THE RISK PERCEPTION OF IT
OUTSOURCING IN TURKEY

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Abstract

The competition in today's business is getting stronger each day. Due to its proven cost reduction potential the usage of Information Technology (IT) outsourcing and the flexibility it provided are among the attractive and effective features to both SMEs (Small Medium enterprises) and large enterprises. Most enterprises with different sizes decide to transfer some or all of their IT services to outsourcing vendors. Implementing IT outsourcing has some advantages such as decreasing time required to enter a market, increasing quality, enhancing customer satisfaction, and allowing an organization to focus on its core areas. However, the use of IT outsourcing comes with many risks which need to be carefully evaluated before any engagement. This thesis surveys the recent literature for the most important risk factors inherent to the IT outsourcing such as increase in expenses, increased dependence on outsourcing firm, confidentiality and communication problems, etc. Herein, we focus on identifying the IT outsourcing usage characteristics and understanding the perception of IT outsourcing risk factors by conducting a survey in both IT companies and IT departments of the companies in Turkey. The conducted data obtained by the survey is used to discover the variance among the management levels of IT personnel, in the perceived factors that may lead to IT outsourcing risks. We analyze the survey data and portrayed the current situation of risks of IT outsourcing perceived by IT practitioners in Turkey.

Keyword: Information Technology (IT), risk, risk factor, survey, outsourcing, Turkey.

TÜRKİYE'DE DIŞ KAYNAK

KULLANIMININ RİSK ALGISI

Özet

Günümüz iş dünyasındaki rekabetin her geçen gün daha çok artmaktadır. Bilgi Teknolojileri (BT) dış kaynak kullanımının maliyeti azaltabilmedeki kendisini ispatlamış potansiyeli ve bunun sağladığı esneklik hem KOBİ'ler (Küçük Orta işletmeler) için hem de büyük ölçekli işletmeler için cazip ve etkin özellikler arasındadır. Farklı büyüklüklerdeki pek çok şirket, BT servislerinin bir kısmını ya da hepsini dış kaynak satıcılarına transfer etmişlerdir. BT dış kaynak uygulamanın birçok avantajı vardır, bunlar: bir pazara girmek için gereken zamanı azaltma, kalitenin arttırılması, müşteri memnuniyetini arttırmak ve bir kuruluşun temel alanlarına odaklanmasına olanak sağlamasıdır. Ancak, BT dış kaynak kullanımı birçok riskleri ile birlikte gelir ki bunlar herhangi bir angajmana girmeden önce değerlendirilmesi gerekmektedir. Bu tez, BT dış kaynak kullanımının doğasında olan gider artışı, dış kaynak firmasına olan bağımlılığın artması, gizlilik ve iletişim sorunları vb gibi en önemli risk faktörlerini yakın zamandaki literatürde inceler. Burada, biz Türkiye'deki BT dış kaynak kullanım karakteristiklerinin belirlenmesine ve Türkiye'deki BT firmaları ve firmaların BT bölümlerinin risk faktörleri algılarını anlamaya odaklandık. Anketten elde edilen veriler, BT dış kaynak risklerine yol açabilicek faktörlerin algılanması ile BT personelinin yönetim kademeleri arasındaki varyansı keşfetmek için kullanıldı. Bu bağlamda, anket verilerini analiz ettik ve Türkiye'deki BT uygulayıcılarının BT dış kaynak kullanım risk algısındaki mevcut durumu tasvir ettik.

Anahtar Kelimeler: Bilişim teknolojileri, risk, risk faktörleri, anket, dış kaynak, Türkiye.

Acknowledgements

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List of Abbreviations

BT   Bilişim Teknolojisi

CRM   Customer Resource Management

ERP   Enterprise Resource Planning

IEEE   Institute of Electrical and Electronics Engineers

IS   Information Systems

ISP   Internet Service Provider

IT   Information Technology

KOBI   Küçük ve Orta Büyüklükteki İşletmeler

SLA   Service Level Agreement

SME   Small Medium Enterprises

Chapter 1

1.   Introduction

Nowadays, an aggressive competition forces enterprises to reduce their costs in order to survive in the market and to be more profitable, due to compelling effects of globalization, deregulation, and e-commerce etc. One of the most widely used cost reduction technique is the usage of "outsourcing" if "strategically viable".

In broad terms, outsourcing can be inferred as transferring internal business activities to an external provider [1]. Outsourcing provides various benefits to businesses. These potential benefits can be enumerated as reducing costs, increasing productivity, improving quality, enhancing customer satisfaction, decreasing time to a market and bringing the organization to focus core areas [2-11]. In this respect, outsourcing has become a widespread phenomenon [1].

As IT (Information Technology) has become the essential and the integral part of the enterprises, outsourcing has been using heavily to replace some or all IT functionalities of the companies. This transfer of the IT functionalities (which will also refer to as "IT services" in the subsequent sections of this thesis) forms the basis of "IT outsourcing". IT outsourcing can basically be inferred as the clients –usually being non-IT-entities- use vendors to keep track, manage, and maintain their IT services. Clients are the organizational entities that are willing to outsource their services whereas the vendors are the entities which these services are outsourced to.   In short, IT outsourcing is the transfer of part or all of the IT functions to an external vendor.

Since the inception of IT outsourcing, best practices, case studies, and researches have shown a rule of thumb that some or all of non-strategic IT services may be outsourced while the strategic IT services which are related to the core business can be retained in-house or in-sourced [12]. However, as the businesses perform their number of activities relying on the IT infrastructure, there are also outsourcing practices for the strategic application if in-house IT department of a company could not develop it by itself. Therefore, there may be cases where there exists a move to strategic IT applications outsourcing for an organization where its in-house IT department cannot develop strategic IT systems. In these

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cases, outsourcing for develop strategic IT systems may also be exploited [12].

Whether or not the attempt to transfer the strategic or non-strategic IT functionalities to an external vendor, IT outsourcing has penetrated to organizations' almost all functions as it offers wide range of advantages. With this respect, organizations have been using outsourcing for their IT services for a quite long time and moreover the needs of organizations with IT outsourcing still continues to increase. According a recent Gartner [3], Inc. report on IT outsourcing, it is forecasted that the worldwide IT outsourcing market will reach $288 billion in 2013, a 2.8 percent increase in U.S. dollars from 2012. Given that such a huge and expanding market, it is imperative to analyze not only the success factors to IT outsourcing activities but also risk factors associated to them.

 The history of IT outsourcing roughly dates back to 1989 when Eastman Kodak turned its entire data center, network and microcomputer operation into three IT external suppliers [7]. From that dates to present, IT outsourcing has been evolving at a great pace with various business strategies, service types, and organizational arrangements [7]. However, due to the fact that IT companies operate at a wide spectrum of activities and non-IT companies name a similar or identical IT activity with a different term, there is a lack of consensus in the "IT functionalities" related terminology. In order to avoid these misunderstandings and ambiguities, the organizations from the industry and academia attempt to broadly categorize the IT services (or sometimes called IT functionalities) as;

  1) Applications

  2) Operations

  3) Management/support services.

This broad categorization of IT services eventually influences the content and the scope of IT outsourcing terminology. With this respect, the types of IT outsourcing activities based on IT service categorization are given in [14]. One can identify three main groups of services for IT outsourcing. The first one is "application outsourcing" dealing with application development, implementation, operations, and maintenance. Secondly, mainframe & server outsourcing that comprises of desktop, network – data and network – voice. And finally, "management / support" outsourcing includes disaster recovery,

helpdesk, procurement, strategic planning, system integration and training.

Regardless of which IT services are outsourced, the outsourcing should bring the anticipated advantages or should evidently have targeted benefits to the enterprises. Cost reduction is the primary advantage of employing IT outsourcing. There are other benefits for IT outsourcing, these are focusing on strategic issues [2-7, 11], innovation [2, 4, 6, 8], ensuring increase flexibility [2, 4-8, 10] and improving quality of delivered IT services [2, 6, 9].

Despite the above mentioned benefits of IT outsourcing, there is a number of researches that focus on the risks of IT outsourcing and this topic is still one of the main interests of many researchers. These potential risks are: shirking [9, 12, 15, 16], increasing the total costs [2, 4, 15, 17-19], hidden costs [1, 2, 4, 10, 15, 17, 20, 21], switching costs [1, 4, 17], transition costs [1, 2, 4, 17-19], dependency problem [2, 19], poaching [1, 2, 4, 12, 16, 19, 21], poor communication skills [1, 4, 15, 21, 22], cultural problem [1, 4, 10, 15, 17, 21], technical and management skills [4, 10, 15, 20-22], unable to relate to the business needs [1, 4, 10, 12, 15, 18, 20], inability to adapt new technology [2, 12, 19-21], loss of internal skills [2, 4, 15, 18-20], loss of key IT employees [4, 15, 18, 19, 21, 22], staff problem [2, 12, 15, 17, 19, 20], transfer knowledge [1, 4, 15, 22], incomplete or improperly prepared contracts [2, 4, 10, 15, 17, 19, 22], managing external resources [4, 10, 12, 15, 17, 20, 21]. Risk factors mentioned above will be described in Chapter 2 in greater detail later.

1.1.   Objectives of the Study

IT outsourcing comes with its inherited risks which need to be carefully evaluated before any engagement. However, it is not always easy to evaluate the IT outsourcing risks as there are wide-ranging of IT services. Moreover, each of these IT services is performed in a different way in different sector and differently in different organization even within the same sector.

In this study, the main purpose is to portray the current usage characteristics of IT services outsourced and to reveal the perceptions of IT practitioners' about widely accepted IT outsourcing risks in a large representative sample in Turkey. Herein, the three fundamental research questions to be addressed are:

1) What are the IT outsourcing usage characteristics in the selected IT

Companies and in the IT departments of non-IT companies in Turkey? In other words, which IT services are outsourced mostly?

2) Is there any dissimilarity in the perceptions of IT outsourcing risk factors?

3) To what extent do the management levels of IT personnel account for the variance in the perceived factors that may lead to IT outsourcing risks? In other words, are there any differences how IT practitioners with different management levels perceive the IT outsourcing risks?

1.2. Organization of the thesis

This thesis is composed of five chapters. In chapter 2, the required research background is presented, followed by a description for the most widely accepted risk factors in the related literature. Then, the research approach is discussed in Chapter 3 where the research methodology is explained in detail. In Chapter 3, we also describe the data collection and the sampling process along with how we design the survey questions. Chapter 4 introduces the survey results which are to conceive IT outsourcing risk perceptions of our respondents. Chapter 5 concludes the thesis and makes a projection on potential future research topics.

Chapter 2

2.   Research Background

In this chapter, we opt to introduce the relevant terminology and to provide guiding definitions of the concepts required for the rest of this thesis. We first discuss the standard definition of the terms "risk" and "outsourcing" and then we give number of definitions for the term "IT outsourcing" in the related work. Finally, we describe shortly the key motivations for the usage of IT outsourcing and the possible risks when devising IT outsourcing.

2.1.   Definition of Risk and Outsourcing

Although the term "risk" is used very frequently in our daily lives, presentation of the formal definition would be useful. As far as context of the study is concerned, the standard definition of the term "risk" in [23] is "the chance that an investment will lose value". As this thesis is dealt with "outsourcing risk(s) and its perception", we refer risk as the probability of the loss of money or sometimes, the loss of other organizational assets as a consequence of implementation of an outsourcing activity. Similar to the term "risk", the term "outsourcing" has also become part of our daily language and similarly, it is often used heavily. "Outsourcing" is first coined as an abbreviation for the a sequence of words "outside resource using" as cited in [24] and it basically involves transferring any kind of internal business activities, assets or process for a predefined period of time to a third party organizations as an external provider. Obviously, it is not a new concept and its ancestors date back to the practice of traditional subcontracting which is based on a simple make/buy decision. However, the impact of outsourcing to contemporary Small Medium Enterprises (SME) or larger enterprises is serious than subcontracting as it constitutes a highly strategic management concept and thus it affects the continuity of the enterprises.

