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New ICT Supply Process, Interfaces between Supply Process and Project Management Process in ITIL Service Design Framework

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Tämän työn tarkoitus on suunnitella, rakentaa ja arvioida uusi ICT hankintaprosessi. Hankintaprosessin kehittämiseen on useita tarpeita. Ulkoiset toimittajat esimerkiksi olettavat toimointojen pohjautuvan uusimpaan ITIL versioon. Olemassa olevat hankinta- ja projektinhallintaprosessit ovat toisitaan irrallisia ja niiden riippuvuudet ovat kuvaamatta.

ITIL on prahaiten tunnettu kehittämisen viitekehys tietojärjestelmien ylläpito- ja hallintaprosesseille koko niiden elinkaaren ajan. Huolimatta Service Design materiaalin puutteista, se oli riittävä uuden hankintaprosessin rakentamiselle. ITIL Service Design ei muun muassa sisällä hankintaprosessia tai vaiheistettua projektinhallintaprosessia. Vain joitakin tärkeitä ja työssä hyödynnettäviä eri tasoisia tehtäviä eri prosesseissa. Tämän työn tutkimuskysymys on: Millainen prosessi tarvitaan ICT hankintoihin?

Uusi versio ICT hankintaprosessista perustuu ITIL Service design versioon kolme. Uusi prosessi on yhdistetty tarvittaviin tukiprosesseihin, projektinhallintaprosessiin ja ITIL Service designiin. Työn aikana esiin nousi projektinhallinnan johtava rooli tapauksissa, jolloin tarvitaan ulkoista toimittajaa ja kehitystyötä. Uudessa prosessissa hankintaprosessin käynnistää projektinhallintaprosessi ja hankintaprosessin tuotokset ovat projektinhallintaprosessin syötteitä. Prosessien eri vaiheiden yhdistäminen vaati päätöspisteiden lisäämistä. Uusi ICT hankintaprosessi arvioitiin teoriassa kahta muuta parasta prosessia vasten. Toinen on prosessi julkisiin hankintoihin ja toinen on suunnattu muille kuin ICT ostajille. Arviointi osoitti uuden ICT hankintaprosessin riittävyyden, täyttämällä suurimman osan ITIL:stä valituista kriteereistä sekä organisaation tarpeista.

Saavuttaaksemme parempia tuloksia ICT projekteissa (2009 vain 32 % ICT projekteista onnistui (Galorath Incorporated 2008, 1)) työn tulokset osoittavat uuden hankintaprosessin mahdollisesti tuovan asiaan parannusta. Uusi prosessi mahdollistaa tehokkaamman hankinnan. Päällekkäiset tehtävät ovat tunnistettu ja poistettu uudesta prosessita. Koska uuden ICT hankintaprosessin pohjana hyödynnettiin olemassa olevia prosesseja, se sopii hyvin organisaatioon. Uuden prosessin ottaminen yksinään käyttöönotto, ilman tukiprosesseja, ei kuitenkaan riitä.

Tutkimus perustuu tietojärjestelmien suunnittelutieteeseen, jossa tutkija määrittelee, rakentaa ja arvioi saadakseen jotakin uutta aikaiseksi ja tämä uusi on ”artifacti”. Toinen vaihtoehto olisi ollut toimintatutkimus, mutta se sopii paremmin jatkotutkimukseksi tälle työlle. Tapaustutkimus taas olisi ollut tämän työn kannalta liian aikaisessa vaiheessa.

Asiasanat: ITIL, Service Design, Supply process, Purchasing

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Abstract

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Year 2009 Pages 41

The purpose of this work is to design, build and evaluate new ICT Supply Process. The needs for developing the supply process are several. External partners for example expect the newest version of ITIL in common operations and existing supply process and project management process tasks have no connections either dependencies are identified.

ITIL is the best known framework for ICT process maintenance and governance within the lifecycle of the initial system. Regardless of the Service Design materials shortcoming, the material is adequate to build the new ICT supply process. ITIL Service Design does not include a supply process or phased project management process only some relevant usable steps in various processes and levels. The research question is: What kind of process is needed when purchasing ICT systems?

The new version of ICT supply process is based on ITIL Service Design version three. The new process has been connected with the main supporting processes Project management process and ITIL Service Design. During the work the leading role of the project management process was found, when an external supply together with development is needed. In the new process the supply process is triggered by the project management process and the deliverables of the supply process are inputs to the project management process. To combine the phases of the process some major decision points are added. The new ICT supply process is evaluated in theory against the two best process models. One is process for public procurement and the other is the guide for non-specialist ICT Purchasers. Evaluation proves that new ICT supply process is more than adequate. It fulfils most of ITIL framework valid criteria and most organizations needs.

To achieving better results in IT projects (in 2009 only 32 % successful IT projects (Galorath Incorporated 2008, 1)) works results shows that new ICT supply process can be a tool for it. The new process should make purchasing more effective. Overlap tasks have been identified and extracted from the new process. Due to that fact that new ICT supply process is based on existing processes, it will fit easily in present environment. Implementing the new process alone without needed supporting processes it is inadequate.

The research method is based on design science research for information systems in which a researcher defines builds and evaluates in order to get something new and the new is an artifact. The second alternative would have been an Action Research but it is suitable for the further study better to this work. The Case Study, however, would have been at too early a stage from the point of view of this work.

Key words: ITIL, Service Design, Supply process, purchasing

Content

1 Introduction

This work is focusing on the supply process for ICT systems including its phases. The work is based on ITIL version three Service Design. The four views described in Service Design are inspected and the findings are brought as an input material to supply process development. The findings are expected to give input to improve and create more comprehensive ICT supply process.

In general too little time is used to prepare ICT purchases. Often there is too little time spends on preparation and monitoring. Evaluation of alternatives is often insignificant and preparation do not support decision making. Targets are not set clear and they do not have connection to the strategy. In many ICT investments decision based on the investments costs and underestimates maintenance fees which often are many times higher than investment it shelf. Project management is needed at least to fulfil these holes in ICT purchasing process. Project Management inherently includes tasks that ICT purchasing process often lacks. (Karvinen, Reponen & Vehviläinen 1994, 16-30.)

Standish Chaos Reports is probably the most referenced. They define success as projects on budget, of the cost and with expected functionality. There are several updates to the Standish "Chaos" reports and the 2009 report shows:

- Failed Projects: 24 %
- Challenged Projects: 44 %
- Successful Projects: 32 %

(Galorath Incorporated 2008, 1).

ITIL version 3 was published 2007. Delta for version 2 version 3 focuses on cyclic governance model based on life cycle management. Ten separate processes of ITIL V2 have been grouped and completed to five approaches which include altogether 26 processes in V3. (Introduction to ITIL 2006;Lloyd & Rubb 2007.) This work is focusing on area of V3 Service Design, but extends to other areas when applicable.

The research method is based on design science research for information systems (Hevner, March, Park & Ram 2004). In this work new artifact is defined, builds and evaluated. The deliverable of this work is an updated ICT supply process. The deliverable – the new ICT supply process – in the building phase Design Science Research Guidelines by Hevner et al. is used and it is evaluated against two processes. One is process for public procurement and the other is the guide for non-specialist ICT Purchasers. Criteria's for evaluation is based on ITIL V3 Service Design and criteria addressed by Organization.

2 Problem description and expected new results

There are several needs for developing ICT supply process: external partners expect the newest version of ITIL in common operations, the new model of lifecycle management is presented only in the new version. Only parts of the supply process are added to the new version and the big picture of the supply is still missing. Regardless of Service Design shortcoming of material, the material is adequate to build the new ICT supply process.

In Organization's ICT supply process, project management process tasks are only mentioned, but no direct connections either dependency are identified. Also the roles responsible for the processes are not connected anyway. The "leading" process for each step have not recognized anyhow.

In order to get the supply process and the project management process to co-operate, a new process is needed. The connections and parallel flows of other processes, management and ITIL framework need to be described. Also support processes are needed from ITIL framework processes. Tasks in these support processes, for example requirements gathering, service catalogues and service level requirements provide the key information or key input for supply and project management process.

There is a gap in organization between ITIL versions two and three. This result from status, that all needed processes from Service Design has not been implemented yet and the processes have been developed in different parts of organization and during various times. Also the triggers for using the processes have had no connection. In version three Service Level Management process is split into three processes, besides Service Catalogue Management and Supplier Management processes. In Organization, Information Security Management needs to be upgraded from version two to three. Capacity Management and Availability Management in V2 and V3 are quite the same. There is no connection between the ICT supply process and any ITIL based process, either.

Supply process is overall inadequate mentioned for a framework in the literature, but Service Design appendix C: Process documentation templates in Service Design give a good basic list of the typical contents of the process framework.

The expected result of my research work is the new ICT supply process which fulfils organizations needs. Supply process and project management process phases, connections and dependences are described for example. Most of all the new process must have the framework from ITIL the latest version. Also the new ICT supply process must fit and implemented in present environment.

When comparing and analyzing the existing process of Organization and the list provided by service design the existing process does not include the following topics:

- No version control
- No described goal either deliverables for phases
- Criteria for decision making is inadequate
- No audit or evaluation methods either quality criteria exist
- Roles or responsibilities for the process are missing
- Tools needed in process are inadequate
- Process measurement is missing
- Deliverables documentation requirements either templates for them are missing (Lloyd et al. 2007, 237).

