IDENTIFYING THE EFFECTS OF EDUCATION, ACTIVITIES AND SKILLS OF
INFORMATION TECHNOLOGY (IT) SENIOR MANAGERS AND THEIR IMPACT TO
THE ORGANIZATION IN THE PRIVATE SECTOR


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# ABSTRACT

IDENTIFYING THE EFFECTS OF EDUCATION, ACTIVITIES AND SKILLS
OF INFORMATION TECHNOLOGY (IT) SENIOR MANAGERS AND THEIR
IMPACT TO THE ORGANIZATION IN THE PRIVATE SECTOR

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Information Technology (IT) is considered as a very important part of today's world
of business and researches indicate that it helped and still helps companies to lower
their costs and increase the information quality with speed. On the other hand, Senior
IT Managers, such as Chief Information Officers (CIO) roles are very important in
the IT department more than other department's relationships with their senior
managers. This study investigates the identification of the effects and importance of
the activities and skills of senior IT managers and their impact to the organization in

the private sector. Previous studies generally studied the IS/IT Managers skills and their effects to the IS/IT department and also listed those skills and tasks. Also literature researchers focused on IS/IT managers skills, IS/IT managers effects to the IT/IS departments and IS/IT departments effects to the organization. This research study helps to highlight the importance and role of IS/IT Managers within not only private but also public sector organizations and other industries.

# ÖZ

ÜST DÜZEY BİLİŞİM TEKNOLOJİLERİ (BT) YÖNETİCİLERİNİN
EĞİTİMLERİNİN, BECERİLERİNİN VE AKTİVİTELERİNİN
ETKİLERİNİN VE ÖZEL SEKTÖRDEKİ ŞİRKETLERE ETKİLERİNİN
BELİRLENMESİ

Ekimci, Namık Atila

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Bilişim Teknolojileri (BT) günümüz iş dünyasının çok önemli bir parçası olarak görülmekte ve araştırmaların belirttiğine göre kendi maliyet masraflarının düşmesine ve bilginin kalitesinin hız ile birlikte artmasına imkân sağlamış ve hala da sağlamaktadır. Öte yandan, CIO gibi üst düzey BT yöneticilerinin sahip olduğu departmanlarında ve onun diğer departmanlarla olan ilişkilerinde büyük önem

taşımaktadır. Bu araştırma bu etkilerin ve üst düzey BT yöneticilerinin beceri ile beraber aktivitelerin belirlenmesini ve özel sektördeki şirketler içindeki etkilerini incelemektedir. Bundan önceki araştırmalar BT/BS (Bilişim Sistemleri) yöneticilerinin becerilerinin ve BT/BS departmanlarına etkilerinin ve ayrıca o beceri ve görevlerin listelenmesini içeriyordu. Bunun yanı sıra, önceki araştırmalarda BS/BT yöneticilerinin becerileri, BS/BT yöneticilerinin BT/BS departmanlarına etkilerini ve BS/BT departmanlarının organizasyona olan etkileri üzerine yoğunlaşmışlardır. Bu araştırma BS/BT yöneticilerinin önemine ve sadece özel sektördeki firmaların değil ayrıca kamu kuruluşlarının ve diğer endüstri alanlarındaki BS/BT yöneticilerinin önemine ışık tutmaktadır.

 Anahtar Kelimeler: Bilişim Teknolojisi, Özel Sektör, Üst düzey yönetici, Bilişim Sistemleri, Beceriler ve Aktiviteler.

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# ABBREVIATIONS

ACM: Activity Competency Model

CIO: Chief of Information Officer

ITAA: Information Technology Association of America

IT: Information Technology

IS: Information Systems

JCT: Job Characteristics Theory

MANOVA: Multivariate Analysis of Variance

MBA: Master of Business Administration

SME: Small-Medium Enterprises

# CHAPTER I

# INTRODUCTION

Information System (IS) is defined as "computerized tools that assist people in transforming data into information" in Penn State University Dictionary. In addition, the Information Technology Association of America (ITAA) defined the Information Technology (IT) as "the study, design, development, implementation, support or management of computer-based IS, particularly software applications and computer hardware". As the value of information is rapidly increasing, IT is drawing a larger attention in the business world. The importance of Information Technologies (ITs) is increasing day by day and in parallel the position of IT has changed from a supporting role to an increasingly strategic role with a competitive advantage over the past five decades (Smaltz, 1999). This rapid increase of importance of IT in business world made IT one of the key components of the companies. The main reason why IT is such a promising and effective department in the companies is the advances in electronic data processing and telecommunication areas which are having a deep impact on the internal structure of the organizations.

The importance of IT especially in private sector is much more crucial than many others because of its competitive and fierce-full environment. The private sector companies where the speed and information are some of the biggest advantages, brings a lot of attention and urges to provide huge investments on the IT departments. The capital spending on IT has grown rapidly over the previous decade. "It is estimated that U.S. companies spent more than $250 billion every year for approximately 175,000 IT application development projects during the 1990's"

(Eom, 2006). "Global IT spending reached nearly $3.3 trillion in 2002."(Anonymous, 2001 as cited in Eom, 2006). "Organizations such as Dell, e-Bay, and Amazon are using IT to create new business models. And some are also using IT to signal their progressiveness to the organization's stakeholders" (Dos Santos, Peffers & Mauer, 1993). This means, IT has a more important role especially in large organizations in today's world and it seems that Information Technology's (IT's) positions will reach the top and the IT department will be one of the most critical departments in the future's business environment, especially in the ferocious private sector.

Today, with the increasing organizational importance of IT, the management of IT is becoming more crucial and more effective for the organizations. For example, a number of researchers found that IT managers who don't have a clear communication with top management team and who could not participate in decision making process involving IT related issues, faced significant problems in developing and executing IT strategic planning (Watson, 1990 as cited in Alshilash, 1997). The focus in this research is specifically on the senior management in IT departments and IT focused companies (e.g. Chief Information Officer (CIO), IT Director, Vice president of IT etc.) because of their positions at the top of the IT business structure and they are the most qualified and authorized personnel within the IT command chain (e.g. the responsibilities and decision making for longer terms, interaction with more critical personnel; organizing, controlling IT etc.). Thus, the senior IT managers must know exactly what they are doing, how and why they are using their authorization, skills and education in order to achieve the goals that are assigned by the top management for the benefit of the company. However, the IT applications in business environment have changed and continue to change dramatically. And this forces not only the Senior IT managers but also all other IT personnel to upgrade their professional skills and educational knowledge constantly. Therefore, obtaining and retaining IT managers with the skills and knowledge required to support the organization effectively is an important challenge (Wu, Chen & Lin, 2004).

To satisfy and meet a firm's information needs, IS managers must know exactly what they should be doing in their positions and have the requisite skills and knowledge to operate and manage their IT resources effectively (Wu, Chen & Chang, 2006). Finding the senior managers with the right qualifications for the IT departments can be very challenging because of the identification of adequate and required qualifications so that the managers can use them in order to give the maximum benefit to the company. In general perspective, "IS managers typically exhibit management roles requiring effective communication with other functional areas and organizations, managing information resources, influencing organizational strategy and responsibility for the information technology (IT) planning to cope with the firm's competitive environment" (Longenecker & Fink, 2001 as cited in Wu, Chen & Chang, 2006).Lack of any of required qualifications of IT managers which in this case IT senior manager, can be significantly costly to the companies.

This has been widely asserted within the IT literature. Chan, Huff, Barclay, & Copeland, 1997; Luftman & Brier, 1999 claims that a possible reason for IT failure in delivering results is the misalignment of IT systems with organizational goals. They also assert that the IT expenditures are mostly on inappropriate IT (Chan, Huff, Barclay & Copeland, 1997). Indeed, a recent survey of US companies shows that only 10% of the participating companies link their IT investments explicitly to corporate strategy and just 29% say their IS strategy is strongly linked to their company's budget (Anonymous, 2002d as cited in Eom, 2006). Approximately 45% of the respondents to a survey conducted by CIO Insight feel that IS leaders are responsible for ensuring the proper utilization of IT resources supporting organizational strategy (Anonymous, 2002c as cited in Eom, 2006). Therefore, it is not surprising that an IS leader's inability to effectively manage/use resources to develop IT solutions is considered as one of the major reasons for current failure of IT projects (Dickerson, 2003 as cited in Eom, 2003).

Such failures can be based on lack of IT senior management's skills and knowledge. Defining the senior managers with the right qualifications for the IT departments can be very challenging. The main is because of the identification of the right and required qualifications for the position so that the senior IT managers can use them in order to give the maximum benefit to the company.

## 1.1. Thesis Objective

It has been proved by many researchers that IT plays a very important role for the organizations for many reasons which lead speed of information. Alter (Alter, 1989 as cited in Alshilash, 1997) stated that top management has realized that IT has an important effect in organizational performance and IT makes organizations more efficient and productive (Drucker, 1988 as cited in Alshilash, 1997). In addition, the private sector companies investing millions of dollars to their IT departments. In 2002, Global IT spending reached nearly $3.3 trillion (Anonymous, 2001 as cited in Eom, 2006) and it's increasing day by day. Even though companies do not get the expected return from their investments, the importance of IT is increasing. A recent survey of US companies shows that only 10% of the participating companies link their IT investments explicitly to corporate strategy and only 29% of the companies say their IS strategy is strongly linked to their company's budget (Anonymous, 2002d as cited in Eom, 2006 ).

The reasons of this inefficiency can be many such as misalignment of IT, communication gap between IT and other departments in the company or mismanagement by the IT managers. Mismanagement of IT department by the Senior IT managers such as CIO, IT Director or Vice president of IT, can cause much more damage to the IT efficiency than the other IT personnel because of their critical position. "Approximately 45% of the respondents to a survey conducted by Chief Information Officer (CIO) Insight feel that IS leaders are responsible for ensuring the proper utilization of IT resources supporting organizational strategy (Anonymous, 2002c as cited in Eom, 2006)". Senior IT manager's inability to

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manage effectively can be based on their lack of skill and/or knowledge required for the IT Department Leaders. "Executives in 38% of organizations that depend on IT for strategic advantage believe that finding skilled employees has had the single most significant impact on their broad organizational goals" (Ketler and Willems, 2001 as cited in Okonkwo, 2003) Indeed, finding the right senior manager for the IT departments is challenging because of the IT's nature and hard to define those skills and knowledge and detect them from the future senior IT manager candidates.

The aim of this research is to define the required skills/knowledge and activities of the Senior IT managers. Additionally, this study tries to define the proposed educational background of senior IT managers. With the results of this research, another aim is to group and list the right the skills and activities with mathematical analysis to test as explanatory factor analysis and reliability analysis.

## 1.2. Thesis Scope

Many IT researchers have been trying to define and the requisite IT manager skills due to the importance of IT and the effect of IT personnel skills. However, in previous studies, researchers faced many difficulties from low return rate to misleading identical answers. To avoid facing such problems, the study will reach all possible IT employees as possible as it can and elect the inappropriate survey answers from the results attentively.

The focus group of this study is based on senior managers of IT who lead the IT department and has long term decision making authorizations. The possible research people are CIOs, IT Directors, IT vice-presidents but the research survey completed by the entire IT/IS personnel from various industrial areas in the private sector in order to gain more effective results. However, since the focus group are senior IT managers, to enhance the study, face-to-face personal interviews with senior IT managers of the leading firms have been conducted, which have helped to improve the findings of this study.

### 1.3. Thesis Outline

The thesis is following a sequential flow: literature review, proposed model, research questions and hypotheses, results, and discussion and conclusion.

Chapter 2 presents the results of the comprehensive review of relevant academic literature. The review investigates the related literature in three parts: The senior IT manager's activities and skills, the senior IT managers' effects to IT departments and the impact of IT departments to the companies.

Chapter 3 presents the details of skill and activity sets, how they are defined as social, business and technical with activities and skills. Secondly, the research questions and hypotheses are displayed in this part in details including the purposes and research methods used in this research. This chapter also presents the research methodology used in the study and the definition of target population and data collection are also presented in this part of the study.

Chapter 4 covers the results of the study. In other words, findings of the research and hypotheses testing with the results of the statistical analyses and demographical data came out from the quantitative and qualitative researches.

Chapter 5 offers the conclusion reached upon this thesis study. Findings of the research are evaluated and discussed, especially based on the related literature studies. Moreover, recommendations for further studies are also offered in this section.

# CHAPTER II

# LITERATURE REVIEW

Technology is being used in almost every organization in the world. In order to catch up with the other companies, the organizations must use IT departments efficiently. Based on their level of authorities, perhaps one of the most effective people in the IT departments is the senior managers. And many researchers studied in three different perspectives based on this subject which are "the activities and skills of IT managers", "effects of their position to their department" and "the impact of IT departments to their private companies" in various different articles and dissertations in order to investigate the relationship between skills, activities of senior IT managers and organizational success. Although not many research have been published about this specific subject, some studies based on very certain or general areas like exploring the effects of CIO's in the Senior IT managers which have been very helpful to investigate the history of the research. In fact, most of the papers are focused on about the skill sets of the all kinds for IT managers.

In short, this chapter contains the previous studies about this subject and since there aren't too many studies , in three chapters depending on the on the previous studies, which are: "The IT senior manager's activities and skills", "The Senior IT managers' effects to IT departments" and "The effects of IT departments to its' the private sector companies".

## 2.1.The Senior IT Manager's Activities and Skills

Many researchers tried to identify those skills and activities that are required for the Senior IT managers. However, the identification of those skills and activities are not evident to determine. Researchers have focused on different skill sets and different manager groups in the both IT and Information Systems (IS) departments in their researches.

As one of the famous key techniques in defining IS manager's skills and activities, the Activity Competency Model (ACM) was developed in 2004 by Wu, Chen, and Lin (2004) based on Job Characteristics Theory (JCT) model Hackman and Oldham (1976) as illustrated in Figure 1. Described by the ACM theory, the IS manager's each of the needed professional activities requires certain skills/knowledge in order to contribute the departmental and organizational success. Also very similar to the previous study of Wu, Chen and Lin's in 2004, Wu et al.'s study in 2006, the ACM model is being used to provide a connection between the skills and knowledge of management levels with the accommodation of the company's information resources and each competency at lower level is likely to support more than one competency at a higher level. They also point out that a skill is not only necessarily naturally inborn, but also can be developed and can be revealed during the performance, not only in the potential of managers.
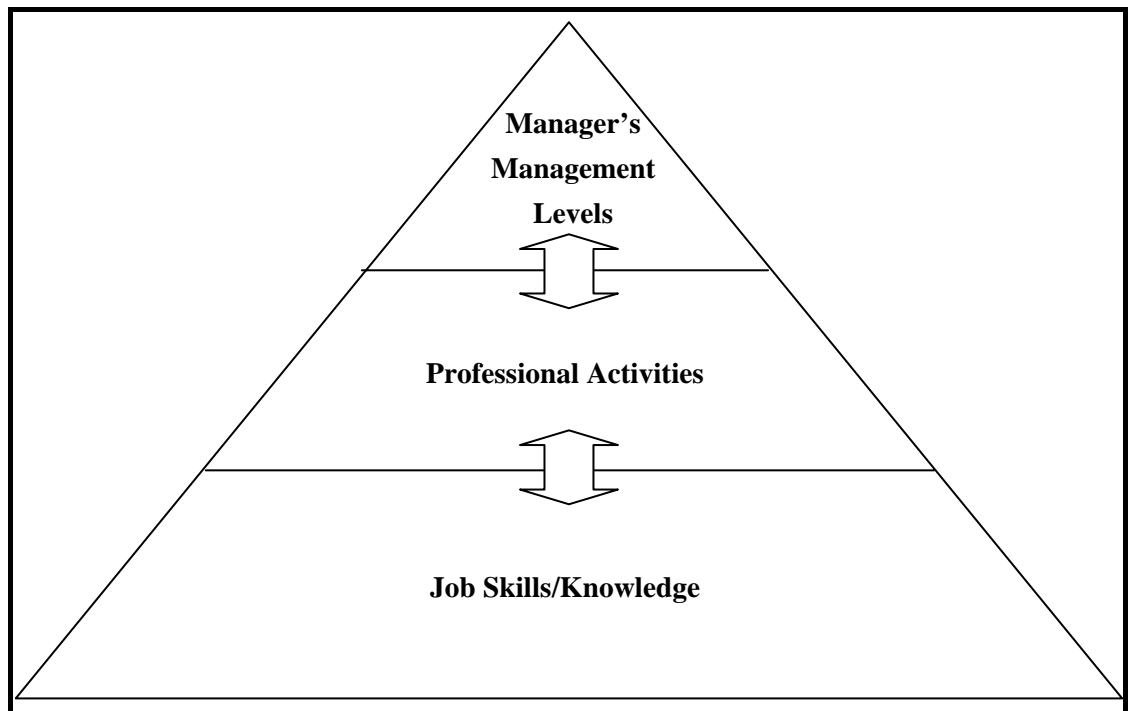
**Figure 1 - Activity Competency Model (Wu Et Al. 2004)**

Based on these ACM and JCT concepts; Wu, Chen and Chang in 2006, studied the importance of professional activities. The research's conclusion is, in any type of industry, there is an obvious degree of homogeneity in IS professional activities. More specifically, as seen in Table 1, IS managers at different management levels perceived the importance of IS critical activities somewhat differently. For instance, top and middle level IS professionals have similar roles in their organizations. However, top IS executives more focused on strategic and visionary orientations. They pointed out some skills such as "manage/plan feasibility/approval process for new systems and technology" and "manage/plan corporate IS strategies, strategic applications, technology architecture" as more important activities than those for middle level IS managers. It expresses the importance of the top IS/IT managers' position clearly.

Furthermore, the researchers claimed there's an interesting connection between the activities and the skills/knowledge which are required to perform those activities. According to the frequency analysis performed by Wu et al. (2006), these professional activities require some specific skills. For instance, to perform "Re-skill the IS personnel"; top managements require Programming Language, Telecommunications and Network, Operating Systems and Systems Integration knowledge. In short, as summarized in Table 1, the top IS managers have the most of the activities / responsibilities and therefore they have almost all of the skills / knowledge as the result of the research.

**Table 1 - Portfolios Of Critical IS Activities And Professional Skills/Knowledge By Management Levels By Wu, Chen And Chang (2006)**

| | Top Level | Middle Level | Supervisory Level |
|---|---|---|---|
| IS manager's critical activities | **PA1** Establish IS documentation standard<br>**PA2** Establish IS operation standard<br>**PA3** Reskill IS personnel<br>**PA5** Manage IS crisis<br>**PA7** Manage/plan systems development/implementation<br>**PA8** Analyze business problems and IS solutions<br>**PA9** Manage/plan corporate IS strategies, strategic applications, technology architecture<br>**PA10** Manage/plan feasibility/approval process for new systems and technology<br>**PA11** Support information access and security<br>**PA12** Integrate existing and new business application | **PA3** Reskill IS personnel<br>**PA5** Manage IS crisis<br>**PA7** Manage/plan Systems development/implementation<br>**PA8** Analyze business problems and IS solutions<br>**PA9** Manage/plan corporate IS strategies, strategic applications, technology architecture<br><br>**PA11** Support information access and security | **PA3** Reskill IS personnel<br>**PA5** Manage IS crisis<br><br>**PA12** Integrate existing and new business applications |

**Table 1 (Cont.)**

| | Top Level | Middle Level | Supervisory Level |
|---|---|---|---|
| IS manager's critical activities | **PA20** Manage vender partnerships | | |
| IS manager's skills / knowledge requirements | **PC1** Systems analysis and design<br>**PC2** System life cycle management<br>**PC3** Database management<br>**PC4** Distributed systems<br>**PC5** Business domain knowledge<br>**PC6** Programming language<br>**PC7** Telecommunications and network<br>**PC8** Operating systems<br>**PC9** Systems Integration<br>**PC10** Project Management<br>**PC11** Information technology management<br>**PC12** Analysis and Judgment<br>**PC13** Communication and coordination<br>**PC14** Team working | **PC1** Systems analysis and design<br>**PC2** System life cycle management<br>**PC3** Database management<br><br>**PC5** Business domain knowledge<br>**PC6** Programming language<br>**PC7** Telecommunications and network<br>**PC8** Operating systems<br>**PC9** Systems Integration<br>**PC10** Project Management<br><br>**PC12** Analysis and Judgment | **PC3** Database management<br>**PC5** Business domain knowledge<br><br>**PC7** Telecommunications and network<br>**PC8** Operating systems<br>**PC9** Systems Integration<br>**PC10** Project Management<br>**PC12** Analysis and Judgment |

IT/IS managers effects can differ in various areas. Although Wu et al. (2006) concluded the IS managers in different industries requires the same skills and activities, some researchers focused on area specific skills and activities the doctorate student Ejike C. Okonkwo, in 2003 at Nova Southeastern University, studied about the IS manager skill sets required particularly for Transition from Legacy Systems to Client/Server and Distributed Computing Environments. The study was based on multiple-case studies with MANOVA(Multi-Variance Analysis). Even though the research focused for Client/server and Distributed Computing Environments, the skill sets required for the IS Managers were similar skills with other researchers'

whose studies are for general IS/IT managers. Based on the previous dissertations and articles such as Haggerty, 2000 and Sawyer et al.1998; Okonkwo, 2003 separated the skills in four different categories. These categories are technology, business, interpersonal, and management skills.


