SLA's. As there can't be hundreds of different SLA's the SLA's in use must be well defined. There could be numerous performance indicators usually known as Key Performance Indicators (KPI). Sample performance indicators for any process could be process speed, process volume, errors in process or cost of process.

"Contractual elements under governance characteristics include communication plan (documenting communication processes to facilitate consistent knowledge exchange), measurement charter (specifying tactical measures of service performance), conflict arbitration plan (stating the parameters and conduct rules for involving a third party for resolving problems), enforcement plan (states appropriate incentives and penalties based on performance)." [14]

The service levels should be possible to be changed during the contract period. The continuous change in business and processes causes that requirements for service levels and quality are changing also regularly. Client should maintain the possibility to adjust Service Levels during the contract period. For example change the measurement of process time to process quality.

A weak IT service (with little redundancy or over-utilized resources) has the advantages of having low running cost but may generate high business losses - resulting from low availability and customer defections due to high response times. A service with much better availability and lower response times will possibly generate lower business losses but have usually much higher running costs. Thus, in both cases, total financial outlay (TCO plus business losses) may be

high. It appears that a middle ground can be found that will minimize this sum. [9] This is illustrated in Figure 5. On Y axis there is the total cost and on X axis there service quality.
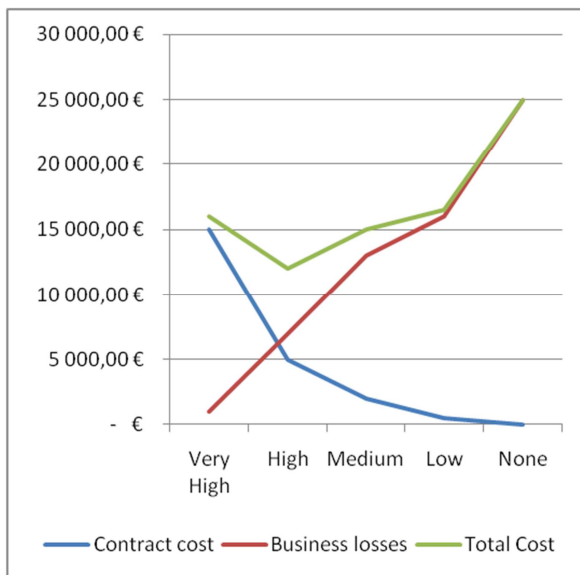

Figure 6 - Sample figure total cost of SLA levels

The SLA based management requires the key deliverables of supplier are well defined as well as the metrics for the service. Enforcing very high SLA requirements which are going above business requirement could cause very high running costs towards the IT service.

IV. DISCUSSION

The foundation for IT Service governance is based on ITIL service management. The service strategy is the driving the service portfolio based on business requirements.

Around the service strategy is cycle for planning, implementing and operating services. The input for service requirements is coming from inside from the service strategy.

Within the service design phase is planned how the service should be delivered. For service design there are alternatives from standard utility servers to the tailored in-house systems. The aspects of utility based computing and selective sourcing should be planned as shown in figures 4 and 5. Is the service something is effective to operate in-house? Is the service something that can be provided cost effectively as cloud/utility service? Main sourcing strategy for the service is chosen at this stage.

Next phase for service is the service transition. Within the service transition is implemented the service and defined in detailed level the service operating model. In order to assure effective governance model in service transition phase a RACI matrix should be created, the matrix informs the deliverables and responsibilities between client and the suppliers. Creating a RACI matrix assures that during service operation phase all roles and scope are defined in advance and the service can be operated. Based on the RACI matrix and the service deliverables can be started design of Service Level Agreements (SLA's) and other Key performance indicators (KPI). These service levels will be in the agreement between suppliers and client.

The final service operation phase is when the service is in production phase and used. Based on the responsibilities defined in service transition can be designed initial SLA measures for the agreement. This way can be assured that SLA's are in line with supplier accountability and are in line with deliverables, the SLA's must be flexible in order to maintain possibility to adjust those based on changing business requirements.

