T.C.
YEDİTEPE UNIVERSITY
GRADUATE INSTITUTE OF SOCIAL SCIENCES

ASSESSING THE EFECTIVENESS OF TURKISH DEFENSE PROCUREMENT PROJECTS

By

Tamer ISIR

Thesis' Asvisor: Dr. Haluk KORKMAZYÜREK

Submitted to the Institute of Social Sciences
İn partial fulfillment of the requirements fort he degree of
Master of Business Administration

ISTANBUL, 2000

ASSESSING THE EFFECTIVENESS OF TURKISH DEFENSE PROCUREMENT PROJECTS

Approved by:

Dr. Haluk KORKMAZYÜREK .....
Thesis Advisor

Assoc. Prof. A. Kadir VAROĞLU .....

Dr. Baransel ATÇI .....

Date of Approval: 4 / 3 / 2000

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
AoM	Assembly of Ministers
BWB	Bundesamt für Wehrtechnik und Beschaffung, The German Weapon Development and Procurement Department
CC	Core Concept
CDL	Chief of Defense Logistics
CIC	Commander-in-Chief
DEMO	Demographic
DIS	Defense Industries Secretariat
DF	Degree of Freedom
DoD	Department of Defense
DPA	Defense Procurement Agency
DPP	Domestic Procurement Department
FMS	Foreign Military Sales
FPD	Foreign Procurement Department
IPT	Integrated Project Team
ISD	In-Service Date
MBA	Master of Business Administration

[oD	Ministry of Defense
[SB	Milli Savunma Bakanlığı
'AMSA	North Atlantic Maintenance and Supply Agency
'MFTS	Operational Maneuver From The Sea
'YTEP	On Yıllık Tedarik Programı
L	Procurement Plan
. & D	Research and Development
:AF	Requirement Announcement Form
:FI	Request For Information
:FT	Request For Tender
;C	Sub Concept
;EMP	System Engineering Management Plan
;GP	Strategic Goal Plan
;OW	Statement of Work
;PI	Smart Procurement Initiative
;PSS	Statistics Program for Social Sciences
SSM	Turkish Defense Industries Secretariat (Savunma Sanayi Müsteşarlığı)
TGS	Turkish General Staff
TGSGPPD	Turkish General Staff General Plan Principles Division
TLMP	Through-Life Management Plan

ÜBİTAK	Türkiye Bilimsel ve Teknik Araştırma Kurumu
'YPP	Ten-Year Procurement Program
JK	United Kingdom
JN	Union Nation
JS	United State
JSA	United State of America

IST OF FIGURES

.IST OF TABLES

ACKNOWLEDGMENTS

would like to express my gratitude to my thesis advisor Dr. Haluk KORKMAZYÜREK for his nvaluable comments, his supports by providing valuable sources of his library his advices and ıelp throughout my study. It was a great honor for me to study with him.

would like to express my best regards to Ord. Major Sinan CAYNAK for his invaluable :omments and his contributions.

wouldn't pass unless expressing my thanks to my beloved father Kemal and mother Ayten for heir unlimited supports and motivations during this study.

also would like to thank to Nihal for her contributions, helps, tolerance and incredible patience. 'm sure that she will help me in the rest of my life any time.

BSTRACT

he acquisition system requires a governmental organization that is capable of responsively and ffectively working towards closing the gaps. To perform this mission there must be an effective ıd efficient internal system structure. It is believed that there are organizational, procedural, ersonnel and regulatory problems in current acquisition system, and internal of acquisition odies which are Ministry of Defense (MoD), General Staff, and Force commands (FORCOMs).

he main objective of this study is to try to make clear basic problem areas which cause ıeffectiveness in the management of defense procurement projects and to propose some ıggestions for the concerned problems and to find the ways how to improve the effectiveness of oordination related issues within MoD and other bodies of Turkish Acquisition System which in ırn will provide a higher satisfaction level for Turkish defense needs.

ı this study basic or fundamental research (when research is being done chiefly to improve our nderstanding of certain problems that commonly occur in organizational settings, and how to olve them, the research is called *basic* or *fundamental research)* will be used to try to make clear ıe problems of defense procurement projects. The methodology of the study also includes the evelopment of a theoretical framework, formulation of hypotheses, and deduction from the esults of the study.

Keywords : Acquisition system, Acquisition phases, Effective internal system structure, Coordination and team work, Basic research, Defense Procurement Projects.

ÖZET

Tedarik sistemi, ihtiyaca cevap veren ve etkili çalışan devletin içerisinde bir iç yapıya gereksinim luymaktadır. İhtiyaçları karşılamak için etkili ve verimli bir iç sistem yapısı olmalıdır. Araştırmacının inancına göre, mevcut tedarik sisteminde organizasyona bağlı, yasal ve sürece bağlı ve personele bağlı olan aksaklık ve problemler mevcuttur.

Bu tez çalışmasının asıl amacı, savunma tedarik projelerinin yönetiminde aksamalara sebep olan ve etkinliği azaltan problem alanlarını tanımlamak, ortaya çıkarmak, ve bu problemlere çözüm önerileri getirmek, tedarik sürecinde ilgili birimler arasındaki çalışmanın etkinliğini arttırmak, işbirliğini geliştirmenin yollarını bulmaya çalışmaktır.

Bu çalışmada temel araştırma metodu kullanılacaktır. Bu araştırma metodu; incelenen problemlerin anlaşılmasını sağlayan ve buradaki problemlere çözüm önerileri sunmaktadır. Bu araştırmayı yaparken, önce teorik çerçeve çizilecek, hipotezler ortaya konacak ve bu hipotezlerin test edilmeleri neticesinde ortaya çıkan bulgulardan sonuçlar çıkarılacaktır.

Anahtar kelimeler : Tedarik sistemi, Tedarik aşamaları, Etkili iç sistem yapısı, İşbirliği ve takım çalışması, Temel araştırma metodu, Savunma satın alma projeleri.

1. INTRODUCTION

1.1. General

Many societies seem to demand "security" as much as they demand social services, like health and education. In today's world, large and modern military establishments are often believed to provide status and influence.

Turkish security policy and doctrine are defensive in nature and are designed to preserve and protect the national independence, sovereignty, territorial integrity and vital interests of the country. This doctrine also aims at contributing to regional and global peace and security.

Turkey is a member of the Union Nation (UN), Council of Europe, NATO and the OSCE and an associate member of the WEU. Turkey's responsibilities and commitments arising from her NATO memberships are indispensable components of her defense policy.

In view of recent developments, peacekeeping now occupies an important place in Turkish defense doctrine. In view of its defense policy and doctrine and the changing circumstances, the Armed Forces of Turkey are going through a process of restructuring in order to meet the requirements of the present day and the near future.

It is faced a greater variety and uncertainty in overall defense security risk. The cold war, with its deterrent basis encouraged the deployment of the most advanced, therefore risky and often unreliable, technology as quickly as possible. Today's threats to the world order know no boundaries, and they require armed forces ready to provide a flexible response. Those forces need faster, easier upgrades to their equipment, allowing them to stay current more reliably and more cheaply.

Security is seen to be linked with military force; the psychological need to feel secure is normally and politically most conveniently satisfied by military expenditures. In today's world, large and modern military establishments are often believed to provide status and influence so political leaders striving for hegemony within their region may devote

considerable sources to the military. So the perceptions and requirements like these results in allocation of defense budgets for military spending.

According to the independent observers, Turkey ranks as one of the most prominent players in the international defense markets. The current defense spending is cited at well over 8 billion annually (Egeli, 1999, p.7). Extracting operating, personnel, construction and other expenditures, some 40% or roughly $3.5 billion is allocated to defense equipment procurement. Yet, due to the relatively small size of the local defense industry, roughly 75% of those needs are being currently met from abroad, involving active participation by foreign contractors and governments (NATO Review, 1999, p.13). Even the remaining 25% involves some kind of foreign relations dimension, through joint venture deals, licensing arrangements, and/or simply through the production inputs/ingredients acquired abroad.

Turkey's unique geographic and strategic location and by the reason of a substantial portion of the current equipment holdings were originally received from other allied countries during the Cold War years, as surplus aids, will force to take modern defense equipment during the coming decade. But, at the same time, Turkey will have to be a developed country by using the same economical sources.

Turkey announced the allocation of around $150 billion for the purchase and joint production of arms over the next 30 years. The Turkish Defense Industries Secretariat (DIS) and the Ministry of Defense (MoD) each spend approximately $1.5 billion annually on weapons purchases (Jane's Defense Weekly, 1998, p.33).

Total of money is a huge amount. So it is possible to think that Turkey has to expend this amount very carefully. Total amount of money will be spent to realize the acquisition programs by acquisition bodies.

Defense policy and acquisition are interrelated subjects. Most acquisition programs result from combat planning, or in other words mission area analysis. Each military service performs a series of mission or tasks to meet national security objectives. The services compare their current capabilities with current and future enemy threats and try to decrease

deficiencies by changing tactics, doctrine, organization and other non-costing methods (Fact Sheet, 1998, p.2).

If these methods fail they decide to close the gap by acquiring a new system. At this point the acquisition life cycle phases of the new system starts, which are concept exploration phase, concept demonstration and validation phase, full scale development phase, production and deployment phase, operational and support phase and disposal phase. And no any defense acquisition program can proceed into the next phase unless one is completed (US (United State) Army Regulation 70-1, 1984, p.4).

The Ministry of Defense's acquisition mission is to develop and supply the weapons, services and supplies required to meet the Turkish nation's defense objectives. The success or failure of the acquisition is determined in retrospect by how well the weapon system has served the military (Pinker, Smith, and Booher, 1998, p.8).

All of concerns mentioned above give one more responsibilities to the acquisition and contract managers. Acquisition includes producing, purchasing, renting, leasing, or otherwise obtaining supplies or services in support of the military. Its scope encompasses all functions that pertain to obtaining supplies and services, from the description of supplies and services to disposal.

Defense Acquisition System is a single uniform system whereby all equipment, facilities, and services are planned, developed, acquired, maintained, and disposed of by the Ministry of Defense. The system includes policies and practices that govern acquisition, identifying and prioritizing resource requirements, directing and controlling the process, contracting, reporting to Grand National Assemble. All participants in the System are responsible for making acquisition decisions that deliver the best value product or service to the customer.

In order to ensure technological superiority and meet national defense needs, a sound technology investment strategy must be formulated, the right technology must be developed, and a plan for technology transition must be executed. Expeditiously transitioning the right technology into our future weapon systems requires regular interaction with operational users

as well as teamwork across product divisions, program offices, development planning and engineering organizations, and the laboratories (Przemieniecki, 1998, p.39).

Because of the rapid change of internal and external threats of Turkey, requirements of Turkish Armed Forces are changing rapidly. To meet these requirements huge amount of money should be expended. Acquisition bodies expend these expenditures. So it can be said that the motivation of the thesis stems from huge amount of defense expenditures.

The vision of all participants in the acquisition system are responsible for making acquisition decisions that deliver the best value product or service to the customer which are force commands (FORCOMs). Best value must be viewed from a broad perspective and is achieved by balancing the many competing interests in the system. The result is a system, which works better and costs less.

1.1.1 Objective

The main objective of this study is to identify basic problem areas, which cause ineffectiveness in the management of defense procurement projects, for the MoD procurement bodies together with other bodies such as General Staff, FORCOMs authorized to make some defense expenditure.

Another objective is to propose some suggestions for the concerned problems and to find the ways how to improve the effectiveness of coordination related issues within MoD and other bodies of Turkish defense procurement which in turn will provide a higher satisfaction level for Turkish defense needs.

This thesis is expected to have some supportive influences in the direction of;

1. Enhancing parties' organizational learning capacity, and prevent duplicative works with the thesis' proposed project management organization structure.

2. Increasing coordination capacity among MoD- General Staff- FORCOMs by using the Procurement Team.

3. Helping parties to decrease their research and development (R&D) budgets, and to use cost-effective methods.

Turkish Army Forces' expectations from this kind of coordination and team working is defined as follows;

- High quality products,
- Use of new technologies,
- Cost-effectiveness and use of life cycle method,
- Decreasing acquisition time.

1.1.2 Definition of the problem

Turkey is a developing country with limited sources. It has to spend its money very carefully. There are limited resources and decreasing defense budgets. All participants in the acquisition system are responsible for making acquisition decisions that deliver the best value product or service to the war-fighter. The mission of defense acquisition is to develop and supply the weapons, services, and supplies required to meet the Turkish nation's defense objectives.

Today, in many areas, countries must use high technology. For defense of the countries also, there is a need to use high technology. Having high technology is very expensive and risky. Coordination and team-working are methods to reduce expenses and risks of having high technology. Together with other components of the acquisition system, this requires a governmental organization that is capable of responsively and effectively working towards meeting those needs. To perform this mission there must be an effective and efficient internal system structure. It is believed that there are organizational, procedural, personnel and regulatory problems in current defense procurement system that is a part of the acquisition system, and also in the internal structure of procurement bodies which are MoD, General Staff, and FORCOMs. These kinds of problems are thought to have some side effects on the management of defense procurement projects.

1.1.3 Scope of the Thesis

There are organizational, procedural, personnel and regulatory issues which cause problems in the government side of the overall acquisition system directly or indirectly. As a part of acquisition system, defense procurement system will also be affected by these issues. These effects on the management of defense procurement projects will be examined by research in details.

The requirements of Turkish armed forces are divided in 4 categories. These are major defense system requirements, maintenance and supply requirements, office materials-feeding-clothing-health materials requirements, construction requirements. In this study only procurement of major defense requirements will be covered.

On the other hand, there are some acquisition departments and institutions (Coast Security Command, Gendarmarie General Command and MoD) in Turkey's defense acquisition system. But in this study only Ministry of Defense (MoD), which is managing huge amount acquiring of requirements of Turkish army forces, will be included.

Ministry of National Defense has two undersecretaries. These are;

1. Undersecretary for Economical Affairs

2. Undersecretary for Defense Industry

In this study MoD's Undersecretary for Economical Affair's procurement procedure will be focused. All equipment, facilities, and services are planned, developed, acquired, maintained, and disposed of by the Ministry of Defense. If MoD gives an procuring-competence to FORCOMs, procuring will be made by FORCOMs. But in this thesis only MoD's Undersecretary for Economical Affair's procurement procedure will be analyzed.

MoD's Undersecretary for Economical Affair's procurement procedure can be divided into two parts. First domestic, second foreign procurement. In this thesis only foreign procurement procedure will be analyzed.

1.2 Methodology

The selected method of research's methodology will be explained in Chapter: 4, Methodology, in detail. Research can be described as a systematic and organized effort to investigate a specific problem that needs a solution. In this study, the research will focus primarily on the survey methodology that is conducted by collecting data and analyzing them to come up with answers to various issues of interest to researcher.

Research can be undertaken for two different purposes. One is to solve a currently existing problem in the work setting; the other is to add or contribute to the general body of knowledge in a particular area of interest to the researcher.

In this study basic or fundamental research will be used to try to make clear the problems of defense procurement system. The methodology of the study also includes the development of a theoretical framework, formulation of hypotheses, and deduction from the results of the study.

1.2.1. Observation

The subject of this thesis is surfaced in the courses of Master of Business of Administration (MBA), especially Defense Acquisition Management course. In this lesson, it was understood that there are some organizational, procedural, personnel and regulatory problems currently existing in Defense Acquisition System that need to be solved.

1.2.2 Preliminary information gathering

To be able to find out the problems correctly, first of all, general structure of the entire acquisition system should be mastered. This, in turn, entails a thorough and comparative investigation between Turkish Acquisition System and leading western countries' acquisition systems together with United States'. For this reason, in the second chapter, American and UK Defense Acquisition systems will be presented in detail and revolutionary acquisition activities within American acquisition system will be explained. Past problems of acquisition systems of UK, most of which are currently eliminated will also be briefly dealt with.

Literature and internet survey are used during the research session of the thesis. There are many books, articles, papers, conferences, and dissertations about. But because of the need for the knowledge concerning the problems among procurement bodies, MoD- General Staff-FORCOMs, and solving ways is new in Turkey. There aren't enough data about this topic.

As internet survey, search engines such as Yahoo, AltaVista, and Web Crawler etc. are used to obtain data about acquisition, defense acquisition system, and revolution of acquisition system, procurement, project management, coordination and teamwork. Obtained plenty of data about acquisition system, new approach to the acquisition process, coordination, teamwork and project management also are available in Chapter II, Literature Review.

1.2.3 Theoretical framework

In this thesis, the effectiveness of Turkish defense procurement projects will be assessed. For this reason effectiveness of Turkish defense procurement projects is a core concept of the theoretical framework. There are four sub-concepts of the effectiveness of Turkish defense procurement projects. Every sub-concept is affected by independent variables called factors.

1.2.4 Hypothesis

Hypothesizing is the next logical step after theory formulation. Once the researcher has identified the important variables, which affect the effectiveness of defense procurement projects and established the relationships among them through logical reasoning in the theoretical framework, now the time to test whether the relationships that have been in theory hold true. By testing these relationships scientifically some reliable information can be obtained on what kinds of relationships exist among the variables. Formulating such testable statements is called hypothesis development. Hypotheses and the result of hypothesis testing is explained chapter 4: Methodology.

1.2.5 Further scientific data collection

Data can be collected in a variety of ways, in different settings, and from different sources. Data collection methods include face-to-face interviews, telephone interviews, computer-

assisted interviews; questionnaires that are personally administered, sent through the mail, or electronically administered; observation of individuals and events.

In this thesis a structured questionnaire is designed for collecting data. Because it is an efficient data-collection mechanism (Sekaran, 1992, p: 200). The structure of the questionnaire is also explained in Chapter: 4, Methodology.

1.2.6 Data analysis

SPSS program version 5.0.1 is used to analyze data. The analysis of output of the research is also in Chapter: 4, Methodology. In data analysis there are three objectives; getting a feel for the data, testing the goodness of data, and testing the hypotheses developed for the research.

The "feel for the data" will give preliminary ideas of how good the scales are, how well the coding and entering of data have been done, and so on.

The second objective, "testing the goodness of data", can be accomplished by submitting the data for factor analysis, obtaining the Cronbach's alpha or the split-half reliability of the measures, and so on.

The third objective, "hypothesis testing", is achieved by programming the computer to test each of the hypotheses with the appropriate statistical test, the results of which will determine whether or not the hypotheses are substantiated (Sekaran, 1992, p: 282-283).

1.2.7 Deduction

Deduction for the research was explained in Section 4.5.4: Summary.

2. LITERATURE REVIEW

Acquisition is very important in the military area as well as civil area. All countries want to improve their acquisition process to overcome their acquisition problems. The defense acquisition system provides the countries to make defense expenditures effectively.

United State of America's (USA) acquisition system is a good example for many countries. Other countries examine the revolution in USA's acquisition system. It will be useful to understand some conceptual background to do this.

2.1 Definition of the Acquisition

The process of requirement setting, procurement management and support management, implying a whole-life approach (http:// www.mod.uk/policy/spi/handbook/contents.htm).

Acquisition includes producing, purchasing, renting, leasing, or otherwise obtaining supplies or services in support of the military. Its scope encompasses all functions that pertain to obtaining supplies and services, from the description of supplies and services to disposal.

"Acquisition" means the acquiring by contract with appropriated funds of supplies or services (including construction) by and for the use of the Federal Government through purchase or lease, whether the supplies or services are already in existence or must be created, developed, demonstrated, and evaluated. Acquisition begins at the point when agency needs are established and includes the description of requirements to satisfy agency needs, solicitation and selection of sources, award of contracts, contract financing, contract performance, contract administration, and those technical and management functions directly related to the process of fulfilling agency needs by contract (Federal Acquisition Regulation, 1997, p.20).

The term "acquisition" pertains to any transaction to acquire property or services for the direct benefit or use of the army (United States Army Logistics Management College, Mam Course Reference Book #3, 1996, p.1-1).

Acquisition = Requirements + Procurement + Support (http://www.mok.uk).

Defense Acquisition System is a single uniform system whereby all equipment, facilities, and services are planned, developed, acquired, maintained, and disposed of by the Ministry of Defense.

The system includes policies and practices that govern acquisition, identifying and prioritizing resource requirements, directing and controlling the process, contracting and reporting to Assembly.

The system provides the framework for acquisition of weapons and automated information systems and other items used by the armed forces to meet threats to national security and to support the decision-making process.

2.2 Defense Acquisition Process Overview

The Armed Forces face a greater variety and uncertainty in overall defense security risk. The cold war, with its deterrent basis encouraged the deployment of the most advanced (therefore risky and often unreliable) technology as quickly as possible. Today's threats to the world order know no boundaries, and they require armed forces ready to provide a flexible response. Those forces need faster, easier upgrades to their equipment, allowing them to stay current more reliably and more cheaply.

At the broadest level the government acquisition process can be said to be following the classic defense system life cycle stages. The government defense system acquisition process starts with the identification of the deficiency of the current system and/or a new combat requirement that consequently entails a thorough and accurate conceptual design. After delineating the consumer requirement and making the relevant conceptual design, test and production of the conceptualized system is conducted. This test and production stage further comprises many multi-discipline efforts which together must be harmonized and coordinated with the aim of reducing the system life cycle cost to the extent possible while satisfying the defined user's needs. It is important to state here that, most European countries and especially The United States, in contrast with former acquisition strategy where "design to cost" philosophy prevails, now treats cost as an independent variable from other decision criteria,

and applies a cost focused design effort. In this new strategy, performance characteristics are not as strictly defined as before, and in every milestone of acquisition effort, cost is treated as a driving consideration (Department of Defense (DoD) Directive 5000.1, 1999, p.56). The final stage in this process includes deployment of the system, logistical support and its disposal. Predicting the system's useful life is one of the most challenging tasks in this process. Since the ever-changing nature of the national defense requirements, this puts considerable stress over the governmental bodies that are actively participating in the government acquisition process.

Figure 2.1 depicts those stages in detail. This figure applies to new product development and/or major defense system acquisitions. But not every acquisition program is new product development. New system development is the costliest and the most tedious method of all alternatives (Cost Analysis Manual, 1997, p.35; Turkish General Staff (TGS) Directive: MY 369-1A, 1999).