2.2.   Defining IT Outsourcing

Recently, a lot of researches have been carried out and many practices have been experienced on IT and IS outsourcing. Consequently, there exist several

promising and mature definitions of IT outsourcing. Table 2.1 summarizes these definitions with the corresponding references.

Table 2.1: Classification of IT Outsourcing Definitions

Definition / Reference
"The handover of an activity to an external supplier as an alternative to internal production." [25]
"To turn over part or all of an organization's IS functions to external service provider(s)" [26]
"A delegation of the authority to another party for the provision of services." [27]
"The use of external agents to perform an organizational activity." [28]
"The provision of services by a vendor firm to a client." [29]

From a holistic perspective, the definitions given in Table 2.1 have emphasis on some common concepts. As can be inferred from these common points, IT outsourcing is usually implemented through a single or a set of IT services. As mentioned earlier, these typical IT services can be categorized [14] as "applications", "operations", and "management and support". Throughout all discussions in this thesis, by the term "IT Outsourcing" we mean the transfer of a single or all of these IT services to a vendor.

After giving the definition of the term "IT outsourcing", it is important to highlight some key issues (i.e., misconceptions or flaws) with regard to IT outsourcing. The first one is, although IT outsourcing is usually preferred by IT entities, it can be an option for non-IT entities as well. There is a common misunderstanding is that IT outsourcing can only be implemented by IT companies. Indeed, a non-IT company may benefit from IT outsourcing more than a typical IT firm. Another key issue regarding IT outsourcing (is also common to any "outsourcing" activities) is that a customer should avoid transferring "strategic IT services" to a vendor.

2.3. Motivation of IT outsourcing

While numerous advantages of devising IT outsourcing have been cited in the related literature, "cost-effectiveness" and "lack of in-house expertise" are the two most widely accepted motivations behind the usage of IT outsourcing. "Enhancement of the quality" and "access up-to-date technologies" are another two motivating drivers for the usage of IT outsourcing.

IT outsourcing can be a cost effective method when there is a need for highly qualified staff and the cost of employment of these skilled staff is high. In this scenario, these staff can be hired by the vendor companies and thus the total cost of staff may be relatively cheaper than employing the staff [2, 19] within the client organization.

Enterprises especially SME usually have limited resources. Allocation of these limited resources is vital for the sustainability and profitability of the organizations. In this respect, enterprises regardless of their sizes should concentrate on their core competencies and allocate the necessary resources for the promising projects. "Focusing on core competency" is another motivation factor in which the enterprises can give more attention to their core business when IT services are outsourced to the third party vendors [2-7, 11, 19].

Quality is obviously one the most important assets of an organization in order to gain market share, to have more profitable, and to position itself uniquely within its market. Herein, what we mean by the term "quality" is the quality of product as well as the quality of the services. Organizations may therefore be motivated to use IT outsourcing to improve the quality of their IT services. IT outsourcing usually has positive impact on the effectiveness of projects by achieving better IT services. Consequently, outsourcing can improve the quality of delivered IT services [2, 6, 9, 19].

Due to today's extremely fast developing technologies, some organizations cannot allocate the required resource keep up with this pace of the technological progress. These resource- scarce organizations may benefit from IT outsourcing to close the gap between their current level and required up-to-date technologies. As mentioned in [2, 4, 6, 8, 19], the adoption of IT outsourcing also brings businesses to access to up-to date technologies. This factor is also known as "facilitating access to technology".

2.4.   Risk of IT outsourcing

Although there are a number of successfully implemented IT outsourcing projects, there still exists considerable amount of IT outsourcing failures which cannot be ignored. Due to the serious complications of these failed projects, organizations usually lose significant amount of their revenue and more importantly lose their reputation. And this destructive effect continues to be an important issue and that is why IT outsourcing risk factors are among the topics which are studied extensively. This section mainly focuses on the identification and categorization of IT outsourcing risk factors.

IT outsourcing risk factors are addressed by many researchers [2-11, 18, 20, 22] as surveyed in this thesis. We go through the studies which are most influential in the literature. And, we decide to focus on risk factors that are quite common, well-known, and applicable in the global-scale. 18 risk factors are surveyed and summarized in Table 2.2 with their corresponding references and their descriptions. These risk factors are of paramount importance since these factors form the basis of the questions of our survey. As will be explained in Chapter 3, these well-known risk factors (which we will refer to each as the "subclass") are consolidated (which we will call each group as the "main class") them based on the keyword analysis and on expert judgment, and then each main class is mapped to a single question in the survey.

Table 2.2 Risk Factors of IT Outsourcing (Subclasses)

Risk Factors of IT Outsourcing	Description	Risk Factors of IT Outsourcing	Description
Shirking [9, 12, 15, 16]	Shirking, which is evasion of work duty. It refers to a vendors' ability to demand higher than market prices.	Technical and management skills [4, 10, 15, 20-22]	Vendors' technical and management skills and capability may be less than expected and required.
Increasing the total costs [2, 4, 15, 17-19]	All the services have been agreed in the contract but sometimes additional fees are invoiced.	Unable to relate to the business needs [1, 4, 10, 12, 15, 18, 20]	Vendors prove unable to relate to the business needs, so this can be a reason of wrong project results.
Hidden costs [1, 2, 4, 10, 15, 17, 20, 21]	Maintenance, training and upgrades are considered as the hidden cost.	Inability to adapt [2, 12, 19-21]	Some of the vendors may not adapt fast enough to the new technologies.
Switching costs [1, 4, 17]	Due to the fast changing nature of the rquirements, the organizations may need to switch to another product.	Loss of internal skills [2, 4, 15, 18-20]	Loss of internal may be the case in a client in-house employee- loses their hands-on experience.
Transition costs [1, 2, 4, 17-19]	When the vendors contract expire, the clients decide to perform its IT activities outsourced or internally.	Loss off key IT employees [4, 14, 15, 18, 19, 21, 22]	The loss of key IT employees occur while firms start to outsource their services to vendors.
Dependency [2, 19]	Clients may feel a dependence when they feel like they start to lose their knowledge.	Staff problem [2, 12, 15, 17, 19, 20]	Outsourcing generates staff problems, as employees face an uncertain situation which provokes low morale, demotivation.
Poaching [1, 2, 4, 12, 16, 19, 21]	Vendors may sell clients' internal software product to other clients.	Transfer knowledge [1, 4, 15, 22]	Transfer knowledge problem between internal employees and vendors' staff occurs some missing informations.
Poor communication skills [1, 4, 15, 21, 22]	Language may be a barrier between the staffs of vendor and client if they have poor communication skills.	Inflexible contracts [2, 4, 10, 15, 17, 19, 22]	Inflexible contracts occurs after unwell-contract between vendors and clients.
Cultural Problem [1, 4, 10, 15, 17, 21]	Different geographical location, history may the reasons for cultural problem.	Managing external resources [4, 10, 12, 15, 17]	It is the difficulty for the client to cope with external resources such as difficulty during the .

Chapter 3

3. Research Approach

3.1. Research Methodology

In the previous chapter, the preliminary research background is introduced, and especially there is a special emphasis on IT outsourcing risk factors. 18 risk factors are discovered as a result of a comprehensive literature survey and these factors were listed in Table 2.2 with their compact description. To reveal these, an extensive literature search is conducted for the risk factors of IT outsourcing in the most recently papers published in journals, books, and the conference proceeding papers. The search procedure in the literature is based on following search phrases: "IT outsourcing", "IT outsourcing perception" and "IT outsourcing risks". We use the below mentioned electronic databases:

- Google Scholar,
- IEEE Electronic Library,
- Science Direct,
- Emerald

While some of the researches focusing on IT outsourcing risks use "conceptual examination", some others attempt to the matter "empirically". In this study, we pursue the use of a descriptive research method due to three features of this methodology. Firstly, a descriptive research enables researchers to describe the characteristics of a certain group. In our case, we aim to put forward the IT outsourcing usage characteristics of Turkish IT sector through the selected sample. That is, we present the IT services which are outsourced more frequently than the others. Secondly, a descriptive research can typically be used to determine the proportion of people who behave in a certain way. In our case, the goal is to discover dissimilarities in the perceptions of IT outsourcing risk factors. We would like to examine which proportion of our respondents answer in a certain way and how they respond the questions. Last but not the last, it is very common to use a descriptive research to examine differences between groups or other relationships between variables. In our case, we would like to put forward the variance among the management levels and IT perception

risk factors. More specifically, we try to answer the following research question: To what extent do the management levels of IT personnel account for the variance in the perceived factors that may lead to IT outsourcing risks?

In order fulfill the aforementioned objectives of a descriptive study; we use an electronic survey to be answered by our sample selected from the population of interest. This study would have done this survey with the entire population –all IT personnel in Turkey– to make the findings be reliably generalizable. However, as it is an expensive and inconvenient procedure, we select a sample of IT staff that more or less have an experience or at least an idea about IT outsourcing. In the rest of this section, we describe how the data is collected, mention about the type of scale used, and explain the sampling process pursued.

3.1.1. Data Collection

We devise the "electronic questionnaires" method during the data collection. Electronic questionnaires are known to be easily administrated, globally accessible, inexpensive, and promptly delivered. Moreover, electronic questionnaires enable their respondents to answer the questions at their convenience. However, one must be careful about using an electronic questionnaire since it requires computer literacy and that respondents must have access to the facility. Since all of our respondents are IT personnel and computer literate and they all have easy access to the facility. Yet another issue regarding to electronic questionnaires is that respondents shouldn't be demotivated to complete the survey. Thus we got in touch with our respondents (or their representatives) to describe the underlying objective of the study. Finally, it is also worth mentioning that our respondents are either from IT companies or from IT departments from non-IT companies.

3.1.2. Type of Scale

In our survey Table 2.1, we exploited a 5-level (with the following anchors: 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Disagree) Likert scale. The Likert scale is one of the most widely used approach to scale responses in survey research and it is a scale designed to examine how strongly respondents agree with a statement (such as "I believe that the use of IT outsourcing may increase the expenses") on a five-point scale.

If all pairs of adjacent levels in a Likert scale are equidistant, then the scale is considered as an interval scale. However, in this study, Likert scale is treated as ordinal scale or nominal since we cannot assume that all pairs of adjacent levels are equidistant. Thus, our survey data is of type categorical.

3.1.3. Sampling Process

Herein, we employ two sampling processes namely, convenience and judgment sampling. The former is used since the most easily accessible IT personnel are chosen as respondents. The main advantage of convenience sampling is that it is fast and less expensive that other methods. However, the main problem about the convenience sampling is it is hard to be generalizable thus we had large number of samples with different IT Companies with different management levels.

The latter sampling technique used is the judgment sampling in which the respondents on the basis of their expertise in the subject are investigated. As we investigate the relationship between the management levels of IT personnel and the perceived factors that may lead to IT outsourcing risks, we found that the judgment sampling is the only meaningful way to investigate. As with the convenience sampling, the judgment sampling is also hard to be represent the entire population. However, our intention is just to comprehend the characteristics of IT personnel in Turkish IT sector using outsourcing and think systematically about the probable risk factors related to IT outsourcing.