The ESM framework is guiding to check the readiness for sourcing at different phases of service design. Is the organization ready for multi sourcing, what are the targeted benefits, how those can be measured, are the suppliers compliant with corporate requirements, how to migrate it to an integrated supplier and in the operation phase is some further orchestrations required? The ESM practice is described in outermost cycle.
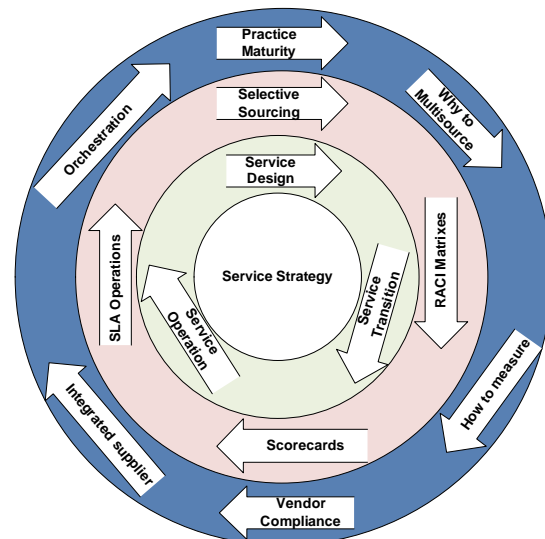
Figure 7 - Selective sourcing, RACI matrixes, SLA's and ESM at the different phases of service strategy

V. RESULTS AND BENEFITS

If the multi-supplier governance on service strategy is done based on described practices there can be gained several benefits. The ITIL service strategy is divided into three phases, design, transition and operation. In this chapter the benefits are described for each phase.

The decision about what and how to outsource is done in design phase. There are areas which are more effective to be outsourced and some areas where insourcing is more effective. [13] Further there can be some areas where utility based services are more effective than traditional services. Using this framework gives organizations the right sourcing solution from the start. The ESM practice also guides to answer why that is being done.

In the service transition phase the RACI matrix usage will clarify in clear documented form the responsibilities between the client and suppliers. If this RACI matrix is done prior service operation phase a lot of problems during the operation can be avoided when all gaps and responsibilities are defined in advance. Based on the responsibilities defined in service transition can be designed initial SLA measures for contract. This way can be assured that SLA's are in line with supplier accountability and are in line with deliverables. What is measured and how.

Prior going to service operation phase the service compliance must be verified that they are compliant with corporate service and policy requirements and assign correlating scorecards.[1]

The service operations phase is the phase where service is operation and supplier has integrated to part of corporate services. During this phase the service is reviewed and performance evaluated if there are requirements to change the SLA levels. The benefit of adjusting SLA measures and levels at this stage is to have service levels responding to the business requirements.

In brief the model will allow multi-supplier governance deliverables to be well defined, measurable, aligned, sourced best way and service levels to be adjustable based on requirements. This model also provides corporates with answers why they are multi sourcing certain activities, are they compliant with their service requirements and are the targets achieved.

VI. CONCLUSION

The multi-supplier governance has been well studied during the past years. Despite the research no standard best practices for managing multi-supplier governance are yet in place. ITIL and other ITSM methodologies support and give certain advices for this matter but a framework is required in order to assure that the service quality in multi-supplier governance is high quality and meeting expectations by all parties.

This paper proposes a new framework for operating model in multi-supplier sourcing. This new model is combination of smart sourcing, usage of RACI matrixes and ongoing SLA management. These are toolkit for ESM making the companies compliant with service requirement. When correctly applied model will improve the service quality, supplier collaboration and cost efficiency of IT services. The proposed framework provides organizations with sourcing method aligned with corporate ITIL practices.

VII. FURTHER RESEARCH

This paper has been written from IT Service strategy perspective looking at the overall picture of IT Services. The methodologies in multi-supplier management in ITIL core processes have not been studied. Multi-supplier operating framework for some of the ITIL main processes such as change management, incident management and problem management would be important to be studied to provide organizations with more practical approach in operational duties.

Each organization has their own requirements for IT services. When external suppliers are providing IT services there might inflexibility in standard services in multitenant service base. Supplier standard services might not respond to client requirements. The ways how organizations could manage the gaps between the supplier's standard services and clients requirements is vital to understand and study.

This method is not looking the dependencies between the different IT Services for multi-supplier service base but from single IT service perspective only. Synergies and/or conflicts between the IT services need to be studied multi-supplier service base.

Additionally should be investigated how governance practices for traditional outsourcing methodology differ from cloud sourcing governance methodology where the services are more fixed for multitenant especially in public cloud services.