2.2.1 Defense Acquisition Process of United State of America (USA)

United States acquisition process is shown in Figure: 2.1.

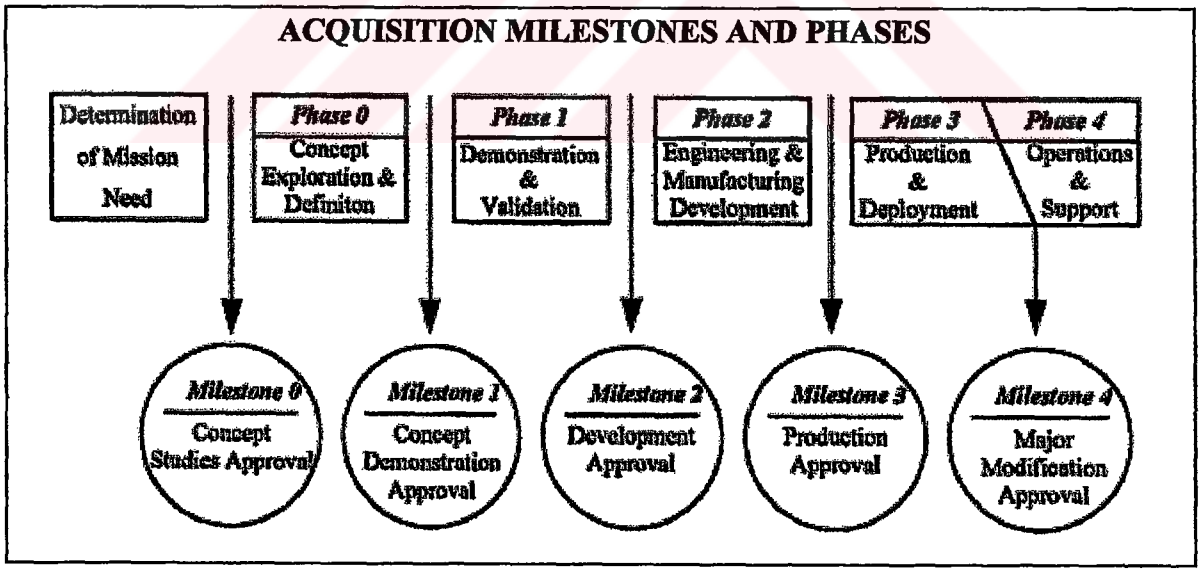

Figure 2.1 Acquisition process of USA
Source: Blanchard & Fabrycky, Systems Engineering and Analysis,1991, p.3

2.2.1.1 Concept Exploration Phase

This phase focuses on exploring any concept that might meet the mission need. Mission requirements are translated into performance factors, risk areas are defined, initial design concept is developed, produce ability of design and time planning, logistics support and initial life cycle cost estimation are carried out.

There is extensive numerical and computer analysis and modeling to determine the best concepts based upon cost, schedule and, performance and other parameters the user and the program manager feel are important.

Initially at this phase a system engineering management plan (SEMP) will help to control and cover all system-engineering activities planned from thereon (Blanchard, 1997, p.196).

Technologies that might contribute to the success of the program will be examined and technology roadmaps are dealt in detail to choose the most promising one.

This phase identifies related areas of support that must be developed simultaneously (such as test equipment, threat simulators, or training devices), and coordination required with other agencies and activities involved with these areas.

At the end of this phase system requirements should be reviewed and statement of work (SOW), which describes and establishes all non-specification requirements for contractors efforts (Glossary Defense Acquisition Acronyms and Terms, 1991), system specifications and other documentation will be prepared for the next phase.

2.2.1.2 Demonstration and Validation Phase

This phase starts with declaration of SOW. The goal is to determine which contractor or supplier satisfies the most appropriate solution to the program objectives. This must be considered as the most critical phase of a system development program. Tradeoff analysis of many parameters at the subsystem level and risk analysis of the program and system design should be executed. At the end of these analyses the most preferred system design prototypes

are prepared for later considerations and initial test and evaluations to make a decision on which alternative to go in to full scale development phase.

Subsystem prototype development, development testing, limited operational testing, planning and developing the logistics support system, and updating plans started in Concept exploration phase are the major activities to be carried out in this phase. The trades off studies are carried out to refine the time, cost, technical performance measure characteristics and if needed the targets are reshaped. The prototypes of contractors are tested and decision on to do the business with one or more contractors is made at this period. The user and intelligence communities (who are capable of executing mission area analysis) should be involved into these stage activities too.

2.2.1.3 Engineering & Manufacturing Development Phase

At this phase the defense system is developed up to a full-up system integrating the supporting subsystems together. With all aspects system is subjected to engineering development. Technical information package is prepared and for the production phase and system is prepared for technology implementation.

System engineering activities are intensively applied at this stage, life cycle cost estimate, done at the first stage, is updated. Production and deployment schedule, logistics support planning, labor and personnel training requirements related factors are identified (Atçı, 1991).

2.2.1.4 Production and Deployment Phase

Key activities of this phase can be defined as; monitoring of the manufacturing process and the contract, product acceptance testing, quality assurance audits and surveillance efforts and accepting contract deliverables from the contractor.

Now it is time for users/operators of the system being developed to be trained for the new technical system functions. And these people trained as operators and maintainers will provide feedback data for the engineering development activities, on the area of deficiencies that are possible not to appear in the tests carried out during full-scale development phase.

Operational deployment locations will be configured (if not) and facilities to train and maintain will be completed at this phase. A group of government and contractor engineers, configuration control experts; quality assurance officers will go and examine the deployment areas to solve the unforeseen problems or complications possible to arise from system's fielding areas (Fact Sheet, 1988, p.19).

2.2.1.5 Operation and Support Phase

Even the acquisition of the system seems to be finished the life cycle does not finishes with the deployment of the defense item to the operational locations. But unfortunately user or operator is alone and confronts all the problems faced from now on, on his/or her own.

At this stage the development engineers can be called to address specific malfunctions that might occur after the system's being in operational use. After one or two years passing from deployment of the defense system, an initial deployment audit should be held to recover the deficiencies in the operating functions and logistics support functions of the system. At this phase the latter major activity to be executed is checking the entire system with all support equipment and facilities whether the system is still operating adequately and facing the current and due threats. This is an activity to be carried out after 5-10 years of deployments (Fact Sheet, 1988, p.6). Using the technical data derived from this control a new evaluation of the system must be done if there is a need for upgrading or replacement with a new one.

2.2.1.6 Disposal Phase

Governmental organizations seem to be considering operation and support phase of the product and systems during development and acquisition decisions of systems and products. But in spite of this, rarely some decisions are made based upon an additional evaluation of disposal of the system or product in hand.

Most of the defense or weapon systems will be retired out of the organization or inventory when the defined life span for them is passed or if it is considered that the threat cannot be

defeated by the existing defense mechanism. Also it must have been determined that any modification or extension of life span cannot be accomplished.

Key activities to be executed in this phase of the defense system can be defined as, making a plan for how the system will be taken out of the entire defense organization; and the retired materials and equipment belonging to major disposed one will be evaluated.

2.2.2 Defense Acquisition Process of United Kingdom

USA acquisition cycle consists of four phases, where United Kingdom (UK) acquisition cycle, which is a new approach on acquisition, consists of six phases. The first phase is the concept phase; defining the current user need, identify and cost technology and procurement options, the second phase is the assessment phase; producing a system requirement document and identifying the most cost effective technical and procurement solution, the third phase is the demonstration phase; selecting prime contractor, ability to produce an integrated capability will be demonstrated, the fourth phase is the manufacturing phase; delivering the solution to the military requirement, completing the system development and production, accept equipment into service which meet user requirements, the fifth phase is the in-service phase; providing effective support, maintain the level of performance, carrying out approved upgrades or improvements, the last phase is the disposal phase; carrying out efficient, effective, safe disposal of the military equipment (http://www.mod.uk/policy/spi/handbook/contents.htm). Key features of the new acquisition cycle are;

1. A formal division of the procurement cycle into phases, with a formal decision point between each one was introduced to the Ministry of Defense as the Downey Cycle. The report on the Acquisition Organization Review introduced a modified Acquisition Cycle, which is a development of Downey, aimed at improved evaluation of risk and at reducing the interruptions to the flow of project work. This is achieved by redefining the phases to increase effort early in the project life cycle whilst reducing the number of phases and formal approval points. Also the associated submissions will be less bureaucratic than those produced currently.

2. When used as the basis of the work of an Integrated Project Team (IPT), with particular focus on the customer for the IPT's activity, a seamless flow of responsibility is achieved from start to finish of the acquisition process. The IPT will be answerable to a Capability Manager, representing the customer, who will control the project from cradle to grave.

3. The word Acquisition is used to embrace all the activities associated with requirement, procurement and support of military equipment from concept to disposal (http://www.mod.uk/policy/spi/iptguide/newcycle.htm.).

2.2.2.1 Concept Phase

The objective of the concept phase is to identify which options for a given mission should be developed further; eliminating those options not worthy of further investigation. Survey and demonstration of technologies is taken from the Applied Research Program, along with high level Operational Analysis.

Broad evaluation of the options to meet a capability gap will be carried out by the Capability. Working Groups, applying the principles of Systems Engineering in the systems area. As equipment options emerge, an embryonic IPT will be formed to make preliminary through-life costing to go with the draft User Requirement Document, with a shortlist of viable options, for presentation as the case for Initial Gate Approval.

At the Initial Gate, the approving authority approves the resources necessary for Assessment, recognizing that the significant expenditure entailed requires formal approval of a mission need and the scale of resources to be consumed. The approving authority also notes the preliminary through-life costing as a reasonable scale of investment for the proposed capability, subject to the verification to be achieved in Assessment (http://www.mod.uk/policy/spi/iptguide/newcycle.htm.).

2.2.2.2 Assessment Phase

The objective of the assessment phase is to down-select to a single technological option for demonstration, with technical risk from sub-systems reduced to acceptable levels.

Technologies for all sub-systems are demonstrated including those, which require integration from the research program. Operational analysis is completed embracing comparative analysis of alternative options.

Indicative procurement and life cycle costs have been set at the start of the Assessment phase. During Assessment, operational performance trade-offs are undertaken on an iterative basis to determine the optimal balance between whole-life cost, performance and time. A ceiling capitalized asset value price and whole-life costs, together with a firm Equipment Program funding line, should be established at the end of Assessment, when an informed judgement on the solution offering optimal value for money can be made.

The approvals submission then contains the Performance Requirement, consisting of

- Systems Requirement Document
- Key Performance Parameters
- Tradable Requirements

All requirements are linked to mission needs. Only the Key Performance Parameters are absolute: all others are tradable during the Demonstration phase. Output requirements will be specified, but not implementation or technical details.

The approvals submission also contains cost and time boundaries, procurement and through-life support strategy and a plan for managing the remaining risk, which are important sub-sets of the developing Through-Life Management Plan (TLMP).

Up to 15 per cent of project costs can be spent up to the end of assessment: this will usually allow iterative risk reduction if needed. A key change is that rather than pressing ahead to Full Development to meet a pre-determined ISD, the IPT will be encouraged to focus on those activities, including, if necessary, main or sub-system development, which will be key to

reaching a position where both MoD and the selected contractor(s) are satisfied that they have a solid basis on which the project can proceed.

This major review point, which determines commitment to an individual project, is established at the end of the Assessment phase. At this point, the IPT and the customer should jointly submit to the approving authorities recommendations on whether the project should continue to Demonstration and Manufacture, as well as on the firm parameters which should be established for the project going forward: i.e., a firm Equipment Program funding line, ceiling capitalized asset values and whole-life costs, a firm in service date and a finalized performance-based requirement. At this point, projects not providing an acceptable balance between performance, whole-life cost and time should be killed off. The IPT Leader and customer should have the opportunity to present the project directly to the approving authorities in association with their documentary submission (in line with industry practice).

Further referral to the approving authorities post Demonstration should only be conducted in exceptional circumstances if:

- The project goes outside the agreed boundaries on performance, cost and time.

- Wider affordability or other issues have arisen in the interim that could alter or undermine the original decision.

The approvals process itself will be significantly simplified to ensure that Main Gate preparation is carried out insofar as possible in parallel with ongoing development work during the Assessment phase. In cases where the recommendation is to proceed to Demonstration, the IPT should have authority to continue with preparatory work for the Demonstration phase while waiting for approval; funding for this should be sought at the initial gate (so that the cost of the decision making period is visible) (http://www.mod.uk/policy/spi/iptguide/newcycle.htm).

2.2.2.3 Demonstration Phase

The objective of this phase is to down-select to a single contractor and place a contract for remaining development and production. Technical risk from an integrated solution will have been reduced to a level that the contractor is willing to assume and the project manager is willing to transfer.

Further performance trade-offs should be undertaken throughout the Demonstration phase to refine and finalize the solution, and establish a firm capitalized asset value and best estimates of support costs. Design to cost principles are usually employed - a significant change from previous practice - using requirements management to maximize performance at a fixed cost.

Demonstration of integration capability will be made by physical models, prototypes, computer models or proven contractor ability. Development will be started and some operational trials, in field or synthetic environment, may be carried out (http://www.mod.uk/policy/spi/iptguide/newcycle.htm).

2.2.2.4 Manufacture Phase

Manufacture delivers the solution to the military task. The remainder of full development is completed and the production run is carried out.

Techniques of working in closer partnership with the industrial supplier will be used that involve the latter as part of the Integrated Project Team. This will include identifying incentives for identifying and sharing cost reductions that do not prejudice the contracted performance.

Trials of the equipment are carried out against acceptance criteria. Equipment acceptance by the customer marks the entry to the in-service phase and the completion of the Capability Manager's role as customer for the equipment as currently defined.

In-Service Date on which capability is available to the relevant Commander-in-Chief (CIC) is possibly the most significant milestone in the equipment's life. At this point effective support

to the front line must be available, and sustainable, as identified and agreed in the equipment support plan.

The appropriate CIC becomes the IPT's customer; for availability and activity levels for the equipment. It should be noted that this customer activity is different from that of the Capability Manager: The latter has to define the requirement and accept the details of the form the capability is taking. Once in service the capability is not only defined but in being; apart from any upgrades or incremental acquisition that the capability manager still requires.

IPT control should transfer to the PAO as soon as development, technical risk-reduction and acceptance into service are complete. This point will vary depending on the type of equipment and the number of units being produced. For example, for a project involving the production of a large number of units (e.g. 500 missiles), it would be entirely feasible to transfer the project to the Single Service once a small number have been successfully produced. However, in the development of a new class of submarine, with production of three units, transfer would not occur until the last unit had been manufactured and completed in-service acceptance trials. To manage this variability, we recommend that the point of transfer between the PE and the PAO should be agreed by the Center and the Single Service at the beginning of the Demonstration phase and would be visible from the earliest stages within the Through-Life Management Plan (TLMP) (http://www.mod.uk/policy/spi/iptguide/newcycle.htm.).

2.2.2.5 In-Service Phase

Equipment support management is carried out by the IPT: there is never more than one team responsible for the same equipment.

The size of an IPT is considerably smaller by this stage than at the peak of procurement activity; and a number of equipment can be routinely managed in a group by more junior grade personnel. However, when a project first deals with the in-service customer, and transfers line management to the Chief of Defense Logistics (CDL), which is earlier in the life cycle than before Smart Procurement Initiative (SPI), the IPT will still be a large management charge. The initial transfer will be as an IPT, typically led at 1* for a large project, which will

report to the senior level of equipment support management; continuity of management, expertise and personnel will be at a premium for this transfer. Subsequently IPT activity may reduce, subject to upgrade activity discussed below, and the size and responsibility will reduce correspondingly: for certain equipment the PAO may rationalize the smaller team into an existing equipment support management grouping.

The existing IPT should be responsible for incremental technology acquisition, minor upgrades, and refits according to the project's Through-Life Management Plan, and should contract for additional project management resource with the Defense Procurement Agency (DPA) or elsewhere, as required. For major modifications that significantly change the capability of the equipment, a parallel IPT with overlapping membership and led by the DPA should be formed for the Concept and Assessment phases. Once a firm decision to proceed has been taken at the end of the Assessment phase, this IPT should be formally integrated into the original IPT.

2.2.2.6 Disposal Phase

The IPT will be responsible for drawing up and carrying out plans for the disposal phase. Disposal should be by the most efficient and effective means, and comply fully with national and international safety and environmental legislation. Disposal may mean onward sale, recycling or destruction of all or part of equipment (http://www.mod.uk.).

2.3 Revolution in Military Acquisition Affairs

During the past two years in the US, upper management in the Department of Defense has challenged the acquisition community to reduce cycle time by at least 50% by the year 2000 (LaBerge, 1996, p.79). In February of this year it is indicated that the while the defense acquisition system is not broken, it "can and must operate much more efficiently." "The Department must continuously evaluate the way it does business in order to ensure that the war fighter has access to leading edge technology that is affordable and military effective. Its vision is to be the smartest, most efficient, most responsive buyer of best value goods and services to meet the war fighter's needs" (Kaminski, 1997, p.1).

More recently, in November 1997 *Defense Reform Initiative Report,* discussed vision of "igniting a revolution in business affairs within DoD that will bring to the Department management techniques and business practices that have restored American corporations to leadership in marketplaces" (Cohen, 1997, p. i).

The overall acquisition community is being challenged to develop a strategy that focus on reducing acquisition cycle times, costs, and improves the war fighter's ability to engage the enemy. What is required is an acquisition strategy that complements the war fighter's operational view of how they will fight in the 21st century.

The conceptual framework for how US forces will fight in the future is *Joint Vision 2010,* which charts a path to ensure US forces will be able to conduct decisive operations in any environment. *Joint Vision 2010* describes this goal as "full spectrum dominance" (Cohen, 1997, p. ii.).

The naval vision, which complements *Joint Vision 2010,* is embodied in *From the Sea, Forward From The Sea,* and *Operational Maneuver From The Sea (OMFTS).* At the heart of these concepts is the ability to collect, process, and disseminate a steady flow of information to US forces throughout the battle space, while denying the enemy ability to gain and use battle-relevant information. This Revolution in Military Affairs promises to enable our forces to attack enemy weaknesses directly throughout the battlefield with great precision (and therefore with fewer munitions, less lift, and less collateral damage); to better protect themselves from enemy attack during deployment, maneuver and combat; and to receive supplies in the right place at the right time, thereby reducing support requirements. The result will be forces that are more deployable, agile, and lethal.

These capabilities for transforming our military forces are attainable- but the extent and pace of this transformation depends upon the availability of resources to invest in the necessary research, development, testing and procurement. Reducing overhead and support structures by bringing the Revolution in business Affairs to DoD will be critical to achieving the Revolution in Military Affairs. This is not just a matter of freeing up resources. To be effective in the future, support operations will rely increasingly on speed and agility. Absent a

concomitant revolution in the support activities of defense, the Revolution in Military Affairs will quickly outrun the ability of logistics, personnel, medical and other systems to support it (Cohen, 1997, pp. ii-iii).

The reason for strong endorsement of minimal cycle time is a war fighter, not a financial, one. The figures of merit of minimal cycle time probably are the differences between winning and losing wars, not the savings of 10-15% in procurement costs (LaBerge, 1996, p. 80).

DoD's current organization, infrastructure, legal and regulatory structure, and business practices were developed over the course of the Cold War, often through accretion (Cohen, 1997, p. iii). The nature of the threat produced a requirements process responsive to the era of Soviet confrontation. In that era, the overwhelming Soviet threat to national interests forced it to implement a requirements process that was based on a threat model of an unknown but competent isolated enemy (LaBerge, 1996, p. 80).

The latest national security strategy stresses that it must be prepared for tomorrow's uncertain future. Key to this evolution is the need to foster innovation in new operational concepts, capabilities, technologies and organizational structures; modernize forces; and take prudent steps today to position themselves to respond more effectively to unlikely but significant future threats (A National Security Strategy for A New Century, 1997, p.15).

From a military threat perspective, it is generally considered that for the next several decades there will be no serious challenge to US military preeminence, and the short-term contingencies cannot be accurately defined. The threat will be different from each of their enemies, and their response will vary depending on how they posture themselves. In their open post- Cold War society their potential enemies can easily see what they are doing to improve their military capability, and enemies can straightforwardly be expected to change directions to thwart them.

The real threat to neutralizing US forces in the coming era is, in commercial terms, their enemies' potential dominance in product cycle time. From potential enemy's view, all that is needed is to be able to adapt current US technology to the particular circumstances of

enemies' operational environment faster than the US can learn of enemies' intention what they are up to and respond with improvements that neutralize their actions. US's primary hope is to be the winner in a "cycle time race," on a level playing field where, their open society permits, their enemies too much of their technology. They need to prepare technologically for everything an enemy might decide to do; but because of their uncertainty and financial limitations build very little for the field until they know what is going to be needed, and then to build it as fast as they can (LaBerge, 1996, p. 81).

Building it as fast as they can is what American industry is doing today. The customer's number one priority is to receive a quality product at the lowest price. So why focus on cycle time? How does a vision of reducing cycle time meet the customer's need for a high quality, low-cost product? The answer reminds them of the geometry lesson, "the shortest distance and most efficient path between two points is a straight line" (Clubb, 1996, p.175).

As the pace of the world quickens, the value of being first to market with innovative solutions is the key to true competitive advantage. This is true in the commercial marketplace and it is also true in the military market. Considering the lessons of Desert Storm. "Texas Instruments participated in the GBU-28 Bunker Buster Program. A new system was needed to deal with deeply buried command and control bunkers that are beyond the reach of existing systems. The need was great, the time was short, and the only solution was to innovate a solution in an unprecedented short period of time. A team government and industry people came together sharing the common objective of solving a difficult technical challenge in a breakneck race against time. The team worked to trade time against everything (cost, risk, performance). Reuse of existing subsystems offered the only answer. However, the pieces would have to be integrated in a very innovative way to achieve the desired results. The result was conceived, developed, tested, and deployed in approximately 28 days. This was less time than had ever been dreamed possible. The team effort made a difference and the reasons was *time- blinding fast cycle time.* There were other benefits: the cost was low because the entire effort was accomplished in such a short period. Quality and reliability was also high because it was made of existing proven subassemblies (Clubb, 1996, p.175).

