AN APPLICATION OF VIABLE SYSTEM DIAGNOSIS TO ERDEMIR

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by

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To My Wife

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I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Arts.

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AUTHOR DECLARATIONS

1. The material included in this thesis has not been submitted wholly or in part for any academic award or qualification other than that for which it is now submitted.

2. The program of advanced study of which this thesis is part has consisted of:

i) Research Methods course during the undergraduate study

ii) Examination of several thesis guides of particular universities both in Turkey and abroad as well as a professional book on this subject.

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ABSTRACT

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AN APPLICATION OF VIABLE SYSTEM DIAGNOSIS TO ERDEMIR

The thesis deals with an analysis and application of Stafford Beer's Viable System Diagnosis which is a cybernetic method in the management systems field. Viable system model is a method that allows everyday manager, planner, decision maker or consultant to pave the way for qualitative appreciation of cybernetic conceptions in the determination of organizational problems, particularly those coming up in complex probabilistic systems.

Although viable system diagnosis is a useful model for organizations and managers, it is very little known in Turkey. For this reason we have applied this model to a Turkish company which is one of the biggest organizations in Turkey.

The thesis gives an account of Viable System Diagnosis in terms of its historical background, philosophy, principles, and methodology, provides a detailed description of a large scale company, Erdemir in Turkey, and then applies Viable System Model to its Sales and Marketing Department. As a result of this application, some recommendations for the department of the company are offered.

Key words:

Viable system diagnosis, Beer, Recursion, System identification, System diagnosis, Cybernetic model

KISA ÖZET

Selman TETİK **Temmuz 2009**

YAŞAYABİLEN SİSTEM TEŞHİSİNİN ERDEMİR'E BİR UYGULAMASI

Tez, yönetim sistemleri alanında sibernetik bir method olan Staffor Beer' ın yaşayabilen sistem teşhisinin bir uygulmasını ve analizini ele almaktadır. Bu model çalışmalarının bir ürünüdür. Yaşayabilen sistem modeli, yöneticilere, planlama yapanlara, karar verme mekanizmasında yer alanlara, danışmanlara hergün için özellikle karmaşık ihtimalli sistemleri içeren organizasyonel problemlerin tespitinde sibernetik düşüncenin niteleyici değerlendirilmesinde kolaylık sağlayan bir yöntemdir.

Yaşayabilen sistem teşhisi organizayonlar ve yöneticiler için faydalı bir model olmasına rağmen Türkiye' de çok az bilinmektedir. Bu nedenle bu modeli Türkiyenin en büyük organizasyonlarından bir olan Türk firmasına uyguladık.

Tez tarihsel zemin, felsefe ve methodoloji başlıkları ile Yaşayan sistem teşhisine bir tanımlama vermekte, Türkiye' de geniş ölçekli bir şirket olan Erdemir'in detaylı bir tanımını sağlamakta ve daha sonra Yaşayan sistem modeli Erdemirin satış ve pazarlama bölümüne uygulanmakta. Bu uygulamanın bir sonucu olarak şirketin bu bölümü için bir takım tavsiyeler sunulmaktadır.

Anahtar Kelimeler

Yaşayabilen sistem teşhisi, Beer, Özyineleme, Sistem tanımlaması, Sistem teşhisi, Sibernetik model

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LIST OF ABBREVIATIONS

VSM	Viable System Model
VSD	Viable System Diagnoses
ERDEMİR	Eregli Iron and Steel Works Company

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INTRODUCTION

When the reductionism and the natural scientific method are used it is possible to have problems. However, when we are faced with complex, real-world problems set in social Systems (Checkland, 1981) the very problems which we encounter in abundance today and which most threaten our organizations and societies. (Jackson, 2000:1) Complex problems occur from highly interconnected sets of parts and the relationships between the parts can be more important than the nature of the parts themselves. (Jackson, 2000) Therefore, in order to solve complex problems, there is need to approach which takes into account different beliefs and purposes. System thinking, it is argued by Checkland (1981), can be thought as a reaction to the failure of natural science when faced with complex, real-world problems set in social systems. (Jackson, 2000) The fundamental goal of system thinking is to convert the subdivision of the sciences into smaller and more highly specialized disciplines. The systems line of sight is characterized by the development of two independent movements; general system theory and cybernetics. They aim the sketchy the same goal.

Cybernetics is the science of control and communication in the animal and in the machine. By drawing heavily from engineering, computer sciences, mathematics, telecommunications, and physiology, cybernetics attempted to devise general principles and laws by which one can study the

phenomenon of control and communication whether in the living or in the nonliving system. (Schoderbek and Kefalas, 1975:20)

It is can be useful to refer to the systems approach as the application of both general system theory and cybernetics to the study of human. Cybernetic is the approach to the control of systems and communication within systems. Moreover, the application of cybernetics to industrial problems asserts that organizations are most effectively viewed from the based on industrial dynamics. Industrial Dynamics (ID) is known the application of cybernetics to the industrial problems and first developed by MIT's Jay Forrester. (Schoderbek and Kefelas, 1975) Beer's management cybernetics is another application of the system approach to industrial problems.

The Viable System Model (VSM) of Stafford Beer is a complete analysis of ideas from the science of organisation, or cybernetics. In our perspective, we lead a process concerning with the qualitative features of VSM for social context and in what way these can demonstrate strong external image as a well-equipped organisation or institution. VSM put more emphasis on the evolutionary process of organisation rather than the structure. VSM can be employed for diagnosing organisational concerns in 'complex probabilistic system' that include purposeful parts, are open to environment, evolve over time, are subject to behavioural influences and have parts that achieve compromise easily.