3 Concept and structure of this work

The concepts and structure of this report are presented in the next chapter. Both give assistance in reading and following this work. They are defined in the scope required by this work.

3.1 Concept of this work

Artifact: The design process is a sequence of expert activities that produces an innovative product for example the design artifact (Hevner et al. 2004, 78). The new ICT supply process is the artifact of this work.

IT or ICT: Information Technology or Information Communication Technology. The use of technology for storage, communication or processing of information. The technology typically includes computers, telecommunications, licences, applications and other software. The information includes for example business data, voice and video. IT or ICT is used mainly to support business processes. (Lloyd et al. 2006, 300.)

ITIL: Information Technology Infrastructure Library. It is a set of best practice guidance for IT Service Management. ITIL consists of a series of publications giving guidance on the provision of quality IT service and on the processes and facilities needed to support those. (Lloyd et al. 2006, 301.)

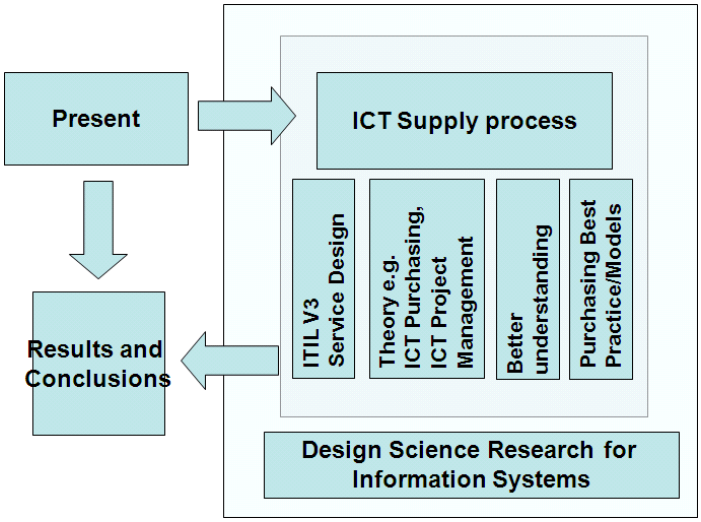
ITIL framework: The work is based on ITIL version three Service Design (Lloyd et al. 2006).

Non-specialist ICT Purchaser: Other than professional ICT Purchaser (Accredit UK 208)

Process: In ITIL framework process has defined as such: "A connected series of actions, activities, changes etc, performed by agents with the intent of satisfying a purpose or achieving a goal" (ITIL Service Support 2002, 271).

3.2 Structure of this work

First, I will define and describe the framework for this work. From organizations present situation in existing supply process and project management process tasks have been used as input in building the new artifact – new ICT supply process. The present process situation relevant to this work is described in Chapter 5. The short organization background (Chapter 4) explains reason for choosing the public procurement process as one of the evaluated processes. The other process is chosen to give the non ICT point of view in ICT purchasing.



Picture 1: Framework of this work

Organizations needs have been one input defining evaluating criteria for new supply (Chapter 2). In Organization ITIL processes have been under implementation for a long period and a few have been used for a long time. Implementation of the new ones from ITIL V3 is still ongoing. Due to organizations situation ITIL was both given and therefore the most natural framework for this works (Chapter 6). In ITIL V3 Service Design is the only possible stage from all five stages relevant to this work.

Second, I will present previous work in building the artifact (Chapter 9) and evaluating the new ICT supply process (Chapter 10). The process model method is used for presentation of new artifact and the 7 -step guideline was used for the process of creating the new artifact (Chapter 8). The theory operates then as a framework for providing the deliverables and at the same time as the main framework to verify the scientific contribution (Chapter 7).

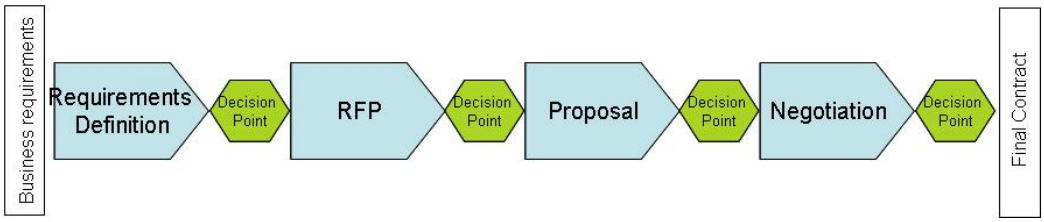
Finally, I will introduce the results (Chapter 11) and conclude the conclusion (Chapter 12) of the work. The results are this works deliverables. In conclusion I present what could be conducted from results. I give some recommendations what should be considered in Organization and in ITIL Service Design material and new ICT supply process further development.

4 Organization background

Organization is operating in the service sector. It provides information handling and logistic services mainly for business customers. Organization uses government funds in purchasing and therefore must follow national procurement legislation. Organization purchasing department exist at a corporate level, while individual business units also conduct strategic and tactical purchasing activities. Corporate purchasing department deals with the design of procedures and guidelines for purchasing. Organization ICT department exist at a corporate level while individual business units also conducts IT projects. Corporate ICT department deals with the design of procedures and guidelines for IT project management and are responsible for implementing ITIL processes to the whole Organization.

5 Existing supply process

The supply process for an ICT system is triggered by business needs and is closed when the supply contract is signed. The process includes four main phases: Business requirement specification including Request for Information (RFI) phase, Request for Proposal (RFP) phase, Proposal and Negotiation phases (Organization 2007, slide 2). The decision points are located between the main phases.



Picture 2: Supply process (Organization 2007, slide 2)

5.1 Requirement Definition

The purpose of Requirement definition is to collect and document business requirements in a way which enables RFI creation and to make a proposal for the decision point. The RFI target is to shortlist the supplier candidates, to whom the customer might later issue an RFP.

The RFI process is included in the Requirement Definition phase. The main activities are to collect all needed information to finalize the RFI, request answers from suppliers and analyze the received answers and to make a proposal of possible suppliers for the RFP phase. The main criteria are the business case, the solution fit and the suppliers' analysis. The main documents attached to RFI are the Requirement Specification and the Technical Architecture. The Requirement Specification identifies the functional requirements (what business functions the system must be capable of carrying out) and non-functional requirements (for example performance, usability, availability). The Technical Architecture is the overview of the technical architecture of the customers existing data centre and the overview of the technical architecture of the customer's data network.

At the decision point after the Requirement definition phase, the decision to whether to precede the supply process is made.

In this phase Business owner is the role responsible for the requirements and the business case. The Supply process manager is the role responsible for RFI process.

5.2 Request for Proposal

The Requirement definition phase can be informal, but the request for proposal (RFP) and next phases are very formal. The purpose of RFP phase is to receive respectable proposals from suppliers and to make proposal for the decision point. The first thing to do is to set the group for the supply process. The main roles needed in the phase are the business owner and the lawyer. There is also a need for experts in different areas of technical, security issues and purchasing. The main activities are to create the plan for the supply process, including the schedule, tasks and responsibilities, to finalize the RFP and to define the supply criteria.

The main documents attached to RFP, with most effort needed, are the Functional Specification, User cases, Architecture Reference, Security Requirements, Technical Requirements and Requirements related to implementation. The RFP attachments include also the description of the project model, used in the project and the contract templates. The Customer should also make the requirements concerning licensing, support and maintenance. In the RFP, the content of sections also controls how the supplier should provide the proposal. The RFP phase can be closed when proposals in given time have been received.

In this phase, the Business owner is responsible for accepting the supply process team, the supply criteria, the commercial issues and the functional requirements. The Supply process manager is responsible for the RFP process.

5.3 Proposal

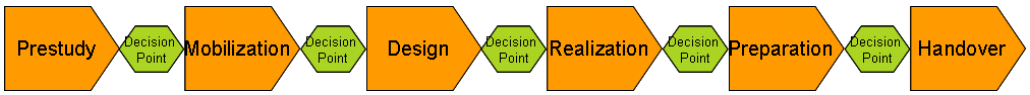
The target of the Proposal phase is to shortlist the supplier candidates, which the customer might choose for further negotiation. The main activity is to analyze the proposals and the supplier presentations. The MS Excel or similar tool is used for proposal comparison.

5.4 Negotiation

The target for the Negotiation phase is to sign the contract. The main purpose is to negotiate a contract in an acceptable term, risks and price. To achieve those goals, the customer may organize reference meetings, arrange a Proof of concept (POC) and arrange workshops, to reach a better understanding about the proposed solution. Along with the negotiations, the business case is updated, as well as the comparison of the shortlist suppliers. At the final supply process decision point, the supplier is chosen. The subsequent activities, after signing the contract, are to provide the written notification for suppliers, who were not chosen and implement the negotiated contract into project team and into project board.

5.5 Connection of Supply Process to Project Management Process

The supply process and its phases include tasks, which are executed in the Project Management process. The Project management process includes six main phases: Prestudy, Mobilization, Design, Realization, Preparation and Handover (Organization 2005, 3). The first two phases are the most relevant to the supply process.



Picture 3: Project management process (Organization 2005, 18)

To start Project management process there must be a business need to solve. To start the supply process, a Business Requirements gathering is needed. The prestudy phase of the Project management process includes Business requirement determination, which is the trigger to start the supply process. The Prestudy phase also produces a Functional and technical conceptualization for the supply process. To start official Project, after the supply process is finalized, Mobilization phase includes the entire task, which must be done before. Project team includes project manager, representatives from business, technical, security and a quality issues expert.