Correspondingly; Sawyer, Eschenfelder, Diekema and McClure (1998) categorized the skills in four different groups to investigate general IT skills required for supporting information technology. The categories are business, technology management, interpersonal skills, and IT skills. These four categories represent the skills required to support information systems effectively in organizations. In detail, Business Skills are: General Business Skills, Organizational/Environmental Understanding, Technology Management Skills are: Operating Management, Strategic Management, Product Analysis, Project Management, Vendor Management, Self Management. Interpersonal Skills are: Personal Network Development, Client Support, Influencing, and Group Processes. And IT Skills are: Infrastructure, Distributed Technology, Programming Lang., Systems Integration, Network Fundamentals, Network Protocols, Internet/Intranet Tech., Desktop Support, Operating Systems, Database and System Analysis as shown in Table 2. Based on the results of the study, Sawyer et al. (1998) asserted Business, Technology Management and Interpersonal skills are presently very important and the demand for these skills will be higher in the future.

**Table 2 - List Of Skills By Sawyer, Eschenfelder, Diekema And Mcclure (1998)**

| Category | Skills |
|---|---|
| Business Skills | General Business Skills |
| | Organizational/Environmental Understanding |
| Technology Management Skills | Operating Management |
| | Strategic Management |
| | Product Analysis |
| | Project Management |
| | Vendor Management |
| | Self Management |
| Interpersonal Skills | Personal Network Development |
| | Client Support |
| | Influencing |
| | Group Process |
| IT Skills | Infrastructure |
| | Distributed Technology |
| | Programming Languages |
| | System Integration |
| | Network Fundamentals |
| | Network Protocols |
| | Internet/Intranet Technology |
| | Operating systems |
| | Database |
| | System Analysis |

Furthermore, another research tried to identify the future importance of IS/IT skills based on the previous records of demand for IS employees including the IS managers. Todd, McKeen and Gallupe (1995) examined the IS job advertisements from 1970 to 1990 including the senior IS managers job advertisements. Since one of this study's purposes is to define the future importance of skills, their research is highly investigated in order to investigate the results of this research will or will not be in parallel with their results. For the study, the researchers decomposed the IS job

skills to three main categories (technical, business, systems) which have seven more detailed categories (hardware, software, business, management, social, problem solving, and development methods) based on the ACM model developed by Wu et al (2004) as described in Table 3. The general analysis of the research founded on the number of technical, business and systems requirements displayed on job advertisements.

**Table 3 - Classification Of IS Knowledge/Skills By Todd, Mckeen And Gallupe (1995)**

| Class | Category | Description | ACM Categories |
|---|---|---|---|
| Technical Knowledge | 1. Hardware | Mainframe, mini, and personal computer. Other Devices such as storage devices, controllers, printers, and other peripherals plus networks | Computers |
| | 2. Software | Application systems, operating systems, packaged products (such as database, graphics, word processing), networking software, and languages | |
| Business Knowledge | 3. Business | Functional expertise(such as finance marketing) and industry expertise (such as retail, mining) | Organizations |
| | 4. Management | General management skills including leadership, project management, planning, controlling, training, and organization. | |
| | 5. Social | Interpersonal skills, communication skills, personal motivation and ability to work independently | People, Society |
| | 6. Problem Solving | Creative solutions, quantitative skills, analytical modelling, logical capabilities, deductive/inductive reasoning, innovation. | |

**Table 3 (Cont.)**

| Class | Category | Description | ACM Categories |
|---|---|---|---|
| Systems Knowledge | 7. Development Methodology | Knowledge of systems development methodologies, systems approach, implementation issues, operations and maintenance issues, general development phases, documentation and analysis/design tools/techniques. | Models Systems |

In consequence, Todd et al. (1995) pointed out technical knowledge requirement for IS managers is predominately related to operating systems, the business knowledge requirements are in relation with leadership, and the systems knowledge requirements are related to development methodology. Meanwhile, the three main lowest-ranking skills are hardware knowledge, business skills, and problem-solving skills. To summarize their 20 years of job advertisements investigation, business skills took %85-90 of the total job advertisement's requirements. Similarly, systems knowledge skills were consistently mentioned in about 80 percent of the ads. Surprisingly, while in 1970's, %20 technical knowledge, %40 business knowledge and %40 system knowledge consisted in the advertisements but in 1990's, this skills requirement profile has changed to %30 technical knowledge, %40 business knowledge and %30 percent systems knowledge. In absolute terms, not only there was an increasing demand for business skills reflected, but also a unexpected increase of demands for technical skills in job advertisements as illustrated in the Figure 2. References to technology increased from about %50 of job advertisements in 1970 to about %65 of them in 1990. Thus, both the number of technical references and the proportion of advertisements they appear in, have been increasing. At the same time, the general appearance of advertisements points out technology is not universally acknowledged to be important to the job of an IS manager.

| Service Industry | Manufacturing Industry |
|---|---|
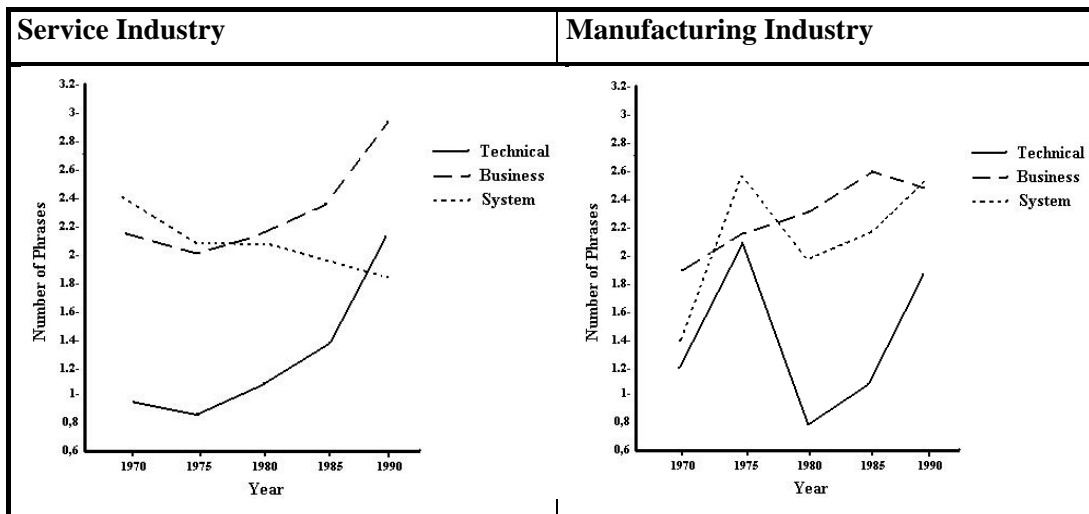


**Figure 2 - The Composition Of IS Manager Jobs By Skill Class-Service And Manufacturing Industries (Raw Data) By Todd, Mckeen & Gallupe (1995)**

Likewise, Lee, Trauth and Farwell (1995) tried to determine the future needs of critical IS activities and skills. The skills and activities are defined for all IT employees. The research focus of the study is to which the survey group is IS Managers, User Managers and IS consultants. Similar with other researchers, they categorized the skills as Technical Specialties, Technology Management Knowledge, Business Functional Knowledge, Interpersonal and Management Skills listed in Table 4 and also Table 5 indicates critical IS activities which have similarities with other researcher's IS/IT activities.

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## Table 4 – Critical IS Skills/Knowledge By Lee, Trauth And Farewell (1995)

| A - Technical Specialties Knowledge | B -Technology Management Knowledge |
|---|---|
| 1. COBOL, or other third generation language | 1. Ability to learn new technologies |
| 2. Telecommunications | 2. Ability to focus on technology as a means, not an end |
| 3. Network | 3. Ability to understand technological trends |
| 4. Operating systems: Mainframes | 4. Technology Management Knowledge |
| 5. Operating systems: Minis | |
| 6. $4^{th}$ generation language | |
| 7. Systems integration | |
| 8. Operating systems: Micros | |
| 9. Systems analysis/structured analysis | |
| 10. Systems life cycle management | |
| 11. Relational databases | |
| 12. Distributed processing | |
| 13. A specific programming language | |
| 14. Data management(e.g., data modelling) | |
| 15. Structured programming/CASE methods or tools | |
| 16. Decision support systems | |
| 17. Assembly language | |
| 18. Expert systems/AI | |

Table 4 (Cont.)

| C - Business Functional Knowledge | D - Interpersonal and Management Skills |
|---|---|
| 1. Ability to learn about business functions | 1. Ability to work cooperatively in a one-on-one and project team environment |
| 2. Ability to interpret business problems & develop appropriate technical solution | 2. Ability to plan and execute work in a collaborative environment |
| 3. Ability to understand the business environment | 3. Ability to deal with ambiguity |
| 4. Knowledge of business functions | 4. Ability to work closely with customers and maintain productive user or client relationship |
| | 5. Ability to accomplish assignments |
| | 6. Ability to teach others |
| | 7. Ability to plan, organize and lead projects |
| | 8. Ability to develop and deliver effective, informative, and persuasive presentations Ability to plan, organize & write clear, concise, effective memos, reports, and documentations |
| | 9. Ability to be self-directed and proactive |

### Table 5 – Critical IS Activities By Lee, Trauth &Fareewell (1995)

| | |
|---|---|
| 1. | Support existing portfolio of applications |
| 2. | Develop in-house applications |
| 3. | Manage/plan systems development/implementation |
| 4. | Analyze business problems and IS solutions |
| 5. | Support existing portfolio of applications |
| 6. | Develop in-house applications |
| 7. | Manage/plan systems development/implementation |
| 8. | Analyze business problems and IS solutions |
| 9. | Integrate existing and new business applications |

**Table 5 (Cont.)**

| | |
|---|---|
| **10.** | Develop application software-purchase and tailor |
| **11.** | Develop databases |
| **12.** | Implement new or changed computer-supported business processes |
| **13.** | Support hardware |
| **14.** | Analyze software packages-evaluation & selection |
| **15.** | Manage/plan feasibility/approval process for new systems and technology |
| **16.** | Train and educate IS professionals |
| **17.** | Support information Access and security |
| **18.** | Manage/plan corporate IS strategies, strategic applications, technology architecture |
| **19.** | Integrate networks |
| **20.** | Support end-user computing (e.g. info. Center, hot line) |
| **21.** | Train and educate end users |
| **22.** | Implement data management procedures |
| **23.** | Implement system evaluation processes |
| **24.** | Support user-developed systems |
| **25.** | Integrate data types (e.g. video, voice) |

In conclusion, the skills and/or activities for senior managers of IT and IS departments, have been categorized by many different researchers for years. Even tough, some of the researchers avoided categorizing; the general tendency was to categorize the skills into technical, business and social skills sets and Table 6 has the summary of the Skill sets defined by other researchers. As a result, to emphasize the importance of senior IT managers, some of them such as Wu et al. (2004) specifically defined models due to determine the skills and/or activities. However, the general purpose of all researchers, similar to this research, was to define the future needs of Senior IT managers as skills and/or activities.

**Table 6 - The IT/IS Skill Sets Defined By Researchers**

| Academic Researchers | Categories of the Skills |
|---|---|
| Sawyer, Eschenfelder, Diekema & McClure (1998) | Business Functional<br>Interpersonal<br>Technology Management<br>Information Technology |
| Todd, McKeen & Galluppe(1995) | Technical Knowledge<br>Business Knowledge<br>Systems Knowledge |
| Lee, Trauth & Farewell(1995) | Technical Specialties Knowledge<br>Technology Management Knowledge<br>Business Functional Knowledge<br>Interpersonal and Management Skills<br>+ Activities |
| Wu, Chen and Lin(2004) | No categorization(Listed each skill as singular) |
| Wu, Chen & Chang (2006) | No categorization(Listed each skill as singular) |

### 2.2.The Senior IT Managers' Effects to IT Departments

The second part of the study is about the effects of Senior IT managers' to the IT departments. This part summarizes the other researchers' study results and conclusions about these effects in various aspects. Although some of these studies are not directly related to the study's research area, for instance IT manager's effects in higher education, it guides the study in order get a clear understanding of the possible effects.

One of the latest relevant researches is published in 2006 by Mike (Tae-In) Eom. He studied the IS leadership effects on the IS units. The researcher's main purpose of this study is to propose a model that examines the relationships of IS leadership with strategy of IS unit's execution and the alignment of IS strategy with an organization's business strategy. Findings from this study provides appropriate

behaviours and the use of systems of knowing for IS as managerial implications for IS executives, especially for CIO's, these behaviours and systems' knowledge will increase IS teamwork process which will lead to a better IS Strategy Execution. As a result of his research, according to Mike Eom IS executives should consider developing systems of knowing for IS that impose the involvement of IS leaders and an IS department in the company's business planning.

Between the senior IT managers, CIOs and their effects are one of the most investigated issues by many researchers from various fields. One of the CIO focused research is done by Stephens, Ledbetter, Mitra and Ford. The main purpose of the study was to find out the real function of CIOs. In other words, they tried to identify if CIOs are really an executive managers or simply functional managers of the MIS. They studied on five different CIOs from various areas as: The insurance company, University, Manufacturing Company, Government and Utility Company CIOs.

They also stated, as a senior IT manager; the main function of the CIO is to bridge the gap between IT department and the firm's strategic plans. "Scheduled meetings", "Interaction outside the IT department", "Skilled reading of situations", "participation in strategy meetings" and "Maintaining a long-term/strategic focus for job responsibilities and purposes" are the five main factors affecting the CIO's ability to successfully bridge the gap between the IT and firm's strategic objectives.

In brief to sum up their research, CIO's are not just a functional manager or new named MIS manager, but in fact they are the executive managers. Therefore, CIO's are required to fill the gap between IT department and the other functional units and also the company's strategic plans. Thus this strategic role gives a lot of importance to the CIO's position and in conclusion, CIO's role effects the IT departments more than it seems.

CIO's have been the focus of IS and IT related researches for years. Similarly to the study of Stephens, Ledbetter, Mitra &Ford (1992).; Detlev H. Smaltz's research is also based on CIO's in 1999. Since the CIOs are the biggest authority and position given by the company as IT manager, it's position is mostly investigated than any other positions in IT/IS departments. The researcher while researching the antecedents of CIOs, he used field survey with suggesting the field surveys are more appropriate when attempting to answer "what", "how much" or "how many" type of research questions. The research questionnaires were sent to the CIOs and TMT (Technology Management Team) members.

The research also examined the relationship between CIO capability, TMT and CIO relationship and CIO effectiveness. The general conclusion was as Smaltz stated: "CIO capability simply dominates the paths of CIO effectiveness" with the CIO effectiveness' relationship with TMT through the organization.

As a continuation of Smaltz's study, Wayne A. Brown (2004) focused on CIO effectiveness in higher education. The researcher's main interests were CIO effectiveness and the action and the communication gap with replicating the study completed in a healthcare environment by Dr.Herb Smaltz with his permission. Brown's main conclusion was that there's a communication and action gap between IT and the other institutions. He states this gap is a major challenge and more detrimental than it seems which leads to major failures. The success of the IT leaders as well as the whole organization can have detrimental effects by this gap. But since senior IT executives have some of the most important systems' responsibilities inside the organization, the researcher believes it's mostly led by and responsibility of the IS executives, especially CIO's. Because of these causes, CIO's role has moved to a more strategic role in the institution, the researcher focused on CIO's effectiveness in four-year and higher education in the United States. The results of the study shed light on CIO's effectiveness that is debated in the literature. Brown emphasized there's a strong relationship between CIO's strategic business knowledge, IT

knowledge, interpersonal skills, political savvy and CIO effectiveness as perceived by the IMT (Information Management Team) in various CIO roles.

One of the leading literature researches for this study is investigated by Boynton, Zmud and Jacobs (1994). They studied the influence of IT management practice on IT use in large organizations. The main discuss was to research and understand the relationships between IT knowledge, IT management process with their influence on the IT use. They put the study result forward as: "The study's findings are encouraging and provide theoretical and practical insights into the complex realm of successful IT management. The results also indicate that the theoretical notions surrounding the construct of absorptive capacity may prove to be important in efforts to develop our understanding of IT management and IT use". In other words, the researchers indicated to increase the firm's absorptive capacity requires not only information exchange among IT providers but also an IT management climate within which gives IT and line managers a broad freedom to apply and focus on their personal ways of methods and increase their creativity inside both the IT department and the whole firm.

As an another view point to the issue of senior IT managers effects to their department, Kishen Parthasarathy Iyengar from Texas University discussed the leadership styles effects on CIO effectiveness in 2007. The research's' argue based on the leadership styles of CIOs. The researcher's' general tendency to examine the CIO leadership is coming from the general belief of leadership's effects not only to the CIO himself but also to the IT departments through the IT managers. As a result, researcher claimed that better management strategy and positive leadership reduces IT failures. The results pointed out the CIOs' position as a great degree of challenge and their need to commitment from their subordinates, in order to implement their strategic vision. Iyengar also underlined that CIO's need to show have certain technical knowledge in order understand technical discussions with subordinates.

As a result, many researchers studied the IS/IT leaders' effects to their departments from their leadership styles to their skills and activities. While some researchers specifically focused on CIOs others investigated the IT leaders generally. In conclusion, according to the researchers, senior managers of IT and IS departments have effects their departments in various levels.

## 2.3.The Impact of IT Departments to the Companies

The third and last part of the literature research is about the effects and relationship between IT departments and the organization of the private sectors. Since the rapid increase in technological development made IT and IS departments as one of leading departments in the organizations, their importance is increasing day by day. Therefore there are many researchers studied about this certain subject from various aspects.

Firstly, another Turkish doctorate student Ekin Keskin (2003) investigated the IT's effects in selected Turkish SMEs (Small-Medium Enterprises) in 2003. With case studies and surveys, Keskin's research aimed to bring attention to the importance to the IT applications in the business environment. As the use of IT increased day by day both decentralization and centralization increased as a result of lower level empowerment and upper level management's decision making process. Also it was evident by the research that increases in IT use, lead to easier and less costly formalization and larger span of control. The research's hypothesis supported that IT has changing effects to the organization structure and improves in various aspects.

In conclusion, the study claimed the impact of IT has changed in, not only technological aspects, but also after the IT practices implementation. Some of the obvious benefits are using less paper, faster information central storage, updating, retrieval, distribution and also improvements of decision making processes, authorization distribution which increases SMEs organization structure. In Addition

to the IT's effects to the SMEs structure, the researcher stated that the network of organization is one of the most effected part of the organization.