Viable System Diagnosis (VSD) is the product of Stafford Beer's studies—in the *Brain of the Firm* (Beer, 1972), *Brain of the Firm*, second edition (Beer, 1981), *The Heart of Enterprise* (Beer,1979), and *Diagnosing the System for Organizations* (Beer, 1985). Beer went further than anyone in applying cybernetics to management and in VSD he set out the invariant rules, which he claims to ensure the viability of an organisation. In *Brain of the Firm*, he assumed that the human body, controlled by the nervous system, is the most flexible viable system of all. It includes five-level hierarchy of systems that can functionally be differentiated. Beer constituted its model on the basis of this analysis. In *The Heart of Enterprise*, he claimed that the model he built up was perfectly general, thus it could be applied to all kinds of firms and organisations. In *Diagnosing the System for Organizations*, he gave practicality to its model and prepared the 'manager's guide' for the employment of VSD.

VSD is a method that allows everyday manager, planner, decision maker or consultant to pave the way for qualitative appreciation of cybernetic conceptions in the determination of organisational problems, particularly those coming up in complex probabilistic 'systems.' Such organisations can be characterised as having purposeful organised units and are open to a volatile business environment. This is called 'complex systems.' Yet there is a general or easily achievable compromise about the goals or objectives. This is called 'unitary' relationship among participants of the system. In light

of these VSD is most appropriate for systems that have 'complex-unitary' characteristics.

In this study, we aim to examine Viable System Model that allows manager, decision maker or practitioner to use cybernetic conceptions in the determination of organisational problems. Increasing complexity and diversity are the main problems that the managers have to cope with in order to make their organisations viable and competitive. The application of this model includes the Erdemir's Vice Presidency of Sales and Marketing in this study.

The thesis consists of four chapters. In the introduction part, we give a very specific overall view of VSD and also a summary of the chapters' contents.

The Chapter one, called "Description of Viable System Diagnosis", includes philosophy, principles, and methodology of Viable System Diagnosis (VSD). Under the philosophy of VSD, we provide its theoretical description, historical development, and theory. In its principles, we demonstrate essentials for organisations that desire to perform efficiently and effectively. In the methodology, we examine the Viable System Model (VSM) and its use.

The Chapter two, called "Background Information about Erdemir", describes and illustrates the work process, the organisation chart, and the organisation structure as well as culture, politics, resources of Erdemir.

The Chapter three, called "Viable System Diagnosis in Action", employs VSD at Erdemir's Vice Presidency of Sales and Marketing. First, its system will be identified, and then its diagnosis will be realised.

Finally, in the last chapter, some conclusions and the value of Viable System Diagnosis will be given to the managers of the company on the basis of this experience.

CHAPTER 1

DESCRIPTION OF VIABLE SYSTEM DIOGNOSIS

Before getting into the review of VSD, it is most appropriate to grasp the evolution of cybernetic modelling in management.

According to Norbert Weiner, (1948) Cybernetics dealt with the general laws that governed control processes in any type of system whether it is mechanical, biological, or political. Weiner made clear two significant concepts in cybernetics: control and communication. In grasping control, the idea of 'negative feedback' must be taken into account. Information about any deviation of behaviour from a predetermined goal should be transmitted and corrective action should be taken in order to bring the behaviour back toward the goal. In other words, the actual performance of a system should be compared with its desired performance. If there is a divergence of behaviour, the corrective action should be taken. Communication is also important, because if we control the actions of a machine or human being, we must communicate with that machine or individual (Jackson, 2000). This kind of control is extremely effective since any movement from the goal automatically sets in motion changes aimed at bringing the system back on to course. In designing feedback system rapid and constant comparison of actual performance against desired goal, as well as rapid and constant corrective action are necessary. Feedback systems are capable of considering and choosing among a variety of different responses to

changes, as well as at changing the goal state itself in response to feedback. There are also both positive feedback and negative feedback in the system. In addition, feedback alone will not be enough to achieve adequate regulation of organisations. It is necessary to employ strategic control based on feed forward information that attempts to predict disturbances before they actually affect the organisation.

In the 1950s, the work of W. Ross Ashby (1956) revealed the important notion of variety—the number of distinct components in a system or the number of possible states a system can display. In the application of cybernetics to management, he formulated the 'law of requisite variety' that states 'only variety can destroy variety.' In other words, the variety of a controller must be as great as the variety of a system being controlled. In order to control a system, we need to have as much variety available to use as the system itself. If a machine has twenty ways of breaking down we need to able to respond in twenty different ways to be in control of machine (Jackson, 2000).

In the 1960s and early 1970s, Stafford Beer and Jay W. Forrester became significant names in the field. Beer regarded the management as the science and profession of control and developed his VSD during this period. Forrester created system dynamics, (Jay W. Forrester, 1961) which emphasised that the behaviour of whole systems could be symbolised and

appreciated through modelling the dynamic feedback processes going within them. (Forrester, 1969)

In considering the main components of cybernetic account of organisations, both the system and the environment shows 'extreme complexity,' this can be dealt with black box technique, negative feedback, and 'variety engineering.' (Jackson, 1991) In black box technique, the complexity of a system is the outcome of the interface of four factors. They are the number of components making the system, interactions among these components, the attributes of the specified components of the system, and the preset rules guiding the relationships (Schoderbek and Kefelas, 1985). The behaviour of exceedingly complex systems cannot be understood easily because their processes that lead to behaviour cannot be discovered. In the analysis of such systems reductionist method that separates the parts of the system will never enable whole interactions to be understood. Instead input manipulation and output classification and monitoring should be employed (Schoderbek and Kefelas, 1985). In negative feedback, the assumption is that exceedingly complex probabilistic systems must be controlled through 'self-regulation.' Ensuring self-regulation through feedback requires certain elements: (1) a desired purpose of the system, (2) a sensor who senses the current state of the system, (3) a comparator, which compares the current state with the desired outcome, and (4) an activator who makes the decision about any deviation discovered

by the comparator in such a way as to bring the system back to its purpose. (Jackson, 1991) In variety engineering, a system is defined as the number of states it is capable of exhibiting. The system can survive, if it is capable of displaying equal or greater variety than the system is being controlled. (Ashby, 1956) If the system faces with a massive variety, it must either reduce the variety of the system ('variety reduction') or increase its own variety ('variety amplification'). The process of maintaining equilibrium among varieties is known as 'variety engineering. (Beer1979) In order to reduce the external variety, managers could employ structural (e.g., divisionalisation, functionalisation, delegation), planning (e.g., determining priorities), and operational (e.g., management by exception) methods. By contrast, in order to increase organisation's own variety, managers could use structural (e.g., team and group work), augmentative (e.g., employing experts, consultants), and informational (e.g., management information systems) methods. (Espejo and Harden, 1989)

After a brief account of the evolution of cybernetic modelling in management, we shall now discuss the philosophy, principles and the methodology of VSD.

