Managing IT Costs by ABC

- A study of the "Service and Support" function at Toyota Industries IT Supply Europe

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Preface

The journey of composing this thesis has been characterized by an immense opportunity of learning. Throughout the whole process we have had the opportunity to meet and converse with several individuals, some of which we would like to thank. Firstly, we want to thank our supervisor Christer Kedström for being a source of inspiration and for providing us constant support throughout this whole process.

Secondly, we want to thank Ronny Ideskär our Project Host at BT IT Supply and the rest of the people at IT Supply. Their assistance and support was of great importance during our stay at IT Supply.

Last but not least we want to thank Urban Järund architect developer at BMC Software, the initiator for this project.

Without the help of these individuals this thesis could not have been conducted.

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Abstract

Title: Managing IT Costs by ABC - a study of the "Service & Support" function at Toyota Industries IT Supply

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Purpose: The purpose of this essay is to identify costs for providing First-line and Second-line support, and then allocate these cost to different goods and services (cost objects) being supported. The thesis also intends to improve the overall cost awareness in IT settings.

Methodology: The methodology is based on a deductive approach. A study of a single case is applied, mostly based on semi-structured interviews and questioners.

Theoretical perspectives: Activity Based Costing

Conclusions: Today many publications relate IT to increased business value but few studies are linking Cost Management to IT more closely, which creates a false illusion about IT as something that does not generate solid costs. We have in this thesis presented an initial ABC model for how to allocate costs within a Service and Support function.

Table of contents

INDEX OF FIGURERS AND DIAGRAMS

Chapter 1

Introduction

In this chapter we intend to present a background to the subject and to give an introduction to the questions at issue. The chapter will also bring clarity to existing definitions and limitations within the theme and provide a disposition for our study.

1.1 Background

Cost management is by far one of the most important managerial tools when it comes to allocating costs within an organization.[1] The literature about this is extensive and provides different models and different approaches, but there seems to be a glitch between the academic discourse and the contemporary situation. This is especially profound when it comes to allocating costs in IT environments.

Since the early 1970 production has transformed towards a more mechanized and computerized way and the proliferation of computers and internet related systems has changed the way for how business is conducted.[2] This transformation has also been triggered by global competition which has led to striking innovations in the use of financial and non financial innovations in organizations.[3] As a result organizations are increasing their investments in IT and IT related services. Consequently managing IT has become a more complex and costly activity, therefore managers in high tech industries and IT divisions have to consider new ways to control these costs. The need for a more sophisticated way to measure IT costs is essential in order to develop long run strategies and to sustain competitive advantage.

Today many publications relate IT to increased business value but few studies are linking Cost Management to IT more closely, which creates a false illusion about IT as something that doesn't generate concrete costs. Since the degree of intangibility is high, the way of measuring the costs becomes a major challenge. Today many organizations are using internal pricing in order to manage the costs of IT services; another solution is to outsource the whole IT division. The latter of these two alternatives is very convenient since it provides a fixed cost for the whole service.

To realize economies of scale many organizations have introduced IT units that allow service to be shared among different divisions in the organization. The IT division is often vertically integrated which gives the organization the ability to reduce total cost of support functions but it also brings new challenges. If the functional structure of an IT department is an autonomous division and its daily work is vertically shared through the organization, how does one control the cost

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[1] Shank, John K. & Govindarajan Vijay, *Strategic Cost Management (*1993*)* Maxwell-Macmillan: Canada.
[2] Gerdin, Jonas, *ABC-kalkylering* (1995) Studentlitteratur: Lund. Page 13
[3] Kaplan, Robert S. & Cooper, Robin, *Cost and Effect* (1997) HBS Press: Boston.

for IT and ensure that the right division or unit is accountable for the specific IT service it is using? This imposes a major dilemma for organizations both when it comes to measuring and allocating costs. What is the cost for using an email system? Which division shall be accountable for this? The IT division can be seen merely as a support function where its main goals are to deliver services to other units. Therefore the ideal situation would be an IT division with a 0$ budget. Instead the costs for the different IT services should be allocated to the different divisions using them not to the IT division itself. Figure 1.1 shows the IT division supporting the production process with different services, but the cost for each service is unknown.
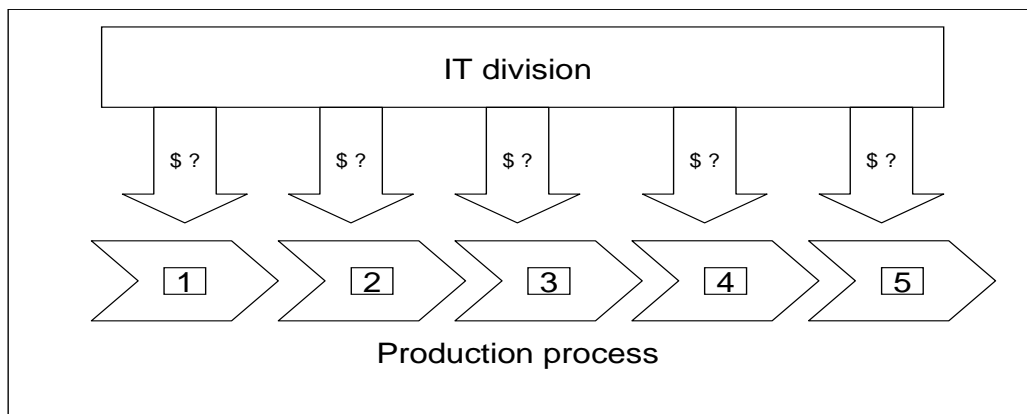
Figure 1 The IT Support division

Robert S. Kaplan and Robin Cooper argue that too many managers in organizations rely on information from a cost system designed for a simpler technological age, when competition was local not global, that featured standard not customized products and services and when speed, quality, and performance were less critical to success.[4] They argue that the solution for organizations is that they must use many cost systems at the same time. We find their discussion very interesting and this study can be seen as an enhancement of their argument. We are now in a situation where IT related services are becoming more and more costly. At the same time many organizations are using old cost systems not designed for this new technological era which eventually will lead to a situation with a cost mass very difficult to control. The solution for this can be not only to use many cost systems at the same time within the same organization, but to come up with a completely new.

Johnson Kaplan (1987) discuss the American manufacturing industry during the 20th century and point out that the current cost systems have become obsolete and needs to be revised. Johnson and Kaplan argue that this is one of the reasons for the declining American manufacturing industry.[5] In this essay we take the same argument and apply it on an IT environment. We argue that the need for a modification and an upgrading of the current cost systems are essential. Today it has become a prerequisite for all organizations and consequently the cost for managing IT has rapidly increased. An IT organization must be scrutinized like any other division of the company. One must be able to trace costs in IT to the

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[4] Kaplan, Robert S. & Cooper, Robin, *Cost and Effect* (1997) HBS Press: Boston.
[5] Ibid.

activities that drive these costs. Why should the IT division be an exception? The journey of trying to control and define these costs has just begun.

1.2 Problem Discussion

The fact that most IT services have varied degrees of intangibility and a relatively high degree of complexity makes it a challenge to measure the cost of the services that are being delivered. A further challenge is that IT settings continuously evolves and changes which makes them difficult to measure and analyze. [6] As a result IT organizations have had difficulties in not only accounting their costs but also accounting for the work they perform and the services they deliver.

When activity based costing emerged in the 1980s managers got a clearer picture of the company's economics. The use of ABC enabled indirect and support expenses to be controlled, first to activities and processes, then to products, services and customers.[7] This new way of cost allocation was a natural evolvement because of new industrial and economic demands. At the time there was an ongoing transformation towards a more mechanized and computerized production, overhead and in-direct costs had significantly increased in proportion to direct costs.[8]

Advances in IT during the late 1990s gave organizations opportunities to create improved production systems, but the benefits from these systems would not be fully realized unless the cost structure was identified. Without such understanding organizations may believe that they have acquired a modern and integrated system that only provides benefits. To support an organizations strategic planning and decision process, the ability to remain competitive and improve performance, understanding and managing costs is an absolute requirement.[9] This may i.e. include outsourcing considerations. Should the organization provide the service internally or should the organization purchase IT solutions externally? In order to evaluate the alternatives the organization has to be able to evaluate what solution that is the most profitable. Is the cost for (purchase + external / internal support) less or more expensive than a total outsourcing agreement?

The IT structure of a company is complex and needs to be separated in different components in order for the cost structure to be illuminated. During recent years a world-wide standard in IT Service Management has been acknowledged. This is known as the IT Infrastructure Library, ITIL. Developed in the late 1980´s as a guide for the UK government in IT management issues it has today gained acceptance from both private enterprise as well as government institutions world wide. ITIL is based on a set of processes that organizations are recommended to implement in order to structure their IT environment.[10] The ten processes are generic and described to apply to all IT services. We believe that a setting based on these structuralized processes provide a fruitful ground for a cost allocation process within an IT organization. It is although important to understand that

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[6] Neumann, R. Bruce, et. al., *Cost management using ABC for IT activities* (2004) in MAQ.
[7] Ax, Christian & Ask, Urban, *Cost Management* (1995) Studentlitteratur: Lund. Page 55
[8] Gerdin, Jonas, *ABC-kalkylering* (1995) Studentlitteratur: Lund. Page 15
[9] Kaplan, Robert S & Cooper, Robin, *Cost and Effect* (1997) HBS Press: Boston.
[10] Macfarlane, Ivor & Rudd, Colin, *IT Service Management* (2001) itSMF Ltd: UK.

ITIL only provide a framework of guidelines, a sort of best practice of how to conduct and organize an IT division. In order to systematically control costs a sharper tool is necessary and the practical instrument we will use is "Activity Based Costing". ITIL will be further explored in the theory chapter.

The contribution of the ABC model is to divide the organization into different activities and then use cost drivers to distribute overhead and in-direct cost.[11] Cost drivers can be defined as an incident that occurs as a result of an activity that is performed in order to produce a product. The model constitutes that activities consume resources and that products consume activities.[12] Costs will consequently depend of how much the activity for a product costs and not of the quantity of the product. In other words the model should provide a method for calculating cross charges back to the business unit or product so that costs can be justified and tracked with demand. This will help the organization to develop a deeper understanding of how and why IT costs occur.
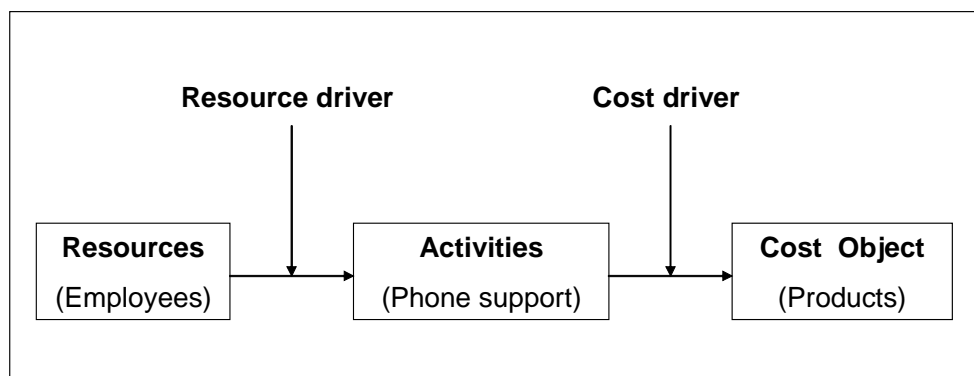
Figure 2 Activity Based Costing[13]

With the help of BT–Industries, a subsidiary of Toyota Industries Corporation, we have been given the possibility to conduct our essay on their IT division. The initiative for this originated from the consulting firm BMC Software. BT Industries is the world's largest manufacturer of warehouse trucks and was in 2000 acquired by Toyota Industries Corporation (TICO). Together they created a world leading constellation in industrial trucks.[14]

Toyota Industries is divided in four regions Europe, North America, Japan and International (Rest of the world). Within each region and business segment there are several support division and this essay has it focus on the support division, Toyota Industries IT Supply Europe AB (from know known as BT IT Supply or IT Supply). A further description of the organization will follow in the empirical chapter.

For us BT IT Supply represents an ideal case company when it comes to the predicaments with controlling IT costs. BT´s world leading position and its awareness in these issues are two major factors supporting this. We discussed our

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[11]Ax, Christian, et.al., *Den nya ekonomistyrningen* (2002) Liber ekonomi: Malmö. Page 265

[12] Kaplan, Robert S. & Cooper, Robin, *Cost and Effect* (1997) HBS Press: Boston.

[13] Ax, Christian & Ask, Urban, *Cost Management* (1995) Studentlitteratur: Lund. Page 61

[14] http://www.bt-industries.com/en/ourcompany/btbusiness/history.htm (2006-11-20)

vision of this essay with our Project Host at BT IT Supply and together we scoped down the issue and formulated questions at issue to look into.

1.3 Problem Focus

In order to investigate an issue that relates costs to IT activities the ability to scope down the problem is essential. IT services of a company are everything from a company's email system and intranet to the Service Desk and internal support. Figure 1.2 shows the basic overview structure of an IT division based on the ITIL-library.
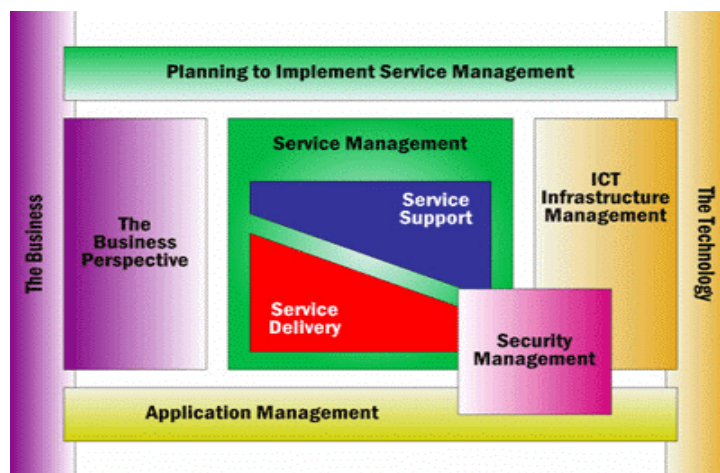
Figure 3 The ITIL publication framework[15]

In the left side of the figure we have "the business" which is the core process of the company. At the right side we have the technology which is the IT services needed in order to achieve the objectives. In this framework they represent two opposites and they merge together in the middle with "Service Management" consisting of "Service Delivery" and "Service Support". It is in the Service & Support component this study will have its focal point.

At the Service and Support function the Service Desk is the initial point of contact which makes it a central part for the whole organization. When a problem arises of any kind the Service Desk will be there to solve it. If the Service Desk cannot solve the problem it is forwarded to a relevant Service Group. Service desk has previously been referred to as Help Desk.[16]

The ITIL framework makes a distinction between different levels of support. First-line support is the one provided by the Service Desk, Second-line support is typically provided by the management department or a Service Group, third-line by the software developers and the fourth-line by the suppliers. The larger the organization, the more escalation levels are there.[17] First-line support is often associated with incident management whereas second-line support is associated

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[15] Von Bon, Jan, *Introduction to ITIL* (2001) Van Haren Publishing: The Netherlands. Page 7
[16] Von Bon, Jan, *Introduction to ITIL* (2001) Van Haren Publishing: The Netherlands.
[17] Macfarlane, Ivor & Rudd, Colin, *IT Service Management* (2001) itSMF Ltd: UK. Page 33

with problem management. We believe that the combination of First-line support and Second-line support represents a very interesting part of the IT department. The IT controller of BT underlined the need for a cost allocation study in this area which was a heavy argument for choosing this particular component.

1.4 Questions at issue

• Which resources, activities, cost drivers and cost objects and can be identified at the Service and Support division at BT IT Supply?

• How much of the indirect and overhead costs should be allocated to the different cost objects?

• How can BT IT Supply benefit from the ABC model?

1.5 Purpose

The purpose of this essay is to identify costs for providing First-line and Second-line support, and then allocate the costs to different deliverables (cost objects) that are being supported. By this the essay intends to improve the allocation and understanding of costs regarding First-line and Second-line support. This will be done using the basic principles of an ABC model.

1.6 Intended Readers

This study aims to bring clarity into the relationship between IT costs and the allocation of these to different deliverables. The main target group for this are organisations and companies that want to expand their knowledge in this particular area and in particular our case company BT Industries and their IT-division IT Supply. The limited information about cost structures in IT settings is widespread, whereas this thesis can be seen as an embryo of clarification to this immense dilemma.

Our essay can also work as a source for inspiration for other academics and scholars interested in this field. The area of allocating IT costs is not very well explored and more academic research is needed. This also serves another great purpose which is the recognition that is paid to a field when academics get involved. The principles of Activity Based Costing were used long before Johnson and Kaplan wrote "Relevance Lost", but it wasn't until the academic discourse approached the area it got world wide recognition.[18] Therefore it is of importance that other academics continue this interesting research.

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[18] Ax, Christian & Ask, Urban, *Cost Management* (1995) Studentlitteratur: Lund. Page 42

1.7 Disposition

Chap 2

Method
In this chapter we clarify our methodological approach and the validity and reliability of our thesis. We also make a critical discussion concerning our methodological choices and present alternative approaches.

Chap 3

Theory
We present the theory necessary to link the empirical material to the analysis. Here we will use the principles of Activity Based Costing and Activity Based Management. In addition to this a presentation of the IT Infrastructure Library will be made.

Chap 4

Empirical
We begin with a presentation of our case company and its organizational structure. Further, we describe all the information we achieved through interviews, literature and our questioner. In addition to this we discuss our chosen theoretical framework on behalf of the empirical findings.

Chap 5

Analysis
Here we combine the theoretical framework with the empirical findings and create an ABC model. This chapter also includes a discussion concerning the choice of activities, resources and cost objects. A discussion about ABM and the benefits from ABC will follow.

Chap 6

Results
Our final results are systemized and discussed, as well as the potential for an ABC model in IT settings. Further, we present suggestions for additional research in this area

Chapter 2

Methodology

The purpose of this chapter is to provide the reader with insight in our methodological considerations. We will clarify the methods we use and why we use them. Further we will present our course of action considering data and information gathering. These will be critical reviewed and followed by a discussion concerning validly and reliability.

2.1 Methodology Approach

A requirement for an IT organization, in the process of making strategic decisions and pricing its deliverables, is to understand the costs for its operations and the cost for specific services and products. In order to meet these requirements we have applied the basic principles of an ABC model.

As a result this essay has a normative purpose, but in order to fulfill this normative purpose the process also has to be explanatory.[19] The explanatory process concerns the study of how the IT division was structured and considered the identification of the IT division's resources, activities and cost drivers. The normative purpose was made in order to clarify the benefits of the ABC model. We therefore argue that this essay is both explanatory and normative since it both depicts the current situation but also indicates how potential problems can be solved.[20]

When describing the methodological approach, we consider it relevant to mention that a preliminary purpose initially was formulated, but during the process this has been adjusted. The process has been characterized by a journey of scoping from broad to more narrow. In the initial phase we had limited information and insight about the context of BT IT Supply, whereas our opening ambition was to conduct a more wide and general study of the whole IT setting. Eventually we were faced with its profound complexity and a demarcation with focus on "Service and Support" was made. An IT department is often organized with a wide range of interrelated activities and a combination of both horizontal and vertical relationships.[21]

It could also be of value to point out that BT IT Supply recently carried out a reorganization and at the time for our stay was involved in intense budget talks. As a result of this restructuring the new budget will now comprise new cost centres. On the basis of these premises we had dialogues with members of the IT division and together we scoped down our purpose which eventually led to the research of the First-line and Second-line support. All parties involved were satisfied.