Primary data was obtained by conducting from the above mentioned electronic survey which has been filled by 341 participators. Our research needed a case where

> (a) The client organization was outsourcing or already outsourced its IT services from a vendor. Thus, the sample was selected from prominent Telecom companies, Internet service providers (ISPs), insurance companies, and foremost banks which are located in Turkey. Furthermore, these organizations are either currently outsourcing or already outsourced at least one of their IT services in Turkey. Thus it is assumed that all of our respondents are more or less having an experience or even an idea about IT outsourcing. More importantly, the participators voting the questionnaires work at any management level

from the key managerial positions to the operational level IT experts. Even though the amounts of experience of the participants on the subject matter are different, all respondents took at least a role in an outsourcing project.

(b) The client organization had the sufficient experience with outsourcing to the extent that its benefits, costs and risks were experienced or made evident. That is main reason why we devised judgment sampling.

(c) The client organization could provide access to managers that could talk through their experiences with IT outsourcing. Moreover, those managers were willing and able to share their insights on IT outsourcing.

(e) Our survey was conducted between 3/1/2013 and 28/2/2013 as this thesis study needs to satisfy certain milestones.

3.2. Designing the Survey Questions

The main objective of this study is to describe the key risk factors in the course of IT outsourcing between clients (both IT companies and non-IT companies) and vendors. The respondents of the survey were selected among the organizations that have one or more IT outsourcing projects that already realized or currently being undergoing with more than one vendor.

In chapter 2, we already mentioned about the possible risk factors resulting in failures in the IT outsourcing projects appeared in the related literature. We listed these factors along with their descriptions in Table 2.2. As can be seen from Table 2.2, some authors use different terminology for the same concept and moreover some of these risk factors seem to be highly correlated understood even if a simple keyword analysis is performed. We noticed that there are overlapping risks due to the different naming. We also realized that these 18 risk factors may first appear to be independent at first look however, in reality they may be correlated or be dependent to one another. Regardless of whether these are overlapped and dependent or not, we call all risk factors in Table 2.2 as subclasses then we tried to group the correlated and overlapped factors and decide to call them as "main classes" as shown in Table 3.1. During this grouping process, we use a combination of expert judgment method (based on

consultation with one or more experts that have experience with similar domain) and keyword analysis method to improve the reliability of the risk factors. As seen from Table 3.1, 18 possible risk factors (right coloumn) are grouped and merged to 10 possible risk factors (left column).

Table 3.1 Risk of IT Outsourcing – Main Classes

Number	Risk of IT Outsourcing – Main Classes	Risk of IT Outsourcing – Sub-Classes
1	Increase in expenses was observed	*Shirking* *Increasing the total costs* *Hidden costs* *Switching costs* *Transition costs*
2	Increased dependence on outsourcing firm	*Dependency*
3	Confidentiality problem	*Poaching*
4	Communication problem	*Poor communication skills* *Cultural*
5	Lack of required level of know-how of outsourcing firms	*Technical and management skills* *Unable to relate to the business needs* *Inability to adapt*
6	Loss of internal skill	*Loss of internal skills* *Loss off key IT employees*
7	Lack of Motivation Problem	*Staff Problems*
8	Lack of knowledge transfer	*Transfer knowledge*
9	Incomplete contract with vendor	*Inflexible contracts*
10	Challenge to manage vendor	*To manage external resources*

For the sake of completeness, we explain briefly each main class of risk factors as below;

Increase in expenses: Although the main purpose of the use of IT outsourcing is to reduce costs, in some cases however, it may incur unexpected costs. For example, vendor firm may not provide the agreed IT services or they may be behind the schedule even if there is a well-written and a realistic contract between the parties.

Increased dependence on outsourcing firm: The clients typically require tools or applications which they replace their legacy systems or integrate to their existing IS. These outsourced tools or applications can be a mission-critical or be a strategically important IT services for the clients such as, Enterprise Resource Planning (ERP) or Customer Resource Management (CRM) system. If clients give up working with those vendors or similarly give up using those tools or applications, they would not be able to continue their business as before. This may result in a lack-in problem.

Confidentiality problem: Vendors may share some confidential information of the clients with their competitors which may create a trust problem.

Communication problem: As a result of globalization and in particular to IT domain a vendor may usually be a non-local organization. As such, there may be cultural problems between a vendor and its client.

Lack of business needs: Mostly, vendors are proficient and experienced in a particular set of IT services. If a client outsources a certain IT service which the vendor is not proficient with then that vendor may not give the required level of service as good as its proficient domain. As such, it is likely that a vendor not support in all business domains and client may not receive the same quality service for all IT services.

Loss of internal skill: When a firm outsources its IT services, it is likely that internal employees will sooner or later lose their skill.

Lack of motivation; During an IT outsourcing project, client staff may be worried about losing their jobs and thus they may lose their motivation and loyalty.

Lack of knowledge transfer: Since know-how is one of the most important assets of an IT company or more specifically of an IT department, vendor may be reluctant to transfer the know-how they possess to client.

Incomplete contract with outsourcing firms: as a consequence of incomplete and improperly prepared contracts, the outsourcing activities may be invisible and both vendors and clients may not follow the projects milestones or vendors may not deliver the deliverables.

Challenge to manage external resources: The vendor and the client organizations are completely two different entities. And during the course of the IT outsourcing project, high degree of interactions certainly need be installed. However, establishing such interactions is very hard. For example, an IT staff working for either a vendor or a client organization may not be willing to report someone who is not working in her/his own organization.

3.3. IT Outsourcing Risk Factors and Question Mapping

Almost all of the descriptive studies include some form of a survey. Up to this point in this section, we have described10 main classes of risk factors each of which is mapped to a survey question asking the respondent's perception on that specific risk factor. We use a predesigned questionnaire to record targeted data by 12 questions. The survey questions are shown in Table 3.2. These questions allowed the operationalization of the response variable and the determinants of vendors. The concept indicators extracted by the respective sets of items have been verified and prepared for further data processing and analysis of results.

First question is used to capture the IT services that had already been outsourced or is still being outsourced by the participators' organizations. . With this question, we aim to portrait which IT services are outsourced more frequently than the other services.

Second question is basically exploited to identify the position of the participator within her/his organization. The position of the respondent may vary from "Senior Executive" to "End User". It is necessary once again that all of the respondents are familiar with IT outsourcing activities.

The rest of the questions from 3 to 12 are used to capture to understand participators' perceptions on the IT outsourcing risk factors. The survey questions were designed based on the main classes of risk factors. As mentioned earlier, each main class item (10 items) is mapped to a single question in the survey.

The operationalization of the concept indicators in the survey from question 3 to question 12 was performed through a multiple choose questions method which contains strongly disagree, disagree, somewhat agree/disagree, agree and strongly agree answers.

We end this section with the questions (See Table 3.2) used in our survey.

Table 3.2 Survey Questions

Q1-   Which IT outsourcing services do you use in your firms?
- Application - Development
- Application - Support and Maintenance
- Operation - Server
- Operation - Data networks (LAN/WAN)
- Operation - Voice networks
- Operation - Desktop
- Management and Support - Disaster recovery
- Management and Support - Helpdesk
- Management and Support - Procurement
- Management and Support - Strategic planning
- Management and Support- System integration
- Management and Support -Training

Q2-   What is your position in your firm?
- Senior Executive
- Unit Head
- Team Head
- Project Management
- IT Expert
- End User

Q3-   When outsourcing services are used in field of IT services or projects are your expenses increased?
- Strongly Disagree
- Disagree
- Some What Agree/Disagree
- Agree
- Strongly Agree

Q4-   When outsourcing services are used in field of IT services or projects are your dependence increased to provider firms?
- Strongly Disagree
- Disagree
- Some What Agree/Disagree
- Agree
- Strongly Agree

Q5- **When outsourcing services are used in field of IT services or projects, do you think that the risk of sharing confidential information?**

- Strongly Disagree
- Disagree
- Some What Agree/Disagree
- Agree
- Strongly Agree

Q6- **When outsourcing services are used in field of IT services or projects, do you think that there was lack of communication with the employees of the firm to outsource?**

- Strongly Disagree
- Disagree
- Some What Agree/Disagree
- Agree
- Strongly Agree

Q7- **When outsourcing services are used in field of IT services or projects, did vendor fully understand your business needs?**

- Strongly Disagree
- Disagree
- Some What Agree/Disagree
- Agree
- Strongly Agree

Q8- **When outsourcing services are used in field of IT services or projects, do you think that your employees lose their expertise.**

- Strongly Disagree
- Disagree
- Some What Agree/Disagree
- Agree
- Strongly Agree

Q9- **When outsourcing services are used in field of IT services or projects, do you think that your employees have lack of motivation?**

- Strongly Disagree
- Disagree
- Some What Agree/Disagree
- Agree
- Strongly Agree

Q10- **When outsourcing services are used in field of IT services or projects, do you think that is there a lack of knowledge transfer problem?**

- Strongly Disagree
- Disagree
- Some What Agree/Disagree
- Agree
- Strongly Agree

Q11-   When outsourcing services are used in field of IT services or projects, do you have an incomplete contract with the outsourcing firm?

- Strongly Disagree
- Disagree
- Some What Agree/Disagree
- Agree
- Strongly Agree

Q12-   When outsourcing services are used in field of IT services or projects, do you have a problem which is managing external resources?

- Strongly Disagree
- Disagree
- Some What Agree/Disagree
- Agree
- Strongly Agree

Chapter 4

4.   Results of the Survey

In this chapter, the results of our survey are introduced. The survey is used to address our three research questions. We firstly aim to portray the current situation of IT services that are being or were already outsourced in Turkey. Secondly, we try to highlight the risk factors of IT outsourcing perceived by Turkish IT practitioners. Lastly, we figure out to what extent the management levels of IT personnel affect the variance in the perceived factors that may lead to IT outsourcing risks. The answers to the first and second research question of the study do not require any statistical testing for hypothesis and its validation as basic frequency analysis is sufficient. On the other hand, for our third research question, we use Chi-square testing to validate the discrepancy.

4.1.   Data Analysis

During the discovery of the impact of management levels of IT personnel on the discrepancy in the perceived IT outsourcing risk factors, Chi-Square test is performed on our categorical data. We opt to determine whether there is a statistically significant difference between the answers of different management levels. Before applying the Chi-square test, the data set must meet certain requirements of the Chi-Square test. These requirements are tested for each data set, which are defined as follows:

- All data must be categorized as in some category or another,
- Expected cell counts should not be low (definitely not less than 1 and preferable not less than 5) in order to prevent a wrong analyze.

After we verify that our data set has satisfied the above mentioned requirements, we follow the below mentioned 4-step procedure given in [30] to apply Chi-square test.

Hypothesis-Testing Procedure

Step1. State the null hypothesis and the alternate hypothesis. The null hypothesis, H_0, is that there is no difference between the set of observed

frequencies and the set of expected frequencies; that is, any difference between the two set of expected frequencies can be attributed to sampling (change).The alternate hypothesis, H_1, is that there is a difference between the observed and expected sets of frequencies.

Step2. Select the level of significance. We selected the, 0.05 level, the probability is 0,05 that a true null hypothesis will be rejected.

Step3. Select the test statistic. The test statistic follows the chi-square distribution, designated as X^2:

$$X^2 = \sum \frac{(f_e - f_o)^2}{f_e} \text{ Equation 1}$$

Df = [(number of rows-1)*(number of colomns-1)]

- With k-1 degrees of freedom, where:
- Df is degree of freedom : (r-1)*(c-1)
- k is the number of categories.
- f_o is an observed frequency in a particular category.
- f_e is an expected frequency in a particular category.

