

PERCEPTION OF IT GOVERNANCE
IN TURKEY

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Abstract

Effective governance of IT in an organization is essential for delivering value to its business. IT Governance can be identified as an integral part of enterprise governance that includes processes and methods for making decisions, accountability and authority standards for giving IT decisions in an organization. From an academic perspective, many studies in the literature investigate the IT governance from several aspects. However, the literature on IT governance in emerging markets such as Turkey, China and Hungary is scarce. Thus, there is a need for understanding a degree of which IT governance is realized truly. This research aims to contribute to an understanding of an extent to which IT governance practiced in Turkey. The study intends to show how well an IT governance practice is realized in Turkey and performs an empirical study on the IT Governance perception of practitioners in Turkey. A special emphasis is given on decisions on budget planning, project prioritization, and approval and execution of IT projects. Also it provides valuable suggestions for suitable IT governance model for Turkey.

TÜRKİYE'DEKİ BİLİŞİM TEKNOLOJİLERİ

YÖNETİŞİMİ ALGISI

Özet

Firmaların verimli bir şekilde bilişim teknolojileri (BT) yönetişimini uygulamaları, işlerine değer katması açısından önemli ve gereklidir. BT yönetişimi bir organizasyonun yönetişiminin bir parçası olmakla beraber, bir çok karar verme mekanizmaları, yöntemleri, süreçleri, stratejik BT kararları için çeşitli sorumluluk ve otorite standartları içerir. Akademik perspektiften bakıldığında, BT yönetişiminin bir çok farklı açıdan incelendiği çalışmalar bulunmaktadır. Ama, literatürde, Türkiye, Çin, Macaristan gibi yeni gelişen ülkelerde BT algısını ve yönetişimini inceleyen çalışmalar oldukça seyrek. Bu yüzden, BT yönetişiminin hangi ölçüde nasıl gerçekleştirildiğini anlamaya ihtiyaç vardır. Bu araştırma, Türkiye'de BT yönetişiminin hangi ölçüde uygulandığını anlamayı hedeflemektedir. Bu çalışma BT yönetişimi uygulamalarının Türkiye'de ne ölçekte yürütüldüğünü göstermekle beraber Türkiye'deki profesyonellerin ve uygulayıcıların BT yönetişimi algısı üzerine ampirik bir çalışma gerçekleştirmektedir. Bu çalışma özellikle BT projelerinin bütçe planlamasının nasıl yapıldığı, projelerin nasıl önceliklendirildiği, kabul edilme ve karar verilme aşamalarının nasıl uygulandığı konularına önem vermektedir. Aynı zamanda bu çalışma, Türkiye için uygun BT yönetim modeli hakkında değerli önerilerde ve öngörülerde bulunmaktadır.

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List of Abbreviations

ASL	Application Services Library
APA	American Psychological Association
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CIO	Chief Information Officer
CISR	Center for Information Systems Research
CMM	Capability Maturity Model
CMMI	Capability Maturity Model Integration
COO	Chief Operating Officer
COBIT	Control Objectives for Information and Related Technology
COSO	Committee of Sponsoring Organizations
ISACA	Information Systems Audit and Control Association
IEEE	Institute of Electrical and Electronics Engineers
IT	Information Technology
ITIL	Information Technology Infrastructure Library
MIT	Massachusetts Institute of Technology
MSCI	Morgan Stanley Capital International
SAS70	Statement on Auditing Standards (SAS) No. 70
SOX	Sarbanes Oxley
SLA	Service Level Agreement

Chapter 1

Introduction

IT Governance became a popular research topic in 1990s and since then it has been increasingly studied and discussed. Different definitions for IT governance are given however, most authors agree on the definition that “*IT Governance is a top management concern of controlling IT’s strategic impact that delivers value to the business*” [1, 2, 3, 4, 5]. However, still there is not a common understanding on the essentials of IT Governance whether it is a set of processes and relational mechanisms, performance metrics for supporting IT process monitoring or the balanced scorecards [6, 7, 8, 9]. There are also gaps between what is stated in the literature by academicians and researchers and what is performed by consultants and CIOs [10, 11].

As stated in [12], “*IT governance drives strategic alignment between the IT and the business*” in an organization, and also measures performance of an organization’s IT processes. IT governance can be identified as “*an integral part of enterprise governance*” [12]; it operates a model for how organization will make decisions on IT usage in organization and involves external relationships for obtaining IT relationships. Also it includes authority, control, accountability, roles and responsibilities, processes and methods for making decisions as well as involves judgments about how well use of IT enables strategic direction [12]. In other words, IT governance is the process by which decisions are made about IT investments. Such decisions include how those decisions are made, who makes those decisions, who is held accountable, and how the outcomes of those decisions are measured and monitored are all parts of IT governance [13].

While there is no 'standard' definition of IT Governance, in general IT governance involves specifying the decision rights, the accountability and authority standard for crucial IT decisions “with the objective of encouraging desirable behaviors in the use of IT” [14].

According to the IT Governance Institute, IT governance is the responsibility of the board of directors and the executive management, and is an integral part of enterprise governance. “It elevates information as a key organizational asset and treats governance of information at par with governance of other assets like human, financial, intellectual, and relationship assets” [15].

Many studies in the literature investigate the IT governance from various aspects as well as case studies. Especially the markets in the process of rapid growth and industrialization do not have a clear standard on IT governance. One can argue that emerging markets differ from other markets in terms of market characteristics, cultural, economic, and political issues, educational background of the community, and IT perception.

Turkey is also one of the countries that has an emerging market; this is also stated in [16]; “In July 2011, Frontier Strategy Group released the F-10, a list of the top 10 emerging markets Western multinational senior executives at Fortune 500 companies are tracking globally. Turkey is in the F-10 emerging market list, As of May 2010, Dow Jones classified the 35 countries as emerging markets Turkey is in the list, As of 31 December 2010, Standard and Poor's classified the 19 countries as emerging markets. Turkey is in the list, As of May 2010, MSCI Barra classified the 21 countries as emerging markets. Turkey is in the list”. As discussed later on in the literature section, literature on IT governance in emerging market is scarce and in particular such studies concerning Turkish market are yet to be present. Moreover, there is not any study in the literature that tries to create a suitable IT governance model for Turkey and even tries to understand the current IT governance in Turkey.

In this study, we aim to understand the current practice of IT governance in Turkey. We have analyzed the IT governance in the similar emerging markets to Turkey such as China, Slovenia and Hungary.

Up to now, a variety of standard set of tools and frameworks have been emerged for analyzing the IT Governance and evaluating the performance of IT [17]. Some of these tools and frameworks are Information Technology Infrastructure Library (ITIL), Control Objectives for Information and Related Technology (COBIT), Application Services Library (ASL), Six Sigma, Sarbanes Oxley (SOX) Act and on. The study of [17] provides a valuable classification of the IT Governance tools as depicted in Table 1.1.

Table 1.1 Classifications of IT Governance Tools [17]

Decision Making Processes	SAS70	COBIT		IT Governance Review IT Governance Assessment IT Governance Checklist IT Governance Assessment Process Model
Core Business Processes	ITIL / BS15000	CMM / CMMI IT Audit IT Due Diligence	Six Sigma	IT Service CMM
Support Processes	ISO 17799 / BS7799 SysTrust	ASL Prience 2		SQX
Process Type Organizational Entity	Procure	Activity	Business Unit	Business System

In accordance with [18], “*COBIT is a framework based on best practice, focusing on the processes of IT organization and how their performance can be assessed and monitored*” and “*The ITIL provides useful best practice in the field of service management and service delivery, but does not cover the strategic impact of IT and relation between IT and the business*”. In our research study, COBIT framework provides a valuable road map in data collection process. After gathering required information from both Turkey and similar countries in literature, we have prepared a survey based on IT Governance domains to understand the existing of IT governance situation in terms of decision making and activity perspectives. Three main IT Governance domains are evaluated.

1. IT Decision domain,
2. IT Project accountability domain,
3. Performance monitoring domain.

IT decision making is evaluated with three criteria; IT budget decision mechanism, IT project decision making process, decision of prioritization of IT projects. After that, we considered these criteria and prepared a survey with eight questions to understand how companies Govern IT in Turkey, and relations of IT Governance domains. This survey is performed by IT and business managers in order to increase the participation and understand the perception behind IT governance. At the end of the study, it is found that some IT governance models and proposals with well-defined structural properties and characteristics can be exposed. Actually while introducing proposals, it should be noted that Turkey has different environmental dynamics when compared with other countries. Especially missing IT perception and professionalism in business world are the most important issues that should be handled.

The motivation behind this study is to identify the current status of IT governance practices in Turkey. A special emphasis is given on decisions on budget planning, project prioritization, and approval and execution of IT projects (i.e., “go” or “no go” decision). To the best of our knowledge, this study is one of the first studies on understanding the IT governance and IT perception in Turkey, and valuable insights on existing situation of IT governance practice have been found out.

The remainder of this thesis is organized as follows. Chapter 2 provides the research background which covers issues on IT Governance and related topics mentioned above from several academic studies. Chapter 3 presents the research approach and methodology (i.e., fundamentals of COBIT framework, survey preparation process, analysis of survey results). After giving the methodology, the results of the survey are discussed in Chapter 4. Chapter 5 presents the discussion of the survey results and gives a proposal on IT Governance structure for Turkey. Finally, chapter 6 provides conclusion of my thesis.

Chapter 2

Research Background

The IT Governance Institute, established by the Information Systems Audit and Control Association (ISACA) in 1998, was the first organization that uses “IT governance” term. The Institute also provides methodologies for enabling good IT governance and introduces frameworks such as COSO based framework, COBIT framework and so on. The study [14] clearly expresses the importance of COBIT framework as follows: *“COBIT is now being used as a tool to comply with the present more stringent reporting regulations. The need to use such a framework sometimes gives solutions to hard situations. Certain well-known businesses, after thorough consideration, rejected COBIT as a framework because it would be too impractical to implement. Some timer later, the auditors had to declare that COBIT was in fact going to be used: It was mandatory”*.

It is stated in [12] that *“IT governance refers to the patterns of authority for key IT activities in business firms, including IT infrastructure, IT usage, and project management”*. IT governance determines who makes the IT decisions and also who assigns accountability for the outcomes [13]. Effective governance implementation in an organization aligns IT investments with overall business priorities [37]. Thus, IT governance plays an important role for both reaching IT goals and subsequent performance of the IT functions.

According to literature (Table 2.1), planning and performing complex IT projects involves composition of various issues such as political, legal, organizational, technical, cultural, and personnel issues. In order to perform successful outcome of those projects, the best deal is to charge a team with high responsibility. Governance structure ensures that all stakeholders involve in quality decision making processes, and complex IT projects are effectively implemented with this structure.

As known, IT Management is responsible for establishing methods and practices that support IT operations. In order to support imposed challenges to IT, IT Management has significantly evolved to include IT service management and governance from device, network and systems management. Thus, business driven IT management approach was followed in most IT management solutions [15]. To support this evolution, frameworks such as ITIL [19], COBIT [20] and standards like ISO-IEC 20000 have been largely adopted in several organizations [15, 23].

Table 2.1 IT Governance Approaches in Literature

Researchers	Definition of IT Governance	Underlying Notions, Keywords
Brown and Magill	“IT governance describes the locus of responsibility for IT functions” [11]	Responsibility, IT functions
Luftman	“IT governance is the degree to which the authority for making IT decisions is defined and shared among management, and the processes managers in both IT and business organizations apply in setting IT priorities and the allocation of IT resources” [12]	Authority determination, prioritization of IT and resources
Sambamurthy and Zmud	“IT governance refers to the patterns of authority for key IT activities” [13]	Authority, IT activities
Van Grembergen	“IT governance is the organizational capacity by the board, executive management and IT management to control the formulation and implementation of IT strategy and in this way ensure the fusion of business and IT” [14]	Organization capacity, control and formulation, IT strategy

Weill and Vitale	“IT governance describes a firm’s overall process for sharing decision rights about IT and monitoring the performance of IT investments” [7]	Decision rights, performance monitoring
Schwarz and Hirschheim	“IT governance consists of IT-related structures or architectures (and associated authority patterns), implemented to successfully accomplish (IT-imperative) activities in response to an enterprise’s environment and strategic imperatives” [15]	Authority pattern, strategy imperatives
IT Governance Institute	“IT governance is the responsibility of the board of directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure that the organization’s IT sustains and extends the organization’s strategies and objectives” [19]	Organizational structure, strategy, objectives
Weill and Ross	“IT governance is specifying the decision rights and accountability standard to encourage desirable behavior in using IT” [20]	Decision rights, accountability

Up to now, many researchers and institutions provide the definition of IT governance from different point of views. Some challenging definitions are presented as follows:

- *“IT governance controls the IT development, implements the strategy which will lead to a suitable direction of IT development by the organizations. So it helps organizations to gain competitive advantages” [22].*
- *“IT governance insures the achievement of IT and promotes the development of enterprises strategic objectives by the process of lead and organization. The responsibility of the IT governance is the board of directors and executives, which is also an important part of corporate governance” [3].*
- *“IT governance specifies the decision rights and accountability framework to encourage desirable behavior in the use of IT” [23].*
- *“IT governance is the ability of organizations. It is controlled by the board of directors of the organization. The deployment of IT and the implementation of IT management carry out the integration of IT with the business strategy” [24].*
- *“In general, IT governance is the organizational capacity exercised by the board, executive management to control the formulation and implementation of IT strategy and in this way ensuring the fusion of business and IT” [25].*

According to [26], IT governance should comprise of five essential elements:

- Strategic alignment, which highlights the alignment of IT infrastructure and business strategies within an organization.
- Delivery of business value through IT,
- Performance management,
- Risk management,
- Control and accountability.