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Process, Technology and Contracts: Service Standardization to Utility Model

Markus Vuorinen, Jyri Rajamäki

Abstract—**IT Services are currently delivered in very heterogeneous and customized delivery methods to client organizations. Clients have tailored processes, contracts and technology managed by both internal and external suppliers. The IT service terms, process and technology have been often fully tailored based on client organizations wishes. The next IT Megatrend - utility computing – is very controversy. In utility computing IT services are highly standardized. Same services are provided for multiple clients simultaneously to any device over the network with same terms and conditions. Suppliers have invested to automation to be able to provide the service to as many clients as possible with little or no manual work.**

With utility computing client organizations could achieve considerable savings, quality improvements and strategic initiatives as they would pay only based on the actual usage. The transformation journey from highly tailored service model to highly standardized services requires some careful preparations in order to succeed. Within this paper is studied and presented that processes, technology and contracts needs to be standardized in order organizations to be mature enough to take the benefits of utility computing. The benefits of standardization are described in detail as well some potential issues if standardization is not done.

Index Terms — **Utility services, IT Outsourcing, Service Management**

I. INTRODUCTION

IT services are under evolution phase. The traditional IT services which used to be built of hardware and software components are coming as commodity services. Organizations notices that model where everyone used to build up their own services may not be most effective solution. Using shared large scale utility services is more flexible both from service quality perspective and financially. Multiple standard utility services are out there already. CRM's, managed OS, e-mail, instant messaging and file sharing to name only few of the services. Deployment can be done often in minutes and charging is based on actual usage, time, transactions or other measurable unit with price tag. Deployment of utility services has been typically automated making it very effective to duplicate the service to multiple clients. From business perspective this approach is warmly welcome – time for deployment projects is cut drastically and heavy investments are not required. Additionally even service pilots can be done in very short time and with minimal investments.

A new method is presented for organization how they could prepare to take the benefits of utility computing and also briefly pointed the dangers of jumping in to cloud computing without being mature enough to manage dangers of it.

II. RATIONALE

The utility services are defined "collection of technologies and business practices that enables computing to be delivered seamlessly and reliably across multiple computers" and "capacity is available as needed and billed according to usage." [3] In this type of model companies are able to use resources when they need it and as much as they need it.

Traditional IT services have been insourced or outsourced and the platform is fixed for organization only. This means that organization using the IT service has dedicated environment for them. Organizations has been possibility to have their own technologies which are partly legacy, their own support methods and processes and also custom contracts both internally and externally.

In utility services the platform is shared and there are multiple customers using the service and the platform underneath. As the service is shared the customers in multi-tenancy environment have very little or no possibilities to have special tailoring for their service. In shared service all customers' need to follow service lifecycle the service conditions much more strictly than they are probably use to do earlier [4].

Non-standard custom built technologies supported by informal processes and gentleman agreements are common in organizations. As a contrast - global utility computing service suppliers having thousands of customers from different cultures, have very standard technologies, processes and contracts for their service catalog. Within next chapters is described why and how organizations should standardize their technologies, processes and contracts in order to gain the benefits of utility computing.

III. REVIEW OF LITERATURE

A. IT Architecture and Technology

Ross [3] has studied several large different types of outsourcing arrangements and based on the research had made some conclusions how organizations can achieve better outsourcing agreements.

Ross also expects that in future organizations will continue outsourcing as part of utility computing. Smaller organization will more likely make a partnership with one-supplier where larger organizations are more likely to use selective sourcing with a network of suppliers.

It is noted that organization or likely moving more and more their services to cloud as utility services as that is strategically more feasible to use resources when they are needed.

In order that firms are able to use these cloud resources strategically their architecture should be very standardized. Environment which is very heterogeneous cannot get the benefits of utility computing and therefore a strong global standardization is required.

For some companies it might strategically feasible to look for them a partner that would help to standardize the environment incrementally rather in big-bang approach. This would allow organizations to have roadmap for utility services though they would not have the ability to transform themselves.

In order organizations to survive in the future there is a requirement to go more and more into standard architecture. The IT services should be transferred more and more to commodity type of services. In order IT organizations to succeed they need to have a strong strategy for IT technology standardization. This will allow companies to have cost effective outsourcing models as well as it will allow them to move towards utility computing incrementally.

B. Computing exchange & Contracting

Buyya &al [4] have studied how cloud computing as utility is going to chance the computing model. They have presented a new model where are computing capacity providers proving the capacity same models as today in electricity exchange. In today's electricity exchange the market prices are changing based on the demand and supply. Similar model could work in IT domain where holders of major datacenter capacity could sell their capacity for market price and those requiring it could buy it for the best price. Within this model there are brokers who buy and sell capacity (computing, storage e.g.) and enterprises who can buy this capacity where they can get it for cheapest and run their services on top of it.