Step4. Formulate the decision rule. Recall the decision rule in hypothesis testing requires finding a number that separates the region where we do not reject H_0 from the region of rejection. This number is called the critical value [30].

4.2. Remarks and Comments on the Data Collected from the Survey

Before discussing the remarks and giving the comments, we should recall that the picture of "the current situation of outsourced IT services in Turkey" is drawn from the answers to question 1. Question 2 is solely used to reveal the management level of the respondent. Furthermore, "the impact of management levels of IT personnel on the discrepancy in the perceived IT outsourcing risk factors" is derived from the answers to questions 3 through 12.

4.2.1. Portrait of IT services Outsourced in Turkey – Derived from Question 1

IT services considered in this thesis like in many other related works [14] can broadly be classified into 3 broad categories as "applications", "operations", and

"management and support". These IT services categories can further be divided into more services given in Table 4.1.

Table 4.1 Main IT Services Categories and Subcategories

	A) Applications	B) Operations	C) Management & support
Subcategories	1) Development	3) Mainframe & servers	7) Disaster recovery
	2) Support & maintenance	4) Data networks (LAN&WAN)	8) Help desk
		5) Desktop	9) Procurement
		6) Voice networks	10) Strategic planning
			11) System integration
			12) Training

Table 4.2 Observed frequencies of main IT Services categories outsourced

	Number of votes	Percentage of the votes
Applications	555	%24,91
Operations	723	%32,45
Management & support	950	%42,64
Total	2228	%100

While Table 4.2 gives the observed frequency of main observed IT services categories, Table 4.3 elaborates these categories by further dividing them into the subcategories.

As shown in Table 4.2, "Operations IT Services" receives %32,45 of the votes as the second widely used IT services after "Management & Support IT Services" with %42,64. "Applications IT Services" takes %24,91 of the total votes and has the third rank. As the number of respondents is 341 and the number of options (IT services categories and subcategories outsourced) voted by these respondents is 2228, the average number of options voted per

respondent is roughly 6,5 out of 12. This average value indicates that the majority of the respondents voted for more than one IT services which in turn reflects that the majority of organizations in our sample adapt more than one IT service outsourced. Sometimes, it may be misleading to investigate survey results when there is an aggregated picture of observed frequencies as shown in Table 4.2 and one may need to look at a more detailed picture of IT services and may need to see the frequency of sub-category individually as presented Table 4.3.

Table 4.3 Observed frequencies of subcategories of IT Services outsourced

IT Services	IT Services Subcategories	Number of votes	% of the votes	% of the votes within each IT service
Applications	Development	275	%12,34	%49,55
	Support & Maintenance	280	%12,57	%50,45
Operations	Mainframe & servers	241	%10,82	%33,33
	Data networks (LAN&WAN)	174	%7,81	%24,07
	Voice networks	148	%6,64	%20,47
	Desktop	160	%7,18	%22,13
Management & support	Disaster recovery	62	%2,78	%6,52
	Help Desk	226	%10,14	%23,78
	Procurement	61	%2,74	%6,42
	Strategic Planning	126	%5,66	%13,26
	System Integration	227	%10,19	%23,89
	Training	248	%11,13	%26,10

Based on the answers of our IT practitioners to identify the most frequently outsourced subcategory of IT services is the "Applications/ Support & Maintenance" which captured almost %12,57 of the total number of IT services within our sample. In the second rank, we see "Applications/ Development" subcategory that took the %12,34 of the all votes. And approximately %11,13 of the respondents says that they either are currently being outsourcing or they already outsourced their "Management & support/ Training".

If we need to compare IT services subcategories within its own category, we can again refer to Table 4.3. Within the "Application" category "Development" and "Support and Maintenance" subcategories got almost the same percent of the votes and thus these subcategories are equally likely to appear in our sample. The votes for "Support IT services" which is subdivided into "Mainframe & servers", "Data networks (LAN&WAN)", "Voice networks", and "Desktop" subcategories took %10,82, %7,81, %6,64, and %7,18 of the total votes respectively. Within the "Management & support" category Training, System Integration, and Help Desk subcategories got the close votes with %26,10, %23,89, and %23,78 respectively. Since we observe no significant differences among these subcategories, it is not correct to make a further comment on the observed frequencies.

4.2.2. Number and level in the hierarchy of participators – Derived from Question 2

Number and level in the hierarchy of participators

☐ Senior Executive   ☐ Division / Unit Head   ☐ Team Head
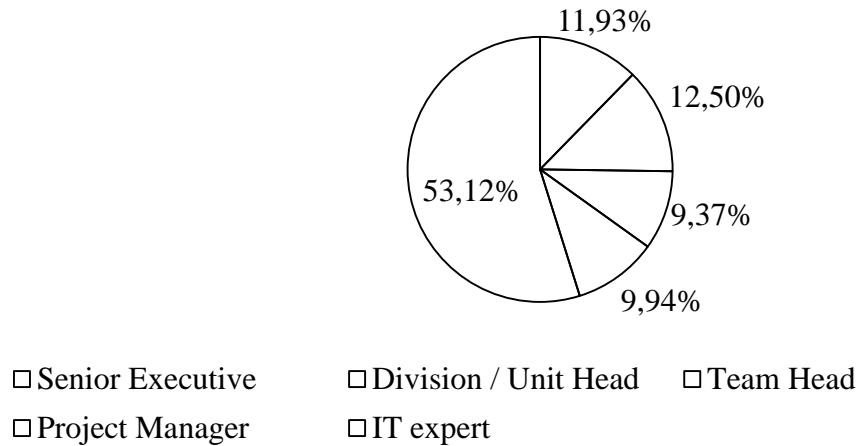☐ Project Manager   ☐ IT expert

Figure 4.1 Number and level in the hierarchy of the participators

As aforementioned in Chapter 3, there were 341 participants conducted our survey between 3/1/2013 and 28/2/2013 various business backgrounds. In question 2, 341 participants were asked to fill this question based on their job titles and roles in the organization. Based on the answers to question 2, 11,93% of IT departments are Senior Executive, 12,5% are Division /Unit Head, 9,37% are Team Head, 9,94% Project Manager and whereas 53,12% are IT expert as seen in Figure 4.1 attended to the survey.

From the questions 3 to 12, we used Chi-square testing to validate the discrepancy. The main reason for asking these questions is to examine differences between groups. Herein, we have two groups. The first group is "Management Level" and the second group is "IT Specialist Level". Our objective is to show whether there is statistically significant discrepancy in the IT risk perceptions. Rest of this chapter mainly questions this variance if any.

4.2.3. Increase in Expenses was observed – Derived from Question 3

As part of the survey, the participators were asked to rate from 1 to 5 (1 - being "Strongly disagree" and 5 - being "strongly agree") to what they believed the factor mentioned in Question 3 (See Table 3.2) may be one of the IT outsourcing risks. The main aim of asking question 3 is to figure out to what

extent the management levels (There are two levels which are "Management Level" and "IT Specialist Level") affect the variance in the perceived factor ("Increase in Expenses") that may lead to IT outsourcing risk.

4.2.3.1. Test of Hypothesis – Question 3

The following null and alternate hypotheses are in introduced:

H_0: There is no relationship between IT department management levels and the perception that "Increased expenses may be one of the IT outsourcing risk factors".

H_1: There is a relationship between IT department management levels and the perception that "Increased expenses may be one of the IT outsourcing risk factors".

Test Result

Chi-square test was conducted to test if there is a variance in the perceived factor (Increase in expenses was observed) that may lead to an IT outsourcing risk and the management levels of the IT department. The value for the Chi-square is 115,41 and the corresponding critical value is 9,488. Thus, H_0 is rejected on 0,05 significance level. We also double checked the H_0 rejection with the p=0,000 < 0,05 condition.

Table 2.1: Classification of IT Outsourcing DefinitionsTable 2.1 Observed Frequencies of the Answers to the Question 3

	Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree
Management Level	13 (8%)	13 (8%)	25 (16%)	21 (14%)	82 (53%)
IT Specialist Level	14 (7%)	108 (58%)	24 (13%)	24 (13%)	17 (9%)

Comment

As H_0 is rejected by the Chi-Square hypothesis test, the discrepancies among the answers of the participants with different levels indicate that the chances that the

variances between the observed and the expected frequencies may stem from sampling errors are very small. We believe that "the increase in the expense" is a factor that is more relevant to managerial level staff, rather than operation level specialists. This is mainly because the managers are the primary IT personnel responsible for preparing the firms' IT budget and for controlling the IT expenses. Thus, we conceive that the answers of IT managers on this risk factor are more reliable than the answers of IT specialists, as IT managers are more experienced than IT specialists.

Survey Result
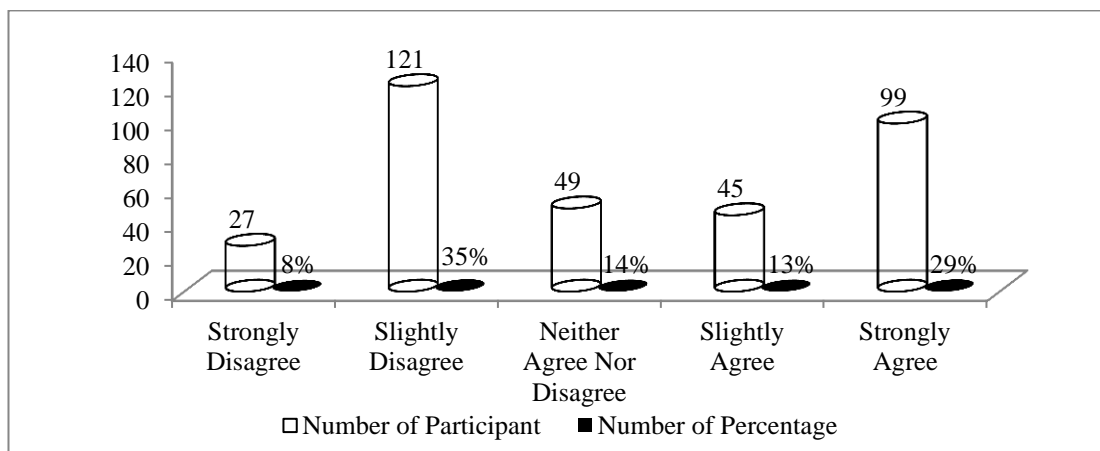
Figure 4.2 Perception in "Increase in expenses" (All levels)

Responses of our participants are summarized in Figure 4.2. As seen from Figure 4.2, 8% of the participators strongly disagree, 37% of the participators slightly disagree, 4% of the participators are neutral, 13% of the participators slightly agree, and 29% of the participators strongly agree with question 3. We cluster "strongly disagree" and "slightly disagree" answers as the negative response toward the question and similarly we consider "strongly agree" and "slightly agree" answers as the positive response toward the question. Moreover, we disregard "neither agree nor disagree" answers.

By looking at overall picture, over 42% of the participators stated that they felt positive, nearly over 14% of the participators stated that they felt neutral, and over 43% of the participators stated that they felt negative toward question 3. Thus, it is not meaningful to make any comment by looking at our sample's

answers that they are quite sure about the factor question 3 attempting to discover may one of the factors stemming to an IT outsourcing risk.

Moreover, 67% of the "Management Level" respondents says that they perceive this factor as an IT outsourcing risk. Similarly, 22% of the "IT Specialist Level" respondents state that they perceive this factor as an IT outsourcing risk.

4.2.4.   Increased dependence on the vendor – Derived from Question 4

Once again, the participators were asked to rate from 1 to 5 (1 - being "Strongly disagree" and 5 - being "strongly agree") to what they believed the factor mentioned in Question 4 (See Table 3.2) may be one of the IT outsourcing risks. The main aim of asking this question is to figure out to what extent the management levels (There are two levels which are "Management Level" and "IT Specialist Level") affect the variance in the perceived factor ("Increased dependence on the vendor") that may lead to IT outsourcing risk.