Helaiel Almutairi (2001) examined the effects of IS departments too but unlike other researchers, he investigated these effects on public organizations. Although this research's focus is on private organizations, his detailed research's focus on IS's adaptation process to the new technologies seemed helpful to the study. While developing a theoretical model and empirical validation, he tried to assess the success of IS within public organizations with developed models. His research area was randomly selected six of Kuwait's public organizations and analyzing their adaptation phase to the new information age. From the result of research, Almutairi concluded: "When users of information perceive that these systems are high quality systems and produce high quality information, the perceptions of these users that IS are making them more productive in terms of providing them with timely and need information for their work related responsibilities increase. This, in turn, leads to increasing the perception that IS lead to enhancing the effectiveness of the organization. Moreover the study findings indicated that when the perception of having high quality IS that produce high quality information increases, the perception that IS lead to enhancing the effectiveness of the organization increases".

In addition to public organization focused research, Guenjoo Lee published his research with the title "The performance impacts of information technology in public organizations" at Indiana University in 1999. The dissertations main focus is state governments with their IT investments. Results of the study found a significant positive impact of state governments' investment in IT on state-wide economic performance. Secondly, the study also indicated IT investment pushes back the investors because of reasons such as changing old equipment with new ones and employees' IT training.

Many researchers tried to investigate and/or measure the IT effects and/or use on various organizations. Ahmed Abdullah Alshilash is also studied on "A study to Measure the Use and Effects of IT on Organizational Functions" in 1997. The main objective of this dissertation was to measure the degree to which IT is utilized in organization functions, internal and external factors; and to examine the positive consequent effects of these functions and factors on organizational performance. Based on the Alshilash's research , in terms of IT use, the various types and percentages of IT have been used as follow: Personal computer(76.2%), Mainframe (58.6%), Database Management (73.3%), Operating System(86.4%), Spreadsheets (49.3%), Word Processing (55.7%), Desktop publishing (18.6%), Computer Languages (33%), Graphics (40.9%), Decision Support System (8.1%), Expert System (4.1%), Executive Information System (5.8%), Communication Networks (33.9%), Statistical Applications (21.4%), Scientific Applications (7.8%) and other applications (14.2%). Finally, based on his dissertation's analysis and findings, it's clear to state that IT use in organizations has a significant effect to the overall organizational performance.

Another example of IT's effectiveness on different industry, Chih-Chung David Huang (1999) researched for human service organizations and IT's organizational effectiveness. He concluded IT use has great effectiveness in organizational performance. The researcher's study results noted employees do not perceive enough training opportunity of IT system which gives less optimistic impacts to the organizational effectiveness from the IT systems. IT systems have great impact to the employees' job perceptions and thus their job satisfaction levels which directly results organizational productivity and performance increase in general. The results of research also stated IT has positive support to the Team effectiveness in many concepts such as fast and secure communication. Since teamwork has the biggest impact on employees' perceived organizational effectiveness, any positive effect to the team effectiveness effects the whole organization positively. Thus as a result, IT has a positive effect the organizational effectiveness.

# CHAPTER III

# PROPOSED MODEL, METHODOLOGY, RESEARCH QUESTIONS AND HYPOTHESES

This chapter presents the proposed model, methodology, research questions and hypotheses of the research. The defined skill and activity sets, their groups and the proposed model of their relationship with each other are discussed and explained with reasons in this chapter. The skills and activities and about how and why they are selected and grouped are also presented.

## 3.1. Research Model

The detailed structure of this research's model is illustrated in Figure 3. In detail, The skills and activities are simply divided into three subsections as social, business, technical skills and social, business, technical activities.

Another research question is to define the effects of educational background with these skills and activities to the organizational success through the IT departments. Another purpose of this study, illustrated in Figure 3, is to define the future importance of these skill groups. Each skill groups (Business, Social, Technical) is investigated if they will increase or decrease their importance in the future.

Also the roots of these skill groups are investigated. All skill groups are investigated whether are naturally inborn or developed as seen in Figure 3.
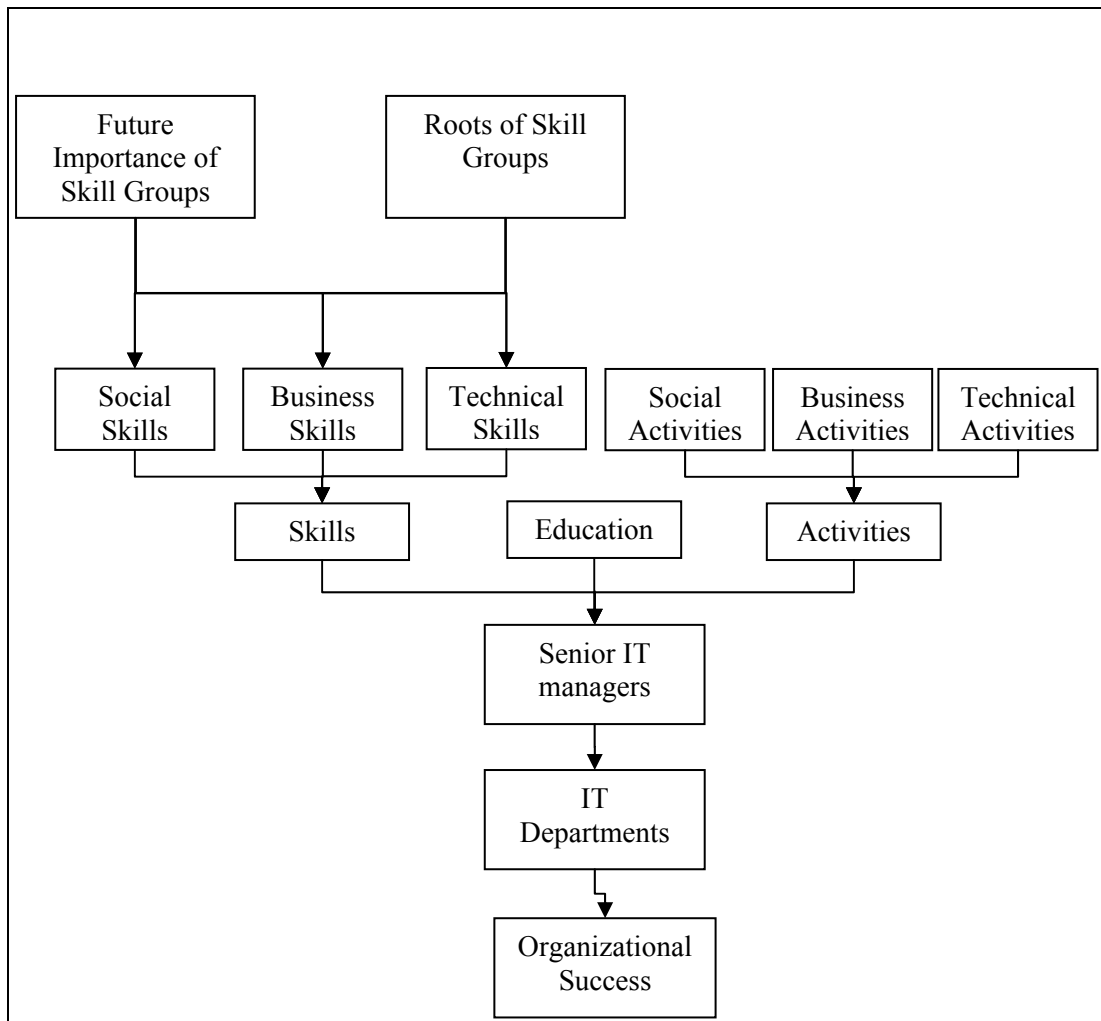
**Figure 3 – The Structure Of Research Model**

### 3.2. The Skill and Activity Sets

To understand senior IT managers functions in more detail, Job Characteristics Theory (JCT), from Hackman and Oldham (1976) and ACM Theory from Wu, Chen and Lin (2004), provided a very good base to understand the roles of senior IT managers with their responsibilities as activities and required skills to perform them. The JCT argued that skill variety is the degree to which a job role requires a variety of different activities when carrying it out; it may involve the use of several skills. In addition, Wu et al. (2004) stated despite IS managers operating in different types of industry, there was a degree of homogeneity in the types of management activities among them. Many other researchers tried to identify the skills and activities that are

required for the Senior IT managers. However, the identification of those skills and activities are not evident to determine. Therefore, not only based on the previous researchers skill set definitions, but also their case study respondents' comments; skills and activities are selected and defined in this research.

Firstly, various skills and/or activities are investigated from previous researches and dissertations. Important skills and/or activities for not only senior IT managers but also all levels of IT employees are investigated. Researches with different study results are specifically investigated in order to get more detailed explanation about the requirements and responsibilities of senior IT managers. Wu et al. (2004), Wu et al. (2006) and Hackman et al. (1980) were the most useful researchers about defining the skills and activities.

Once the initial list of skills and activities were generated, a process involving not only academic researches but also IT related journals that are making comments about the skills and activities were conducted to refine the list. For example, Haggerty (2000) specifically mentioned that his two of his personal interview respondents told him that they used mainly their communication and negotiation skills to be successful in their project management. Getting the opinions of Senior IT managers and IT scholars about skills and activities helped the research to define the final list of skills and activities required for senior IT managers. As an influential journal for definition of skills and activities, Brian Robinson's (2008) "Do CIOs face a glass ceiling?" article which includes various essential requirements of skills for CIOs. Although many of skills and activities from the journals are already listed in literature surveys, some of these skills are re-mentioned by other researchers which implies the importance of these skills and activities. After the evaluation for those journals, on the final list, there were 25 critical senior IT managers' professional activities and 18 professional skills / knowledge as listed in Table 15.

The reason behind the two grouping of senior IT managers as skills and activities, as like defined in Wu et al. (2004) and Wu et al. (2006), is because of the main idea of this research to clarify the relationship between the skills of an senior IT manager and his/her obligations to be successful listed as activities. Wu et al. (2004) and Wu et al. (2006) defined the IS managers skills and activities without grouping them into different areas. Hackman et al. (1980) defined the skill also as an ability that can be developed, not necessarily inborn, and that is manifested in performance, not merely in potential. In addition, Wu et al. (2004) defined the activities as the responsibilities that have to be performed to be successful in their positions. For this reason, the list of skills includes the skills which can be learned.

After the general skills and activities are defined they are both grouped into three different groups as business, social and technical skills and activities. The selection of the activities and skills to these two groups are simply based on their relation with group types. The selection of these groups name based on the review of the literature research on the same subject, skills of IT employees or managers as listed on Table 6. Although the previous studies stated trans-groups in order to group the skills such as Interpersonal Skills (Sawyer et al., 1998) and Interpersonal and Management Skills (Lee et al., 1995); in order to simplify the groups, the skills and/or activities into three main areas as Social, Business and Technical groups.

### 3.3. The Research Questions and Hypotheses
#### 3.3.1. The most requisite skills and activities for senior IT managers

Hackman et al. (1980) defined the skill as an ability that can be developed, not necessarily inborn, and that is manifested in performance, not merely in potential. Hence the proposed list of skills varies from "teamwork" to "general database knowledge skill" for senior IT managers. Secondly, the activities are the requirements in order to perform their duties. The purpose of this research question is to define the most requisite skills and activities for senior IT managers and allow them to re-evaluate their skills and activities. The research is investigated with the

online survey filled by IT employees used Likert type rating scale. The choices will be as -2 = strongly unimportant; -1 = unimportant; 0 = neutral; +1 = important; +2 = strongly important. The online survey linked in Survey Monkey web site (http://www.surveymonkey.com) is shown in Appendix A.  The informants rate the importance level of each skill and activity as listed in a column without any separations without knowing which skills and activities belongs to which group (social, business, technical). The average ratings/means or these skills and activities displays these importance level both as per each skill, activity and as a group such as social skills. The main purpose of displaying skills without defining which group they belongs to, is to avoid the survey respondents to affect their choices of importance by showing them the groups as social, business and technical skills and activities.

### 3.3.2. Senior IT managers' education, skills and activities affect to the organizational success

**H1:** There's a direct relationship between the Senior IT Managers' education, skills, activities and the general success rate of the IT department.

The increasing value of information is putting IT departments into more crucial positions. In parallel, the position of IT departments has changed from a supporting role to an increasingly strategic role with a competitive advantage over the past five decades (Smaltz, 1999). Furthermore the development of technology has an increasing speed day by day. Therefore the position of senior IT managers and their skills, activities constantly alter in time. The biggest example of this situation is the upcoming of CIO position in IT departments at the beginning of 1980's. As a result, changing nature of IT requires to periodical investigation in all fields and perspectives. Therefore, this research's purpose is to investigate the relationship between education, skills and activities of senior IT managers and IT departments in order to define the current position of senior IT managers in latest years.

The investigation of this research question is investigated by face-to-face interviews and online survey questions filled by the online survey respondents of IT employees from any position. The survey questions are in Likert type as -2 = strongly disagree; -1 = disagree; 0 = neutral; +1 = agree; +2 = strongly agree. To investigate of the relationship between senior IT manager's skills, activities and success of IT properly, respondents are asked about including outside the skills and activities listed above the survey, have direct relationship by the Likert type question. The purpose of this question is to include the possibility that the survey informant may not be satisfied with the list of skills and activities defined, and may already have skills and/or activities defined outside the list.

### 3.3.3. The proposed educational background for senior IT managers

**H2:** The proposed education for a senior IT manager should have the IT based engineering undergraduate with an MBA degree after at least 2 years of work experience.

The educational background of senior IT managers, especially CIO's, are one of the most discussed issues in the IT management field. As Nelson (1991) stated although researchers have addressed the training (skill-based) needs of IS and IT personnel (Benbasat, Dexter & Mantha, 1980; Cheney, 1988; Lee et al., 1995; Wu et al., 2006), the educational needs remain largely unexplored. Especially most of the scholars focused on the general educational needs for IS/IT personnel of all levels for the private sector companies but the senior IT managers educational background still remains largely unexplored. With face-to-face interviews with the senior IT managers, the educational background is hoped to be explicitly determined. Investigating the educational background of senior IT managers in detail was part of the face-to-face interviews with the senior IT managers. The first part investigates the undergraduate disciplinary and whether they should work during undergraduate education or not. The second part investigates the graduate and doctorate education disciplinary if they're required and whether they should gain work experience before and during the graduate education. The last question investigates, depending on the

previous answers of the respondents, why senior IT managers shouldn't have any more education with multiple choices including an open-ended question. However, contrary choice "No, they should have as much education as they can" is also included in the choices. In addition, since it was a face-to-face interview, the interviewees were explained they could answer outside of the choices for each question.

The hypothesis is based on the general senior IT management job advertisements requirements and the general MBA education requirements. Most of the job advertisements for senior IT managers require MBA education with technical engineering background, mostly computer engineering undergraduate. And the top MBA educating business schools require between two to five years of work experience in order to apply for the business schools' MBA education.

### 3.3.4. The most important group of skills and activities for senior IT managers' success

**H3a:** The Business skills and business activities are the most significant ones for the senior IT managers' success rate.

**H3b:** The Social skills and social activities are the most significant ones for the senior IT managers' success rate.

**H3c:** The Technical skills and technical activities are the most significant ones for the senior IT managers' success rate.

IT applications in the business environment have changed and continue to change dramatically (Lee et al., 2002). This forces senior IT managers to re-evaluate and upgrade their professional skills and activities on a regular basis. In today's business environment, senior IT managers must not only have the right skills and activities but also make decisions about the needs of their groups and match the job tasks with personnel skills, making long-term resource commitments based on their perception

of tomorrow's IS environment and their organization's future needs (Cheney & Hale; 1990). For this reason, obtaining and retaining senior IT managers with the skills and knowledge required to support the organization effectively is an important challenge. This research question is hoping to find the most important group of skills and activities to overcome this problem and to define today's requirements for senior IT managers. The online survey is used for this purpose and respondents specifically asked to rate each skill and activity without knowing which group they belong to. The choices were the Likert type rating scale as: -2 = strongly disagree; -1 = disagree; 0 = neutral; +1 = agree; +2 = strongly agree. The results came from the informants is hoped to clarify the research question.

### 3.3.5. Group of skills of senior IT managers which are naturally part of personalities or developed

**H4a:** For Senior IT managers, the social skills are naturally part of their personalities.

**H4b:** For Senior IT managers, the technical skills can only be learned during education and at work.

The skills of senior IT managers are the tools for their job performance. Hackman et al. (1980) defined the skill as an ability that can be developed, not necessarily inborn, and that is manifested in performance, not merely in potential. Therefore to investigate which groups of skills are naturally born with or gained with education and/or work experience, the online survey is filled by IT employees from all levels of department. The hypotheses of this research question are based on the general public opinion about the social and technical skills. The online survey respondents specifically asked if they believe the groups of the skills are naturally born or learned with education and/or work experience. They rate the answers with the Likert type rating scale as: -2 = strongly disagree; -1 = disagree; 0 = neutral; +1 = agree; +2 = strongly agree. The results came from the informants is hoped to clarify the research question.

### 3.3.6. Group of senior IT managers' skills that will be more important in the future

**H5:** The Social skills of Senior IT managers will be more important in the future.

As the position of the IT departments is changing, the leaders of the IT departments may require gaining explicitly certain types of skills. In addition to acquiring new skills, the senior IT managers will need to understand not only the business goals of their organizations but also have to guide their employees and projects through these goals. Therefore, for senior IT managers, certain skills gained and will gain more importance as the importance of IT departments and technological developments increases. This research question's purpose is to clarify the groups of skills (business, social, technical) which will be more or less important in the future. To investigate the results of this research question and clarify the hypothesis, online survey's third part is used with Likert type five point rating scale as: -2 = strongly disagree; -1 = disagree; 0 = neutral; +1 = agree; +2 = strongly agree displayed as displayed in Appendix A. The skill groups are listed in tables and asked the survey respondents if they believe the specific skills group will be more important in the future.

### 3.3.7. Group of senior IT managers' skills that will be less important in the future

**H6:** The Technical skills of Senior IT managers will be less important in the future.

Degraded skills are often inadequate for application of new Information Technologies (Benamati and Lederer, 2001) and according to Hunter (1998), generally IT skills deteriorate over time. To support new information technologies, IT professionals need to entail new skills. The new skills may require more than technical skills because the function of new technologies affect the whole IT departmental and organizational structure. Besides, the technological improvements may force the IT departments to take up new roles. Smaltz (1999) stated the position

of IT has changed from a supporting role to an increasingly strategic role with a competitive advantage over the past five decades. In addition to acquiring new skills, the senior IT managers will need to understand not only the business goals of their organizations but also upgrade their skills in order to the fast changing environment of IT business. In the study conducted by Sawyer et al. (1998), the authors reported that there is an implicit set of skills that are expected of IT professionals. And many senior IT managers are lacking these skills (Benamati and Leder, 2001). For this reason, the purpose of this research question is to find out which groups of skills will lose their importance in time and enlighten the future senior IT managers about the not important groups. To investigate the results of this research question and clarify the hypothesis, online survey's third part is used with Likert type five point rating scale as: -2 = strongly disagree; -1 = disagree; 0 = neutral; +1 = agree; +2 = strongly agree. The skill groups are listed in tables and asked the survey respondents if they believe the specific skills group will lose its importance in the future.