1.1. PHILOSOPHY OF VIABLE SYSTEM DIAGNOSIS

The philosophy that drives from Beer's view of cybernetics concerns the kind of changes of our era. He assumes that new methods are needed to cope with these concerns. Beer argued that organisational problems arise as

a result of increasing complexity that is shaped by economics, social, cultural, demographic, environmental, political, legal, governmental, technological, competitive as well as organisational factors. This characterises mounting interdependency. (Beer, 1985)

Beer also emphasised that a scientific cybernetic method that have animations from management science is much more effective than simple conventional tools and techniques.

Furthermore, Beer drew our attention to control as being the major issue in all systems. Then, he injected invariant rules of the 'control system' which is evident in neurocybernetic process of human brain and nervous system into his cybernetic model. (Beer, 1981)

In analysing new ways to deal with complexity Beer considered organisations as well ordered systems that aim at efficiently and effectively achieving their predetermined goals that are subject to change due to rapidly changing environments.

1.2. PRINCIPLES OF VIABLE SYSTEM DIAGNOSIS

The following principles are essential to organisations, if they desire to perform efficiently and effectively (Beer, 1984).

A. VSM does not provide a specific prescription for structuring an organisation. By contrast, it provides conditions that ensure the maintenance

of organisational identity. Thus, recommendations stemming from VSM are relevant to all types of organisations in all types of industry.

B. The notion of "recursion" emphasises that the whole system is replicated into the parts so that the same viable system model may be generated for the subsystem of an organisation, the organisation itself, and the wider system of the organisation.

C. In any viable unit the laterally interdependent departments or division are integrated by a higher management or "meta system."

D. Sources of command and control are given to subunits that enhances "self -organisation" and localised management concerns.

E. Viable units affect their sub-environments and are affected by them. This relationship will promote organisational adaptability and learning

F. Viable system possesses cybernetic principles ranging from simple notion of feedback to significant principles such as Law of Requisite Variety.

1.3. THE METHODOLOGY OF VIABEL SYSTEM DIAGNOSIS

In the methodology of VSD, we analyse the model and then the method of employing it.

1.3.1. THE VIABLE SYSTEM MODEL

VSM is a model which regulates the five functional elements that are interconnected through a complex of information and control loops. We can use this basic model to represent, for instance, a company or an organisation and its divisions of which it may also be a functional part. (Beer, 1984) In order to understand the model clearly we can define five functional elements (Figure 1.1):

1.3.1.1. System1

(S1) Implementation: This functional element carries out the tasks that the organisation should do. S1 have the parts all of which show all the characteristics of a viable system. In other words, the parts in the same recursion level show the characteristics which belongs to the viable system. Each part is autonomous and has its own administration and local environment. Each part of S1 is connected to a wider management by the vertical command axis. This order channel provides the flow of instructions from higher level systems to the subunits. Each localised management has instructions for its operational unit what should do after received information from the down line and interpreted them. The activities of operational units are monitored and their localised management sends the performance information of operational units to the higher level management using the communication channel. If it is necessary, it adjusts the behaviours of unit giving the negative feedback. (Jackson, 2000)

There is an important point in this function; each unit should be autonomous. It means each unit is able to make their own decisions but not ignoring the external world and other subunits. This autonomy does not allow the unit to behave different from the organisation. The autonomy is a requirement of being a part of this organisation. (Jackson, 1991) Their localised managements must accept and implement instructions from higher management levels, use negative feedback to maintain performance, and report back. Moreover, each part of S1 must accept a degree of coordination and control by system 2 and 3. The main functions of S1 are summarised below (Jackson, 2000);

- System 1 parts are directly concerned with implementation
- Each part should show all the features of a viable system itself
- Each part is autonomous
- Each part connects to its local environment

1.3.1.2. System 2

(S2) Co-ordination: This functional element coordinates the S1. Main function of this element is to reduce the uncontrolled oscillations among the parts. Under normal circumstances, it is supposed to be suitable instructions from higher management should provide that the various parts of S1 of an organisation act in harmony. However, in emergency, each part of S1 will

behave in its own benefits based on only local information. This causes the dangerous and unpredictable effects for the each part and the whole organization. S2 has many control centres which are connected to a corporate centre that obtains information about the actions of each parts of S1 and is able to obstacle conflicts emerging in the system. The main functions of S1 are summarised below (Jackson, 2000);

- Co-ordinates the parts that make up System 1 in harmony.
- Reduces uncontrolled oscillations between the parts.

1.3.1.3. System 3

(S3) Control: It provides the allocation of resources to S1 and also internal stability of the organisation. S3 interprets the policies and maintains their effective implementation. S3 also audits the implementation of policies. It has audit channel which gives chance S3 to access the state of affairs in the operational elements directly. S3 can get immediate information via this channel. S3 examine the employee moral, or quality and it can check if the maintenance procedures are being followed or not.