This thesis includes theory concerning both IT Service Management and Cost Management. We have approached the phenomenon by the use of existing

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[20] Jacobson, Dag I., *Vad, hur och varför* (2002) Studentlitteratur: Lund. Page 17

[21] Neumann, James et.al, *Determining the Cost of IT Services* (2002).

theories whereas it can be seen as a deductive study.[22] The theory concerning IT Services consists of the framework that is known as IT Infrastructure Library ITIL and for Cost Management the chosen theory is Activity Based Costing. The purpose of ITIL is to provide a framework that separates the rather complex components and processes in the delivery of IT services, in order to clarify the sub processes within first-line and second-line support. Hereby we refer to ITIL as a theory even though it is mostly a framework of best-practices. We do this because ITIL is an imperative component in the Service Management setting at BT IT Supply.

2.2 Information Gathering

When we first were addressed with this matter we began to gather information about IT and Cost Management from all certain places. The literature of this kind was quite limited which strengthened our motivation to proceed. Our ambition and eagerness to cope with this issue was further enhanced. Our choices of literature selection will be made discussed in 2.2.1.

The next part of the information gathering process approached the context of BT IT Supply. This empirical information was brought together mainly by semi-structured interviews and a supplementary questioner. These interviews and the questioner provided us with information concerning consumption of recourses and what types of services and products the IT division provides. We were also given information about the relationship between IT Supply and the rest of the divisions.

Accordingly, we argue that this thesis primarily is a qualitative study entailing some quantitative features.[23] During the process and as a result from the initial interviews the purpose and questions at issue were modified. The interviews and the questioner were also complemented by studies of documents and informal dialogues. Concerning some sensitive material and as a result of a dialogue with IT Supply we are not able to publish any financial information. Accordingly, the different variables in the ABC model are presented as proportions instead of absolute figures.

2.2.1 Theoretical Framework

The preset conditions for this essay set by BMC Software was to use the principles of an ABC model in an IT setting. Naturally, this had a major influence on the selection of the theoretical framework. On the basis of these premises we began to gather relevant secondary data consisting of articles and literature. This process was mostly conducted through internet and several databases at Lund University. Concerning Cost Management and ABC there was a wide contribution of literature but writings linking ABC to IT were almost nonexistent. This discovery

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[22] Jacobson, Dag I., *Vad, hur och varför* (2002) Studentlitteratur: Lund.
[23] Arbnor, Ingeman & Bjerke, Björn, *Företagsekonomisk metodlära* (1994) Studentlitteratur: Lund.

indicated the contemporary glitch concerning the combination of Cost Management and IT. Nevertheless we were able to find two interesting articles regarding ABC and Cost Management which were "Determining the Costs of IT Services" and "Cost management using ABC for IT activities and services" both written by Bruce Neumann and James Gerlach. These articles targeted about the same issue as our study but from a wider perspective. Neumann and Gerlach have studied an entire IT Department at a multi million dollar company, whereas we have scoped down our research to "Service and Support". Nevertheless the arguments and overall perceptions are much alike and the articles gave us inspiration as well as practical tips on how to implement an ABC model. We were also engaged in a mail correspondence with these gentlemen, which was of great assistance. Further on, we have been reading several Cost Management related literature such as "Relevance Lost" (1987), "Cost Management" (1995) & "Cost & Effect" (1997). This literature constitutes as secondary data although they comprise elements which can be seen as primary data, for example the specific characteristics of the ABC model.

2.2.2 Interviews

The first and most important part of the interview process is to find relevant people to interview. This may sound self-evident but is utterly important to underline. If this part of the process fails the validity totally erodes. (ref). In order to avoid this problem we sat down with our project host at BT and formulated an interview schedule with different key individuals. We informed our project host with our aims and goals and what we expected from the interviews. We then scoped down the range of employees and ended up with 7 key individuals. We started off with the manager of the Service Desk, Hans Berg. For this interview we had prepared questions concerning the current cost mass and how the different IT services were priced. Another important objective was trying to identify the resources indispensable for the Service & Support function and to achieve relevant statistics. Since this was our first interview we also expected to familiarize us with the "every day life" at BT IT Supply. Our next interview had its focus on the daily routines and procedures inside the Service Desk, and for this we interviewed Camilla Ask, the most experienced Service Desk operative. The interview related to the standard procedures and details on errands logging, recording and diagnosing. The aim of this interview was not only to get acquainted with the day by day customs but to familiarize us with the different processes taking place in the Service Desk.

Our three next interviewees were Eirk Nabå, Operational Server Manager, Tommy Adolfsson and Morgan Bjernersjö, IT controller. The intention of these three interviews were to focus more on the different resources, such as computer servers in which different software operates and other technical resources necessary. Our questions also concerned different applications indispensable for the Service Desk. Further on, we interviewed to executives at BT IT Supply, Gisela Fagerstedt and Ronny Ideskär. From these interviews we wanted to get the "big picture" as well as cost information related to First-line and Second-line support, in particular personnel costs. Our aim was also to ask questions about the current reorganization and the new budget in which new cost centres will be created.

Before conducting our interviews we decided to perform a pilot study consisting of an interview with a Service Desk operative working for another company (Bryman 2002). During this meeting we could test our questions and familiarize us with the implications of a Service Desk, which was of great help when we arrived at BT. The questions were broad and Service Desk specific and during this interview we were able to practise our interview technique. This interview was naturally not included in our research material.

The overall structure and the aim for each interview were set in advance and during the interview we let the interviewee speak freely without specific restrictions. Each interview was opened in the same way where we presented ourselves and our vision with the thesis; we also explained our aim with the specific interview. The response from the interviewees was very positive and everyone was eager to help us out. Before the interview began we asked permission to record it, which was accepted by everyone.

All our interviews were transcribed the same day they were conducted. We spent most of our hotel nights listening and summarizing everything into structured categories. This served to purposes. First, it helped us in differing between the inadequate facts and the important facts. We scoped down the essence of each interview into different groups depending on the facts that were given. Secondly, this procedure made us refine and sharpen up our interview technique for the next day.

2.2.3 Questioner

In order to enhance our insight we felt it necessary to complement our interviews with a questioner.[24] The content of this concerned the time consumption per employee based on different deliverables. This approach of seeking a pattern of time consumption is characteristic by a positivistic mindset.[25] The questioner was handed out every morning, for a period of one weak. The employees were instructed to write the time consumption after each activity was performed. We did not want them to estimate time consumption at the end of each day, since the enthusiasm and eagerness to go home might have impacted the precision of their estimations.

Since the intention was to gather comparable and general information the questioners were completely structuralized and without multiple choices. Before we handed out the final version a beta version was presented to the operatives. This led to small adjustments and minor clarifications. By involving the employees in the development process our intention was to make them feel more motivated to present accurate information. In order to further encourage them they received a reward for participating in this assignment. We also explained that their contribution was an absolute requirement for our study and that their contribution was much appreciated. The result from the questioner provided us with time

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[24] This is attached in the appendix
[25] Jacobson, Dag I., *Vad, hur och varför* (2002) Studentlitteratur: Lund. Page 31

consumption based on different deliverables. This will be further discussed in the empirical section.

2.2.4 Studying of Documents

In addition to our interviews and our questioner a central part of our data gathering process was to take part of statistics. The initial idea with this was to find statistics that would help us allocate significant resources to the First-line and Second-line support. These statistics would also serve as a foundation for the creation of the cost base in our final ABC model. During the interviews we asked for statistics about computer servers linked to First and Second line support and the cost information for these servers. Further, we took part of information regarding the two major software "Remedy" and "Unicenter". We received cost statistics for these as well as the amount of "software transactions" that could be directly linked to Service and Support. Additional to this we were provided with a large amount of "everyday" statistics such as number of incidents, incoming calls per person etc. The studying of these formal statistics and documents became a crucial notion for our final analysis.

2.2.4 Observations and Informal Talks

The three whole days we spent at BT IT Supply gave us plenty of time to capture and observe the organization from within. During idle time between and after the interviews we were able to hold informal talks supplementary to the formal interviews, both with former interviewees but also with new individuals. When we talked to new individuals we were able to confirm information from the interviews and were also given new reflections on certain matter. This three-day visit enabled us to absorb the informal culture and make short acquaintances with employees which were of great significance for the final outcome. This approach of information gathering is characterized by a hermeneutic approach and consists of a high degree of interpretation.[26]

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[26] Jacobson, Dag I., *Vad, hur och varför* (2002) Studentlitteratur: Lund. Page 38

2.3 Methodological Discussion

In order to achieve a high degree of replicability the methodological assumptions of a thesis must be thoroughly reviewed. Our choice of method has led us to a certain approach in the process of making this thesis. We thereby mean that it is important to lead a discussion regarding validity and reliability. In addition to this the chosen approach must be discussed and challenged with other methodological alternatives.

2.3.1 Critical discussion

Since this study is characterized by a deductive approach and the empirical gathering was influenced by the preset theoretical framework there is a possibility that some information unwarily has been left out.[27] In the initial phase our information gathering consisted mostly of a qualitative method, which was further complimented by our quantitative questioner. An important factor concerning the entire data gathering process is the suspicion that can be associated with cost related issues. Asking to many questions about the current cost structure may impose suspicion from the interviewees and there is likelihood that questions are not answered correctly. For our concern we did however not encounter this dilemma and all our interviewees were giving us as much support as possible. We were although aware of the possible dilemma before we started our interviews, which might have been to assistance. Another very common quandary when conducting interviews is the possibility that the respondents are not motivated or interested in providing the interviewer with answers.28 This occurrence did we however not encounter. Our situation was quite the opposite and we felt a great willingness from the interviewees in answering our questions.

The use of questioners raises some methodological issues one must consider. Since questioners usually are characterized by a structuralized design the respondents are only able to give answers according to the preset options.[29] An initial mistake in the design of the questioner may consequently lead to dismissal of important information. In order to limit these risks we presented the beta version of the questioner where the respondents could participate in the designing of the final version. One problem that on the other hand is difficult to reduce is the degree to which the respondents give honest answers. The only argument against the significance of this problem is that possible incorrect information from the questioner does not affect the design of the final model, only the proportions between the different components. The proportions can however be modified with the correct information later on which almost constitutes as a must for an everlasting ABC model. Hence, if the respondents were to give incorrect answers this does not pose a major problem.

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[27] Jacobson, Dag I., *Vad, hur och varför* (2002) Studentlitteratur: Lund.
[28] Denscombe, Martyn, *Forskningshandboken* (2000) Studentlitteratur: Lund.
[29] Jacobson, Dag I., *Vad, hur och varför* (2002) Studentlitteratur: Lund.

2.3.2 Validity

The concept of validity tangles whether or not you measure what you intend to measure.[30] Consequently, there must be a clear alignment between the purpose of the thesis and the analysis.[31] Validity is often divided in two perspectives; an internal perspective and an external perspective[32]. In order to achieve a satisfactory level of internal validity alignment must exist between the empirical observations and the theoretical framework.[33] For our concern we argue that our internal validity is far above the satisfactory level. The theory which consists of ABC, ABM and ITIL clearly relates to the empirical observations. The theory we have chosen has a clear and present objective and leaves limited room for interpretation.

External validity entangles the predicament as to which degree the result can be applied and related to other contexts.[34] Since this thesis is a study of a single case it is per definition aimed for a certain context. Despite this we believe that the fundamentals of this thesis can be used in other contexts as well. The reason for this is firstly, ITIL - the setting in which we have applied the ABC model. We believe that other IT divisions organized according to this framework can benefit from the study. Secondly, we believe that the overall tasks in First-line and Second-line support do not remarkably differ between organizations and that the resources identified in this thesis are similar to resources in other IT enviroments. Accordingly, this study can be seen as a generic approach to the subject, even though we have practiced a study of a single case.

2.3.3 Reliability

In similarity with validity reliability is also divided into the two perspectives internal and external. The former of these two covers the dynamic between the researchers (assumed that the research team consists of more than one writer).[35] In order to maintain a high degree of internal reliability it is vital that the authors make similar interpretations about important basics. This thesis is based both on a quantitative and a qualitative method. However, the nature of our interview questions were not of an interpretive character since they mostly approached areas such as identification of resources, cost drivers, and the daily routines. The important basics between the authors of this essay are much alike, especially on behalf of the aim with the study.

The external reliability is often related to the degree to which a study can be replicated. A high degree of external reliability can be achieved if different measurements of the same phenomenon provide the same result (or close to same result).[36] This objective construction is based upon the likelihood that if other

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[30] Bryman, Alan, *Företagsekonomiska Forskningsmetoder* (2005) Liber AB:
[31] Holme, Idar Magne, *Forskningsmetodik* (1997) Lund: Studentlitteratur. Page 163
[32] Bryman, Alan, *Företagsekonomiska Forskningsmetoder* (2005) Liber AB:
[33] Ibid
[34] Ibid
[35] Ibid
[36] Holme, Idar & Solvang, Bernt, *Forskningsmetodik* (1997). Lund: Studentlitteratur. Page 163

researchers with the same competence and presupposition would conduct the same study by the use of the same methods they would come to same conclusion as the first researcher. This occurrence is also known as replicability.[37] Throughout the whole research we have been aware of this occurrence and done our utterly in order to stay objective. We are in no doubt that if other researchers would conduct the same study with the same method they would come to a similar conclusion as we did. The measurements taken in order to maintain a high degree of reliability were discussed in chapter 2.2.1 and chapter 2.2.2. We consider the degree of our reliability to be high, especially on behalf of the replicability.

2.3.4 Alternative Approaches

The initiative for this study originated from the consulting firm BMC Software. We were addressed to study the possibilities of ABC on a specific context, in this case an IT division. Accordingly, we approached the phenomenon based on these premises. During the process we have however considered possible alternative approaches.

One alternative approach could have been to use an inductive method instead of a deductive. By using this method the empirical data would first have been gathered and then act as a guide for the choice of a theoretical framework.[38] This design might have led to a different choice of theory relating to Cost Management. Another approach could have been the use of a Comparative Design where two different IT settings could be compared in order to get a more general approach. A third alternative approach could have been to include other parts of the IT division, additional to First-line support and Second-line support.

2.4 Methodological Summary

Finally, we want to recapitulate our methodological assumptions into a short summary. The purpose of this essay is to identify costs for providing First-line and Second-line support, and allocate these costs to different products and services (cost objects). By this, the essay intends to improve the allocation and understanding of costs for First-line and Second-line support. Based on this premise we describe the thesis as both explanatory and normative.[39] At the time for our empirical data gathering the theoretical foundation was already chosen, which classifies the methodological approach of the study as deductive.[40] The information gathering process was mainly qualitative but was complemented with a quantitative questioner. The purpose of this questioner was to find a pattern and comparable data concerning time consumption relating to the different deliverables. This was difficult to achieve only by a qualitative approach. A combination of approaching the phenomenon by both semi-structured interviews and a structuralized questioner contributes to characterize the thesis as both

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[37] Jacobson, Dag I. *Vad, hur och varför* (2002) Studentlitteratur: Lund
[38] Rienecker, Lotte & Jörgensen, Peter Stray, *Att skriva en bra uppsats* (2002) Liber: Malmö. Page 160
[39] referens
[40] Jacobson, Dag I. *Vad, hur och varför* (2002) Studentlitteratur: Lund. Page 42

hermeneutic and positivistic.[41] Our intention with this methodological explanation is to enable the reader a clear critical review and to achieve a high replicability.

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[41] Jacobson, Dag I. *Vad, hur och varför* (2002) Studentlitteratur: Lund. Page 38

Chapter 3

Theory

In this chapter we present the theory of Activity Based Costing and make a comparison with the traditional cost models. We will also discuss benefits and limitation with this theory and the relationship with Activity Based Management. In addition to this we also present a selection from the ITIL Framework.

3.1 Introduction

The purpose of Activity Based Costing (ABC) is to address our two first questions at issue which deals with clarifying the cost structure of the function "Service and Support" and allocate these costs to selected cost objects. In the process of detecting and selecting activities and cost drivers we believe that the ITIL framework will be helpful since it addresses the rather complex processes that take place in an IT setting. Activity Based Management is the third theoretical constituent which can be seen as an advancement of ABC. This will be used to approach the third question of issue which addresses how BT IT Supply can benefit from the ABC model.

3.2 Traditional cost models relating to ABC

Traditional cost models, also known as unit-based systems, divide total costs in direct and indirect costs. Direct costs are defined as resource utilization that can be directly allocated to the cost object.[42] Other are referred to as "indirect" or "overhead" costs. In order to distribute, traditional cost systems normally registers these expenses to different cost centres.[43] Different cost distributors, i.e. direct material or direct labour, are then used to allocate expenses to different deliverables.

The indirect cost "rent" is a good example since it is normally shared by more than one cost centre. According to a traditional cost model this should be distributed to different cost centres based on their utilization of i.e. space. Normally the "principle of proportions" is applied in this process. The principle states that the chosen cost bases should, at least in the long run, correlate proportionally with the distributed indirect costs.[44]

The ability of traditional cost models to distribute overhead costs has over the years however, been greatly debated.[45] The criticism claims the lack of traditional models ability for correct distribution of overhead costs to specific products.[46] For

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[42] Gerdin, Jonas, *ABC-kalkylering* (1995) Studentlitteratur :Lund. Page 23
[43] Ibid Page 22
[44] Ibid Page 25
[45] Johnson, H. Thomas & Kaplan, Robert Relevance Lost; *The Rrice and Fall of Management Accounting* (1987) HBS Press: Boston.
[46] Ax, Christian & Ask, Urban, *Cost Management* (1995) Studentlitteratur: Lund. Page 63

organizations operating in stable environments with standardized products traditional cost models are argued sufficient[47] But for organization that has a high degree of overhead and indirect costs traditional cost system are considered less appropriate and are sometimes charged for bringing a false illusion of the cost structure.[48] This problem can be referred to as a "problem with the proportions" between overhead and indirect cost and the chosen distributor base.[49] The problem concerns that indirect and overhead costs are distributed to the cost objects by distributors that often are related to volume. As a result a higher degree of direct material means that a higher degree of overhead and indirect costs should be distributed to the cost object. But since overhead costs tend to increase and may depend on other factors than volume, the need for other distributors except volume is vast.[50]

There is yet another predicament with a traditional cost system which is the fact that cost centres often are subject for more than one type of indirect or overhead cost, for example "rent", "salaries" and "right offs". The use of only one cost deliverable to distribute these costs is concerned as a limitation.[51] As a result of the criticism, Cost Management has been developed towards an alternative approach, Activity Based Costing.

3.3 Activity Based Costing (ABC)

The development of ABC has been a process over a long period of time. This process is discussed in four steps by R. G Larsson (2004).[52] Larsson argues that the first step was addressed during Cooper & Kaplan's presentation of the expression in 1988 when they published the article "Measure Costs Right: Make the Right Decisions".[53] At this stage the discussion mostly concerned production costs. The second step was an enhancement of the first and included profitability analysis. The third and the fourth step addressed the activity hierarchy and the capacity utilization.