### 3.4. Methodology Used

The detailed structure of this research's methodology is illustrated in Figure 4. The Senior IT Managers and their general profile, including their effects to the IT departments and the whole organization became a huge issue since the importance of IT departments began to rise up quickly in the latest years. According to O'Hara (1996), the specific skills needed by IT professionals in the changing IT workplace have not been clearly defined. Therefore, to investigate these issues, the research of this dissertation is divided into two parts. The first part of the research was the online survey method and the second part is the face-to-face interviews with the senior managers of the IT departments. In other words, there are two approaches of this research study; qualitative and quantitative.
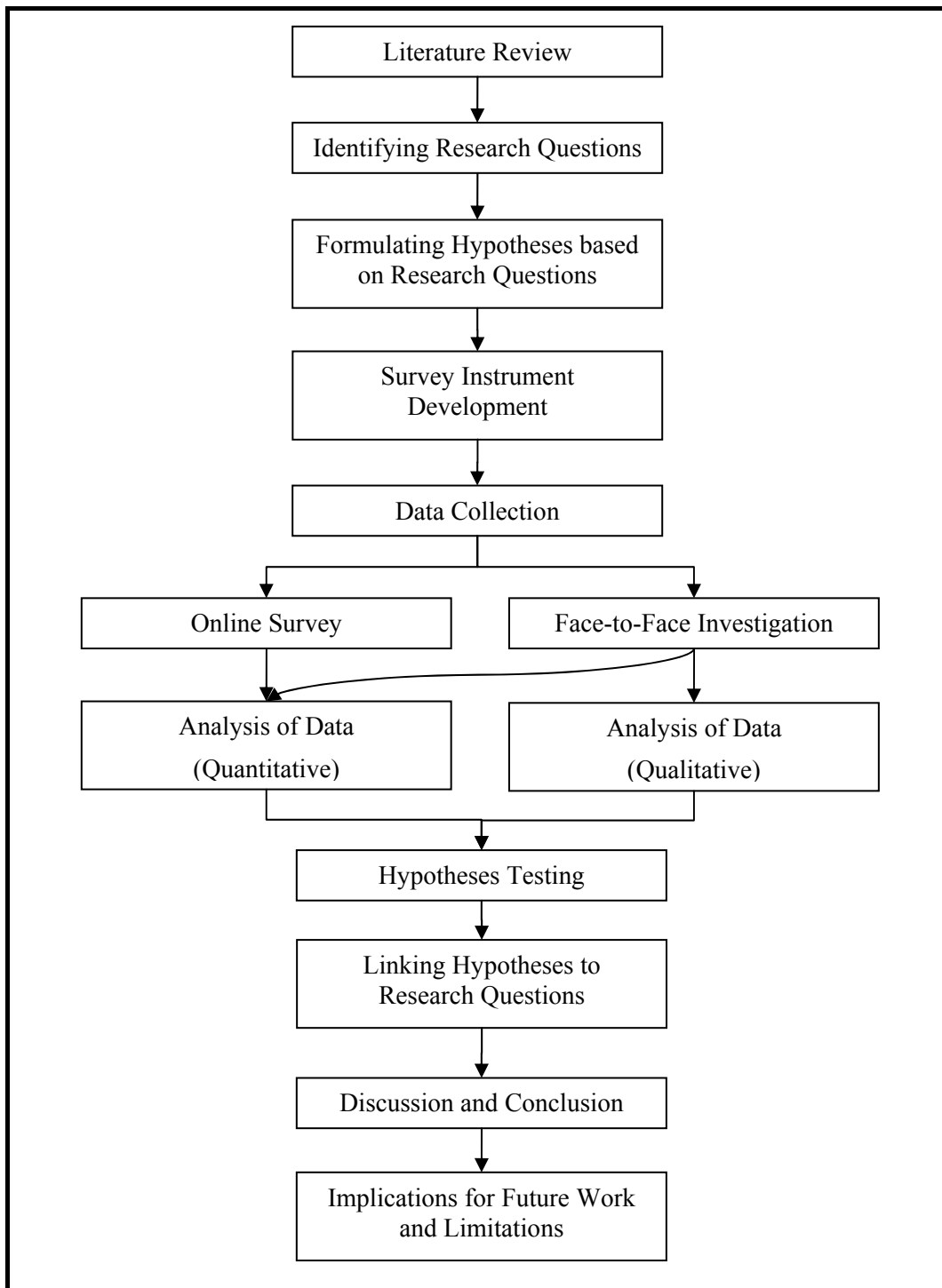
**Figure 4 - The Structure Of Research Methodology**

The qualitative approach is more appropriate to this study because the problem focus is on understanding the full multi-dimensional, dynamic picture of the subject study (Denzin and Lincoln, 2000). Qualitative research is appropriate when describing, understanding, and explaining complex phenomena, for example the relationships, patterns and configurations among factors; or the context in which activities occur (Smith and Dowling, 2001).

### 3.5.Research Design – Qualitative and Quantitative
#### 3.5.1.Online Survey

The first part of the research used quantitative method. Oxford University Press's dictionary defined "quantitative research (n.)" (2009) as "research based on traditional scientific methods, which generates numerical data and usually seeks to establish causal relationships between two or more variables, using statistical methods to test the strength and significance of the relationships.".

The quantitative method used in as online survey, allowed the IT employees to describe their opinions clearly and about how the background of a Senior IT Manager should be depending on their experiences and observations about the Senior IT Managers. The survey created and designed from the Survey Monkey (http://www.surveymonkey.com*)* web-site. After the survey design completed, the link which directs the survey are sent to the IT department employees from any positions in the IT department of a private organization. To gain the general perspective of senior IT managers, the online survey was filled by IT employees.

The privacy of the informants in the survey was protected. Participants were invited to participate in the survey by identifying their general profiles as: age, gender, official title, highest education level, total work experience in years and number of administrators between them and head of IT department. Informed consent is also managed online. An informed consent statement was prepared and survey

respondents were not able to complete survey and provide data for the research without explicitly agreeing to participate.

The second part of the survey contains the main questions investigating Senior IT managers' effect to the departments and whole organization. Respondents were also asked to rate the importance of the skills and activities using a five point Likert type scale, where -2 = highly unimportant; -1 = unimportant; 0 = neutral; +1 = important; '2' = highly important. In addition, the future importance and the nature of skill groups that can be learned and/or born with it In detail were asked with Likert type five point scale as: -2 = strongly disagree; -1 = disagree; 0 = neutral; +1 = agree; +2 = strongly agree. The survey was filled by any IT department employees, who are currently working or previously worked, for getting their general perspective of senior IT managers based on their observations and experiences about their senior IT managers. The main objective is to detect the underestimated and/or unforeseen skills and/or activities which have highly importance for Senior IT Managers.

### 3.5.2.Face-to-Face Interviews

The second part of the research used the qualitative method. According to Creswell (1998) qualitative research is "an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The researcher builds complex, holistic pictures, analyses words, reports detailed views of informants, and conduct a study in a natural setting". Therefore certain parts of the research were investigated with face-to-face interviews with currently working or previously worked senior IT managers only. The face-to-face interviews' questions are displayed in Appendix B. The first phase of the face-to-face interview with the senior IT managers is about collecting the general information about them such as age, sex, work experience and highest education level. With this general information of the interviewees profile also their background such as their education helped the research. The main reason to use face-to-face interview to firstly the need of guidance for the survey respondents understand the complex, and open ended

questions and situations. In addition, most of the face-to-face interviewees request the details and explanations of the certain questions, choices, skills and activities in order to relate them properly.

The privacy of the face-to-face interviewees was also protected. Participants were informed that their personal information will be used only for scientific research. An informant consent statement was prepared and read to the interviewees before the investigation. The face-to-face interview research explicitly began after the interviewees understood the statement and agreed to participate.

The face-to-face interview study methodology was very appropriate for this part of the research especially. In order to clarify the relationship between the skills and activities, the interviewees selected the certain activities needed to perform by each skill. As seen in the direct investigation with the interviewees, some interviewees were unable to understand the activities and skills from one word and therefore to assist the survey respondents by explaining the details, examples of the skills and activities based on their requests and missed points based on the other researchers statements about same and/or similar explanations of the skills and activities.

### 3.6. Target Population
#### 3.6.1. Introduction

The target population of this research's survey is the all IT employees from all levels. The online survey investigates the importance of skills and activities with the nature and future importance of social business and technical skill groups. The other part of the research which investigates the education of senior IT managers and the relationship of the skills and activities in face-to-face interviews has the target population as senior IT managers only. The focus of this research is on senior IT managers from the level of senior Project managers to IT department CIOs. Moustakas (1994) stated the focus should be on those who have lived the experiences

of the phenomenon because "the research participants have experienced the phenomenon, is intensely interested in understanding its nature and meanings, is willing to participate in a lengthy interview and possibly a follow up interview, grants the investigator the right to videotape the interview, and publish the data in a dissertation and other publications" (Moustakas, 1994).

The reason why the focus of this study was on the upper levels of the IT management in the private sector is because of upper level of IT officers possesses the power and capacity to initiate and enforce strategic decisions that impacts of their IT departments. Therefore since as Smaltz stated: "The importance of Information Technologies (ITs) is increasing day by day and in parallel the position of IT has changed from a supporting role to an increasingly strategic role with a competitive advantage" its importance affects directly their organization.

### 3.6.2.Sampling Procedure and Confidentiality

The participants in this study's online survey were IT employees in all levels of IT in the private sector. The face-to-face interview participants were individuals who were reached the senior IT management levels in their organizations. The participants in this study cut across various organizations in the private sector that included banking, insurance, software, telecommunication, technological research and development (R&D) industries. The process for identifying and recruiting the participants for this study was through personal contacts such as phone, mail and face-to-face. While most of the online survey respondents were reached through the e-mails sent to their department leaders and their personal e-mail addresses, the face-to-face interviews done by private meetings where the respondent and the researcher psychically be in the same room.

Before the respondents start the survey, they are informed about the purpose and the details of the research. Including explaining the respondents about the information

they are about to fill in, will be held in strict confidence and all findings will be cited anonymously. At the end of the online survey, respondents of this study checked a paragraph of consent demonstrating their willingness to participate in this study and indication of their willingness with their authorization to participate in this research. This paragraph's check mark is adjusted so that the survey responder couldn't complete the survey without checking it.

Also in the face-to-face interviews, the respondents are informed the about the details and purpose of the research and signs the informed consents paper which describes that the respondents voluntarily participated in the research and  authorized to use this data for scientific purposes.

### 3.6.3.Summary

In this chapter, the research design was investigated which is employed in both qualitative and quantitative. Essentially, 54 IT employees for online survey and nine senior IT managers for face-to-face interviews in the private sector across various organizations were selected to participate in this study. Purposive sampling technique was used to select the participants while telephone and emails tools were leveraged to provide necessary follow up to the online survey and face-to-face interviews.

In summary, this chapter described the ethical manner in which this study was conducted that ensured that the privacy of the participants was protected and the information provided by them.

### 3.7.Data Collection
#### 3.7.1.Online Survey

The online survey, shown in Appendix C, was used to collect data from respondents. This survey was deployed online at www.surveymonkey.com. A link to the survey

was sent in an e-mail to all participants. Participation in the survey was by invitation only. The survey included an informed consent statement at the beginning of the survey and a participant confirmation to be completed. The online survey, "an Investigation of The Activities and Skill Sets Needed by Senior IT Managers" (Appendix A), was emailed to 748 potential survey participants.

The first survey response was received on May 28, 2009. The last survey response was collected on June 15, 2009.Of the 748 original potential participants contacted via email, 76 respondents were filled the online survey. Out of 76 respondents, 22 surveys were either empty or incomplete and 54 respondents completed the survey.

The quantitative data were aggregated by combining all responses for a given item or element in the survey into one average. Descriptive statistics were used to analyze the quantitative data. Means and standard deviations with factor analysis were calculated. Each element in the survey had three parts, and they were the general respondent data; importance of skills, activities and details of the general groups.

### 3.7.2.Face-to-Face Interviews

The researcher also interviewed nine senior IT managers for this study. All face-to-face interviews were contained three main parts: gathering general data of the respondents, defining who the senior IT manager's education should be and determine the relationship between each skills and activities.

The face-to-face interviews, shown in Appendix B, were not only about gathering answers for required questions but also receiving the comments about the skills, activities and the education of the senior IT managers. The answers of the respondents were filled, comments noted on paper and also entered to the Survey

Monkey website by the researcher of this study in order to store the data electronically and analyze them with SPSS.

The first face-to-face interview meeting with interviewees was received on May 30, 2009. The last survey response was collected on June 17, 2009. Out of the 22 original potential participants contacted via email, 9 respondents were agreed to participate the research. During the meeting, at first the general tendency of respondents was to select or deselect all the activities for each skill. Their general reason was the all activities can be applied to all skills on different conditions. Therefore the respondents were explained the senior IT manager in this situation, is working in an international private organization with a classic IT department.

# CHAPTER IV

# APPLICATIONS OF THE RESEARCH

### 4.1.Results of The Statistical Analyses
#### 4.1.1.Factor Analysis and Reliability Test

The factor analysis was conducted to find the required skills and activities for senior IT managers in this research. The data used for factor analysis came from the online survey about the rates of importance of skills and activities. The results, shown in Appendix A display the groups of skills and activities and their percentage of variances which means the percentage of required skills and activities for senior IT managers. Each group has certain skills and activities from various types which covers the requirements of senior IT managers. The first group of factor analysis covers the 44% of the required skills and activities for an ideal senior IT manager as seen in "% of Variance" column in "Extraction Sums of Squared Loadings Column" (Appendix A). Also the second component covers 13% and the third component covers 5% of the required skills and activities for an ideal senior IT manager. The first three groups covers 62% while the rest of six components covers 19% which is very small amount compared to the number of skills and activities included in the components.

Reliability tests were conducted and the results came out very satisfactory. The alpha of the reliability analysis is "0.8617". The results of the reliability analysis states that the demographic details of the online survey respondents; such as age, gender, work

experience; alpha value is bigger than the reliability alpha value. If any data type's alpha value is bigger than the reliability analysis's alpha value, it means the data type's usage in analysis decreases the reliability of the analysis. Therefore the general details of online survey informants were not used during the analysis of this research. In detail, as seen in Appendix B, age's alpha value: "0.8951" > 0.8617, gender's alpha value: 0.8629 > 0.8617, highest education level's alpha value: 0.8621 > 0.8617, work experience's alpha value: 0.8950 > 0.8617 and the number of administrator between the respondent and head of IT department's value: 0.8766 > 0.8617 are all greater than the reliability coefficient alpha value (0.8617).  As a result, the demographical data were removed due to increase the reliability of the explanatory factor analysis which has a leading role in this study

### 4.1.2. Participants' Demographic Information
#### 4.1.2.1. Gender

The majority of the survey respondents were male. Of the 54 survey respondents, 39 informants were males and 15 responses from females. The Distribution is presented by 72.2% male and 27.8% female as shown in Table 7.

**Table 7 - The Gender Distribution**

|  | Frequency | Percent |
|---|---|---|
| **Face-to-Face** | 9 | 100 |
| **Male** | 9 | 100 |
| **Female** | 0 | 0 |
| **Online Survey** | 54 | 100 |
| **Male** | 39 | 72.2 |
| **Female** | 15 | 27.8 |

### 4.1.2.2.Age

The general age range of the face-to-face interviewees was between from 40 to 49. The average age of the senior IT manager participants were 34.9. The majority of the online survey respondents were between from 30 to 39. The 35.3% of the respondents were in the ages between from 20 to 29, 37.0% of respondents' age is between from 30 to 39, 24.0% of respondents between from 40 to 49 ages and 3.7% were above their 50's. The age distribution is displayed in Table 8.

**Table 8 – The Age Distribution**

| Age | Frequency | Percent |
|---|---|---|
| **Face-to-Face** | 9 | 100.0 |
| 20-29 | 0 | 0.0 |
| 30-39 | 3 | 33.3 |
| 40-49 | 4 | 44.4 |
| +50 | 2 | 22.2 |
| **Online Survey** | 54 | 100.0 |
| 20-29 | 19 | 35.3 |
| 30-39 | 20 | 37.0 |
| 40-49 | 13 | 24.0 |
| +50 | 2 | 3,7 |

### 4.1.2.3.Education

The predominant respondents of face-to-face interviews (77.8%) have the masters education from many fields such as computer engineering, electrical engineering, business administration. Most of the online survey respondents, which are 27 of the 54 informants representing the 50.0%, have the undergraduate education degrees. The distribution of the education levels is shown in Table 9.

## Table 9 – The Education Distribution

| Education | Frequency | Percent |
|---|---|---|
| **Face-to-Face** | 9 | 100.0 |
| Pre-Graduate | 0 | 0.0 |
| Undergraduate | 2 | 22.2 |
| Master | 7 | 77.8 |
| Doctorate | 0 | 0.0 |
| **Online Survey** | 54 | 100.0 |
| Pre-Graduate | 1 | 1.9 |
| Undergraduate | 27 | 50.0 |
| Master | 17 | 31.4 |
| Doctorate | 9 | 16.7 |

### 4.1.2.4.Work Experience

The 66.7% of our face-to-face Senior IT manager interviewees have 15 years of work experience at most. On the other hand, the majority of the survey respondents have work experience between from 1 to 15 years with 81.5%. The average work experience of these respondents is 10 years. The percentages of work experiences and frequencies are presented in Table 10.

## Table 10 - The Work Experience Distribution

| Education | Frequency | Percent |
|---|---|---|
| **Face-to-Face** | 9 | 100.0 |
| 0-15 | 6 | 66.7 |
| 16-20 | 1 | 11.1 |
| +20 | 2 | 22.2 |

**Table 10 (Cont.)**

| Education | Frequency | Percent |
|---|---|---|
| **Online Survey** | 54 | 100.0 |
| 0-15 | 44 | 81.5 |
| 16-20 | 7 | 12.9 |
| +20 | 3 | 5.6 |

**4.1.2.5.Number of Administrators between Respondent and IT Department Leader**

The 55% of our face-to-face Senior IT manager interviewees are the head of IT departments and therefore they have no administrators between them and head of the IT departments. On the other hand, the majority of the survey respondents have 1 or 2 administrators to the IT Leaders with 38.8%. The details of the number of administrators are presented in Table 11.

**Table 11 - The Number of Administrator(s) between Respondent and Head of IT Department**

| Education | Frequency | Percent |
|---|---|---|
| **Face-to-Face** | 9 | 100.0 |
| 0 | 5 | 55.6 |
| 1-2 | 1 | 11.1 |
| 2-3 | 2 | 22.2 |
| +4 | 1 | 11.1 |
| **Online Survey** | 54 | 100.0 |
| 0 | 12 | 22.3 |
| 1-2 | 21 | 38.8 |
| 2-3 | 20 | 37.0 |
| +4 | 1 | 1.9 |

### 4.2.Analysis of Frequency Distribution

#### 4.2.1.Introduction

This chapter presents the testing of the hypotheses and the research questions related with them. The hypotheses of the research are investigated with the factor analysis and average ratings of respondents and interviewees answers to the questions. The hypotheses are directly related with the research questions and therefore each hypothesis is investigated under its research question.

#### 4.2.2.Research Questions

##### 4.2.2.1.The most requisite skills and activities for senior IT managers

The explanatory factorial analysis made by the data from the online survey's importance level of skills and activities part. The means of the skills and activities calculated from the same part of the online survey by computing the rating average of all responses per each activity and skill. The rating scale is between from -2 to +2 and from the point zero the higher the mean of a certain skill or activity, the more important for senior IT managers. It also applies as, the lower than zero of the skill or activity's mean, more unimportant for senior IT managers in survey respondents' opinion. The results of factor analysis state the first group of skills and activities covers the 44% of the required skills and activities for senior IT managers. The second group covers the 13% and the third group covers the 5% as the three highest groups in the "Extraction Sums of Squared Loadings" column which explains the percentages for each component. The rest of the 6 groups have percentage of variances lower than %4. In other words, only the first three groups are retained because of their high percentage of variance (Appendix A). The other 6 groups have 19% of variance in total which means the skills and activities of these 6 groups, covers 19% of the required skills and activities for senior IT managers.

**Group 1:** The details of the first group are displayed in Table 12. The group one consist of all social skills except the multi-lingual social skill with two business

skills, one technical activity and one business activity. The multi-lingual skill, which has the lowest mean in the social skills (0.56), is not included in the first group by the factor analysis results. The means are represented in Table 12.