Based on the internal data from S2 and audit channel and external data from S4, S3 interprets policy. One of the duties of S3 is to forward the plan down the line to S1. While the S3 is making this flow of information, S3 uses the line which provides the communication among the units. Another duty of S3 is to audit the effective implementation of policy and distribute resources

to the parts of S1. It has to monitor the performance of S1 and take control action. It must also report upward any information needed by the policy system above it. Especially, vital information for the organisation must be forwarded through an "algedonic" channel.(Jackson, 2000)

Three kinds of information systems converge on S3:

(1) S3 is on the vertical command axis as part of corporate management (interpreting of policy downward, transmitting information from the divisions upward, and sending vital information upward extremely quickly).

(2) S3 receives and acts upon information from S2 (sending instructions downward or consult upward, responding to information received from audit channel).

(3) S1, S2, and S3 are called autonomic management. This means that it is capable of optimising the productive performance of the enterprise and maintaining internal stability without reference to higher management levels. However, this autonomic management is incapable of reviewing corporate strategy and reacting to threats and opportunities in that environment. A control function that ultimately maintains internal stability has the following responsibilities (Jackson, 1991):

- Interprets policy decisions of higher management.
- Allocates resources to the parts of system1.

- Provides effective implementation of policy.
- Carries out "audits" using the system3 auditing channel.

1.3.1.4. System 4

(S4) Intelligence: This function is responsible for gathering and reporting information that captures all relevant data about the system's total environment. S4 provides a model of the organisation's environment and distributes environmental information upwards or downwards according to its degree of importance. S4 also brings together internal and external information in an "operations room"-an environment for decision. The more important function of S4 is to rapidly transmit urgent information from Systems 1, 2 and 3 to System 5 (alerting System 5 through the "algedonic" signal).

1.3.1.5. System 5

S5 (Policy-Making): It is mainly responsible for preparing plans and policies. Another function of S5 is to respond to the significant signals that pass through the various "filters" of Systems 1, 2 3 and 4. S5 arbitrates between the antagonistic internal and external demands on the organisation as represented respectively by Systems 3 and 4. S5 represents the essential qualities of the "whole system" to any "wider system" of which it is a part. (Jackson, 2000)

It is also important to note that in VSM appropriate information flows and communication links should be designed. The information flowing around the various communication channels in the model is information about how the

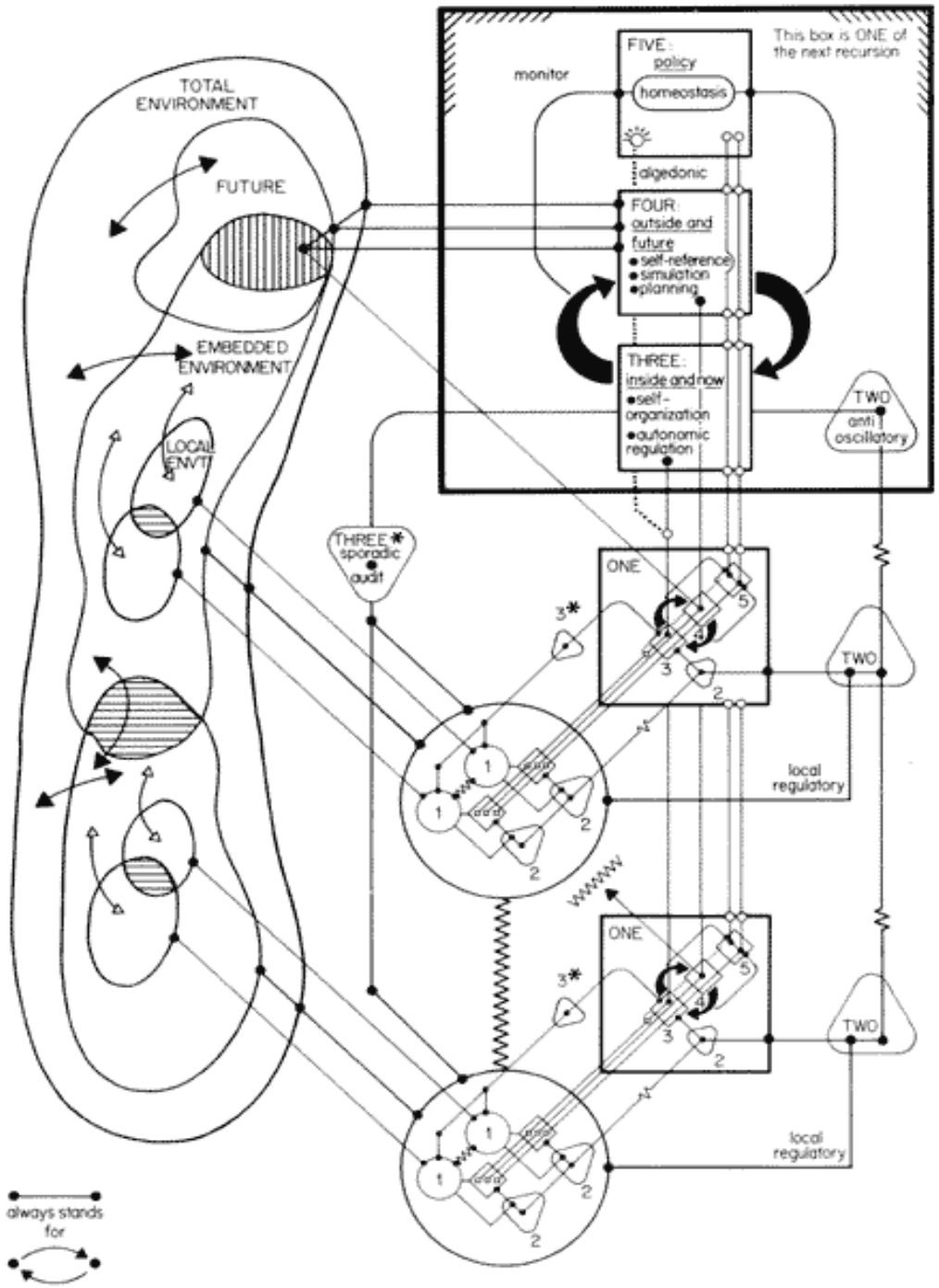

Figure 1.1 Viable System Model

different parts of the organisation and the organisation as a whole are performing in relation to their respective goals.