Lack of effective IT Governance in organizations has crucial effects on organizations. The study [27] highlights that *“The bottom line is that money organizations worldwide are needlessly sacrificing money, productivity and competitive advantage by not implementing effective IT Governance”*. On the other side, the study [28] summarizes the benefits of IT governance when it is implemented in business firms:

- Better IT Operational performance,
- Efficient utilization of IT resources,

- Less unplanned outages,
- Improved information security,
- IT gets aligned with the business,
- Better control over risk,
- Reduce your delivery time,
- Provide better service quality,
- Decrease your service costs,
- Increased stakeholder value.

Weill and Ross's study [2] on IT governance, its effects on business performance and IT governance archetypes are evaluated. The study of Weill and Ross is considered as *"the culmination of extensive research on linking IT Governance practices to business performance"* [29] which was performed at the MIT Sloan School of Management Center for Information Systems Research (CISR). Also, this valuable study provides evaluations and suggestions on IT Governance and its effects on business performance for organizations and governments.

It is performed with more than 300 enterprises in over 20 countries during the period of 1999-2003. In performing this research, Weill and Ross developed various frameworks for analyzing the best practice IT Governance. As stated in [29], *"The lack of a standard way of describing an IT Governance arrangement contributed to their finding that fewer than 50% of senior executives could accurately explain their IT Governance approach. To fill this gap, they developed a Governance Arrangement Matrix with the key IT decisions/activities (i.e., IT Principles, IT Architecture, IT Infrastructure Strategies, Business Application Needs and IT Investment) on one axis, and typical arrangement archetypes that they had observed (i.e., Business Monarchy, IT Monarchy, Feudal, Federal, Duopoly and Anarchy) on the other"*. Please see Figure 2.1.

With this framework, Weill and Ross analyzed the governance patterns of various organizations and classified them. Then, valuable inferences were provided such as which governance pattern provide more effective business performance. *"Overall their research found that the top performing organizations were differentiated from their competitors by up to 40% in terms of returns on their IT investments. There was*

however no dominant pattern of IT Governance that was clearly associated with superior business results. In fact success was related to how well the organization articulated their business strategies, how well they set and monitored their business performance goals and then how well they linked their IT Governance arrangements with their strategies and performance goals” [29].

At the end of the study, Weill and Ross [2] found that poorly articulated business strategies and business accountabilities were generally associated with poor IT Governance performance which means that “*it was hard to shine with IT Governance if the rest of the business was poorly run*” [29]. Hence, clearly defined business strategies are required for establishing appropriate and suitable governance arrangement in an enterprise or government.

IT Governance Arrangements Matrix										
Domain Style	IT principles		IT infrastructure strategies		IT architecture		Business application needs		IT investment and prioritization	
	Input	Decision	Input	Decision	Input	Decision	Input	Decision	Input	Decision
Business Monarchy		Corp office CIO						Corp office CIO		Proj council Corp office
IT Monarchy			CIO IT leaders	CIO IT leaders		Arch office CIO				
Feudal										
Federal							Biz leaders Biz proc own			
Duopoly	Biz leaders IT leaders				Biz leaders IT leaders				Biz leaders IT leaders BT managers	
<p style="text-align: right;"> Input rights Decision rights </p>										
Corp office		<i>Corporate office (CEO, CIO, 3 biz heads)</i>				Proj council		<i>Regional project councils</i>		
Arch office		<i>Office of architecture</i>				BT managers		<i>Business technology relationship managers</i>		
CIO		<i>CIO office and staff</i>				Biz proc own		<i>Business process owners</i>		
IT leaders		<i>IT leadership group</i>				Value realization process				

Figure 2.1 Examples for IT Governance Arrangements Matrix (Weill and Ross 2004, p.11)

Moreover, Weill & Ross [2] identified a set of design principles, indicators and questions for crafting an effective IT. This governance scheme is shortly presented as follows which provide valuable insights for our research as well:

- *Engagement with the Business*
 - Can more than 50% of managers accurately describe their governance approach?
 - How well is the governance approach communicated across the organization?
 - Are senior managers actively involved?
 - Are there clear business objectives for IT investments?
 - Are the business strategies clearly articulated?
 - Are there fewer renegades and more formally approved exceptions?
 - Is the governance scheme relatively stable are minimal changes being made?
- *Starting Point for Governance Arrangements*
 - Federal approach for input to IT decisions,
 - Duopoly arrangements for IT principles and investment decisions,
 - Avoid federal approach for decision making,
 - Joint business/IT decisions for business application investments.
- *General Principles*
 - Top performers on asset utilization typically use duopoly (IT and Business unit) arrangements,
 - Top performers on profit apply more centralized arrangements i.e. business monarchies for decision making,
 - Top performers on growth, balance entrepreneurial needs of the business units with firm-wide strategies and principles i.e. decentralized IT organization, principles supporting innovation and growth, critical infrastructure identified centrally,
 - Further customize these principles for unique strategies and desired behaviors.

In addition to identification of replicable best practices [2], the authors were always careful to emphasize the need for organizations to use these suggestions as a starting point, and to customize them to suite their distinctive competitive situations.

Furthermore, they acknowledge that while the appearance of the IT Governance scheme is a top-down compliance driven one, that in practice, it is far from a command and control situation [29]. They identify a number of communication approaches from senior management pronouncements, formal committees, coaching of non-conformists, and information portals. A systems architect reported that “*We are seeing ourselves more as architectural social workers than architecture police*” [29] to give the true nature of communication challenge within the organization.

Performance monitoring in IT Governance context is all about monitoring each provider’s ability to follow agreements in contracts and SLAs on a competitive level, and to meet the business requirements of the client. These observations have been codified and represented in best practice guidelines such as the COBIT framework as mentioned above. The guidelines typically include other topics as well such as identification of supplier relationships and supplier risk management; while considerable reference work exists in the IT field to guide a deeper understanding of governance mechanisms.

In accordance with the Weill [2], the presented six typical arrangement archetypes (i.e., Business Monarchy, IT Monarchy, Feudal, Federal, Duopoly and Anarchy) illustrate how relationship management and performance monitoring work. Some brief information about these archetypes is given hereunder.

Business Monarchy: In this type of management, senior business executives make the major IT decisions for the whole enterprise. High-level officials such as Chief Executive Officer (CEO), Chief Financial Officer (CFO) and Chief Operating Officer (COO) take the control of the decision rights and input.

IT Monarchy: The top IT professionals make the all IT decisions. Chief Information Officer (CIO) or directors of IT departments have the control of the right to make decision and input information.

Feudal: In this type of governance structure, local leaders (e.g., business unit or region) make their own decisions to optimize their local needs. So, leaders of business departments have control of the right to make decision and input information.

Federal: The archetype represents coordinated decision making process including at least two levels of the business hierarchy. The corporate and departments -including or not including IT department- share the control of the right to make decision and input information.

IT Duopoly: In duopoly archetype, decisions represent agreement between IT executives and one business group. IT directors and other teams share the control of the right to make decision and input information.

Anarchy: Individuals or very small groups make their own decisions based only on their own needs, individuals. These small groups have the control of right to make decision and input information.

Chapter 3

Research Approach

3.1 Research Motivation

The studies related to effective use of IT show that the most of the IT projects are interrupted or failed in recent years [32]. One of the reasons behind this failure is that, returns on IT projects investment are not seen enough or implementations of IT projects are not done properly, which resulted a general 60% of failures [33]. There are many clear reasons that the most of the companies' IT investment are wasted due to some managerial problems such as usage of wrong project management methodologies, unrealistic time estimates, lack of risk management and false budget estimations and so on [34]. According to the researchers [35], one of the major reasons of project failures is that there is not any efficient tool that is easy to use and also that manages, controls, monitors and evaluates IT projects properly. Another important reason for failures is the deficiency of IT accounting infrastructure integration in terms of IT decision makers [33].

Not only in traditional companies but also in government agencies, most of the IT projects have been failed [17]. Another main reason of the failures is also seen as the lack of "IT Governance" [36].

ISACA points out the lack of IT Governance issue with following statements [28]: *"Enterprises are sacrificing money, productivity and competitive advantage by not implementing effective IT governance"*; hence *"executives need a better way to direct IT for optimal advantage, measure the value provided by IT and manage IT-related risks"*.

Turkey is one of these countries, which is considered as an emerging market [16]. Moreover, there is not any study in the literature that tries to create a suitable IT governance model for Turkey, and even tries to understand the current IT governance in Turkey.

3.2 Research Scope

We selected COBIT framework which is globally accepted a set of tools and organized into a framework, that executives can use to ensure their IT is helping them to achieve their goals and objectives. Hence it ensures that IT is working as effectively as possible to minimize IT-related risks and maximize the benefits of technology investment within an organization.

It is possible to say that COBIT bridges the gap between the business and IT. IT projects depend on business and IT, and unfortunately IT project decision makers are generally business executives, not IT staff. Actually, such a situation may play a role in failure of IT projects.

In this study we use COBIT as a reference model to understand the state of how IT governance practices and by this way we set up our empirical study. Actually we adopted COBIT which includes the following *its aspects and domains*:

- *Examined Plan and Organized Aspects*
 - Determine Technological Directions,
 - Define the IT Processes, Organizations and Relationships,
 - Manage Projects.

- *Deliver and Support Aspects:*
 - Define and Manage Service Levels.

- *Monitor and Evaluate Aspects:*
 - Monitor and Evaluate IT Performance,

In addition, our scope was occurred not only IT People/ Unit but also Business People/ Unit. Our focus area is IT Governance's aspects and domains which determined by us. Also IT Governance archetypes are in our scope.

3.3 Research Methodology

The first section of this research contains a research background. We have performed a literature search on IT Governance including articles in journals, books and mostly conference proceeding papers. The search operation in the literature was based on following descriptors: “IT governance”, “IT governance perception”, “IT governance adaptation”, and “emerging market”. Following electronic databases are used:

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

The majority of research on IT governance uses a “conceptual examination” of several IT governance framework propositions. Few researchers attempted to perform empirical studies on this topic [34].

Since the aim of this research includes development of an appropriate IT Governance Model for Turkey, understanding the mechanisms of companies’ decision making structure in Turkey in IT context is essential. This knowledge will be a useful guideline for us to achieve that goal; hence we have conducted well-structured surveys.

3.3.1 COBIT Framework

After the literature review and investigating related frameworks (see Table 2.1), we started to examine some of the IT Governance tools and we concluded that COBIT is one of the best frameworks which covers IT Governance metrics in accordance with our research aim. It is seen that it is the most used framework in studies in the literature and it is also used in many real projects.

COBIT is an internationally accepted set of tools organized into a framework that executives can use to ensure their IT infrastructure is enabling them to achieve their goals and objectives [38]. It ensures IT is working as effectively as possible to minimize IT related risks and maximize the benefits of technology investment. So, COBIT bridges the gap between the business and IT.

COBIT is able to perform following functions:

- Improves IT efficiency and effectiveness,
- Helps IT to understand the needs of the business,
- Puts practices in place to meet the business needs as efficiently as possible,
- Ensures alignment of business and IT,
- Helps executives understand and manage IT investments throughout their life cycle.

COBIT supports IT governance by providing a framework to ensure that:

- IT is aligned with the business,
- IT enables the business and maximizes benefits,
- IT resources are used responsibly,
- IT risks are managed appropriately.

The benefits of implementing COBIT include:

- A common language for executives, management and IT professionals,
- A better understanding of how the business and IT can work together for successful delivery of IT initiatives,
- Improved efficiency and optimization of cost,
- Reduced operational risk,
- Clear policy development,
- More efficient and successful audits,
- Clear ownership and responsibilities based on process orientation.