**Table 12 - Factor Analysis Group 1**

| Name | Type and Group | Mean (-2 to +2) |
|---|---|---|
| Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture | Business Activity | 1.17 |
| Appropriate Risk Taking | Technical Activity | 0.78 |
| Analysis and Judgment Skill | Social Skill | 1.22 |
| Creativity (Innovation) Skill | Social Skill | 1.11 |
| Leadership Skill | Social Skill | 1.35 |
| Team working Skill | Social Skill | 1.31 |
| Communication and Coordination Skill | Social Skill | 1.43 |
| Learning and Adapting Skill | Social Skill | 1.00 |
| Ability to Foresee Problems Skill | Social Skill | 1.21 |
| Monitoring and Controlling Skill | Business Skill | 0.94 |
| Planning and Organizing Skill | Business Skill | 1.26 |

The great proportion of social skills in the first group states its importance. Their mean (1.15) is the highest mean other than all other skill and activity groups. The second greatest group mean comes from the business skills (1.10). From the business skills, "Monitoring and Controlling Skill" and "Planning and Organizing Skill" were included in the first factor analysis group. "Planning and Organizing Skill" has the highest mean between the business skills.

Only two of the activities are included in the first group. "Appropriate Risk Taking" from Technical Activities and "Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture" from business activities has their highest

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mean in their own activity groups. Both of them have the highest means in their groups. The mean ratings from the online survey of groups' skills and activities states the importance of them in addition to the variance percentage of the group. The minority of the activities and majority of the skills also states the importance of skills rather than activities when we also consider the 44% of the first group's cover rating.

**Group 2:** According to the factor analysis results, the 13% of the senior IT managers' required skills and activities are covered by the list of skills and activities shown in Table 13.

**Table 13 - Factor Analysis Group 2**

| Name | Type and Group | Mean (-2 to +2) |
|---|---|---|
| Analyze Business Problems and IT Solutions | Business Activity | 1.04 |
| Analysis and Review of Work Status and Schedule | Technical Activity | 0.76 |
| Develop Technical Solutions to Business Problems | Technical Activity | 0.70 |
| Learning and Adapting Skill | Social Skill | 1.00 |
| Project Management Skill | Business Skill | 1.00 |
| Information Technology Management Skill | Business Skill | 1.11 |
| Software Engineering Body of Knowledge Skill | Technical Skill | 0.83 |
| General Telecommunications/Networking Knowledge Skill | Technical Skill | 0.33 |
| General System Analysis and Design Knowledge Skill | Technical Skill | 0.67 |
| Basic Computer Hardware Knowledge Skill | Technical Skill | 0.26 |
| General Database Knowledge Skill | Technical Skill | 0.44 |
| High-Level Internet Literature Skill | Technical Skill | 0.41 |

The second group like the first group has the majority of skills rather than activities. All the technical skills are included in the second group by results of the factor analysis. "Analyze Business Problems and IT Solutions" is the only business activity in this group. It has the second highest mean after the "Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture" business activity which is included in the first group. "Develop Technical Solutions to Business Problems" has the third highest mean in technical activities. Surprisingly, the technical skills are also included the second group which has the lowest mean between other skill and activity groups. All the technical skills are included in the second group.

**Group 3:** The third group covers the 5% of the senior IT managers' required skills and activities. The group consists of social and business activities only. The activities of this group displayed in Table 14. The third group covers all of the social activities except "Teaching Others" and "Rely on Others to do Critical Work" activities. These two social activities have the lowest mean rating.

**Table 14 - Factor Analysis Group 3**

| Name | Type and Group | Mean (-2 to +2) |
|---|---|---|
| Crisis management | Social Activity | 1.41 |
| Long-term Planning | Social Activity | 1.22 |
| Strategy Setting | Social Activity | 1.24 |
| Conflict Resolution and Motivation of Employee | Social Activity | 1.02 |
| Deal with Ambiguity | Social Activity | 0.94 |
| Leveraging Internal and External Resources | Business Activity | 0.91 |
| Design of Standard Operation Procedure | Business Activity | 0.69 |
| Setting Organizational Resource Standard | Business Activity | 0.61 |
| Recruiting | Business Activity | 0.66 |
| Budget Planning | Business Activity | 0.65 |
| Personnel Performance Evaluation | Business Activity | 0.91 |

In other words, according to the survey respondents, social activities are important except the two unimportant social activities for senior IT managers. In addition, with the business activities in the third group, 8 of the 11 business activities are selected by the first three groups.

As a result, all of the three groups of factor analysis results give us 62% of required skills and activities for senior IT managers. With the three groups, except the "Multi-lingual Skill", all social skills are seemed required for senior IT managers. In addition, all technical and business skills are included in these three groups. The three technical activities "Appropriate Risk Taking" (0.78), "Develop Technical Solutions to Business Problems" (0.70) and "Analysis and Review of Work Status and Schedule" (0.76) which have the highest meanings and importance between the technical activities are included in these groups. In the social activities, except "Rely on Others to Do Critical Work" activity, all social activities are covered in these three groups.

Furthermore, rating average of the skills and activities states "Communication and Coordination Skill" (1.43), "Leadership Skill" (1.35) and "Team working Skill" (1.31)from social skills are all included in these three groups which are the most important skills by the mean of importance based on the online survey informants' responses. The most important activities are "Crisis Management" (1.41), "Strategy Setting" (1.24) and "Long-term Planning" (1.22) from social activities group. In general, it is clearly seen, the mean of social skills (1.15) has the highest average between the skills and activities. Also the first group (44%) is covering of almost all social skills states the significance of social skills in the Table 15.

## Table 15 - The Mean/Rating Average Of Skills And Activities

| Type and Group | Type and Group | Skills and Activities | Mean (-2 to +2) |
|---|---|---|---|
| **Social Activities** Mean = 1.03 | **Social Activities** | **Crisis Management** | **1.41** |
| | **Social Activities** | **Strategy Setting** | **1.24** |
| | **Social Activities** | **Long-term Planning** | **1.22** |
| | Social Activities | Conflict Resolution and Motivation of Employees | 1.02 |
| | Social Activities | Deal with Ambiguity | 0.94 |
| | Social Activities | Rely on Others to Do Critical Work | 0.74 |
| | Social Activities | Teaching Others | 0.67 |
| **Business Activities** Mean = 0,83 | Business Activities | Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture | 1.17 |
| | Business Activities | Analyze Business Problems and IT Solutions | 1.04 |
| | Business Activities | Leveraging Internal and External Resources | 0.91 |
| | Business Activities | Personnel Performance Evaluation | 0.91 |
| | Business Activities | Manage/Plan Feasibility/Approval Process for New Systems and Technology | 0.89 |
| | Business Activities | Evaluate IT Performance and Upgrade Planning | 0.83 |
| | Business Activities | Manage/Plan Systems Development/Implementation | 0.80 |
| | Business Activities | Design of Standard Operation Procedure | 0.69 |
| | Business Activities | Recruiting | 0.66 |
| | Business Activities | Budget Planning | 0.65 |
| | Business Activities | Setting Organizational Resource Standard | 0.61 |

Table 15 (Cont.)

| Type and Group | Type and Group | Skills and Activities | Mean (-2 to +2) |
|---|---|---|---|
| **Technical Activities** Mean = 0.62 | Technical Activities | Appropriate Risk Taking | 0.78 |
| | Technical Activities | Analysis and Review of Work Status and Schedule | 0.76 |
| | Technical Activities | Develop Technical Solutions to Business Problems | 0.70 |
| | Technical Activities | Reskill IT Personnel | 0.54 |
| | Technical Activities | Implement New or Changed Computer Supported Business Processes | 0.48 |
| | Technical Activities | Integrate Existing and New Business Applications | 0.46 |
| **Social Skills** Mean = 1.15 | **Social Skills** | **Communication and Coordination Skill** | **1.43** |
| | **Social Skills** | **Leadership Skill** | **1.35** |
| | **Social Skills** | **Team working Skill** | **1.31** |
| | Social Skills | Analysis and Judgment Skill | 1.22 |
| | Social Skills | Ability to Foresee Problems Skill | 1.21 |
| | Social Skills | Creativity (Innovation) Skill | 1.11 |
| | Social Skills | Learning and Adapting Skill | 1.00 |
| | Social Skills | Multi-lingual Skill | 0.56 |
| **Business Skills** Mean = 1.1 | Business Skills | Planning and Organizing Skill | 1.26 |
| | Business Skills | Information Technology Management Skill | 1.11 |
| | Business Skills | Project Management Skill | 1.00 |
| | Business Skills | Monitoring and Controlling Skill | 0.94 |

**Table 15 (Cont.)**

| Type and Group | Type and Group | Skills and Activities | Mean (-2 to +2) |
|---|---|---|---|
| Technical Skills Mean = 0.49 | Technical Skills | Software Engineering Body of Knowledge Skill | 0.83 |
| | Technical Skills | General System Analysis and Design Knowledge Skill | 0.67 |
| | Technical Skills | General Database Knowledge Skill | 0.44 |
| | Technical Skills | High-Level Internet Literature Skill | 0.41 |
| | Technical Skills | General Telecommunications / Networking Knowledge Skill | 0.33 |
| | Technical Skills | Basic Computer Hardware Knowledge Skill | 0.26 |

### 4.2.2.2. Senior IT managers' education, skills and activities affect to the Organizational Success

**H1:** There's a direct relationship between the Senior IT managers education, skills and activities and the general success rate of the IT department.

The increasing value of information is putting IT departments into more crucial positions. In parallel, the position of IT departments has changed from a supporting role to an increasingly strategic role with a competitive advantage over the past five decades (Smaltz, 1999).Furthermore the development of technology has an increasing speed day by day. Therefore the position of senior IT managers, educational needs and skills with the activities constantly alter in time. Although many researchers investigated effects of senior IT managers to the organizations from different perspectives such as leadership styles (Iyrengar, 2007), no researchers investigated the effects of senior IT manager's education or skills and activities to the whole organization.

The online survey questions of our research about the relation of the education, skills and activities of senior IT managers and the organizational success. Also face-to-face interviewees are questioned about education and skills, activities of senior IT managers' affects to the organizational success.

The online survey results stated senior IT managers' skills and activities affects to the success of the organization as seen in Table 16. The mean rating for the question is "1.44". As expected, almost all of our survey respondents strongly agreed (96%) that senior IT manager's skills and activities affect to the success of the organization. The face-to-face interviewees are also generally agreed to the hypothesis.

**Table 16 –Senior IT Managers' Effects**

| Senior IT Managers' … | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mean (-2 to +2) |
|---|---|---|---|---|---|---|
| Skills and activities affects to the general success of the organization. | 0.0% (0) | 0.0% (0) | 3.7% (2) | 48.1% (26) | 18.1% (26) | 1.44 |
| Including outside the listed skills and activities above, all skills and activities affects to the general success of the whole organization? | 0.0% (0) | 3.7% (2) | 16.7% (9) | 59.3% (32) | 20.1% (11) | 0.96 |
| Educational background affects the general success rate of the whole organization? | 3.7% (2) | 7.4% (4) | 18.5% (9) | 46.3% (25) | 24.1% (13) | 0.80 |

The survey about, the affects of senior IT manager's education to the success of the organization, is also investigated. The online survey results stated senior IT managers' education directly affects to the success of the organization. The mean rating for the question is "0.80". As expected, almost all of our survey respondents (70%) agreed that senior IT manager's skills and activities affects to the success of the organization. The average ratings of both questions clearly states that effects of skills and activities are deeper than education of senior IT manager to the whole organization. The face-to-face interviewees also believed that skills and activities of senior IT managers are more crucial than education to affect the organizations. They generally agreed that the main reason of the difference is since required skills and activities for senior IT managers are periodically changing, the affects of skills and activities to the organization.

### 4.2.2.3.The proposed educational background for senior IT managers

**H2:** The proposed education for a senior IT manager should have the IT based engineering undergraduate with an MBA degree after at least 2 years of work experience.

The face-to-face respondents of our research were replied our series of questions about how the education of a senior IT manager's education should be with details and reasons. All the respondents of our face-to-face interviews are actively working or previously worked as senior IT managers. Each respondent answered the question of education at each level.

**Undergraduate Education:** The majority of the respondents (%66) stated that the undergraduate education of senior IT managers should be computer engineering, and MIS (Management of Information Systems), Electrical & Electronic Engineering and Electronic & Computer engineering get one votes from the other respondents. The distribution of the responses is as seen in Table 17.

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**Working with Undergraduate Education:** The respondents' answers were very interesting about the idea of working while the prospective senior IT manager is undergraduate student. While 3 respondents (33%) strongly disagreed and stated he/she should concentrate on his/her education, 4 respondents strongly agreed the idea and said the work experience is very important. Also 1 respondent agreed this idea as not necessarily. So the general average of this question is 0.33 which is closer to the neutral (0) than having agreement (1) to the idea.

**Graduate Education:** The majority of the respondents agreed to MBA education of senior IT managers. More than half of the respondents (55.6 %) said MBA education is required in order to understand general the general business life and managerial positions. The distribution of graduate education decisions is shown in Table 17.

**Work Experience before Graduate Education:** The 44.4% of the respondents agreed on having 2 year education. All 4 of the respondents who require 2 year work experience before graduate education were selected the MBA as graduate education. In addition, none of them said more than three years of work experience before graduate education is required for senior IT managers.

## Table 17 –Education Of Senior IT Managers

| | CE | MIS | Elec. & Elec. Eng. | | Elec. & Comp. Eng. | |
|---|---|---|---|---|---|---|
| Undergraduate education | 66.7% (6) | 11.1% (1) | 11.1% (1) | | 11.1% (1) | |
| | **MBA** | **CE** | **Elec. & Elec. Eng.** | | **MIS** | **No Education** |
| Graduate Education | 55.6% (5) | 11.1% (1) | 22.2% (2) | | 11.1% (1) | 0.0% (0) |
| | **Strongly Disagree** | **Disagree** | **Neutral** | **Agree** | **Strongly Agree** | **Mean (-2 to +2)** |
| Working with Undergraduate Education | 33.3% (3) | 0.0% (0) | 11.1% (1) | 11.1% (1) | 44.4% (4) | 0.33 |
| Working with Graduate Education | 0.0% (0) | 0.0% (0) | 0.0% (0) | 33.3% (3) | 66.6% (6) | 1.63 |
| Doctorate Education | 11.1% (1) | 0.0% (0) | 44.4% (4) | 33.3% (3) | 11.1% (1) | 0.33 |
| Working During Doctorate Education | 0.0% (0) | 0.0% (0) | 12.75% (1) | 37.5% (3) | 50.0% (4) | 1.37 |
| | **No Need** | **1 Year** | **2 Years** | **3 Years** | **4 Years** | **+5 Years** |
| Work Experience Before Graduate Education | 22.2% (2) | 11.1% (1) | 44.4% (4) | 22.2% (2) | 0.0% (0) | 0.0% (0) |

**Working with Graduate Education:** As expected, the entire senior IT manager respondents agreed on a senior IT managers' working during their graduate education. Most of the respondents it's a necessity of working during senior IT manager's graduate education. In addition rating average of the question is 1.63 which means generally the respondents see it as necessity.

**Doctorate Education:** The majority of the respondents answer to this question as neutral. They stated it's the senior IT manager's choice to have or not to have a doctorate education. They generally believe that the doctorate education has its advantages although it's not too much for the position of senior IT management. Also the mean of question is 0.33 therefore the general perspective of respondents is as neutral. As seen in the Table 17, one of the respondents strongly disagreed to the doctorate education. The respondents strictly stated the doctorate education is too much for senior IT managers and it's unnecessary. Another respondent strongly agreed of having doctorate education. He clearly stated that "The senior IT managers' position is very important and has to interact with different technologies and business applications related with technology, therefore they must have doctorate education".

**Working during Doctorate Education:** Except one, all of the respondents said senior IT managers shouldn't break their education if they will decide to have doctorate degree. Therefore gaining work experience before doctorate education didn't require any details. During the interviews, the respondent who strongly disagreed of doctorate education naturally skipped this question. Other respondents generally agreed of senior IT managers working during doctorate education. Most of the respondents said if the senior IT managers decided to have doctorate education, they shouldn't stop working in their area because of the danger of estrangement. The average rating of this question is 1.37 which means it's a general agreement that senior IT managers should work during doctorate education.

**General Opinion About Senior It Managers' Education:** The respondents are also being asked about their general opinions about the senior IT managers' education strategy. The majority of respondents agreed on continuing the education and learning as much as they can, is crucial for senior IT managers. One of the respondents said they should blend the education and work experience together in order to have the greatest advantage in business world. The general opinion is that the education does not require learning in public schools and it's better for senior IT managers to learn themselves with researching the required subjects after the graduate education. In addition, self–research seemed more advantageous because of the positions randomly busy times in working environment by the face-to-face respondents. The response rates are displayed in Table 18.

### Table 18 – General Opinion About Senior IT Managers

| The Respond | Percentage |
|---|---|
| They should have as much education as they can | 55.6 % (5) |
| Too Much education Alienate from real working environment | 0.0 % (0) |
| After certain education level, Just work experience is more advantageous than further education. | 22.2 % (2) |
| The Gap Between academic preparation and industry expectations | 11.1 %(1) |
| Other(Open ended):Blending the education and work experience together depending on the circumstances | 11.1 % (1) |

As a result of the face-to-face interviewees' responses, the questions about how a senior IT manager's education should be enlightened the one of the most speculated subject in the business world. According to the respondents; a senior IT manager should have a computer engineering undergraduate education. Working during the graduate education was given to the future senior IT managers' decisions and free times although some respondents strongly disagreed and stated that they should and concentrate on their field. As heavily supported, the MBA degree is a necessity for

senior IT managers with two years of work experience before the graduate education. As expected, the respondents' general opinion for future senior IT managers is to live and understand the IT environment and business world, before the MBA education and applying what they learned in their positions in order to promote to senior IT management. The doctorate should be started right away if the senior IT manager seems required to do so and shouldn't stop working because of doctorate education. The details of the face-to-face respondents' opinions are displayed in Table 19.

**Table 19 – Education Of Senior IT Managers**

| Steps of Education | General Response | Mean (-2 to +2) / Percentage |
|---|---|---|
| Undergraduate Education | Computer Engineering | %66,6 |
| Working During Undergraduate Education | Neutral | +0,33 |
| Working Before Graduate Education | 2 Years | %44,4 |
| Graduate Education | MBA | %55,6 |
| Working During Graduate Education | Strongly Agree | +1,63 |
| Working Before Doctorate Education | Strongly Disagree | -2,00 |
| Doctorate Education | Neutral | +0,33 |
| Working During Doctorate Education | Agree | +1,37 |
| General Opinion About Education | They should have as much education as they can | %55,6 |

### 4.2.2.4. The most important group of skills and activities for senior IT managers' success

**H3a:** The Business skills and business activities are the most significant ones for the senior IT managers' success rate.

**H3b:** The Social skills and social activities are the most significant ones for the senior IT managers' success rate.

**H3c:** The Technical skills and technical activities are the most significant ones for the senior IT managers' success rate.

The factor analysis and the average ratings states social skills and activities are the most important groups in their types. The average group ratings of the online survey results clearly state the importance of social skills with general average rating of 1.15 while the other skill groups' means were 1.10 (Business Skills) and 0.49 (Technical Skills) (Table 15). The importance also stated by the ratings of the factor analysis. The first group of the factor analysis covers 44% of the required skills and it consists of almost all social skills except the "Multi-Lingual Skill" of social skills. Furthermore face-to-face interviews with the senior IT managers clearly show the general conclusion is that social skills are more important than other skill groups. As a result, social skills' importance is stated in both factor analysis groups and means/average ratings.

Social activities, like the social skills, have the highest group average between the activity groups. Their general mean is 1.03 while other means are 0.83 (Business Activities) and 0.62 (Technical Activities). Also their importance is stated by the factor analysis results. The group three consist of almost all activities except the "Rely on Others to Do Critical Work Skill" which has the second lowest mean between the social skills (0.74).