1.3.2. USING THE VIABLE SYSTEM MODEL

In order to use VSM or design an organisation according to VSM there are two activities to be undertaken. They are system identification and system diagnosis.

a. System identification (according to the "organisation" of the VSM)

b. System diagnosis

1.3.2.1. System Identification

As with any "unitary" methodology it is necessary initially to identify or determine the purpose(s) to be pursued. Taking the purpose as given, it is necessary to determine the relevant system for achieving the purpose(s). This is called the "system in focus". There is a need to remember that the purpose of a system is what it does and what the viable system does is done by system 1 of the system in focus (Jackson, 2000). It is essential to specify the viable parts of the System 1 of the system in focus (recursion level 1) and the viable system of which the system in focus is part (recursion level 0, wider systems, environment, etc.). Figure 2 illustrates an analysis of VSM on three levels of recursion. At level one, there is a system (University X) we are currently most concerned—system-in-focus. At level 0, there is wider system

of which the system-in-focus is part (Universities Y, Z, and W). At level two, there are primary activities of system-in-focus (literature, history, undergraduate, postgraduate, research, international relations and public administration).

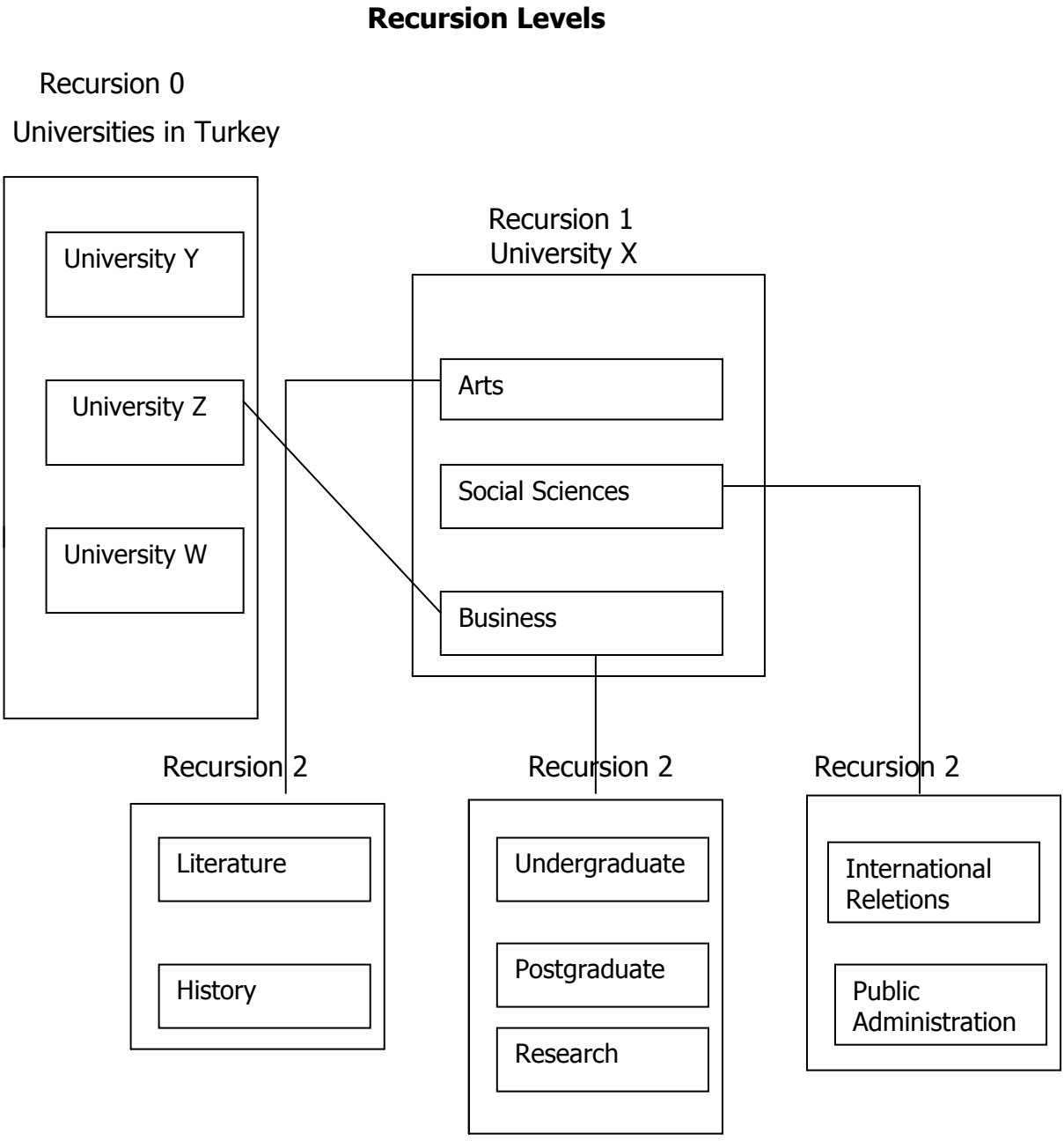

Figure 1.2 Triple Recursion Levels: An example

1.3.2.2. System Diagnosis

There is a need to rely on cybernetic principles to accomplish the following.

- Firstly we need to study the System 1 of the system in focus (Jackson, 2000):

  - Describe for each part of System 1 details of its environment, operations and localised management (Jackson, 2000:164);

  - We understand what constraints are imposed upon each part of system 1 by higher management;

  - We have to ask how accountability is exercised for each part, and what indicators of performance are taken (Jackson, 2000:164);

  - Model System 1 according to the VSM diagram.