Transition from physical servers lying in office corner to buying computing capacity for a daily spot price is a long way. Different technologies for moving the IT services from server to another, sliced to different virtual machines (VM's) is developed and developing to respond for such a challenge.

The idea of computing exchange sounds effective way to manage the demand and supply of computing capacity globally. However technology and standards supporting move of IT services between different supplier's datacenters on fly is not there yet.

Addition to the technical boundaries there are also other things to be considered to make computing exchange possible. Contracts for computing capacity should be standardized.

Possible risks would include that supplier is selling capacity more than he actually holds and that might cause unavailability of service, performance issues or unavailability to transfer the service between the suppliers. Different type of Quality of Service (QoS) agreements must be in place together with penalties and aligned with Service Level agreements and key performance indicators.

There are several ways to measure performance e.g. MIPS and FLOAT for computing, storage can be measured in size (Mb) or in performance (IOPS) network performance again can be measured in speed and latency. This makes very complicated to have standard computing unit that could be used for any service. The hosted application should be guaranteed with certain transaction time or turnaround time. Transaction speeds and turnaround times would describe if the application is performing as expected.

All of different type of contract terms for computing exchange should be standardized and preferably categorized in order to make computing exchange possible.

C. Demand management & Processes

Salle [1] presents the history of IT management from dark '70's until the beginning of 21st century. It is described how the IT domain is starting to work in more structured way and how same practices have spread around the world for IT service management. With same IT service management frameworks being used; also core IT processes are looking similar in most of the companies. Salle describes also how the role of company's IT manager is changing from technical IT expert to organization's strategic business partner managing the services based on the business requirements.

In the early years of IT computing there were no common processes or practices. No standard procedures existed for testing or practices for problem management. IT was seen only as technology and not as a service towards business organization. The IBM ISMA was first service management practice that was created to respond to this problem. ISMA was later extended and refined with for example with ITIL, HP ITSM and MOF which are taking broader look into service management and defining core functions and processes in more detailed and practical way.

The trainings for different IT Service Management practices have been growing continuously over the years. More and more the companies are aware that in order IT to be managed efficiently some standard service management frameworks needs to be followed.

When organizations are considering have part of the business supported by utility services they should validate their capability to operate with supplier which is following ITSM principles. For client organization the change is not to manage the technology any longer but to master the demand from business and work with supplier accordingly.

One of the strategic changes for clients is to understand that IT is no longer only a expense to be controlled but rather and investment that can be managed.

IV. Three Pillars of IT Services

We have presented three pillars of IT services that are required to be standardized on journey to utility services. These three pillars are technology, contracts and processes; these are presented in Table 1. Next is presented briefly the benefits for both supplier and customer when these three pillars are widely standardized.

The first standardization aspect is technology and architecture. In this sample is presented a client which is looking for the most efficient hosting solutions for their web application developed with PHP. PHP is very popular web - application development language. There can be found hundreds of hosting services which provides managed hosted server where clients can install their own PHP applications. Clients are not required to have their own team around the clock to maintain the availability of servers which is done by the supplier. This type of utility services is often cost effective as the same platform can be shared among tens of clients with no customization or manual work. However if this web-application have requirements to run some custom scripts running on the host operating system level time to time with root access the service offering is diminishing. Usually none of the suppliers have such option to access to data files on OS level and run scripts in their portfolio. This would make the management very complex if users would have customized access and cause security concerns if they would have access to each other's data. In such case client would be required to have non-standard and usually dedicated service for them which is considerably more expensive. Applications which are not built to run on standard technology based on best-practices can be very expensive in a long run.

The next standardized aspects that we describe are contracts. Contracts would describe the service performance, availability, support hours etc. These are usually referred as different SLA's. If the contract between the supplier and client do not have any warranties about e.g. performance or service hours the client (or the supplier) could be in troubles later. Clients should validate if their suppliers are capable to deliver services based on their contractual requirements such as 24*7 hour support or four hour response time for contact center. If contracts are standardized and describes the service detailed enough it makes also possible to compare the service between the different suppliers helping both client and suppliers.