A common threat emerges when this experience is compared with other similar ones. It is stated: "If cycle time can be driven down, cost and quality will improve. The bottom line is that *time is a precious commodity and has value-* it is true every time a new product arrives well in advance of the competition. The companies that meet their customers' needs of low cost and high quality will be the companies that maintain prominence." Cycle time, speed and improvement system methodology is the key in fulfilling customer needs. To meet critical customer needs of reduced cost and improved quality, successful companies realize a key methodology in achieving these demands lies in properly reducing cycle time.

By evaluating a process, unneeded tasks can be identified and removed. Tasks such as audits, inspections, hand-offs, and signature approvals are considered wasteful steps, non-value-added curves in a road and deviations in a straight-line path. To reduce time and improve upon cost without affecting quality, straighten out the curves from start to finish. Merely performing the same process steps faster- do not reduce cost or improve quality. These actions drive up overhead, add cost, and do little to address the customer's needs. The same curves are in the road. When applying the proper methodology to existing processes one must first understand the existing process. Mapping the current process is critical in identifying all the curves in the road. Arrive at an understanding of why a process either needs the curves, because of current design, or establish the reason for removing the curves from the process. In order to effectively reduce cycle time, the complete process has to be reviewed, not just functions. "Typically, businesses are organized around functions. This is called a hierarchical functional organization. Functional organizations work to optimize a functional expertise. The entire recognition and reward structure is designed around creating this behavior. In today's environment of speed, this bureaucratic culture is not conducive to the behavior required for incremental, fast, dynamic, ongoing change required by today's customer. Industry is attacking this hierarchical culture by introducing teaming concepts. These concepts are designed to give businesses a process focus. The teaming models are designed to break down traditional organizational boundaries and remold these functions into skills that are required by the process. These models obviously attack the heart and soul of traditional management practices. Moving a company from a functional improvement model to a process

improvement model is a key in reducing the wasted motion involved in producing a product. The teaming business of the future must team to relish change, question everything, think outside the box, and never stop learning. Time is a precious commodity and has value. The bottom line is- *blinding speed equals competitive advantage"* (Clubb, 1996, p.177-180).

DoD has labored under support systems and business practices that are at least a generation out of step with modern corporate America. The current defense Reform Initiative reflects the insights of numerous business leaders who have restructured and downsized their corporations and not only survived but also thrived in a rapidly changing marketplace. One major corporation has adopted to motto "Strength with Speed," emphasizing that winning in the new era depends as much on the ability to respond quickly to new threats and opportunities as on the ability to overpower competitors head-on. US military forces have learned the same lessons, but they will not reach their full and necessary potential unless the business side of DoD marches in lock step. The collective experience shared by corporate leaders can be distilled into common set of principles for reform:

- Focus the enterprise on a unifying vision;
- Commit the leadership team to change;
- Focus on core competencies;
- Streamline organizations for agility;
- Invest in people;
- Exploit information technology; and
- Break down barriers between organizations (Cohen, 1997, p. iii).

- The choice for the military war fighter is almost equivalent to those in corporate business today: Get with minimum cycle time and respond to the marketplace, or get out of business because no one will use these products. What industry calls "marker research" DoD must copy with its intelligence systems, so it can predict correctly what products should go to marketplace? In periods of curtailed investment in the business world, little is put into the market that the public cannot be expected to need and therefore buy. The same is inevitably the case for defense acquisition (LaBerge, 1996, p. 82).

- The final metrics (measures of effectiveness or return on investment) is timely support to the war fighter. "First priority is to get systems fielded that will be useful to our combat forces and to do that as quickly and with as low as it possibly can be. And cycle time is a key measure of progress. The Department of Defense cannot afford a 15-year acquisition cycle time when the comparable commercial turnover is every 3-4 years. The issues are not only cost. The lives of soldiers, sailors, marines and airmen will increasingly depend upon shortened acquisition cycle times as well. In a global market, everyone, including potential adversaries, will gain increasing access to the same commercial technology base. The military advantages goes to the nation who has the best cycle capture technologies that are commercially available; incorporate them in weapon systems; and get them fielded first. New national security challenges require DoD to design a more flexible, agile, and timely acquisition system capable of meeting unpredictable threats. This means that the DoD acquisition system must improve its support to the war fighter by reducing the acquisition cycle time and leveraging the latest available technologies" (Kaminski, 1997, p. 2).

The post-Cold War era poses new worldwide political, economic, and military security challenges for the United States. By fiscal year 1997, defense spending will have been reduced in real terms by more than 40 percent compared to 1985. At the same time, the administration is committed to maintaining a strong, effective force capable of deterring aggression against the United States and its allies and responding to threats anywhere their national security and the requirements of national domestic policy, acquisition reform is imperative.

The DoD acquisition system is a web of laws, regulations, and policies adopted for laudable reasons over many years. The intent of the system was to ensure standardized treatment of contractors; prevent fraud, waste, and abuse; ensure that the government acquisition process was fair; check the government's authority and its demand on suppliers; and, enhance socioeconomic objectives. While the intent of these provisions is laudable, combined, the result is a cumbersome system that takes too long to satisfy customer requirements. In addition, the system places administrative burdens on both DoD and suppliers that adds cost

to the product procured. It can be no longer afforded these costs and meet mission requirements within current fiscal constraints.

The solution is; the world in which DoD must operate has changed beyond the limits of the existing acquisition system's ability to adjust or evolve. It is not enough to improve the existing system. There must be a carefully planned, fundamental reengineering of each segment of the acquisition system so it can be responded to the demands of the next decade. In order to meet the national domestic policy, it must be able to procure state-of-the-art technology and products, rapidly, from reliable suppliers who utilize the latest manufacturing and management techniques; assist United States companies now predominantly dependent on DoD business to transition to dual-use production; aid in the transfer of military technology to the commercial sector; and, preserve defense-unique core capabilities.

The process of reform has begun by targeting segments of the acquisition system that promise to yield immediate and substantial improvements. These actions will lead to reduced costs while ensuring that it is maintained technological superiority and sustain a strong, globally competitive national industrial base that can support the nation's future defense needs (Preston, 1994, pp.6-7).

DoD acquisition programs and projects frequently experience cost overruns, performance deficiencies, schedule delays, or cancellation. US defense acquisition is arguably the largest "business" in the world. Annual purchases by DoD of approximately $178 billion. Defense acquisition involves almost 15 million contract actions annually and employs more than 165,000 civilian and military workers who manage research and development, procurement, logistics, and support activities (Sammet and Green, 1990, p.23).

With such a large system, errors and inefficiencies are bound to occur. Examples are frequently reported in newspapers and magazines, which use these examples to illustrate the poor state of the DoD acquisition system. The real impact (beyond the negative publicity) is on defense readiness, performance, and cost effectiveness. Since World War II, six blue-ribbon commissions have studied DoD acquisition and recommended remedies. Adoption of

some of these recommendations, new regulations, and laws has failed to alter the paradigm (Rx for Ailing Procurement System. 1990, p.F2).

As regards to identify factors those contribute to program success. The factors identified can effectively improve the current acquisition system, vice the multiple attempts to reform the system itself. Surveying DoD program managers identified factors of program success.

The most significant factors contributing to program success fall into two categories. The first is acquisition factors, which consist of:

- Well-defined requirements;
- The acquisition strategy;
- A program product that works well when fielded; and
- Stability in the program.

The second category is resources factors:

- Quality people;
- Program manager responsibility and authority;
- Total team concept; and
- Program manager skills (Delano, 1998, pp.35-49).

Organizational processes today are markedly different than they were several years ago. The accelerated development of new technologies, combined with the increasing globalization of the economy, has helped shape a global market in which organizations can have access to tools that make their processes efficient and effective anywhere in the world.

To survive in such an environment, several organizations have had to become "virtual organizations," in the sense that they have come to chiefly depend on knowledge and process flexibility to generate and deliver products on a competitive basis.

Organizational flexibility, as well as the accumulation and proper deployment of process-related knowledge, depend on structural characteristics of organizations such as departmental

and functional configuration, hierarchical levels, and information access and flow.

These are the problematic areas of USA acquisition process. Also there were many problems in UK acquisition process. Before the new acquisition process, the main problems with the current UK acquisition system were;

- There was no clear single customer within MoD for equipment projects

- A number of processes - principally defining the requirement for equipment, researching potential technologies, managing procurement projects and supporting equipment throughout its life - were managed separately within MoD, making an effective whole-life approach impossible

- Insufficient resources were allocated to the early procurement stages of projects, which meant that key decisions were being taken without sufficient information and understanding of the risks involved, often resulting in significantly greater expenditure and delays in later project stages to put matters right

- The procedures available to both the procurement and the logistics organizations were not flexible enough to cope with the different sorts of procurement and support tasks they had to carry out

- Those managing at all the various stages of the equipment life cycle were not delegated enough authority to do their jobs effectively

- The approvals process was cumbersome, causing substantial delays and inefficiencies at project level while failing to deliver effective oversight

- The incentives available to outside contractors and to MoD staff were ineffective and contract conditions often discouraged innovative solutions that might change things for the better (http://www.mod.uk/policy/spi/handbook/contents.htm).

2.4 Summary

In this chapter firstly the definition of the acquisition is made, then acquisition system of USA and United Kingdom, which are the leader nations to the world, are explained. Finally revolutions of the current acquisition systems of these countries are defined.

To analyze the defense procurement system, which is the scope of this thesis, it is necessary to examine the general Turkish defense acquisition system. In the following chapter this acquisition system will be broadly explained.

3. BASIC CHARACTERISTICS OF THE TURKISH DEFENSE ACQUISITION SYSTEM

3.1 General

New system development is the costliest and the most tedious method of all alternatives (Cost Analysis Manual, 1997; MY 369-1A, 1999, p.35). But not every acquisition program is new product development. When a new combat need emerges after making relevant threat assessment and/or mission area analysis, government first seeks one of the following alternatives: First, it can revise its doctrine or tactics again to ascertain whether the defined mission need can be defined in another way. Second, it seeks ways of modifying the existing system to increase its effectiveness. Third, it can choose to increase the number of current systems by directly purchasing them. Last, it can buy new commercial or developmental defense unique items (Savunma Sanayii Alanında Ar-Ge Faaliyetleri Rehberi, 1997, pp.2-3). If the first three of these alternatives cannot satisfactorily meet the government's need/s then the process of new system development, depicted in Figure 2.1, becomes fully applicable.

Actually it is the government's policy and ultimate goal to be able to design and develop defense systems that are supported by national defense technology (Türk Savunma Sanayi Politikası ve Staratejisi Uygulama Esasları Yönergesi, 1999, pp.7-9).

According to the nature of the acquisition program, some or all-separate but interrelated parts of the project management are applied in the overall acquisition process. Some of those include time, cost, quality, human resources, risk and procurement management disciplines. Since it is MoD's responsibility to develop, acquire every kind of weapon system and logistics materiel, those and other related activities are coordinated and executed by MoD in Turkey (Milli Savunma Bakanlığı' (MSB) nın Görev ve Teşkilatı Hakkındaki Kanun, 1983).

For defense acquisition, based on R & D work, government coordinates with the industry in projects where new product developments are involved. For technological innovations in the defense industry, government works together with TÜBİTAK, and the R & D departments of the related defense firms. In the area of basic research, government coordinates with the

universities. It is a prerequisite to have an effective collaboration and coordination between those institutions in order to be able to produce national defense technology (Batmaca and Uysal, 1999, p.10). Government, as the specifier and the user of the defense systems, must play an integrative role in that process. It should direct and harmonize the works of TÜBİTAK, universities, and defense firms and eliminate costs of possible repetitive R & D works. It is also important to state that for an R & D network, the locus of innovation remains on the linkages between participating organizations. When the knowledge base of an industry is both complex and expanding (such as the case in defense industry), and the sources of technical expertise are widely dispersed, the locus of innovation rests in networks of learning, rather than in individual firms. So called "learning through networks" requires a large number of R & D alliances and experience at managing ties at a given time, experience in R & D management, and finally having a centrally location in the whole R & D network (Powell, Koput, and Smith-Doerr, 1996, pp.116-118).

3.2. Turkish Acquisition System

In view of Turkey's defense policy and doctrine The National Security Policy is shaped. Turkish acquisition system starts after identifying the National Security Policy. The National Security Policy is determined and implemented by the Government in light of the recommendations of the National Security Council.

The policy formulation process involves the General Staff, the Ministry of National Defense, the Ministry of Foreign Affairs and other relevant institutions that provide their respective inputs and contributions.

Defense planning process builds upon the studies made by the relevant institutions. The Turkish General Staff (TGS) is responsible for coordinating all the planning actions and determining the guidelines in accordance with the directives of the Government. National defense planning is a process that covers studies conducted nearly in a two-year period in four different terms in a cyclic manner.

Within the context of the process, the resources that can be allocated to defense budget are determined following political evaluations and risk assessments, and at the end the most suitable force structure and utilization policies of Armed Forces are materialized.

The Chief of the General Staff determines programs and priorities related with the military needs, in accordance with the National Goals and National Security Policy, develops the National Military Strategy, establishes coordination with the related institutions in order to supply the needs of the Turkish Armed Forces.

In the first phase of the Defense Planning Process the national military strategy is prepared and published. In the preparation of the national military strategy; the national strategy as well as the political, politico-military, technological, economic and threat assessments are taken into consideration.

The second phase covers the activities for the preparation of the planning and programming directive. In this phase; general operational concept is published by TGS, in the light of the national military strategy and then the three services prepare their respective operational concepts, tactical concepts, tactical sub-concepts and weaponry concepts. Upon the completion of the concepts, the services determine their requirements by taking into account these concepts and relevant operational plans and forward them to the TGS for the finalization of the planning and programming directive.

The requirements of the services are evaluated by TGS. The planning and programming directive is published to give the way for the detailed planning and programming.

In the third phase, in the light of the planning and programming directive, the services prepare their force proposals without considering any financial restrictions and forward them to TGS. Force proposals are then jointly evaluated in accordance with the criteria and the objectives mentioned in the planning and programming directive. After approval of these force proposals, they compiled in a single document, namely the strategic goals plan.

The fourth phase covers the preparation and publishing of the ten-year procurement program (TYPP) (OYTEP). In this phase, TGS promulgates the program budget directive by considering the possible resources that may be allocated to Turkish armed forces in the coming ten years. The services and other units lay their requirements into a ten-year period, within the limits of the allocated resources and forward them to TGS. These are evaluated and the ten-year procurement program (TYPP) is prepared which is revised every two years. The first two-year period of TYPP constitutes the basis for the proposals of the modernization section of the national defense budget. This process is as shown in Figure: 3.1 (as simplified)

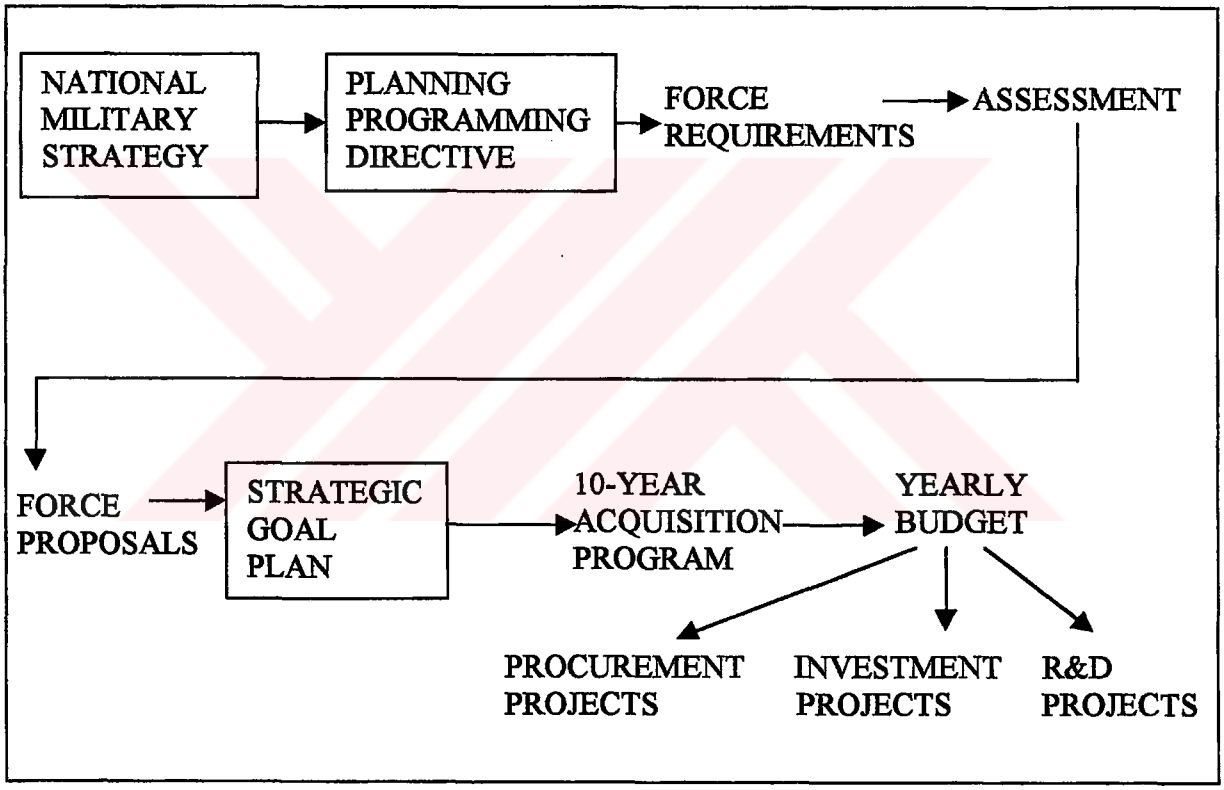

Figure: 3.1 Planning-Programming- Budgeting Cycle

TYPP also cites the categories of financial resources from which those requirements are to be met, and the particular procurement organization to under take each one of those. The three main categories of financial resources in this respect are;

- National Defense Budget (used by MoD subsidiaries)
- The Defense Industry Support Fund (over US$ 1 billion, at the disposal of SSM)
- The Foreign State/Contractor Credits (which are paid back by the undersecretaries for Treasury)

3.2.1 Governmental Bodies and Organizational Structure Responsible for Acquisition

The structure of Turkish acquisition organization is highly complex and bureaucratic. In this section of the study rather than going deeply into the details of the organizational structure, general information about the governmental bodies participating in the acquisition process and the interrelations between them will be given. There are four main organizations taking place in government defense acquisition process which are presented in Figure 3.2: Ministry of National Defense, Turkish General Staff, Individual Force Commandants (FORCOMs: Army, Navy, Air Force), and Assembly of Ministers (AoM). National Security Board and National Defense Commission, at their periodic or extraordinary meetings, also can make some decisions that may be binding or advisory for the government defense acquisition activities.

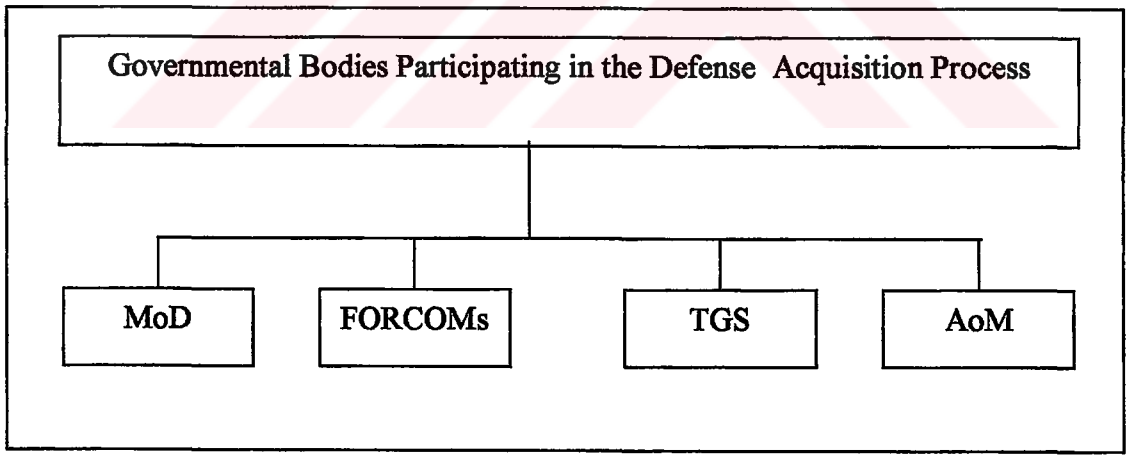

Figure 3.2: Main Governmental Acquisition Bodies

Even though the relationships between those bodies are complex and procedural, an effective coordination and teamwork is inevitable for the overall success of defense acquisition activities.

MoD is the prominent player in the government defense acquisition system. In the following paragraphs, a concise information about the structure and role of MoD and other acquisition procedures will be presented.

3.2.2 The process of procurement projects

The Turkish General Staff (TGS) is responsible for coordinating all the planning actions and determining the guidelines in accordance with the directives of the government (1324 Sayılı Genel Kurmay Başkanı'nın Görev ve Yetkilerine Ait Kanun, 1970, p.2751). The starting point of any acquisition project is "Ten Year Acquisition Program" or "TYPP" which is formulated by the Turkish General Staff. Headquarters, on the basis of the defense system and equipment requirements reported periodically by individual Force Commands. "TYPP"s form the basis for Turkish General Staff's "Strategic Goal Plan". TYPP also cites the categories of financial resources from which those requirements are to be met, and the particular procurement organizations to undertake each one of these. The three main categories of financial resources cited in TYPPP are;

- National Defense Budget (used by MoD Undersecretary for Economical Affairs),
- The defense industry support fund (over $ 1 Billion, allocated for MoD Undersecretaries for Defense Industry –SSM),
- The undersecretaries pay the foreign state/contractor credits -which back to the Treasury (TGS Directive: MY 369-1(A), 1999).