- In next phase we need to study the System 2 of the system in focus:

  - List possible sources of oscillations or conflicts between the various parts of System 1 and their environments and identify the elements of the system (the various System 2 elements) that have a harmonizing effect (Jackson, 2000:164);

  - Ask how System 2 is perceived in the organization (as threatening or as facilitating).

- We have to study the System 3 of the system in focus (Jackson, 2000:164):

  - List the System 3 components of the system in focus;

  - Ask how System 3 exercises authority;

  - Ask how resource bargaining with the parts of System 1 is carried out;

  - Determine who is responsible for the performance of the parts of System 1;

  - Clarify what "audit" enquiries into aspects of System 1, System 3 conducts;

  - Understand the relationship between System 3 and the System 1 elements (its perceived to be autocratic or democratic?) and find out how much freedom System 1 elements posses.

- We have to study the system 4 of the system in focus (Jackson, 2000:164);

  - List all the System 4 activities of the system in focus;

  - Ask how far ahead these activities consider;

  - Question whether these activities guarantee adaptation to the future;

  - Determine if System 4 is monitoring what is happening to the environment and assessing trends;

- Assess in what ways, if any, System 4 is open to novelty;

- Find out whether System 4 provides a management centre, bringing together external and internal information and providing an "environment for decision";

- Question if System 4 has facilities for alerting System 5 to urgent developments.

- We have to study the System 5 of the system in focus (Jackson, 2000:164):

- Ask who is on "the Board" and how it acts;

- Assess whether System 5 provides a suitable identity for the system in focus;

- Ask how the "ethos" set by System 5 affects the "perception" of System 4;

- Determine how the "ethos" set by System 5 affects the System3-System 4 homeostat (is System 3 or System 4 taken more seriously?);

- Investigate whether System 5 shares an identity with system 1 or claims to be something different.

- We have to check that all information channels, transducers and control loops are properly designed (Jackson, 2000:164).

Diagnosis often leads to the discovery of violations of cybernetic principles. Some of the common faults found in organisations are presented below (Flood, R. L. and Jackson, M. C., 1991).

- Faults are made in the definition of different levels of recursion.
- The parts of System 1 are not recognised, so they are not treated as viable system and the localised management of System 1 elements does not exist.
- The existence of additional irrelevant features can threat the viability of the organisation.
- System 2, 3, 4, and 5 tend to become "antipoetic" and they seek viability separately. In a viable system, System 2, 3, 4, and 5 should sustain the total system's viability. The organization should not allow becoming bureaucratic.
- S2 and S4 are often perceived weak in organisations because local managers of System 1 interference from this control function of System 2. System 4 also appears weak because it is considered as a "staff" function and its suggestions are ignored. According to the Beer it should be part of "line management".
- System 3 managers often interfere in the management of System1.

- Transmission of information is not rapid enough because communication channels in the organization and between the organisation and the environment are not often properly designed.

Achievement in many firms is gauged by profit but Beer does not find it satisfactory for the criterion of success. The firms ignore the investment to the research and development or employee morale for the firm's long term success. Many times they try to reach immediate profit but they damage the organisation's long term future. Thus, Beer suggests implementing three levels of achievements which can be combined to give three indices. These levels of achievements: actuality, capability and potentiality. The indices that are obtained: productivity, latency, performance. (Jackson, 2003)

Actuality is the things that organisation manages to do now, with current resources and under existing constraints.

Capability is what the organisation can achieve now, if it works hard under current constraints and using current resources.

Potentiality is what the organisation might be doing by removing all constraints and developing their resources.

According to these levels of achievements the descriptions of indices are:

Productivity is the ratio of actuality and capability, latency is the ratio of capability and potentiality, performance is the ratio of actuality and also the product of latency and productivity.

CHAPTER 2

2.1. BACKGROUND INFORMATION ABOUT ERDEMİR IRON – STEEL COMPANY

In this chapter we will give a description of Erdemir iron-steel company and understand the role of sales and marketing department in it. The chapter is divided into eight parts. The first part is about the company profile. The second part explains the partnerships. The third part handles Erdemir's importance and place in Turkey. The fourth part is concerned with the production technology and products of Erdemir. The fifth part describes company culture and perfection philosophy. The sixth part analyses the financial review of Erdemir and sales policy. The seventh part illustrates the Erdemir's organisation chart. The eighth part portrays the organisational structure of vice presidency of sales and marketing.

2.1.1. Company Profile

In 1950s when industrial production had begun to outweigh the economy, major changes were experienced in economic and social structure of Turkey. Urbanisation increased during the period along with rising agricultural loans, accelerated highway and dam constructions, irrigation works, the need for flat steel were increased in myriad fields, such as tins, pipes, wagons and agricultural tools. It was nearly impossible to meet these needs with foreign

reserves which were gradually decreasing due to major investments ventured.

In 1954, the requirement of a national iron and steel industry was brought to the agenda through a committee established consisting of representatives from relevant Ministries leading by Sümerbank. Afterwards, in 1959, a feasibility study was initiated by Koppers from the USA by the assistance of a committee established by the Ministry of Industry, along with studies on the status of the company that was going to be founded. Koppers Associates SA, İş Bankası A.Ş., General Directorate of Iron and Steel Enterprises and Ankara Chamber of Commerce and Industry were among the founders of the company which would produce flat steel. Through a protocol signed at the end of 1959 by these companies, an entrepreneur committee was selected to issue draft bills, Founders' Agreement and Articles of Association in order for the Company to be established.

The Founders' Agreement was signed on February 12, 1960 for the establishment of the first flat steel manufacturing facility in Turkey. The Council of Ministers was authorised for the foundation of an incorporated company with the title of Ereğli Demir ve Çelik Fabrikaları T.A.Ş. (Erdemir) under the law no 7462 was accepted on February 28, 1960. Erdemir was officially registered on May 11, 1960 both for the enhancement of the industry and establishment and development of new industry branches in Turkey, which was going through a rapid industrialisation period.