5.6 Connection of supply process to existing ITIL processes

ITIL processes have been under implementation for a long period and a few have been used for a long time. Implementation of the new ones from ITIL V3 is still on-going. At the same time, also a need for updating the existing ones is already recognized.

In the Organization, the implemented processes are IT Financial Management, Service Level Management, Capacity Management, Availability Management, Change Management, Service Configuration Management, Release Management and Incident Management based on the ITIL version two. Access Management is being implemented according to ITIL version three. Service Continuity Management, Security Management and Problem Management are the next processes to be implemented.

6 ITIL as framework

ITIL (Information Technology Infrastructure Library) is a library, where the best practices have been collected to improve organization's ability to procedure equal in quality solutions fit to customer needs (Roos 2006, 3). It has not been standardized, but it has become the most widely accepted approach to IT Service Management in the world (Lloyd et al. 2007, viii).

ITIL is owned by the Office of Government Commerce (OGC). IT Service Management Forum (ITSMF) is the responsible body for development (Introduction to ITIL 2006, vi-vii).

The original version of ITIL was developed at the same time as and in alignment with BS 15000, the former UK standard for IT Service Management. BS15000 was fast tracked in 2005 to become ISO/IEC 20000, the first international standard in ITSM. OGC is committed to the maintenance of alignment between future versions of ITIL and ISO/IEC 20000. (OGC 2009.)

6.1 ITIL version 3

In 2007 new version three of ITIL was published. In the version, the perspective has moved from a process into focusing more service lifecycle thinking (IT Service Management Forum 2007, slide 10). ITIL version three includes five stages, which are Service Strategy, Service Design, Service Transition, Service Operation all belonging to Continual Service Improvement (Lloyd et al. 2007, 6). Service Strategy aligns business and IT and it ensures that every element of the Service Lifecycle is focused on customer outcomes. Service Transition provides guidance and process activities for the transition of services in the operational business environment. Service Operation introduces, explains and details delivery and control activities to achieve operational excellence on a day-to-day basis.

6.2 ITIL Service design

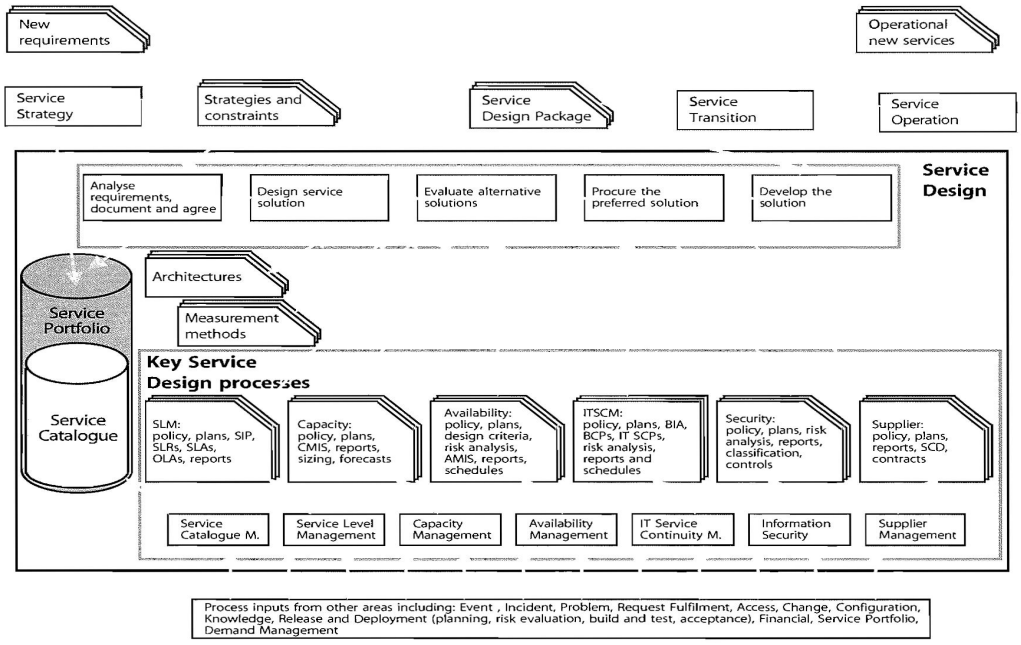
"A service is a means if delivering value to customers by facilitating ownership of specific cost and risks" (Lloyd et al. 2007, 11).

The purpose of the Service Design stage is the design of new or changed services to production. In the design, it is fundamental, that all aspects and areas are covered and all activities and processes are integrated. Doing so, it is ensured that there will be only minimal issues arising during the subsequent stage. (Lloyd et al. 2007, 13-15.)

Service Design covers five aspects which are:

- New or changed service
- Service Management systems and tools
- Technology architecture and management systems
- The processes required
- Measurement methods and metrics (Lloyd et al. 2007, 30).

Service design includes designing of the solution and development of the solution as in Picture 4. The Service design stage starts with a set of new or changed business requirements and ends with the development of a service solution to meet the documented needs of the business (Lloyd et al. 2007, 15).

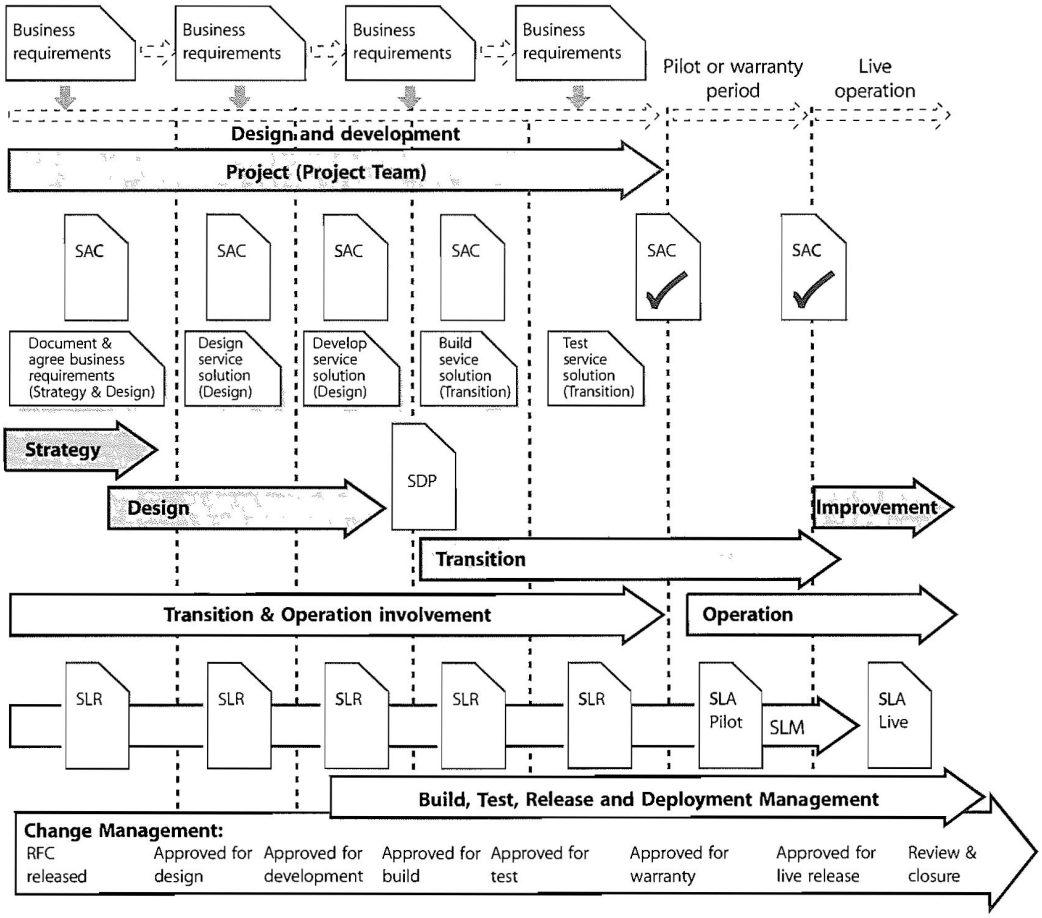


Picture 4: Service design – the big picture (Lloyd et al. 2007, 60)

Subsequent activities, the evaluation of the alternative solutions and the procurement of the preferred solution must be completed in Service Design stage. One of the deliverables from design activities is ITT (Invitation to Tender) (Lloyd et al. 2007, 30, 46).

To enable the Service design to get the needed information, the key supporting processes should be up and running (Lloyd et al. 2007, 59). In ITIL Service Design version three the processes are Service Level Management, Capacity Management, Availability Management, IT Service Continuity Management, Information Security Management, Supplier Management and Service Catalogue management.

The project manager and the project team maybe need to manage stages from Strategy to Transition. The role is illustrated in Picture 5. Project management is needed in the development stage, where service design is translated into a plan. (Lloyd et al. 2007, 31, 47.)