While traditional cost systems often are associated with issues such as how the organization can control costs for financial reporting and departmental cost control, ABC highlights the activities that are being performed and the resources needed for these activities. The ABC model seeks to answer why an organization needs to perform activities and business processes and how much of each activity is required for different products, services and customers?[54] A properly constructed model is considered to provide the answer to these questions and based on organizational activities present an economic map of the expenses and profitability.[55]

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[47] Kaplan, Robert S. & Cooper, Robin. *Cost and Effect* (1997) HBS Press: Boston
[48] Ibid
[49] Gerdin, Jonas, *ABC-kalkylering* (1995) Studentlitteratur: Lund. Page 27
[50] Ax, Christian, et.al. *Den nya ekonomistyrningen* (2002) Liber ekonomi: Malmö. Page 263
[51] Gerdin, Jonas, *ABC-kalkylering* (1995) Studentlitteratur: Lund. Page 29
[52] Larsson, Rolf G., *Prototyping inom ABC och BSC* (2004) Växjö University Press: Växjö. Page 59
[53] Ibid
[54] Kaplan, Robert S. & Cooper, Robin, *Cost and Effect* (1997) HBS Press: Boston. Page 79
[55] Ibid

The basic assumption for ABC is that all activities occur in an organization as a result of production and distribution of products.[56] Accordingly, all costs are considered as production costs.[57] As for traditional models direct costs are distributed directly to different cost objects. The difference occurs for the indirect- and overhead costs. In order to allocate these the ABC model requires different cost drivers for distribution to activities and from activities to cost objects.

The model states that in order to produce a deliverable resources such as labour and material are consumed by activities. Another postulation for the ABC model is that different products (cost objects) create demand for different activities. Consequently the costs for an activity should be distributed to different deliverables in proportion to their consumption of the activity. [58]

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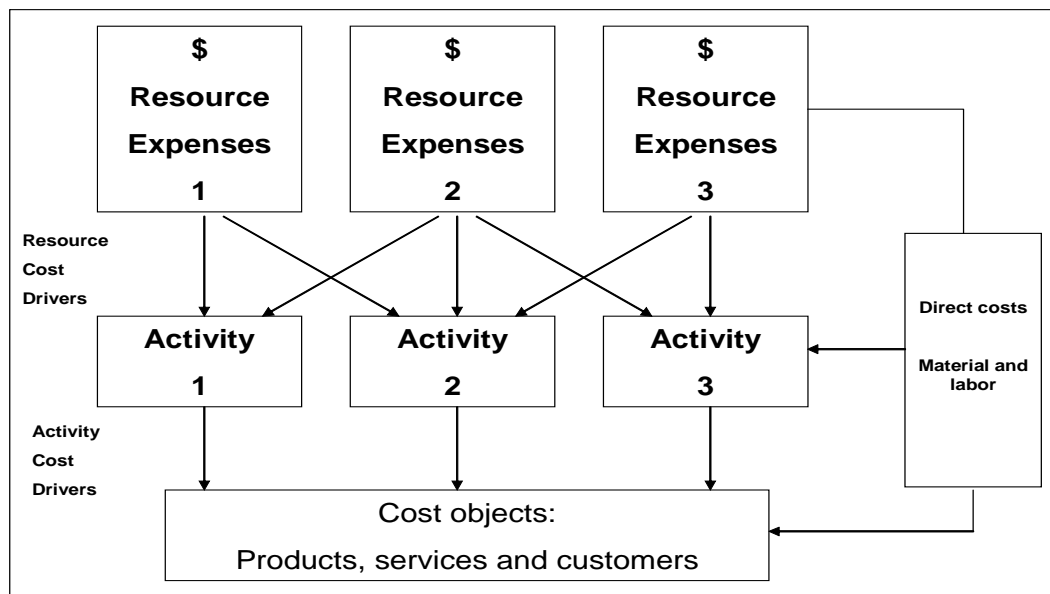
Figure 4 The ABC model[59]

The ABC model requires costs to be allocated in two steps. The first step is to distribute the costs from the resources to the activities. This distribution occurs by the use of different resource drivers. During the allocation of costs to the activities it is necessary to estimate the embracement of each activity.[60] For this estimation there is a tendency that this should occur during conditions of full capacity utilization. By full capacity the ABC model refers to full practical capacity. Since there may be complications in determining the practical capacity a solution is to correlate full capacity utilization by the normal capacity utilization over a period of time.[61] The final step is to distribute the costs from the activities to the different cost objects. The allocation is done by the use of activity cost drivers. [62]

[56] Kaplan, Robert S. & Cooper, Robin, *Cost and Effect* (1997) HBS Press: Boston
[57] Gerdin, Jonas, *ABC-kalkylering* (1995) Studentlitteratur: Lund. Page 61
[58] Ax, Christian, et.al. *Den nya ekonomistyrningen* (2002) Liber ekonomi: Malmö. Page 276
[59] Kaplan, Robert S. & Cooper, Robin, *Cost and Effect* (1997) HBS Press: Boston. Page 83
[60] Ax, Christian & Ask, Urban, *Cost Management* (1995) Studentlitteratur: Lund. Page 66
[61] Kaplan, Robert S. & Cooper, Robin, *Cost and Effect* (1997) HBS Press: Boston. Page 79
[62] Ax, Christian, et.al., *Den nya ekonomistyrningen* (2002) Liber ekonomi: Malmö

3.3.1 Direct Costs

Direct costs are directly allocated to the cost object, without any specific cost driver. This could for example be material or labour that is used specific for a product. As a result these costs would not exist if the activity did not occur.[63] An example of a direct cost could be the licence for software aimed to a certain product or service. The cost for this licence would then directly be allocated to the cost object and consequently not be part of the ABC model.[64]

3.3.2 Resources

In order to conduct activities the organization requires resources in terms of labour, manufacturing, buildings, and machinery.[65] Resources can often be quantified as salaries, material costs or software licenses. The resources constitute the foundation for the ABC model since this is the starting level for the cost distribution. It is therefore very important for the resource identification process to be thorough and meticulous. Having identified the wrong resources or resources with minimal impact for the cost objects will most certain lead to an inaccurate outcome of the ABC model.

3.3.3 Activities

Activities can be described as actions and processes that are conducted by labour or equipment. The activities consume a certain amount of input (Recourses) in order to produce a certain amount of output (Activities). As a result an activity may be seen as a process for transforming resources.[66] From this wide definition it may occur as if almost all operations in an organization are activities. This however is a false assumption. To be relevant for an ABC model activities have to be aggregated. It is also important that the aggregation is at a satisfactory level. Unique and far to complex activities are difficult and sometimes impossible to include.[67]

3.3.4 Cost Drivers

There are two types of cost drivers in an ABC model, resource cost drivers and activity cost drivers.[68] The resource cost drivers are the linking factors used to distribute resources to activities and should therefore indicate activity consumption of the resources. The activity costs drivers act as an indication of the cost objects consumption of activities and can be divided into three categories. "Transactions related" refers to, for example in an IT division, the

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[63] Ax, Christian & Ask, Urban, *Cost Management* (1995) Studentlitteratur: Lund. Page 64

[64] Ax, Christian & Ask, Urban, *Cost Management* (1995) Studentlitteratur: Lund.

[65] Billgren, Rolf, *ABC kalkylering i praktiken* (1995) Förlags AB Industrilitteratur. Page 23

[66] Gerdin, Jonas, *ABC-kalkylering* (1995) Studentlitteratur: Lund. Page 66

[67] Andersson, Göran, *Kalkyler som beslutsunderlag* (1997) Studentlitteratur: Lund. Page 129

[68] Kaplan, Robert S. & Cooper, Robin, *Cost and Effect* (1997) HBS Press: Boston.

amount of errands being reported. "Time related" cost drivers refer to how much time each activity consumes. The third category, "Intensity related" is appropriate when the cost objects demands special activities for example labour with higher salary or special equipment. This however is dependent of a separate registration of the resource utilization for each cost object.[69]

3.4 The implementation of the ABC model

When implementing ABC the theory declares that two questions are to be considered. The first refers to where the organization initially should look for the potential benefits from implementing an ABC model. The second question concerns during which circumstances the model will have the greatest impact. The answer to these questions can be found in two rules that are called the "Willie Sutton rule" and the "High-diversity rule".[70]

These rules are to be considered as guides in the search for high-potential ABC applications. The "Willie Sutton rule" states that organizations should notice areas with large indirect costs; especially if these costs have increased significantly and are difficult to allocate. The "High diversity rule" declares that ABC should be implemented in organizations with a high diversity of products, customers and processes.[71] In the case of Service and Support in an IT environment we believe that both the "Willie Sutton rule" and the "High diversity rule" are evident. The indirect costs mass is extensive as well as the range of products and services. These two rules make the "Service and Support" division a very interesting setting for an ABC implementation.

Implementing an ABC model could suitably be described as a process with supporting steps that not necessarily has to occur in the presented line of order.[72] This process is visualized in the following model:
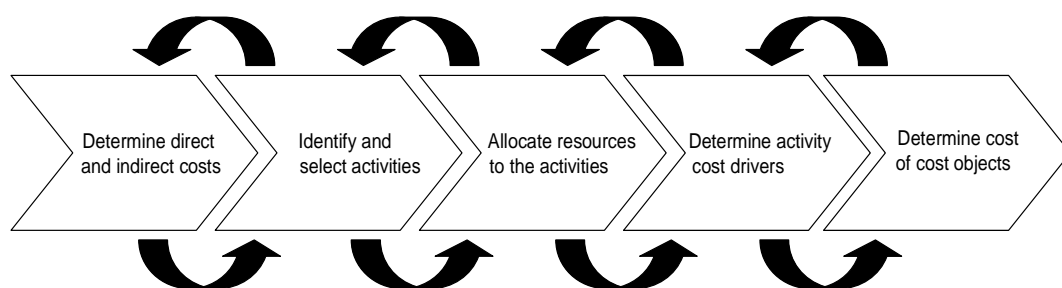
Figure 5 The ABC implementation process

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[69] Ax, Christian, et.al., Johansson, Kullvén, Håkan *Den nya ekonomistyrningen* (2002) Liber ekonomi: Malmö

[70] Kaplan, Robert S. & Cooper, Robin, *Cost and Effect* (1997) HBS Press: Boston

[71] Ibid

[72] Ax, Christian, et.al., *Den nya ekonomistyrningen* (2002) Liber ekonomi: Malmö. Page 270

3.4.1 Determination of Direct and Indirect Costs

An ABC model only distributes indirect costs. All direct expenses should bypass the ABC calculations and go directly to the cost object. The first consideration will consequently be to separate all direct costs from the indirect costs. An analysis of the budget is according to Kaplan & Cooper an appropriate action in the process of determining direct and indirect costs.[73]

3.4.2 Identification and Selection of Activities

A critical decision is to define the different activities. The definition of an activity varies a lot and depends on the chosen level of analysis. Generally an "activity" can consist of everything from a detailed description of a certain task to a more general description such as a whole department within a company. They often constitute of concrete assignments whereas it can be appropriate to begin with the different functions within the division or the organization.[74] Since IT environment constitutes of a great variety in tasks it is important to select activities at an appropriate level of detail.[75] In order to do this one must use some kind of criteria. The most central criteria for choosing activities are the fluctuations in proportions that the cost objects generate in terms of activity consumption. As a result activities with great fluctuation in proportion should be included in the model.[76]

When choosing activities it is important to bear in mind that the choice of activities often affects the cost of developing and maintaining the model.[77] Having very detailed activities can create a large apparatus just in order to keep track of all these. Detailed activity modelling is usually needed for operations planning and process improvement, but when it comes to cost management more general activity models are often sufficient.[78] In the process of selection activities we intend to use three different criteria:

Activity Criteria

- Activities with significant affect on the cost objects
- Activities with difference in resource consumption
- Activities with relevance for BT IT Supply

Figure 6 Activity Criteria

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[74] Ax, Christian & Ask, Urban, *Cost Management* (1995) Studentlitteratur: Lund. Page 63
[75] Gerlach, James et.al., *Determining the Cost of IT Services.* Sep 2002/Vol 45. No 9 Page 61-67
[76] Ax, Christian, Johansson, Kullvén, Håkan *Den nya ekonomistyrningen* (2002) Liber ekonomi: Malmö. Page 271
[77] Gerlach, James et. al, *Determining the Cost of IT Services* Sep 2002/Vol 45. No 9 P. 122
[78] Ibid

3.4.3 Allocation of resources to Activities

To allocate costs from resources to activities such as "salaries" ABC requires resource cost drivers. The percentage of time IT personal spends on supporting errands could be used when assigning labour costs to a supporting customer activity. If "time" is selected as cost driver, the amount of time employees spend on each activity will determine a percentage part of the total indirect and overhead costs. [79] Assignments may however be more complex. If the supporting customer activity consumes more then labour additional cost drivers may be needed. [80]

3.4.4 Determination of activity cost drivers

This process continues by choosing appropriate activity cost drivers unique for the activities so that the cost object's consumptions of activities can be traced. In other words the activity driver measures the rate at which an activity contributes to a cost object. In order to be useful the cost driver must be a compromise between functionality and complexity. [81] In similarity with the selection of resource cost drivers an important criterion for activity drivers is that it should illustrate a possible diversity in how the activity is being consumed by cost objects. [82]

3.4.5 Determination of the cost to the cost objects

The ABC allocation for each cost object is calculated by applying each activity cost driver to the activity costs. Finally the direct costs and the ABC assignments are summed to compute the total cost of providing a specific IT related deliverable.

3.5 The IT Infrastructure Library framework

The above mentioned steps represented the process of implementing ABC. We believe that the "Service and Support"-function consists of a variety of tasks and processes which needs enhanced definitions. In order to accomplish this we present the ITIL framework.

The IT Infrastructure Library Framework (ITIL) is a world wide standard for organizing IT environments. [83] The purpose of the framework is to provide detailed descriptions of important IT practices that can be adapted in an IT organization. These descriptions are made by a set of processes that organizations are recommended to implement in order to structure their IT

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[79] Kaplan, Robert S. & Cooper, Robin, *Cost and Effect* (1997) HBS Press: Boston.
[80] Gerlach, James et. al *Determining the Cost of IT Services* Sep 2002/Vol 45. No 9. Page 61-67
[81] Kaplan, Robert S. & Cooper, Robin. *Cost and Effect* (1997) HBS Press: Boston.
[82] Ax, Christian & Ask, Urban, *Cost Management* (1995) Studentlitteratur: Lund. Page 65
[83] Von Bon, Jan, *Introduction to ITIL* (2001) Van Haren Publishing: The Netherlands.

environment.[84] According to the framework an organization will develop a clearer structure, become more efficient, and more focused on the corporate objectives if the framework is applied.[85] We do not intend to further explore the constituents of ITIL, mostly because the framework is rather comprehensive and goes beyond the range of this study. We however consider two organizational functions and two processes relevant in this study. These are "Incident Management", "Problem Management" and First-line & Second-line support.

3.5.1 Service & Support according to ITIL

According to the ITIL framework the organizational structure of a "Service and Support" division consists of two levels of support, First-line and Second-line.[86] First-line support is normally provided by the Service Desk, which serves as the frontier for an organization's IT environment. The Service Desk handles multiple queries without needing to contact specialized personnel and for the end users it provides the single point of contact. If an errand cannot be solved by the Service Desk, then more expertise or authority will have to be involved and the request is escalated to Second-line support, which is a more specialized service group.[87] First-line support and Second-line support both handle activities related to a number of basic ITIL processes. The primary process for First-line support is the "Incident Management" process whereas Second-line support is associated with "Problem Management".[88]

The primary objective of "Incident Management's" is to return to the normal service level as soon as possible, with the smallest impact on the business activity of the organization and the user. An important notion is to keep effective records of all incidents and record all incoming incidents.[89] An incident is defined as any event which is not part of the standard operation of a service which causes, or may cause, an interruption to, or a reduction in the quality of service.[90]

"Problem Management" focuses on resolving the underlying root cause of incidents and prevents incidents from recurring.[91] The difference between this and "Incident management" is that the latter has its focus on the service and takes action if there is an incident to make sure that the service is restored. The aim is to resolve an incident quickly, by whatever means possible and also to work pro-actively.

ITIL defines more processes additional to "Incident Management" and "Problem Management" and other organizational functions within an IT setting.[92] These processes and organizational functions however occur at a level outside our

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[84] Macfarlane, Ivor & Rudd, Colin, *IT Service Management* (2001) itSMF Ltd: UK. Page 1
[85] Von Bon, Jan, *Introduction to ITIL* (2001) Van Haren Publishing: The Netherlands.
[86] Ibid
[87] Macfarlane, Ivor & Rudd, Colin, *IT Service Management* (2001) itSMF Ltd: UK. Page 33
[88] Von Bon, Jan, *Introduction to ITIL* (2001) Van Haren Publishing: The Netherlands
[89] Macfarlane, Ivor & Rudd, Colin, *IT Service Management* (2001) itSMF Ltd: UK. Page 34
[90] Ibid Page 31
[91] Ibid Page 46
[92] Introduction to ITIL" (2005)Van Haren Publishing: Netherlands.

research aim, which is why we discuss them. It is important to bear in mind the difference between a *functional* separation and a *process* separation. The distinction between First-line and Second-line support is a *functional* separation, whereas the distinction between "Incident Management" and "Problem Management" is a *process* separation. The correlation within this dichotomy is as stated above that "First-line" support is mostly associated with "Incident Management" whereas "Second-line" support is associated with "Problem Management". **We believe that the definitions and descriptions of these processes and organizational functions will provide a greater understanding for our analytical discussion.**

3.6 Activity based management (ABM)

The purpose of Activity Based Costing is to provide managers with more accurate information regarding costs and activities.[93] The next step in this process is *how* managers can use this information and benefit from it. Activity Based Management can be seen as an enhancement or the practical consequence of an ABC model. ABM concerns how managers can utilize the results from ABC in order to enhance profitability and efficiency. The basic principles of ABM are that it concerns potential benefits, on a better informed basis, with activity-based costing information. Enhanced cost knowledge is essential not only for purchasing goods but also for internal transactions among divisions. An organisation categorized by both these processes has a lot to gain from a better cost understanding.

In order to achieve this ABM is divided into two sub categories; *Operational* and *Strategic* ABM.[94] Operational ABM covers the actions that increase efficiency, lower costs - in short, the actions required to do things right. Strategic ABM is about doing the right things. Generically ABM can be described as a collection of common ideas for how to preserve the benefits of ABC. This does not mean that a small amount of resources are preferably to use, only that the resource utilization must be efficient.[95] Since ABC can be applied in very different contexts the outcome of the model has to be adjusted to the specific case. ABC does not guide how management will be pulled off it enlightens how to flourish from the benefits of ABC. It is however important to know that ABM should not be seen as a modus operandi for how companies can come across business opportunities on the market, but as a set of rules that aim to a more efficient resource utilization.[96]

3.7 Critical Discussion

Although the benefits are vital the limitations of ABC are important to discuss. Ax and Ask (1995) argue that the overall debate over ABC has been almost too positive and that managers and academics have accepted the theory rather uncritical.[97] The authors also question the freshness that forcipes with this theory. It is therefore plausible to assume that ABC caused most attention in the academic

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[93] Kaplan, Robert S. & Cooper, Robin, *Cost and Effect* (1997) HBS Press: Boston
[94] Ibid Page 137
[95] Ax, Christian & Ask, Urban, *Cost Management* (1995) Studentlitteratur: Lund. Page 96
[96] Kaplan, Robert S. & Cooper, Robin, *Cost and Effect* (1997) HBS Press: Boston.
[97] Ax, Christian & Ask, Urban, *Cost Management* (1995) Studentlitteratur: Lund. Page 80

discourse when it first was introduced.[98] H. Thomas Johnson, the co-author of Relevance Lost (1987) has critically commented the ABC debate arguing that "Activity-based" is a phrase managers hear almost frequently and is used almost as a standard solution to problems that arise. "Have problems with profitability? Try activity-based costing. Difficulty competing? Try activity-based management." [99]

There are also operational difficulties with ABC. Since an activity has to be aggregate and consistent there are limitations in the ability to consequently utilize the model for all consumption of resources. Many of the actions taking part in an IT department are difficult to define as recurring activities. Measuring problems such as what constitutes an activity and what kind of resources that must be included are typical quandaries. Another difficulty is the use of "time" as a cost driver. Having this means that all activities must be measured which is a profound and very time consuming operation. This leads us into the overall drawback with ABC which is its complexity and time consuming implementation.[100] The implementation of an ABC model will consume a lot of time and effort and many organizations do not have the resources or willingness to do this. The identification of activities and cost drivers may also be a problem, especially if the operations by organizations are complex. Activities and cost drivers also change over time. As a result the ABC model has to be constantly updated in order to be useful otherwise it just becomes a static model useful for a certain moment in the process.[101]

Since our model mainly will be based on interviews with organizational members these are able to affect the outcome of the model. We believe that this fact leads to a model that will be well anchored in the operations and the organization. To include many people in the process of developing a model enhances the presupposition for a positive implementation.[102] In other words the complexity of this theory can be considered positive since it necessitates large parts of the organization to take part in the implementation process.