3.3.2 Empirical Study

Based on COBIT framework, we prepared a survey which includes 8 questions that can be seen in Table 3.2. Data collection for the survey is done via online questionnaire. We enable people to reach that survey link via different tools. Survey was sent people via e-mail and social media tools such as Facebook message, Twitter, LinkedIn and so on. In this case, we sent our survey not only IT people, but also business people. By this way, we gather valuable insights on the IT perception of business people as well as IT staff within organization.

As mentioned before, in questionnaire set up process, we emphasis on that each question should be based on a COBIT aspect and domain; thus we selected the questions which are related with our research scope.

We gave importance on to understand governance archetype (i.e., Feudal, Federal, Duopoly, Business Monarchy, IT Monarchy, and Anarchy) of organizations. Survey was completed by 252 business and IT people. The first 3 questions in the survey are related with the IT governance archetype of the company. Also, this survey is based on domain components of COBIT framework again.

Table 3.1 Selected Domain and Aspects [7]

Question #	Scope	Aim	Aspect	COBIT
1	About Decision-Makers	To understand IT Governance effect on existing situation	Plan and Organize (PO)	Manage the IT investment (PO5)
2	About Influencing-Actor	To understand IT Governance effect on existing situation	Plan and Organize (PO)	Define the IT processes, organizations and relationships (PO4)
3	Priorities	To understand IT Governance effect on existing situation	Plan and Organize (PO)	Determine technological directions (PO3), Define the information architecture(PO2), Communicate managements aims and directions (PO6), Manage Human Resources (PO7)
4	Monitoring	To understand monitoring process	Monitor and Evaluate (ME)	Monitor and Evaluate IT Performance (ME1), Monitor and Evaluate Internal Controls (ME2)
5	IT Project Man.	To understand Accountability process	Plan and Organize (PO)	Manage Projects (PO10),Communicate managements aims and directions (PO6)
6	IT Manager Level	To understand which type of organizations use IT Governance and IT represent which managerial level (business unit or IT unit)	Plan and Organize (PO)	Define the information architecture (PO2), Define the IT processes, organizations and relationships (PO4)
7	Job position	People who attend the survey, to understand their reliability and their job position	Deliver and Support (DS)	Define and manage service levels (DS1)
8	Represent IT on executive board	To understand IT Governance and companies managerial board structure, IT represent on board or not	Plan and Organize (PO)	Manage Human Resources (PO7)

These domains are presented as follows:

- 1) Manage the IT investment,
- 2) Define the IT processes, organizations and relationships,
- 3) Manage Human Resources, Determine technological directions, Define the information architecture, Communicate managements aims and directions,
- 4) Monitor and Evaluate Internal, Monitor and Evaluate IT Performance,
- 5) Manage Projects, Communicate managements aims and directions,
- 6) Define the IT processes, organizations and relationships, Define the information architecture,
- 7) Define and manage service levels,
- 8) Manage Human Resources, Define and manage service levels.

Such a long but rigorous survey period helped us to analyze both IT people and business people point of views in a clear way, and in this period COBIT framework is our valuable road map and guideline.

To sum up, we may consider our empirical study in terms of two rounds of data collection: the first round seems to be like a pilot study, which aims to examine construct validity and to explore significant relations.

Table 3.2 Survey Questions

1-Who participates and manages the decision making process of annual IT budget planning and control on within the company?

Top Management of the Organization (e.g., executive committee, board of directors, general manager)
Top Management and Business Units
Business Unit Managers and IT Department
Business Unit Managers, IT Department and Top Management
IT Department
Each department gives and performs its own decision independently from Top Management

Table 3.2 Survey Questions Continued

2-Who influences or control in the approval decision process of IT projects of Business Units?

Top Management of the Organization (e.g., executive committee, board of directors, general manager)
Top Management and Business Units
Business Unit Managers and IT Department
Business Unit Managers, IT Department and Top Management
IT Department
Each department gives and performs its own decision independently from Top Management

3-Who influences or controls in the decision making process of prioritization of Business Units' IT projects?

Top Management of the Organization (e.g., executive committee, board of directors, general manager)
Top Management and Business Units
Business Unit Managers and IT Department
Business Unit Managers, IT Department and Top Management
IT Department
Each department gives and performs its own decision independently from Top Management

4-Is the performance of Business Units' IT projects are measured and evaluated by Business Units in the company?

Yes
No

5-Which department of unit has the responsibility and management of project in Business Units' IT projects in the company?

Business Units
IT Department or Units
Business and IT Units
Other

6-Which business title is used to represent highest IT authority in the organization?

Chief Information Officer (CIO)
IT Director
IT Manager
IT Executive
IT Specialist or Other

Table 3.2 Survey Questions Continued

7-What is your position in the company?

IT Department Manager
Business Unit Manager
Top Manager (e.g., C Level)
IT Expert or Other

8-IS representation in the executive committee in the organization?

Yes
No

3.3.3 Statistical Analysis

In order to make evaluations on these results, *Chi-Square Test* is performed on the results of the surveys. We tried to determine whether there is a statistically significant difference between archetypes. Since the data is categorical, Chi-Square Test is the ideal choice for this assessment. Actually in order to apply Chi-square test, the data set must meet the requirements of the Chi-Square Test. These requirements are tested for each data set, which are defined as follows:

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

3.3.3.1 Hypothesis-Testing Procedure

“Step1. State the null hypothesis and the alternate hypothesis. The null hypothesis, H_0 , is that there is no difference between the set of observed frequencies and the set of expected frequencies; that is, any difference between the two set of expected frequencies can be attributed to sampling (change).The alternate hypothesis, H_1 , is that there is a difference between the observed and expected sets of frequencies.

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

Step 3. Select the test statistic. The test statistic follows the chi-square distribution, designated as X^2 :

$$X^2 = \sum \left[\frac{(f_o - f_e)^2}{f_e} \right] \quad Df = [(number\ of\ rows - 1) * (number\ of\ columns - 1)]$$

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

Step 4. Formulate the decision rule. Recall the decision rule in hypothesis testing requires finding a number that separates the region where we do not reject H_0 from the region of rejection. This number is called the critical value.” [39]

SPSS 16 software tool is used to perform the required analysis. Chi-Square Test is performed in “Analyze” menu of SPSS by selecting “Descriptive Statistics” and then “Crosstabs” as illustrated. Answers of survey have been quantized for statistical analysis.

Chi-Square module of the SPSS tool enables to perform the analysis on categorical data. Categorical data should be first assigned with appropriate numbers and converted into a table format. A database structure is created with *categorical names, types, data width, values* and also *values which measurement will be performed on*. For the *values* option, for each categorical data’s value and label is defined.

For instance, for “butce_karar” category, “1” means feudal, “2” is federal, “3” is duopoly, “4” is business monarchy, “5” is IT monarchy and finally “6” is anarchy. For all categories, same meaning or semantic matching process is performed.

After completion of the matching process, “Analyze - > Descriptive Statistics - > Crosstabs” is selected. Then the rows and columns should be created, and then Chi-Square module is selected from the “Statistics” menu. With the implementation of the necessary requirements, as depicted, the desired results are achieved.

Chapter 4

Results of the Survey

In this section, we present the results of the survey and analyze them. Total of 252 users are participated in our survey in different periods from various business backgrounds. As described earlier, the IT governance is investigated from three different criteria which are *IT project budget decision making process*, *IT project decision making process*, *decision of prioritization of IT projects*. In Table 4.1, the results of the survey are given in terms of IT governance model and governance criteria.

The survey is given in Table 3.2. The results of the first question are given in Figure 4.2. When we investigate the organizations that involve IT departments in budget decision making processes, IT department is involved in responsibility about 89,41%.

Another considerable point is that 87,50% of the organizations do not involve IT departments in budget decision making processes.

Moreover IT is responsible on by its own of the 35,48% of projects. These organizations' IT departments are represented by CIOs around 24% and 64% of the CIOs are involved in executive boards in C level.

It is also seen that 62% of the organizations measure performance whereas 38% of the organizations do not perform.

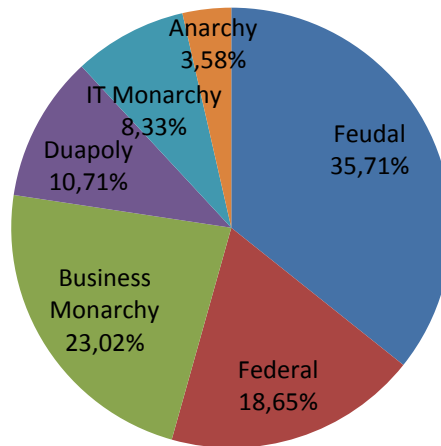


Figure 4.1 IT Governance Archetypes in terms of Budget Decision of IT Projects

The results of the second question are given in Figure 4.2. It is seen that the most organizations' decision on IT projects is decided by federal IT governance type. On the other hand feudal and business monarchy governance types have considerable percentage on the decision making process. In terms of Business Dominated (Federal or Feudal), IT dominated (IT Monarchy) and Contributed (Business +IT Business Monarchy or Duopoly) decision type classification results can be reflected as follows

Business dominated decision on IT projects is 54,36% where IT dominated was 8,33%. Both business and IT contributed decision is 33,73% in Turkey.

It is clear that business dominated decision are made on IT project in Turkey.

Moreover 23% of these organizations' IT departments are represented by CIOs and 62% of these CIOs are in the executive committee however they are not involved in the decision making process.

When we examine the organizations that involve IT departments in decision making process, it is found out that IT department is responsible of those projects with a high percentage, 88,33%, by its own or with another business entity. In 52,42% of the projects IT department is responsible by its own. In addition, 20,37% of these organizations' IT departments are represented by CIOs, and 63,63% of the CIOs are involved in executive boards in C level, and IT department are involved (i.e., both business and IT contribute decision) in the decision making process. It is also seen that 71,57% of the organizations measure performance whereas 28,43% do not perform.

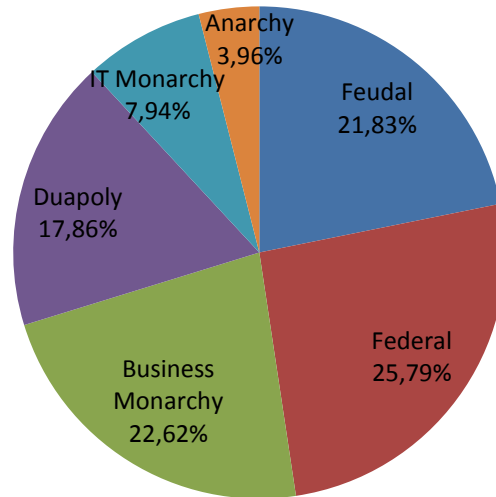


Figure 4.2 IT Governance Archetypes in terms of Decision Making of IT Projects

The results of the third question are given in Figure 4.3. It has been seen from the survey that the IT department is not involved in the 47,62% of IT projects' prioritization decision. A high percentage of the organizations perform Feudal or Federal (i.e., Business Dominated) IT governance model on the prioritization of the projects.

When the results are investigated for the organizations that do not involve IT departments in project prioritization (i.e., Business Dominated); it has been seen that, IT department carries out the responsibility of the project in 73,27% of the organizations that do not involve IT department in project prioritization process. Moreover in 19,82% of these organizations', IT departments are represented by CIOs and 56,52% of these CIOs are involved in executive boards in C level however they are not involved in the decision making process. It is also seen that half of the organizations perform performance measurement whereas other half do not perform. In 25,24% of the organizations, IT department is involved (i.e., Business and IT Contribute) in the project decision making however they are not involved in prioritization (i.e., Business Dominated). However, it can be said that, the organizations that do not involve (i.e., Business Dominated) IT department in project prioritization decision process, they also do not involve (i.e., Business Dominated) in project decision making process, since 71,55% of the organizations do not involve.

When we analyze the organizations that involve IT departments (i.e., Business and IT Contribute) in prioritization of IT projects decision making process, in 89% of the projects IT departments have the responsibility of the project or share the responsibility with another business entity. In 50% of the projects IT department is responsible by its own. Moreover, 25% of these organizations' IT departments are represented by CIOs, and 71% of the CIOs are involved in executive boards in C level, and IT departments are also involved in the decision making process. It is also seen that 64% of the organizations perform performance measurement whereas 36% do not perform. Another important finding is that, in 59,22% of the organizations, IT department is also involved (i.e., Business and IT Contribute) in project decision making process if they are involved (i.e., Business and IT Contribute) in the project prioritization decision process. 30,20% of the organizations that involve IT departments in prioritization decision making process do not involve (i.e., Business Dominated) them in project decision making process.