Organizational structure of MoD is depicted in Figure 3.3. Ministry of National Defense has two undersecretaries. One is "Undersecretary for Economical Affairs" and the other is "Undersecretary for Defense Industry". The latter is founded with the purpose of promoting national defense industry through direct or indirect support to the national defense industry ranging from organizing contracts so as to maximize technology transfers from foreign prime contractor to national prime contractor to giving credits to national defense firms from the defense industry support fund. SSM carries a special importance in that sense because it is the governmental organization where government- defense contractor interaction is the heaviest.

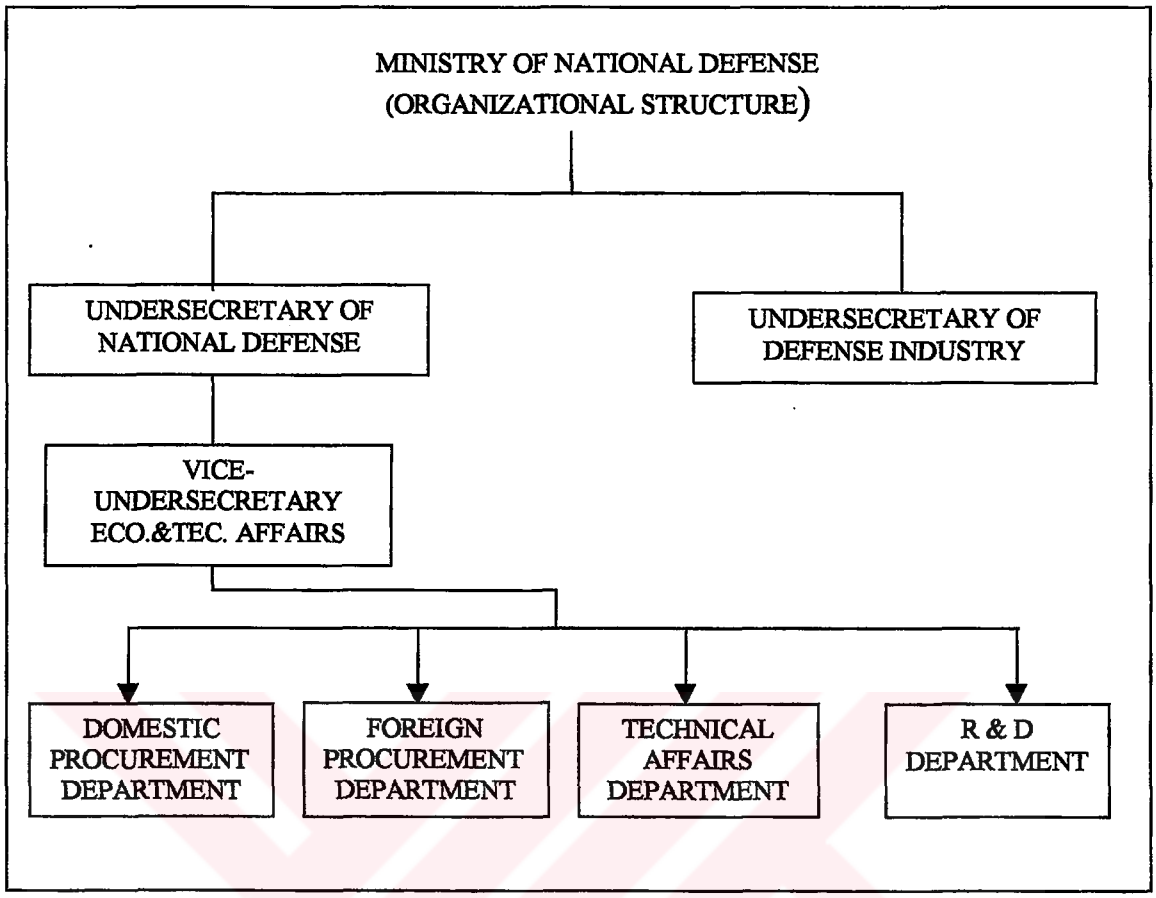

Figure 3.3: Organizational Structure of MoD
Source: M.S.B.' nın Görev ve Teşkilatı Hakkında Kanun, 1970 ve S.S.M.'nin Kurulması, Görev ve Yetkilerine ait Kanun, 1985

The other undersecretary of MoD comprises Domestic Procurement, Foreign Procurement, Technical Affairs, and R & D departments and conducts acquisition programs supported by national defense budget. Those are mostly the items that would involve off-the-shelf procurement, and the procedures stated in the State Tendering Law that dictates launching of a competitive tender with the participation of all interested parties and willing bidders. However, under some exceptional circumstances, defense equipment could also be purchased from any source without a tender, and using a Counsel of Ministers Decree that would designate the equipment and its supplier (State Tendering Law, Article 89 –amendment in 1984). The other major mechanisms involves the projects undertaken by Undersecretaries For Defense Industries (SSM) using the national industry support fund, and those projects undertaken by Undersecretary For Economical Affairs using national defense budget.

In Turkish Procurement System, procurement activities are divided into two main groups. The first one is Domestic Procurement and the second one is Foreign Procurement. Figure 3.4 schematically depicts those different kinds of procurement.

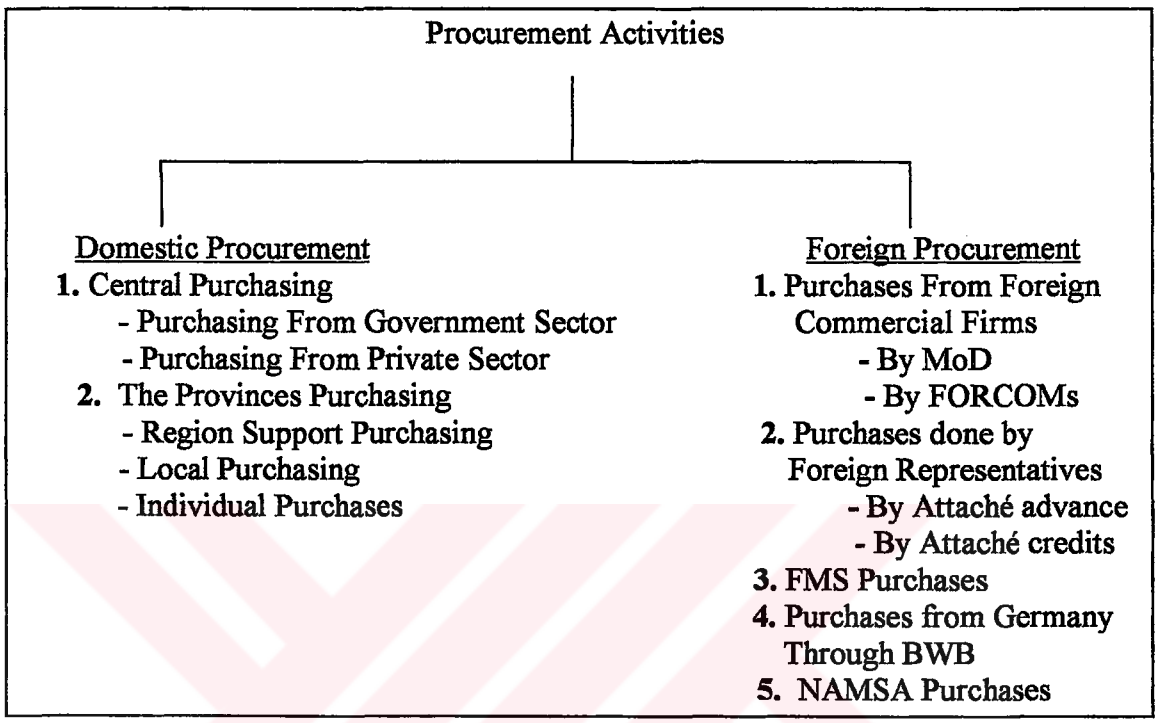

Figure 3.4: Classification of Defense Purchases
(Source: MoD Domestic (M.S.B. No. 70-12, 1990) and Foreign (MSY 310-1, 1993) Procurement Directives).

3.2.2.1 Domestic Procurement

Domestic procurement can be done by as either central purchasing or provincial purchasing.

Central purchasing, planned and conducted by Undersecretaries of Ministry of National Defense for Economical and Technical Affairs, can be further done in two ways. Central purchasing can be either done from government sector or private commercial sector. State Tendering Law regulates these purchasing activities and show how they should be conducted (State Tendering Law, 1983, prg.44-45).

As to central purchasing, the initiating document is the Requirement Announcement Form (RAF) prepared and sent to Turkish General Staff for evaluation by individual Force

Commands. RAFs are then classified and evaluated on the basis of whether they are in the Strategic Goal Plan or not. Those that exist in the SGP are under the authority and responsibility of General Turkish Staff for approval. Those that are approved by TGS are then sent to Economical & Technical Affairs Department of MoD which further are sent to the Domestic Procurement Department (DPP). Those RAFs that do not exist in the SGP are directly sent to Economical & Technical Affairs Department of MoD. Finally Domestic Procurement Department organizes those RAFs so as to form a "Procurement Plan" (PL). In PLs, DPP determines the way of source selection, contracting procedures, method of procurement, and scheduling.

The other method of domestic procurement is provincial purchasing. Provincial purchasing can be done in three ways: Region support purchasing, local purchasing, and individual purchasing. Region support purchases are done for first class army supplies (such as food, textile, cleansing materials etc.). Corpses do those purchases from the potential suppliers located near their region. Since the products have commercial attributes, sealed bidding, or firm fixed price contracting methods are used. For those Corpses located near Domestic Procurement Department, purchases are done by this department upon the approval Corpses Commands. Local purchasing is done to meet the requirements of Corps Commands for the first and third class army supplies (as an example to third class army supplies, fuel and lubricants can be given). Finally individual purchasing is done by corpses commands to meet their immediate and small-scale requirements.

3.2.2.2 Foreign Procurement

There are five ways of foreign procurement in the Turkish Procurement system: "Purchases from foreign commercial firms" (conducted both by individual Force Commands and MoD), "purchases done by foreign military representatives" (through either military attaché advances or credits), "FMS purchases" (Foreign Military Sales), "purchases from Germany" (through BWB- The German Weapon Development and Procurement Department), and "North Atlantic Maintenance and Supply Agency (NAMSA, an logistical agency of NATO) purchases".

Purchases from foreign commercial firms that are conducted by MoD have almost the same procedure with the purchases from commercial firms that are directly conducted by FORCOMs. In some instances FORCOMs may have the required technical personnel and expertise with them and may propose conducting foreign purchases themselves to the MoD. In accordance with the Strategic Goal Plans, those projects can be executed by the FORCOMs with slight deviations from the usual procedure. Foreign purchases from foreign commercial firms follow this procedure: MoD Foreign Procurement Department (FPD) sorts and classifies the RAFs that are processed in TGS by the related "Requirement Office" and then sent to it. Each sorted and classified RAF is given a separate project code number and treated as a new military project from there on. This project code number shows the force, fiscal year, and the class of the army materiel/system. Then, the foreign procurement department wants a final approval and inspection of the project (represented by its special code number) from FORCOMs. After getting the approvals and final contributions of FORCOMs, FPD improves the system specifications and does other corrections to eliminate duplication, and other inefficiencies. After those activities and price estimation has been finished, it prepares approval certificate and sends the certificate to the Ministry of Industry and Commerce to ascertain that there is no capability of procuring the system internally from domestic firms. After getting it approved by Ministry of Industry and Commerce, FPD declares it through official newspaper in the form of "Request For Information (RFI)" or "Request For Tender (RFT)". This declaration can be also be made through foreign military attachés or by directly sending RFIs or RFTs to the foreign contractor firms. This purchasing procedure will be analyzed detail in section 3.2.3: MoD Procurement Process.

Military attachés are also authorized to do some expenditure themselves. The purpose of this provision is that not all the urgencies can be appropriately estimated before and the fact that there may be some contingencies for which there is not enough time to follow the common procedural way. Purchases done by foreign military representatives are subject to strict constraints and cannot be used for large scale purchasing. Those appropriations can be spent within one month after the request for a money order has been sent to the related requirement office in the FORCOMs by the military attaché. Those requests must be for satisfying an

urgent need and for only pre-assigned use. The common conditions for both way of expenditure by military attachés are that they must be for satisfying an urgent need, and compliance with the State Tendering (or solicitation) Law if Article 89 of State Tendering Law is not evaluated as relevant in the particular situation.

The last three types of foreign military procurement are natural consequences of the international military agreements signed between Turkey and foreign countries or NATO. All of these are excluded from State Tendering Law (Article 82) and conducted in accordance with those agreements. FMS (Foreign Military Sales) purchases are done by FMS credits, appropriated by USA to Turkish Government, in those areas such as reorganization of Turkish Military Forces, and modernization of the equipment and weapon systems. BWB purchases are the consequence of the agreements between Turkey and Germany as two NATO members. According to this agreement, German Weapon Technique and Procurement Department (BWB) purchases the demanded materiel/system on behalf of the Turkish government at the same prices they pay for those systems in Germany but applying their own contracting methods.

3.2.3 MoD Procurement Process (Purchases from Foreign Commercial Firms)

The next year material and services' RAFs must be sent to Turkish General Staff General Plan Principles Division (TGSGPPD) by the user.

TGSGPPD department examines RAFs in order to put them in SGP, and then sends the RAFs, which is now in final form, to MoD.

MoD Foreign Procurement Department (FPD) study on the RAF and determines the procurement way and if there are same kind of requirement material and services puts them together. As it was discussed before for every project a RAF should be prepared. Finally FPD sends the project to operation division and give a project code number to project that is taken in process. This project code number shows the force, fiscal year and type of purchasing material. In the process for any kind of transportation and corresponding the project code number is using by MoD.

If the project approved by TGS, requirement office must prepare the technique specifications of the project and send it to MoD. After taking the specifications Foreign Procurement Department follows the procedure below;

- FPD wants the allowance of the project from the Force Commands
- Improve the specifications, eliminate deficiency, mutually correspondingly with owner of the requirement
- Guess the price by investigating same kind of old projects offer prices, etc.
- Prepare approval certificate
- Takes a certificate from Ministry of Industry and Commerce for there is no production of the required material in state,
- Declare the required material on news paper, Request For Information or Request For Tender
- This declaration can be made by Military Attachés abroad or can be send directly to the firms who are related with the subject,

If the project is under the scope of Solicitation Law 2886 a tendering commission must be built. This commission executes the tendering process and can give decision on award of contract. It means the commission takes the offers and can open or closes the envelopes, according the type of contract, examines and apprises the offers.

The most important point in the process, after examining and apprising the offers, is determining the bidder. The cheapest price is not the bidder, proper price is the bidder. The commission determines the proper price by analyzing the firm's position and effectiveness in the industry, capacity, potential and fiscal power of the firm.

After awarding contract, The Ministry of Finance & Custom gives visa, The Exchequer & Audit Department register the file, and payment, delivery process begins.

Materials, which procured from abroad, have inspection and acceptance operation two times in Turkey and in the original country where it is produced.

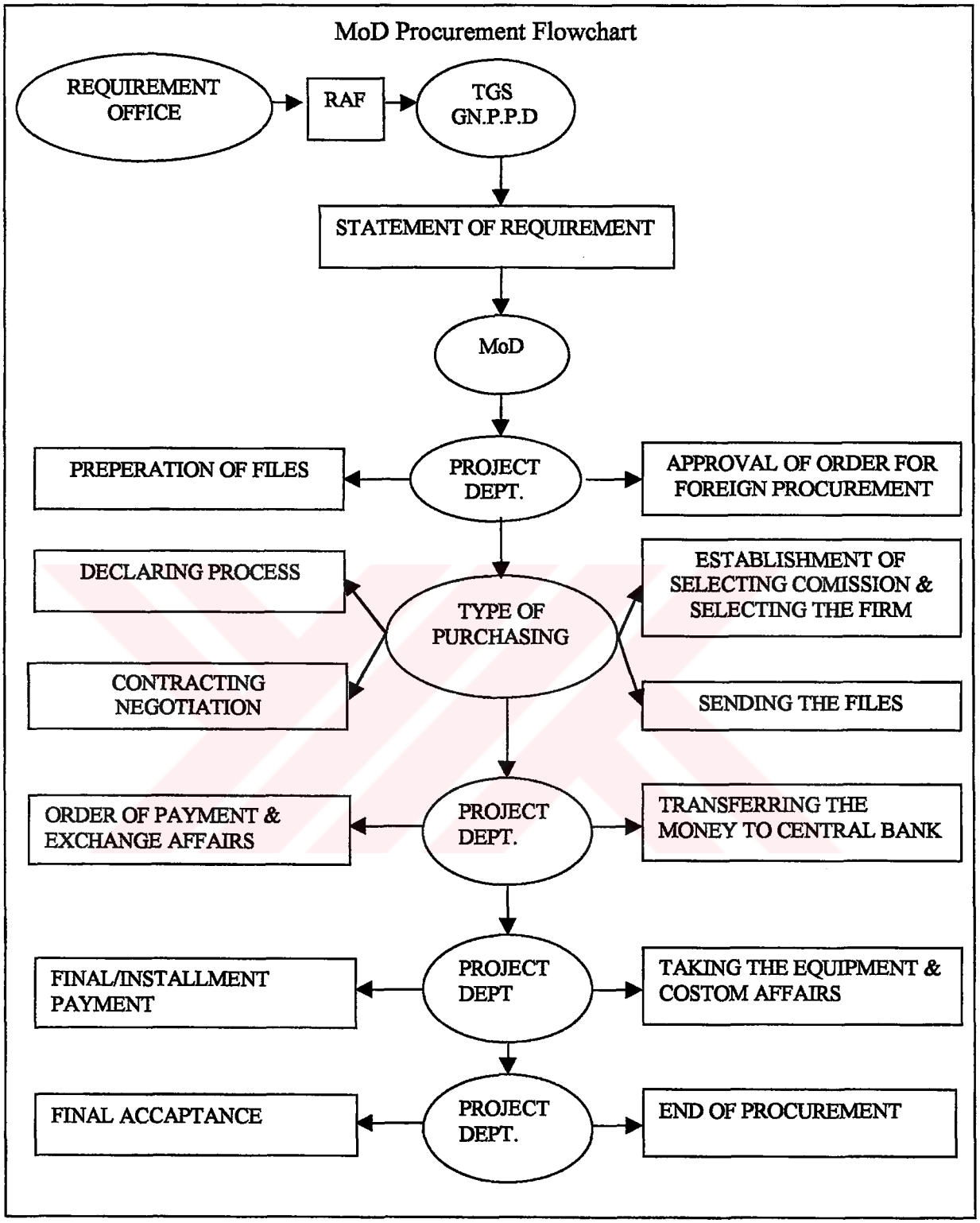

Figure3.5: MoD Procurement Flowchart

3.2.4 Factors Affecting Turkish Defense Procurement

Collapse of the Soviet Union in 1991, the dissolution of the Warsaw Pact in the same year and the economic crisis in 1998 caused changes in nations' procurement strategies. These changes can be characterized by: Large reductions in the defense budgets in the world. At this point, it will be good enough to see the dramatic picture by having reduction level from 1989 to 1997 the total world defense budgets have fallen from US$ 1196 Billion to US$ 678 Billion (which is about 43.5 %) (Küçükseyhan, 1999, p.2).

Security, political frameworks, military requirements, economic resources, progress of technology and competition are the key factors in the defense industry providing the market potential of the companies, their product policy and their position, as regards both competition and cooperation strategies. When looked at Europe all of these factors dramatically change for the European nations. This situation has also reshaped the procurement policies of the nations. Turkey is surrounded by an unstable geographical environment and also Turkey has problems with some of its neighborhoods. As a result Turkey has to have a strong army with modern weapons systems.

3.2.5 Problems in Current Acquisition System

Defense equipment is becoming increasingly complex and diverse, demanding more flexible and shorter acquisition procedures. The Turkish Armed Forces are facing less predictable threats and a wider range of tasks, so new technology needs to be deployed more quickly. The Armed Forces cannot keep pace with the rate of technological change that in many areas now commercially led. In the present procurement procedure and organization, major weapons systems are still taking some twenty years to bring into service. Cost continue to exceed planned levels and reliability and maintainability of new equipment frequently remains a problem (Strategic Defense Review, 1998, p.67).

The present procurement procedure and organization cannot strike the right balance between cost, time, and performance in the very early stages of a project. Insufficient investment in the risk reduction at this stage has cost more to armed forces later on. The present procurement

process and organization has deficiency to give project managers sufficient delegated authority (Burçak, 1999, p.9).

People, who involved in procurement process, show tendency to avoid taking the responsibility (interviews made with contract manager in MoD). They are transferring commercial and technical risk to contractors despite the fact that they are unable to absorb it. Insufficient pricing pressure on inflation and delays involved in decision-making on collaborative projects make the stakeholders to fall short of targets.

The current procurement procedure also tends to be solution focused, with early attention paid the characteristic of the equipment to be procured. Many procurements proceed purely on the basis of an assumed solution, resulting in a concentration on equipment performance rather than user and system needs. Focus should be made to the needs of the users by defining what the users of a particular future system will need and focuses on the requirement for whole systems through-life rather than just initial procurement.

There are also little researches about the problems of Turkish acquisition system. Main resource book is "DEFENSE INDUSTRY AND ACQUISITION". In this book the problems are divided into five parts. These are;

- Insufficiencies at determination of requirement and planning
- Insufficiencies at process and organization
- Insufficiencies at regulation
- Insufficiencies at program management
- Not putting in working order at training and continuity of duty

Another document links thesis' subject is "ACTIVATING OF POTENTIAL DOMESTIC R&D CAPABILITIES". In this document problematic areas in Turkish Defense Acquisition System are defined as;

- Insufficiencies at definitions of requirements
- Uncertainties for targets of R&D principles and priorities

- Insufficiencies at team-working
- Insufficiencies of organization and coordination between bodies
- Problems of personnel
- Not planning of technological product for dual-use
- Judicial Problems
- Financial Problems

After these data are collected, to find the problem areas of Turkish defense procurement system, the effectiveness of management of defense procurement projects will be defined.