We argue that the use of ABC in IT environments can provide organizations with indispensable information about its actual costs and is therefore a major tool in its overall cost strategy. The need of a new cost allocation tool is vast and would provide the same benefits for IT settings as for a classical manufacturing company. We managed to find a few examples of service intense companies that have successfully implemented an ABC model; airlines, hospitals and banks.[103] The study by Gerlach et.al. (2002) confirms the possibilities of implementing ABC in an IT environment. Therefore we argue that ABC is a model that can be of much help to allocate costs at the Service and Support function of BT IT Supply.

Creating an ABC model for a certain part of an organization will however take time and will likely be far more accurate than the existing traditional costing model, but one must be aware of that this still is a first approximation of what the model will look like after several years of feedback and learning. An ABC model is

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[98] Ax, Christian & Ask, Urban, *Cost Management* (1995) Studentlitteratur: Lund. Page 80ff
[99] Johnson, Thomas *Relevance Regained* (1992) New York Free Press: Toronto. Page 26
[100] Ax, Christian, et.al., *Den nya ekonomistyrningen* (2002) Liber ekonomi: Malmö.
[101] Ibid
[102] Andersson, Göran, *Kalkyler som beslutsunderlag* (1997) Studentlitteratur: Lund. Page 138
[103] Doktoravhandlingen

never static and is never complete; it evolves over time endlessly as long as it is in use.[104]

3.8 Theoretical Summary

Our theoretical discussion includes three components, where Activity Based Costing is the most central. This is complemented by Activity Based Management witch is an enhancement of ABC and the ITIL framework. ABC was developed due to criticism of traditional ability to allocate overhead and indirect costs. While traditional cost systems often are associated with issues such as how the organization can control costs for financial reporting and departmental cost control, ABC highlights the activities that are being performed and the resources needed for these activities. A developed and implemented ABC model may further be enhanced by a collection of common ideas and tools that together work for a more efficient way of utilizing resources. These are referred to as ABM. The purpose of ITIL is to assist with descriptions of the organizational functions and processes that occur within an IT environment. In addition to this we have critically reviewed our choices and discussed benefits and limitations regarding ABC. Our theoretical tools will be of assistance when analyzing our empirical material in order to address our questions at issue.

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[104] Kaplan, Robert S. & Cooper, Robin, *Cost & Effect* (1997) HBS Press: Boston.

Chapter 4

Empirical

In this chapter we present our empirical study. The chapter begins with an introduction, followed by a description of the Service and Support function, the selected deliverables and a presentation of the empirical material.

4.1 Introduction

This chapter will be introduced by a short description concerning our empirical data gathering process. Some of this was accounted for in the methodological section, though it will be more fully explored at this stage. This is followed by an organizational description of BT Industries. The purpose of this is to clarify the relationship between BT Industries, BT IT Supply and its parent company Toyota Industries. Further, a presentation of the function "Service and Support" will follow. Naturally, our emphasis will be put on this function as it constitutes the core marrow of our study. The chapter ends by a short summary.

4.2 Empirical Data Gathering

The empirical material was assembled through a series of qualitative interviews, a questioner, studies of documents and informal talks. Together with our project host at BT we formulated an interview schedule with key employees including service desk operatives, technicians and managers. The first interview was with the Service Desk manager. He provided us with an overview of the Service Desk and its main objectives, together with a wide assortment of statistics from working hours to number of handled errands. Much of the interview targeted the current cost system of the Service Desk and the distinction between the tasks for the Service Desk and the Technicians.[105] The next interview was with an operator at the Service Desk.[106] The focus of this interview was specific tasks, statistics and time consumption regarding different activities. The interest for time consumption originated from the idea to use "time" as a cost driver. From these two interviews we however realized that there were limitations concerning the understanding of "costs" and "time consumptions" for specific tasks. Neither the operators nor managers could give us information concerning i.e. how much time an operator or a technician spend supporting a specific product or providing a specific service. Neither did they have the knowledge for the cost of supporting a specific product or a specific service.

Additional to this we conducted interviews with the manger for IDC, Technicians, two different controllers and the Director of BT IT Supply. The interview with the manager of IDC provided us with information concerning servers, associated applications and maintenance costs. From the Technicians we obtained material

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[105] Interview with Hans Berg, Director Service & Support, 2006-12-07.
[106] Interview with Camilla Ask, Service Desk Operator, 2006-12-08.

concerning specific tasks, daily routines and statistic material relating to support activities.

The two forthcoming interviews provided us with different perspectives regarding the role of an IT Controller. [107] The controller at BT IT Supply informed us about the technical hitches in pricing IT deliverables, recharge rates and engaging support agreements without knowing the actual costs. The situation he stated is at present characterized by an arbitrary pricing method rather than pricing from rational knowledge. [108] This limited knowledge also affects the bargaining power towards external suppliers of IT deliverables. When negotiating a price for i.e. support agreement a better understanding for how much this costs and is worth enhances the possibility of taking a cost rational decision.

The other controller represented IS Promotion. [109] This function is responsible for the purchase of IT related deliverables for BT Europe. The relation between BT IT Supply and IS Promotion is that BT IT Supply sells IT deliverables to IS Promotion. The controller at IS Promotion presented us with a perspective as an internal buyer. He explained the shortcomings in engaging negotiations when there is a lack of knowledge concerning the costs related to the negotiated or offered price for i.e. support. He also underlined that an understanding for the cost structure has increased due to more restricted tax regulations regarding internal transactions. Inaccurate pricing of internal transactions of deliverables may lead to misleading corporate accounting related to group contribution among subsidiaries. These two interviews were very interesting and useful since they presented an insight in the considerations from both a seller perspective and a buyer perspective of IT deliverables. Some of our interviews were also complemented by supplementary questions. The fact that we spent three working days at BT enabled us to ask further questions at our disposal, which was of great importance.

Based upon the lack of information and our theory, especially ABC, we found it necessary to complement our interviews with a questioner. The intention was to measure how much time and how many errands the Service Desk and the Service Group handle over a period of one weak. This would illustrate that certain errands necessitate more support capacity than others and should therefore be charged with a larger cost. The use of "time" as a cost driver also made it possible to measure the capacity utilization. Based upon the interviews with the operators at the Service Desk, the Service Desk Manager and statistic we came to the conclusion that one weak represented a fairly correct indicator of the annual total workload. One of the outcomes from our initial interviews led to the conclusion that a similar time measuring questioner would be difficult to conduct on the Service Group. The reason behind this setback was that errands supported by the technicians are often related to time periods exciding several days or weeks. Different technicians are also involved in the same errands at different occasions which enhance the difficulties in tracing how much time a specific errand has consumed. Even though the Support Group has a program registering the technician's working hour the working hours for specific incidents are not registered. [110] These circumstances made us abandon the idea of measuring time

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[107] Interview with Ronny Ideskär, IT Controller at BT IT Supply, 2006-12-06
[108] Interview with Ronny Ideskär, IT Controller at BT IT Supply, 2006-12-06
[109] Interview with Morgan Bjernersjö, Controller at IS Promotion, 2006-12-06
[110] Interview with Tommy Adolfsson, Technician, 2006-12-07

consumption for the technician and instead use statistics to measure number of supported errands..

4.3 The Organization of BT Industries

In 1946 BT was founded under the name "AB Byggekonomi" as an importer for equipment in the construction and transportation industry. A year later the name was changed to "AB Bygg- och transportekonomi" and BT started its own manufacturing of hand pallet trucks. During the following 30 years BT invented and developed trucks and began to establish international sale end service through a number of sales and service organizations. In 1986 the organisation changed its name to BT industries and in 1995 BT industries was listed at the stock market. The acquisition of North America's The Raymond Corporation in 1997 made BT Industries the world leader in warehouse trucks and through the acquisition of CESAB of Italy in 1999/2000 the product range was extended to also include own manufactured counterbalanced trucks. The BT Industries Group comprises four brands, BT, Raymond, Lift-Rite and CESAB.[111]

In 2000 BT industries was acquired by Toyota Industries Corporation (TICO). Toyota Industries has over the years, from the foundation in 1926, developed into four business segments: Material Handling, Engines, Lomb Machines and Others. After the acquisition BT industries is a part of the segment "Material Handling" specialized in the development and production of trucks. This acquisition meant that the world's largest manufacture of warehouse trucks (BT Industries) and the largest manufacture of counterbalanced trucks (Toyota) created a world leading constellation in industrial trucks.

Toyota Industries is divided in four regions Europe, North America, Japan and International (Rest of the world). Within each region there are several business segments that constitutes of Material Handling (MH), Compressors (C), Engines (E) and Lomb Machines (LM).[112] Within each region and business segment there are several support division and this essay has it focus on the support division, Toyota Industries IT Supply Europe AB (from know known as BT IT Supply or IT Supply).

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[111] http://www.bt-industries.com/en/ourcompany/btbusiness/history.htm (2006-11-20)
[112] Interview with Gisela Fagerstedt, Director IT Supply, 2006-12-07
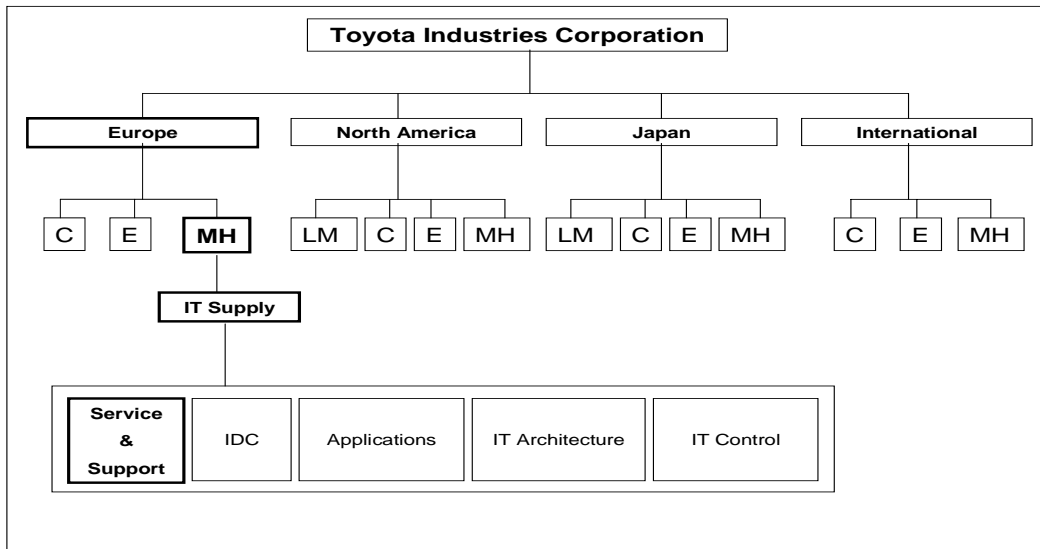
Figure 7 Organization of Toyota Industries corporation

The purpose of BT IT Supply is to design, develop and maintain IT related solutions for the business segment Material Handling in Europe.[113] The BT IT supply organization is divided into five areas which are "Service & Support", "IDC", "Applications" (development & maintenance), "IT Architecture" (mobile & network solutions) and "IT Control".[114] The IDC function is responsible for the computer centre containing all the internal servers.[115] Additional to the internal servers BT IT Supply also utilizes external servers but the associated applications for these are not utilized in support activities and are not included in this thesis. The function "Applications" are naturally responsible for the maintenance and development of applications. "IT Architecture" consists of mobile & network solutions and "IT Control" is an administrative function. This essay has its focus on the function "Service and Support".

4.4 The Service and Support Function

This part will describe the circumstances of the Service and Support function and the different units involved in the process of providing support activities. For confidential reasons some empirical data however is presented in percentage.

"Service and Support" at BT IT Supply allows internal customers and users (within Material Handling in Europe) to access the appropriate services supporting their activities and businesses. As a result this function serves as front office for the back office of the underlying Service Group and Specialists. The Support function is dependent on several components. Firstly, there are two major applications; Remedy and Unicenter. The former of these two is an application handling registration and logging of errands. Whenever an errand arrives it is logged in Remedy. This is done in order to structuralize and facilitate the support process. The procedure also allows the support function to register which division that

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[113] Interview with Gisela Fagerstedt, Director IT Supply, 2006-12-07
[114] Interview with Ronny Ideskär, IT Controller, 2006-12-07
[115] Interview with Erik Nåbo, Manager IDC, 2006-12-07

utilizes the support function. This is an important procedure since only users with support licenses with BT IT Supply are allowed to engage in the support activities. The license for Remedy has been purchased and has remaining write-offs. In order to run Remedy seven different servers are needed. Each server has a yearly cost that includes service and maintenance. The seven servers are place in the computer centre handled by IDC. Remedy also consumes 75 % of a full-time technician responsible for upgrading and support.[116] In addition to this technician BT IT Supply has an agreement with an external supplier that provide support for Remedy. For this support agreement BT IT Supply is charged with an annual fee.

Remedy is shared among many functions at BT in addition to "Service and Support" which means that many divisions shall bear the cost for Remedy. Based upon statistics of utilization we have been able asses that 60 % of the total amounts of errands logged in Remedy are associated with "Service and Support".[117] We have used the total number of logged errands relating to "Service and Support" and contrasted this with the total amount among all the divisions This will provide us with an percentage that can be dedicated to Service and Support.

**Cost Structure
(Service & Support)**

- Remedy licence (4%)
- Remedy Write-offs (2%)
- Remedy Servers (2%)
- Remedy Technician (3%)
- Unicenter (39%)
- Unicenter Servers (1%)
- Unicenter Technician (6%)
- Salary (43%)
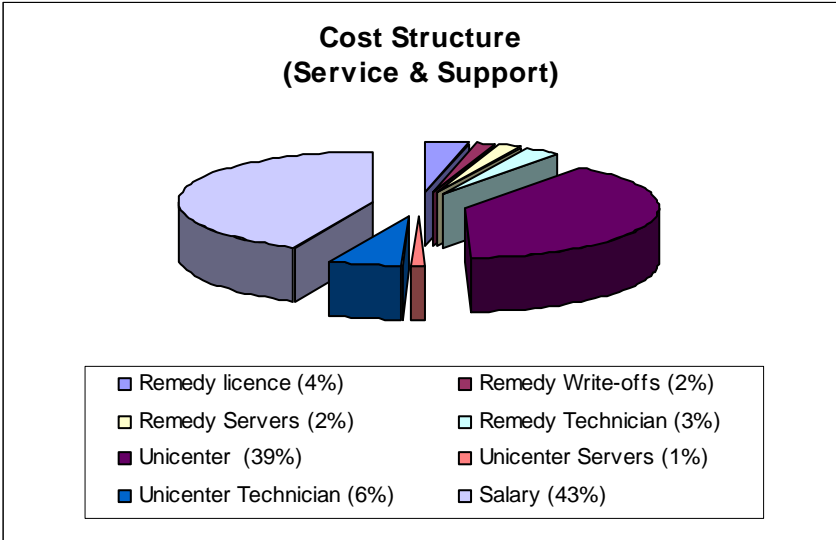
Diagram 1 Cost Structure of Service & Support

Based on our interviews the utilization of Remedy is distributed 70/30 between the Service Desk and the Service Group where 30% is to be accounted to the Service Group and 70% to the Service Desk. These figures are based upon the interviews with both operators and technicians and represent an estimation of the utilization. The number of errands registered from the Service Desk excides the number of errands from the Support Group. The Service Group is however very dependent of the application in their support activities whereas it is not reasonable to allocate the whole cost the Service Desk. A 50% division between the two is not either a satisfactory allocation since the Service Desk de facto has more errands and therefore should bare the majority of the cost. Based on the interviews we estimated a ratio by 70 % to the Service Desk and 30% to the Service Group.

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[116] Interview with Hans Berg, Director Service & Support, 2006-12-07

[117] See appendix 4.3 for statistics of utilization

Unicenter is the other major application and is used to monitor servers and web platforms. When Unicenter detects an errand this is visualized through large LCD screens located both in the Service Desk and at the Service group. Unicenter has not been purchased instead BT IT Supply pays an annual license for this application. In addition to this Unicenter requires four servers for which a yearly cost for service and maintenance is paid. The application also requires one fulltime technician for support and upgrading related tasks. In contrast with Remedy Unicenter is not shared by as many functions at BT. The only two functions utilizing Unicenter are the Service Desk and the Service Group which mean that the total cost will be allocated to "Service and Support". From our interviews we obtained a ratio between the Service Desk utilization and the Service Group utilization where the majority of the Unicenter cost, 90%, shall be allocated to the Service Group. The remaining 10% goes to the Service Desk.[118]

4.4.1 The Service Desk

The Service Desk plays an important role since it serves as the front for the entire IT department. For the end user, the Service Desk acts as a link to the IT organisation and ensures that the customers get help with their requests.[119] Hence, the users need not look for somebody who can solve their problem; this is the core reason why the Service Desk exists - to give service and support to the customer. The Service Desk at IT Supply is rather small and consists of four operators. These are divided according to a rotating scheme that specifies their individual responsibilities. Number one is responsible for all errands that arrive through telephone. Number two handles all e-mail, web and surveillance of Unicenter. Number three and four assists number one and two in the supporting process.

The setting in which they operate is in a glass room in a newly built annex surrounded by an open office architecture. Outside the glass room the Service Desk Manager and the technicians are positioned. This group gets forwarded the requests and errands that could not be dealt with in the Service Desk. A typical request arriving to the Service Desk can be a Microsoft related problem i.e. Outlook.[120] At this level the operators are often skilled and capable of solving the problem directly. More complex issues i.e. errands concerning server malfunctions are normally forwarded to the technicians in the Service Group.

There are four possible communicating tools used in order to rapport an error or request a service: Telephone, e-mail, web and by surveillance. Depending on the nature of the errand it is then categorized into a specific category and set at a priority level. Example of a category can be the e-mail system MailMarshal. Depending on the importance of the errand it is also classified into a priority. There are four types of priorities. Number four means that the errand has to be solved within 4 days, priority three means 2 days, priority two 4 h and priority 1 direct. An errand that cannot be solved by the Service Desk is passed on to a relevant service group.