4.2.4.1.   Test of Hypothesis – Question 4

The following null and alternate hypotheses are in introduced:

H_0: There is no relationship between IT department management levels and the perception that "Increased dependency on the vendor may be one of the IT outsourcing risk factors".

H_1: There is a relationship between IT department management levels and the perception that "Increased dependency on the vendor may be one of the IT outsourcing risk factors".

Test Result

Chi-square test was conducted to test if there is a variance in the perceived factor (Increase dependencies on vendors) that may lead to IT outsourcing risks and the management levels of the IT department. The value for the Chi-square test is 117,04 and the corresponding critical value is 9,488. Thus, H_0 is rejected on 0,05 significance level. We also double checked the H_0 rejection with the p=0,000 < 0,05 condition.

Table 4.4 Observed Frequencies of the Answers to the Question 4

	Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree
Management Level	2 (1%)	6 (4%)	74 (48%)	42 (27%)	30 (19%)
IT Specialist Level	2 (1%)	6 (3%)	12 (6%)	27 (14%)	140 (75%)

Comment

As H_0 is rejected by the Chi-Square hypothesis test, the discrepancies among the answers of the participants with different levels indicate that the chances that the variances between the observed and the expected frequencies may stem from sampling errors are very small. We believe that "the increased dependence on the vendor" is a factor that is more relevant to IT Specialist Level, rather than Management Level staff. This is mainly because the specialists usually work very close to and sometimes collaboratively with vendors' employers. Thus, specialists are more likely to judge better whether s/he is locked in vendors' capability and thus s/he observe the dependence on the vendor's IT personnel more clearly when the vendor leaves the client at the end of the project. Therefore, we think that the answers of IT Specialist Level on this risk factor are more trustworthy than that of management level staff.
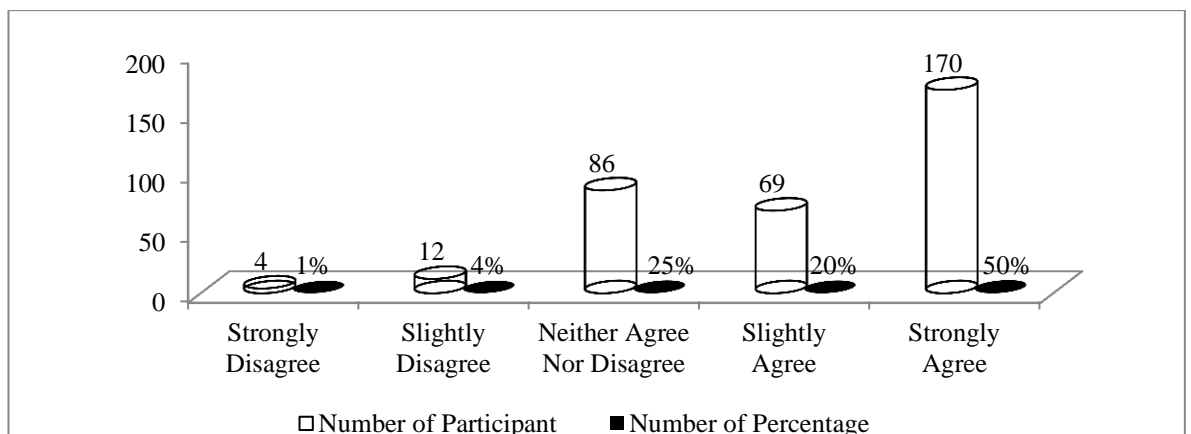
Survey Result

Figure 4.3 Perception in "Increase dependencies" (All levels)

Figure 4.3 shows that 70% participators agree on the possible impact on this risk factor. Thus, according to the IT practitioners' answers, organizations in Turkey may suffer from the dependency on vendors whenever an IT outsourcing project is considered.

Moreover, 46% of the "Management Level" respondents say that they perceive this factor as an IT outsourcing risk. Similarly, 89% of the "IT Specialist Level" respondents state that they perceive this factor as an IT outsourcing risk.

4.2.5. Risk of sharing confidential information – Derived from Question 5

Once again, the participators were asked to rate from 1 to 5 (1 - being "Strongly disagree" and 5 - being "strongly agree") to what they believed the factor mentioned in Question 5 (See Table 3.2) may be one of the IT outsourcing risks. The main aim of asking this question is to figure out to what extent the management levels (There are two levels which are "Management Level" and "IT Specialist Level") affect the variance in the perceived factor ("Risk of sharing confidential information") that may lead to IT outsourcing risk.

4.2.5.1. Test of Hypothesis – Question 5

The following null and alternate hypotheses are in introduced:

H_0: There is no relationship between IT department management levels and the perception that "Sharing confidential information may be one of the IT outsourcing risk factors".

H_1: There is a relationship between IT department management levels and the perception that "Sharing confidential information may be one of the IT outsourcing risk factors".

Test Result

Chi-square test was conducted to test if there is a variance in the perceived factor (Confidentiality problems) that may lead to IT outsourcing risks and the management levels of the IT department. The value for the Chi-square test is 20,05 and the corresponding critical value is 9,488. Thus, H_0 is rejected on 0,5

significance level. We also double checked the H_0 rejection with the p=0,000 < 0,05 condition.

Table 4.5 Observed Frequencies of the Answers to the Question 5

	Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree
Management Level	8 (5%)	29 (19%)	13 (8%)	31 (20%)	73 (47%)
IT Specialist Level	3 (2%)	14 (7%)	17 (9%)	26 (14%)	127 (68%)

Comment

As H_0 is rejected by the Chi-Square hypothesis test, the discrepancies among the answers of the participants with different levels indicate that the chances that the variances between the observed and the expected frequencies may stem from sampling errors are very small. We believe that "disclosure of the confidential information" is a factor that is more relevant to IT Specialist Level, rather than Management Level staff. This is mainly because the specialists may be more focused and involved in every detail of the outsourcing projects or IT services. Thus, we believe that the answers of IT Specialist Level specialists on this risk factor are more reliable than the answers of Management Level.
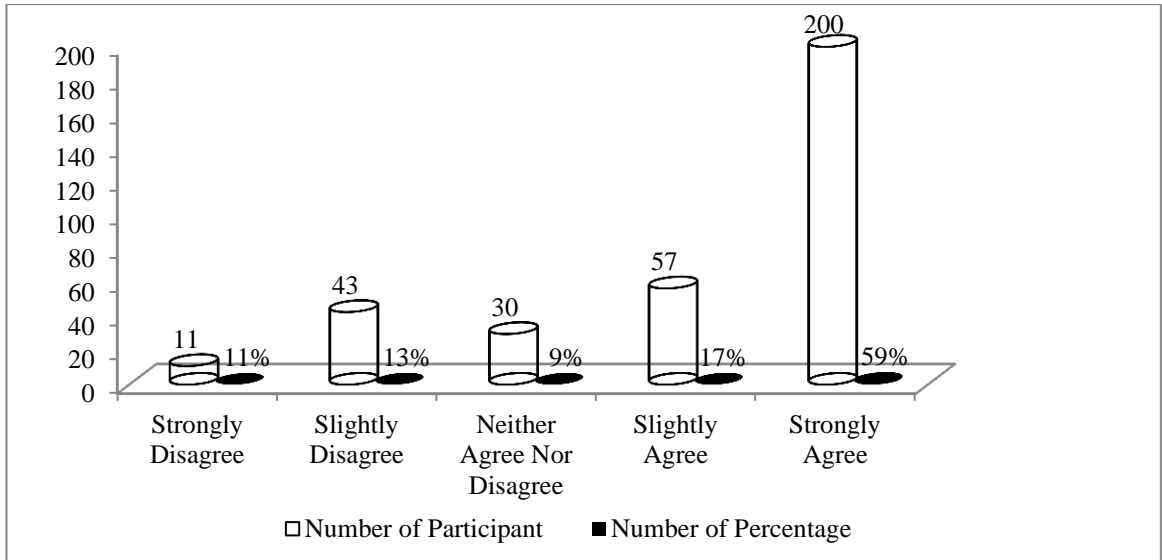
Survey Result

Figure 4.4 Perception in "Sharing Confidential Information" (All levels)

Disclosure of confidential information may be one of the risk factors during an IT outsourcing project as shown in Figure 4.4 because vast majority of our sample (76% of the all participators) has a high level of perception on this risk factor.

Moreover, 67% of the "Management Level" respondents says that they perceive this factor as an IT outsourcing risk. Similarly, 82% of the "IT Specialist Level" respondents state that they perceive this factor as an IT outsourcing risk.

4.2.6. Lack of Communication – Derived from Question 6

Once again, the participators were asked to rate from 1 to 5 (1 - being "Strongly disagree" and 5 - being "strongly agree") to what they believed the factor mentioned in Question 6 (See Table 3.2) may be one of the IT outsourcing risks. The main aim of asking this question is to figure out to what extent the management levels (There are two levels which are "Management Level" and "IT Specialist Level") affect the variance in the perceived factor ("Lack of Communication") that may lead to IT outsourcing risk.

4.2.6.1. Test of Hypothesis – Question 6

The following null and alternate hypotheses are in introduced:

H_0: There is no relationship between IT department management levels and the perception that "Lack of communication may be one of the IT outsourcing risk factors".

H_1: There is a relationship between IT department management levels and the perception that "Lack of communication may be one of the IT outsourcing risk factors".

Test Result

Chi-square test was conducted to test if there is a variance in the perceived factor (Lack of communication) that may lead to IT outsourcing risks and the management levels of the IT department. The value for the Chi-square test is 24,89 and the corresponding critical value is 9,488. Thus, H_0 is rejected on 0,05 significance level. We also double checked the H_0 rejection with the p=0,000 < 0,05 condition.

Table 4.6 Observed Frequencies of the Answers to the Question 6

	Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree
Management Level	13 (8%)	17 (11%)	37 (24%)	25 (16%)	62 (40%)
IT Specialist Level	15 (8%)	62 (33%)	28 (15%)	19 (10%)	63 (34%)

Comment

As H_0 is rejected by the Chi-Square hypothesis test, the discrepancies among the answers of the participants with different levels indicate that the chances that the variances between the observed and the expected frequencies may stem from sampling errors are very small. As the management level staff may not have the chance to monitor the communication between vendor and client staff, it may be hard for them to identify whether there is a communication problem or not. Thus, communication problem may be best captured by IT specialists.
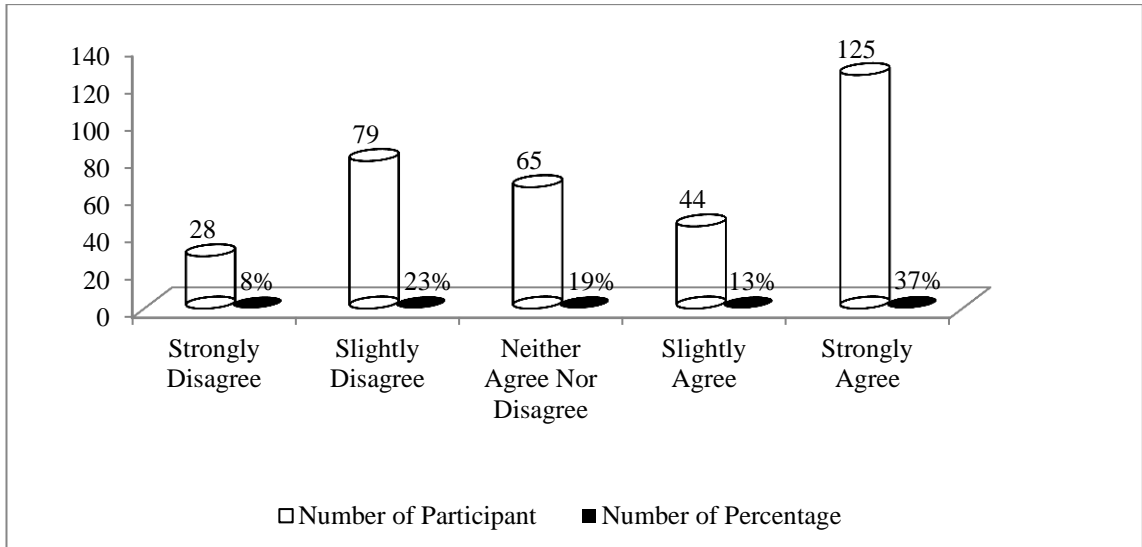
Survey Result

33

Figure 4.5 Perception in "Lack of communication" (All levels)

According to survey result, Figure 4.5 shows that lack of communication between vendor and client may be a risk of IT outsourcing for the reason that 50% of our participators agree this risk factor while almost 20% of them are neutral on this factor.