### 4.2.2.5. Group of skills of senior IT managers which are naturally part of personalities or developed

**H4a:** For Senior IT managers, the social skills are naturally part of their personalities.

**H4b:** For Senior IT managers, the business skills are naturally part of their personalities.

**H4c:** For Senior IT managers, the technical skills can only be learned during education and at work.

**Social Skills**

The roots of social skills gave us controversial results. Although the mean rating of "Are social skills naturally parts of their personalities?" question is 0.96, the "development both with education and work experience" question has 0.76 mean close to the contrary question. Even though the supporting results came from "can social skills only be developed?" (-0.20) and "can social skills only be developed with education" (-0.44) questions. In other words, the results gave insignificant results that couldn't answer the research question whether they are naturally part of their personalities or developed. Therefore the hypothesis that suggests, the social skills are naturally part of senior IT managers, are unproved given by the analysis of the data from the online survey. The details of responses are listed in Table 20.

**Table 20 –Roots Of Social Skills For Senior IT Managers**

| Social Skills | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mean (-2 to +2) |
|---|---|---|---|---|---|---|
| Are naturally parts of their personalities? | 0.0% (0) | 5.6% (3) | 13.0% (5) | 61.1% (33) | 20.4% (11) | 0.96 |
| Can only be developed? | 5.6% (3) | 33.3% (18) | 37.0% (20) | 24.1% (13) | 0.0% (0) | -0.20 |
| Can only be developed with education? | 9.3% (5) | 44.4% (24) | 27.8% (15) | 18.5% (10) | 0.0% (0) | -0.44 |
| Can only be developed with work experience? | 5.6% (3) | 27.8% (15) | 25.9% (14) | 35.2% (19) | 5.6% (3) | 0.07 |
| Can be developed both with education and work experience? | 0.0% (0) | 5.6% (3) | 29.6% (16) | 38.9% (21) | 25.9% (14) | 0.76 |

**Business Skills**

The results of the business skills also gave us controversial results. Similar to the social skills' results, "Are business skills naturally parts of their personalities?" (0.17) and "Can business skills be developed both with education and work experience?" (1.19) questions have both positive rating averages, even though they are supporting the opposite opinions about the roots of business skills as shown in Table 21. As a result, like the results of social skills, business skills' roots are unidentified because of the controversial results and therefore the second hypothesis couldn't be proved by the results.

**Table 21 –Roots Of Business Skills For Senior IT Managers**

| Business Skills | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mean (-2 to +2) |
|---|---|---|---|---|---|---|
| Are naturally parts of their personalities? | 5.6% (3) | 16.7% (9) | 38.9% (21) | 33.3% (18) | 5.6% (3) | 0.17 |
| Can only be developed? | 0.0% (0) | 11.3% (6) | 37.7% (20) | 45.3% (24) | 5.7% (3) | 0.46 |
| Can only be developed with education? | 5.6% (3) | 32.2% (18) | 22.2% (12) | 35.2% (19) | 3.7% (2) | -0.02 |
| Can only be developed with work experience? | 1.9% (1) | 29.6% (16) | 20.4% (11) | 31.5% (17) | 16.7% (9) | 0.31 |
| Can be developed both with education and work experience? | 0.0% (0) | 0.0% (0) | 11.1% (6) | 59.3% (32) | 29.6% (16) | 1.19 |

**Technical Skills**

The technical skills' survey results gave clear opinions about the roots of technical skills. Based on the survey results, the respondents clearly stated the technical skills are not natural parts of their personalities with the rating average "-0.48". Supporting to this argument, the other questions related with the idea of technical skills' development have positive means. As shown in Table 22, the highest average rating came from "the technical skills' development both with education and work experience" (1.31), supported by the other related questions' positive means including the question that suggests opposite opinion which is "the technical skills are naturally part of personalities" with "-0.48" average rating. In other words, the results gave clear insight to the roots of technical skills In other words, according to the survey respondents' results, the technical skills can only be developed both with education and work experiences and these skills are not naturally parts of senior IT managers' personalities.

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**Table 22 –Roots Of Technical Skills For Senior IT Managers**

| Technical Skills | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mean (-2 to +2) |
|---|---|---|---|---|---|---|
| Are naturally parts of their personalities? | 18.5% (10) | 35.2% (19) | 24.1% (13) | 20.4% (11) | 1.9 % (1) | -0.48 |
| Can only be developed? | 3.7% (2) | 11.1% (6) | 20.4% (11) | 50.0% (27) | 14.8% (8) | 0.61 |
| Can only be developed with education? | 5.6% (3) | 18.5% (10) | 25.9% (14) | 40.7% (22) | 9.3% (5) | 0.30 |
| Can only be developed with work experience? | 3.8% (2) | 24.5% (13) | 20.8% (11) | 41.5% (22) | 9.4% (5) | 0.28 |
| Can be developed both with education and work experience? | 0.0% (0) | 1.9% (1) | 7.4% (4) | 48.1% (26) | 42.6% (23) | 1.31 |

### 4.2.2.6. Group of senior IT managers' skills that will be more important in the future

**H6:** The Social skills of Senior IT managers will be more important in the future.

### 4.2.2.7. Group of senior IT managers' skills that will be less important in the future

**H7:** The Technical skills of Senior IT managers will be less important in the future.

As previous researchers and this study clearly stated, the skills are very important for senior IT managers. Although, obviously, the future importance of skills has many variables such as development of technologies and business structures; this research investigated the phenomenon by asking the general opinions of the IT employees through the online survey. Therefore the online survey included the question about the future importance of groups of skills. The respondents replied the online questions of whether these groups of skills gain or lose importance in the future.

**Social Skills**

The survey respondents clearly stated that the social skills will increase its importance in the business world for senior IT managers. While 65% of respondents agreed or strongly agreed the increasing importance of these skills, 63% stated they disagreed or strongly disagreed to the idea of social skills loosing importance in the future. As the general averages of responses clearly stated, the social skills will gain importance (0.85) and definitely not lose importance (-0.67) over time. The Table 23 displays the results of social skills' gaining and losing importance over time.

**Business Skills**

The survey respondents stated the business skills will increase its importance with a higher average rating (1.07) than social skills' (0.85). While 62% of respondents' agreed or strongly agreed to the increasing their importance in the future, 52% stated they disagreed or strongly disagreed to the idea of losing importance in the future of the social skills. In addition, the general averages of responses, the business skills will increase their importance (1.07) and definitely not decrease their importance (-0.46) over time. The business skills' average ratings of increasing and decreasing importance over time state the respondents have stronger belief of business skills to increase their importance in the future rather than social skills. However according to the online survey results, respondents believe that it's more probable for business skills to lose their importance than social skills. The Table 23 displays the results of business skills' gaining and losing importance in the future.

**Technical Skills**

The respondents stated controversial responses to the questions about the future importance of technical skills. The general averages ratings shown the respondents are indecisive about the technical skills' future importance. The average rating of increasing importance in the future of technical skills is 0.83 while the losing importance rating is 0.04. In other words, while 75% of respondents' agreed or strongly agreed to the increase of their importance, 35% of respondents also stated they believed or strongly believed that the losing importance of technical skills in the future. Unlike the general public opinion of IT specialists that the losing importance of technical skills, the survey results stated the technical skills will gain importance as the previous researchers stated such as Todd, McKeen and Galluppe's research in 1990. The Table 23 displays the results of technical skills' increasing and decreasing importance in the future.

**Table 23 –Future Importance Of Social Skills**

| | | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mean (-2 to +2) |
|---|---|---|---|---|---|---|---|
| **Social** | More important in the future? | 0.0% (0) | 5.6% (3) | 29.6% (16) | 38.9% (21) | 25.9% (14) | +0.85 |
| **Skills** | Less important in the future? | 18.5% (10) | 44.4% (24) | 25.9% (14) | 7.4% (4) | 3.7% (2) | -0.67 |
| **Business** | More important in the future? | 0.0% (0) | 3.7% (2) | 14.8% (8) | 51.9% (28) | 29.6% (16) | +1.05 |
| **Skills** | Less important in the future? | 14.8% (8) | 37.0% (20) | 31.5% (17) | 13.0% (7) | 3.7% (2) | -0.49 |
| **Technical** | More important in the future? | 1.9% (1) | 3.7% (2) | 29.6% (16) | 28.9% (21) | 25.9% (14) | +0.83 |
| **Skills** | Less important in the future? | 11.1% (6) | 16.7 (9) | 37.0% (20) | 27.8% (15) | 7.4% (4) | +0.14 |

As a result, the respondents clearly believe that the social and business skills will gain importance over time supported by responding disagreement to the losing importance of these skills over time as seen in Table 24. However, even though the responses to the questions related about technical skills are in contradiction, the increasing importance of skills seemed more likely to occur than losing according to the survey respondents.

**Table 24 – The Means of Skill Groups Increasing and Decreasing Importance Questions**

| Skills Types | Mean of Increasing Importance Question (-2 to +2) | Mean of Decreasing Importance Question (-2 to +2) |
|---|---|---|
| Social Skills | +0.85 | -0.67 |
| Business Skills | +1.07 | -0.46 |
| Technical Skills | +0.83 | +0.04 |

# CHAPTER V

# DISCUSSION AND CONCLUSION

This section is divided into three subsections. In the first subsection, findings of the study are discussed and evaluated. The second subsection presents the conclusion reached based upon this research study. The third subsection offers recommendations for further research.

## 5.1.Discussion

One of the main purposes of this study is to identify the details of Senior IT Managers' skills& activities. The results clearly stated that the social skills and activities are the most important parts of Senior IT Managers. This is in parallel with previous research where it has been stated that the social skills are the most important group of skills. Todd et al. (1995) concluded their business and system skills are always in high demands based on their analyses from the job advertisements from 1970's to 1990's. Although they grouped these skills as business and system classes, the contents of these skill groups include high amount of social and business skills in our groups. Such as Interpersonal skills, communication skills, personal motivation, project management leadership in management, problem solving and social categories of business and system knowledge classes as displayed in Table 3. These skills stayed in high demand from 1970's to 1990's both in service and manufacturing industries for IS Managers. This proves the social skills importance for senior IT managers along with business skills which have 1.15 and 1.10 average ratings.

One of the many other studies that support the importance of social skills is researched by Lee et al. (1995). In their study, most of the social skills are grouped in "Interpersonal and Management Skills" group by the researchers. According to their multivariate analysis results, these skills currently have the highest variance (3.87) for IS managers among other groups of skills.

Social activities are also highly supported by researchers such as the Wu et al. (2004) and Wu et al. (2006). Even though in their research, the activities are not grouped or classified in different types; the social activities displayed in the study have the leading average rating among with business skills. Some of the leading social skills in the study are "Conflict resolution and Motivation" (4.10) and "Crisis handing" (3.86) which are close with our "Conflict resolution and Motivation of Employees" and "Crisis Management" social activities. Another researcher Okonkwo (2003) also supported the importance of social activities. In the study, the activities are displayed in two groups as Business Functional and Interpersonal skills. The case studies of the study stated these skills will be more important in the future. The major examples are "Plan project budget" (Budget Planning), "Rely on others to do critical Work". The mean of the importance of skills named as "Rely on others to do critical Work" varies between 2.81 to 3.89.

The proposed educational background for senior IT managers is also investigated in this research. Clearly the computer engineering is the most adequate for senior IT managers' according to face-to-face interviewees who are currently working or worked at the position of senior IT management. Most of the respondents stated although computer engineering is the best choice of education for it, it's not necessarily required and any related engineering field should also be adequate even though not as much as computer engineering. They also stated if the student has time to work during the undergraduate education, it gives an advantage in the business world as long as the work doesn't affect their educational success. MBA (Masters of

Business Administration) is also heavily supported by the respondents. They also stated before the MBA education whether they go to military service or not, they should work for two years. Therefore, according to the face-to-face respondents, they should merge easily what they learned in MBA with what they are experiencing in their jobs and get promotion with what they learned at school. Doctorate education is one of the dividing subjects between the respondents. The general conclusion is that they should have the doctorate education, if they require having doctorate education depending on the required area they are working on. In addition if the doctorate education seemed required by the future IT managers, they should stop working neither to gain work experience before the education nor to totally concentrate on it. However the general advice by the respondents is after the MBA education they should continue learning and improving them by doing their own research on the related subject. The interviewees' general reason for this was that the private business world's fierce-full environment gives less amount of free time on certain periods of time, especially on the senior IT management position as the responsibility increasing more and more.

The future importance of skills is also investigated in this study. The results clearly stated that social and technical skills will be more important in the future and will not lose their importance. Supporting to this hypothesis results, Okonkwo (2003) investigated the skill sets with the focus on Transition from Legacy Systems to Client/Server and Distributed Computing Environments. The researcher studied the future importance of skills and found out except certain skills, all skills' importance will increase in the future. The degrading skills are not included in our research due to its specific relativity with client/server and distributed computer environments such as "Understand importance of technical trends". The leading skill "Develop IT strategy" currently has 3.03 mean with 4.62 future mean in case organization A. The average ratings of this and other skills related to this study's is increasing in the future according to all other organizations. Another research studied by Lee et al. (1995), the social skills grouped in "Interpersonal and Management Skills" has

currently 3.87 average rating with 4.30 average rating in the future for IS managers. According to the researchers, all skills listed in the study will increase their importance; however similar to the technical skills, the "Technical Specialities Knowledge" of the study's future importance is not very likely to increase their importance in the future. The Technical Specialities Knowledge including very similar skills, such as "Systems analysis/structured analysis"(General System Analysis and Design Knowledge Skill), "Telecommunications", "Network" (General Telecommunications / Networking Knowledge Skill), has the lowest mean both for now and in the future as from 3.01 to 3.72.

Perhaps more important than any specific finding in our arguments is social skills and activities importance is still are and will be more important than any other skills in the future. However to investigate these issues including the other arguments studied in this research, the future studies could focus on the responses for two different groups of respondents as Senior IT Managers and other IT employees in order to investigate the inside and outside look to the Senior IT managers' related issues.

One of the main purposes of this research was to identify the relationship between the skills and activities. The relationship between the different groups of skills and activities has never been investigated in the literature about the same or similar subject. Therefore finding the relationship between the skills and activities from different groups such as the connection between social skills and business activities, will clarify not only the most required skills but also the most required skill group for all activities The Face-to-face interviews with senior IT managers were developed for this purpose as shown in Appendix B.

Logically, the relationship between the same group of activities and skills should be closer than others. However, although this research investigated this subject by asking senior IT managers in face-to-face about which activities are required for each skill, the results were unsatisfactory and irrelevant (Appendix B). For example, even though the business skills' (1.10) importance is no higher than social skills' (1.15); business skills are required by activities more than social skills. In detail, according to face-to-face respondents a business skill is required by 8 activities per skill in average while a social skill is required by 5.125 activities. Table 25 displays the theoretical relationship between the skills and activities no matter if they are from the same group or not, can affect each other.

**Table 25 - The Relationship Between The Skills And Activities**
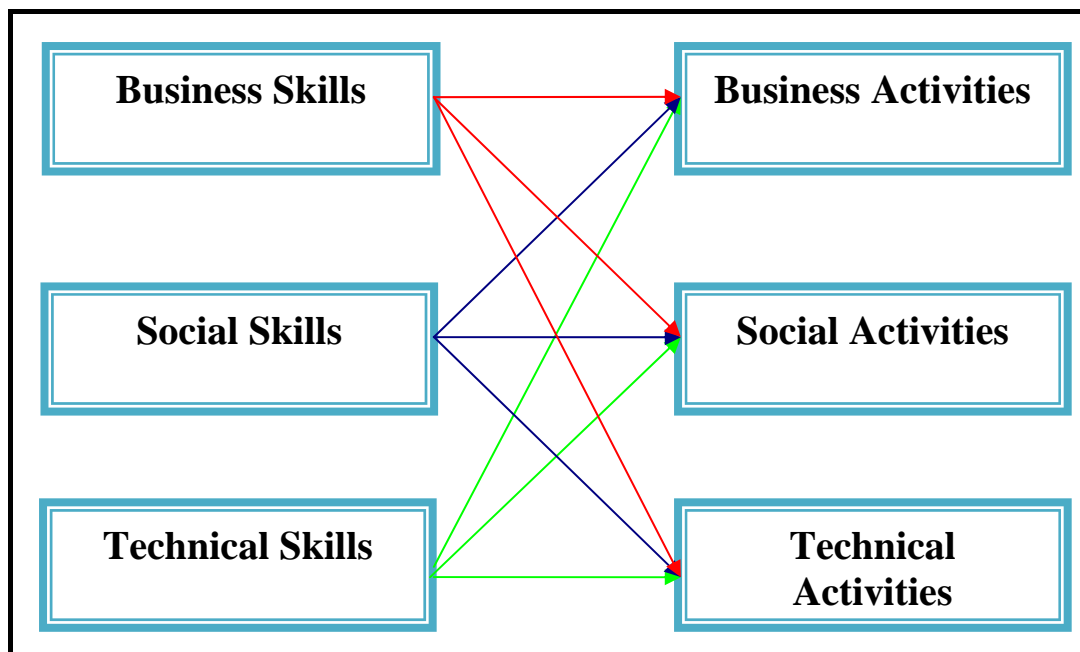


### 5.2.Conclusion

We believe that this study and especially the required skills and activities defined in our study will help senior IT managers to develop themselves and as a result enable to gain advantage in the private business world. The defined skills and activities with

their level of importance and the recommended education for senior IT managers may also help future senior IT managers when preparing themselves. Moreover this study forms a set of guidelines and a road map for IT managers on their way to developing themselves to become a senior IT manager. We believe that the findings presented in this study may provide important direction and guidance for senior IT managers labouring in the private sector.

As a result the study proved that the "Crisis Management" (1.41), "Strategy Setting" (1.24) and "Long-Term Planning" (1.22) activities has the highest ratings among the activities and "Communication and Coordination Skill" (1.43), "Leadership Skill" (1.35) and "Team working Skill" (1.31) has the highest skill ratings among skills. Also since all of the top three highest rated skills and activities came from the social skills and social activities groups, the general average rating of social skills (1.15) and social activities (1.03) have the highest average rating among the skill and activity groups which proves that social skills and social activities are the most important groups for senior IT managers. Research emphasis could also be placed on identifying the required education for future senior IT managers. The education advised by our interviewees, is to have computer engineering undergraduate and with at least 2 years work experience before MBA education. The doctorate education and working during the undergraduate education is given to the decision of the future senior IT managers.

The research also indicated that there's a direct relationship between the senior IT managers' education, skills, activities and the organizational success. The survey respondents clearly stated that the organizational success and the senior IT managers' educational background with skills and activities have a direct relationship with each other.

In addition research results proves the hypothesis that technical skills can only be learned with education and work experience and these skills are not naturally parts of senior IT managers' personalities. Also the last research question was about the future importance of skill groups and the study results clearly stated that social and technical skills will be more important in the future and will not decrease their importance over time.

## 5.3. Future Research

This study was initiated with the aim to investigate the skills and activities of senior IT managers. The data collection was collected from a diverse group of senior IT managers and IT employees who are within various industries and at different ages. Although the study was limited to certain numbers of respondents, considerable results have been acquired throughout the study. For further investigation, the study could be expanded by investigating the difference of importance of skills by organizational types such as differences between the banking sector's senior IT managers and the telecommunication sector's senior IT managers. Also our response rates, particularly the senior IT managers, were lower than desired. These limitations are notwithstanding and we hope that by focusing on IT skills, activities and education, we have raised some critical issues as well as some specific suggestions, such as how the education of senior IT managers should be.