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[118] Interview with Tommy Adolfsson
[119] Macfarlane, Ivor & Rudd, Colin (2001) ITSMF Ltd United Kingdom. Page 101
[120] Interview with Camilla Ask, Service Desk Operator 2006-12-05.

If someone is reporting errands by telephone the individual is told to state user name and phone number. This information is then used in order to log the incident in Remedy. All errands are also recorded. If the errand is reported by e-mail then the e-mail address is logged instead of the phone number. Incidents that are reported by the web application are already registered in Remedy. The initial purpose with this application was to transfer the work load from the Service Desk to the end user. When reporting an incident through this application the customer is logging the errand in Remedy himself or herself. Consequently, the Service Desk operators do not have to do the logging procedure. Very often however these errands are not properly categorized, therefore the Service Desk has to control each errand and the idea with the shifted work load diminishes. According to the same procedure as for "telephone" and "mail" the Service Desk then tries to solve the errand emerging from the web application. Incidents may also be detected on different surveillance screens (Unicenter). By these the Service Desk is able to supervise i.e. servers operations. If an incident is detected by Unicenter the incident is logged in Remedy and then handled according to the same procedure as for telephone, mail and web.

The four operators in the Service Desk share about the same salary which represents about 71 % of the total cost structure in the Service Desk.[121] Another major identified cost concerns the licence fee for Unicenter and Remedy. Costs associated with these software concerns the 7 servers that Remedy operates by, one technician spending 75 % of his working hour supporting Remedy and the annual paid "Service and Support"-agreement. Costs associated with Unicenter are licence fee, four servers, and a full-time technician.

Cost Structure (Service Desk)

- ☐ Remedy Licence (6%)
- ■ Remedy Write-offs(3%)
- ☐ Remedy Servers (3%)
- ☐ Remedy Technician (5%)
- ■ Unicenter Licence (10%)
- ☐ Unicenter Servers (0%)
- ■ Unicenter Technician (2%)
- ☐ Salaray (71%)
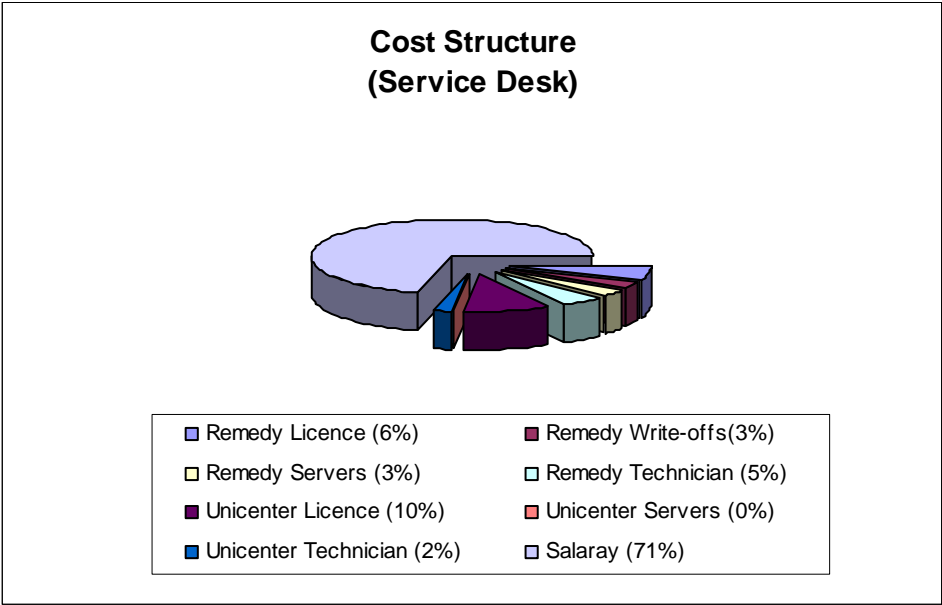
Diagram 2 Cost Structure Service Desk

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[121] Interview with Hans Berg, Manager, Service and Support, 2006-12-06.

A part from these there are a few minor remaining costs generated by the Service Desk, i.e. telephone and some other hardware. These are shared by a numerous amounts of functions within the IT department and represent a marginal portion of the total cost structure

4.4.2 The Service Group

The technicians at the Service Group complement the Service Desk in solving more complicated requests. They have different competence areas for which they handle errands for example Network and Web platform related issues. The Service Group comprises eight technicians and as mentioned before they are positioned next to the Service Desk. They work around different working stations and are placed in an open environment, which enhances the informal communication among them.

In contrast to the Service Desk the tasks of the Service Group goes beyond the support function and deals with various software and hardware installations and improvements. An interviewee informed us that he was at the moment involved with an upgrade process of Unicenter, which consumed almost all of his working time.[122] The fact that the Service Group is involved in tasks that does not exclusively relate to support constitutes a major difference between the Service Desk and the Service Group.

This difference in tasks also relates to the competence discrepancy of the operatives, where technicians generally have more detail skills about certain areas. Hence, this skill will be used to more than answering incoming incidents from the Service Desk. According to our interviews the ratio between the supports related tasks and other tasks is about 25/75 %, where 25% of the working hours are devoted to support of incoming errands from the Service Desk and detected errands by Unicenter.[123] The other 75 % are devoted to installations, maintenance, and upgrading and repair activities.[124]

The technicians normally begin their day by supporting errands that has been passed by the Service Desk and checking if new errands have been detected by Unicenter during the night. Unicenter runs 24 h per day and is a comprehensive surveillance system for servers and web platforms. It works proactively since it detects problems at an early stage. As a result Unicenter is an important tool for the Service Group. The other communication entrance of errands goes through Remedy and consists of errands that have been forwarded from the Service Desk. As mentioned the Service Group encompasses different specialists with different competence areas. Depending on the nature of the errand the Service Desk has hopefully assigned the errand to the correct technician.

In contras with the Service Desk the largest cost for the Service Group consists of the application Unicenter which represent 59%. Salaries only represent 25 % of the total cost structure and there is no significant difference among the eight

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[122] Interview with Tommy Adolfsson, Technican, 2006-12-05
[123] Interview with Tommy Adolfsson, Technician, 2006-12-05
[124] Interview with Erik Nåbo, Manger IDC; Interview with Tommy Adolfsson 2006-12-06

technicians[125] Due to the ratio of 25% that were devoted to solving incoming errands from the Service Desk and from Unicenter, it is only this amount that will be charged from the salary resource in our calculations. The remaining 75% is devoted to upgrades and installations. Since our focal point of this study is to measure costs related to support, these other tasks will not be taken into account.

**Cost Structure
(Service Group)**

☐ Remedy Licence (2%)   ☐ Remedy Whrite-offs (1%)
☐ Remedy Servers (1%)   ☐ Remedy Technicians (1%)
☐ Unicenter Licence (59%)   ☐ Unicenter Servers (2%)
☐ Unicenter Technician (9%)   ☐ Salary (25%)
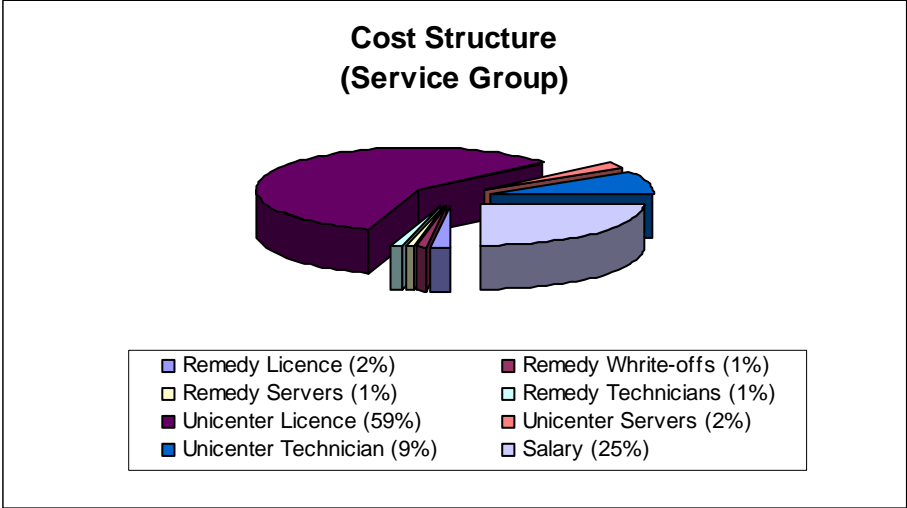
Diagram 3 Cost Structure Service Group

4.5 Supported Deliverables

Since the underlying purpose in this study is to trace cost for support to specific deliverables we find it relevant to present a clear definition and description of these. The "Service and Support" function of BT IT Supply supports a wide range of deliverables, everything from Microsoft related difficulties in Outlook to advanced server malfunctions. The complexity among the different deliverables is vast. We begin by presenting an overview of all the services and products supported by IT Supply according to their own classification.[126]

Categorize of supported deliverables

- Backup/Restore **- Business Applications** **- Hardware** **- MailMarshal**	**- Network** **- Password Reset** **- Request** **- Software** **- Printer**

Figure 8 Categorize of supported deliverables

Every time an incoming errand arrives to the Service Desk it must be classified according to these categories. They represent both specific products (MailMarshal, the mail system used at BT) and services (Requests).

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[125] Statistics provided by Gisela Fagerstedt
[126] Interview with Hans Berg, Director Service & Support, 2006-12-07

Errends per Category 2006

[Bar chart showing Service Desk and Service Group percentages across categories: Backup/Restore, Business Applications, Hardware, Printer, MailMarshal, Network, Password Reset, Request, Software. Y-axis from 0% to 70% in 10% increments.]
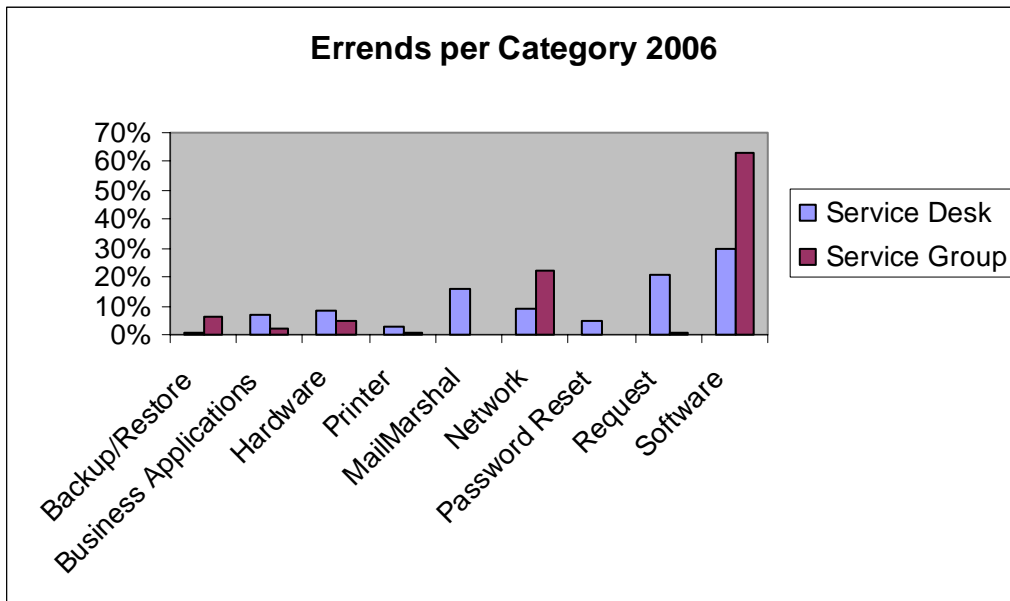
Diagram 4 Errands per category and support function

Within these categories sub categories exist which are the next step in the logging process of an incoming incident.[127] As illustrated above there is a great variation between the number of errands on the different categories. This figure also tells the difference between the Service Desk and the Service group.

4.5.1 Selection of Deliverables

Based on the present categories and from consultation with BT IT Supply the selected deliverables of this thesis were determined. We performed a reorganization of the total amount of supported deliverables in order to increase the degree of relevance in our final cost objects. The selection was made from statistics of the number of supported errands per deliverable and in consultation with our project host. The purpose was to capture the deliverables with most interest for BT IT Supply and with the highest frequency of support.

We extracted some of the specific software from the software category and used these as specific cost objects. For some software the cost significance of each product was so low that only assembled together with other products in the same category a significant cost allocation could be made. That is why for example "other software" is placed as a special group. The web platform was also extracted from the category Business applications. This was a result from BT IT Supply's desire of having the web platform as specific deliverable and a result of that this was the only deliverable in the category that had a significance in support.[128] Further on we have chosen these following nine deliverables:

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[127] See appendix
[128] See appendix

Selected Deliverables

- Network - Hardware - Servers - Requests - Other software	- Citrix - Exchange - MailMarshal - Web platform

Figure 9 Selected Deliverables

An important notion is that these deliverables are a variety of both products and services. Network relates to a service when the Service Desk or the Service Group assists users to gaining access to the network. Hardware relates to incidents regarding desktops, laptops and printers. In the original classification of this category Servers were also included. We decided to extract this and have it as a separate cost object, because of its importance for the IT setting. When it comes to laptops, desktops and printers we believe that these can be viewed as one group which is why we have these under the category hardware. "Servers" represents all server related issues. This can for example be incidents relating to switches and different firewall settings. This category provides information about the cost for supporting the servers.

Next deliverable is called "Requests" and represents a service which includes answering all kinds of questions regarding a great variety of products and services. One of the Service Desk operatives told us that answering these questions almost made them feel like telephone operators at an information desk. We believed that it would be interesting to show the cost of this service, since it somehow is positioned outside the daily duties of providing support. That is why we will select it as a cost object.

Our next deliverable is something called "Other Software" which includes all other software that the Service Desk and the Service Group support. These constitute of BT workplace, Matrix, Easy Production, Microsoft and Other. The reason why these software are not separated as specific products is because of their marginal affect on the costs. We decided to exclude Citrix, Exchange and MailMarshal, and use these as separate software because of their importance at IT Supply. This was also discussed with our project host. But for the rest of the software; these have been grouped together into one pool.

Citrix is a distributor that provides secure access to applications from a wide range of clients. Exchange is messaging platform from Microsoft. MailMarshal is the e-mail system of BT industries and Web Platform can be defined as provider of network access.

4.5.2 Support of Deliverables

The Service Desk personnel and the Technicians in the Service Group unfortunately lacked information regarding time consumption spent on supporting the deliverables. Therefore we created a questioner which was handed out to the operators in the Service Desk for a period of one week. From this we achieved time consumption based on the different deliverables. The result from this questioner is presented in the figure below. The next figures present the same distribution "per errand" instead of "time".
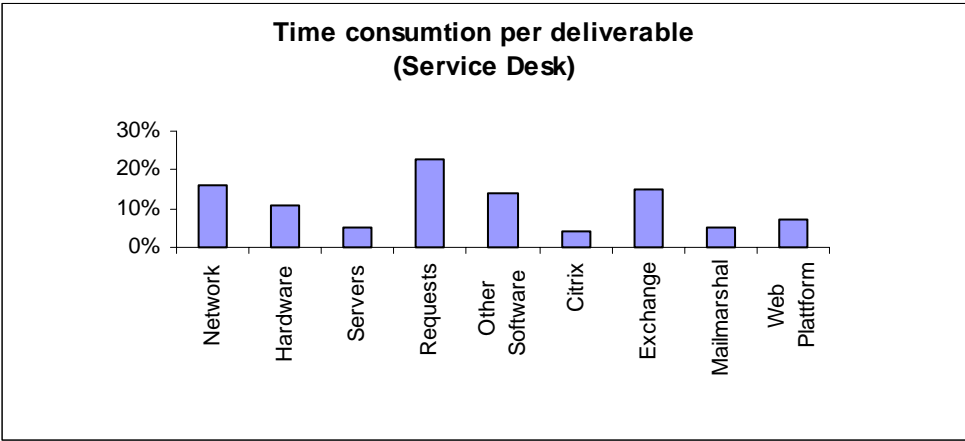
Diagram 5 Time consumption per deliverable (Service desk)
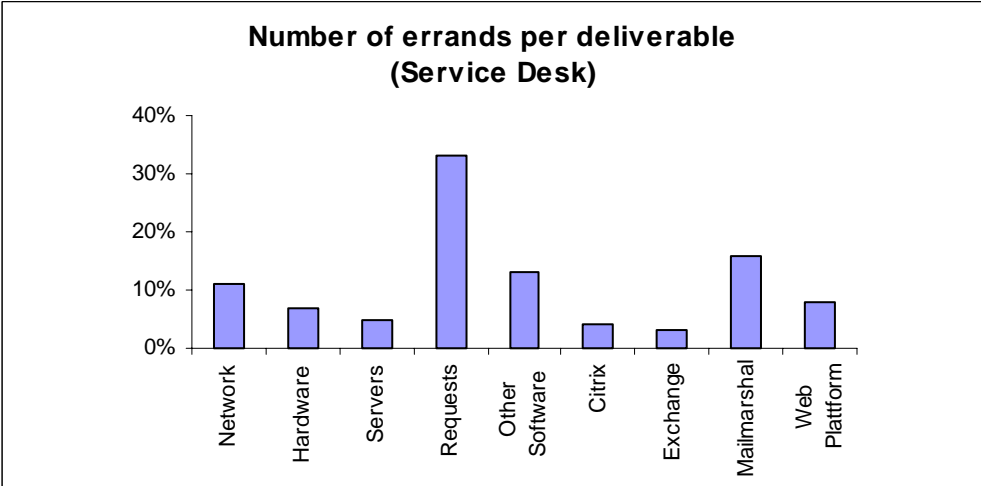
Diagram 6 Number of errands per deliverable (Service Desk)

According to both interviews and statistics a one week study represents a good estimate of the annual situation. The variety among errands differs mostly within the week where Mondays are often charged with the highest amount of errands. As the week progresses the amount declines. The statistics over a period of one

year is however relatively consistent with a short decline during the summer. See appendix xx for statistics. Based upon the working hours for the operators in the Service Desk (except lunch break) the questioner also reviled used and latent capacity. Of a total of 8460 minutes 2868 were dedicated to support of errands. The proportions are illustrated below.

Capacity Utilization (Service Desk)

Used Capacity 34%

Latent Capacity 66%
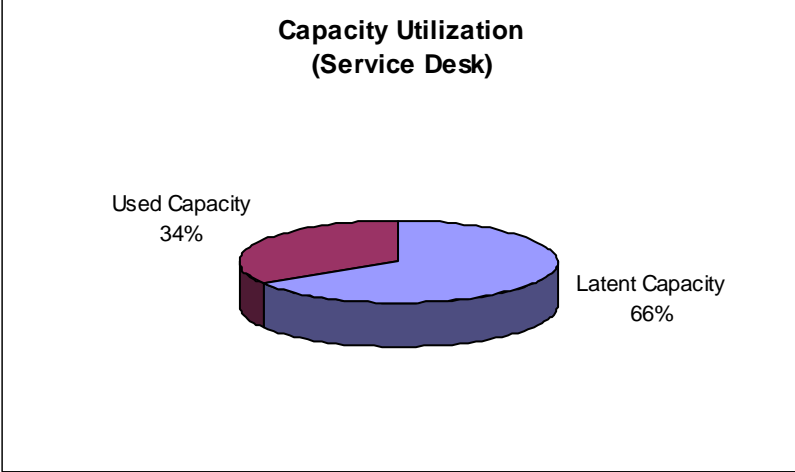
Diagram 7 Capacity Utilization (Service Desk)

The time consumption for the Service Group per deliverable was more difficult to obtain. Sometimes the technicians work simultaneously with many errands for several days making the measurement of time consumption difficult. Figure XX shows number of errands divided on the deliverables supported by the Service Group.