Moreover, 87% of the "Management Level" respondents say that they perceive this factor as an IT outsourcing risk. Similarly, 44% of the "IT Specialist Level" respondents perceive this factor as an IT outsourcing risk.

4.2.7. Lack of knowledge on business needs – Derived from Question 7

Once again, the participators were asked to rate from 1 to 5 (1 - being "Strongly disagree" and 5 - being "strongly agree") to what they believed the factor mentioned in Question 7 (See Table 3.2) may be one of the IT outsourcing risks. The main aim of asking this question is to figure out to what extent the management levels (There are two levels which are "Management Level" and "IT Specialist Level") affect the variance in the perceived factor ("Lack of knowledge on business needs") that may lead to IT outsourcing risk.

4.2.7.1. Test of Hypothesis – Question 7

The following null and alternate hypotheses are in introduced:

H_0: There is no relationship between IT department management levels and the perception that "Lack of business needs may be one of the IT outsourcing risk factors".

H_1: There is a relationship between IT department management levels and the perception that "Lack of business needs may be one of the IT outsourcing risk factors".

Test Result

Chi-square test was conducted to evaluate the If there is variance in the perceived factor (Lack of knowledge on business needs) that may lead to IT outsourcing risks and the management levels of IT personnel that establishes the awareness for this discrepancy among the management levels. The value for the Chi-square test is 34,56 and the corresponding critical value is 9,488). Thus, H_0 is rejected on 0,05 significance level. We also double checked the rejection of H_0 with the p=0,000 < 0,05 condition.

Table 4.7 Observed Frequencies of the Answers to the Question 7

	Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree
Management Level	10 (6%)	16 (10%)	85 (55%)	32 (21%)	11 (7%)
IT Specialist Level	21 (11%)	64 (34%)	74 (40%)	18 (10%)	10 (5%)

Comment

As H_0 is rejected by the Chi-Square hypothesis test, the discrepancies among the answers of the participants with different levels indicate that the chances that the variances between the observed and the expected frequencies may stem from sampling errors are very small. The management level IT staffs generally prefer to have a globally-accepted or nationally-reputed organization when deciding on a vendor. However, by just looking at the wide acceptance or the good

reputation of a vendor firm, these management level l staff may not be able to capture how much these firms will bring themselves the required contribution and targeted benefit. However, during the early stages of the outsourcing project, IT Specialist Level experts' prediction on how much that vendor firm has the competence or experience on the project is more accurate than the management level IT staffs.
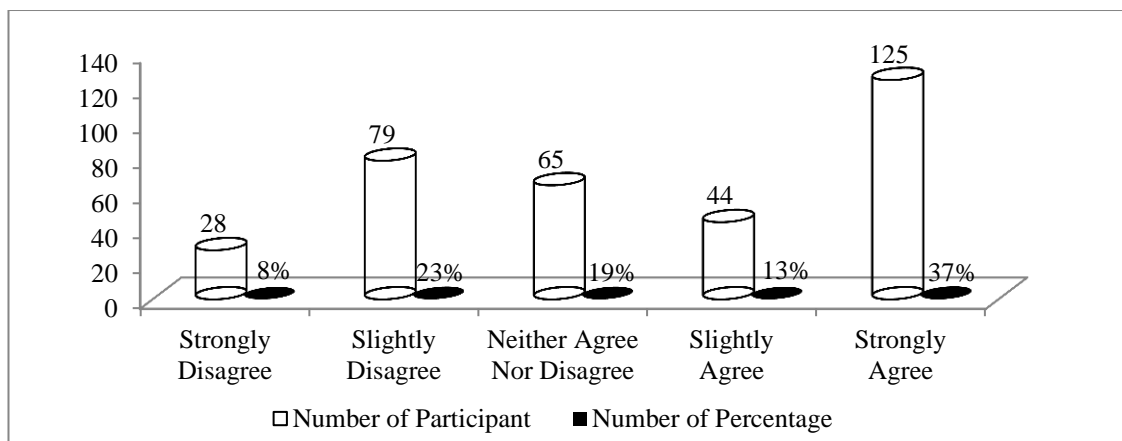
Survey Result

Figure 4.6 Perception in "Lack of knowledge on business needs" (All levels)

Figure 4.6 does not give us the exact picture of this factor in survey. Because, we may not conclude that, whether our participators agree or disagree on this risk factor as there are no clear-cut in the distribution of votes.

Moreover, 28% of the "Management Level" respondents say that they perceive this factor as an IT outsourcing risk. Similarly, 15% of the "IT Specialist Level" respondents state that they perceive this factor as an IT outsourcing risk.

4.2.8.   Loss of internal skills – Derived from Question 8

Once again, the participators were asked to rate from 1 to 5 (1 - being "Strongly disagree" and 5 - being "strongly agree") to what they believed the factor mentioned in Question 8 (See Table 3.2) may be one of the IT outsourcing risks. The main aim of asking this question is to figure out to what extent the management levels (There are two levels which are "Management Level" and "IT Specialist Level") affect the variance in the perceived factor ("Loss of internal skills") that may lead to IT outsourcing risk.

4.2.8.1.   Test of Hypothesis – Question 8

The following null and alternate hypotheses are in introduced:

H_0: There is no relationship between IT department management levels and the perception that "Loss of internal skills may be one of the IT outsourcing risk factors".

H_1: There is a relationship between IT department management levels and the perception that "Loss of internal skills may be one of the IT outsourcing risk factors".

Test Result

Chi-square test was conducted to test if there is a variance in the perceived factor (Loss of internal skills) that may lead to IT outsourcing risks and the management levels in the IT department. The value for the Chi-square test is 70,39 and the corresponding critical value is 9,488. Thus, H_0 is rejected on 0,05 significance level. We also double checked the H_0 rejection with the p=0,000 < 0,05 condition.

Table 4.8 Observed Frequencies of the Answers to the Question 8

	Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree
Management Level	13 (8%)	14(9%)	36 (23%)	31 (20%)	60 (39%)
IT Specialist Level	12 (6%)	65 (35%)	73 (39%)	21 (11%)	16 (9%)

Comment

As H_0 is rejected by the Chi-Square hypothesis test, the discrepancies among the answers of the participants with different levels indicate that the chances that the variances between the observed and the expected frequencies may stem from sampling errors are very small. Before the start of an outsourcing project, the experts usually have hands-on experience and certain technical skills and they

are supposed to know every detail on IT services such as application development, implementation, operations, maintenance etc. However, during or at the end of an outsourcing project, technical staff may recognize that they lose their skill which may in turn lead to organization's internal skill lost. Thus, for this question we believe that IT Specialist Level staff's answers may be more representative than that of Management level personnel.
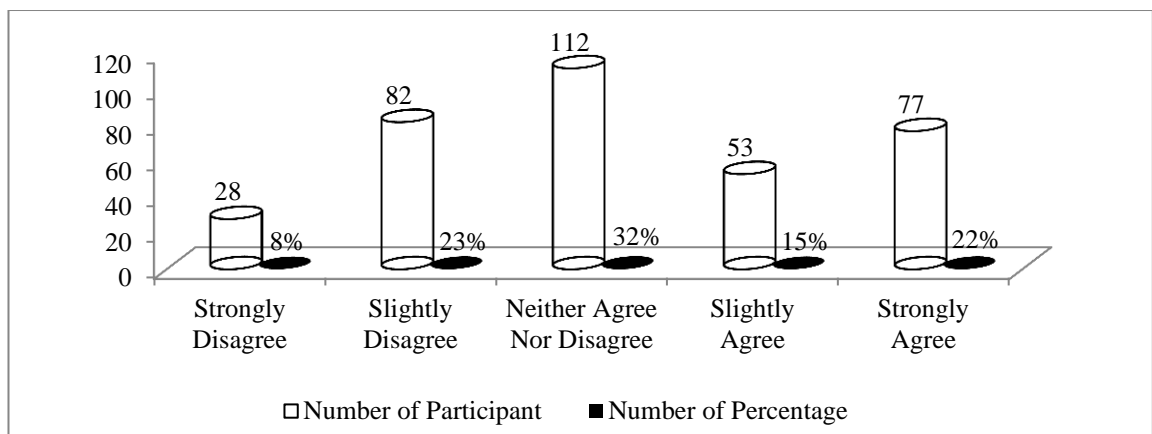
Survey Result

Figure 4.7 Perception in "Loss of internal skills" (All levels)

Figure 4.7 shows that distribution of agree and disagree votes are almost the same for this risk factor. So, we cannot infer that, "Loss of internal skills" may be one of the risk factor for IT outsourcing projects.

Moreover, 59% of the "Management Level" respondents say that they perceive this factor as an IT outsourcing risk. Similarly, 20% of the "IT Specialist Level" respondents state that they perceive this factor as an IT outsourcing.

4.2.9. Lack of motivation – Derived from Question 9

Once again, the participators were asked to rate from 1 to 5 (1 - being "Strongly disagree" and 5 - being "strongly agree") to what they believed the factor mentioned in Question 9 (See Table 3.2) may be one of the IT outsourcing risks. The main aim of asking this question is to figure out to what extent the management levels (There are two levels which are "Management Level" and "IT Specialist Level") affect the variance in the perceived factor ("Lack of motivation") that may lead to IT outsourcing risk.

4.2.9.1. Test of Hypothesis – Question 9

The following null and alternate hypotheses are in introduced:

H_0: There is no relationship between IT department management levels and the perception that "Lack of motivation may be one of the IT outsourcing risk factors".

H_1: There is a relationship between IT department management levels and the perception that "Lack of motivation may be one of the IT outsourcing risk factors".

Test Result

Chi-square test was conducted to test if there is a variance in the perceived factors (Lack of motivation) that may lead to IT outsourcing risks and the management levels in the IT department. The value for the Chi-square test is 101,40 and the corresponding critical value is 9,488. Thus, H_0 is rejected on 0,05 significance level. We also double checked the rejection of H_0 with the p=0,000 < 0,05 condition.