The independent variables that affect the management of defense procurement projects will be dealt with in the research section of this study. The effectiveness of defense procurement projects is divided into four parts. These are;

1.Effectiveness of Procurement Process,

- Determination of requirement
- Technological development of procurement projects
- Stability of requirements of procurement projects
- R&D based procurement procedure

2. Effectiveness of Procurement Organization,

- Coordination among procurement bodies
- Cooperation of procurement bodies
- Teamwork between procurement bodies
- Authority of procurement bodies
- Answerability and accountability of procurement bodies
- Responsibility of procurement bodies
- Policy of procurement bodies

3. Effectiveness of Procurement Regulations,

- A comprehensive, single acquisition regulation

4. Effectiveness of Procurement Personnel,

- Training of procurement personnel
- Multidisciplinary personnel in procurement projects
- Continuity of personnel over the procurement projects' life

As it categorized above, every parts is affected by some factors. Also, these are shown in Figure: 4.2. The results of the research that are about the effectiveness of defense procurement projects will be explained in Chapter 4: methodology.

3.3 Summary

In this chapter, firstly general characteristic of Turkish acquisition system are examined. Secondly the governmental bodies and organizational structure responsible for acquisition are identified. And MoD procurement process has been focused in detail. Factors, which may affect general Turkish Defense Procurement and also mostly cited problems in current acquisition system, are defined.

In this study, the focus is on MoD's Foreign Procurement Department. In the defense procurement project process, there might be some problems. The main objective of the study is to identify and give some suggestions how those problems can be solved. To find these problems, the effectiveness of defense procurement projects will be investigated. If effectiveness of defense procurement projects is affected in negative direction by independent variables, these variables will be called as a problems. For this reason the effectiveness of defense procurement projects are categorized in four groups in this research. These are;

- Effectiveness of procurement process,
- Effectiveness of procurement organization,
- Effectiveness of procurement personnel,
- Effectiveness of procurement regulations.

4. METHODOLOGY

4.1 Overview

This chapter provides a detailed summary of the research design and method that were used to evaluate the hypotheses presented in 4.5.3. The chapter begins with a discussion of the data collection method, together with specifying the criteria used in sample selection. The selection and measurement of the relevant variables for this research are then discussed. Finally, the statistical analyses used in this research are described.

4.2 Data Collection

Since the nature of the data for this research, in terms of the type and amount of the desired information, necessitates the use of primary data sources, they were gathered through structured-questionnaire (Appendix-A) filled out by the personnel of the Ministry of Defense and the Land Forces Command who have reliable knowledge about defense procurement projects procedures and are experienced in defense procurement projects.

The defense acquisition literature has been reviewed and thorough interviews have been carried out. The researcher in defense acquisition system course has caught initial thought. After reviewing the literature and interviewing the personnel of acquisition bodies, the questionnaire was designed.

Questionnaire is applied in Turkish, because of the participants. Questionnaire contains four different groups, and 28 questions total. These groups are procurement process, organizational structure of procurement, procurement regulations, and procurement personnel questions. And also a core concept question and demographic questions are added to questionnaire. As a scale, interval scale is applied.

4.3 Sampling

With regards to the Ministry of Defense and the Turkish Land Forces Command, the attempt has been to interview all the personnel that take part in the procurement projects procedure.

However, due to the personnel on leave and those unwilling to fill in the questionnaire, only 30 of the above-mentioned personnel could be interviewed. The demographic properties of this sample is given in Table 4.1. These demographic properties were also used as demographic variables in the questionnaire.

Table: 4.1 Demographic Properties of the Sample

	Frequency	Percent	Cumulative Percent
1. AGE	30		
22-25	1	3,34	3,34
26-29	5	16,66	20,00
30-33	7	23,34	43,34
34-37	8	26,66	70,00
38-41	3	10,00	80,00
42-	6	20,00	100,00
2. ACQUISITION BODY	30		
Army	9	30,00	30,00
MoD	21	70,00	100,00
3. DEPARTMENT	30		
Personnel	4	13,34	13,34
Quality & Control	2	6,66	20,00
Testing	2	6,66	26,66
Technical Service	9	30,00	56,66
Procurement	12	40,00	96,66
R & D	1	3,34	100,00
4. RANGE	30		
Lieutenant	7	23,33	23,33
Captain	3	10,00	33,33
Major	4	13,33	46,66
Lieutenant Colonel	1	3,34	50,00
Colonel	3	10,00	60,00
Civilian	12	40,00	100,00
5. BRANCH	30		
Engineer	20	66,66	66,66
Air Defense	1	3,34	70,00
Ordnance	8	26,66	96,66
Infantry	1	3,34	100,00

6. JOB EXPERIENCE	30		
0-2	1	3,34	3,34
3-5	2	6,67	10,01
6-8	7	23,33	33,34
9-11	6	20,00	53,34
12-14	2	6,66	60,00
15-17	5	16,67	76,67
18-	7	23,33	100,00
7. FOREIGN LANGUAGE	30		
English	22	73,33	73,33
German	1	3,34	76,67
French	---	-------	76,67
Two Languages	3	10,00	86,67
No language	4	13,33	100,00
8. EDUCATION	30		
College	---	------	--------
High School	1	3,34	3,34
University	19	63,33	66,67
Master's Degree	10	33,33	100,00

Table: 4.1 Demographic Properties of the Sample (continued)

It can be seen at the table that the mean age of the respondents is 34. 70 percent of them are in MoD and 30 percent are employed in Land Forces Command. 40 percent of the sample is working in procurement department, besides 30 percent are working technical service department. The sample comprised 60 percent military personnel and 40 percent civilian personnel. 66,66 percent of the sample are working as engineer. Job experience of the 60 percent is at most fourteen years. There are 22 people, 73,33 percent of the sample, know English as a foreign language, besides 10 percent knows a second foreign language besides English. 66.67 percent of the survey participants are college graduates at least, 33,33 percent have a master's degree.

4.4 Questionnaire

Questionnaire was applied in MoD, and Land Forces Command, Ankara, with the participation of 30 people. Questionnaire was carried out by the researcher himself during two week's time.

Questionnaire was developed by researcher. This questionnaire identifies the effectiveness of Turkish defense procurement projects. In questionnaire there are four different groups of questions;

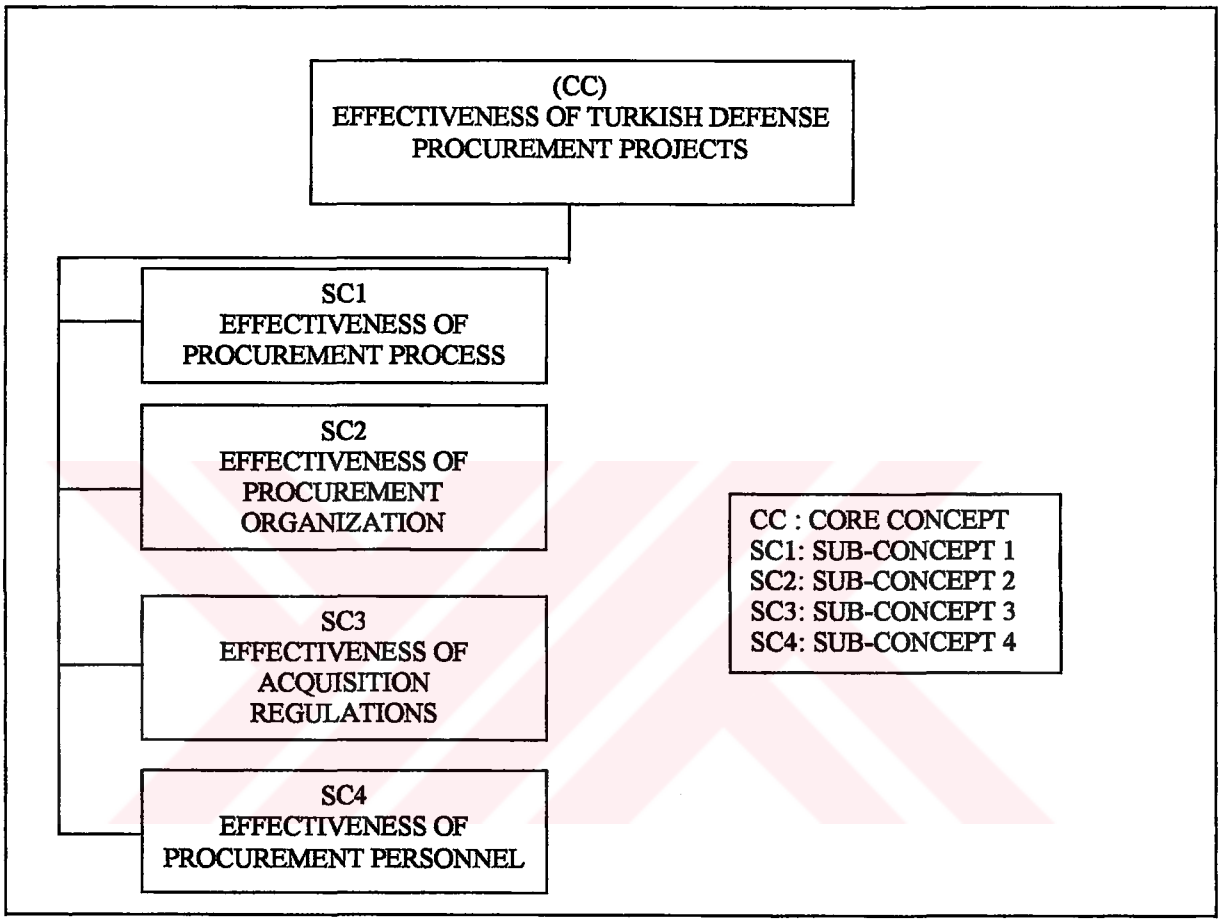

Figure 4.1: Schematic Diagram of the Theoretical Framework-1

Every sub-concept is affected by independent variables called factors.

These factors and their relationships with sub-concepts and core concept are depicted in Figure 4.2.

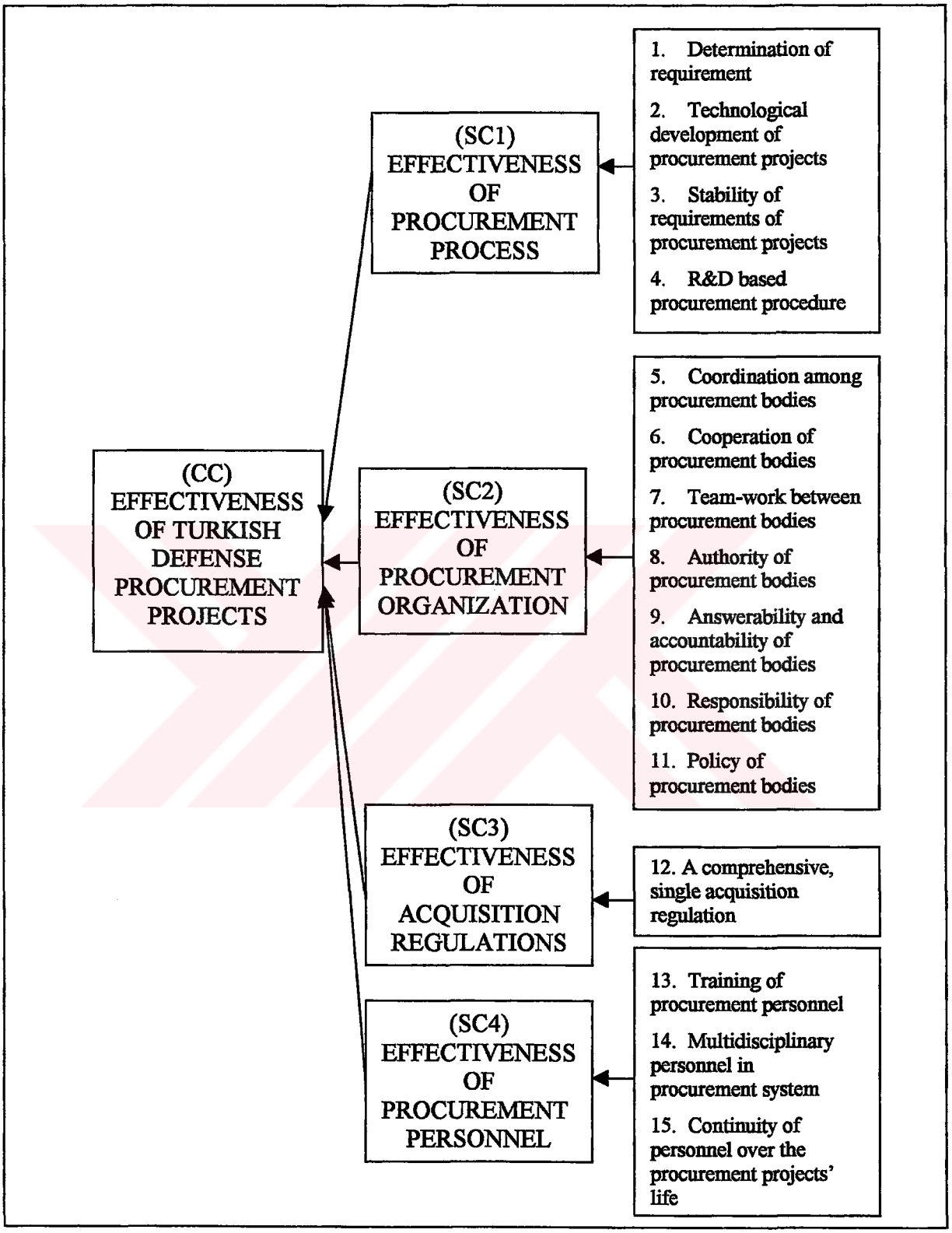

Figure 4.2: Schematic Diagram of the Theoretical Framework-2

Researcher added a core concept question, to analyze multiple regression of the questionnaire.

4.5 Data Analysis Methods

In this study some statistical techniques were used to determine the importance degree of the factors. After questionnaire responses have been obtained, the data were edited, coded, and categorized in terms of variables. After the raw data have been keyed into computer manually, the analysis have been done using SPSS (Statistics Program for Social Sciences) for Windows version 5.0.1.

This program can be used for generating frequencies, descriptive statistics such as the mean and the standard deviation, correlation, t-test, the ANOVA, multiple regressions, factor analyses and for drawing tables and graphs. The analyses in the research have been performed at a 95 % confidence level; (the generally accepted level of confidence in social research is 95 %, 2-Tailed). The statistical methods used in data analysis are as follows;

- *"Factor analysis"*, for the grouping of different criteria and for the explanation of the variation among a set of interrelated groups,
- *"Reliability analysis"*, for measuring the internal consistency of both the different factors and the criteria that make up these factors (Reliability here refers to how accurate the estimation of the true score in a population is).
- Then independent variables that were grouped under 3 Factor groups were regressed on the dependent variables to find out the explanatory power of these factor groupings (Via a "*multiple-regression*" analysis).
- *"Chi-square test"*, for the detection of relationships among nominal variables,
- *"The paired sample t-test"*, for the detection of significant mean differences between two groups,
- Finally *"One-way ANOVA"*, for detection of significant mean differences among multiple groups was also executed.

4.5.1 Factor Analysis

Factor analysis allows us to comment more easily and satisfactorily on a great number of variables by bringing them together in a meaningful pattern. It has been used in this study in order to determine the affecting factors of the effectiveness of defense procurement project.

In the factor analysis section, Kaiser-Meyer-Olkin measure of Sampling Adequacy, Barlett Test of Sphericity and its significance were also detected. Factors that were grouped in Factor analysis (Eigen value>1) were later used in multi-regression analysis. But for reliability tests, all of the variables (dependent and independent) together with factor groupings were used.

As a result, as seen in table 4.2, 14 independent variables have been meaningfully reduced to 3 factor groupings in total. One independent variable (a comprehensive, single acquisition regulation) is omitted from analysis. When determining these 3 factor groupings (G1, G2 and G3), the factor groupings with an eigenvalue of at least 1 have been accepted as meaningful. Cumulative percentage of explanatory power for these three factor groupings is 72,9. This means that, these three factor groupings explain 72,9 % of the total variance of the questionnaire. The explanatory power of these 3 factor groupings is found to be 72.9 %, which is a satisfactory percentage (because 72.9 % is greater than 70%).

Table 4.2: Factor analysis of the variables

---------- FACTOR ANALYSIS ----------

Variable	Communality	* Factor	Eigenvalue	Pct of Var	Cum Pct
F8	1,00000	* 1	5,57118	39,8	39,8
F9	1,00000	* 2	2,65496	19,0	58,8
F6	1,00000	* 3	1,96970	14,1	72,9
F10	1,00000	* 4	,95888	6,8	79,8
F7	1,00000	* 5	,89105	6,4	86,2
F5	1,00000	* 6	,59073	4,2	90,4
F11	1,00000	* 7	,54502	3,9	94,3

PC extracted 3 factors.
Kaiser-Meyer-Olkin Measure of Sampling Adequacy = ,61813
Bartlett Test of Sphericity = 242,24554, Significance = ,00000

It can be seen that the estimated "Kaiser- Meyer- Olkin Measure of Sampling Adequacy" value is 0,61813; this shows the appropriateness of choosing this data set for the explanation of this subject. That the significance obtained by the "Bartlett Test of Sphericity" is at the level of 0.00000 allows the researcher to perform the multi-regression analysis. These can be seen from the table 4.2. The research's factor questions are well grouped and homogenous.

The factors that are produced by the factor analysis and the explanatory power of the criteria that make up these factors have been outlined in the table 4.3. As can be seen from the table, the criterion just under each factor has the greatest explanatory power on that factor.

As shown in table 4.3, these 3 groups are identified as organizational, procedural and personnel problems respectively.

Table 4.3: Grouping of the variables by factors analysis

Factors	**Explanatory Power**
Grup1 Organizational problems	**% 39,8**
F6-Cooperation of procurement bodies	0.88753
F8-Authority of procurement bodies	0.82014
F9-Answerability and accountability of procurement bodies	0.75187
F7-Team-work between procurement bodies	0.74962
F10-Responsibility of procurement bodies	0.73441
F5-Coordination among procurement bodies	0.63076
F11-Policy of procurement bodies	0.62689
F4-R&D based procurement procedure	0.59478
Grup2 Procedural problems	**% 19.0**
F1-Determination of requirement	0.86127
F3-Stability of requirements of procurement projects	0.81599
F2-Technological development of procurement projects	0.64364
Grup3 Personnel problems	**% 14.1**
F14-Multidisciplinary personnel in procurement projects	0.82541
F13-Training of procurement personnel	0.80676
F15-Continuity of personnel over the procurement projects' life	0.72107

It can be seen in the rotated factor matrix that in first factor group, generally the procurement organization questions are grouped. 8 factors are collected in first group and first 5 factors' explanatory power on that factor is high. The other two factors are acceptable, but last factor, which is F4, explanatory power value is low but it is near the .60. For this reason it was also included into the model. In the second and third groups, there are generally procurement procedure and procurement personnel questions respectively. Both groups have 3 factors, each of which has high explanatory power. In the light of these meaningful results, it can be said that the research's factor questions are well grouped and homogenous. Rotated factor matrix is given in Table 4.4.

Table 4.4: Rotated Factor Matrix

	Factors	Factor 1	Factor 2	Factor 3
GROUP 1	Cooperation of procurement bodies	,88753	-,05453	,18595
	Authority of procurement bodies	,82014	,20503	-,14159
	Answerability and accountability of procurement bodies	,75187	,31401	-,02116
	Team-work between procurement bodies	,74962	-,04017	,28252
	Responsibility of procurement bodies	,73441	,02290	,43087
	Coordination among procurement bodies	,63076	,36475	-,09501
	Policy of procurement bodies	,62689	,35815	,14062
	R&D based procurement procedure	,59478	,22367	,37100
GROUP 2	Determination of requirement	,12249	,86127	-,09295
	Stability of requirements of procurement projects	,04924	,81599	,20475
	Technological development of procurement projects	,24204	,64364	-,01459
GROUP 3	Multidisciplinary Personnel in procurement projects	,28859	-,20343	,82541
	Training of procurement personnel	-,09336	,03020	,80676
	Continuity of personnel over the procurement projects' life	,27384	,41250	,72107

4.5.2 Reliability Analysis

Reliability analysis gives internal adequacy of factor, grouped factor, core concept, and sub-concept questions.

In general, the concept of reliability refers to how accurate, on the average; the estimate of the true score is in a population of objects to be measured. Reliability tests how consistently a measuring instrument measures whatever concept it is measuring. In other words, reliability is concerned with stability and consistency in measurement. The internal consistency of measures is indicative of the homogeneity of the items in the measure that tap the construct. In other words, the items "should hang together as a set" and be capable of independently measuring the same concept such that the respondents attach the same overall meaning to each of the items.

First of all, the internal consistency of the factors grouped by the Factor Analysis and, secondly, the internal consistencies of the criteria that make up these factors have been measured by subjecting them to Reliability Analysis.

"*Cronbach's Alpha Method*" was used for testing the reliability of these factors. It is a reliability coefficient that reflects how well the items in a set are positively correlated to one another. It is computed in terms of the average intercorrelations among the items measuring the concept. The closer Cronbach's Alpha is to 1, the higher the internal consistency reliability. Reliabilities less than 0,60 are generally considered to be poor, those in the 0,70 range, to be acceptable, and those over 0,80 to be good. The closer the reliability coefficient gets to 1.0, of course, the better.

The analysis of reliability of the four sub-concepts is made and findings of this analysis are shown in Table 4.5. The result indicates that the Cronbach's alpha measure is 0,7120. Thus the internal consistency reliability of the measures used in the study can be considered to be acceptable (the items measured what they are considered to really measure, they really tap the research construct which is quite homogenous). It can be said that these four sub-concepts (effectiveness of procurement process, effectiveness of procurement organization,

effectiveness of procurement regulations, effectiveness of procurement personnel) explain the core concept (effectiveness of Turkish Defense Procurement Projects) reliably.

If Sub Concept-2 (Procurement Organization) is removed from the questionnaire, then the alpha would be .7208 which is higher than the former alpha coefficient. But, since the difference is not so high, it was not excluded from the questionnaire.