Number of errands per deliverable (Service Group)

Network, Hardware, Servers, Requests, Other software, Citrix, Exchange, MailMarshal, Web platform
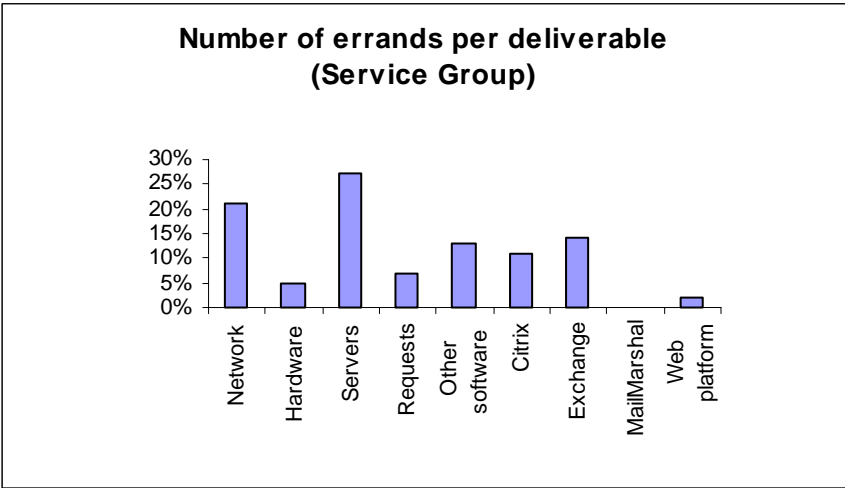
Diagram 8 Number of errands per deliverable (Service Group)

4.6 Empirical Summary

We began this chapter with an organisational description of BT being a subsidiary of Toyota Industries. We then, rather quickly scoped down our perspective and explored the specifics of "Service and Support" with focus on the Service Desk and the Service Group. At the time for this study the knowledge was rather limited concerning costs in this department. As a result the whole division has recently been reorganized in order to gain a better cost understanding.

Being a support function delivering IT products and services to other functions within MH Europé, IT Supply gets its income from support agreements with other divisions. The price for these support agreements are today not based on the actual costs, but on an arbitrary pricing method. This problem is increasing due to more restricted tax regulations regarding internal transactions and a higher demand for accurate pricing methods.[129]

All relevant material regarding the "Service and Support" function have been disclose in this chapter. Its two constituents the Service Desk and the Service Group have been examined for which we have presented both relevant statistics and clear assignment descriptions. In the next chapter this material will be dissected and scrutinized with the use of our theoretical framework, Activity Based Costing.

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[129]

Chapter 5

Analysis

The purpose of this chapter is to present an analysis of the empirical observations. The theoretical foundation will be used to analyze the empirical material with the intention to address the questions at issue. The purpose is to create an ABC model that can enhance the understanding and allocation of costs

5.1 Introduction

Based on the present theories this chapter aims to construct an ABC model that will approach our first two questions at issue. These are which activities, resources cost objects and cost drivers that can be identified and how much of the indirect and overhead costs that should be allocated to the cost objects? We begin with a reminder of the cost objects and the relevance of the ABC model in an IT setting. Further, we follow the implementation procedure presented in the theoretical chapter and finally present a full scale model and a discussion concerning operational and strategic ABM. This discussion will approach our third question at issue which deals with the ABC model's potentials for managerial decision making?

5.2 Cost Objects

The purpose of an ABC model is to determine the final costs for the cost objects, whereas we consider it appropriate to bear these in mind when taking part of the analysis. The model below demonstrates the cost objects of the ABC model. From now on these deliverables will be referred to as cost objects.

Cost Objects

- Network - Hardware - Servers - Requests -Other Software	- Citrix - Exchange - MailMarshal - Web platform

Figure 10 Cost Objects

5.2 Implementation of the ABC Model

As mentioned in the theoretical discussion the process of implementing an ABC model needs to consider two questions at issue. The first refers to *where* the organization initially should look for the potential benefits from implementing ABC. The second question concerns during *which conditions* the model will have the greatest impact. The answer to these questions was recognized by two rules, the "Willie Sutton Rule" and the "High Diversity rule".[130] The first of these two rules recognizes that organizations should notice areas with large indirect costs that are difficult to allocate. The second rule argues that an ABC model should be implemented in organizations with a high diversity of products, customers and processes.[131]

The empirical material reveals that "Service and Support" provides different levels of Support. The Service Desk allows internal customers access a service that can support their daily activities. For the more complicated matters the Service Desk passes incidents further to the technicians. Because of its central role as a front to the majority of internal customers and the wide range of incidents the Service Desk covers a high diversity of products, services and customers. The fact that the Support Group is involved in the same errands as the Service Desk makes this function highly applicable for the High Diversity rule as well.

At the Service Desk salaries represent a major cost pool of the total cost structure. The other expenses include software and hardware. In the Service Group salary is not as dominant mostly because of Unicenter, the server surveillance application. These IT related tools are in many cases shared by both the Service desk and the technicians. As a result a majority of the costs are indirect and needs to be allocated to a wide range of products and services (cost objects).

Since both the Service Desk and the technicians are involved in a high diversity of products and services combined with an extensive indirect cost mass we argue that both the "Willie Sutton rule" and the "High Diversity rule" are fulfilled. Hence, the context of the "Service and Support" division is considered a very interesting setting for an ABC implementation. The other reason for developing an ABC model is the fact that up until today no advanced cost allocation study has been made concerning "Service and Support" at BT IT Supply. In the up coming budget this function will compose a specific cost centre which makes this study even more interesting. This pragmatic cause constitutes our final reason why this cost allocation study has been made.

In the theoretical chapter we described the development of an ABC model as a process with interdependent steps.132 In order to be systematic and stay consistent our analytical process will follow the same structure. Consequently, it will be divided into the steps described below, where each step will be carefully explored and discussed:

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[130] Kaplan, Robert S & Cooper, Robin Cost, *Cost & Effect* (1997) HBS Press: Boston.
[131] Ax, Christian, et. al., *Den nya ekonomistyrningen* (2002) Liber ekonomi: Malmö. Page 270
[132] Ibid.
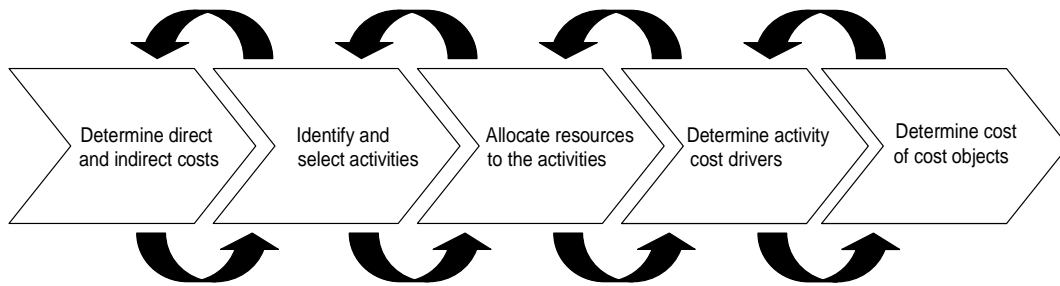
Figure 11 The implementation process of ABC

5.1 Determine Direct and Indirect Costs

All direct costs will bypass the ABC calculation and go directly to the cost object.[133] If a cost can be directly traced to a certain cost object, there is no need for a cost distribution through activities. The empirical material reveals that there are no significant costs that can be considered as direct. Both the operators and the technicians are involved in varied tasks and services which mean that several cost objects share their time. There is at present no system that directly traces how much time each employee spends on different tasks. As a result there is limited knowledge concerning how much time a specific errand consumes. Hence, how much it costs. Next to "salaries" the other major indirect cost consist of IT related tools. This hardware and software can to some extent be traced to different cost objects but there is no specific hardware or software that only supports one specific cost object. The major IT tools Remedy and Unicenter are used by both the Service Desk and the Service Group in their supporting of different cost objects.

5.2 Identify and Select Activities

Selecting activities is an important notion of the ABC model. The definition of an activity varies a lot and depends on the chosen level of analysis. Generally an activity can consist of everything from a detailed description of a certain task to a more general description such as a whole department within a company. When choosing activities it is important to bear in mind that the choice of activities often affects the cost of developing and maintaining the model.[134] Having very detailed activities can create a large apparatus just in order to keep track of all these. Detailed activity modelling is usually needed for operations planning and process improvement, but when it comes to cost management more general activity models are often sufficient.[135] Activities often constitute of concrete assignments whereas it can be appropriate to begin with the different functions within the division or the organization.[136]

A central criterion in our selection of activities was that these must have a significant affect on the cost objects. There is no need in determining activities for

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[133] Kaplan, Robert S & Cooper, Robin Cost, *Cost & Effect* (1997) HBS Press: Boston.
[134] Gerlach, James et. al *Determining the Cost of IT Services* Sep 2002/Vol 45. No 9. Page 122
[135] Gerlach, James et. al *Determining the Cost of IT Services* Sep 2002/Vol 45. No 9. Page 123
[136] Ax, Christian & Ask, Urban, *Cost Management* (1995) Studentlitteratur: Lund. Page 63

the sake of having many, at least not from a cost management perspective. A central difference between an ABC model and a traditional cost model is that in the latter the resources are consumed directly by the cost objects, whereas in the ABC model the activities are consumed by the cost objects. The selected activities play therefore an important role for the final allocation.

Our second criterion when selecting activities was that we wanted to choose activities with different resource consuming. If the selected activities consume the same amount of resources the basic principle with an ABC model diminishes. This resource would then be equally divided between the activities and from a cost management perspective the use of a traditional cost system would depict the same result on the final cost objects. Hence, we saw it as an imperative to choose activities with a different resource consumption pattern.

Our third criterion in the selection of activities was based on what BT IT Supply wanted us to investigate. Their anticipation with this study was to be able to trace the costs of the products and services that were being supported. The width of the ABC model could accordingly not be too large, but on the other hand a microscopic analysis was not either desirable. The ideal situation was to select activities that also could work as a foundation in a larger ABC context. Since the "Service and Support" function at BT IT Supply will comprise a specific cost centre in next year's budget, the use of more general activities were desirable.

These criteria eventually led to the selection of "First-line" and "Second-line" support as our two main activities which are defined according to the ITIL framework. First-line support is responsible for recording, classifying, matching, solving, and assigning to other support groups. Second-line is primarily involved in investigation and solving incidents forwarded by First-line.[137] There is a clear distinction in all above mentioned categories between these activities which make them very interesting. It can be more easily understood if one looks at it from an "errand perspective". When an errand arrives either by telephone, mail or web application it goes directly to the Service Desk. From this point on it has two choices: It can either stay and be solved in this function, or it can pass on to the next level of support where more specialized technicians take over. If it stays in First-line support then the final cost object will only be charged with resources needed for "First-line". If it needs more specialized support and gets passed on to Second-line it will be charged with resources from both "First-line" and "Second-line" and will consequently be more expensive. The distinction between these two levels of support constitutes the most significant difference in resource consumption within the "Service and Support" function. Consequently the costs for these two levels of support are different. The salary between the employees is also different as well as the amount of IT related tools needed. Consequently, First-line and Second-line constitutes a major difference in resource consumption for errands. Using these as our activities will show the difference between First-line and Second-line in their resource consuming and how this affects the cost objects. It will also show the total support cost for a deliverable going through both levels of support.

Within these two activities we have defined interrelated sub processes which the activity is based on. These sub processes are based on the IITL framework and

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[137] Von Bon, Jan, *Introduction to ITIL* (2001) Van Haren Publishing: The Netherlands.
Page 42

will work as a better understanding of the activity. Further, we will in more detail explain the selected activities "First-line" and "Second-line" support.
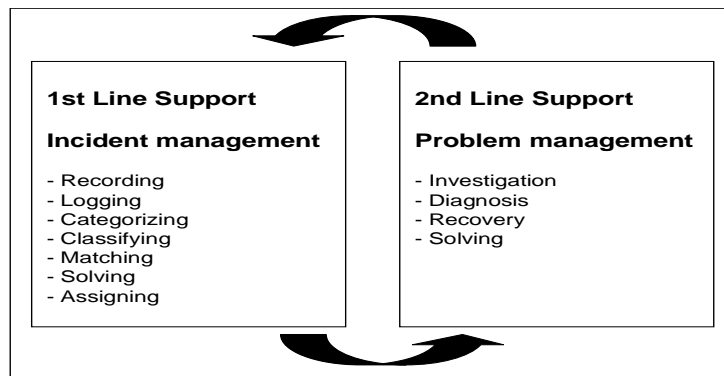
Figure 12 Selected Activities

5.2.1 First-line Support

First-line support is conducted through its organizational application the Service Desk. This is an important role since it serves as the front for the entire IT department and is the operational interface between IT and the users.[138] The variety of errands being reported to the Service Desk is vast and covers everything from basic Microsoft related issues to advanced server problems. All errands are reported through mail, telephone, and web application or by surveillance. These four communication tools are the only communication entrance to the Service Desk. One of the key objectives of the Service Desk is to provide support for errands and to return to normal service level as soon as possible. This correlates strongly with the definition of "Incident Management" whereas this process constitutes First-line support's main responsibility.[139] Another important task for First-line support is to keep track and log all incoming incidents which is yet another important notion of "Incident management". Regardless of whether the incident can be solved by First-line or Second-line support the logging procedure becomes an important concept for both levels of support. Since it enables the errand to be traced and saved.

The definition of the activity "First-line support" comprises all those actions that relates to "Incident Management" taken in the Service Desk such as logging, handling and process incoming incidents. Those requests and services that cannot be solved by the Service Desk will be passed on to a technical specialist in Second-line support. This process is symbolized in figure XX by the combining arrows from First-line to Second-line.

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[138] Macfarlane, Ivor & Rudd, Colin (2001) ITSMF Ltd United Kingdom page 11
[139] Introduction to ITIL" (2005)Van Haren Publishing: Netherlands, page 42.

5.2.2 Second-line Support

The daily routines in Second-line support differ a lot from the ones in "First-line" support. In the latter the operatives solely handle incoming errands, whereas the tasks in Second-line support are of greater variety. The technicians at Second-line support are also involved with other tasks such as software upgrade operations and new software and hardware installations. These tasks are however not affiliated with support activities and will therefore not be included in our calculations.

"Problem Management" is the process mostly associated with Second-line support. The focus of this process is to resolve the underlying root cause of errands and prevent them from recurring. An important step in this process is to proactively identify and resolve problems and known errors thus minimizing incident occurrences.[140]

The operatives at Second-line support normally begin their day by solving passed by errands from First-line support and from the surveillance application Unicenter. During the day they are also involved in support activities with emergency errands. This process is characterized by the sub processes that were defined in figure XX. Second-Line support does not only focus on temporary incident solving but also has its emphasis on investigating the underlying root of the incident. When solving an incident the solution is filed and described in Remedy in order to assist First Line if the incident reoccurs. This sub process is symbolized by the arrow from Second Line to First Line.

Through our interviews we have been able to calculate a percentage between tasks that relates to "Problem Management" and the other assignments. From this calculation we can distribute an adequate cost mass that associates only to "Problem Management" affiliated tasks forwarded from First-line support.

Our definition of the activity "Second-line support" comprises all those actions that relates to "Problem Management" such as incidents forwarded from First-line support that already has been logged. A common incident can be a server breakdown for which the competence only can be found in Second-line support. Additional to this, the activity "Second-line support" involves incidents reported by the surveillance application Unicenter. This plays on important role in the "Service and Support" function since it supervises all servers. These two actions together constitute the activity "Second-line support".

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[140] Macfarlane, Ivor & Rudd, Colin, *IT Service Management* (2001) itSMF Ltd: UK. Page 19

5.3 Allocation of Resources to the Activities

The selection of resources constitutes a fundamental base in an ABC model. The resources build the elementary cost mass that will be distributed to the cost objects through the chosen activities. In this selection process it is almost impossible to account all the resources whereas a demarcation must be made and only resources with a significant impact should be included.

Our empirical material reveals that the "Service and Support" function incorporates several major resources necessary in order to deliver IT services. Due to confidentiality this figures will be presented in percentage instead of absolute figures.

**Resources
(Service & Support)**

- ☐ Remedy licence (4%)
- ☐ Remedy Write-offs (2%)
- ☐ Remedy Servers (2%)
- ☐ Remedy Technician (3%)
- ☐ Unicenter (39%)
- ☐ Unicenter Servers (1%)
- ☐ Unicenter Technician (6%)
- ☐ Salary (43%)
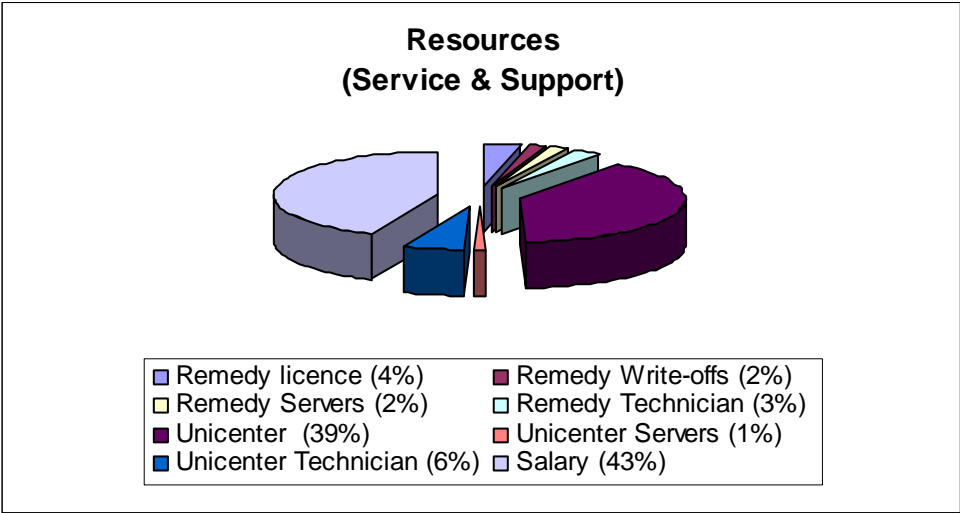
Diagram 9 Resources Service & Support

The cost of Unicenter, the surveillance application mainly used in Second-line support, is based on an annual licence fee. In addition to this it needs 4 servers and a full time technician that supports the platform. Within the Unicenter cost pool these three costs are accounted for:

- Annual Support and licence agreement
- 4 Servers
- One full-time technician

Remedy, which is the logging software, plays an important role both in First-line and in Second-line. Remedy was initially bought for a fixed price but in addition to this there is an annual licence and support agreement. Remedy needs 7 servers in order to function and 75% of a full time technician. A very important notion is that Remedy is used by more functions at BT than IT Supply. Consequently not all Remedy costs should be charged to "Service and Support". In order to cope with this problem we managed to find out the amount of transactions done in Remedy by "Service and Support" and compared this with the transactions made by other divisions. In this calculation we used the total transaction amount during 2005. The ratio between these figures would create a reliable percentage of the costs that

could be allocated to "Service and Support". The ration showed that 60% of the total transactions in Remedy were done by the "Service and Support"-function. Hence, 60% of the Remedy cost pool will be used in our calculations. Within the Remedy cost pool these four costs are accounted for:

- Write offs from the initial purchase
- Annual Service and Support agreement
- 7 Servers
- 75% of a full-time technician

An additional process in the distribution of resources to the activities regards capacity utilization.[141] Since our empirical material presented us with the opportunity we have consider this possibility. However, we believe that the nature of the service desk is to be considered as a constant stand by function. As a result the cost objects should also bear the cost for this stand by. If capacity utilization had been accounted for, only 34 % of the resources (Costs) should have been allocated to the cost objects.