Table 4.9 Observed Frequencies of the Answers to the Question 9

	Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree
Management Level	17 (11%)	13 (8%)	23 (15%)	94 (61%)	7 (5%)
IT Specialist Level	17 (10%)	10 (6%)	85 (50%)	27 (16%)	48 (28%)

Comment

As H_0 is rejected by the Chi-Square hypothesis test, the discrepancies among the answers of the participants with different levels indicate that the chances that the variances between the observed and the expected frequencies may stem from sampling errors are very small. When an outsourcing project starts, it is usually the "IT experts" to be affected "directly" and "seriously" by this project. For

example, when a certain duty or a task is transferred from client's employer and given to a vendor's staff, the motivation of firm's employer will be disturbed. As illustrated, this question regarding to the "lack of motivation" factor is more likely to be answered adequately by IT Specialist Level than the staff at the management level.
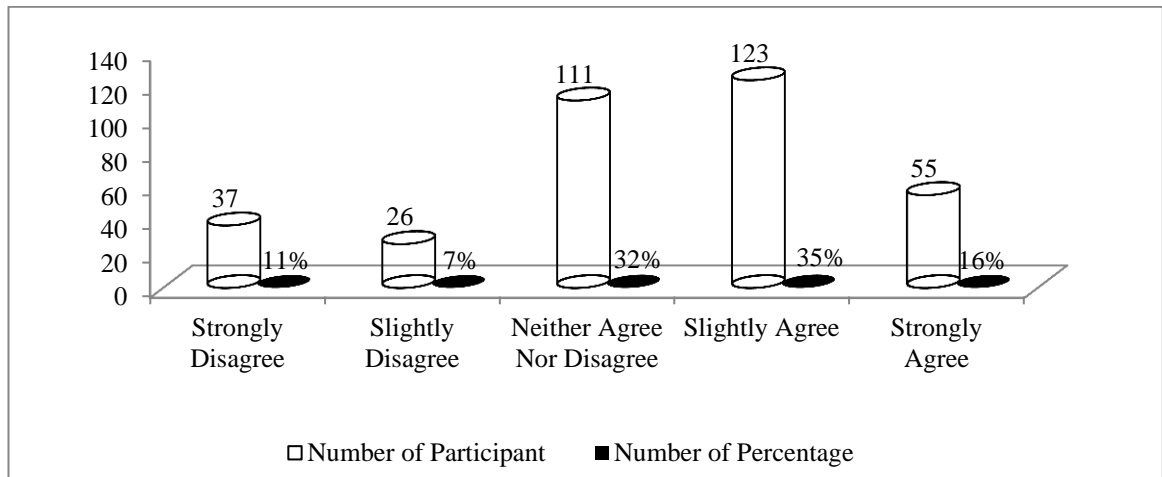
Survey Result

Figure 4.8 Perception in "Lack of motivation" (All levels)

The lack of motivation may be considered as one of the risk factors for IT outsourcing. As can be inferred from Figure 4.8 total of 51% our sample agrees about this risk factor.

Moreover, 66% of the "Management Level" respondents say that they perceive this factor as an IT outsourcing risk. Similarly, 44% of the "IT Specialist Level" respondents state that they perceive this factor as an IT outsourcing risk.

4.2.10. Lack of knowledge transfer – Derived from Question 10

Once again, the participators were asked to rate from 1 to 5 (1 - being "Strongly disagree" and 5 - being "strongly agree") to what they believed the factor mentioned in Question 10 (See Table 3.2) may be one of the IT outsourcing risks. The main aim of asking this question is to figure out to what extent the management levels (There are two levels which are "Management Level" and "IT Specialist Level") affect the variance in the perceived factor ("Lack of knowledge transfer") that may lead to IT outsourcing risk.

4.2.10.1. Test of Hypothesis – Question 10

The following null and alternate hypotheses are in introduced:

H_0: There is no relationship between IT department management levels and the perception that "Lack of knowledge transfer may be one of the IT outsourcing risk factors".

H_1: There is a between IT department management levels and the perception that "Lack of knowledge transfer may be one of the IT outsourcing risk factors".

Test Result

Chi-square test was conducted to test if there is a variance in the perceived factor (Lack of knowledge transfer) that may lead to IT outsourcing risks and the management levels in the IT department. The value for the Chi-square test is 9,95 and the corresponding critical value is 9,488. Thus, H_0 is rejected on 0,05 significance level. We also double checked the H_0 rejection with the p=0,000 < 0,05 condition.

Table 4.10 Observed Frequencies of the Answers to the Question 10

	Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree
Management Level	11 (7%)	22 (14%)	18 (12%)	25 (16%)	78 (51%)
IT Specialist Level	10 (5%)	11 (6%)	19 (10%)	26 (14%)	121 (65%)

Comment

As H_0 is rejected by the Chi-Square hypothesis test, the discrepancies among the answers of the participants with different levels indicate that the chances that the variances between the observed and the expected frequencies may stem from sampling errors are very small. This question basically aims to address whether an organization may benefit from outsourcing through knowledge transfer from

its vendor company. Therefore, the answers of participants who already observed the effects of this factor make sense   after the completion of the outsourcing projects. With this respect, we think that our sample consists of participants whose organizations are still performing an ongoing outsourcing project. Thus, we cannot comment on the reliability of the answers either of these two management levels.
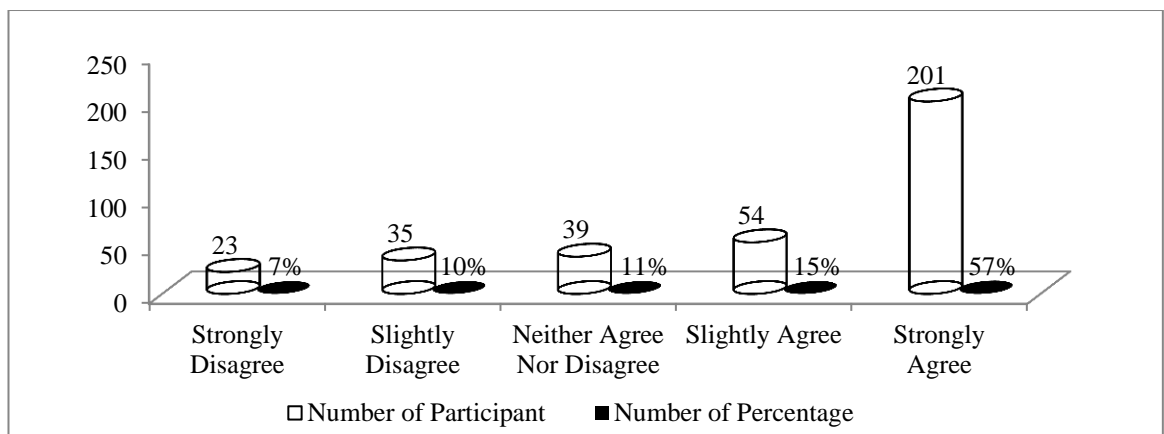
Survey Result

Figure 4.9 Perception in "Lack of knowledge transfer" (All levels)

The survey result shows that vast majority of our sample (72% of the total participators) agree that lack of knowledge transfer may be considered as one of the risk factors for IT outsourcing in Figure 4.9.

Moreover, 67% of the "Management Level" respondents say that they perceive this factor as an IT outsourcing risk. Similarly, 79% of the "IT Specialist Level" respondents state that they perceive this factor as an IT outsourcing risk.

4.2.11. Incomplete contract – Derived from Question 11

Once again, the participators were asked to rate from 1 to 5 (1 - being "Strongly disagree" and 5 - being "strongly agree") to what they believed the factor mentioned in Question 11 (See Table 3.2) may be one of the IT outsourcing risks. The main aim of asking this question is to figure out to what extent the management levels (There are two levels which are "Management Level" and "IT Specialist Level") affect the variance in the perceived factor ("Incomplete contract") that may lead to IT outsourcing risk.

4.2.11.1. Test of Hypothesis – Question 11

The following null and alternate hypotheses are in introduced:

H_0: There is no relationship between IT department management levels and the perception that "Incomplete contract may be one of the IT outsourcing risk factors".

H_1: There is a relationship between IT department management levels and the perception that "Incomplete contract may be one of the IT outsourcing risk factors".

Test Result

Chi-square test was conducted to test if there is a variance in the perceived factor (Incomplete contract) that may lead to IT outsourcing risks and the management levels in the IT department. The value for the Chi-square test is 99,74 and the corresponding critical value is 9,488. Thus, H_0 is rejected on 0,05 significance level. We also double checked the H_0 rejection with the p=0,000 < 0,05 condition.

Table 4.11 Observed Frequencies of the Answers to the Question 11

	Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree
Management Level	28 (18%)	12 (8%)	21 (14%)	75 (49%)	18 (12%)
IT Specialist Level	12 (6%)	80 (43%)	43 (23%)	19 (10%)	33 (18%)

Comment

As H_0 is rejected by the Chi-Square hypothesis test, the discrepancies among the answers of the participants with different levels indicate that the chances that the variances between the observed and the expected frequencies may stem from sampling errors are very small. For this question, we believe that the answers of the management level staff may reflect the real-life scenarios more that the

answers of the IT Specialist level staff as the managers are more concerned about preparing, controlling, and accepting the contracts between the vendors.
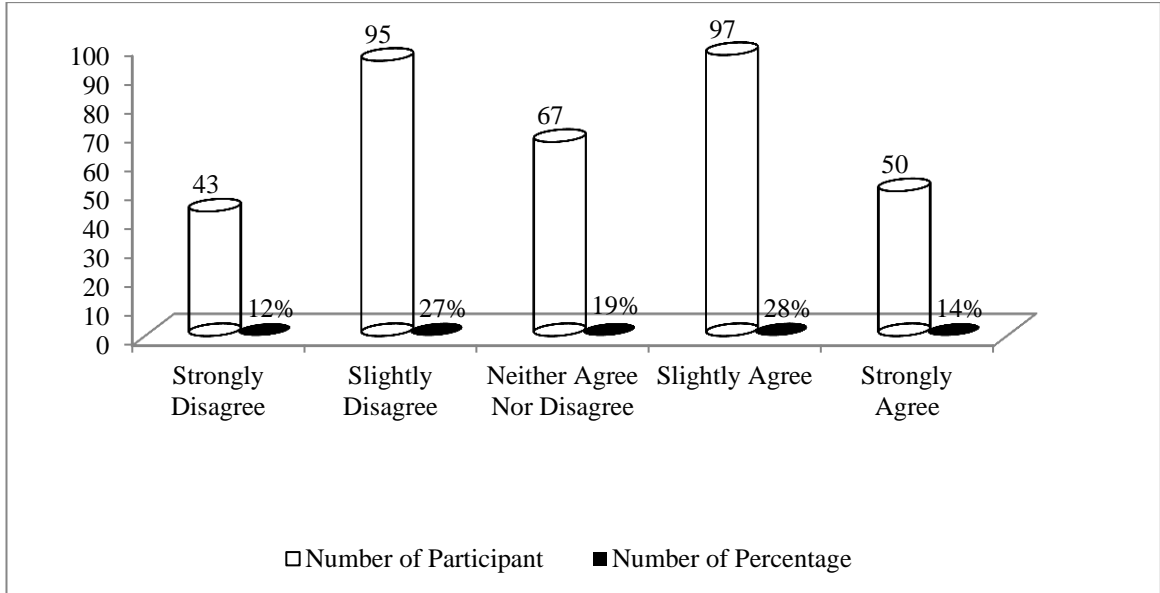
Survey Result

Figure 4.10 Perception in "Incomplete contract" (All levels)

The distribution of the votes for question 11 depicted in Figure 4.10 shows that one cannot conclude exactly whether "Incomplete contract" may not be considered as a risk factor for IT outsourcing or not. Because, percentage of agree and disagree participators are almost same.

Moreover, 61% of the "Management Level" respondents say that they perceive this factor as an IT outsourcing risk. Similarly, 28% of the "IT Specialist Level" respondents state perceives this factor as an IT outsourcing risk.