Erdemir began its activities on May 15 in 1965 with a capacity of 470.000 tons/year and has made important contributions to our country's economy ever since. Today with a total annual crude-steel production capacity of 4.0 million tons, it is the largest iron & steel factory only integrated flat steel producer in Turkey. It produces sheet, hot and cold rolled coils, zinc, tin and chromium plated steel.

The production in the integrated plants is made with the coke/sinter/blast/BOF/continuous casting/hot rolling mill/cold rolling mill/tin, chromium and zinc plating technology. It provides input to many production industries such as automotive, pipes, home appliances, pressurized containers and machinery.

Special attention is given to the spread of a perfection philosophy within the company. Employee satisfaction and customer-oriented servicing forms the fundamentals of company culture. The principle of continuous development, labour health and security, and environmental sensitivity are Erdemir's preceding objectives. Customer expectations and production of high value added products are given utmost importance in investments. With the Capacity Increase and Modernisation (CIM) Project realized in the period between 1990-1996, which was the largest industrial investment in the history of Turkey with a cost of 1.6 billion USD. The project reached the most developed technology and increased its competing power. In 1999, tin and chromium-coating line began commercial production. In 2001, the

Galvanizing Line started production and a Steel Service Centre was established in Gebze.

The market share of Erdemir in 2008 was approximately 42%. Erdemir can easily export its high quality products to the international markets. 0.5 Million tons of export has been made to the quality sensitive countries, mainly to the EU members and the United States in the year 2000.

In addition to capacity expansions, Erdemir transformed into a group of companies by establishing new companies according to our growth strategies and performing acquisitions in domestic and outside markets.

Leading by Ereğli Iron & Steel Works Co., Erdemir Group incorporates Erenco (Engineering Management & Consulting Services Inc.) and ERDEMİR Steel Service Center Co. established in 2001, Erdemir Romania S.R.L., İsdemir (İskenderun Iron & Steel Works Co.) and Çelbor Seamless Steel Tube and Pipe Co. were acquired in 2002, Erdemir Logistics Services Joint-Stok Co., and Erdemir Gas Industry and Trade Inc. established in 2004 and Erdemir Mining Industry and Trade Inc. were acquired in the same year. Erdemir Group has been carrying on its activities since February 27, 2006 with the guidance of OYAK's experience at international markets, financial power and modern management principles as one of the biggest groups of Turkey. As it is illustrated in the Table 2.1 OYAK has the major share of Erdemir group with the rate of 49.29%. 47.29% share belongs to other

shareholders. In addition to distribution of shares, the distribution of capital is portrayed in Figure 2.1.

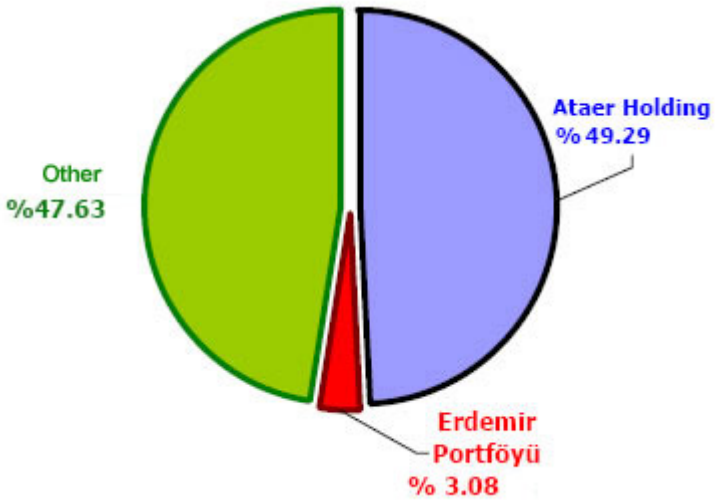

Figure 2.1 Distribution of Shares

Source http://en.erdemir.com.tr/Investors/)

	SHARES IN THE CAPITAL		BEARER
THE NAME OF THE CORPORATION	**(TL.)**	**%**	**(TL.)**
ATAER COMPANY	566.194.732	49,29	566.194.732
ERDEMİR PORTFOLIO	35.395.530	3,08	35.395.530
OTHERS	547.222.238	47,63	547.222.238
TOTAL	**1.148.812.500**	**100**	**1.148.812.500**

Table 2.1 Distribution of Capital

Source (http://en.erdemir.com.tr/Investors/)

As it is seemed in the Table 2.1 Ataer Company has the largest capital of the company with the amount of 566.194.732 TL.

2.1.2. Related Partnerships

As it is illustrated in the Table 2.2 Erdemir Group is the biggest industrial corporation of Turkey in terms of total assets, with 9 subsidiaries.

The parent company of our group is Ereğli Iron and Steel Works Co., which is the largest flat steel manufacturer of Turkey, located in Blacksea Ereğli. Erdemir's subsidiaries are: Iskenderun based İsdemir, long steel manufacturer whose production is now extended with flat steel by new hot mill investments, Erdemir Mining Industry and Trade Inc. with reserves in Sivas and Malatya -Hasançelebi, Turkey's only seamless steel pipe plant Çelbor in Kırıkkale, the siliceous steel plant Erdemir Romania in Romania, Erdemir Engineering Management & Consulting Services Inc., which offers investment and engineering service for iron and steel investors, Erdemir Logistics Services Joint-Stock Co. providing logistics service, Erdemir Steel Service Centre Co. steel service centre for cold product cutting and slitting in Gebze and Erdemir Gas, founded to meet the group's need of gas. Erdemir group is one of the major players of iron and steel industry with industrial facilities in Turkey and Romania and also owns 80% of iron ore reserves in Turkey.

Erdemir as a group has two ports, which are located in Ereğli and İskenderun. Investments with the highest budget in the national steel sector have always been made by the companies of Erdemir Group.