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# APPENDICES

## APPENDIX A: THE EXPLANATORY FACTOR ANALYSIS

| Component (Factor / Group) | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 18.664 | 44.437 | 44.437 | 18.664 | **44.437** | 44.437 | 8.103 | 19.293 | 19.293 |
| 2 | 5.555 | 13.227 | 57.664 | 5.555 | **13.227** | 57.664 | 7.643 | 18.197 | 37.490 |
| 3 | 2.200 | 5.239 | 62.903 | 2.200 | **5.239** | **62.903** | 7.287 | 17.350 | 54.840 |
| 4 | 1.641 | 3.907 | 66.811 | 1.641 | 3.907 | 66.811 | 3.196 | 7.608 | 62.449 |
| 5 | 1.477 | 3.516 | 70.327 | 1.477 | 3.516 | 70.327 | 1.951 | 4.644 | 67.093 |
| 6 | 1.372 | 3.267 | 73.594 | 1.372 | 3.267 | 73.594 | 1.693 | 4.031 | 71.124 |
| 7 | 1.250 | 2.975 | 76.569 | 1.250 | 2.975 | 76.569 | 1.555 | 3.703 | 74.827 |
| 8 | 1.102 | 2.623 | 79.192 | 1.102 | 2.623 | 79.192 | 1.538 | 3.661 | 78.488 |
| 9 | 1.073 | 2.555 | 81.747 | 1.073 | 2.555 | 81.747 | 1.369 | 3.259 | 81.747 |
| 10 | 0.910 | 2.166 | 83.914 | | | | | | |
| 11 | 0.817 | 1.945 | 85.858 | | | | | | |
| 12 | 0.690 | 1.643 | 87.501 | | | | | | |

# APPENDIX B: RELIABILITY ANALYSIS

**Reliability Analysis – Scale (Alpha)**

| **Reliability Coefficients** | | | |
|---|---|---|---|
| N of Cases = 43.0 | N of Items = 52 | Standardized Alpha = 0.8617 | |
| **Item-total Statistics** | | | |
| **Variables / Items** | **Scale Mean if Item Deleted** | **Scale Variance if Item Deleted** | **Corrected Item-Total Correlation** | **Alpha If Deleted** |
| AGE | 197.1860 | 775.2979 | 0.4362 | 0.8951 |
| GENDER | 229.0465 | 1042.6168 | -0.1438 | 0.8629 |
| EDUCATION | 226.7209 | 1033.3965 | 0.0689 | 0.8621 |
| WORK EXPERIENCE | 220.6512 | 936.7087 | 0.1343 | 0.8950 |
| NUMBER OF ADMINISTRATORS | 228.0223 | 1114.0223 | -0.5840 | 0.8766 |
| CRISIS MANANAGEMENT | 226.0000 | 1007.5238 | 0.5145 | 0.8580 |
| LONG-TERM PLANNING | 226.1860 | 1006.1074 | 0.5383 | 0.8578 |
| STRATEGY SETTING | 226.1628 | 1005.6157 | 0.5127 | 0.8578 |
| TEACHING OTHERS | 226.5814 | 1009.0111 | 0.5817 | 0.8580 |
| CONFLICT RESOLUTION AND MOTIVATION OF EMPLOYEES | 226.3488 | 991.5183 | 0.7129 | 0.8556 |
| DEAL WITH AMBIGUITY | 226.4186 | 1002.1539 | 0.6361 | 0.8571 |
| RELY ON OTHERS TO DO CRITICAL WORK | 226.5581 | 993.8715 | 0.6000 | 0.8563 |
| LEVERAGING INTERNAL AND EXTERNAL RESOURCES | 226.5349 | 999.2071 | 0.6176 | 0.8568 |
| DESIGN OF STANDARD OPERATION PROCEDURE | 226.6279 | 1007.4297 | 0.4701 | 0.8582 |
| SETTING ORGANIZATIONAL RESOURCE STANDARD | 226.7674 | 1012.1827 | 0.4726 | 0.8586 |
| RECRUITING | 226.6744 | 1010.6058 | 0.3570 | 0.8590 |
| BUDGET PLANNING | 226.6512 | 1003.3754 | 0.4575 | 0.8579 |
| PERSONNEL PERFORMANCE EVALUATION | 226.3953 | 1007.5781 | 0.5643 | 0.8579 |

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| Reliability Coefficients | | | | |
|---|---|---|---|---|
| N of Cases = 43.0 | N of Items = 52 | Standardized Alpha = 0.8617 | | |
| **Item-total Statistics** | | | | |
| **Variables / Items** | **Scale Mean if Item Deleted** | **Scale Variance if Item Deleted** | **Corrected Item-Total Correlation** | **Alpha If Deleted** |
| MANAGE/PLAN FEASIBILITY/APPROVAL PROCESS FOR NEW SYSTEMS AND TECHNOLOGY | 226.6279 | 1007.8583 | 0.5338 | 0.8580 |
| ANALYZE BUSINESS PROBLEMS AND IT SOLUTIONS | 226.3256 | 1004.2248 | 0.5619 | 0.8575 |
| MANAGE/PLAN CORPORATE IT STRATEGIES, STRATEGIC APPLICATIONS, TECHNOLOGY ARCHITECTURE | 226.2326 | 1005.4684 | 0.5450 | 0.85777 |
| MANAGE/PLAN FEASIBILITY/APPROVAL PROCESS FOR NEW SYSTEMS AND TECHNOLOGY | 226.4651 | 1004.3023 | 0.6209 | 0.8574 |
| EVALUATE IT PERFORMANCE AND UPGRADE PLANNING | 226.5349 | 1002.6833 | 0.6504 | 0.8571 |
| ANALYSIS AND REVIEW OF WORK STATUS AND SCHEDULE | 226.5581 | 1005.5858 | 0.5228 | 0.8578 |
| RE-SKILL IT PERSONNEL | 226.6744 | 1001.9867 | 0.7011 | 0.8569 |
| INTEGRATE EXISTING AND NEW BUSINESS APPLICATIONS | 226.8837 | 1001.9147 | 0.6038 | 0.8571 |
| IMPLEMENT NEW OR CHANGED COMPUTER SUPPORTED BUSINESS PROCESSES | 226.8837 | 996.9147 | 0.6537 | 0.8564 |
| APPROPRIATE RISK TAKING | 226.6977 | 998.4064 | 0.6732 | 0.8565 |
| DEVELOP TECHNICAL SOLUTIONS TO BUSINESS PROBLEMS | 226.6279 | 1005.4773 | 0.5141 | 0.8578 |

| Reliability Coefficients | | | | |
|---|---|---|---|---|
| N of Cases = 43.0 | N of Items = 52 | | Standardized Alpha = 0.8617 | |
| **Item-total Statistics** | | | | |
| **Variables / Items** | **Scale Mean if Item Deleted** | **Scale Variance if Item Deleted** | **Corrected Item-Total Correlation** | **Alpha If Deleted** |
| ANALYSIS AND JUDGMENT SKILL | 226.1628 | 995.8538 | 0.7314 | 0.8561 |
| CREATIVITY (INNOVATION) SKILL | 226.3488 | 998.5183 | 0.6690 | 0.8566 |
| LEADERSHIP SKILL | 226.0465 | 999.2835 | 0.6647 | 0.8567 |
| TEAM WORKING SKILL | 226.0698 | 1005.2569 | 0.5468 | 0.8577 |
| COMMUNICATION AND COORDINATION SKILL | 225.9535 | 999.3311 | 0.6931 | 0.8566 |
| LEARNING AND ADAPTING SKILL | 226.3023 | 1003.4064 | 0.6026 | 0.8573 |
| MULTI-LINGUAL SKILL | 226.8372 | 998.8538 | 0.5535 | 0.8570 |
| ABILITY TO FORESEE PROBLEMS SKILL | 226.2558 | 998.0044 | 0.5578 | 0.8570 |
| MONITORING AND CONTROLLING SKILL | 226.3488 | 994.2802 | 0.7430 | 0.8559 |
| PLANNING AND ORGANIZING SKILL | 226.0930 | 999.4197 | 0.7419 | 0.8565 |
| PROJECT MANAGEMENT SKILL | 226.3953 | 998.8638 | 0.5705 | 0.8569 |
| INFORMATION TECHNOLOGY MANAGEMENT SKILL | 226.2791 | 996.7298 | 0.6923 | 0.8563 |
| SOFTWARE ENGINEERING BODY OF KNOWLEDGE SKILL | 226.5814 | 1012.8682 | 0.3315 | 0.8594 |
| GENERAL TELECOMMUNICATIONS/NETWORKING KNOWLEDGE SKILL | 226.1163 | 1011.8195 | 0.4165 | 0.8588 |
| GENERAL SYSTEM ANALYSIS AND DESIGN KNOWLEDGE SKILL | 226.6977 | 1002.2636 | 0.5320 | 0.8574 |
| BASIC COMPUTER HARDWARE KNOWLEDGE SKILL | 226.1395 | 1006.3134 | 0.5252 | 0.8679 |
| GENERAL DATABASE KNOWLEDGE SKILL | 226.9302 | 1007.7807 | 0.4338 | 0.8684 |
| HIGH-LEVEL INTERNET LITERATURE SKILL | 227.0465 | 998.6645 | 0.6067 | 0.8568 |

# APPENDIX C: ONLINE SURVEY



## 1. General Details

This survey is part of the research lead by the Middle East Technical University, Informatics Institute, Information Systems graduate student Namık Atila Ekimci.

If you are not a formal employee of IT Department, please forward this web-page's link to an employee of IT Department.

The purpose of the study is to investigate the importance of senior IT managers' skills and activities. The following questionnaire is intended for employees of IT departments.

The survey contains 72 questions with multiple choices of rating. The survey doesn't contain questions that violate the respondent's privacy. However if you feel any discomfort related to filling the survey, you can quit by clicking the "Cancel" button at the bottom.

The information filled in this questionnaire is held in strict confidence and all findings will be cited anonymously. No specific reference will ever be made to you, your organization or any member of your organization from this questionnaire. Your participation is very valuable and the outcomes of this survey will determine the research results. PLEASE FILL THE FORM CAREFULLY.

IF YOU HAVE ANY QUESTION PLEASE MAIL TO: atila.ekimci@gmail.com

**1. Please Enter Your Age:**

**2. Please Select Your Sex:**

- ☐ Male
- ☐ Female

**3. Please Enter Your Official Title in the private sector:**

**4. Please Enter Type of Your Organization in the private sector (Banking, Automotive, Telecommunication etc.):**

**5. Please Select Your Highest Education Level:**

- ☐ High School
- ☐ Pre-Graduate
- ☐ Undergraduate
- ☐ Graduate (Master)
- ☐ Doctorate
- ☐ Other:

**6. Please Enter Your Total Work Experience in Years in the private sector:**

**7. Please Enter the Number of Administrators Between You and the Head of IT Department:**

| |
|---|

## 2. Rating

**8. The following is the list of activities and skills for Senior IT Managers. Please, based on your view and experience, assess these activities and skills by the importance level for an ideal Senior IT Manager.**

**FOR IDEAL SENIOR IT MANAGER:**

| | Highly Unimportant | Unimportant | Neutral | Important | Highly Important |
|---|---|---|---|---|---|
| Crisis Management | ☐ | ☐ | ☐ | ☐ | ☐ |
| Long-term Planning | ☐ | ☐ | ☐ | ☐ | ☐ |
| Strategy Setting | ☐ | ☐ | ☐ | ☐ | ☐ |
| Teaching Others | ☐ | ☐ | ☐ | ☐ | ☐ |
| Conflict Resolution and Motivation of Employees | ☐ | ☐ | ☐ | ☐ | ☐ |
| Deal with Ambiguity | ☐ | ☐ | ☐ | ☐ | ☐ |
| Rely on Others to Do Critical Work | ☐ | ☐ | ☐ | ☐ | ☐ |
| Leveraging Internal and External Resources | ☐ | ☐ | ☐ | ☐ | ☐ |
| Design of Standard Operation Procedure | ☐ | ☐ | ☐ | ☐ | ☐ |
| Setting Organizational Resource Standard | ☐ | ☐ | ☐ | ☐ | ☐ |
| Recruiting | ☐ | ☐ | ☐ | ☐ | ☐ |
| Budget Planning | ☐ | ☐ | ☐ | ☐ | ☐ |
| Personnel Performance Evaluation | ☐ | ☐ | ☐ | ☐ | ☐ |
| Manage/Plan Systems Development/Implementation | ☐ | ☐ | ☐ | ☐ | ☐ |
| Analyze Business Problems and IT Solutions | ☐ | ☐ | ☐ | ☐ | ☐ |
| Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture | ☐ | ☐ | ☐ | ☐ | ☐ |

| | Highly Unimportant | Unimportant | Neutral | Important | Highly Important |
|---|---|---|---|---|---|
| **Manage/Plan Feasibility/Approval Process for New Systems and Technology** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Evaluate IT Performance and Upgrade Planning** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Analysis and Review of Work Status and Schedule** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Reskill IT Personnel** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Integrate Existing and New Business Applications** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Implement New or Changed Computer Supported Business Processes** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Appropriate Risk Taking** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Develop Technical Solutions to Business Problems** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Analysis and Judgment Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Creativity (Innovation) Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Leadership Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Teamworking Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Communication and Coordination Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Learning and Adapting Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Multi-lingual Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Ability to Foresee Problems Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Monitoring and Controlling Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Planning and Organizing Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Project Management Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Information technology management skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Software Engineering Body of Knowledge Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **General Telecommunications/Networking Knowledge Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **General System Analysis and Design Knowledge Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Basic Computer Hardware Knowledge Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **General Database Knowledge Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |
| **High-Level Internet Literature Skill** | ☐ | ☐ | ☐ | ☐ | ☐ |

**9. Do you believe Senior IT Managers'...?**

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| Skills and activities above affects to the general success of the organization? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Including outside the listed skills and activities above, all skills and activities affects to the general success of the whole organization? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Educational background affects the general success rate of the whole organization? | ☐ | ☐ | ☐ | ☐ | ☐ |

## 3. Skills Specified Questions

**10. SOCIAL SKILLS**

-Analysis and Judgment Skill
-Creativity (Innovation) Skill
-Leadership Skill
-Team working Skill
-Communication and Coordination Skill
-Learning and Adapting Skill
-Multi-lingual Skill
-Ability to Foresee Problems Skill

**Do you believe, for Senior IT Managers, the Social Skills....**

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| Are naturally parts of their personalities? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Can only be developed? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Can only be developed with education? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Can only be developed with work experience? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Can be developed both with education and work | ☐ | ☐ | ☐ | ☐ | ☐ |

|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| experience? | | | | | |
| Promote over time? (Will be more important in the future?) | ☐ | ☐ | ☐ | ☐ | ☐ |
| Degrade over time? (Will lose its importance in the future?) | ☐ | ☐ | ☐ | ☐ | ☐ |

## 11. BUSINESS SKILLS

-Monitoring and Controlling Skill
-Planning and Organizing Skill
-Project Management Skill
-Information technology management skill

Do you believe, for Senior IT Managers, The Business Skills...

|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| Are naturally parts of their personalities? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Can only be developed? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Can only be developed with education? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Can only be developed with work experience? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Can be developed both with education and work experience? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Promote over time? (Will be more important in the future?) | ☐ | ☐ | ☐ | ☐ | ☐ |
| Degrade over time? (Will lose its importance in the future? | ☐ | ☐ | ☐ | ☐ | ☐ |

## 12. TECHNICAL SKILLS

-Software Engineering Body of Knowledge Skill(Such as SW engineering, development, testing, SW processes & SW management)
-General Telecommunications/Networking Knowledge Skill
-General System Analysis and Design Knowledge Skill
-Basic Computer Hardware Knowledge Skill

**-General Database Knowledge Skill**
**-High-Level Internet Literature Skill**


**Do you believe, for Senior IT Managers, The Technical Skills...**

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| **Are naturally parts of their personalities?** | ⬜ | ⬜ | ⬜ | ⬜ | ⬜ |
| **Can only be developed?** | ⬜ | ⬜ | ⬜ | ⬜ | ⬜ |
| **Can only be developed with education?** | ⬜ | ⬜ | ⬜ | ⬜ | ⬜ |
| **Can only be developed with work experience?** | ⬜ | ⬜ | ⬜ | ⬜ | ⬜ |
| **Can be developed both with education and work experience?** | ⬜ | ⬜ | ⬜ | ⬜ | ⬜ |
| **Promote over time? (Will be more important in the future?)** | ⬜ | ⬜ | ⬜ | ⬜ | ⬜ |
| **Degrade over time? (Will lose its importance in the future?** | ⬜ | ⬜ | ⬜ | ⬜ | ⬜ |


**13. Confirmation**

⬜   I confirm that I voluntarily participate in this survey. By selecting this button, I am indicating my willingness to participate in this research study and my authorization for the survey data to be used for scientific purposes.

# APPENDIX D: FACE-TO-FACE INTERVIEW



## 1. General Details

**1. Your Name & Surname:**

[                    ]

**2. Your Age:**

[                    ]

**3. Gender:**

○   Male

○   Female

**4. Official Title:**

[                    ]

**5. Highest Education Level:**

- ☐ High School
- ☐ Pre-Graduate
- ☐ Undergraduate
- ☐ Graduate(Master)
- ☐ Doctorate
- ☐ Other:

---

**6. Total work experience in years:**

---

**7. Number of administrators between you and the head of IT Department:**

---

## 2. Senior IT Managers' Education

**8. Please select the ideal undergraduate education for an ideal Senior IT Manager.**

- ☐ Business Administration
- ☐ Computer Engineering
- ☐ Software Engineering
- ☐ Electrical Engineering
- ☐ Electronic Engineering
- ☐ Electrical & Electronic Engineering
- ☐ Management Information Systems
- ☐ Other:

**9. An Ideal Senior IT Manager should work during undergraduate education.**

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| Undergraduate education with work | ☐ | ☐ | ☐ | ☐ | ☐ |

**10. Please select the ideal graduate education for an ideal Senior IT Manager. (Please select "none" if you think there's no need for graduate education)**

☐   MBA (Business Administration)

☐   Computer Engineering

☐   Software Engineering

☐   Electrical Engineering

☐   Electronic Engineering

☐   Electrical & Electronic Engineering

☐   Management Information Systems

☐   No Need For Graduate Education (Go To 14th Question)

**11. for an Ideal Senior IT Manager, how many years of work experience is required before the graduate education?**

| | No need for work experience | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years | More Than 5 Years |
|---|---|---|---|---|---|---|---|
| Work experience before graduate education | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**12. An Ideal Senior IT Manager should work during graduate education.**

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| Working with graduate education | ☐ | ☐ | ☐ | ☐ | ☐ |

**13. An ideal Senior IT Manager should have doctorate education.**

| | Strongly Disagree (Go to 14th Question) | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|

| | Strongly Disagree (Go to 14th Question) | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| **Doctoral degree** | ☐ | ☐ | ☐ | ☐ | ☐ |

**14. An Ideal Senior IT Manager should work during doctorate education.**

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| **Working with Doctorate education** | ☐ | ☐ | ☐ | ☐ | ☐ |

**15. Please explain why they shouldn't have any more education?**

☐  No, they should have as much education as they can

☐  The too much education alienate from the real working environment.

☐  After certain education level, work experience is more advantageous than further education.

☐  The gap between academic preparation and industry expectations.

☐  Other:

_____

## 3. Skills' Relation with Activities

The following questions aim to investigate the skills required for each activity, for Senior IT Managers. Please select the activities used by the mentioned skill for an ideal Senior IT Manager based on your view and experience.