Picture 5: Aligning new services to business requirements (Lloyd et al. 2007, 31)

7 Related theories

Theories about purchasing, project management and communication are presented in the next chapter. Relatively little academic research has been undertaken in area of purchasing. Van Wheele brings the practical point of view to this area and in this work purchasing theory is mainly based on van Wheeles text from Purchasing & Supply Chain Management (2005). The IT project Management relativity theory is based on Joseph Phillips IT project Management certificate (2005) book. It is very practical and includes the whole range of cases. The researcher's experience of ICT work from ten years has been the reason for the communication chapter. It has brought up the fact that there is different terminology between ICT and business people which causes misunderstandings. Theory in communication area is wide but it has a shortcoming about how to deal with ICT and business people communication problems.

7.1 ICT Purchasing

In general purchasing mean buying goods and services. It involves customer needs determination, supplier selection, arriving at a proper price, negotiating terms and conditions, signing a contract and following up the delivery (van Wheele 2005, 12). Goods are concrete for example raw material or books and services are not concrete for example software or licences (van Wheele 2005, 33). From this definition point of view and OECD (2009) also defines that ICT (Information Communication Technology) includes in a service category.

Supply issues must be considered as a process approach. A process includes steps and steps are connected. Moving from step to another previous step tasks must have been completed. To do so there must be decision after every step (van Wheele 2005, 28-29). Van Wheele (2005, 13) describes Purchasing as a six Phase function, first three Phases are specified as Sourcing and three last phases as Supply. In this work, Supply Process is as van Wheele describes purchasing function, including phases from requirement determination to follow up tasks.

Van Wheele (2005, 224) defines ICT support needed in purchasing the form of database including article, quotation and supplier such as SAP. The focus is in buying goods which have for example article number and quantity. Nevertheless in many cases these database systems are still not capable of supporting the purchasing management so that required information is available. A shortage of overviews, vendor rating and purchasing performance reports for management are often the lacks in purchasing transactional process supporting systems.

In real life van Wheele (2005, 33) sees that ICT licenses and development contracts are purchased by research and development manager.

This does not mean that companies do not have departments for purchasing. It only shows that agreed disciplines within company are actively engaged in buying services.

7.2 IT Project Management

In general Project is work which is done for some unique purpose and to achieve defined results. A project has defined a goal, tasks and an outcome. It has start and end dates and budged. In project works allocated resources combined from know-how to achieve the set target (Organization Oyj 2000, 2). A project is like a virtual organization which is building up for some task. The organization is temporary and it will be wind up when results has been achieved. (Luomala et al. 2001, 10.) Projects are needed because there is seldom a unit in organizations which includes all the needed know-how to build an ICT system.

Phillips (2005, 328-329) defines that IT Project management process includes five phases; Project start, Planning, Delivery, Project controlling and Ending the Project. The start and planning phases prepare the material for decision making for example the supplier evaluation and the supplier selection takes a palace in Project start phase (Phillips 2005, 196).

In IT projects Phillips (2005, 194-199) defines development purchasing starting from identifying suitable suppliers. The next is shortlist two or three suppliers and interviewing them. Then send RFP (Request for Proposal). When you have supplier's proposals external help for evaluating in very technical issues is recommended. Before signing the contract reference call and visits are recommended to do. Phillips (2005, 98, 115, 195) sees that purchasing unit in organization buy licenses but IT project manager is responsible for project development work purchasing.

Phillips (2005, 143, 233) recommends that ICT support tools such as the Microsoft Project should bee used in IT projects. The tool can support only the project management process but it does not replace the need for project management, team leading or cost controlling. Project Management tools are very helpful when planning project tasks so that they fit in a limited schedule. Manager can easily see where more resources are needed or where reconstructive actions are needed. If general tools are used widely in organisation, dependences to other projects can be recognised and handled if needed.

7.3 Communication

We are constantly suffering from misunderstandings in discussions between well-intentioned business party and well-intentioned ICT party (Karvinen et al. 1994, 29). It is understandable that parties from a different background and orientation do not have common professional language.

A proper training - navigation and main transactions to business party and introduction to business operations to ICT party – gives a good launching point for common understanding. Issues to be considered when entering to a situation where the exact understanding is needed are organization and environment, business type and the integration of core business to ICT, existing solutions and ICT oriented education of employees. Getting into common understanding does not bring the leverages automatically; a good method that is focusing on a desired output is often needed.

From my experiences in ICT work has brought up the fact that there is different terminology between ICT and business people which causes misunderstandings. The misunderstandings may conclude from

- the double meanings of initial terms
- language specific terms not known by other party
- terms dependent on frames where they are used
- attitudes, interests and view points

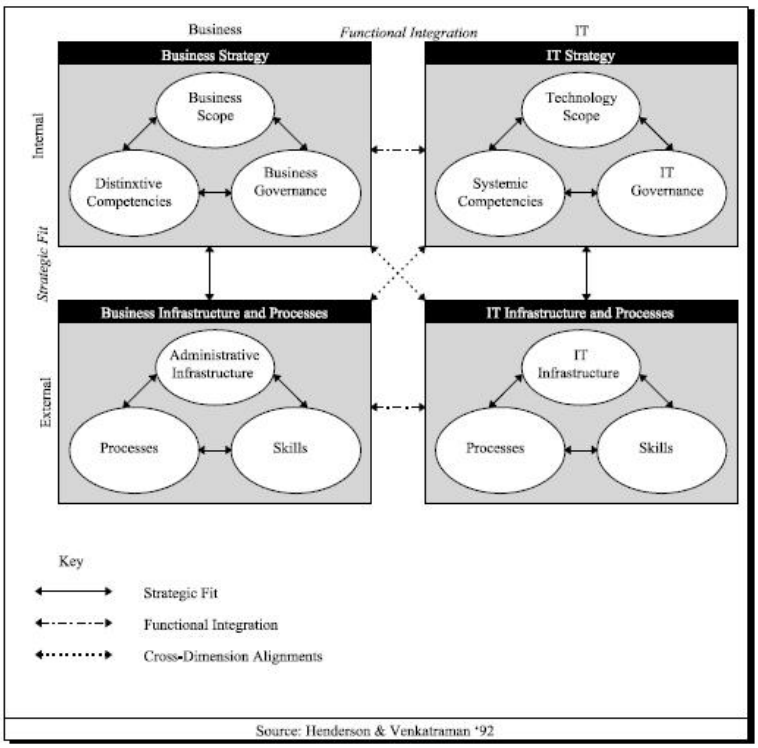
Situations realizing these misunderstandings may happen unconsciously. The results and outcomes may lead to the loss of money, time and efforts (Karvinen et al. 1994, 23).

The framework for practical design is stated by the organization where the utilization of ITIL is standard for models and processes as wide as possible. ITIL has grown to become the most widely accepted approach to IT Service Management in the world (Lloyd et al. 2007, viii). ITIL provides the best practices for systems management and terminology framework for ICT people. The main aim of Service Design – one of the ITIL's main stages – is to design IT services, together with governing IT practices, processes and policies, to realize the strategy and to facilitate the introduction of these services into the live environment ensuring quality service delivery, customer satisfaction and cost effective service provision (Lloyd et al. 2007, 3). Service Level Agreements (SLA) for example is the document agreed with the customer and service provider. It specifies the level, scope and quality of service to be provided (Lloyd et al. 2007, 24). The service compared with any material in the supply process is considered more difficult to specify and an accurate specification is inclined to contain subjective, opinion-based dimensions and indicators. Instead of indicator definition of services is done using the SLA (Iloranta & Pajunen-Muhonen 2008, 390).

SLA defining the performance criteria a provider promises to meet while delivering a service is of growing commercial interest with a deep impact on the strategic and organizational processes.

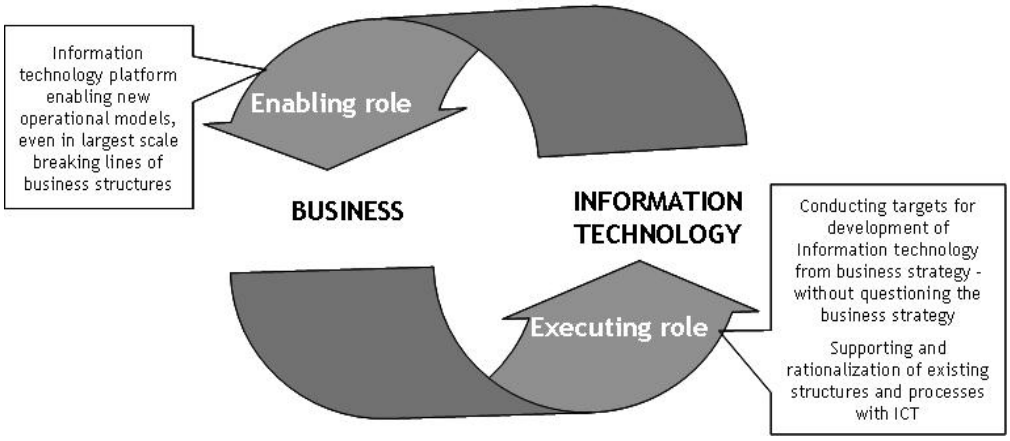
A well defined and effective SLA correctly fulfils the expectations of all participants and defines the quality attributes and guarantees a service is required to process. It typically also sets out the remedial actions and any penalties that will take effect if performance falls below the promised service levels (Iloranta et al. 2008, 395). Customer and a service provider should talk through the service level agreement so that both parties agree on the matters and contents included. Therefore attention to the realization of follow-up and control should be considered already in the supply phase (Iloranta et al. 2008, 396.)