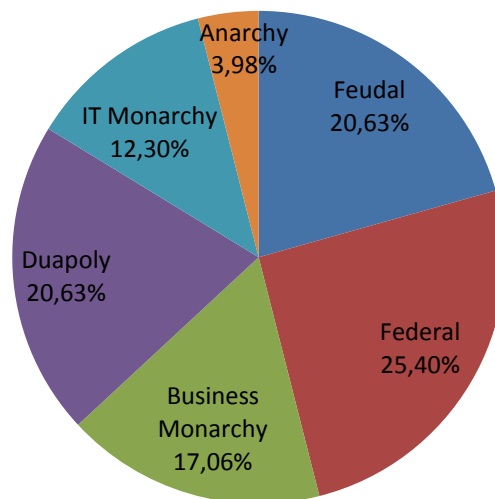


Figure 4.3 IT Governance Archetypes in terms of Priority of IT Projects

4.1 Performance Measurement

When the results are analyzed in terms of responsibility and performance measurement; it is seen that when the business units are responsible for the projects, IT projects' performance are measured by business units. It is seen that 43% of the projects' performance are not measured whereas 57% is measured as seen as Figure 4.4.

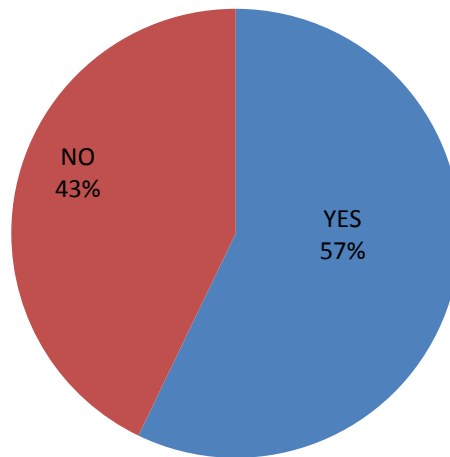


Figure 4.4 Performance Measurement

4.2 IT Project Management and Responsibility

When we analyze the projects in terms of project responsibility, it is discovered from the results that IT department has the responsibility of nearly half of the projects, whereas business units and IT department share the responsibility of 35% of the projects as seen in Figure 4.5. Totally IT departments own or share the 81% of the projects. The rest of the projects are controlled by business units or other units in the organizations.

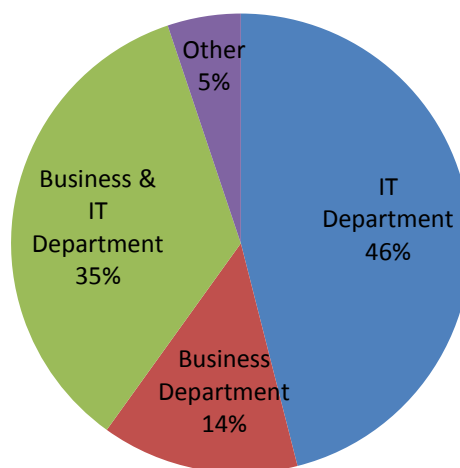


Figure 4.5 Management and Responsibility of IT Project

4.3 Representation of IT Department

IT departments can be represented by different titles. According to the results of the survey, 29% of IT departments are represented by IT directors, 26% are represented by IT managers, whereas 23% are represented by CIOs as seen in Figure 4.6. Moreover 11% of IT departments are represented by IT executives and other 11% are represented by specialists.

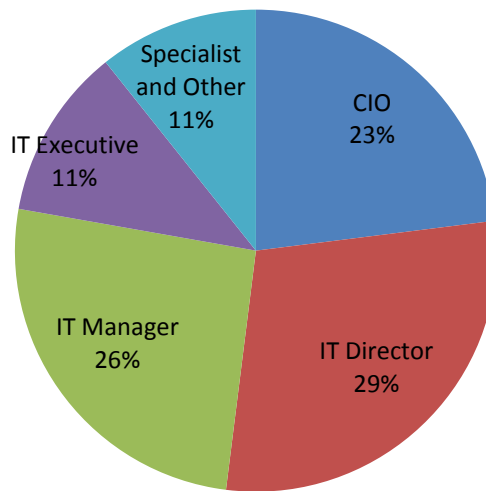


Figure 4.6 IT Department Representation

4.4 IT in Executive Committee

Another result that we tried to analyze from the survey is that if the IT departments' highest level manager in the organization is attending to the executive committee. It is seen that 38% of the IT department managers do not attend to the executive committee whereas 62% do attend as seen in Figure 4.7. Thus the IT managers that attend to the executive committee have ability to represent the IT department and they may involve in the budget decision making process, decision making process, decision of prioritization of IT projects.

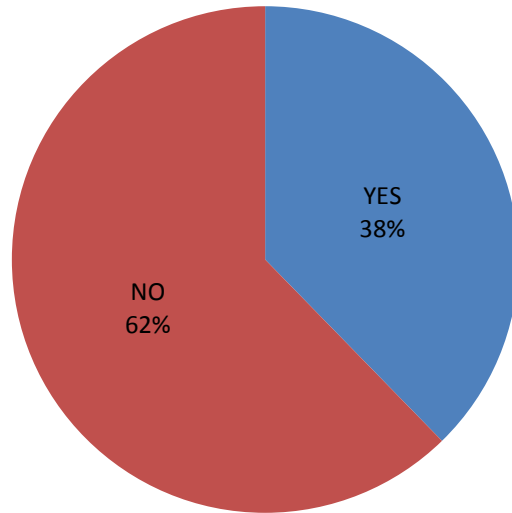


Figure 4.7 IT in Executive Committee

As it can be seen from Table 4.1, feudal governance model is dominant in budget decision making process whereas federal governance model is dominant in the decision of prioritization.

Table 4.1 Governance Model in terms of Decision of Prioritization, Decision Making Process and Budget Decision Making Process

Governance Model	Decision of Prioritization	Decision Making Process	Budget Decision Making Process
	%	%	%
Feudal	20,63	21,83	35,71
Federal	25,40	25,79	18,65
Business Monarchy	17,06	22,62	23,02
Duopoly	20,63	17,86	10,71
IT Monarchy	12,30	7,94	8,33
Anarchy	3,98	3,96	3,58
Total	100,00	100,00	100,00

According to our survey results, the involvement of Federal, Duopoly, IT Monarchy governances are drastically decreased from prioritization stage to the budgeting stage. However, Feudal and Business Monarchy governances are considerably increased from prioritization stage to the budgeting stage (Figure 4.8).

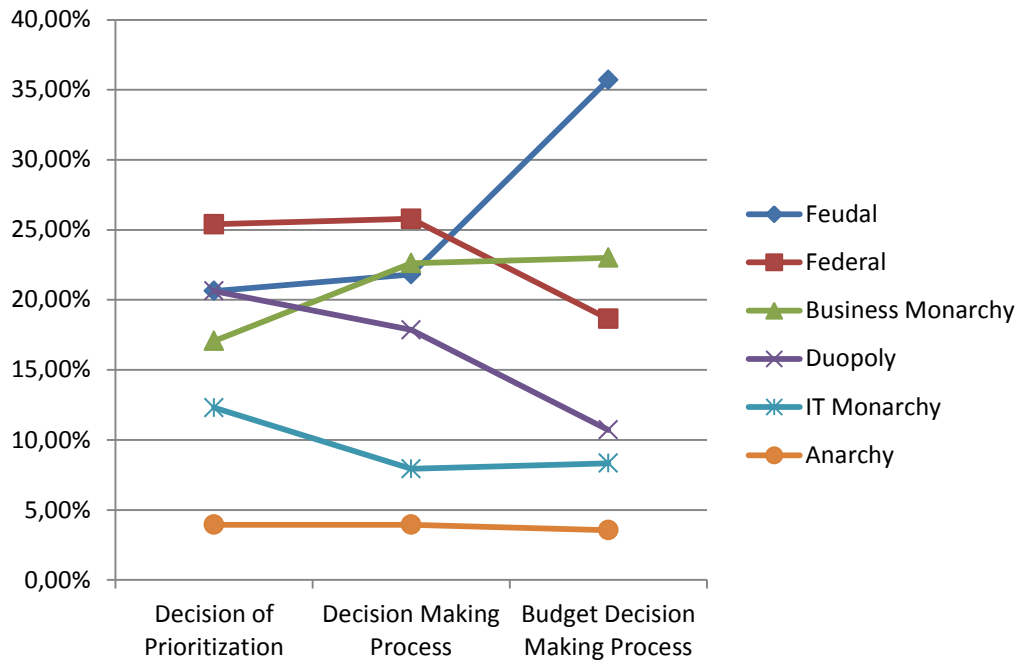


Figure 4.8 IT Governance Archetypes

It is seen that the most organizations' IT budget is decided by feudal IT governance type. On the other hand federal and business monarchy governance types have significant percentage on the decision making process. In terms of IT department's involvement in IT projects' budget decision making processes, ratio of IT Contribute to Business Dominated is about 62,04%.

If we analyze the organizations that do not involve (i.e., Business Dominated) IT departments in budget decision making processes, it is worth to say that IT department carries out the responsibility of 53,28% of these projects' by its own and they shares the responsibility of 46,71% of these projects. Moreover 17,18% of these organizations' IT departments are represented in CIO level. Most of these organizations represented in CIO level are in executive committee. However they are not involved in the budget decision making process. It is also seen that about half of the organizations perform performance measurement whereas other half do not perform.

4.5 Statistical Analysis of the Results

The data are examined with the SPSS 16 software tool as also described in the Methodology section. Chi-square test is used since the data to be examined are

categorical. The chi-square test is performed in “Analyze” menu of SPSS by selecting “Descriptive Statistics” and then “Crosstabs”.

Data Set Chi-square Test Requirements

The chi-square requirements which are also described in Methodology section is as following:

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

The requirements are tested for the data and it has been observed that the data has passed the requirements test, so that, the data can be analyzed with chi-square test.

First Hypothesis

With our first hypothesis, we wish to investigate if there is a dependence on the IT governance archetypes for budget decision making process and for project decision making process. Thus we define our hypothesis as following:

- H_0 : There is no relationship between IT Governance archetype for budget decision making process and IT Governance archetype for project decision making process.
- H_1 : There is a relationship between IT Governance archetype for budget decision making process and IT Governance archetype for project decision making process.

Test Results

In Table 4.2, the results for the test are given in APA format. As seen from the table, a total of 252 data was investigated. Chi-square test was conducted to evaluate the hypothesis if there is a significant difference between the IT governance archetypes for budget decision making process and project decision making process. As seen from Table 4.2, at the end of the chi-square test study, the difference between the IT governance archetype is found as statistically significant ($X^2 = 98,043$; $p = ,000 < ,05$). According to the results, it can be said that the relation between the IT governance archetypes on budget decision making process and project decision making process is found statistically significant. Thus, H_0 hypothesis is rejected on 0,05 significance level.

Table 4.2 The Results of First Hypothesis in APA Format

			IT governance archetype for budget decision making process					Total	X ²	Df	P	
			Feudal	Federal	Duopoly	Business Monarchy	IT Monarchy					Anarchy
IT governance archetype for project decision making process	Feudal	f _o	33	11	2	7	1	1	55	98,043	25	0,000
		f _e	19,9	10,0	5,9	12,7	4,6	2,0	55,0			
	Federal	f _o	25	20	6	10	0	3	64			
		f _e	23,1	11,7	6,9	14,7	5,3	2,3	64,0			
	Duopoly	f _o	13	8	13	8	4	0	46			
		f _e	16,6	8,4	4,9	10,6	3,8	1,6	46,0			
	Business Monarchy	f _o	15	5	4	25	7	1	57			
		f _e	20,6	10,4	6,1	13,1	4,8	2,0	57,0			
	IT Monarchy	f _o	5	2	1	6	5	1	20			
		f _e	7,2	3,7	2,1	4,6	1,7	0,7	20,0			
	Anarchy	f _o	0	0	1	2	4	3	10			
		f _e	3,6	1,8	1,1	2,3	0,8	0,4	10,0			
	Total	f _o	91	46	27	58	21	9	252			
		f _e	91,0	46,0	27,0	58,0	21,0	9,0	252,0			

Second Hypothesis

In the second hypothesis, we wish to analyze if there is a dependence on the IT governance archetypes for budget decision making process and for decision making process of prioritization of project. Thus we define our hypothesis as following:

- H_0 : There is no relationship between the IT governance archetype for budget decision making process and the archetype for decision making process of project prioritization.
- H_1 : There is a relationship between the IT governance archetype for budget decision making process and the archetype for decision making process of project prioritization.

Test Results

In Table 4.3, the results for the test are given in APA format. As seen from the table, a total of 252 data was investigated. Chi-square test was conducted to evaluate the hypothesis if there is a significant difference between the IT governance archetype for budget decision making process and project decision prioritization process. As seen from Table 4.3, at the end of the chi-square test study, the difference between the IT governance archetype is found as statistically significant ($X^2 = 65,348$; $p = ,000 < ,05$). According to the results, it can be said that the relation between the IT governance archetype on budget decision making process and project decision prioritization process is found statistically significant. Thus, H_0 hypothesis is rejected on 0,05 significance level.