The last presented aspect is process standardization. Within all main ITSM frameworks there are few processes which are very similar. Change Management, Problem Management and Incident Management are some of the most common ITSM processes. All of these processes have also certain roles from both supplier and client perspective. Communication and collaboration is very complex if there is no common understanding what is incident or what the responsibilities of change manager are. Typical issue would be that clients who are unfamiliar with ITSM practices are requesting for support from certain people or asking for contact persons where they

should be looking for corresponding role to help them in their matters. This is model is beneficial for both client and the supplier, people tend to be on holidays, change positions and not all requests can be managed by single person anyway. Organizations which are used to work in gentleman agreement need to revise their requirements on their journey.

Table 1 - Service standardization

	Standardized	*Non-Standardized*
Process	Ability to operate with practically any supplier. Capabilities to manage changes and problems between the companies not only between people.	Based on people relationships, no roles. Does not scale to support large business models.
Technology	Operations can be automated. Commodity, cost effective to run, transferrable from supplier to another. No special knowledge required.	Tailored and heterogeneous. No automation, a lot of manual work and client specific special knowledge.
Contracts	Predefined Service Levels and penalties, formal papers and agreements.	Based on gentleman agreements, no official warranties or penalties.

V. Discussion

The history of IT services over the past decades has been usually based on the collaboration of two companies, client and supplier or even customer and engineer. Such service model has been based very much on personal relationships instead of role based responsibilities. However when the service model is changing where suppliers have multiple customers for same service or clients have multiple suppliers for different services the technology, processes and contracts should standardized.

It has been presented that on a journey to utility computing the IT services are required to be standardized. Neither clients nor suppliers c utilize the benefits of utility computing unless the services are very standardized. The benefits of standardized technology, processes and contracts are obvious. Clients are able to change their supplier more flexible when the service is transferrable from supplier to another. The technology must commodity compliant so clients are able to move their services from provided to another. The suppliers are becoming more providers of commodity service. The prices for standard utility services are decreasing and in order clients to be able to take the advantage of the trend they need

to be compliant with standard service platform's, contracts and processes.

Due to nature of utility services the standardization is driven by group of suppliers rather than e.g. legal requirements. The standards should be voluntary defined by consortia of organizations. This type of De Facto standards could be flexible and easily adopted by the community of service suppliers and clients. Ownership of standard development should be owned by similar way as the ITSM processes; where consortia of organizations are maintaining the industry practices. [14] [10]

VI. CONCLUSION

There has been presented that the state of current IT services is very heterogeneous as the services are usually tailored for each customer's requirements. Clients have had their own customized technologies, processes and contracts for each supplier.

As the IT services are coming utility services the tailoring of services is vanishing. Same services are provided for multiple customers with same technology, terms and conditions and processes. Cloud computing provides the benefits of massive scale. Services are provided over the network almost fully automated and charged based on actual usage. For most clients it is strategically more feasible to use resources when they are needed.

In order clients and suppliers to get the best benefits out of their IT services they need to focus on De Facto standardization of IT services.

- Organizations should focus how to standardize their technology and architecture to be technically compliant with utility services. All tailored non-strategic solutions should be planned for retirement or migration.
- Organization needs to assure that they are mature with global ITSM methodologies. ITIL framework is industry standard to be followed. To effectively work with IT suppliers with ITIL processes must be followed
- Organizations are required to validate their maturity with contracts. Gentleman agreements should be moved to standard contracts. Terms of SLA's and QoS must be agreed with supplier in order to assure service quality and make service transferable.

VII. FURTHER RESEARCH

This paper has been written from IT Service strategy perspective looking at the overall picture of IT Services. The methodologies in multi-supplier management in ITIL core processes have not been studied. Multi-supplier operating framework for some of the ITIL main processes such as change management, incident management and problem

management would be important to be studied to provide organizations with more practical approach in operational duties.

Each organization has their own requirements for IT services. When external suppliers are providing IT services there might inflexibility in standard services in multitenant service base. Supplier standard services might not respond to client requirements. The ways how organizations could manage the gaps between the supplier's standard services and clients requirements is vital to understand and study.

This method is not looking the dependencies between the different IT Services for multi-supplier service base but from single IT service perspective only. Synergies and/or conflicts between the IT services need to be studied multi-supplier service base.

Additionally should be investigated how governance practices for traditional outsourcing methodology differ from cloud sourcing governance methodology where the services are more fixed for multitenant especially in public cloud services.

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