Henderson & Venkatraman introduced the connection of business and ICT domains. The following picture illustrates the essential alignments between the business and information technology strategies and between organizational and information systems infrastructures (Henderson et al. 1992, 1).



Picture 6: The IT Alignment model (Henderson et al. 1992, 1)

Hannus (2004, 276) provides a presentation of a process aligning the business and ICT goals seen through the operative roles in the following figure. The model includes both the strategic and operational domains. Information technology strategies are based on business strategies. It is essential to understand the strategic impact of information technology into the business leadership (Hannus 2004, 277).



Picture 7: Enabling and executing roles of Information Technology (Hannus 2004, 277)

Taking the change management into consideration the traceability of a process is essential to enable to translate the changes of business needs to the changes of contracts under negotiation and further to the changes of supplier agreements during the life cycle of systems (Phillips 2005, 296; Karvinen et al. 1994, 23).

8 Method

In this work used research and process modelling methods are presented in the next chapter. The research method is based on design science research authors by March and Smith (1992), Hevner, March, Park & Ram (2004), Järvinen and Järvinen (2004) and Järvinen (2007). Harmon brings the practical point of view to process modelling techniques and basic vocabulary. The works process modelling method is based on Harmon's text from Business process change (2003).

8.1 Research method

Philosophy in this work is pragmatism. It is philosophical trend which emphasize actions and practice corollary's relevance in science. Pragmatism tries to understand present through past. However as a philosophy it is focused on the future. Philosophical pragmatists deny the correspondence notion of truth, proposing that truth essentially is what works in practice (Rorty 1982, 5).

March et al. (1992, 4) presents design science research as method which attempts to create information technology based innovative things for people and they needs. Numbers of authors used March and Smith science thoughts in their future work such as Hevner et al. and Järvinen et al.

Design science research produces artifacts, models, methods and instantions and includes two main activities build and evaluate. March and Smith see that artifact must produce utility and the utility must be pointed out by criteria. The criteria must be generated from the artifacts environment and they will define does the artifact work and how well it works (March et al. 1992, 4-5, 11, 16.)

When research question includes verbs such as build, enhance, improve the scope of work is probably in the scope of design science research or design research (Järvinen et al. 2004, 103). In future work Järvinen (2007, 1391, 1395) has done extension that human and informational resources could be included in the artifact. Knowledge has used in this work in communication context. Järvinen (2007, 1394) also preferred that artifacts should be evaluated against the best earlier innovation.

The design science research paradigm is proactive with respect to technology. It focuses on creating and evaluating innovative IT artifacts, which enable organizations to address important information-related tasks. The behavioural science research paradigm is reactive with respect to technology in a sense, that it takes technology as "given." It focuses on developing and justifying theories, which explain and predict phenomena related to the acquisition, implementation, management and use of such technologies. Hevner et al. (2004, 98) argue that both design science and behavioural science paradigms are needed to ensure the relevance and effectiveness of IS research.

During this creative process, the design science researcher must be cognizant of evolving both the design process and the design artifact as part of the research (Hevner et al. 2004, 78). Relatively little behavioural research has focused on evaluating models, a major focus of research in the management science literature (Hevner et al. 2004, 77).

The problem of combining “real life” and “scientific approach” is recognized as a challenge to this work, too. It is recognized that a lag exists between academic research and its adoption in industry.

Is also recognized the possible ad hoc nature of technology-oriented solutions developed in industry. The latter gap can be reduced considerably by developing and framing the industrial solutions based on proposed guidelines (Hevner et al. 2004, 98). The artifacts constructed in design science research are rarely full-grown Information systems that are used in practice (Hevner et al. 2004, 83).

Design science is inherently a problem solving process. The fundamental principle of design science research from which seven guidelines (Hevner et al. 204, 83) are derived, is that knowledge and understanding about a design problem and its solution are acquired in the building and application of an artifact. That is, design science research requires the creation of an innovative, purposeful artifact (Guideline 1) for a specific problem domain (Guideline 2). Because the artifact is "purposeful," it must yield utility for the specified problem. Hence, the thorough evaluation of the artifact is crucial (Guideline 3). Novelty is similarly crucial since the artifact must be "innovative," solving a heretofore unsolved problem or solving a known problem in a more effective or efficient manner (Guideline 4). In this way, design science research is differentiated from the practice of design. The artifact itself must be rigorously defined, formally represented, coherent and internally consistent (Guideline 5).

The process by which it is created and often the artifact itself, incorporates or enables a search process whereby a problem space is constructed and a mechanism posed or enacted to find an effective solution (Guideline 6). Finally, the results of the design science research must be communicated effectively (Guideline 7) both to a technical audience (researchers who will extend them and practitioners who will implement them) and to a managerial audience (researchers who will study them in context and practitioners who will decide whether they should be implemented within their organizations). The purpose of establishing these seven guidelines is to assist researchers, reviewers, editors and readers to understand the requirements for effective design science research. (Hevner et al. 2004, 82.)

Table 1: Design-Science Research Guidelines

Guideline	Description
Guideline 1: Design as an Artifact	Design-science research must produce a viable artifact in the form of a construct, a model, a method, or an instantiation.
Guideline 2: Problem Relevance	The objective of design-science research is to develop technology-based solutions to important and relevant business problems.
Guideline 3: Design Evaluation	The utility, quality, and efficacy of a design artifact must be rigorously demonstrated via well-executed evaluation methods.
Guideline 4: Research Contributions	Effective design-science research must provide clear and verifiable contributions in the areas of the design artifact, design foundations, and/or design methodologies.
Guideline 5: Research Rigor	Design-science research relies upon the application of rigorous methods in both the construction and evaluation of the design artifact.
Guideline 6: Design as a Search Process	The search for an effective artifact requires utilizing available means to reach desired ends while satisfying laws in the problem environment.
Guideline 7: Communication of Research	Design-science research must be presented effectively both to technology-oriented as well as management-oriented audiences.

Picture 8: Design Science Research guidelines (Hevner et al. 2004, 83)

In this research, based on design science research for information systems (Hevner et al. 2004), the researcher defines builds and evaluates in order to get something new and the new is an artifact. The second alternative would have been an Action Research (Järvinen et al. 2004) but it is suitable for the further study better to this work. A Case Study (Yin 2009), however, would have been at too early a stage from the point of view of this work.

8.2 Process model method

The modelling techniques are used for the description of processes. The reason to use visual modelling is to make the process easy to understand, follow and train. They are also a part of documentation of the processes used to standardize, explain and make more visible the big picture of operations. Documents can be used as a part of any other processes, like quality documentation or training material. A good picture allows easy understanding about material.

Diagrams, especially diagrams describing business processes and software systems, can become very complex (Harmon 2003, 91). The grouping is chosen to reflect the way a given company or group thinks about its processes and may vary from company to company. A process can be subdivided to any detailed level. The smallest process to picture in process models is an activity. Many activities can be subdivided into smaller steps.

Processes are made up of sub processes and ultimately activities and linked together to produce organizational outputs. Processes describe the flow of work; functions represent the reporting relationship of the company. (Harmon 2003, 109). The process picture of the new ICT supply process uses the standard objects, to provide the fast familiarization. The main phases, for example high-level process pictures, are described with labelled pentagon arrows. The decision points are labelled hexagons. Roles or parties are provided as labels and dividing lines. The start and closing are indicated with labelled squares.

9 The New ICT Supply Process

The new version of the ICT supply process is based on ITIL Service Design version three. The input of deliverables to this work is the existing situation of the supply process in an organization, together with recognized needs of reengineering the process. The output of deliverables is then the revised version of ICT supply process. The process model method is used for presentation of new artifact and the 7 -step guideline was used for the process of creating the new artifact. The theory operates then as a framework for providing the deliverables and at the same time as the main framework to verify the scientific contribution. In addition, the new version has been evaluated and connected with the main supporting processes: Project management process and ITIL Service Design.

The new ICT supply process is build by authors Kati Helenius and Marjo Nissilä in the spring of 2009. Authors work was to find how to connect the supply process, the project management process together with ITIL Service Design supply relevant processes.

Authors used the existing tasks from supply process and project management process and collected relevant tasks from Service Design to be added into the new ICT supply process. In order to understand how these processes are connected, how the tasks in different processes are triggering each other and which task is the leading one in any phase, authors created an analysis of steps in parallel processes. The leading tasks were found by finding the decision points and their owner processes. This is described in detail in the following picture.