Table 4.3 The Results of Second Hypothesis in APA Format

			IT governance archetype for budget decision making process					Total	X ²	Df	P	
			Feudal	Federal	Duopoly	Business Monarchy	IT Monarchy					Anarchy
IT governance archetype for decision making process of prioritization of project	Feudal	f _o	27	12	2	10	1	1	53	65,348	25	0,000
		f _e	19,1	9,7	5,7	12,2	4,4	1,9	53,0			
	Federal	f _o	25	20	4	10	2	3	64			
		f _e	23,1	11,7	6,9	14,7	5,3	2,3	64,0			
	Duopoly	f _o	14	6	14	15	4	0	53			
		f _e	19,1	9,7	5,7	12,2	4,4	1,9	53,0			
	Business Monarchy	f _o	12	5	3	15	7	0	42			
		f _e	15,2	7,7	4,5	9,7	3,5	1,5	42,0			
	IT Monarchy	f _o	10	2	3	7	6	2	30			
		f _e	10,8	5,5	3,2	6,9	2,5	1,1	30,0			
	Anarchy	f _o	3	1	1	1	1	3	10			
		f _e	3,6	1,8	1,1	2,3	0,8	0,4	10,0			
	Total	f _o	91	46	27	58	21	9	252			
		f _e	91,0	46,0	27,0	58,0	21,0	9,0	252,0			

Third Hypothesis

In the second hypothesis, we wish to analyze if there is a dependence on the IT governance archetype for project decision making process and for decision making process of prioritization of project. Thus we define our hypothesis as following:

- H_0 : There is no relationship between the IT governance archetype for project decision making process and the archetype for decision making process of project prioritization.
- H_1 : There is a relationship between the IT governance archetype for project decision making process and the archetype for decision making process of project prioritization.

Test Results

In Table 4.4, the results for the test are given in APA format. As seen from the table, a total of 252 data was investigated. Chi-square test was conducted to evaluate the hypothesis if there is a significant difference between the IT governance archetype for project decision making process and project decision prioritization process. As seen from Table 4.4, at the end of the chi-square test study, the difference between the IT governance archetype is found as statistically significant ($X^2 = 65,643$; $p = ,000 < ,05$). According to the results, it can be said that the relation between the IT governance archetype on project decision making process and project decision prioritization process is found statistically significant. Thus, H_0 hypothesis is rejected on 0,05 significance level.

Table 4.4 The Results of Third Hypothesis in APA Format

			IT governance archetype for decision making process of prioritization of project						Total	X ²	Df	P
			Feudal	Federal	Duopoly	Business Monarchy	IT Monarchy	Anarchy				
IT governance archetype for project decision making process	Feudal	f _o	34	7	5	5	4	0	55	65,643	25	0,000
		f _e	11,6	14,0	11,6	9,2	6,5	2,2	55,0			
	Federal	f _o	7	36	14	5	1	1	64			
		f _e	13,5	16,3	13,5	10,7	7,6	2,5	64,0			
	Duopoly	f _o	4	9	21	6	3	3	46			
		f _e	9,7	11,7	9,7	7,7	5,5	1,8	46,0			
	Business Monarchy	f _o	4	9	12	21	8	3	57			
		f _e	12,0	14,5	12,0	9,5	6,8	2,3	57,0			
	IT Monarchy	f _o	3	2	1	3	11	0	20			
		f _e	4,2	5,1	4,2	3,3	2,4	0,8	20,0			
	Anarchy	f _o	1	1	0	2	3	3	10			
		f _e	2,1	2,5	2,1	1,7	1,2	0,4	10,0			
	Total	f _o	53	64	53	42	30	10	252			
		f _e	53,0	64,0	53,0	42,0	30,0	10,0	252,0			

Fourth Hypothesis

In the fourth hypothesis, we wish to analyze if there is a dependence on the IT projects' performance measurement and project responsibility owner. Thus we define our hypothesis as following:

- H_0 : There is no relationship between project responsibility owner and IT projects' performance measurement.
- H_1 : There is a relationship between project responsibility owner and IT projects' performance measurement.

Test Results

In Table 4.5, the results for the test are given in APA format. As seen from the table, a total of 252 data was investigated. Chi-square test was conducted to evaluate the hypothesis if there is a significant difference between the project responsibility owner and projects' performance measurement. As seen from Table 4.5, at the end of the chi-square test study, a significant difference is not found between the IT projects' performance measurement and project responsibility owner ($X^2=2,330$; $p=.507 > .05$). According to the results, it can be said that the relation between the project responsibility owner and projects' performance measurement is not found statistically significant. Thus, H_0 hypothesis can not be rejected at the 0,05 significance level.

Table 4.5 The Results of Fourth Hypothesis in APA Format

			Project Responsibility Owner				Total	X ²	Df	P
			IT department	Business Departments	IT and Business Departments	Other				
Project Performance Measurement	Yes	f _o	65	16	51	8	140	2,330	3	0,507
		f _e	64,4	20,0	48,3	7,2	140,0			
	No	f _o	51	20	36	5	112			
		f _e	51,6	16,0	38,7	5,8	112,0			
Total		f _o	116	36	87	13	252			
		f _e	116,0	36,0	87,0	13,0	252,0			

Fifth Hypothesis

In the fifth hypothesis, we wish to analyze if there is dependence between IT departments' representative manager level and IT governance archetype for budget decision making process. Thus we define our hypothesis as following:

- H_0 : There is no relationship between IT departments' representative manager level and IT governance archetype for budget decision making process.
- H_1 : There is a relationship between IT departments' representative manager level and IT governance archetype for budget decision making process.

Test Results

In Table 4.6, the results for the test are given in APA format. As seen from the table, a total of 252 data was investigated. Chi-square test was conducted to evaluate the hypothesis if there is a significant difference between the IT departments' representative manager level and IT governance archetype for budget decision making process. As seen from Table 4.6, at the end of the chi-square test study, a significant difference is not found between IT departments' representative manager level and IT governance archetype for budget decision making process ($X^2=21,342$; $p=,377 > ,05$). According to the results, it can be said that the relation between the IT departments' representative manager level and IT governance archetype for budget decision making process is not found statistically significant. Thus, H_0 hypothesis can not be rejected on 0,05 significance level.

Table 4.6 The Results of Fifth Hypothesis in APA Format

			IT governance archetype for budget decision making process						Total	X ²	Df	P
			Feudal	Federal	Duopoly	Business Monarchy	IT Monarchy	Anarchy				
IT departments' representative manager level	IT Manager	f _o	31	10	6	13	3	2	65	21,342	20	0,377
		f _e	23,5	11,9	7,0	15,0	5,4	2,2	65,0			
	IT Director	f _o	19	19	11	19	3	2	73			
		f _e	26,4	13,3	7,8	16,8	6,1	2,6	73,0			
	IT Executive	f _o	8	4	3	9	4	2	30			
		f _e	10,8	5,5	3,2	6,9	2,5	1,1	30,0			
	CIO	f _o	20	10	6	12	7	2	57			
		f _e	20,6	10,4	6,1	13,1	4,8	2,0	57,0			
	Specialist and Others	f _o	13	3	1	5	4	1	27			
		f _e	9,8	4,9	2,9	6,2	2,2	1,0	27,0			
	Total	f _o	91	46	27	58	21	9	252			
		f _e	91,0	46,0	27,0	58,0	21,0	9,0	252,0			

Sixth Hypothesis

In the second hypothesis, we wish to analyze if there is dependence between IT departments' representative manager level and IT departments' representation on executive committee. Thus we define our hypothesis as following:

- H_0 : There is no relationship between IT departments' representative manager level and the IT departments' representation on executive committee.
- H_1 : There is a relationship between IT departments' representative manager level and the IT departments' representation on executive committee.

Test Results

In Table 4.7, the results for the test are given in APA format. As seen from the table, a total of 252 data was investigated. Chi-square test was conducted to evaluate the hypothesis if there is a significant difference between the IT departments' representative manager level and IT departments' representation on executive committee. As seen from Table 4.7, at the end of the chi-square test study, the difference between the IT departments' representative manager level and IT departments' representation on executive committee is found as statistically significant ($X^2 = 37,015$; $p = ,000 < ,05$). According to the results, it can be said that the relation between the IT governance archetype between IT departments' representative manager level and IT departments' representation on executive committee is found statistically significant. Thus, H_0 hypothesis is rejected on 0,05 significance level.

Table 4.7 The Results of Sixth Hypothesis in APA Format

			IT departments' representative manager level					Total	X ²	Df	P
			IT Manager	IT Director	IT Executive	CIO	Specialist & Other				
IT departments' representation on executive committee	Yes	f _o	16	33	3	37	6	95	37,015	4	0,000
		f _e	24,5	27,5	11,3	21,5	10,2	95,0			
	No	f _o	49	40	27	20	21	157			
		f _e	40,5	45,5	18,7	35,5	16,8	157,0			
Total		f _o	65	73	30	57	27	252			
		f _e	65,0	73,0	30,0	57,0	27,0	252,0			

Table 4.8 Summary of Hypotheses

	Hypothesis Parameters	Hypothesis Result	Rejected & not rejected
1st Hypothesis	Budged Decision Making - Decision Making Process	Relation between the IT Governance Archetype on budgeted decision making process and project decision making process is found statistically significant. Thus, Ho hypothesis is rejected on 0,05 significance level.	Is rejected
2nd Hypothesis	Ho: Budged Decision Making- Decision Making Process of Prioritization	Relation between the IT Governance Archetype on budgeted decision making process and decision making process prioritization is found statistically significant. Thus, Ho hypothesis is rejected on 0,05 significance level.	Is rejected
3rd Hypothesis	Ho: Decision Making Process - Decision Making Process of Prioritization	Relation between the IT Governance Archetype on project decision making process and project decision prioritization process is found statistically significant. Thus, Ho hypothesis is rejected on 0,05 significance level.	Is rejected
4th Hypothesis	Ho: Responsibility Owner - Project Performance Measurement	Relation between project responsibility owner and projects' performance measurement is not found statistically significant. Thus, Ho hypothesis cannot be rejected on 0,05 significance level.	Cannot be rejected
5th Hypothesis	Ho: IT Dep. Representative manager level- Budged Decision Making Process	Relation between IT Dep. Representative manager level and Budged Decision Making Process is not found statistically significant. Thus, Ho hypothesis cannot be rejected on 0,05 significance level.	Cannot be rejected
6th Hypothesis	Ho: IT Dep. Representative manager level- IT Dep. Representative on Executive Committee	Relation between the IT Governance Archetype on IT Dep. Representative manager level and IT Dep. Representative on Executive Committee is found statistically significant. Thus, Ho hypothesis is rejected on 0,05 significance level.	Is rejected

Chapter 5

Discussion

According to the results of our comprehensive survey, it seems that the gathered results from both surveys and statistics are meaningful and give incredible insights for our study. They allowed us to understand the existing situation of the IT governance model in Turkey clearly. The results are really helpful for us to make valuable recommendations and future directions concerning IT governance model in Turkey.

Results of the survey gives that 57,43% of organizations are business dominant (i.e., Feudal and Federal) and are not including IT department in the decision making process of annual IT budget planning (Figure 5.1).

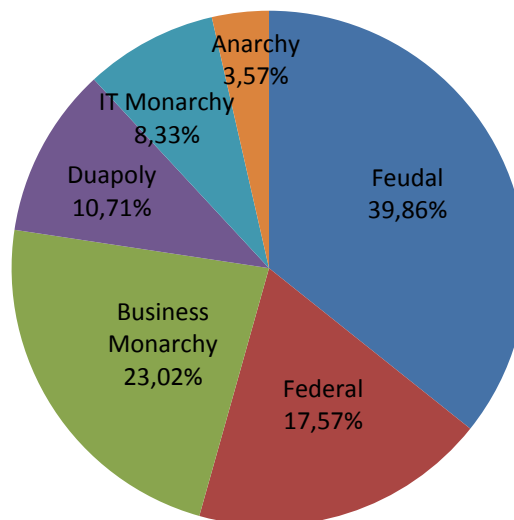


Figure 5.1 IT Budget Decision Making Percentages

In case of IT project's implementation approval 51,35% of organizations are business dominant (Feudal and Federal) and are not including IT departments in the processes. The result of these two decision domains are somewhat close to each other in terms of excluding IT people in decision making process related with IT (Figure 5.2).