Table 4.5: Reliability Analysis-Sub-concepts

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	SC1	4,9333	,9803	30,0
2.	SC2	5,1333	,8193	30,0
3.	SC3	4,7000	,8367	30,0
4.	SC4	4,1667	1,0199	30,0

Statistics for	Mean	Variance	Std Dev	N of Variables
SCALE	18,9333	7,2368	2,6901	4

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
SC1	14,0000	4,0690	,5580	,6110
SC2	13,8000	5,2000	,3654	,7208
SC3	14,2333	4,8747	,4499	,6777
SC4	14,7667	3,7023	,6355	,5551

Reliability Coefficients

N of Cases = 30,0 N of Items = 4

Alpha = ,7120

In the reliability analysis of the factor questions, Cronbach's Alpha is found to be 0,8693 for total factor questions. Since Alpha is bigger than 0.7, factor questions are reliable. The internal consistency of all the factors has a reliability coefficient of 0,8693 that is considered to be good and they hang together as a set. It means that the respondents attach the same overall meaning to each of the items that is capable of independently measuring the effectiveness of the defense procurement projects. The result of the all factors' reliability analysis is given in Table 4.6.

In the table, it is seen that it is possible to increase the total reliability of the questionnaire by omitting F-13 and F-1. If F-13 is omitted the reliability would be .8807. If F-1 is removed

from the questionnaire, this time, it would be .8699. Since the difference is not so great, they were not excluded from the questionnaire.

Table 4.6: Reliability Analysis- All factors

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	F14	4,6000	1,0372	30,0
2.	F13	4,8333	1,5775	30,0
3.	F15	4,2000	1,4479	30,0
4.	F1	3,8667	1,4794	30,0
5.	F3	3,1000	1,2959	30,0
6.	F2	3,2333	1,3566	30,0
7.	F5	4,1000	1,5166	30,0
8.	F6	3,6333	1,3257	30,0
9.	F7	3,6333	1,4016	30,0
10.	F9	3,5667	1,3309	30,0
11.	F8	3,3000	1,3429	30,0
12.	F10	3,4000	1,2758	30,0
13.	F11	3,6333	1,5862	30,0
14.	F4	3,6333	1,4259	30,0

Statistics for	Mean	Variance	Std Dev	N of Variables
SCALE	52,7333	140,7540	11,8640	14

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
F14	48,1333	130,3264	,3949	,8667
F13	47,9000	131,8172	,1780	,8807
F15	48,5333	119,0161	,6217	,8554
F1	48,8667	126,6713	,3572	,8699
F3	49,6333	126,9989	,4134	,8661
F2	49,5000	126,3966	,4104	,8665
F5	48,6333	119,6885	,5655	,8585
F6	49,1000	119,3345	,6788	,8529
F7	49,1000	120,3000	,6014	,8566
F9	49,1667	119,7299	,6610	,8538
F8	49,4333	120,5989	,6222	,8557
F10	49,3333	119,8851	,6887	,8528
F11	49,1000	116,2310	,6434	,8538
F4	49,1000	119,1966	,6271	,8551

Reliability Coefficients

N of Cases = 30,0 N of Items = 14

Alpha = ,8693

There were 3 different factor groupings in the questionnaire related with the factor analysis. All found alphas are bigger than 0,7. So, these three factor groupings have, as a whole, a high reliability among themselves. The results of the factor reliability analysis of the groups are given in Table 4.7. Among these factors, only one has reliability coefficient bigger than 0,8 (Factor Grouping 1, Organizational Problem) , which is known to be a good satisfactory criterion to establish an adequate reliability measurement for factor groupings. This finding can be explained by the fact that the organizational variables that make up the 1st group, hang together as a set, and they are be capable of independently explaining the same factor grouping that is, organizational problems in a reliable way. On the other hand, the factor groupings – Determination of requirement, stability of requirements of procurement projects, technological development of procurement projects – that make up the 2nd group have a reliability coefficient of 0,7402, and the factors - multidisciplinary personnel in procurement projects, training of procurement personnel, continuity of personnel over the procurement projects' life- that make up the 3rd group have a reliability coefficient of 0,7422 closer to 0,8 may be considered to be good for explaining the procedural problems and personnel problems respectively.

Table 4.7: Reliability Analysis-Groups

Groups	Cronbach's Alpha
Group 1 (Organizational Problems)	0,8701
Group 2 (Procedural Problems)	0,7402
Group 3 (Personnel Problems)	0,7422
Total	0,8693

4.5.3 Hypothesis Testing

The relevant hypotheses are developed based on the research framework as shown in Figures 4.1 and 4.2. These hypotheses are tested through the multiple regression analysis, the Chi-Square test, the t-test, and the ANOVA.

4.5.3.1 Multiple Regression Analysis

Firstly in factor analysis, the independent variables are grouped in three. After the reliability analyses for the three factor groupings are executed, it is found that they are reliable that is they are capable of independently explaining the Factor Groupings. But these findings give no idea of how much of the variance is explained in the dependent variables. To find this explained variance, the multiple regression analysis will be made.

Descriptive statistics of the multiple regression analysis is given in Table 4.8. The research's core concept question is "Does participants believe that Turkish Defense Procurement Projects is effective?". Core concept question is dependent variable for the multiple regression. The research's three groups found in the factor analysis are independent variables. SPSS package (Version 5.0.1) program is used for multiple regression analysis.

Table 4.8: Descriptive statistics of the multiple regression

	Mean	Std. Dev	Cases Label
CORE CONCEPT	4.000	1.114	30
ORGANIZATIONAL PROBLEM	28.900	8.503	30
PERSONNEL PROBLEM	13.633	3.347	30
PROCEDURAL PROBLEM	10.200	3.357	30

The hypothesis, which will be analyzed with multiple regression, is;

H_0: There is no significant relationship between having organizational, personnel, procedural problems and effectiveness of Turkish defense procurement projects.

H_1: It cannot be said that such a relationship does not exist.

4.5.3.1.1 Steps in Multiple-regression analysis

First step of the regression analysis is analyzing linearity between Factor Groupings and dependent variable. Linearity can be found by analyzing results of the regression (Table 4.9).

Table 4.9: Regression Results (Pearson Correlation Matrix)

	CORE CONCEPT	ORGANIZATIONAL PROBLEM	PERSONNEL PROBLEM	PROCEDURAL PROBLEM
CORE CONCEPT	1.000 - 30	.462 .005 30	.240 .100 30	.230 .110 30
ORGANIZATIONAL PROBLEM	.462 .005 30	1.000 - 30	.362 .025 30	.379 .019 30
PERSONNEL PROBLEM	.240 .100 30	.362 .025 30	1.000 - 30	.166 .190 30
PROCEDURAL PROBLEM	.230 .110 30	.379 .019 30	.166 .190 30	1.000 - 30

First row in Table 4.9 gives linearity. The linearity explains the relationship between dependent variable and independent variables. In the first row of table 4.9, the linearity coefficients are .462, .240, .230 for the independent variables respectively. If the second row's significance values are smaller than 0,05, it can be confidently said that there is a linear relation between dependent and independent variables. Organizational Problem's significance is ,005 that is much smaller than 0,05. Only organizational problem's significance proves the linearity between independent variable (organizational problem) and dependent variable (effectiveness of Turkish defense procurement projects) (0,462). Thus, H_1 (alternative hypothesis) cannot be rejected for only organizational problems. For the other two independent variables (personnel problem, procedural problem) H_0 (Null hypothesis) can be accepted confidently. For this reason, it can be said that there is a significant relationship between organizational problem and effectiveness of defense procurement projects. But this result cannot be said for other independent variables, personnel and procedural problem. There is no a significant relationship between these variables and effectiveness of defense procurement projects.

Second step is finding multi-collinearity. If there is no correlation among independent variables, it can be said that the results are acceptable. To understand this relation, relationships among independent variables must be investigated. If there is a relation bigger than 0,7 among independent variables, it can be said that there is a linear relation (multi-collinearity) between these two independent variables. In this situation, one independent variable must be removed that has small linearity with the dependent variable. In table 4.9, 4^{th}, 7^{th} and 10^{th} rows show multi-collinearity. When looked at the table there is no value greater than 0,7. So it can be said that in this study case, there is no such multi-collinearity. There is not correlation among independent variables, which are grouped in three factors. This is a good result.

Third step of the regression is test of auto-correlation (Durbin-Watson test). This also gives the danger of the independent variables' having relation with each other. This study's Durbin-Watson Test result is found to be 2,01824 as shown in Table 4.10. From the Durbin Watson test table, (at the 5% significance level, for a number of independent variables 3, and for a

number of participants 30) dL is found to be equal to 1,214 and dU is found to be equal to 1,650. The study's Durbin-Watson test result is bigger than 1,650. So, it can be said that there is no auto-correlation among independent variables that are three factor groupings (organizational problems, procedural problems, personnel problems).

Table 4.10: Durbin-Watson test

**** MULTIPLE REGRESSION ****

Equation Number 1 Dependent Variable.. CC1

Residuals Statistics:

	Min	Max	Mean	Std Dev	N
*PRED	3,1593	4,9990	4,0000	,5262	30
*RESID	-2,2551	2,2491	,0000	,9821	30
*ZPRED	-1,5976	1,8983	,0000	1,0000	30
*ZRESID	-2,1743	2,1685	,0000	,9469	30

Total Cases = 30

Durbin-Watson Test = 2,01824

Fourth step is multiple significance test (F-Test). The F values give the significance level of the multiple regression coefficients. When the R-square value, the F statistic, and its significance level are known, the results can be interpreted in a meaningful way. Multiple significance (F) test results are given in table 4.11.

Table 4.11: Multiple Significance (F) test

**** MULTIPLE REGRESSION ****

Equation Number 1 Dependent Variable.. CC1

Variable(s) Entered on Step Number

1.. SRECPROB

2.. PEOPPROB

3.. ORGPROB

Multiple R	,47232
R Square	,22309
Adjusted R Square	,13344
Standard Error	1,03717

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	8,03115	2,67705
Residual	26	27,96885	1,07572

F = 2,48860 Signif F = ,0827

As a result, it is found that,

Multiple R = 0,47232 (Correlation of the three independent variables with the dependent variable after all the intercorrelations among the three independent variables are taken into consideration).

R Square = 0,22309 (Square of the Multiple R).

Adjusted R Square = 0,13344

F = 2,48860

Signif F = ,0827.

It can be said that 22,31 percent of the variance in the dependent variable has been significantly explained by the set of independent variables. The chance of this not being true is only 0,0827 percent. So, 22,31 % percent of the variance in the dependent variable (effectiveness of Turkish defense procurement projects) has been significantly explained by the three independent variables.

Fifth and last step is coefficient Beta (t test) test. It gives the researcher the significance of linear equation. The Beta test results are given in Table 4.12. From the table, only organizational problem is found to be a significant independent variable. Because, its Sig. T value, which is shadowed in Table 4.12, is smaller than 0,05.

Table 4.12: Variables in the Equation

Variable	B	SE B	Beta	T	Sig T
PROCEDURAL PROBLEM	.020529	.062030	.061852	.331	.7433
PERSONNEL PROBLEM	.027272	.061759	.081937	.442	.6624
ORGANIZATIONAL PROBLEM	.053613	.025906	.409155	2.070	.0486
(Constant)	1.869383	.963337		1.941	.0632

4.5.3.2 Chi-Square Test Hypotheses

Sometimes researchers want to know if there exists a relationship between two nominal variables or whether they are independent of each other. The Chi-Square (χ^2) test is a non-parametric test, which indicates whether the observed pattern is incidental, or not. So, the χ^2 test of significance helps researchers to see whether or not two nominal variables are related.

In the Multi-Regression analysis, the first factor grouping (Organizational Problems) is significantly related to the dependent variable. Since linearity of organizational problems with the dependent variable is not so much high as .70, independent variables that are grouped under Factor Grouping 1 (Organizational Problems) are also included into the χ^2 test. Since the other factor groupings are already not significantly related to the dependent variable, the independent variables that are grouped under these factor groupings (personnel and procedural problems) are also used in the χ^2 test.

Hypothesis 1: *H_0:* There is no significant relationship between cooperation of procurement bodies in procurement projects and effectiveness of Turkish defense procurement projects.

H_1: It cannot be said that such a relationship does not exist.

Table 4.13: Chi-square test for Hypothesis-1

Chi-Square (χ^2) Value	DF	Significance
5,6667	4	0,2255

As can be seen from the Table 4.13, H_0 (null hypothesis) can be accepted. Thus, it can be said that there is no significant relationship between cooperation of procurement bodies in procurement projects and effectiveness of Turkish defense procurement projects.

In the questionnaire, 20 % of the respondents replied that they believed there was a certain amount of cooperation among procurement bodies. 53 % of the sample believed that there were little cooperation among procurement bodies. The remaining respondent group (27 %),

expressed that there were no cooperation among procurement bodies. Although the relationship was not found significant, in general, approximately 70 % of the respondents said that there is a certain amount of cooperation among procurement bodies.

Hypothesis 2: *H_0:* There is no significant relationship between authority of procurement bodies in procurement projects and effectiveness of Turkish defense procurement projects.

H_1: It cannot be said that such a relationship does not exist.

Table 4.14: Chi-square test for Hypothesis-2

Chi-Square (χ^2) Value	DF	Significance
11,2000	5	0,0476

As can be seen from the Table 4.14, H_1 (alternative hypothesis) cannot be rejected. Thus, it can be said that there is a significant relationship between authority of procurement bodies in procurement projects and effectiveness of Turkish defense procurement projects.

In the questionnaire, 36 % of the respondents replied that they believed there was a certain amount of authority of procurement bodies. 20 % of the sample believed that there were little authority of procurement bodies. The remaining respondent group (44 %) expressed that there were no authority of procurement bodies. The relationship was found significant, in general, approximately 60 % of the respondents said that there was no a certain amount of authority of procurement bodies.

Hypothesis 3: *H_0:* There is no significant relationship between the answerability and accountability of procurement bodies in procurement projects and effectiveness of Turkish defense procurement projects.

H_1: It cannot be said that such a relationship does not exist.

As can be seen from the Table 4.15, H_0 (null hypothesis) can be accepted. So, it can be said that there is no a significant relationship between the answerability and accountability of procurement bodies and effectiveness of Turkish defense procurement projects.

Table 4.15: Chi-square test for Hypothesis-3

Chi-Square (χ^2) Value	DF	Significance
8,0000	5	0,1562

Hypothesis 4: *H_0:* There is no significant relationship between team working between procurement bodies in procurement projects and effectiveness of Turkish defense procurement projects.

H_1: It cannot be said that such a relationship does not exist.

Table 4.16: Chi-square test for Hypothesis-4

Chi-Square (χ^2) Value	DF	Significance
10,6667	4	0,0306

As can be seen from the Table 4.16, H_1 (alternative hypothesis) cannot be rejected. So, it can be said that there is significant relationship between team working between procurement bodies in procurement projects and effectiveness of Turkish defense procurement projects.

In the questionnaire, 23 % of the respondents replied that they believed there was a certain amount of team working between procurement bodies. 30 % of the sample believed that there were little team working between procurement bodies. The remaining respondent group (47 %), expressed that there were no team working between procurement bodies. The relationship was found significant, in general, approximately 70 % of the respondents said that there was no a certain amount of team working between procurement bodies.

Hypothesis 5: *H_0:* There is no significant relationship between responsibility of procurement bodies in procurement projects and effectiveness of Turkish defense procurement projects.

H_1: It cannot be said that such a relationship does not exist.

Table 4.17: Chi-square test for Hypothesis-5

Chi-Square (χ^2) Value	DF	Significance
11,6000	5	0,0407

As can be seen from the Table 4.17, H_1 (alternative hypothesis) cannot be rejected. So, it can be said that there is significant relationship between responsibility of procurement bodies in procurement projects and effectiveness of Turkish defense procurement projects.

In the questionnaire, 20 % of the respondents replied that they believed there was a certain amount of responsibility of procurement bodies. 57 % of the sample believed that there were little responsibility of procurement bodies. The remaining respondent group (23 %), expressed that there were no responsibility of procurement bodies. The relationship was found significant, in general, approximately 75 % of the respondents said that there was no a certain amount of responsibility of procurement bodies.

Hypothesis 6: *H_0:* There is no significant relationship between coordination among procurement bodies in procurement projects and effectiveness of Turkish defense procurement projects.

H_1: It cannot be said that such a relationship does not exist.

Table 4.18: Chi-square test for Hypothesis-6

Chi-Square (χ^2) Value	DF	Significance
11,6000	5	0,0407

As can be seen from the Table 4.18, H_1 (alternative hypothesis) cannot be rejected. So, it can be said that there is significant relationship between coordination among procurement bodies in procurement projects and effectiveness of Turkish defense procurement projects.

While 13 percent of the survey participants believed that there was a certain amount of coordination among procurement bodies, 50 % of the sample believed that there were little coordination among procurement bodies. The remaining respondent group (37 %), expressed

that there were no coordination among procurement bodies. The relationship was found significant, in general, approximately 85 % of the respondents said that there was no a certain amount of coordination among procurement bodies.

Hypothesis 7: *H_0:* There is no significant relationship between policy of procurement bodies and effectiveness of Turkish defense procurement projects.

H_1: It cannot be said that such a relationship does not exist.

Table 4.19: Chi-square test for Hypothesis-7

Chi-Square (χ^2) Value	DF	Significance
4,80000	5	0,4408

As can be seen from the Table 4.19, H_0 (null hypothesis) can be accepted. So, it can be said that there is no significant relationship between policy of procurement bodies and effectiveness of Turkish defense procurement projects.

In the questionnaire, 27 % of the respondents replied that they believed there was a certain amount of policy of procurement bodies. 43 % of the sample believed that there were little policy of procurement bodies. The remaining respondent group (30 %), expressed that there were no policy of procurement bodies. Although the relationship was not found significant, in general, approximately 70 % of the respondents said that there is a certain amount of policy of procurement bodies.

Hypothesis 8: *H_0:* There is no significant relationship between R&D based procurement procedure and effectiveness of Turkish defense procurement projects.

H_1: It cannot be said that such a relationship does not exist.

Table 4.20: Chi-square test for Hypothesis-8

Chi-Square (χ^2) Value	DF	Significance
8,8000	5	0,1173

As can be seen from the Table 4.20, H_0 (null hypothesis) can be accepted. So, it can be said that there is no a significant relationship between R&D based procurement procedure and effectiveness of Turkish defense procurement projects. 77 percent of survey participants agree with the idea that "R&D based procurement procedure is not appropriate the procurement projects".

Hypothesis 9: *H_0:* There is no significant relationship between determination of requirement for procurement projects and effectiveness of Turkish defense procurement projects.

H_1: It cannot be said that such a relationship does not exist.

Table 4.21: Chi-square test for Hypothesis-9

Chi-Square (χ^2) Value	DF	Significance
4,4000	5	0,4934

As can be seen from the Table 4.21, H_0 (null hypothesis) can be accepted. So, it can be said that there is no a significant relationship between determination of requirement for procurement projects and effectiveness of Turkish defense procurement projects.

Hypothesis 10: *H_0:* There is no significant relationship between the stability of requirements of procurement projects and effectiveness of Turkish defense procurement projects.

H_1: It cannot be said that such a relationship does not exist.

Table 4.22: Chi-square test for Hypothesis-10

Chi-Square (χ^2) Value	DF	Significance
9,2000	5	0,1013

As can be seen from the Table 4.22, H_0 (null hypothesis) can be accepted. So, it can be said that there is no significant relationship between the stability of requirements of procurement projects and effectiveness of Turkish defense procurement projects.

Hypothesis 11: *H_0:* There is no significant relationship between the technological development of procurement projects and effectiveness of Turkish defense procurement projects.

H_1: It cannot be said that such a relationship does not exist.

Table 4.23: Chi-square test for Hypothesis-11

Chi-Square (χ^2) Value	DF	Significance
12,8000	5	0,0253

As can be seen from the Table 4.23, H_1 (alternative hypothesis) cannot be rejected. So, it can be said that there is significant relationship between the technological development of procurement projects and effectiveness of Turkish defense procurement projects.

Hypothesis 12: *H_0:* There is no significant relationship between the multidisciplinary personnel in procurement projects and effectiveness of Turkish defense procurement projects.

H_1: It cannot be said that such a relationship does not exist.

Table 4.24: Chi-square test for Hypothesis-12

Chi-Square (χ^2) Value	DF	Significance
13,6667	4	0,0084

As can be seen from the Table 4.24, H_1 (alternative hypothesis) cannot be rejected. So, it can be said that there is a significant relationship between the multidisciplinary personnel in procurement projects and effectiveness of Turkish defense procurement projects.

Hypothesis 13: *H_0:* There is no significant relationship between the continuity of personnel over the procurement projects' life and effectiveness of Turkish defense procurement projects.

H_1: It cannot be said that such a relationship does not exist.

Table 4.25: Chi-square test for Hypothesis-13

Chi-Square (χ^2) Value	DF	Significance
9,2000	5	0,1013

As can be seen from the Table 4.25, H_0 (null hypothesis) can be accepted. So, it can be said that there is no a significant relationship between the continuity of personnel over the procurement projects' life and effectiveness of Turkish defense procurement projects system.

4.5.3.3 t-test Hypotheses

There are many instances when researchers would be interested in knowing whether the variables in a group are different from each other. A t-test is used to see if there are any significant differences in terms of the means and the standard deviations of the variable in the group. The t-test takes into consideration the means and the standard deviations of the variables and examines if the numerical difference in the means is significantly different from 0 (zero) as postulated in our null hypothesis (H_0).

Hypothesis 14 : *H_0:* One of the body of procurement projects is MoD, and the other is FORCOMs (in this test, Land Forces Command). There is no any significant mean difference between procurement bodies (MoD- Land Forces Command) on a dependent variable (effectiveness of Turkish defense procurement projects).

H_1: It cannot be said that such a mean difference does not exist.

Table 4.26: t-test for Hypothesis-14

Value label	Means	Standard Deviations	Significance
Land Forces Command	4,3333	0,7071	,2913
MoD	3,8571	1,2364	

As can be seen from the Table 4.26, hypothesis 14 is not sustained, the null hypothesis (H_0) can be accepted. So, there is no mean difference between the procurement bodies to the effectiveness of procurement projects.

Hypothesis 15 : *H_0:* One of the problems of procurement organization is teamwork between acquisition bodies that affects the effectiveness of Turkish defense procurement projects and the other is coordination among procurement bodies. There is no difference between the levels of importance attached to these two problems.