Process	Input	Phase	Description	Output	Decision point
Project Management Process	Business requirements determination	Prestudy	Gather adequate input for decision point of project initiation	Financial analysis Business needs and requirements Preliminary solution description Preliminary Technical roadmap	Common Decision point (decisions about project initiation and RFP)
Service Design/ITIL	Business needs	Analyze requirements	To define change, to document new functional and non functional requirements	Documented requirement	
Supply Process	Business requirements Preliminary supply proposal	Requirements definition	Collect and document business requirements for RFI	RFI	
Project Management Process	Go decision	Mobilization	Initiates project and prepares requisites for project launch	Project Plan Project organizatin Cost and benefit analysis Confirmed business requirements	Common Decision point (about contract)
Supply Process	RFI answers analysis Preliminary vendor evaluation	RFP	Collect and document materials for RFP Supply organization mobilization Receiving tenders	Supply plan RFP	Decision point for sending RFP
Service Design/ITIL	RFP	Design service solution (ext)	To define solution	Tender	
Supply Process	Tenders	Proposal	Evaluation tenders and create shortlist	Proposal for shortlist	Decision point for shortlist
Service Design/ITIL	Tenders	Eveluate alternative solutions	Evaluate solutions, vendors and score tenders. Proof of concep activities.	Proposal for shortlist	
Supply Process	Shortlist	Negotiation	To get better undestandig about proposed solution, terms, risks and price. Proof of concept	Proven solution concept Proposal for contract	
Service Design/ITIL	Decision of the contract	Procure the preferred solution	Finalize contract	Contract	
Project Management Process	Contract Proven solution concept	Design	To define solution	Update Project Plan Functional and technical solution description	Decision point (Aprove solution description)
Project Management Process	Functional and technical solution description	Realization	To build solution	Documented and tested system solution	Decision Point (Aprove solution and services)
Service Design/ITIL	Contract Proven solution concept Functional and technical solution description	Develop the solution	To build services	Documented and tested service solution	

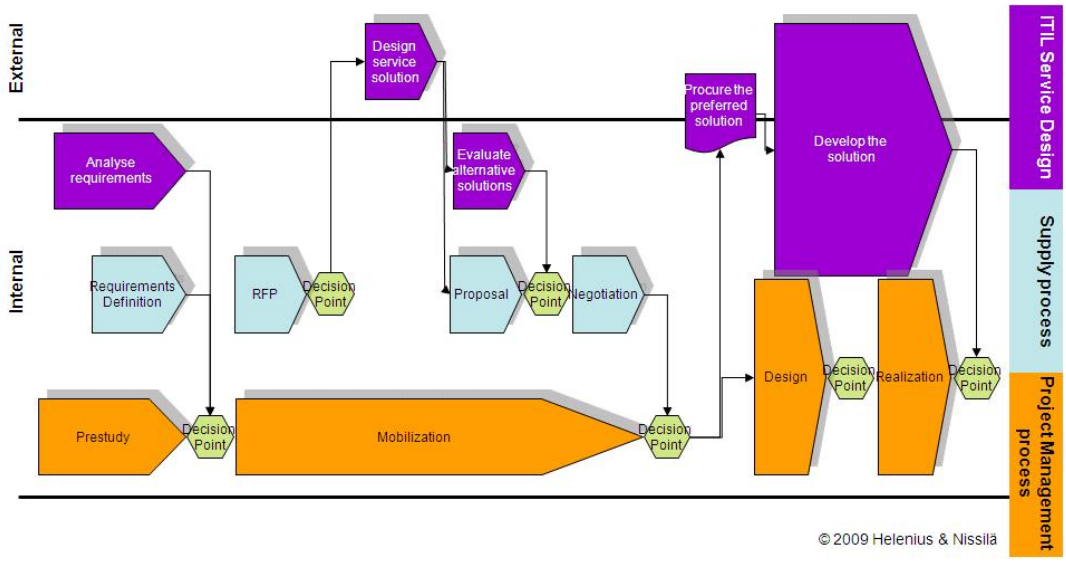
Picture 9: Analysis of steps in parallel processes

Based on the analysis of steps, the new process was designed to give a common overview of how these processes are connected to each other as separate process flows. In the new ICT supply process (Picture 10) the parties are described in the left panel at a generic level: external and internal, where the external is the vendor party.

The new ICT supply process is triggered by the project management process, which is triggered by business decision. The project management process starts with gathering the business requirements, which provide the input for supply process first task: requirement definition. The needs for the supply process are different though, as the input serves only the creation of RFI, compared with the needs of the project management process, but this does not justify the processes for separate requirements gathering.

The new ICT supply process deliverables are the inputs to the project management process Design phase and for the Service Design procures the referred solution task. Compared with the existing supply process, where the finalizing the contract was part of the negotiation phase, the task of procuring the solution has been transferred to Service Design.

The needed ITIL support processes are excluded from the new ICT supply process. This does not understate their necessity.



Picture 10: The New ICT Supply Process

10 Evaluation of the New ICT Supply Process

The new ICT supply process is evaluated in theory against two process and their phases. In this work process is the unit of analysis. One is process for public procurement and the other is a guide for non-specialist ICT Purchasers. Organization uses government funds in purchasing and therefore must follow national procurement legislation. The guide for non-specialist ICT Purchasers is aimed for business owners and managers who often see ICT highly technical and specialist subject. The criteria for evaluation are on the other hand based on Service Design appendix C (Lloyd et al. 2007, 237).

It gives a good basic list of the typical contents of a process framework. On the other hand criteria are based on organization needs to update the existing supply process. The researcher would also like to see if the new ICT supply process can make communication better between ICT and business people.

10.1 Processes

Finnish public procurement is subject to national procurement legislation which derives from the European Community directives on public procurement. Under these rules public sector procurement must follow transparent open procedures ensuring the fair and non-discriminatory conditions of competition for suppliers. The regulation of public procurement aims at a more efficient use of public funds in order to ensure value for money on public procurement financed out of general taxation.

A further aim of the regulation on public procurement is to enhance the competitiveness of national and European enterprises. (Aarla 2003, 4.) The guide for non specialist ICT Purchasers is a process guide to help make better, more reliable purchasing decisions. It is designed for infrequent and small value Purchasers for ICT. The guide has been produced by Accredit UK as a result of research. The guide has been part financed by the European Union (Accredit UK 2008, 2).

The evaluation is done by the design science research static analysis method by Hevner et al. (2004, 86). In the evaluation of the New ICT supply process: case study; experimental; field study or simulation, are excluded evaluation methods due to their real live nature. The theoretical evaluation is made from the customer (internal) point of view.

10.2 Evaluation criteria's

When designing a new revised process, it should be kept in a fairly high level. ITIL Service Design gives criteria to evaluate the new ICT supply process. Only valid criteria from ITIL framework for the new process evaluation are picked up and used in this work. Selected criteria that new process must include are: process name, description, administration, objectives, scope, inputs, procedures, activities, outputs, triggers, tools, communication, roles and responsibilities, interfaces and dependences to other valid processes, process measurements and metrics, deliverables and reports.

When evaluating the new ICT supply process it must fulfil organizations needs. Supply process and project management process tasks, connections and dependences should be described. Roles and responsibilities for the process and their connections should be described.

Supply process and project management process phase orders should be described. Most of all the new process must have the framework from ITIL the latest version. Also the new ICT supply process must fit and implemented in present environment. Researches would also like to see that new process could give tools for better understanding between ICT and business people.

10.3 Evaluation

In order to combine and analyze other two processes and the new ICT supply process similarities and differences and to draw conclusions, the researcher created an analysis template (Yin 2009, 126-127). The following abbreviations are used; PMP, Project Management Process, ITIL as ITIL Service Design and SP, Supply Process. In the middle is the new ICT supply process which describes the phases in the process. First from left is described Accredit UK's (2008, 3) process for purchasing ICT. On the left side is described the open procedure process for public procurement (Aarla 2003, 1-3).

Guide to purchasing ICT: Phase	New Supply Process: Phase	Public procurement: Phase
Stage One - Plan the Purchase Stage Two - Detail your Requirements	Prestudy (PMP) Analyse requirements (ITIL) Requirements Definition (SP)	Planning of the procurement Publication of a prior information notice Setting up a specification and other substantive requirements
Stage Three - Identify Suppliers and Request a Quatation	Mobilization (PM) Request for Proposal (SP)	Invitation to submit Tenders Evaluation of the contents of tenders choosing the winning tender
	Design service solution (ITIL)	
Stage Four - Evaluate the Suppliers´Responses	Mobilization (PMP) Evaluate alternative solutions (ITIL) Proposal (SP)	Invitation to submit Tenders Evaluation of the contents of tenders choosing the winning tender
Stage Five - Select your Preferred Supplier	Mobilization (PMP) Negotiation (SP)	Invitation to submit Tenders Evaluation of the contents of tenders choosing the winning tender
Stage Six - Palce Ored with Supplier	Procure the preferred solution (ITIL)	Notification of the decision and the instructions for appeal conclude the Contract
Stage Seven - Implementation	Design (PMP) Develop the Solution (ITIL)	
Stage Seven - Implementation	Realization (PMP) Develop the Solution (ITIL)	

Picture 11: Evaluation processes

The guide for non specialist ICT Purchasers process includes seven phases: Plan the Purchase, Detail your Requirements, Identify Suppliers and Request a Quotation, Evaluate the Suppliers' Responses, Select your Preferred Supplier, Place Order with Supplier and Implementation (Accredit UK 2008, 3).

The new ICT supply process includes six internal phases: Prestudy, RFP, Proposal, Negotiation, Design and Realization.

Each phase has interface to supply process phases in ITIL framework. Prestudy phase in connected to supply process phase Requirement definition and in ITIL framework phase Analyze requirements. RFP, Proposal and Negotiation phases are connected to project management phase Mobilization and in ITIL framework to Design service solution and Evaluate alternative solutions. The new ICT supply process identifies one external phase also in ITIL framework, Design alternative solution. Design and Realization phases have a connection in ITIL framework, Develop the solution.

The open procedure process for public procurement includes three phases. First phase includes the Planning of the procurement, Publication of a prior information notice and Setting up a specification and other substantive requirements. Second phase includes Invitation to submit Tenders, Evaluation of the contents of tenders and choosing the winning tender. Last phase includes Notification of the decision and the instructions for appeal and concludes the Contract (Aarla 2003, 1-3; Sihvola 2006, 8-9).