4.2.12. The challenge to manage vendor' staff – Derived from Question 12

For the last question once again, the respondents were asked to rate from 1 to 5 (1 - being "Strongly disagree" and 5 - being "strongly agree") to what they believed the factor mentioned in Question 12 (See Table 3.2) may be one of the IT outsourcing risks. The main aim of asking this question is to figure out to what extent the management levels (There are two levels which are "Management Level" and "IT Specialist Level") affect the variance in the

perceived factor ("The challenge to manage vendor' staff") that may lead to IT outsourcing risk.

4.2.12.1. Test of Hypothesis – Question 12

The following null and alternate hypotheses are in introduced:

H_0: There is no relationship between IT department management levels and the perception that "The challenge to manage vendor' staff" may be one of the IT outsourcing risk factors".

H_1: There is a relationship between IT department management levels and the perception that "The challenge to manage vendor' staff" may be one of the IT outsourcing risk factors".

Test Result

Chi-square test was conducted to test if there is a variance in the perceived factor (The challenge to manage vendor' staff) that may lead to IT outsourcing risks and the management levels in the IT department. The value for the Chi-square test is 40,60 and the corresponding critical value is 9,488. Thus, H_0 is rejected on 0,05 significance level. We also double checked the H_0 rejection with the p=0,000 < 0,05 condition.

Table 4.12 Observed Frequencies of the Answers to the Question 12

	Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree
Management Level	15 (10%)	9 (6%)	59 (38%)	38 (25%)	33 (21%)
IT Specialist Level	44 (24%)	43 (23%)	53 (28%)	31 (17%)	16 (9%)

Comment

As H_0 is rejected by the Chi-Square hypothesis test, the discrepancies among the answers of the participants with different levels indicate that the chances that the variances between the observed and the expected frequencies may stem from sampling errors are very small. When an outsourcing project starts, the manager

in the client organization has to deal with both his/her own staff as well as the vendor's representative (such as outsourcing consultant). In such a scenario, the problem in this client organization is that internal staff is accountable to these managers whereas the vendor's representative is only accountable to her/his own managers but at the same time they will be reporting to the internal manager. Thus, a manager in the client cannot behave the vendor's representative like s/he treat to her/his own employee. Concerns similar to exemplified case above may lead to managerial conflicts. As this sample scenario reveals, question 12 is much more related to managers and we believe that this question may be best answered by Management Level staff.
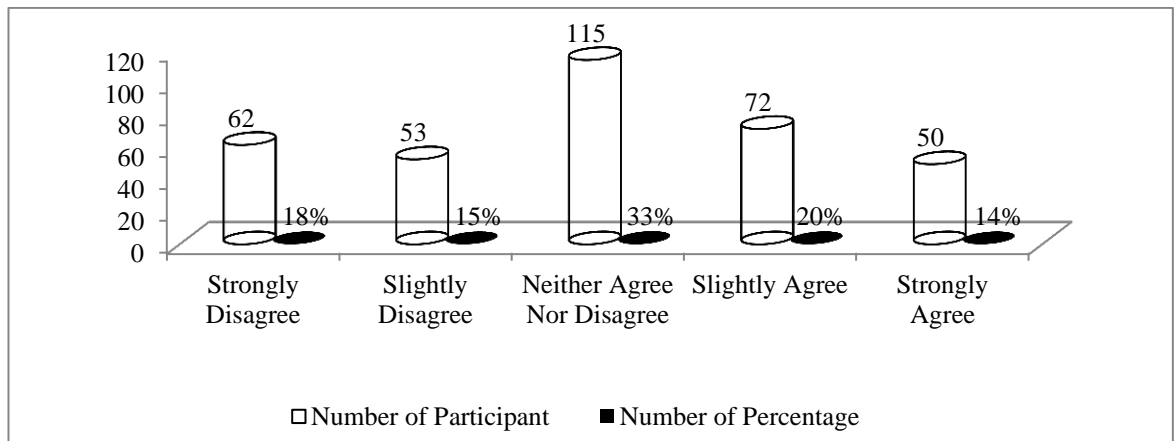
Survey Result

Figure 4.11 Perception in "The challenge to manage vendor' staff" (All levels)

As can be seen from Figure 4.11, the result does not explain that the challenge to manage vendor' staff may be a risk factor or not.

Moreover, 46% of the "Management Level" respondents say that they perceive this factor as an IT outsourcing risk. Similarly, 26% of the "IT Specialist Level" respondents state that they perceive this factor as an IT outsourcing risk.

To sum up, the participators were asked to rate 10 questions given Table 3.2 (each representing 10 IT outsourcing risk factors) from 1 to 5 (1 - being "strongly disagree" and 5 - being "strongly agree") to what they believe, experience, and shortly they perceive . Based on the number of their positive

answers (the number of answers being "Strongly Agree" and "Agree" answers), the top three factors that are perceived as the risks for IT outsourcing were:

1) Sharing confidential information (with 76% "Strongly Agree" and "Agree" answers to question 5)

2) A lack of knowledge transfer (with 72% "Strongly Agree" and "Agree" answers to question 10)

3) Increased dependence to on the vendor (with 70% "Strongly Agree" and "Agree" answers to question 4)

Similarly, based on the negative answer frequencies (The number of answers being "Strongly Disagree" and "Disagree"), the top three factors that are not perceived as the risks for IT outsourcing were:

1) Increased dependence on outsourcing firm (with 43% "Strongly Disagree" and "Disagree" answers to question 3)

2) Incomplete contract with vendor (with 39% "Strongly Disagree" and "Disagree" answers to question 11)

3) Challenge to manage vendor' staff (with 33% "Strongly Disagree" and "Disagree" answers to question 12)

Chapter 5

5.   Concluding Remarks

In this thesis, we perform a descriptive study to reveal the Turkish IT practitioners' perceptions on IT outsourcing risks. To gather the required information, we conduct an electronic survey with 341 selected IT practitioners. The sample was selected among the leader Telecom companies, prominent ISPs, insurance companies, and leading banks which are located in Turkey. All of the participators are familiar with the outsourcing activities one way or another. Moreover, participants consist of employees working at all levels (including key managerial or expert positions) of these organizations. After collecting the data from the electronic survey, we preprocess the raw data to attempt to understand the perception risk of IT outsourcing in Turkey and attempt to answer our research questions.

There are 12 questions whose answers are evaluated in likert scale. Ten of these questions are aimed to capture our participators' IT outsourcing risk perceptions. 2 of questions are asked to identify their management levels and their outsourced IT services. All of the type of the data collected in the survey is on likert and thus they are of type categorical. With this respect, we could not make any arithmetical operations on this data set.

In question 1, we simply asked the participants which IT services categories and subcategories they have outsourced in their firms. In the survey, "Operations IT Services" receives %32,45 of the votes as the second widely used IT services after "Management & Support IT Services" with %42,64. "Applications IT Services" takes %24,91 of the total votes and has the third rank.

Likewise, if the subcategories of IT Services are concerned, "Applications/ Support & Maintenance" captured the most of the total number of IT services in Turkey. In the second rank, we see "Applications/ Development" subcategory. And the respondents says that they either are outsourcing or they already outsourced their "Management & support/ Training" in the third rank.

In this study, the following research question is also addressed:

To what extent do the management levels of IT personnel account for the

variance in the perceived factors that may lead to IT outsourcing risks?

The above mentioned research question is addressed by the votes of the practitioners to questions 3 to 12. As discussed in the previous chapter, it is revealed that there is statistically proven discrepancy between the management levels and the perceived factors that may lead to IT outsourcing risks in our sample.

The detailed analysis of our survey data are discussed in the previous chapter. Herein, we summarized our findings in Table 5.1. And as can be seen, the conventional risks of IT outsourcing which are widely accepted by academia reveal more or less the same with our participators' perception risk.

However, we intentionally group the answers from question 3 to 12 into two broad categories namely, "Agree" and "Disagree" and neglect the answers for the neutral respondents. After this categorization, summary of our findings are exhibited in Table 5.1.

Table 5.1: Summary of findings

Name of the IT Outsourcing Risk Factor	Hypothesis result	Distribution of Agree and Disagree Answers	Comments
Increase in expenses was observed	H_0 is rejected[1]	• %42 agree • %43 disagree	As the scores are too close, we believe there is no definite perception observed on this risk factor.
Increased dependence on outsourcing firm	H_0 is rejected[1]	• %70 agree • %5 disagree	Although it is impossible to generalize this risk factor to be perceived by the whole Turkish IT industry, our sample agrees that this factor is one of the risks of IT outsourcing in Turkey.
Confidentiality	H_0 is	• %76 agree	Although it is impossible to generalize this risk

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[1] There is a relationship between management levels and the perception

Name of the IT Outsourcing Risk Factor	Hypothesis result	Distribution of Agree and Disagree Answers	Comments
problem	rejected[1]	• %24 disagree	factor to be perceived by the whole Turkish IT industry, our sample agrees that this factor is one of the risks of IT outsourcing in Turkey.
Communication problem	H_0 is rejected[1]	• %50 agree • %31 disagree	Although it is impossible to generalize this risk factor to be perceived by the whole Turkish IT industry, our sample agrees that this factor is one of the risks of IT outsourcing in Turkey.
Lack of knowledge on business needs	H_0 is rejected[1]	• %50 agree • %21 disagree	As the scores are too close, we believe there is no definite perception observed on this risk factor.
Loss of internal skill	H_0 is rejected[1]	• %37 agree • %31 disagree	As the scores are too close, we believe there is no definite perception observed on this risk factor.
Motivation problem	H_0 is rejected[1]	• %51 agree • %18 disagree	Although it is impossible to generalize this risk factor to be perceived by the whole Turkish IT industry, our sample agrees that this factor is one of the risks of IT outsourcing in Turkey.
Lack of knowledge transfer	H_0 is rejected[1]	• %72 agree • %17	Although it is impossible to generalize this risk factor to be perceived by the whole Turkish IT

Name of the IT Outsourcing Risk Factor	Hypothesis result	Distribution of Agree and Disagree Answers	Comments
		disagree	industry, our sample agrees that this factor is one of the risks of IT outsourcing in Turkey.
Incomplete contract with vendor	H_0 is rejected[1]	• %42 agree • %39 disagree	As the scores are too close, we believe there is no definite perception observed on this risk factor.
The challenge to manage vendor' staff	H_0 is rejected[1]	• %34 agree • %33 disagree	As the scores are too close, we believe there is no definite perception observed on this risk factor.

5.1. Future Work

In this thesis we pursue a descriptive study methodology to portray the current situation of IT outsourcing domains (i.e., IT services) in Turkey and the perceived risks associated with them. We believe that the IT outsourcing risk factors faced in Turkish IT sector may involve some uncertainty parameters and hence these probable risk factors may be obscure and vague for a survey or quantitative methodologies to be explored. These risk factors which may be specific to Turkish organizations could be rooted from the organizations' culture. Therefore, as future research directions, we intend to make an explorative study, based on the descriptive study conducted in this thesis, to identify whether there are new risk factors that impact the success of IT outsourcing projects specific to Turkish IT sector.

In this study, we faced with statistically significant variance in the perception of the some of the IT outsourcing risk factors and the management levels of IT personnel. Due to again the descriptive nature of our study, there are no clear

explanations whether each perceived risk factors should really be considered as independent. With this respect, the above mentioned potential future work directions should be elicited and a conceptual framework that would definitely contribute to this field should be established.

We are also planning to conduct an explorative study to find the risk factors in IT outsourcing activities, processes, or firms which involve multiple vendors and multiple clients.

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Curriculum Vitae

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