H_1: The level of importance attached to the former is higher than that attached to the latter.

Table 4.27: t-test for Hypothesis-15

Factors	Means	Standard Deviations	Significance
F7	3,6333	1,402	0,079
F5	4,1000	1,517	

Hypothesis 15 is not sustained, the null hypothesis (H_0) can be accepted. So, there is no difference between the levels of importance attached to these two problems.

4.5.3.4 Analysis of Variance (ANOVA)

Whereas the t-test indicates whether or not there is a significant mean difference between two variables, the Analysis of Variance (ANOVA) helps us to examine if there are significant mean differences between more than two groups.

The result of ANOVA indicates whether or not the means of the various groups of variables are significantly different from each other. If there are significant mean differences among the groups as indicated by the significance level of the F statistics, the ANOVA results cannot solely account for the differences. So, several tests such as Scheffe's test, Duncan Multiple Range test, Tukey's test are available and can be used, where appropriate, to detect where exactly the mean differences come from.

Hypothesis 16: *H_0:* There will be no difference in effectiveness of Turkish defense procurement projects at six different training year levels.

H_1: The effectiveness of Turkish defense procurement projects at six different training year levels will vary significantly.

Table 4.28 Analysis of variance for Hypothesis-16

-------ONEWAY----------

Variable CC1 Effectiveness of Turkish defense procurement projects
By Variable F13 Training year of procurement personnel

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	5	2,2500	,5625	,4167	,7950
Within Groups	24	33,7500	1,3500		
Total	29	36,0000			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
2,2223	5	24	,095

Variable CC1 Effectiveness of Turkish defense procurement projects
By Variable F13 Training year of procurement personnel

Multiple Range Tests: Scheffe test with significance level ,05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= ,8216 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE: 4,70

- No two groups are significantly different at the ,050 level

The results of ANOVA shown in the Table 4.28, do not indicate any significant differences in effectiveness of Turkish defense acquisition system among six different training year levels. (sig. level .095). Thus, hypothesis 16 is not sustained, the null hypothesis can be accepted. For six different training levels, there is no significant difference for them.

Hypothesis 17: H_0: There will be no difference in effectiveness of Turkish defense procurement projects at six different groups of age of procurement personnel.

H_1: The effectiveness of Turkish defense procurement projects at six different groups of age will vary significantly.

Table 4.29 Analysis of variance for Hypothesis-17

```
-------------------ONEWAY-----------------

Levene Test for Homogeneity of Variances

  Statistic   df1   df2     2-tail Sig.
   1,1246      5    24        ,374

 Variable          CC1    Effectiveness of Turkish defense procurement projects
 By Variable       DEMO1  Ages of participants

Multiple Range Tests:  Scheffe test with significance level ,05

The difference between two means is significant if
 MEAN(J)-MEAN(I) >= ,8238 * RANGE * SQRT(1/N(I) + 1/N(J))
 with the following value(s) for RANGE: 5,12

- No two groups are significantly different at the  ,050 level
```

The results of ANOVA shown in the Table 4.29, do not indicate any significant differences in effectiveness of Turkish defense procurement projects among six different age groups. (sig. level .374). Thus, hypothesis 17 is not sustained, the null hypothesis can be accepted. For six different age groups, there is no significant difference for them.

Hypothesis 18: H_0: There will be no difference in effectiveness of Turkish defense procurement projects at six different departments of procurement personnel.

H_1: The effectiveness of Turkish defense procurement projects at six different departments of procurement personnel will vary significantly.

Table 4.30 Analysis of variance for Hypothesis-18

```
-------------------ONEWAY-----------------
Levene Test for Homogeneity of Variances
Statistic   df1   df2     2-tail Sig.
  ,6327      5    24        ,724

Variable      CC1      Effectiveness of Turkish defense procurement projects
By Variable   DEMO3    Departments of procurement personnel

Multiple Range Tests:  Scheffe test with significance level ,05
The difference between two means is significant if
MEAN(J)-MEAN(I) >= ,7527 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE: 5,87

- No two groups are significantly different at the  ,050 level
```

The results of ANOVA shown in the Table 4.30, do not indicate any significant differences in effectiveness of Turkish defense procurement projects among six different departments of procurement personnel (sig. level .724). Thus, hypothesis 18 is not sustained, the null hypothesis can be accepted. For six different departments of procurement personnel, there is no significant difference for them.

Hypothesis 19: *H_0:* There will be no difference in effectiveness of Turkish defense procurement projects at six different ranges of procurement personnel.

H_1: The effectiveness of Turkish defense procurement projects at six different ranges of procurement personnel will vary significantly.

Table 4.31 Analysis of variance for Hypothesis-19

```
----------ONEWAY----------
Levene Test for Homogeneity of Variances
    Statistic   df1   df2     2-tail Sig.
      ,8631      5    24        ,536
Variable     CC1        Effectiveness of Turkish defense procurement projects
By Variable  DEMO4       Ranges of procurement personnel

Multiple Range Tests:  Scheffe test with significance level ,05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= ,7940 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE: 5,51

- No two groups are significantly different at the ,050 level
```

The results of ANOVA shown in the Table 4.31, do not indicate any significant differences in effectiveness of Turkish defense procurement projects among six different ranges of procurement personnel (sig. level .536). Thus, hypothesis 19 is not sustained, the null hypothesis can be accepted. For six different ranges of procurement personnel, there is no significant difference for them.

Hypothesis 20: *H_0:* There will be no difference in effectiveness of Turkish defense procurement projects at four different branches of procurement personnel.

H_1: The effectiveness of Turkish defense procurement projects at four different branches of procurement personnel will vary significantly.

Table 4.32 Analysis of variance for Hypothesis-20

```
--------------------ONEWAY----------------
Levene Test for Homogeneity of Variances
      Statistic   df1   df2     2-tail Sig.
       ,3110      3     26       ,293

Variable     CC1       Effectiveness of Turkish defense procurement projects
By Variable  DEMO5     Branches of procurement personnel

Multiple Range Tests:  Scheffe test with significance level ,05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= ,7906 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE: 3,12

- No two groups are significantly different at the ,050 level
```

The results of ANOVA shown in the Table 4.32, do not indicate any significant differences in effectiveness of Turkish defense procurement projects among four different branches of procurement personnel. (sig. level .293). Thus, hypothesis 20 is not sustained, the null hypothesis can be accepted. For four different branches of procurement personnel, there is no significant difference for them.

Hypothesis 21: *H_0:* There will be no difference in effectiveness of Turkish defense procurement projects at seven different job experience year groups of procurement personnel.

H_1: The effectiveness of Turkish defense procurement projects at seven different job experience year groups of procurement personnel will vary significantly.

Table 4.33 Analysis of variance for Hypothesis-21

```
--------------------ONEWAY----------------
Levene Test for Homogeneity of Variances
      Statistic   df1   df2     2-tail Sig.
       ,6210      6     23       ,685
Variable     CC1       Effectiveness of Turkish defense procurement projects
By Variable  DEMO6     Job experiences years of procurement personnel

Multiple Range Tests:  Scheffe test with significance level ,05
The difference between two means is significant if
MEAN(J)-MEAN(I) >= ,8176 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE: 5,12

- No two groups are significantly different at the ,050 level
```

The results of ANOVA shown in the Table 4.33, do not indicate any significant differences in effectiveness of Turkish defense procurement projects among seven different job experience year groups of procurement personnel (sig. level .685). Thus, hypothesis 21 is not sustained, the null hypothesis can be accepted. For seven different job experience year groups of procurement personnel, there is no significant difference for them.

Hypothesis 22: *H_0:* There will be no difference in effectiveness of Turkish defense procurement projects at five different groups of languages of procurement personnel.

H_1: The effectiveness of Turkish defense procurement projects at five different groups of languages of procurement personnel will vary significantly.

Table 4.34 Analysis of variance for Hypothesis-22

ONEWAY

Variable CC1 Effectiveness of Turkish defense procurement projects
By Variable DEMO7 Languages of procurement personnel

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	17,6818	5,8939	8,3656	,0005
Within Groups	26	18,3182	,7045		
Total	29	36,0000			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
3,6489	3	26	,026

Variable CC1 Effectiveness of Turkish defense procurement projects
By Variable DEMO7 Languages of procurement personnel

Multiple Range Tests: Scheffe test with significance level ,05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= ,5935 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE: 4,23

(*) Indicates significant differences which are shown in the lower triangle

Mean	DEMO7	Grp 1	Grp 5	Grp 2	Grp 4
3,5909	Grp 1				
4,5000	Grp 5				
5,0000	Grp 2				
6,0000	Grp 4	*			

The results of ANOVA shown in the Table 4.34, indicate significant differences between Group1-Group4, which is marked with (*), in effectiveness of Turkish defense procurement projects (sig. level .026). Thus, hypothesis 22 is sustained, the alternative hypothesis cannot be rejected. For five groups of language of procurement personnel, there is significant difference for group1 (English) and group4 (two languages).

Hypothesis 23: *H_0:* There will be no difference in effectiveness of Turkish defense procurement projects at four different education levels of procurement personnel.

H_1: The effectiveness of Turkish defense procurement projects at four different education levels of procurement personnel will vary significantly.

Table 4.35 Analysis of variance for Hypothesis-23

ONEWAY

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
,9750	2	27	,390

Variable CC1 Effectiveness of Turkish defense procurement projects
By Variable DEMO8 Education level of procurement personnel

Multiple Range Tests: Scheffe test with significance level ,05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= ,7809 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE: 3,66

- No two groups are significantly different at the ,050 level

The results of ANOVA shown in the Table 4.35, do not indicate any significant differences in effectiveness of Turkish defense procurement projects among four different education levels of procurement personnel (sig. level .390). Thus, hypothesis 23 is not sustained, the null hypothesis can be accepted. For four different education levels of procurement personnel, there is no significant difference for them.

4.5.4 Summary

The study's questionnaire is designed so as to identify the factors that affect the effectiveness of Turkish defense procurement projects. For this reason, descriptive statistics, factor analysis, reliability analysis, and hypotheses testing (multiple regression analysis, Chi-Square (χ^2), t-test hypotheses, ANOVA) are used. From all of these analyses, it is found that,

1. Sample size was big enough to carry out such a statistical method, because, Kaiser Meyer Olkin Sampling Adequacy coefficient was greater than .60 which was .61813. Therefore sample size was found to be sufficiently large. But a research with a larger sample size would create more consistent results.

2. The factor analysis grouped independent variables into three separate factor groupings. Those groupings are not in conformity with the sub-dimensions made before. These were grouped according to the answers respondents gave to the questions in the questionnaire. Also, one of the items have remained out of these factor groupings. For this reason, this independent variable (a comprehensive, single acquisition regulation) were removed from the questionnaire.

3. In the questionnaire, ANOVA result that was carried out for the dependent and independent variable (training of acquisition personnel) has showed that there were no significant differences for the dependent variable between different training levels. On the other hand, an ANOVA was also made for the 7 demographic variables that are age, department, range, branch, job experience, foreign language, education. Except foreign language demographic variable (only between the people knowing 2 foreign languages and the personnel knowing English), all other demographic variables have showed no significant differences for the dependent variable (effectiveness of Turkish defense procurement projects).

4. A t-test for the acquisition bodies, which was also a demographic variable, was also carried out to see if there were any significant differences in the dependent variable for the personnel working in MoD and for those working in Land Forces Command. It was found

that there was no significant difference between the procurement bodies looking the effectiveness of defense procurement projects.

5. Theoretical framework was consistent with what was thought of before. All reliability coefficients were around .80. These high alpha values indicated that the items' internal consistency was also high. For this reason, it can be said that the participants gave same meaning to the questions. The only exception was procurement regulations. The reason for that was the wrong wording of the question. Instead of asking the respondents their feelings about the requirement for a new, comprehensive acquisition regulation, it would be more appropriate to ask directly their feelings about the current system's effectiveness.

6. There was no multi-collinearity between factor groupings. This also shows that the research construct was consistent with what has been originally planned before.

7. According to the results of the factor analyses, except one factor question (F12- a comprehensive, single acquisition regulation), all independent variables were grouped into 3 main factor groupings. These were not consistent with the original research model because factor analysis groups these independent variables according to the answers respondents gave to these questions. These factor groupings were named as organizational problems, personnel problems, procedural problems and were later used in the multi-regression analysis as independent variables.

8. Multi-regression analysis resulted in a meaningful relationship for only organizational problems and the dependent variables. The other two factor groupings have not reached statistical significance level. Organizational problems relationship was also not high. Therefore all independent variables that were grouped under factor groupings were separately included into the χ^2 test.

9. The χ^2 tests resulted in 6 significant relations. These were;

- Authority of procurement bodies in procurement organizations,
- Team-working between procurement bodies,

- Responsibility of procurement bodies,
- Coordination among procurement bodies,
- Technological development of procurement projects,
- Multi-disciplinary personnel in procurement projects.

Finally, it can be said that these independent variables affect the effectiveness of Turkish defense procurement projects system. The aim of this study was to find the problem areas which effect the effectiveness of Turkish defense procurement projects. End of the results these problems (as said above) was found as a significantly.

5. CONCLUSION

Defense Acquisition System is a single uniform system whereby all equipment, facilities, and services are planned, developed, acquired, maintained, and disposed of by the Ministry of Defense.

The vision of all participants in the acquisition system are responsible for making acquisition decisions that deliver the best value product or service to the customer which are force commands (FORCOMs). Best value must be viewed from a broad perspective and is achieved by balancing the many competing interests in the system. The result is a system, which works better and costs less.

The procurement acquisition system requires a governmental organization that is capable of responsively and effectively working towards closing the gaps. To perform this mission there must be an effective and efficient internal system structure. It is researcher's belief that there are organizational, procedural, personnel and regulatory problems in current procurement system that is part of acquisition system, and internal of procurement bodies which are Ministry of Defense (MoD), General Staff, and Force commends (FORCOMs). These kinds of problems are thought to have some side effects on the management of defense procurement projects.

The methodology of the study included the development of a theoretical framework, formulation of hypotheses, and deduction from the results of the study.

For this reason, first, it was realized where the problem areas were in the-Turkish Defense Procurement-and identified as clearly and specially as possible the problems that need to be studied and rectified. After the problems clearly defined, information was gathered by questionnaire, the data analyzed and delineate the factors that were associated with the problem. Finally recommendation was presented for solving problems.

To realize the problems of current procurement, firstly the broad areas problems were analyzed. These were briefly;

- With such a large system (defense acquisition system), errors, effectiveness and inefficiencies are bound to occur.

- In order to insure technological superiority and meet national defense needs, a sound technology investment strategy must be formulated, the right technology must be developed, and a plan for technology transition must be executed. Expeditiously transitioning the right technology into future weapon systems requires regular interaction with operational users as well as teamwork across product divisions, program offices, development planning and engineering organizations, and the laboratories.

- The team worked to trade time against everything (cost, risk, performance). The team effort made a difference and the reasons was *time-blinding fast cycle time.* There were other benefits: the cost was low because the entire effort was accomplished in such a short period.

- The teaming business of the future must team to relish change, question everything, think outside the box, and never stop learning.

- Unneeded tasks could be identified and removed by evaluating a process. In order to effectively reduce cycle time, the complete process had to be reviewed, not just functions. "Typically, businesses were organized around functions. This was called a hierarchical functional organization. Functional organizations work to optimize a functional expertise. The entire recognition and reward structure was designed around creating this behavior. In today's environment of speed, this bureaucratic culture was not conducive to the behavior required for incremental, fast, dynamic, ongoing change required by today's customer. Industry is attacking this hierarchical culture by introducing teaming concepts. These concepts are designed to give businesses a process focus. The teaming models are designed to break down traditional organizational boundaries and remold these functions into skills that are required by the process".

- The lives of soldiers will increasingly depend upon shortened acquisition cycle times as well.

- The acquisition system is a web of laws, regulations, and policies adopted for laudable reasons over many years. The intent of the system was to ensure standardized treatment of contractors; prevent fraud, waste, and abuse; ensure that the government acquisition process was fair; check the government's authority and its demand on suppliers; and, enhance socioeconomic objectives. While the intent of these provisions is laudable, combined, the result is a cumbersome system that takes too long to satisfy customer requirements. In addition, the system places administrative burdens on both MoD and suppliers that adds cost to the product procured. It can be no longer afforded these costs and meet mission requirements within current fiscal constraints.

After looking to the foreign countries' general acquisition system problems, Turkish acquisition system was examined. And at the end of the literature survey these problems are found;

- Defense equipment is becoming increasingly complex and diverse, demanding more flexible and shorter acquisition procedures. The Turkish Armed Forces are facing less predictable threats and a wider range of tasks, so new technology needs to be deployed more quickly. The Armed Forces cannot keep pace with the rate of technological change that in many areas now commercially led. In the present procurement procedure and organization, major weapons systems are still taking some twenty years to bring into service. Cost continue to exceed planned levels and reliability and maintainability of new equipment frequently remains a problem.

- The present procurement procedure and organization cannot strike the right balance between cost, time, and performance in the very early stages of a project. Insufficient investment in the risk reduction at this stage has cost more to armed forces later on. The present procurement process and organization has deficiency to give project managers sufficient delegated authority.

- People, who involved in procurement process, show tendency to avoid taking the responsibility. They are transferring commercial and technical risk to contractors despite the fact that they are unable to absorb it. Insufficient pricing pressure on inflation and delays

involved in decision-making on collaborative projects make the stakeholders to fall short of targets.

- The current procurement procedure also tends to be solution focused, with early attention paid the characteristic of the equipment to be procured. Many procurements proceed purely on the basis of an assumed solution, resulting in a concentration on equipment performance rather than user and system needs. Focus should be made to the needs of the users by defining what the users of a particular future system will need and focuses on the requirement for whole systems through-life rather than just initial procurement.

After all, finally it can be said that the problems in current Turkish acquisition system summarily are;

- Insufficiencies at definitions of requirements
- Uncertainties for targets of R&D principles and priorities
- Insufficiencies at team-working
- Insufficiencies of organization and coordination between bodies
- Problems of personnel
- Not planning of technological product for dual-use
- Judicial Problems
- Financial Problems

After these data were collected, to find the problem areas of defense procurement projects, the effectiveness of defense procurement projects will be defined.

The independent variables that affect the effectiveness of defense procurement projects will be dealt with in the research section of this study. The effectiveness of defense procurement projects is divided into four parts.

As it categorized, every parts was affected by some factors. Also, these were shown in Figure: 4.2. The results of the research that were about the effectiveness of defense procurement projects was explained in Chapter 4: methodology.

To identify the factors that affect the effectiveness of Turkish defense procurement projects, descriptive statistics, factor analysis, reliability analysis, and hypotheses testing (multiple regression analysis, Chi-Square (χ^2), t-test hypothesis, ANOVA) were used. From all of these analyses, it was found that,

1. Theoretical framework was consistent with what was thought of before. All reliability coefficients were around .80. These high alpha values indicated that the items' internal consistency was also high. For this reason, it can be said that the participants gave same meaning to the questions. The only exception was procurement regulations.

2. There was no multi-collinearity between factor groupings. If there is no correlation among independent variables, it can be said that the results are acceptable. In table 4.9, 4^{th}, 7^{th} and 10^{th} rows show multi-collinearity. When looked at the table there is no value greater than 0,7. So it can be said that in this study case, there is no such multi-collinearity. There is not correlation among independent variables, which are grouped in three factors. This is a good result. This also shows that the research construct was consistent with what has been originally planned before.

3. According to the results of the factor analyses, except one factor question (F12- a comprehensive, single acquisition regulation), all independent variables were grouped into 3 main factor groupings. These were not consistent with the original research model because factor analysis groups these independent variables according to the answers respondents gave to these questions. These factor groupings were named as organizational problems, personnel problems, procedural problems and were later used in the multi-regression analysis as independent variables.

4. Multi-regression analysis resulted in a meaningful relationship for only organizational problems and the dependent variables. The other two factor groupings have not reached statistical significance level. Organizational problems relationship was also not high. Therefore all independent variables that were grouped under factor groupings were separately included into the χ^2 test.

5. The χ^2 tests resulted in 6 significant relations. These were;

- Authority of procurement bodies in procurement organizations,
- Team-working between procurement bodies,
- Responsibility of procurement bodies,
- Coordination among procurement bodies,
- Technological development of procurement projects,
- Multi-disciplinary personnel in procurement projects.

These independent variables affect the effectiveness of Turkish defense procurement projects.

As said above, sample size was found to be sufficiently large, theoretical framework was consistent with what was thought of before. Because all reliability coefficients were around 0,80 that means the participants gave same meaning to the questions.

After all of them, it can be said that the findings of descriptive statistics, factor analysis, reliability analysis, and hypotheses testing is sufficient to make a commend that there are problems in current procurement system, which are lack of team working and coordination between procurement bodies, lack of responsibility and authority of procurement bodies, rapid changing of technology, and lack of multi-disciplinary personnel in procurement projects.

6. RECOMMENDATION

After analyzing of the results of the research it can be seen that the current procurement system does not work very well. There are some problems. These are;

- Lack of authority of procurement bodies in procurement projects,
- Lack of team-working between procurement bodies,
- Lack of responsibility of procurement bodies,
- Lack of coordination among procurement bodies,
- Rapid changing of technology,
- Lack of multi-disciplinary personnel in procurement projects.

To solve these problems and to create more effective procurement system there must be a new organizational structure to adapt. Because, in this study only organizational problems are significant. The other two problems could not be measured significantly. So recommendation of the study is only dealing with organization.

All of these procurement related bodies must work as a team. Because there must be a close coordination between different departments of these bodies and between themselves as well. Project type or matrix type structures have proved themselves more effective in military project management.

As it was said before Turkish Acquisition system, especially procurement process is managed by functionally based management and reporting structure. If the procedure is examined thoroughly, it would be seen that definition of the requirements are made by the user organizations (FORCOMs), then General Staff analyzes these requirements by paying attention to of national security priorities of Turkey and compile them in order to be delivered to MoD. When requirement documents are sent to MoD, MoD wants the general and technical specification of requirement from the user.