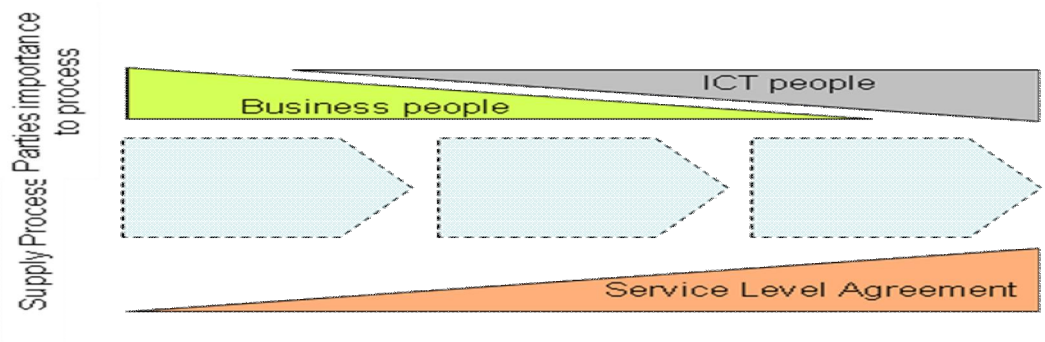
From these three processes, common features can be identified. All three are processes and managed on a project basis. All three processes are a connected series of actions, activities, performed by people with the intent of achieving a goal. All three exist as long as the goal is achieved. Projects build up for some purpose and usually are unique. Processes are also based on a model which is common for Purchasers and Suppliers. Accredit UK (2008, 2) provides quality mark for Supplier and the mark demonstrate for ICT Purchasers that companies holding the mark operate with defined processes. The new ICT supply process is based on ITIL which is the most widely accepted approach to It Service management (Lloyd et al. 2007, viii). The public procurement process is based on legislation and it is an open transparency process for bout sides.

From these three processes differences features can be also identified. Process for public procurement processes third phase includes Notification of the decision and the instructions for appeal and conclude the Contract and so the process ends when the decision of a supplier is made. In the guide for non specialist ICT Purchasers process and in the new ICT supply process the processes end until the implementation is finalized. Terminology in some phases differs although the meaning is the same for example Request for Quotation, Request for Proposal and Invitation to Submit Tenders.

In addition the new ICT supply process includes features which were not included in either of evaluated processes. A process decisions points are described and the need for support processes is recognized. The new support process describes both internal and external processes phases not only internal.

Process for public procurement first phase includes definition and decision about what kind of method is going to use in the process, negotiation or open. In the new ICT supply process or in the guide for non specialist ICT Purchasers process such phase cannot be identified.

All processes lack in communication and knowledge transformation aspects. It is the heart of good customer's and staff relations (Lilley 2006, 98). Communication is a two-way thing but it is challenging to add in process. In Service Level Agreements requirements gathering for example if business needs are not clarified ICT people do agreement which does not fulfill business needs. If ICT people cannot clarify supplier's technical services in business language, it can lead to over service and over priced agreement.



Picture 12: Framework for Service level requirements gathering

As the picture 12 presents both ICT and business parties are needed to complete Service Level Agreement. The upper part of the figure illustrates the parties involved in the process and their importance in phases. Business people's involvement is high in the beginning of the process and declines when reaching the end of the process. ICT people's involvement is other way around, at the beginning of the process beginning low and getting higher when the process is coming to its end.

While evaluating the new ICT supply process, ITIL framework the valid criteria was met in most aspects. ICT Supply Process (name) and the process are for ICT purchases when external supply together with development is needed. The process is triggered by business needs gathered in the project management process and is closed when solution is developed (description). The new process is administrated by Corporate ICT department as the exciting one (administration). The goal of the new ICT supply process is to purchase and develop ICT systems and services so that business requirements are met (objectives and scope). The supply process is triggered by the project management process (trigger), which provides the input for supply process first task requirement definition (inputs). There are a number of other inputs in supply process phases and they are described in picture 9.

Procedures of the process and activities in a high level are represented in picture 10 (procedures and activities). The ICT supply process output is documented and tested service solution and other outputs are described in picture 9 (outputs). Although ITIL process framework requires communication content in process Service Design does not have a tool or model to describe it in process (communication). The chosen process model method for this work does not include technique to describe roles and responsibilities in process (roles and responsibilities). The new ICT supply process has a very tight connection to the project management process as pictures 9 and 10 shows. The project management process triggered the supply process and deliverables of the supply process are inputs to project management inputs (interfaces and dependences). Deliverables at a high level are presented in picture 9 (deliverables). Process measurements and metrics, tools and reports are not being defined and included in the new ICT supply process in this work scope.

The new ICT supply process must also fulfil organizations needs. While evaluating the new process most organizations needs were met. During the evaluation, the leading role of project management process was found. To support project management governance, some major decision points were added to combine supply process and project management process phases. Both process phases have connections and dependences to each other and phase's orders are described. The need for a common model and better communication for suppliers and organization was met due to the new ICT supply process is based on ITIL version 3. The new process itself gives a big picture for organization but it does not resolve the communication challenge between ICT and business people. Roles and responsibilities are covered in the previous chapter. Existing tasks from the supply process and the project management process were used when building the new ICT supply process. Due to that fact, it should fit easily in present environment. Implementing the new process alone without needed supporting processes, process measurements and metrics, tools and reports it is inadequate.

11 Results

In this chapter researcher presents the results of this work. What problems presented in Chapter 2 has been solved, excellence of the work for ITIL, challenges and limitations.

11.1 Problem solved

Organizations existing supply process needs the project management process. While analyzing the existing supply process, project management process tasks are only mentioned and in project management process supply process tasks are also only mentioned. No direct connections either dependency were identified. Also the latter project management phases like design and realization need to connect and co–operate together with supply process.

The project management process is always needed for development based purchased solutions but not for maintenance based purchased solutions. The importance of project management came clear during the evaluations, as well as its leading role in the new process.

Some major decision points from existing processes to the new process have been combined. Decision points were needed in order to situate the tasks of the supply process and ITIL support into the phases of the project management process. The supply process connections are only a partial view of the service design deliverable process, as the supply process is always connected to a vendor party. Service design instead does not recognize parties, only roles and they are generic. In order to operate effectively the steering groups should be also aligned.

Service Design contains previous and subsequent phases compared with the supply process. During the work researcher noticed that both the project management process and service design process are connected to subsequent phases. The basic deliverables of the supply process – final contract with attachments – should have an addressee with a task to trigger to the develop phase. In the new process, it has been connected to the project management decision point. The governance for the purchase decision point is handled now in project management.

In the new ICT supply process uses only the deliverables of the project management process. In existing processes some tasks are carried out by the project management process and in the supply process. Requirement gathering for example is done in both processes.

During the evaluation, the new ICT supply process is more than adequate. It fulfils most of ITIL framework valid criteria and most organizations needs. The new process includes six internal phases and one external phase. Two other processes instead do not recognize parties. Also no decision points were included in these two processes. All three process starts by requirement definition and purchase planning. Two of the models end until the implementation is finalized and one end when the decision of a supplier is made. Process measurements and metrics, tools and reports are not be defined and included in the new ICT supply process in this work scope.

11.2 Excellence of the work for ITIL

Going through ITIL Service Design author notices that there was no real existing supply process only some relevant tasks exist. Tasks related in theory material were not considered relating to each other and they had different hierarchical statuses in processes. Also no decision points were included in Service Design material.

Service design either ITIL does not contain a phased project management process, so if a process exists in the organization, it needs to be adjusted to ITIL processes. This work will be sent as a proposal to the owner of ITIL, OGC to the development of the following version of ITIL. The suggestions are described in more detail in Chapter 12 in Chapter 12.5.

11.3 Challenges

All three models are processes and managed on a project basis. The new ICT supply process is based on ITIL which is the most widely accepted approach to It Service management. Although ITIL process framework requires communication content in process, Service Design does not have a tool or model to describe it in process. Also all process models lack in communication and knowledge transformation.

The needed ITIL support processes are excluded from the new process. This does not understate their necessity. If any part of maintenance for the purchased solution is included in the contract – as it should be – the support processes need to evaluate, stated in detail and planned to be up and running when the go-live for solution is executed. Tasks in these support processes, for example requirements gathering, service catalogues and service level requirements provide the key information or key input for supply and project management processes.

In theory the supply process and the project management process roles and responsibilities must be defined so that both processes are synchronized and work effective. In the existing supply process version, Business owner is the role responsible for the gathering requirements, creating the business case, accepting the supply process team, the supply criteria and the commercial issues. The supply process manager is the role responsible for RFI process and the RFP process. The project manager of the project management process has no connection to supply process. So the role of business owner is more of a part of the project management process and it should be one individual operating in both processes.

11.4 Limitations

In the new process Prestudy phase nor the guide for non specialist ICT Purchasers process first phase does not include definition in which kind of a method is going to be used in process. Process for public procurement first phase includes definition in method is going to use in the process negotiation or open.

Due to that fact that new ICT supply process is based on existing processes it will fit easily in present environment. Implementing the new process alone without needed supporting processes, process measurements and metrics, tools and reports it is inadequate.