5.3.1 Resource Allocation to First-line Support

The "Incident management" process represents the foundation within First-line support. In order to conduct this process all the resources of "Service and Support" with exception of the Service Group salary, has to be accounted for. These resources are however shared by both First and Second line. Hence, their individual consumption also must be determined. Neither First nor Second line can perform whiteout Remedy and based upon the empirical material the importance of Remedy is consider to be divided 70%/30% between First-line and Second-line. As a result 70% percent of the Remedy recourse was allocated to First Line support. For Unicenter the utilization and importance differ and based upon the empirical material 10 % of the Unicenter cost was to be accounted in First Line Support.

Resources Selection First Line

- Remedy Licence 70%	- Unicenter Licence 10 %
- Remedy Write – offs 70 %	- Unicenter Servers 10 %
- Remedy Servers 70 %	- Unicenter Technician 10 %
- Remedy Technician 70 %	- Salaries Operators 100 %

Figure 13 Resource Selection First Line

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[141] Kaplan, Robert S. & Cooper, Robin, *Cost and Effect* (1997) HBS Press: Boston.

According to this distribution of resources the following cost structure emerges.

**Resources
(First Line)**

☐ Remedy Licence (6%)   ■ Remedy Write-offs(3%)
☐ Remedy Servers (3%)   ☐ Remedy Technician (5%)
■ Unicenter Licence (10%) ■ Unicenter Servers (0%)
■ Unicenter Technician (2%) ☐ Salaray (71%)
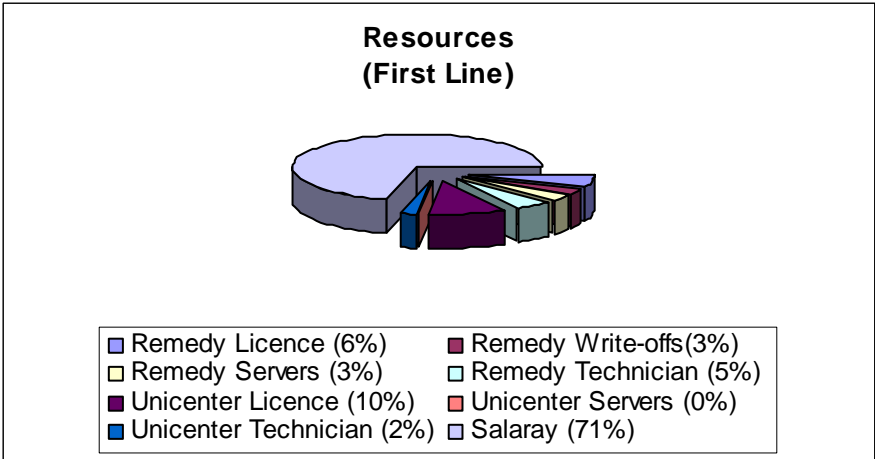
Diagram 10 Resources First Line

Salaries for the operators represent the majority of expenses and constitute 79 % of the total cost structure. This includes the four operators that belong to the Service Desk. They operate on a rotating schedule and all four are involved in the different sub processes within the activity. As a result the four operators are considered as one resource pool and not as four unique.

5.3.2 Resource Allocation to Second-line Support

The technicians at Second-line are involved in giving support but this activity does not constitute all of their working hours. Since their daily routines involve other tasks than "Problem Management" we must make a time allocation between these different assignments. The empirical material reveals that 25 % of the technicians' working hours are related to "Problem Management" and therefore only 25 % of their salary will be used in our calculation. Since there is no significant difference between the eight technicians salary this is considered as one cost pool. The Remedy cost pool will be allocated with 30 % and since Unicenter exclusively is used for incident detection the reaming of this resource will be allocated to Second Line, by 90 %.

Resource Selection Second Line

- Remedy Licence 30 %	- Unicenter Licence 90 %
- Remedy Write – offs 30 %	- Unicenter Servers 90 %
- Remedy Servers 30 %	- Unicenter Technician 90 %
- Remedy Technician 30 %	- Salaries Technicians 100%

Based on these calculations the following cost structure for Second-line support emerges.

**Resources
(Second Line)**

- Remedy Licence (2%)
- Remedy Whrite-offs (1%)
- Remedy Servers (1%)
- Remedy Technicians (1%)
- Unicenter Licence (59%)
- Unicenter Servers (2%)
- Unicenter Technician (9%)
- Salary (25%)
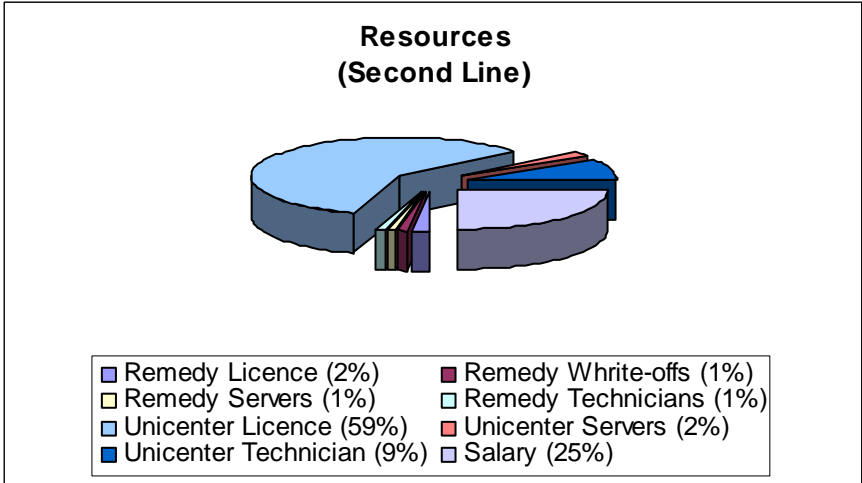
Diagram 11 Resources Second Line

5.4 Determine Activity Cost Drivers

When the activities and the resources are determined it is time to select the Activity Cost Drivers. These will measure the rate at which an activity contributes to a cost object. An important criterion is that a cost driver must illustrate the diversity in how the activity is being consumed by the cost objects.[142]

Due to the present circumstances unique cost drivers for First and Second-line have been selected. For First-line support the percentage of time operator each operator directs to the cost objects will be used as activity cost driver for salary. These percentages were obtained from the questioner handed out to the operators in the Service Desk We believe that the time related cost drivers are the most satisfactory and accurate cost driver to use, since they encompass the time diversity spent on the cost objects. Providing support to a more complicated product will consume more time than answering a simple password question. Accordingly using "time" as Activity Driver is the most suitable choice. The other resources will be distributed by a transaction related cost driver. We believe that the utilization of Remedy and Unicenter will be better distributed using this type of driver. The amount of time an errand consumes does not affect the capacity usage of the application. An errand taking one minute to solve is handled in Remedy according to the same sub processes as an errand taking 20 minutes. Each notification in Unicenter is handled according to the same sub processes and will therefore also have a transaction related cost driver.

Due to the measuring difficulties we were not able to hand out a similar questioner to the technicians in Second-line support. Thereby the model will not include time related cost drivers for this activity. Instead "number of incidents" will be used as a cost driver. We do believe that "time" represents a more accurate cost driver than "number of incidents" but given the circumstances "nr of incidents" was the most feasible cost driver to use. Even though the proportions may vary using "number of incidents" instead of "time" we believe that number of incidents will provide an adequate distribution of the cost mass. In accordance with First-line

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[142] Kaplan, Robert S. & Cooper, Robin, *Cost & Effect* (1997) HBS Press: Boston.

support the cost drivers for Remedy and Unicenter associated resources will be allocated by transaction related cost drivers.

Finally, we want to make an interesting notion when it comes to the selection of cost drivers. One might think that the three different communication ways into the Service Desk; telephone, mail and web application, would constitute as different activity cost drivers. At the initial phase of this study we contemplated this possibility, but during the process we realized it was a false assumption. The amount of resources consumed is equal regardless of which entrance way an incident has. Consequently, these three different entrances do not drive the costs separately. "Time consumption" or "Number of errand" is the same regardless of the communication entrance.

5.5 Determine Cost of Cost Objects

Figure x.x on next page depicts the complete illustration of the ABC process. The nine resources have been distributed to the activities according to the chosen cost drivers. Further, we see how these activities are consumed by the cost objects. If there had been any direct costs these would have been allocated at the same time. "Network" which is a service provided to the different users at BT involves problems when logging on to a network. Providing support for this service consumes 9,2% of the total resources. The next cost object "Hardware" encompasses support for laptops desktops and printers. This cost accounts for 4,5 % of the total resources. Servers take on a large cost mass, mainly because of the surveillance system Unicenter and its essential component within the IT infrastructure, a total of 48,6%. "Requests" deals with rather simple questions regarding backups, status issues and general questions. This service consumes 10,3% of the total resources. "Other Software" is a collection of Microsoft related software, Matrix and BT Workplace. These consume 7,3 % of the resources. Citrix, the distributor providing secure access to applications consumes 3,4% and Exchange the Microsoft messaging platform consume 7%. Mailmarshal, the in house mailing system accounts for 2,6% of the total resources. Web platform which is the intranet at BT 7,1% of the resources.

5.6 The ABC Model

The model begins with the identified resources which already have been defined. These resources are allocated with resource drivers obtained from the interviews and statistics. These were presented in the analysis and the empirical section. By the use of these resource drivers the expenses for Labour, Software and Hardware have now been distributed to First-line and Second-line support. Further, these costs are distributed among the different cost objects with the use of two different drivers: Transaction related and Time related. Finally the total resource consumption of the cost objects is presented. A full scale illustration of the developed model is presented on the next page.

Resources (100%)

- Remedy licence (4%)
- Remedy Servers (2%)
- Unicenter (39%)
- Unicenter Technician (6%)
- Salary Technicians (15%)
- Remedy Write-offs (2%)
- Remedy Technician (3%)
- Unicenter Servers (1%)
- Salary Operators (28%)

Cost Drivers	1st Line	2nd Line
Remedy licence	70%	30%
Remedy Write-offs	70%	30%
Remedy Servers	70%	30%
Remedy Technician	70%	30%
Unicenter licence	10%	90%
Unicenter Servers	10%	90%
Unicenter Technician	10%	90%
Salary Operators	100%	0%
Salary Technicians	0%	100%

Cost Drivers	1st Line	2nd Line	Total
Remedy licence	2,8%	1,2%	4,0%
Remedy Write-offs	1,4%	0,6%	2,0%
Remedy Servers	1,4%	0,6%	2,0%
Remedy Technician	2,1%	0,9%	3,0%
Unicenter licence	3,9%	35,1%	39,0%
Unicenter Servers	0,1%	0,9%	1,0%
Unicenter Technician	0,6%	5,4%	6,0%
Salary Operators	28,0%	0,0%	28,0%
Salary Technicians	0,0%	15,0%	15,0%
	40,3%	**59,7%**	**100,0%**

Cost Drivers 1st Line	Remedy	Unicenter	Salary
Network	11%		16%
Hardware	7%		11%
Servers	5%	73%	5%
Requests	33%		23%
Other software	13%		14%
Citrix	4%		4%
Exchange	3%		15%
MailMarshal	16%		5%
Web platform	8%	27%	7%
Total	**100%**		**100%**

Cost Drivers 2nd Line	Remedy	Unicenter	Salary
Network	21%		21%
Hardware	5%		5%
Servers	27%	93%	27%
Requests	7%		7%
Other software	13%		13%
Citrix	11%		11%
Exchange	14%		14%
MailMarshal	0%		0%
Web platform	2%	7%	2%
Total	**100%**		**100%**

Cost Objects	1st Line	2nd Line	Total
Network	5,3%	3,8%	9,2%
Hardware	3,6%	0,9%	4,5%
Servers	5,1%	43,4%	48,6%
Requests	9,0%	1,3%	10,3%
Other software	4,9%	2,4%	7,3%
Citrix	1,4%	2,0%	3,4%
Exchange	4,4%	2,6%	7,0%
MailMarshal	2,6%	0,0%	2,6%
Web platform	3,8%	3,3%	7,1%
Total	**40,3%**	**59,7%**	**100,0%**

Figure 15 The ABC Model for Service & Support

5.7 A Fictive Version of the ABC Model

Due to confidentiality we are not able to present the actual figures in the ABC model. Instead we have used percentage as an indicator of the total cost structure. This however may be confusing for the reader. As a result we in this section intend to further explain and illustrate the developed model by the use of fictive numbers. The model is exactly the same as the one presented in chapter 6.x.x. and represents the same proportions. In our fictive model the entire cost mass of "Service and Support" incorporates € 1 000 000.

Fictive Resources

- Remedy Licence: € 40 0000	- Unicenter Licence: € 390 000
- Remedy Write – offs: € 20 000	- Unicenter Servers: € 10 000
- Remedy Servers: € 20 000	- Unicenter Technician: € 60 000
- Remedy Technician: € 30 000	- Salaries technicians: € 150 000
- Salary Operators: € 280 000	

Figure 16 Fictive Resources

These resources will further be allocated by the use of the calculated resource drivers to First-line and Second-line support. The percentage of the resource cost drivers are depicted in the model. For example, 70 % of Remedy licence, write-offs, servers and technician will be allocated to First-line support, 30 % to Second-line.

The next step is to distribute the activity costs by the use of activity cost drivers to the different cost objects. In First-line support the cost driver for Remedy and Unicenter is transaction related and refers to the amount of incidents being reported. In order to distribute the expense for "salary" the cost driver is time related and disclosures "time consumption" per cost object. In Second-line however the cost drivers are only transaction related. Consequently, the allocation is in correlation of how many errands a specific cost object generates. Figure x.x is an excerpt of Activity cost drivers for First-line support. Here the cost object consumption of activity First-line support is depicted.

Activity Cost Drivers 1st Line	Remedy	Unicenter	Operators
Network	11%		16%
Hardware	7%		11%
Servers	5%	73%	5%
Requests	33%		23%
Other software	13%		14%
Citrix	4%		4%
Exchange	3%		15%
MailMarshal	16%		5%
Web platform	8%	27%	7%
Total	**100%**	**100%**	**100%**

Figure 17 Activity cost Drivers First Line

The model on next page illustrates the entire ABC process where the resources are first allocated to the activities and then to distributed among the cost objects.

Resources (€ 1 000 000)

- Remedy (€ 40 000)
- Remedy Write-offs (€ 20 000)
- Remedy Servers (€ 20 000)
- Remedy Technician (€ 30 000)
- Unicenter Licence (€ 390 000)
- Unicenter Servers (€ 10 000)
- Unicenter Technician (€ 60 000)
- Salary Operators (€ 150 000)
- Salary Technicians (€ 280 000)

Cost Drivers	1st Line	2nd Line
Remedy licence	70%	30%
Remedy Write-offs	70%	30%
Remedy Servers	70%	30%
Remedy Technician	70%	30%
Unicenter licence	10%	90%
Unicenter Servers	10%	90%
Unicenter Technician	10%	90%
Salary	100%	100%

Activity Costs	1st Line	2nd Line	Total
Remedy licence	€ 28 000	€ 12 000	€ 40 000
Remedy Write-offs	€ 14 000	€ 6 000	€ 20 000
Remedy Servers	€ 14 000	€ 6 000	€ 20 000
Remedy Technician	€ 21 000	€ 9 000	€ 30 000
Unicenter licence	€ 39 000	€ 351 000	€ 390 000
Unicenter Servers	€ 1 000	€ 9 000	€ 10 000
Unicenter Technician	€ 6 000	€ 54 000	€ 60 000
Salary	€ 280 000	€ 150 000	€ 430 000
Total	**€ 403 000**	**€ 597 000**	**€ 1 000 000**

Cost Drivers 1st Line	Remedy	Unicenter	Salary
Network	11%		16%
Hardware	7%		11%
Servers	5%	73%	5%
Requests	33%		23%
Other software	13%		14%
Citrix	4%		4%
Exchange	3%		15%
MailMarshal	16%		5%
Web platform	8%	27%	7%
Total	**100%**		**100%**

Cost Drivers 2nd Line	Remedy	Unicenter	Salary
Network	21%		21%
Hardware	5%		5%
Servers	27%	93%	27%
Requests	7%		7%
Other software	13%		13%
Citrix	11%		11%
Exchange	14%		14%
MailMarshal	0%		0%
Web platform	2%	7%	2%
Total	**100%**		**100%**

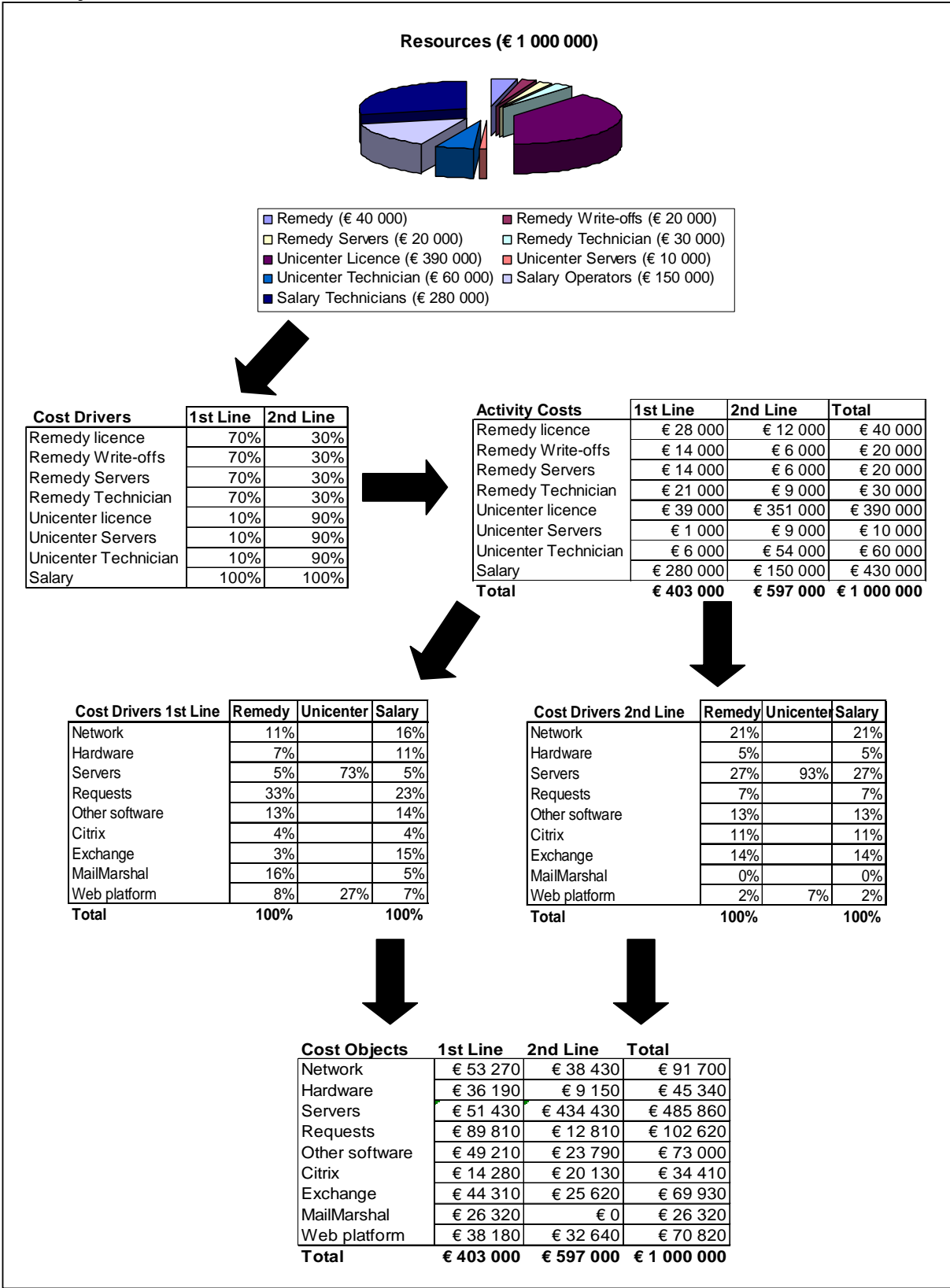| Cost Objects	1st Line	2nd Line	Total
Network	€ 53 270	€ 38 430	€ 91 700
Hardware	€ 36 190	€ 9 150	€ 45 340
Servers	€ 51 430	€ 434 430	€ 485 860
Requests	€ 89 810	€ 12 810	€ 102 620
Other software	€ 49 210	€ 23 790	€ 73 000
Citrix	€ 14 280	€ 20 130	€ 34 410
Exchange	€ 44 310	€ 25 620	€ 69 930
MailMarshal	€ 26 320	€ 0	€ 26 320
Web platform	€ 38 180	€ 32 640	€ 70 820
Total	**€ 403 000**	**€ 597 000**	**€ 1 000 000**

Figure 18 A fictive version of the ABC model

5.8 Activity Based Management

Kaplan & Cooper (1997) argues that developing an ABC model is the first step towards company-wide implementation. It enables managers to view its operations in terms of how resources are consumed.[143] This is of elevated significance in the case of BT IT Supply since "Service and Support" never has been a cost centre. If a division never has been accountable for the costs it generates then naturally an initial ABC model will help managers to think in terms of resources consumed. We argued in the theory chapter that the idea by ABC is to provide managers with more accurate information regarding the cost structure. The next step in this process is *how* managers can use this information and benefit from it.