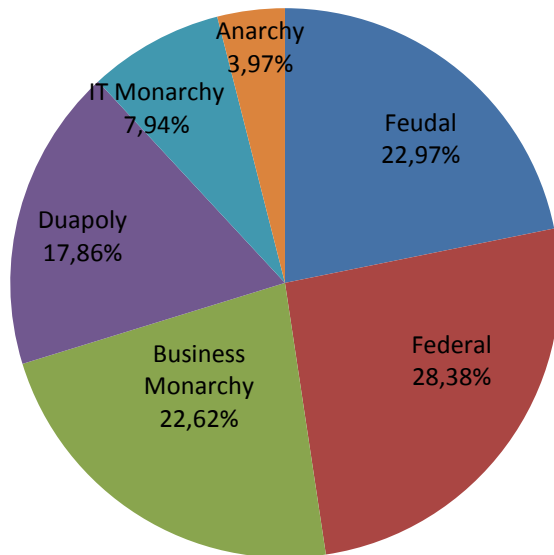


Figure 5.2 IT Project Approval & Decision Making Percentages

Another significant result is that 48,65% of organizations are business dominant (Feudal and Federal) and are not including IT departments in the prioritization decision of IT projects. Result of all surveyed decision domain shows that, business people are dominating the IT project decision in the organizations in Turkey (Figure 5.3), where we cannot foresee the presence of IT governance with just business domination

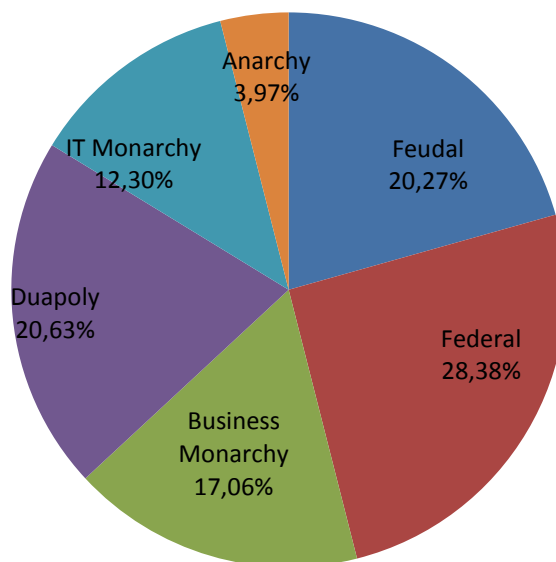


Figure 5.3 IT Project Prioritization Percentages

Again, in accordance with the survey results, 62% of the respondents expressed that IT department is not represented in the executive committee or board of directors (Figure 5.4).

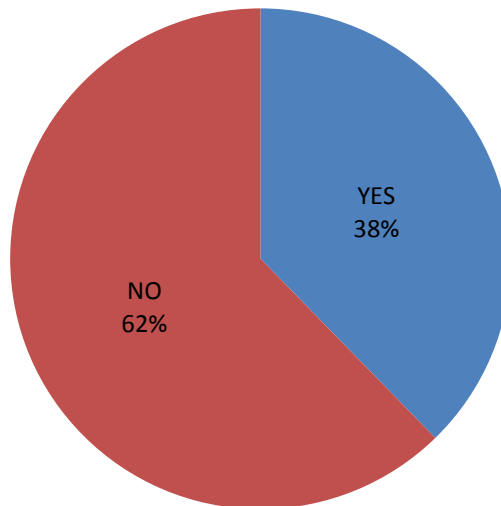


Figure 5.4 IT Department Representation on Board

5.1. Effect of IT Representation on Board

If we drill down IT departments which are not taking seat on board, only 34,39% out of 62% are involved in (i.e., Business and IT Contribute) the IT budget planning and decision making process (Figure 5.5).

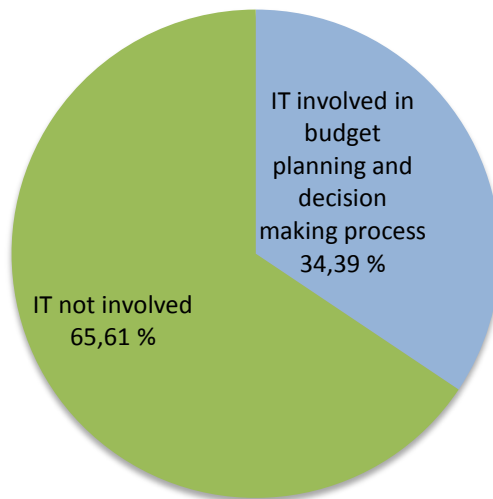


Figure 5.5 Distribution of 62,30% of the Organizations Not Represented on Board - I
 Also 33,75% of the same group is included in the decision process of prioritization of IT projects (Figure 5.6).

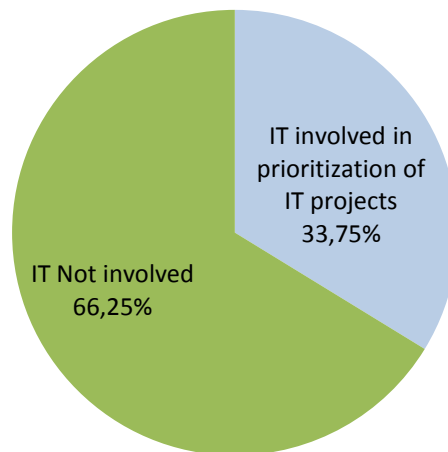


Figure 5.6 Distribution of 62,30% of the Organizations Not Represented on Board -
 II

Again, 38,21% of the ones that are not represented in board of directors take role in the approval (i.e., go or not go) process of IT projects (Figure 5.7).

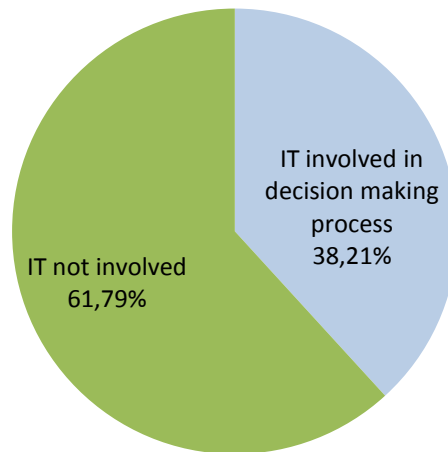


Figure 5.7 Distribution of 62,30% of Organizations Not Represented on Board - III

78,98% of the group that is not involved in board of directors responds that the responsibility of the IT projects is under the IT and/or IT and business units. Actually this result highlights that IT does not participate in the budget planning. However in case of performing IT projects with business units jointly, it was seen that IT involve in (i.e., Business and IT Contribute) budget planning process not directly but through the business unit manager in board of directors (Figure 5.8).

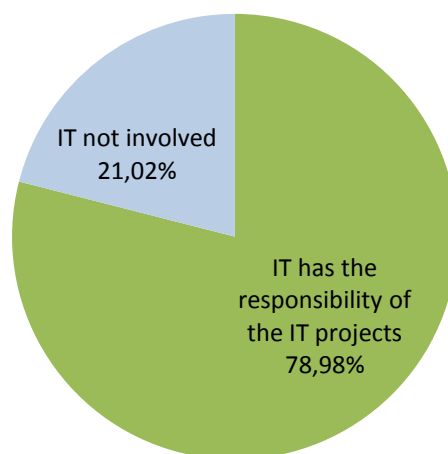


Figure 5.8 Distribution of 62,30% of Organizations Not Represented on Board – IV

In case of performance measurement process, 48% percentage of the IT that are not represented in board are comprised from 13% CIOs, 25% IT Directors, 31% IT

Executives, 17% IT Managers and 14% Specialists and others (Figure 5.9). The important point here is that IT is involved in CIO level however not takes part in the Executive Board. Also half of that 13% of CIOs are implementing IT project details, but the responsibility and management of the projects belongs to business and IT units. Here, we can conclude that IT may involve in the budget planning, prioritization and other similar decision making processes indirectly through the mentioned business unit managers above.

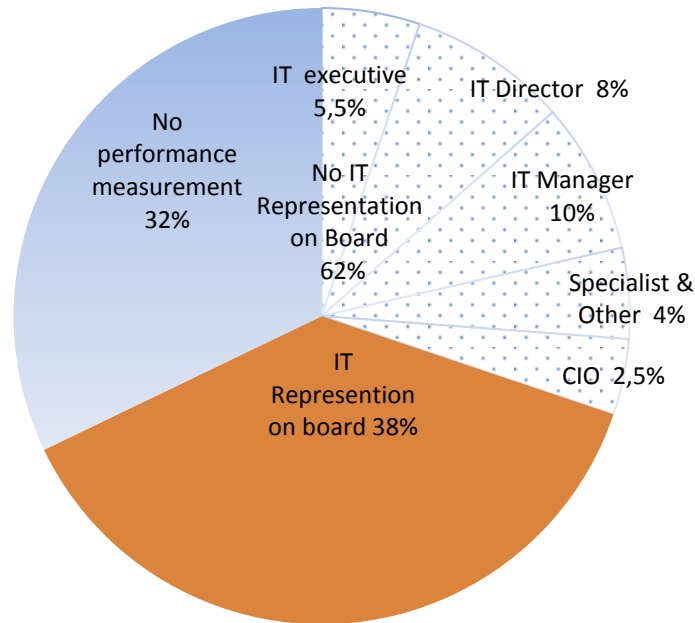


Figure 5.9 IT is NOT Represented on Board & Measure Performance by IT Representative's Percentage

Another important issue is that the representation of IT by middle and top level reaches 86%. However 78% of the results says that the projects are under the control of IT and IT is not included in board of directors. This means that, although IT departments do not take part in approval process of IT projects, prioritization and budget planning processes, IT takes more responsibility of the projects.

The representation of IT in executive board is 38% which is really poor. In accordance with the IT representation ratio in executive board, the 84% of respondents say that the responsibility of the IT projects belongs to IT department and business and IT units which is a considerable ratio. In terms of IT governance archetype structure, 47% says that IT involves (i.e., Business and IT Contribute) in the IT budget planning; 54% expresses that IT involves (i.e., Business and IT

Contribute) in approval process and finally 60% says that IT takes part in project prioritization process. Although IT seems to take part in board of directors and top management, the ratio related with involvement in budget planning process is somewhat poor. It can be concluded that during budget planning process, business and business units are more dominant than IT.

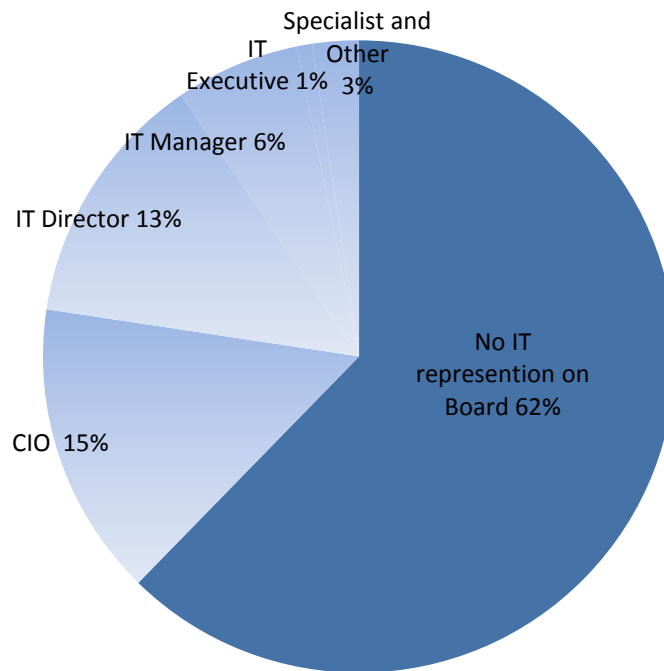


Figure 5.10 IT Representation on Board and IT Representatives

According to the survey results, it is seen that the involvement of IT in approval process of IT projects is increasing and in case of prioritization process this ratio increases to 60%. We can make some conclusions depending on these ratios.

Board of directors within an organization generally perform the necessary budget planning and estimation, and IT people in that same organization is responsible to carry out IT projects, those IT staff are not involved in high level decision making processes such as budget planning (Figure 5.11).

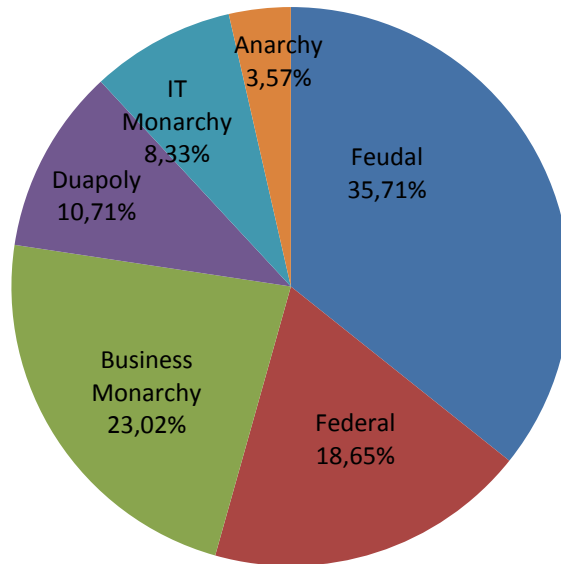


Figure 5.11 Percentages of IT Budget Decision Making Process

IT people who are involved in the board are generally take part in approval process of the IT projects and giving decision whether continuation or cancellation of an IT project (Figure 5.12).