12 Conclusions

In this work ICT purchasing, IT Project Management and communication challenges were studied based on Organization existing processes, previous studies, theory books and articles. Based on design science research method the new ICT supply process where build an evaluated. The new process has been tested in this work for one time. The work framework was ITIL version 3 Service Design.

12.1 Improvements as result of the new ICT supply process implementation

To achieving better results in IT projects (in 2009 only 32 % successful IT projects (Galorath Incorporated 2008, 1)) works results shows that new ICT supply process can be a tool for it. Project management processes first phase Preparation and supply process first phase Requirements definition has been combined with the common decision point. As Karvinen et al. (1994, 16-30) point out to little time has been spend on preparing ICT purchases. Combining these first phase's preparations are done synchronised and inherently Project Management includes tasks which fulfil lacks in supply process. IT project management includes tasks in setting the target (Phillips 2005, 11), defining a connection to company strategy (Phillips 2005, 76) and setting the budged including maintenance fees and follow-up tasks (Phillips 2005, 98-117) which ICT purchasing process lacks.

The new ICT supply process is based on ITIL version 3 Service Design (Lloyd et al. 2007). The ITIL framework does not contain any tools for better two-way understanding for business and ICT people; only a high level approach of aligning is presented. Even so the use of ITIL terms provides a common terminology framework for ICT. The new process supports the need for common operations and models with suppliers. Also in the new ICT supply process both internal and external parties is defined and both parties process phases.

A result of implementing the new ICT supply process makes purchasing more effective. Overlap tasks have been identified and extracted from the new process. The new process uses only the deliverables of the project management process. In existing processes some tasks for example requirement gathering is carried out by the project management process and in the supply process. Effectiveness can also be achieved in resources. The Business owner has many responsibilities in processes and by combining processes some operations such as requirement gathering must be done only one time. It does not however take out the need of requirement change management.

12.2 Fit to Organization environment

Consequence from results several other needs for developing occurred in organization. New ICT supply process combines IT project management and ICT supply processes for example through whit common decision points. This means that Organization purchasing department and ICT department process and project development should be synchronized. As results shows project management has the leading role when external supply together with development is needed. Duo to that ICT department should have the leading role in project management and process development in cases when purchasing involve ICT development. In other cases for example ICT licenses purchasing department should have the leading role (van Wheele 2005, 33; Phillips 2005, 98, 115, 195).

As Accredit UK (2008, 5) prefers all significant ICT purchases should be managed on a project basis. The project management will help keep a project in control and reduce the change of bad decisions. It means that also other purchases in organization such as ICT licenses purchases should be managed project management bases. This statement does not underestimate organizations purchasing departments existing procedures but emphasized their role as giving guidelines to individual business units. Business units also conduct purchasing activities and to do so needs the professional buyer's guidance (van Wheele 2005, 84).

The new ICT supply process also expands the supply task from signing the contract to the implementation of the purchased ICT system. The existing supply process includes four phases and it end when the contract is signed. The new process based on ITIL includes six phases and end when the solution is developed. This means that organization should adjust IT project management Design and Realization phases so that they fulfil needed contractual issues. Existing tasks in phases are described too narrow and too low prior (Organization Oyj 2005, 24, 26).

12.3 Recommended supportive actions in purchasing field

Result from evaluating the new ICT supply process, implementing the new ICT supply process alone without needed supporting processes, process measurements and metrics, tools and reports it is inadequate. Even if measurement and metrics were evaluation criteria from ITIL framework process measurements and metrics, tools and reports are excluded from works scope.

Organization should have an information system to support a decentralized purchasing of ICT systems (van Wheele 2005, 241). It gives the possibility to the coordination of all ICT purchasing activities.

ICT systems in use usually lead to better discipline and more systematic communication from purchasing operations. ICT systems also enable better management information and reports. A result of the greater transparency of purchasing operations on organization it leads situation that suppliers are better managed. In generally an IT project uses ICT tools for gathering information in current situation such as email, excel, web forms, Microsoft Project (Phillips 2004, 259-260). Organization should evaluate the possibilities to use these commonly used tools to support ICT purchases at organization level.

In general processes should be measured and a process should have set metrics (Lloyd et al. 2007, 237). Measurement and metrics main focus is to give information about process situation and development in clear and visual format. It should point out if there are problems or improvement needed areas. A well defined and implemented measurement system gives a transparent picture of results and based on that it is easy to understand the connection between action and measurement. Single, practical model for measurement and metrics in purchasing area is hard to develop. (Iloranta et al. 2008, 434-444;van Wheele 2005, 250-267). As before in this chapter is presented the new ICT supply process is managed on project bases when supply together with development is needed. In such cases IT project management measurements and metrics could be used. Phillps (2005, 13) defines budged, target/scope and a schedule as project metrics. A project needs a budget to illustrate how mush money it is going to take to fulfil the set target. Clear and well defined target is the most important thing for a project or project is lost. The project schedule defines time when the target is achieved and project outcomes are ready to transfer for maintenance organisation.

Regardless of ITIL support processes interference from the new ICT support process they are needed. Tasks in these support processes, for example requirements gathering, service catalogues and service level requirements provide the key information or key input for supply and project management processes. Service Design includes seven supporting processes (Lloyd et al. 2007, 60-164). There is a gap in organization between ITIL versions two and three. Processes have been developed in different parts of organization and during various times. In Organization the implemented processes based on the ITIL version 2 relevant to Service Design are Service Level Management, Capacity Management, Availability Management and Change Management. Service Continuity Management and Information Security Management are the next processes to be implemented based on version 3. In version three Service Level Management process is split into three processes besides Service Catalogue Management and Supplier Management processes and must be implemented. Capacity Management, Availability Management and Information Security Management needs to be upgraded from version two to three.

In the new ICT supply process internal and external parties are described. In Organization process roles and responsibilities should be evaluated and transformed so that process works effective. The Business Owners role emphasizes in the new process. Business units and their executives must take a leadership role in a handful of key ICT decisions. Unless business executives take responsibility for the success or failure of ICT purchases they will end up with systems that will have no impact on business. IT projects and department should be held responsible for delivering solutions that are on time on budget. Only business executives can make organizational changes needed to generate business value from the new system. (Karvinen et al. 1994, 120-123.) Until complaints continue about having spend too much money for too little value.

12.4 New ICT supply process further development needs

In further development of the new ICT supply process, organization could evaluate the need to enhance first phase of the process. Should it include the task to define for which kind of method is going to be used in process negotiation or open? Regardless of development target source this enhancement could clarify and speed up the process. When purchasing target and contract terms are hard to define negotiation is only an option (Sihvola 2006, 17).

Theories recognize that there is challenge and recommend that communication problems and misunderstanding should resolve with talking things through. In my experience and previous studies there is a real existing problem of getting the business language and ICT language mapped so that each party can understand what has basically been defined and agreed and follow that the agreed tasks are done in an appropriate way. In further development of the new ICT supply process, a method or a tool to combine two languages in an effective way should be defined. The method or the tool should enable understanding and controlling of agreed tasks and document it in a structured way. In the best case it could provide a platform for version controls for change management for example Service Level agreement requirements mapping.

12.5 Recognized ITIL development needs

Regardless of the Service Design materials shortcoming, the material was adequate to build the new ICT supply process. Going through Service Design researcher notices that there was no real existing supply process only some relevant tasks exist. Subsequent activities, the evaluation of the alternative solutions and the procurement of the preferred solution must be completed in Service Design stage. One of the deliverables from design activities is ITT (Invitation to Tender) (Lloyd et al. 2007, 30, 46).

Tasks related in material were not considered relating to each other and they had different hierarchical statuses in processes (Lloyd et al. 2007, 46). Picture 4 in this work (copy from Service Design) do not visualise the shortcoming the text material brings out. In the picture task have the same hierarchical status.

For this work was chosen and used process modelling method (Harmon 2003) which includes technique to describe decision points into the new ICT supply process. Neither in ITIL generic process model (ITIL Service Support 2002, 273) nor Service Design process framework (2007, 237) includes decision points. In ITIL process owner is the role responsible for ensuring that process is fit for purpose but steering groups or comparable decision groups are not included.

Going through Service Design researcher notices that there was no real phased project management process only some relevant tasks exist. The project manager and the project team maybe need to manage stages from Strategy to Transition. Also the project management is needed in the development stage, where service design is translated into a plan. (Lloyd et al. 2007, 31, 47.) Tasks presented in text material were not brought out in visual picture number 5 in this work (copy from Service Design). If a phased project management process exists in company, it needs to be adjusted to ITIL processes.

The ITIL framework does not contain any tools for better two-way understanding for business and ICT people only a high level approach of aligning is presented. Although ITIL process framework requires communication content in process (Lloyd et al. 2007, 237) Service Design does not have a tool or model to describe it in process. The use of ITIL terms provides a terminology framework for ICT but it is not focused on business people. If it is used to business discussions, terminology needs to be trained to the business party. In Service Level agreement for example two way understanding and communication support tool would prevent the problems of developing. If service level targets are not aligned with business needs, ICT service provider activities and service levels will not be aligned with business expectations and problems will develop.

12.6 Implications to design science research

Design science research for information systems by Hevner et al. (2004) was suitable for this work. Design Science Research Guidelines by Hevner et al. was used in the building of the new ICT supply process and the evaluation was done by the design science research static analysis method also by Hevner et al. The researcher has no proposals about used research method.

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