After the finding that procurement system had problems, especially organizational problems, the study identifies clearly the need to move from a *functionally* based organizational structure to a *project* based organization. To move the project based organization,

Procurement Team should be formed, bringing together all procurement bodies and involving industry (except during competition phase) under a team leader who is able to balance trade-offs between performance, cost and time within boundaries set by the approving authority. With this Procurement Team, the problems of the coordination and teamwork among acquisition bodies could be solved effectively. To solve the other problems needed in another major change, this is a clearly defined customer-supplier relationship.

Together these changes will allow Procurement Team to deliver consistency and continuity throughout the project life cycle, and ensure close and effective involvement of all major procurement bodies in key decisions.

The key objective of moving from a functional structure to a project based structure will be achieved by bringing core members of the Procurement Team under the line management of the Procurement Team Leader. Functional links to policy setting authorities outside the Procurement Team will remain, and members will draw advice from these authorities.

Project work often requires participation by people who are not usually accustomed to this type of work. When they take part in project work, they only spend a portion of their working hours on it; that is to say they are fully occupied with project activities. Work of this nature and with this type of effort must be organized in a certain way if the project work is to be completed without stumbling into pitfalls.

When a project has to be organized, the following problem can be quickly encountered. Should people who are to participate in project work be fully released from their other daily duties for as long as the project lasts and be physically relocated to a "project room"? Or, while they work on the project, should they still occupy their normal work station and divide their time between project work and daily duties?

Integration of project work into the base organization means that you need to gain acceptance for the fact that development tasks (which projects are) are also an important activity for people who have a job in the ordinary base organization. This integration generally leads to a more positive attitude towards development work in the base organization.

When a project member is sitting in the base organization and is performing project work, it must be permissible for him to let his colleagues know this and that consequently he should not be disturbed with daily matters at this time. Everyone should respect this (this applies in most projects, apart from huge projects where everyone is engaged full-time on the project). This is particularly important when the project work is integrated into the base organization.

It is necessary to clarify the organization's responsibility for and participation in the project and this must be done before it is begun to consider people for the project tasks.

When organizing the project, both the principles of governing relationships between the parties involved and the practical consequences of these relationships must be defined. It must be clear who will make the different types of decisions, who should be informed, and who should perform the different types of work. Through such careful definition, organizational pitfalls can be avoided.

The person responsible for the area of concern should be responsible for taking decisions, which affect that area, and he should do this by virtue of his job in the base organization. However, these demands on the line manager or his subordinates must be defined and agreed upon when setting up the project. Otherwise there is a great danger that the project will usurp the power to make decisions. It can be said that the policy of acquisition bodies will be managed same objectives.

In many projects, a project group will be formally appointed, consisting of the group of people who will carry out the work involved in the project. These people are there from start to finish, and will perform all the large and small tasks in the project. This is a dangerous form of organization. When we have a project organization where people are formally assigned to a project for its lifetime, we will find that we:

- have problems varying the input of resources during the life-time of the project;
- are precluded from using the best line people for certain tasks;
- create a gap between those who are formally included in the project and those who are not.

It is important to be organized in such a way that the project has flexibility to acquire different types of resources at different stages of the project. This is called an accordion-type organization. At the same time it is important that it is stated precisely what each individual should do.

With an accordion-type organization the following can be achieved:

- the number of people working on the project can vary in its lifetime. This is an advantage because during the course of a project the requirement for an input of resources and different types of expertise varies considerably.

- When project members are formally appointed to cover all project jobs, we are prevented from using the most competent people in the base organization when needed. Of course, even with a formally appointed project group we can still get help from people outside the project. However, they are not a part of the project in the same formal way. It is important that everyone working on a project has the same status within it.

- A flexible form of organization means that participation in the project is in a constant state of flux. Permanent appointments create rigidity and management difficulties. The project will be obliged to hang on to people who no longer have anything to do.

The current procurement process tends to be solution focused, with early attention paid to the characteristics of the equipment to be procured. Many procurements proceed purely on the basis of an assumed solution, resulting in a concentration on equipment performance rather than user and system needs. To solve this problem it will be focused to the needs of the users by defining "what the users of a particular future system will need" and focused on the requirements for whole systems through-life, rather than just initial procurement.

There are a lot of people in the acquisition system with terrific ideas about how to change the process. Some of them have been successful in implementing these initiatives in their organizations. Project managers' ideas and proposals, along with concrete plans for

implementing them must be taken into consideration. Summaries of initiatives are also needed in implementing. Most of them have proven successful.

There must be performance standards for the organizational problems. It is necessary to focus on solving the emerging problems. Also the following issues must be taken into consideration before devising organizational structures for the acquisition system:

1. Satisfy the customer in terms of cost, quality, and timeliness of the delivered product or service.

(1) The principal customers for the product or service provided by the System are the users and line managers.

(2) The System must be responsive and adaptive to customer needs, concerns, and feedback. Implementation of acquisition policies and procedures, as well as consideration of timeliness, quality, and cost throughout the process, must take into account the perspective of the user of the product or service.

(3) When selecting contractors to provide products or perform services, The Government will use contractors who have a track record of successful past performance or who demonstrate a current superior ability to perform.

(4) The government must not hesitate to communicate with the commercial sector as early as possible in the acquisition cycle to help the Government determine the capabilities available in the commercial marketplace. The Government will maximize its use of commercial products and services in meeting Government requirements.

(5) It is the policy of the System to promote competition in the acquisition process.

(6) The System must perform in a timely, high quality, and cost-effective manner.

(7) All members of the Team are required to employ planning as an integral part of the overall process of acquiring products or services. Although advance planning is required, each member of the Team must be flexible in order to accommodate changing or unforeseen mission needs. Planning is a tool for the accomplishment of tasks, and application of its discipline should be commensurate with the size and nature of a given task.

2. Minimize administrative operating costs.

(1) In order to ensure that maximum efficiency is obtained, rules, regulations, and policies should be promulgated only when their benefits clearly exceed the costs of their development, implementation, administration, and enforcement. This applies to internal administrative processes, including reviews, and to rules and procedures applied to the contractor community.

(2) The System must provide uniformity where it contributes to efficiency or where fairness or predictability is essential. The System should also, however, encourage innovation, and local adaptation where uniformity is not essential.

3. Conduct business with integrity, fairness, and openness.

(1) An essential consideration in every aspect of the System is maintaining the public's trust. Not only must the System have integrity, but also the actions of each member of the Team must reflect integrity, fairness, and openness. The foundation of integrity within the System is a competent, experienced, and well-trained, professional workforce. Accordingly, each member of the Team is responsible and accountable for the wise use of public resources as well as acting in a manner that maintains the public's trust. Fairness and openness require open communication among team members, internal and external customers, and the public.

(2) To achieve efficient operations, The System must shift its focus from "risk avoidance" to one of "risk management."

(3) The Government shall exercise discretion, use sound business judgment, and comply with applicable laws and regulations in dealing with contractors and prospective contractors. All contractors and prospective contractors shall be treated fairly and impartially but need not be treated the same.

4. Fulfill public policy objectives. The System must support the attainment of public policy goals adopted by the Grand National Council. In attaining these goals, and in its overall operations, the process shall ensure the efficient use of public resources."

REFERENCES

1. A National Security Strategy for A New Century, May 1997, p.15.

2. Atçı, Baransel; "Silah Sistemlerinin Üretim ve Satınalma Kararlarına Yardımcı Bir arac Olarak Ömür Devir Maliyet Sistemi", PhD Thesis, Gazi University ,Institute Of Social Sciences, Ankara, 1991.

3. Batmaca and Uysal, Aselsan, 1999, pp.9-12.

4. Blanchard B.S, System Engineering Management, 1997, p.196.

5. Burçak, Y., The Structure and Functions of Undersecretariat for Defense Industries (SSM)- An Overview, Turkish Procurement Conference, Ankara, April, 1999, pp.1-11.

6. Clubb, G. Dean, "Blinding Speed Equals Competitive Advantages," *Acquisition Review Quarterly,* v.3, no.2, 1996, p.175.

7. Cohen, William S., Secretary of Defense, "Defense Reform Initiative Report," November 1997, pp.i-iii.

8. Cost Analysis Manual, US Department of The Army, 1997, p.35.

9. Delano, Maj. Kenneth J., USAF, Acquisition Review Quarterly: Identifying factors that contribute to program success, winter 1998, pp.35-49.

10. DoD Directive 5000.1, 1999, p.56.

11. Egeli, Sıtkı, Foreign relations- Domestic procurement: An examination of the issues relevant to trading with the SSM and domestic industry, SMi Conferences, Ankara, 27-28 April 1999, pp.1-7.

12. Fact Sheet, Program Manger's Notebook, DSMC, Policy and Organization Management Department, 1988, pp.2-19.

13. Federal Acquisition Regulation, 1997, p.20.

14. Glossary Defense Acquisition Acronyms and Terms, Department Of Defense DSMC, Virginia, 1991.

15. http:// www.mod.uk/policy/spi/handbook/contents.htm .

16. http://www.mod.uk/policy/spi/iptguide/newcycle.htm.

17. Jane's Defense Weekly, 4 March 1998, pp.28-42.

18. Kaminski, Paul G., Under Secretary of Defense for Acquisition and technology, "Statement to Congress on The Basis of Acquisition reform," February 1997, p.1.

19. Küçükseyhan, Yılmaz, Opening Address: The Defense Industry Manufacturers Association Adress, SMi Conferences, 27-28 April 1999, pp.1-10.

20. LaBerge, Walter B., "Cycle Time- A Military Imperative As Well." *Acquisition Review Quarterly*, v.3, no.2, 1996, p.79.

21. MSB nin Görev ve Teşkilatı Hakkındaki Kanun, 1983.

22. MY 369-1A, TGS (Turkish General Staff) Directive, 1999.

23. NATO Review, Issue, Spring 1999, pp.1-18.

24. Pinker, Aron, Smith, Charles G., and Booher, Jack W., Selecting effective acquisition process metrics, 1998, pp.1-14.

25. Powell W. W., Koput K. W., and Smith-Doerr L, Interorganizational Collobaration and the Locus of Innovation: Networks of Learning in Biotechnology, Administrative Science Quarterly, 1996, Vol. 41, pp.116-145.

26. Preston, Colleen A., Acquisition Review Quarterly, Acquisition Reform: Making It a Reality, Winter 1994, pp.6-11.

27. Przemieniecki, J.S., Acquisition of Defense Systems, 1998, p.39.

28. Rx for ailing procurement system, Washington Times, 30 July 1990, p.F2.)

29. Sammet, G., Jr., & Green, D. E., Defense Acquisition Management. Boca Raton, FL. Florida Atlantic University Press., 1990, p.23.

30. Savunma Sanayii Alanında Ar-Ge Faaliyetleri Rehberi, 1997, pp.2-3.

31. Savunma Sanayii ve Tedarik: Ülkemizin Bilim ve Teknoloji Yeteneğinin Yükseltilmesini Esas Alan Bir Yaklaşım, Bilim ve Teknoloji Strateji ve Politika Çalışmaları TÜBİTAK BTP 98/01 Ocak 1998, pp.119-130.

32. Sekaran, Uma, Research methods for business: a skill-building approach /. – 2nd ed.

33. State Tendering Law, 1983, Paragraphs 36, 44, 45, 51, 52, 71, 77.

34. Strategic Defense Review, 1998, p.67.

35. Türk Savunma Sanayi Politikası ve Staratejisi Uygulama Esasları Yönergesi, MSB,1999, pp.7-9

36. United States Army Logistics Management College, Mam Course Reference Book #3, 1996, p.1-1

37. U.S. Army Regulation, 70-1, Headquarter of Department of the Army, 1984, pp.3-7.

38. Yurt İçi Ar-Ge Potansiyelinin Harekete Geçirilmesi'ne dair MSB yazısı, Ek-B, 1997, pp.1-18.

39. 1324 Sayılı Genel Kurmay Başkanı'nın Görev ve Yetkilerine Ait Kanun, 1970, p.2751.

APPENDIX-A

ANKET SORULARI

1. **ELİMDE İMKANIM OLSAYDI TEDARİK PROSEDÜRÜNÜ .....**
   A) HİÇ DEĞİŞTİRMEZDİM
   B) AZ DEĞİŞTİRİRDİM
   C) AZ-ÇOK DEĞİŞTİRİRDİM
   D) ÇOK DEĞİŞTİRİRDİM
   E) ÇOK FAZLA DEĞİŞTİRİRDİM
   F) TAMAMİYLE DEĞİŞTİRİRDİM

2. **İHTİYAÇLAR VE DOLAYISIYLA İHTİYAÇLAR İÇİN YAPILAN PROGRAMLAR ÇOK SIK DEĞİŞİKLİĞE UĞRUYOR.**
   A) HİÇ KATILMIYORUM
   B) AZ KATILIYORUM
   C) AZ-ÇOK KATILIYORUM
   D) ÇOK KATILIYORUM
   E) ÇOK FAZLA KATILIYORUM
   F) TAMAMEN KATILIYORUM

3. **YAPMAKTA OLDUĞUM GÖREVLE İLGİLİ ..... YIL EĞİTİM ALDIM.**

4. **SAVUNMA SİSTEM TEDARİKLERİNİ DÜZENLEYEN, TEDARİK İLKE, USUL VE ESASLARINI BELİRLEYEN ÖZEL BİR YASA GEREKLİDİR.**
   A) HİÇ KATILMIYORUM
   B) AZ KATILIYORUM
   C) AZ-ÇOK KATILIYORUM
   D) ÇOK KATILIYORUM
   E) ÇOK FAZLA KATILIYORUM
   F) TAMAMEN KATILIYORUM

5. **TEDARİK PROGRAMLARI, ÇEŞİTLİ DİSİPLİNLERDEN OLUŞAN UZMANLAŞMIŞ PERSONEL TARAFINDAN GERCEKLEŞTİRİLİYOR.**
   A) HİÇ KATILMIYORUM
   B) AZ KATILIYORUM
   C) AZ-ÇOK KATILIYORUM
   D) ÇOK KATILIYORUM
   E) ÇOK FAZLA KATILIYORUM
   F) TAMAMEN KATILIYORUM

6. **İHTİYACİ BELİRLEYEN KUVVET KOMUTANLIKLARI GÖREV İHTİYAÇLARI YERİNE ALINMASI GEREKEN SİSTEMLERİ BELİRLİYORLAR.**
   A) HİÇ KATILMIYORUM
   B) AZ KATILIYORUM
   C) AZ-ÇOK KATILIYORUM
   D) ÇOK KATILIYORUM
   E) ÇOK FAZLA KATILIYORUM
   F) TAMAMEN KATILIYORUM

7. AR-GE'YE DAYALI BİR TEDARİK SÜRECİ İŞLETİLMİYOR.

A) HİÇ KATILMIYORUM
B) AZ KATILIYORUM
C) AZ-ÇOK KATILIYORUM
D) ÇOK KATILIYORUM
E) ÇOK FAZLA KATILIYORUM
F) TAMAMEN KATILIYORUM

8. TEDARİK GÖREVİNİ YÜRÜTEN KURUM VE BİRİMLER ARASINDA BİLGİ ALIŞVERİŞİ YAPILAMAMAKTADIR.

A) HİÇ KATILMIYORUM
B) AZ KATILIYORUM
C) AZ-ÇOK KATILIYORUM
D) ÇOK KATILIYORUM
E) ÇOK FAZLA KATILIYORUM
F) TAMAMEN KATILIYORUM

9. TEDARİK GÖREVİ, ARALARINDA POLİTİKA BİRLİĞİ OLMAYAN FARKLI KURUMLARCA YÜRÜTÜLMEKTEDİR.

A) HİÇ KATILMIYORUM
B) AZ KATILIYORUM
C) AZ-ÇOK KATILIYORUM
D) ÇOK KATILIYORUM
E) ÇOK FAZLA KATILIYORUM
F) TAMAMEN KATILIYORUM

10. SAVUNMA TEDARİK SÜRECİNİN İHTİYAÇ TESPİTİNDEN BAŞLAYIP, ENVANTERDEN ÇIKARILINCAYA KADAR Kİ AŞAMALARI BOYUNCA İYİ İŞLEDİĞİNİ DÜŞÜNÜYORUM.

A) HİÇ KATILMIYORUM
B) AZ KATILIYORUM
C) AZ-ÇOK KATILIYORUM
D) ÇOK KATILIYORUM
E) ÇOK FAZLA KATILIYORUM
F) TAMAMEN KATILIYORUM

11. SAVUNMA TEDARİĞİNİ GERÇEKLEŞTİREN KURUMLARIN ORGANİZASYON YAPISININ YETERLİ OLDUĞUNU DÜŞÜNÜYORUM.

A) HİÇ KATILMIYORUM
B) AZ KATILIYORUM
C) AZ-ÇOK KATILIYORUM
D) ÇOK KATILIYORUM
E) ÇOK FAZLA KATILIYORUM
F) TAMAMEN KATILIYORUM

12. SAVUNMA TEDARİĞİNİ YAPAN KURUMLARIN İŞLERİNİ YÜRÜTÜRKEN BAŞVURDUKLARI YASAL MEVZUAT, DÜZENLEME VE TALİMATNAMELER YETERLİDİR.

A) HİÇ KATILMIYORUM
B) AZ KATILIYORUM
C) AZ-ÇOK KATILIYORUM
D) ÇOK KATILIYORUM
E) ÇOK FAZLA KATILIYORUM
F) TAMAMEN KATILIYORUM

13. TEDARİK SÜRECİNDE GÖREVLİ PERSONLERİN, İŞLERİNDE BAŞARILI OLDUKLARINI DÜŞÜNÜYORUM.

A) HİÇ KATILMIYORUM
B) AZ KATILIYORUM
C) AZ-ÇOK KATILIYORUM
D) ÇOK KATILIYORUM
E) ÇOK FAZLA KATILIYORUM
F) TAMAMEN KATILIYORUM

14. SAVUNMA TEDARİĞİNDE İLGİLİ KURUMLARIN YETKİLERİ AÇIKÇA BELLİ OLMADIĞIN1DAN KARIŞIKLIĞA NEDEN OLMAKTADIR

A) HİÇ KATILMIYORUM
B) AZ KATILIYORUM
C) AZ-ÇOK KATILIYORUM
D) ÇOK KATILIYORUM
E) ÇOK FAZLA KATILIYORUM
F) TAMAMEN KATILIYORUM

15. TEDARİK SÜRECİNİN HERHANGİ BİR AŞAMASINDA YAPILABİLECEK BİR HATADAN SORUMLU TUTULACAK KURUM VEYA BİRİM YOKTUR.

A) HİÇ KATILMIYORUM
B) AZ KATILIYORUM
C) AZ-ÇOK KATILIYORUM
D) ÇOK KATILIYORUM
E) ÇOK FAZLA KATILIYORUM
F) TAMAMEN KATILIYORUM

16. TEDARİK SÜRECİNDE GÖREVLİ KURUMLARIN SORUMLULUKLARI KESİN HATLARLA BELİRTİLMEMİŞTİR.

A) HİÇ KATILMIYORUM
B) AZ KATILIYORUM
C) AZ-ÇOK KATILIYORUM
D) ÇOK KATILIYORUM
E) ÇOK FAZLA KATILIYORUM
F) TAMAMEN KATILIYORUM

17. TEDARİK PROGRAMLARI BAŞINDAN SONUNA KADAR AYNI PERSONELLER TARAFINDAN TAKİP EDİLEMEMEKTEDİR.

A) HİÇ KATILMIYORUM
B) AZ KATILIYORUM
C) AZ-ÇOK KATILIYORUM
D) ÇOK KATILIYORUM
E) ÇOK FAZLA KATILIYORUM
F) TAMAMEN KATILIYORUM

8. TEDARİK GÖREVİNİ YÜRÜTEN KURUM VE BİRİMLER ARASINDA İŞBİRLİĞİ YOKTUR.

A) HİÇ KATILMIYORUM
B) AZ KATILIYORUM
C) AZ-ÇOK KATILIYORUM
D) ÇOK KATILIYORUM
E) ÇOK FAZLA KATILIYORUM
F) TAMAMEN KATILIYORUM

19. TEDARİK GÖREVİNİ YÜRÜTEN KURUM VE BİRİMLER ARASINDA TAKIM ÇALIŞMASI YAPILMAMAKTADIR.

A) HİÇ KATILMIYORUM
B) AZ KATILIYORUM
C) AZ-ÇOK KATILIYORUM
D) ÇOK KATILIYORUM
E) ÇOK FAZLA KATILIYORUM
F) TAMAMEN KATILIYORUM

20. HIZLA GELİŞEN TEKNOLOJİLERİN YOL AÇTIĞI İHTİYAÇLARDAKİ DEĞİŞİKLİKLER TEDARİK PROGRAMLARININ AKSAMASINA YOL AÇMAKTADIR.

A) HİÇ KATILMIYORUM
B) AZ KATILIYORUM
C) AZ-ÇOK KATILIYORUM
D) ÇOK KATILIYORUM
E) ÇOK FAZLA KATILIYORUM
F) TAMAMEN KATILIYORUM

21. ..... YAŞINDAYIM

22. .....'DE ÇALIŞIYORUM. (MSB,GNKB,KKK,DKK,HKK ŞEKLİNDE)

23. ..... DEPARTMANINDA (BÖLÜM) ÇALIŞIYORUM. (AR-GE, BİLGİ İŞLEM, PLANLAMA, SATIN ALMA, MÜHENDİSLİK, DENETİM, PERSONEL, İDARİ HİZMETLER VB.)

24. ..... RÜTBESİNDEYİM.

25. SINIFIM ..... DİR.

26. ..... YILDIR RÜTBELİ PERSONELİM.

27. BİLDİĞİM YABANCI DİLLER ..... DİR.

28. ÖĞRENİM DURUMUM ..... DIR. (LİSE VE DENGİ, YÜKSEKOKUL, ÜNİVERSİTE, YÜKSEK LİSANS, DOKTORA, VB.)

CV

Birth of date	31.05.1972	
Birth of place	Orhaneli-Bursa	
High School	1983-1986	50th year High School / Şile-İstanbul
	1986-1990	Maltepe Military High School / İzmir
Bachelor's Degree	1990-1994	Military Academy (System Engineering) / Ankara
Institution		Army