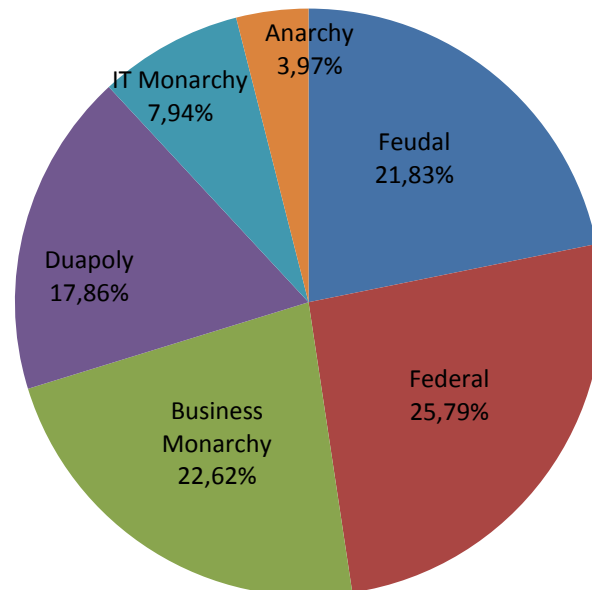


Figure 5.12 Percentages of IT Project Decision Making Process

The involved IT in board of directors performs prioritization process of high number of IT projects that are approved (Figure 5.13).

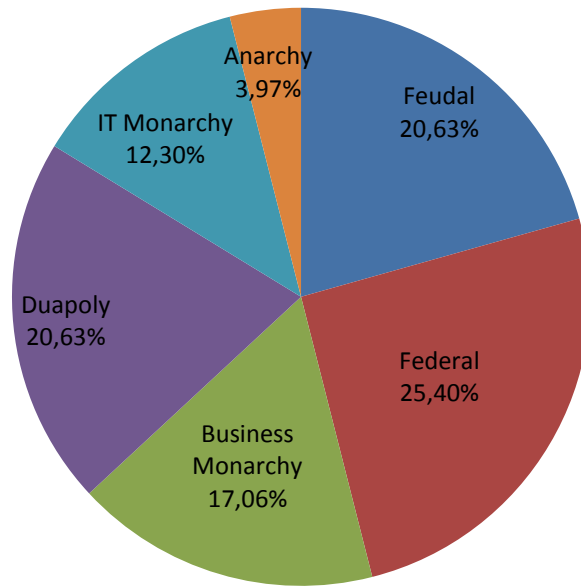


Figure 5.13 Percentages of IT Project Prioritization

In accordance with the results, we can express that involvement of IT in board does not create a big impact on the budget planning or IT projects. 72% of IT people that involves in board takes care of the IT projects and performance evaluation (Figure 5.14).

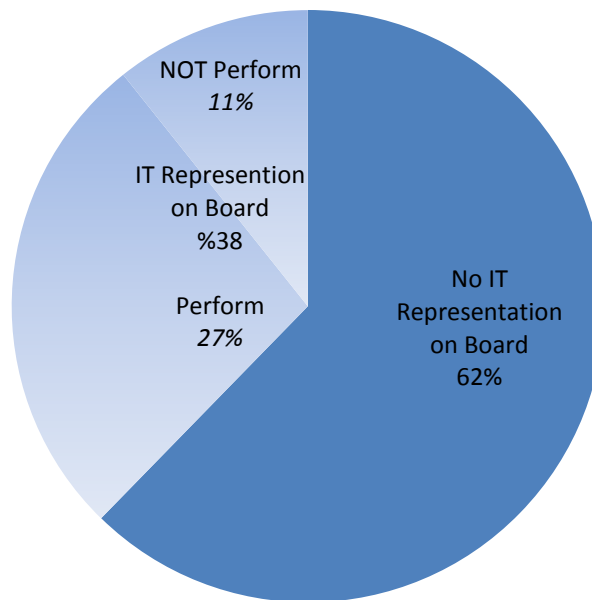


Figure 5.14 IT Representation on Board and Performance Measurement

The performance measurement is carried by IT people because IT is represented at higher levels as well as responsibility, management and prioritization of IT projects is performed by mostly IT. The survey results indicate that, IT project management responsibility by IT is at ratio of 81% (Figure 5.15).

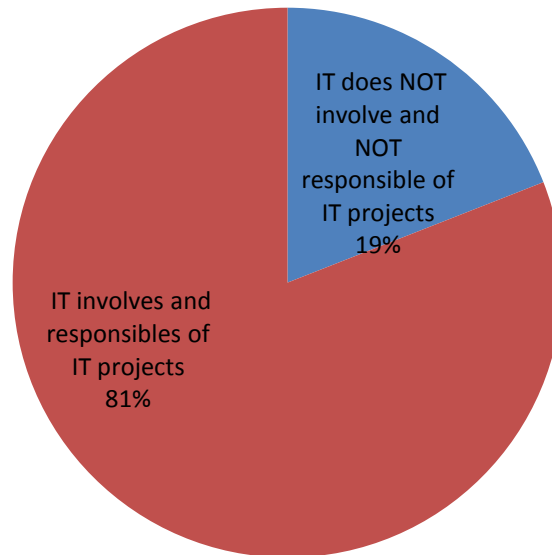


Figure 5.15 IT Involves and Responsible of IT Projects

When responsibility and IT project management belong to IT department or jointly carried out by IT and other business units, 55% of IT people that is involved (i.e., Business and IT Contribute) in project prioritization take part in board (Figure 5.16).

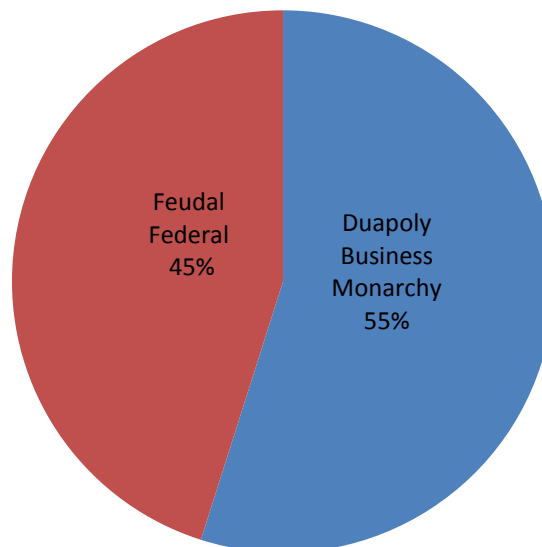


Figure 5.16 IT Projects and Responsibility Belong IT in Terms of Prioritization

In case of involved IT in prioritization of IT projects and taken responsibility and management of projects by IT, the representation of IT is at ratio of 43% (Figure 5.17).

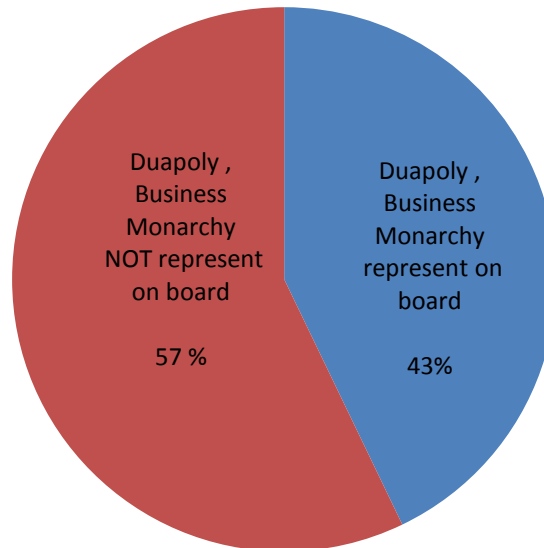


Figure 5.17 IT Project Belongs IT which Represent on Board in Terms of Priority

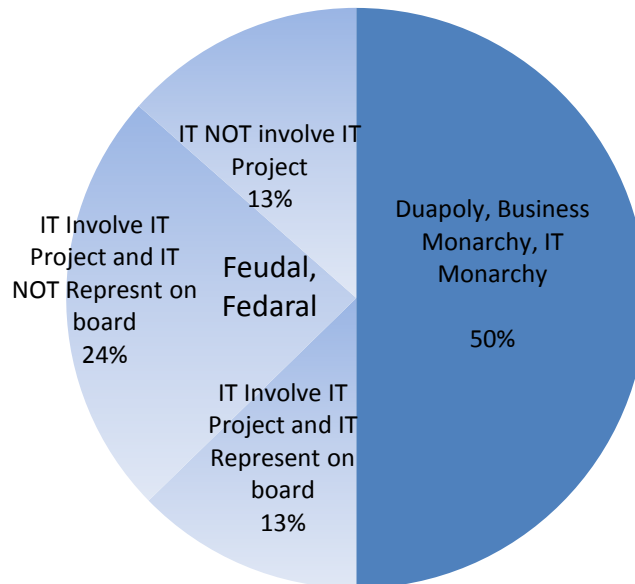


Figure 5.18 IT Priority, IT Project Responsibility and Represent on Board

However in case of taken responsibility and management of projects by IT but no involvement of IT (i.e., Business Dominate) in prioritization, the representation of IT is at ratio of 34% (Figure 5.18).

In prioritization process the involvement of IT in board or not gets importance actually. IT's representation in board is ratio of 40% when the responsibility, approval and management IT projects belong to IT (Figure 5.19).

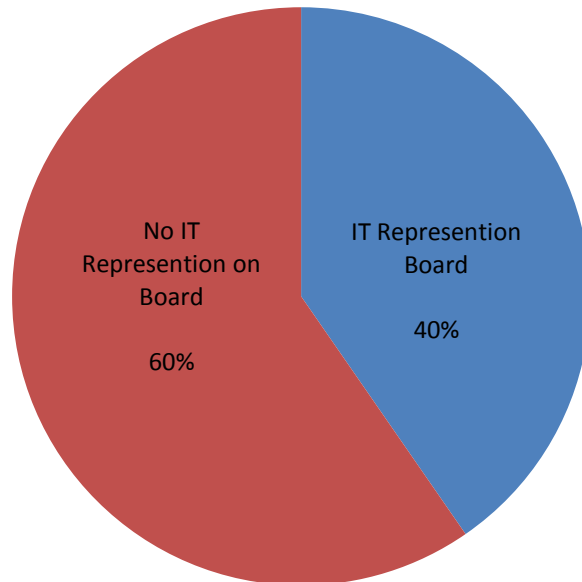


Figure 5.19 IT Involves IT Project in terms of IT Project Decision Making Process

Its representation in board decreases ratio of 37% when the responsibility and management IT projects belong to IT, and IT is not involved in approval process (Figure 5.20).

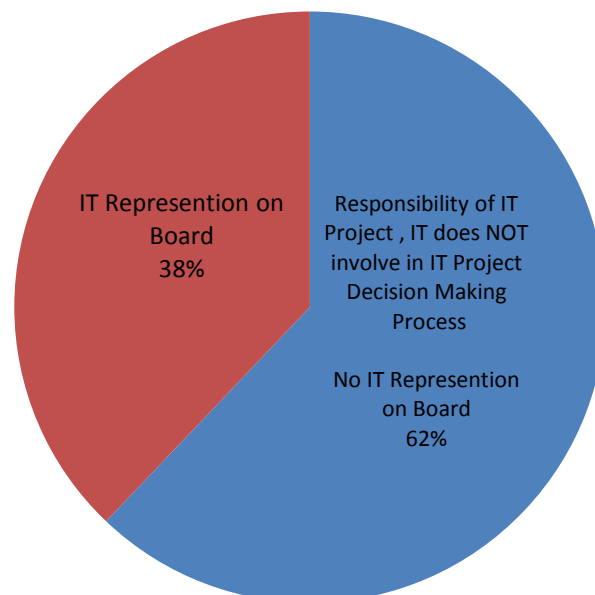


Figure 5.20 IT not involves IT Project in terms of IT Project Decision Making Process

It seems that taking part in approval decision making process in board does not make a big sense. When IT is taking responsibility of project and project management as well as taking role in budget planning period, IT is represented by 37% in board. In this case, when IT does not take role in budget planning only, this ratio increases up to 41%. When IT does not take role in responsibility and project management but involves in budget planning, the same ratio increases up to 58%. Similarly, when IT does not take role in responsibility and project management but involves in approval decision making process, the same ratio changes to 42%. When IT does not take role in responsibility and project management but involves in prioritization of IT projects, IT is represented in board by 28%.