ABM can be seen as an enhancement or the practical consequence of an ABC model. It is through ABM managers are able to steer the processes in the organization to enhance profitability and efficiency.[144] The basic principles of the ABM model are that it refers to an entire set of actions that can be taken, on a better informed basis, with activity-based costing information ABM accomplishes this through its two applications *operational* and *strategic* ABM.[145] The former covers the actions that increase efficiency, lower costs - in short, the actions required to do things right. Strategic ABM is about doing the right things. Generically ABM can be described as a collection of common ideas and tools that together work for a more efficient way of utilizing resources. This does not mean that a small amount of resources are preferably to use, only that the resource utilization must be efficient.[146]

5.8.1 Internal Pricing and Recharge Rates

The results presented in the analysis can be very useful when undertaking strategic decisions. Firstly, it creates a foundation for possible tracing of costs to the different divisions utilizing the support function. The logging procedure in Remedy includes acquiring user name and from which division the user is located. As the internal support for customers all other divisions are using IT Supply's services. Having provided a ground for a cost allocation to the different deliverables in our ABC model, the next step would then be to charge the divisions with a recharge rate according to how much IT resources they consume. This is an example of conducting operational ABM. If a certain division at BT is overrepresented in the utilization of the "Service and Support" function then this division consequently must be charged with the associated costs. This type of information can work as a ground for reorganization and to increase efficiency among the different divisions.

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[143] Kaplan, Robert S. & Cooper, Robin. *Cost and Effect* (1997) HBS Press: Boston.
[144] Ibid.
[145] Ibid. Page 137.
[146] Ax, Christian & Ask, Urban *Cost Management* (1995) Studentlitteratur: Lund. Page 96

This discussion leads us to the complexity of setting an appropriate price for the IT deliverables. We found out from the interviews that this is difficult since proper cost knowledge up until today has been deficient. The pricing method has for a long time been characterized by an arbitrary method not based on factual cost data. Enhanced cost knowledge is essential when negotiating support agreements with different divisions, which was explained to us by the two controllers.[147] They also mentioned the shortcomings in these negotiations when there is a lack about the related costs. Accordingly, inaccurate pricing of internal transactions of deliverables may also lead to misleading corporate accounting. Since there are legal regulations for i.e. group contributions and other internal transactions a lack of understanding for the cost structure may obstruct the possibility to face these regulations. The results presented in the analysis facilitate and provides a ground for the above mentioned dilemma where a clear cost structure emerges.

5.8.2 Purchasing of Deliverables

In order to estimate and judge a purchase price for a deliverable it is important that all associated costs are to be accounted for. Which of the deliverables demand a high utilization of the support resources and which do not? This must be contrasted with the importance and the degree to which the deliverable is used among the divisions. As an example we can look further into the application Citrix which works as a database for other software and plays an important role for the IT setting at BT. The results show that Citrix consumes 3,4% of the support resources which is a marginal figure compared with some of the other deliverables. The results presented in the ABC analysis can work as a chart for tracing the *factual* costs to certain deliverables. If a product or service is associated with a high degree of support cost, then this cost must be taken into account and added to the initial purchase price, in order to come up with the total cost of the deliverable. Some products and services may have a low purchase price, but if the product or service demands a high degree of support, then the total cost (purchase + internal / external support) rises. This creates a false illusion and may lead to bad long-term investments. An initial low-priced product or service may demand a high degree of support whereas the cost for this must be taken into account when the total price of the deliverable is determined. The deliverable may be more economic to outsource than to provide internally. We argue that there must be an alignment between the initial purchase price and the support costs. A clear understanding of the relationship between two variables creates a foundation for fruitful decision making regarding IT purchase.

Based upon the results and the discussion above a basis for negotiating purchase prices has been established. A central question is whether it is profitable to purchase a product with or without an included service agreement? If it turns out that a certain deliverable is associated with a high support cost, then it might be profitable to consider outsourcing of this deliverable. On the other hand, if it turns out that only a marginal cost is associated, then it is profitable to let it stay in the internal support. These are thoughts that IT Supply must take into consideration.

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[147] Interviews with Morgan Bjärnesjö & Ronny Ideskär, IS Promotion & BT IT Supply

Chapter 6

Conclusions

This chapter begins with a summary of our results. A discussion will follow that combines our results with the overall predicament with determining IT costs. Next chapter will consist of further research steps within this area. It all ends with a chapter called Suggestions for BT IT Supply. This part comprises regular advice to IT supply divided in two parts: operational and strategic advice.

6.1 Results

The purpose of this essay was to distribute the resources to specific cost objects. This distribution has been accomplished through the defined and selected activities and cost drivers. The activities have been defined as First-line and Second-line and the cost drivers constitute of both time relating and transaction relating. Our final image in the analysis depicts the percentage of these costs distributed among the following cost objects:

Cost allocation to the cost objects

Network 9,2%	Hardware 4,5%
Server 48,6%	Request 10,3%
OtherSoftwar7,3%	Citrix 3,4%
Exchange 7,0%	MailMarshal 2,6 %
	Web Platform 7,1%

Figure 19 Cost allocation to the cost objects

These figures shall be contrasted with two facts. The first relates to the current service agreements between BT IT Supply and other divisions at BT. Having illuminated the support costs per deliverable it will be interesting to see the utilization difference between the divisions. Based on this IT Supply can assess a plausible cost for its services. This can also have a strategic meaning in the sense that underlying reasons behind the utilization difference can emerge. If a certain division is utilizing a higher capacity of a specific "Service and Support" deliverable, then perhaps this must be further investigated. It will also be possible to benchmark the divisions in order to shed light on the utilization differences. Secondly, the results from our calculations provide a base for potential outsourcing considerations since this depicts the *actual* price (purchase price + support price) for the deliverables. A central question would be whether or not the support of a certain deliverable shall be handled internally or externally.

These two aspects, purchasing of deliverables, and the relationship between IT Supply and the other divisions represent the most important features of our final results. This will be further explored in 6.2.

6.2 Discussion

When we began this cost allocation study at BT IT Supply their knowledge about costs relating to IT was strictly limited. Information about the various support costs based on the supported deliverables was almost none existing. The manager of the Service Desk had no budget responsibility which is a plausible reason for the lacking cost information. As we described in the introduction many publications relate IT to increased business value but few studies are linking Cost Management to IT more closely. This creates a false illusion about IT as something that does not generate solid costs. The high degree of intangibility and the tricky way of measuring the costs is the major challenge. This has been the situation at BT IT Supply for a long time and up until today the "Service and Support" division has not been constituted as a specific cost centre. This will be changed in the budget of 2007.

The ABC model developed in this thesis is supposed to be seen as an initial suggestion for how to allocate costs within a "Service and Support" setting. It is however important to bear in mind that an ABC model is never static and is never complete; it evolves over time endlessly as long as it is in use.[148] We have provided BT IT Supply with a model for how to allocate costs associated with support in the future. This model also provides an understanding of the selected deliverables (cost objects) which creates cost awareness. Presenting this overview of the deliverables was also an initial desire from BT IT Supply. We believe that this can further improve the cost allocation ambitions among the managers at IT Supply.

Being able to manage the costs is imperative in order for organizations to stay competitive. If hundreds of thousands of dollars are spent on certain divisions and functions it is utterly important to know *why* this money is spent. Is it justifiable to spend this amount of money on tasks and divisions without a clear cost structure? This is the case for each organization to decide, but depicting all expenses with the use of an ABC model enhances the likelihood for increased cost awareness. Letting managers think in "resource consumption"-terms and provide a comparable "economic map" will amplify the probability for cost awareness in the organization. Spending money and resources must always be tantamount with a follow up on *where* and *why* the money has been spent. Having provided BT IT Supply with a map of their expenses in our final ABC model we have answered at least the question *where* the money is spent. The question *why* is a strategic decision the managers at BT have to contemplate.

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[148] Kaplan, Robert S. & Cooper, Robin, *Cost & Effect* (1997) HBS Press: Boston.

6.2 Implications for further research

During the process of conducting this study we have come across and contemplated issues regarding further research. These issues concern both questions and aspects we think would be interesting to explore. For future researchers we believe that the usage of time driven cost drivers in Second-line support is the first noteworthy aspect. Having this will provide an even more accurate percentage on the final cost objects. However these cost drivers demand more detailed information concerning the time consumption of different deliverables.

As the process of understanding the cost structure evolves it may also be intersecting to expand the theoretical discussion with other theories concerning i.e. pricing of deliverables, strategic competition and Balanced Score Card. The BSC may be especially of use in a study of an entire IT division. Since this study has been conduced at a specific function further research may have its aim on other parts of the IT division. A similar study can for example be carried out at IDC (the server administration department).

6.3 Suggestions for BT IT Supply

The present situation at BT IT Supply is characterised by limited understanding of the cost structure, especially regarding the Service and Support function. This study has presented suggestions for how to approach this problem. The information and knowledge this model provides are suggested to be used in situations such as i.e. outsourcing considerations, purchase and pricing of deliverables. This was further discussed in 5.8.1 and 5.8.2.

The thesis has also approached some existing limitations with implications on the results. In the empirical section we discussed our initial purpose of measuring time consumption for both First-line line and Second-line. This purpose was however impossible to fulfil within Second-line due to the complexity of the technicians' operations. In order to address this complexity we suggest that BT IT Supply should utilize the possibilities in the support application Remedy to measure time consumption per supported errand. Since each errand is provided with a specific errand number a time measurement would allow a specific errand to be traced through the entire support process. This measurement would provide BT IT Supply with the possibility to upgrade our presented model by using time as a cost driver for the salary allocation in Second-line support.

The presented model is to be considered as a first step towards a division-wide implementation. The Service and Support Manager can with the use of our ABC model tell the price of the supported deliverables going through both levels of support. In addition to this the model is to be seen as a constituent in a larger ABC context. Based on this IT Supply can use this thesis as a component in the creation of a larger ABC model for the entire IT department.

At the present the four operator's tasks in the Service Desk are similar. If this situation however changes and the Service Desk were to be enlarged with more operators and towards a more individual specialization and variation in salary, further activity identification within the Service Desk may be of interest. This expansion of activity identification is also to be considered for Second-line if same expansion occurs. This illustrates and indicates the necessity to understand that an ABC model is never static and is never complete; it evolves over time endlessly as long as it is in use

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8.2 Electronic

http://www.bt-industries.com/en/ourcompany/btbusiness/history.htm (2006-11-20)

8.3 Verbal

Adolfsson, Tommy, *Technician*, 2006-12-06

Adolfsson, Tommy, *Technician*, 2006-12-15

Berg, Hans, *Manager Service Desk*, 2006-12-05

Bjernersjö, Morgan, *Controller IS Promotion*, 2006-12-06

Ask, Camilla, *Operator Service Desk*, 2006-12-05

Ask, Camilla, *Operator Service Desk*, 2006-12-14

Fagerstedt, Gisela, *Manager IT Supply*, 2006-12-07

Nåbo, Erik, *Manager IDC*, 2006-12-06

Ideskär, Ronny *Controller IT Supply* (Project Host), 2006-12-05

Ideskär, Ronny *Controller IT Supply* (Project Host), 2006-12-06

Ideskär, Ronny *Controller IT Supply* (Project Host), 2006-12-07

Appendix 1 – Questioner

Supporting of errands today (Monday)
Fill in current support of errands according to the categories in Remedy. Please observe that there is a selection between mail, telephone, surveillance and web. Every sub category is also represented in addition to the main categories. Tank You for Your time!

Example

Business Application

	CAD	CAD - Other	Easy Test	Easy production	Web Plattform
Phone					3 (Min)
Mail	4, 10 (Min)				
Web					
Surv					

Request

	Account
Phone	
Mail	
Web	
Surv	

Mailmarshal

	Mailmarshal
Phone	
Mail	
Web	
Surv	

Password reset

	Password
Phone	
Mail	
Web	
Surv	

Printer

	Local	Network
Phone		
Mail		
Web		
Surv		

Backup / Restore

	Data Base	File backup
Phone		
Mail		
Web		
Surv		

Network

	Active Direct	AT&T	Other	Firewall	Ipass	Wireless
Phone						
Mail						
Web						
Surv						

Hardware

	Desktop	Laptop	Other
Phone			
Mail			
Web			
Surv			

Software

	BT Workpalce	Citrix	Microsoft	Matrix
Phone				
Mail				
Web				
Surv				

Business Application

	CAD-Catia	CAD-Other	Easy Test	Easy Production	Web platform
Phone					
Mail					
Web					
Surv					

Appendix 2 - **Interview Questions**

1. Can you describe your position?
2. What constitutes the responsibilities for the Service Desk?
3. How many operators work in the Service Desk?
4. How is the Service Desk organized?
5. How many workstations are there?
6. What different type's communications entrance has the Service Desk?
7. How many products does the Service Desk support?
8. How many services does the Service Desk provide?
9. How many operators are answering the Phone, mail etc?
10. What is the cost for salaries?
11. What other costs are related to the Service Desk?
12. Do you at the present know what factors that are affecting the costs?
13. How is the process for errands that can't be handled by the Service Desk?
14. What type of technicians is there?
15. How many technicians is part the Support Group??
16. How do you recharge rate for errands that demand Support Group?
17. How do you recharge rate for your costs?
18. What Costs are related to the Service Group?
19. Does each errand receive a specific number?
20. How do you estimate how much time a specific errand consumes?
21. How is IT related service charged?
22. What cost is generally associated with this IT division?
23. What does Service and Support supply BT Europe whit?
24. Do you know what costs that are associated with service and support?
25. What cost is BT Europe charged by from IT supply?
26. Can you describe your normal working routines?
27. What activities are performed by the operators and the technicians?
28. How is the relationship between IT Supply and Europe?
29. What function shall the new organization include?
30. What where the main objectives for the reorganization?
31. What do you estimate are the reason for the difficulty of understanding the costs?
32. If you don't understand your cost structure today, how do you price you services and products?
33. How do IT Supply charge the other functions?
34. What effects do you believe that the acquisition from Toyota has had?
35. How many servers are included in Service and Support?
36. What divisions does BT IT Supply support?
37. Do you have statistics of the number of supported errands for the Service Desk and the Support Group?
38. What resources are required for the Service Desk and the Service Group?

Appendix 3 – Utilization of Remedy

Utilization of Remedy

Category	Percentage
BT Asset	25%
Service & Support	60%
BT FR IT	4%
Parts Claim	3%
LSC request	8%
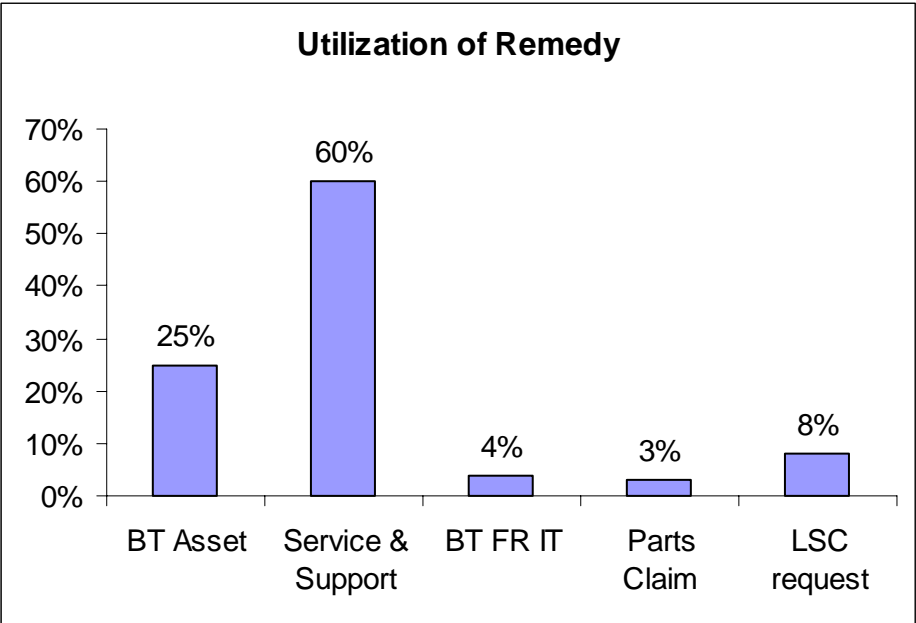
Appendix 4 – Selection of Deliverables

Constituents of

the Deliverables

Selected Deliverables

Constituents	Selected Deliverable
- Active direct - AT & T - Other - Firewall - RAS - IPASS - Switch - Wireless	**Network**
-Desktop -Laptop -Other -Thin client	**Hardware**
- Server	**Server**
- Account -Backup / Restore -Password Reset	**Request**
-BT Workplace -Microsoft -Matrix -Other -Easy Production -CAD -Easy Test	**Other Software**
-Citrix	**Citrix**
-Exchange	**Exchange**
-MailMarshal	**MailMarshal**
-Web platform	**Web platform**