**16. Analysis and Judgement Skill**

☐  Crisis Management       ☐  Design of Standard Operation Procedure       ☐  Manage/Plan Feasibility/Approval

- ☐ Long-term Planning
- ☐ Strategy Setting
- ☐ Teaching Others
- ☐ Conflict Resolution and Motivation of Employees
- ☐ Deal with Ambiguity
- ☐ Rely on Others to Do Critical Work
- ☐ Leveraging Internal and External Resources

- ☐ Setting Organizational Resource Standard
- ☐ Recruiting
- ☐ Budget Planning
- ☐ Personnel Performance Evaluation
- ☐ Manage/Plan Systems Development/Implementation
- ☐ Analyze Business Problems and IT Solutions
- ☐ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture

Process for New Systems and Technology
- ☐ Evaluate IT Performance and Upgrade Planning
- ☐ Analysis and Review of Work Status and Schedule
- ☐ Reskill IT Personnel
- ☐ Integrate Existing and New Business Applications
- ☐ Implement New or Changed Computer Supported Business Processes
- ☐ Appropriate Risk Taking
- ☐ Develop Technical Solutions to Business Problems

## 17. Creativity (Innovation) Skill

- ☐ Crisis Management
- ☐ Long-term Planning
- ☐ Strategy Setting
- ☐ Teaching Others
- ☐ Conflict Resolution and Motivation of Employees
- ☐ Deal with Ambiguity
- ☐ Rely on Others to Do Critical Work
- ☐ Leveraging Internal and External Resources

- ☐ Design of Standard Operation Procedure
- ☐ Setting Organizational Resource Standard
- ☐ Recruiting
- ☐ Budget Planning
- ☐ Personnel Performance Evaluation
- ☐ Manage/Plan Systems Development/Implementation
- ☐ Analyze Business Problems and IT Solutions
- ☐ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture

- ☐ Manage/Plan Feasibility/Approval Process for New Systems and Technology
- ☐ Evaluate IT Performance and Upgrade Planning
- ☐ Analysis and Review of Work Status and Schedule
- ☐ Reskill IT Personnel
- ☐ Integrate Existing and New Business Applications
- ☐ Implement New or Changed Computer Supported Business Processes

☐ Appropriate Risk Taking

☐ Develop Technical Solutions to Business Problems

## 18. Leadership Skill

☐ Crisis Management

☐ Long-term Planning

☐ Strategy Setting

☐ Teaching Others

☐ Conflict Resolution and Motivation of Employees

☐ Deal with Ambiguity

☐ Rely on Others to Do Critical Work

☐ Leveraging Internal and External Resources

☐ Design of Standard Operation Procedure

☐ Setting Organizational Resource Standard

☐ Recruiting

☐ Budget Planning

☐ Personnel Performance Evaluation

☐ Manage/Plan Systems Development/Implementation

☐ Analyze Business Problems and IT Solutions

☐ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture

☐ Manage/Plan Feasibility/Approval Process for New Systems and Technology

☐ Evaluate IT Performance and Upgrade Planning

☐ Analysis and Review of Work Status and Schedule

☐ Reskill IT Personnel

☐ Integrate Existing and New Business Applications

☐ Implement New or Changed Computer Supported Business Processes

☐ Appropriate Risk Taking

☐ Develop Technical Solutions to Business Problems

## 19. Teamworking Skill

☐ Crisis Management

☐ Long-term Planning

☐ Strategy Setting

☐ Teaching Others

☐ Design of Standard Operation Procedure

☐ Setting Organizational Resource Standard

☐ Recruiting

☐ Manage/Plan Feasibility/Approval Process for New Systems and Technology

☐ Evaluate IT Performance and Upgrade

☐ Conflict Resolution and Motivation of Employees

☐ Deal with Ambiguity

☐ Rely on Others to Do Critical Work

☐ Leveraging Internal and External Resources

☐ Budget Planning

☐ Personnel Performance Evaluation

☐ Manage/Plan Systems Development/Implementation

☐ Analyze Business Problems and IT Solutions

☐ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture

Planning

☐ Analysis and Review of Work Status and Schedule

☐ Reskill IT Personnel

☐ Integrate Existing and New Business Applications

☐ Implement New or Changed Computer Supported Business Processes

☐ Appropriate Risk Taking

☐ Develop Technical Solutions to Business Problems

**20. Communication and Coordination Skill**

☐ Crisis Management

☐ Long-term Planning

☐ Strategy Setting

☐ Teaching Others

☐ Conflict Resolution and Motivation of Employees

☐ Deal with Ambiguity

☐ Rely on Others to Do Critical Work

☐ Leveraging Internal and External Resources

☐ Design of Standard Operation Procedure

☐ Setting Organizational Resource Standard

☐ Recruiting

☐ Budget Planning

☐ Personnel Performance Evaluation

☐ Manage/Plan Systems Development/Implementation

☐ Analyze Business Problems and IT Solutions

☐ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture

☐ Manage/Plan Feasibility/Approval Process for New Systems and Technology

☐ Evaluate IT Performance and Upgrade Planning

☐ Analysis and Review of Work Status and Schedule

☐ Reskill IT Personnel

☐ Integrate Existing and New Business Applications

☐ Implement New or Changed Computer Supported Business Processes

☐ Appropriate Risk Taking

☐ Develop Technical Solutions to Business

Problems

## 21. Learning and Adapting Skill

□ Crisis Management

□ Long-term Planning

□ Strategy Setting

□ Teaching Others

□ Conflict Resolution and Motivation of Employees

□ Deal with Ambiguity

□ Rely on Others to Do Critical Work

□ Leveraging Internal and External Resources

□ Design of Standard Operation Procedure

□ Setting Organizational Resource Standard

□ Recruiting

□ Budget Planning

□ Personnel Performance Evaluation

□ Manage/Plan Systems Development/Implementation

□ Analyze Business Problems and IT Solutions

□ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture

□ Manage/Plan Feasibility/Approval Process for New Systems and Technology

□ Evaluate IT Performance and Upgrade Planning

□ Analysis and Review of Work Status and Schedule

□ Reskill IT Personnel

□ Integrate Existing and New Business Applications

□ Implement New or Changed Computer Supported Business Processes

□ Appropriate Risk Taking

□ Develop Technical Solutions to Business Problems

## 4. Skills' Relation with Activities

## 22. Multi-lingual Skill

□ Crisis Management

□ Long-term Planning

□ Strategy Setting

□ Teaching Others

□ Conflict Resolution

□ Design of Standard Operation Procedure

□ Setting Organizational Resource Standard

□ Recruiting

□ Manage/Plan Feasibility/Approval Process for New Systems and Technology

□ Evaluate IT Performance and Upgrade

☐ and Motivation of Employees

☐ Deal with Ambiguity

☐ Rely on Others to Do Critical Work

☐ Leveraging Internal and External Resources

☐ Budget Planning

☐ Personnel Performance Evaluation

☐ Manage/Plan Systems Development/Implementation

☐ Analyze Business Problems and IT Solutions

☐ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture

☐ Planning

☐ Analysis and Review of Work Status and Schedule

☐ Reskill IT Personnel

☐ Integrate Existing and New Business Applications

☐ Implement New or Changed Computer Supported Business Processes

☐ Appropriate Risk Taking

☐ Develop Technical Solutions to Business Problems

## 23. Ability to Foresee Problems Skill

☐ Crisis Management

☐ Long-term Planning

☐ Strategy Setting

☐ Teaching Others

☐ Conflict Resolution and Motivation of Employees

☐ Deal with Ambiguity

☐ Rely on Others to Do Critical Work

☐ Leveraging Internal and External Resources

☐ Design of Standard Operation Procedure

☐ Setting Organizational Resource Standard

☐ Recruiting

☐ Budget Planning

☐ Personnel Performance Evaluation

☐ Manage/Plan Systems Development/Implementation

☐ Analyze Business Problems and IT Solutions

☐ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture

☐ Manage/Plan Feasibility/Approval Process for New Systems and Technology

☐ Evaluate IT Performance and Upgrade Planning

☐ Analysis and Review of Work Status and Schedule

☐ Reskill IT Personnel

☐ Integrate Existing and New Business Applications

☐ Implement New or Changed Computer Supported Business Processes

☐ Appropriate Risk Taking

☐ Develop Technical Solutions to Business

Problems

### 24. Monitoring and Controlling Skill

- ☐ Crisis Management
- ☐ Long-term Planning
- ☐ Strategy Setting
- ☐ Teaching Others
- ☐ Conflict Resolution and Motivation of Employees
- ☐ Deal with Ambiguity
- ☐ Rely on Others to Do Critical Work
- ☐ Leveraging Internal and External Resources

- ☐ Design of Standard Operation Procedure
- ☐ Setting Organizational Resource Standard
- ☐ Recruiting
- ☐ Budget Planning
- ☐ Personnel Performance Evaluation
- ☐ Manage/Plan Systems Development/Implementation
- ☐ Analyze Business Problems and IT Solutions
- ☐ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture

- ☐ Manage/Plan Feasibility/Approval Process for New Systems and Technology
- ☐ Evaluate IT Performance and Upgrade Planning
- ☐ Analysis and Review of Work Status and Schedule
- ☐ Reskill IT Personnel
- ☐ Integrate Existing and New Business Applications
- ☐ Implement New or Changed Computer Supported Business Processes
- ☐ Appropriate Risk Taking
- ☐ Develop Technical Solutions to Business Problems

### 25. Planning and Organizing Skill

- ☐ Crisis Management
- ☐ Long-term Planning
- ☐ Strategy Setting
- ☐ Teaching Others
- ☐ Conflict Resolution and Motivation of Employees
- ☐ Deal with Ambiguity
- ☐ Rely on Others to Do Critical Work

- ☐ Design of Standard Operation Procedure
- ☐ Setting Organizational Resource Standard
- ☐ Recruiting
- ☐ Budget Planning
- ☐ Personnel Performance Evaluation
- ☐ Manage/Plan Systems Development/Implementation

- ☐ Manage/Plan Feasibility/Approval Process for New Systems and Technology
- ☐ Evaluate IT Performance and Upgrade Planning
- ☐ Analysis and Review of Work Status and Schedule
- ☐ Reskill IT Personnel

- ☐ Leveraging Internal and External Resources
- ☐ Analyze Business Problems and IT Solutions
- ☐ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture
- ☐ Integrate Existing and New Business Applications
- ☐ Implement New or Changed Computer Supported Business Processes
- ☐ Appropriate Risk Taking
- ☐ Develop Technical Solutions to Business Problems

## 26. Project Management Skill

- ☐ Crisis Management
- ☐ Long-term Planning
- ☐ Strategy Setting
- ☐ Teaching Others
- ☐ Conflict Resolution and Motivation of Employees
- ☐ Deal with Ambiguity
- ☐ Rely on Others to Do Critical Work
- ☐ Leveraging Internal and External Resources

- ☐ Design of Standard Operation Procedure
- ☐ Setting Organizational Resource Standard
- ☐ Recruiting
- ☐ Budget Planning
- ☐ Personnel Performance Evaluation
- ☐ Manage/Plan Systems Development/Implementation
- ☐ Analyze Business Problems and IT Solutions
- ☐ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture

- ☐ Manage/Plan Feasibility/Approval Process for New Systems and Technology
- ☐ Evaluate IT Performance and Upgrade Planning
- ☐ Analysis and Review of Work Status and Schedule
- ☐ Reskill IT Personnel
- ☐ Integrate Existing and New Business Applications
- ☐ Implement New or Changed Computer Supported Business Processes
- ☐ Appropriate Risk Taking
- ☐ Develop Technical Solutions to Business Problems

## 27. Information Technology Management skill

- ☐ Crisis Management
- ☐ Design of Standard
- ☐ Manage/Plan

☐ Long-term Planning

☐ Strategy Setting

☐ Teaching Others

☐ Conflict Resolution and Motivation of Employees

☐ Deal with Ambiguity

☐ Rely on Others to Do Critical Work

☐ Leveraging Internal and External Resources

Operation Procedure

☐ Setting Organizational Resource Standard

☐ Recruiting

☐ Budget Planning

☐ Personnel Performance Evaluation

☐ Manage/Plan Systems Development/Implementation

☐ Analyze Business Problems and IT Solutions

☐ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture

Feasibility/Approval Process for New Systems and Technology

☐ Evaluate IT Performance and Upgrade Planning

☐ Analysis and Review of Work Status and Schedule

☐ Reskill IT Personnel

☐ Integrate Existing and New Business Applications

☐ Implement New or Changed Computer Supported Business Processes

☐ Appropriate Risk Taking

☐ Develop Technical Solutions to Business Problems

## 5. Skills' Relation with Activities

### 28. Software Engineering Body of Knowledge Skill

☐ Crisis Management

☐ Long-term Planning

☐ Strategy Setting

☐ Teaching Others

☐ Conflict Resolution and Motivation of Employees

☐ Deal with Ambiguity

☐ Rely on Others to Do Critical Work

☐ Leveraging Internal and External Resources

☐ Design of Standard Operation Procedure

☐ Setting Organizational Resource Standard

☐ Recruiting

☐ Budget Planning

☐ Personnel Performance Evaluation

☐ Manage/Plan Systems Development/Implementation

☐ Analyze Business Problems and IT Solutions

☐ Manage/Plan Corporate

☐ Manage/Plan Feasibility/Approval Process for New Systems and Technology

☐ Evaluate IT Performance and Upgrade Planning

☐ Analysis and Review of Work Status and Schedule

☐ Reskill IT Personnel

☐ Integrate Existing and New Business Applications

☐ Implement New or

IT Strategies, Strategic Applications, Technology Architecture

Changed Computer Supported Business Processes

☐ Appropriate Risk Taking

☐ Develop Technical Solutions to Business Problems

## 29. General Telecommunications/Networking Knowledge Skill

☐ Crisis Management

☐ Long-term Planning

☐ Strategy Setting

☐ Teaching Others

☐ Conflict Resolution and Motivation of Employees

☐ Deal with Ambiguity

☐ Rely on Others to Do Critical Work

☐ Leveraging Internal and External Resources

☐ Design of Standard Operation Procedure

☐ Setting Organizational Resource Standard

☐ Recruiting

☐ Budget Planning

☐ Personnel Performance Evaluation

☐ Manage/Plan Systems Development/Implementation

☐ Analyze Business Problems and IT Solutions

☐ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture

☐ Manage/Plan Feasibility/Approval Process for New Systems and Technology

☐ Evaluate IT Performance and Upgrade Planning

☐ Analysis and Review of Work Status and Schedule

☐ Reskill IT Personnel

☐ Integrate Existing and New Business Applications

☐ Implement New or Changed Computer Supported Business Processes

☐ Appropriate Risk Taking

☐ Develop Technical Solutions to Business Problems

## 30. General System Analysis and Design Knowledge Skill

☐ Crisis Management

☐ Long-term Planning

☐ Strategy Setting

☐ Teaching Others

☐ Design of Standard Operation Procedure

☐ Setting Organizational Resource Standard

☐ Manage/Plan Feasibility/Approval Process for New Systems and Technology

☐ Evaluate IT

☐ Conflict Resolution and Motivation of Employees

☐ Deal with Ambiguity

☐ Rely on Others to Do Critical Work

☐ Leveraging Internal and External Resources

☐ Recruiting

☐ Budget Planning

☐ Personnel Performance Evaluation

☐ Manage/Plan Systems Development/Implementation

☐ Analyze Business Problems and IT Solutions

☐ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture

Performance and Upgrade Planning

☐ Analysis and Review of Work Status and Schedule

☐ Reskill IT Personnel

☐ Integrate Existing and New Business Applications

☐ Implement New or Changed Computer Supported Business Processes

☐ Appropriate Risk Taking

☐ Develop Technical Solutions to Business Problems

## 31. Basic Computer Hardware Knowledge Skill

☐ Crisis Management

☐ Long-term Planning

☐ Strategy Setting

☐ Teaching Others

☐ Conflict Resolution and Motivation of Employees

☐ Deal with Ambiguity

☐ Rely on Others to Do Critical Work

☐ Leveraging Internal and External Resources

☐ Design of Standard Operation Procedure

☐ Setting Organizational Resource Standard

☐ Recruiting

☐ Budget Planning

☐ Personnel Performance Evaluation

☐ Manage/Plan Systems Development/Implementation

☐ Analyze Business Problems and IT Solutions

☐ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture

☐ Manage/Plan Feasibility/Approval Process for New Systems and Technology

☐ Evaluate IT Performance and Upgrade Planning

☐ Analysis and Review of Work Status and Schedule

☐ Reskill IT Personnel

☐ Integrate Existing and New Business Applications

☐ Implement New or Changed Computer Supported Business Processes

☐ Appropriate Risk Taking

☐ Develop Technical

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Solutions to Business
Problems

## 32. General Database Knowledge Skill

☐ Crisis Management

☐ Long-term Planning

☐ Strategy Setting

☐ Teaching Others

☐ Conflict Resolution and Motivation of Employees

☐ Deal with Ambiguity

☐ Rely on Others to Do Critical Work

☐ Leveraging Internal and External Resources

☐ Design of Standard Operation Procedure

☐ Setting Organizational Resource Standard

☐ Recruiting

☐ Budget Planning

☐ Personnel Performance Evaluation

☐ Manage/Plan Systems Development/Implementation

☐ Analyze Business Problems and IT Solutions

☐ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture

☐ Manage/Plan Feasibility/Approval Process for New Systems and Technology

☐ Evaluate IT Performance and Upgrade Planning

☐ Analysis and Review of Work Status and Schedule

☐ Reskill IT Personnel

☐ Integrate Existing and New Business Applications

☐ Implement New or Changed Computer Supported Business Processes

☐ Appropriate Risk Taking

☐ Develop Technical Solutions to Business Problems

## 33. High-Level Internet Literature Skill

☐ Crisis Management

☐ Long-term Planning

☐ Strategy Setting

☐ Teaching Others

☐ Conflict Resolution and Motivation of Employees

☐ Deal with Ambiguity

☐ Rely on Others to Do

☐ Design of Standard Operation Procedure

☐ Setting Organizational Resource Standard

☐ Recruiting

☐ Budget Planning

☐ Personnel Performance Evaluation

☐ Manage/Plan Systems Development/Implementation

☐ Manage/Plan Feasibility/Approval Process for New Systems and Technology

☐ Evaluate IT Performance and Upgrade Planning

☐ Analysis and Review of Work Status and Schedule

☐ Reskill IT Personnel

Critical Work

☐ Leveraging Internal and External Resources

☐ Analyze Business Problems and IT Solutions

☐ Manage/Plan Corporate IT Strategies, Strategic Applications, Technology Architecture

☐ Integrate Existing and New Business Applications

☐ Implement New or Changed Computer Supported Business Processes

☐ Appropriate Risk Taking

☐ Develop Technical Solutions to Business Problems

# APPENDIX E: THE AUTHORIZATION OF RESERCH

B.30.2.ODT.0.44.05.02/ 388                                      12/06/2009

GÖNDERİLEN:        Doç.Dr.Belgin Ayvaşık
                   Rektör Danışmanı

GÖNDEREN:          Dr. Ali Arifoğlu
                   Enformatik Enstitüsü Müdür V.

KONU:              Namık Atilla Ekimci

Bilişsel Bilimler Anabilim Dalı yüksek lisans öğrencisi Namık Atila Ekimci'nin, 2008-2009 ders yılı 2. Döneminde tezi ile ilgili "The Skills and Activities of Senior Information Technology Managers" başlıklı araştırma çalışmasına ilişkin İş Bankası, Yapı Kredi Bankasının IT Bölümlerinde, Aselsan, Havelsan Şirketlerinde uygulama yapmak için görevlendirme başvurusu incelenmiş, ilgili EABD Başkanlığı'nın görüşüne dayanarak adı geçen öğrencinin isteği doğrultusunda görevlendirilmesine Etik Komite onayı koşulu ile uygun görülmüştür.

Saygılarımla,


Ek: YKK
    EABD


                        Etik Komite Onayı


                             Uygundur

                          15./06/2009

                   Prof. Dr. Canan ÖZGEN
                   Uygulamalı Etik Araştırma Merkezi
                   (UEAM) Başkanı
                   ODTÜ 06531 ANKARA

# APPENDIX F: PUBLICATIONS OUT OF THIS RESEARCH

Ekimci, A. N., Ozkan, S. (2009) "An Investigation of the Activities and Skill Sets Needed by Senior Information Technology (IT) Managers" full paper accepted to appear in proceedings of the 3rd European Conference on Information Management and Evaluation (ECIME), University of Gothenburg, Sweden on 17-18 September 2009.