In case of no involvement neither in responsibility and project management or budget planning of IT projects, 22% respondents indicate that IT is represented in board. In case of no involvement neither in responsibility and project management or approval process of IT projects, 26% respondents indicate that IT is represented in board. Finally, in case of no involvement neither in responsibility and project management or prioritization of IT projects, 23% respondents indicated that IT is represented in board. In other words, when the responsibility and management of projects are given other entities rather than IT department, in budget planning or estimation step, the managerial people consult to the IT people within the organization or IT people directly involves in that corresponding step. Especially when they are carried out by other departments; IT generally takes part in board of directors or top management to give decisions in budget planning process. Also IT takes role in approval process of those projects and takes part in the board. In the prioritization of IT projects where IT does not have responsibility and control, IT people with a low ratio involve in board.

When IT does not involve in projects' responsibility and management and also when it does not represented in the board of directors by someone; IT involves in

- Budget planning decision process with 15%,
- Approval decision process with 24%,
- Prioritization decision process with 21%.

All these results show that, when IT is not represented by some IT people in the board, and project's management and responsibility is not on the IT department, the projects are carried out by other business units and IT only has a supportive role for those projects. When there is lacking IT in board, top management and also in projects management, we can conclude that in that organization IT is not perceived as a core value of the organization, only seen as a supportive activity.

In case of involvement of IT in approval, budget planning and prioritization of projects, IT is represented by 43% in board. 72% of the respondents indicate that IT is evaluated in terms of performance. However, in case of no involvement of IT in approval, budget planning and prioritization of projects, that ratio is decrease to 29%, and 48% of the respondents indicates that IT is measured in terms of performance. The project's management in responsibility of IT department has an impact on the representation of IT directly or indirectly in board or top management.

In accordance with the survey, ratio of 42% says that business unit managers and C Level managers are involved in the board. Furthermore, 34% of all respondents or IT people takes part in the board or top management which is a considerable ratio in terms of IT perception in Turkey. All the mentioned ratios shows that, IT is not considered as core value of most of the businesses in Turkey, it is still perceived as a supportive activity of an organization. The organization as a whole only expect from IT department to carry out successful IT projects with low cost, high quality and so on. The picture in Turkey can be summarized as follows. IT project's approval decision making process, budget and resource planning, prioritization processes are mostly performed by the top level managers, and only the responsibility of that IT project is given to the IT people in that organization. The top managers or board actually expects IT people to complete that project depending on the budget estimated with success. It is possible to say that most of the IT projects fail in Turkey because of that perception unfortunately.

In Turkey, when a selective/total IT outsourcing decision needs to be given in a business unit for instance accounting department, the approval decision making process is performed by mostly top management and/or accounting department. This case is valid for most of the organizations, no matter their size, management or

governance style, industry or sector and so on. After the system is outsourced, the system's responsibility is given to the IT department in that organization which creates more problematic issues further. For that outsourced IT project, IT department's ideas and experience are not considered in the decision process. Hence, in Turkey still top management and/or business unit managers are working with familiar organizations within the industry which leads to the failure of most projects; the result does not change. The reason behind the high demand for working with familiar organization is generally already formed confidence and trust between them. Instead of building trust with the IT department in its own organization, the top management or boards prefer to work with other IT firms; sometimes they see its own IT people insufficient or incapable in terms of knowledge and experience, or they perceive IT as supportive activity rather than primary activity. Hence they may see IT people as a support team for their projects in the organization.

According to the results, the applied IT Governance structure over the world is not appropriate with the one in Turkey. This research is the first academic study that examines the IT Governance structure in Turkey including a long-running, rigorous survey and statistical study. Our first target group was the Executive Board and C Level, and generally it is hard to reach and make a survey with those people in Turkey. The results are really meaningful and helpful since the first and second survey results are appropriate and support each other. In our first attempt, we have conducted the survey with more detailed questions with a broad scope (e.g., how and at which level IT Governance is perceived and so on). However due to the high number of questions, we could not reach high number of data from C Level managers; hence we preferred to narrow down our scope and conduct another survey. According to the first survey results, it is seen that most of the C level managers consider IT as a supportive activity rather than core business.

5.2. Some Recommendations for Improving IT Governance in Turkey

For applying well-structured IT Governance style, several frameworks or models can be performed or implemented within organizations; however such a change is somewhat impossible for the organizations in Turkey. Hence, for Turkey a novel IT Governance model that is properly working will be more appropriate. To achieve

this, the first requirement is the clarification of roles and responsibilities within IT departments, which is essential for the perception of IT Governance as a core business value rather than supporting activity. Another important issue is that involvement of IT department in board of directors or top management is not highly required. In Turkey, generally the business units that provide high revenue for the company take part in the board of directors. However, IT people or staff in an organization should take part in the decision making process of approval, budget planning and prioritization of an IT project that belongs to a business unit; so that the possible problems or complexities can be easily handled before their occurrence. Some examples for those possible problems are purchasing a software of an IT company that is not highly experienced, or purchasing a software that is not tested in terms of performance, security and other metrics, or buying a software that is developed by an old technology and has a lot of bugs and so on. These are all critical issues for the success completion of the IT projects, and the involvement of IT in critical decision making processes increases the project's sustainability, feasibility and quality.

In Turkey, the representation of IT or IT people as CIO, IT Executive, IT Manager or IT Expert does not make sense in organizations. It is seen from the survey results that CIO in an organization take part in board, however that CIO does not involve in the budget planning, prioritization and other decision making processes. Also some of them do not take the responsibility of the IT projects and their management. In Turkey most of the firms gave top level IT management responsibility to inexperienced people which ratio is 48% according to survey result. The reason behind this, the organization still does not aware of the IT's importance and its business value, which leads us to the lack of IT Governance perception issue again. By the way, IT may not aware of business' importance and business value. Hence, when the companies are compared in terms of their sizes, turnover ratio, and number of IT employees and so on, generally large scale companies represent IT department as CIO and has a governance archetype structure which is completely or partially applied. However this number is 23% in Turkey. Generally it is seen that most of the organizations are applying IT Governance in a different way; they are not aware of the applied IT governance structure.

For enabling the success of IT projects, governance structures needs to be configured properly. In Turkey, the reasons behind the failure of IT projects are started to be searched recently. I believe in that this progress paves the way for understanding the importance of IT Governance.

As mentioned, there cannot be only one appropriate governance model for all of the organizations in Turkey due to its diverse characteristics and factors. However we can highlight and summarize the common properties that should be considered for IT governance structure in an organization:

In budget planning, decision making and prioritization process of IT projects, IT department or people should be directly or indirectly included in all steps of the project. According to survey results that IT does not represent on board 62%, but IT projects manage with business unit 34% which represents on executive committee, so IT represent on executive committee indirectly and in accordance with this, a representation of IT should be established in the organization.

Change of IT perception within organizations;

- Perceiving as a core value of the company rather than support activity,
- Perceiving IT not only as an expense or cost, and realizing the business value or performance of IT.

To sum up, IT people should take part in all three mentioned steps (i.e., budget planning, decision making and prioritization processes) of the IT projects; no matter the management style within the organization or the level of representation of the IT. Such as progress in IT projects will prevent any possible mistakes, failures or deficiencies, and minimizes the risks, and will enable success of IT project with high quality and optimum resources. Actually Turkey needs some time for realizing the importance of IT Governance. In accordance with the survey results, most of the IT companies are performing different governance structure unconsciously. However since the perception of IT does not change in the organizations, the applied governance types will lead to the failure of IT projects with high costs, unmanageable problems, low quality, and technical problems and so on.

Chapter 6

Conclusion

IT Governance as an integral part of an enterprise governance elevates information as a key organizational asset. It is generally the responsibility of the board of directors and the executive management. In recent years, the rapid development and adoption of IT is changing the way of doing business as well as is leading most of the top managers to consider IT as a primary activity within their organizations.

In this thesis, we have performed an explorative study on understanding the IT Governance perception in Turkey. To gather the required information, we have conducted a survey for IT and business people.

The questions are based on the COBIT framework. It was a valuable framework for us in this thesis study. COBIT framework enables us to focus on the IT Governance's core values more clearly and to prepare customized set of questions for the survey. The prepared survey is performed over a web site link which is also shared over social media communication channels with IT and business people. The survey is conducted with 252 IT and business people. The survey result is found with statistical measurements by SPSS 16 tool.

Actually the starting point of this study is to understand the IT Governance perception of companies in Turkey. In addition to our starting motivation, important parameters of IT Governance (i.e., budget planning in IT projects, decision making in IT projects and prioritization in IT projects) are analyzed and assessed. Some conclusions and suggestions are summarized hereunder:

- The perception of IT Governance and governance archetypes is explored. IT department is generally considered as a supporting activity. Thus generally IT people are not completely involved in IT projects from its beginning. IT

decision domain is performed by business units but, project implementation is delegated to IT Department.

- Participants to our survey believe that, including an IT department or IT related businesses performs an IT Governance model consciously or unconsciously. IT Governance is not properly and structurally applied in most companies except in large scale, institutional companies.
- There is no dominant IT Governance model for all companies conducted in the Turkey. It may differentiate depending on the factors or characteristics of the company. So we can investigate if and how dominant models depend on characteristic which industry form, revenue and ownership model.
- In most of the companies, IT does not take part in board or directors, however when they carry out an IT project with a business unit, IT indirectly involves in budget planning process and participates somewhat in a decision making mechanism.
- Up to now, in Turkey, such a rigorous study on IT Governance has not been performed, and thus the survey IT Governance is eagerly awaiting the results of the study.

Possible future research questions include:

- How / What archetypes are effective for IT Governance in Turkey?
- What are the determinants of dominant models for IT Governance in Turkey?
- How is IT Governance effectively realized in organizations?
- Is there any relationship between the results and respondents' categories who have different backgrounds, different management levels?

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APPENDIX A

Survey Questions in Turkish

1-Yillik IT bütçeniz hazırlanırken karar mekanizmasında kimler bulunuyor?

Sirketin Üst Yönetimi (Icra Komitesi, Yönetim Kurulu, Genel Müdür vb.)

Üst Yönetim ve İş Birimleri Yönetimi

İs Birimleri Yöneticileri ve IT Yönetimi

İs Birimi Yöneticileri, IT Yönetimi ve Üst Yönetim

IT Yönetimi

Üst Yönetimden bağımsız her departman kendi karar verip uyguluyor

2-İs birimlerine ait IT projelerinin yapılıp yapılmaması karar sürecinde kimler etkili oluyor?

Sirketin Üst Yönetimi (Icra Komitesi, Yönetim Kurulu, Genel Müdür vb.)

Üst Yönetim ve İş Birimleri Yönetimi

İs Birimleri Yöneticileri ve IT Yönetimi

İs Birimi Yöneticileri, IT Yönetimi ve Üst Yönetim

IT Yönetimi

Üst Yönetimden bağımsız her departman kendi karar verip uyguluyor

3-İs birimlerine ait IT projelerinin önceliklendirilmesi konusundaki karar sürecinde kimler etkili oluyor?

Sirketin Üst Yönetimi (Icra Komitesi, Yönetim Kurulu, Genel Müdür vb.)

Üst Yönetim ve İş Birimleri Yönetimi

İs Birimleri Yöneticileri ve IT Yönetimi

İs Birimi Yöneticileri, IT Yönetimi ve Üst Yönetim

IT Yönetimi

Üst Yönetimden bağımsız her departman kendi karar verip uyguluyor

4-Is birimlerine ait IT projelerinin performansi is birimleri tarafından ölçülüyor ve degerlendiriliyor mu?

Evet

Hayır

5-Is birimlerine ait IT projelerinde sorumluluk ve proje yönetimi hangi birimdedir?

İş Birimlerinde

IT Birimlerinde

İş ve IT Birimlerinde

Diğer

6-Çalışmakta olduğunuz şirkette IT, en üst düzeyde hangi unvan ile temsil edilmektedir?

Chief Information Officer (CIO)

IT Direktörü

IT Müdürü

IT Yöneticisi

Uzman ve diğer

7-Çalışmakta olduğunuz şirkette sizin pozisyonunuz nedir?

IT Departman Yöneticisi

İş Birim Yöneticisi

Üst Yönetim (C Level, vb.)

Uzman ve diğer

8-Çalışmakta olduğunuz şirkette en üst düzey IT yöneticisi yönetim kurulunda veya icra komitesinde yer alıyor mu?

Evet

Hayır

Curriculum Vitae

Fatih ERMİŐ was born in 6 March 1987, in Isparta. He received his BS degree in Management Information System in 2009 from IŐık University, Istanbul. He is currently working as an IT Manager at the  zyurt Madencilik A.Ő. His research interests include web technologies, mobile technologies, and emerging IT technologies.