While serving for the development of Turkey's industry as an integrated flat steel manufacturer, Erdemir shares are one of the blue cips shares listed in ISE.

Acquisition with OYAK, one of the biggest groups of Turkey, in 2006 became the most important milestone in the company's corporate history. Subsequently, the centralisation of the common functions in separate subsidiaries of Erdemir Group strengthened the position of Group in the sector under the principle of sole economic unit and single framework."

COMPANY	**SHARE %**	**PLACE**	**OPERATION FIELD**
1-ERDEMİR-ROMANIA S.R.L	100,00	Romania	Flat steel productions with silisium

2-Erdemir Engineering Management & Consulting Services Inc.	99,98	Ankara	Engineering, Management and Consulting Services in Iron and Steel Industry
3-Erdemir Logistics Services Joint-Stok Co.	100,00	Zonguldak	All chartering operations
4-Erdemir Steel Service Center Co.	100,00	Gebze, Kocaeli	Cutting and designing all Iron and Steel productions
5- Erdemir Mining Industry and Trade Inc.	90,00	Sivas	Mining Iron ore
6-Erdemir Gas Industry and Trade Inc.	100,00	Ereğli	Gas Production
7- ÇELBOR Seamless Steel Tube and Pipe Co.	100,00	Kırıkkale	Pipe Productions
8- İSDEMİR - İskenderun Iron & Steel	90,87	İskenderun	Long Iron & Steel Productions

Works Co.			
Equity Participations			
1. Arcelor Packing Steel Industry Trade Inc.	25,00	İstanbul	Cutting, designing and marketing the Packing steel (thin) productions
2. BORÇELİK Inc.	8,92	Gemlik	Production, Selling and Marketing of steel pipe
3.GERKONSAN Steel Construction and Equipment (Material) Factory Industry Inc.	0,00108	Gerede Bolu	Manufacturing Steel Construction Equipments
4. Sivas Iron and Steel Works Co.	0,000000 45	Sivas	Long Iron & Steel Productions

Table 2.2 Erdemir Group Members

2.1.3. The Importance and the Place of Erdemir in the Turkish Economy

Erdemir is a big family of 30.000 people with its employees and their spouses and children. In addition, some other contracted staffs are also recruited for cleaning, landscape planning, social services, and for various services within the production facilities.

Erdemir gives precedence to the domestic suppliers in both the procurement of materials and spare parts for the maintenance and repair activities and in the production of machinery and equipment needed for the investment projects.

Erdemir contributes to the development of the production industry by providing input to pipe, cement, and sliding factories and shipyards in Ereğli and its surroundings, as well as maintenance and technical support to the industrial facilities in the region. Sheet iron trading made in Ereğli region is another important activity. The 90% of domestic shipping of Erdemir products are done by land. Approximately, 3-3.5 million tons of flat steel products are shipped by land every year.

Erdemir uses natural gas in its facilities for both preventing environmental pollution and meeting its energy needs. In order to be able to do this, it gave some contribution amount to the cost of natural gas line pipes between İzmit-Karadeniz Ereğli. Erdemir gave the opportunity by the main pipe lines

to reach the city centers like Adapazarı, Düzce and Ereğli on the Blacksea using natural gas at the industrial facilities and households.

Erdemir participates in every economical, educational, cultural, and sportive organization related with the community. Besides, it always supports and acts as a partner for the solution of regional problems in panels and symposiums.

2.1.4. Production Technology and Products

Integrated iron-steel production process in Erdemir begins with the preparation of iron ore after breaking, sifting and sintering processes or charging the ore pieces to hut furnaces directly. Hot metal is obtained by taking out the oxygen from the ore that had become iron-oxide with the help of coke coal in the hot furnaces. Liquid steel is refined at a desired ratio from elements like carbon, silicium, phosphorus and sulphur. The necessary alloy substances are added and liquid steel is obtained, and then it gains metallurgical characteristics in the crucible. Afterwards, the liquid steel is hardened in Continuous Casting Facilities and rectangular cross-sectioned slabs of 6,9 or 12 meters in length are obtained.

The first main facilities that the semi-finished products become final products are hot strip rolling mils or sheet rolling mills. Depending on the orders, some of the hot rolled products are sent to cold rolling mills and after

shear and cutting lines to obtain cold rolled products. Cold products, again according to the orders, are processed on tin, chromium or zinc coating lines.

The products changes according to the factories. Some of the products are produced in Erdemir, some of them are produced in Isdemir, and raw materials are produced in Ermaden. The products that are produced in Erdemir; tinplate, galvanized, cold rolled, hot rolled. Isdemir produces; billet, wire rod-rebar, pig iron, slab, and hot rolled products. Pellets and iron ore are produced in Ermaden.

2.1.5 Company Culture and Perfection Philosophy

Erdemir, which is the largest iron & steel factory and only integrated flat steel producer of our country, follows a strategy that gives importance to the human resources as well as other systems.

The information and experiences obtained on Erdemir's journey of Total Quality Management are shared regionally and worldwide. Within this frame Erdemir has provided consulting to Ereğli TED College Foundation Primary and High Schools, Erdemir Primary School, Ereğli Social Security Hospital and Regional Command Headquarters.

As it is illustrated in Table 2.3, Eregli iron and steel works company operates in iron and steel industry. Erdemir is located in the South West cost of Black Sea and Oguz Nuri Ozgen is the CEO of the Company. Erdemir

group has approximately 15,000 employees. The share of the company in the market has realized with the rate of % 28 in 2008.

Name of the Company	**EREĞLİ IRON AND STEEL WORKS CO.**
Company Adress	Ereğli/ZONGULDAK
CEO	Oğuz Nuri ÖZGEN
Operation Field	Iron and Steel
Capital (Outstanding)	1.148.812.500 TL
Contribution of Capital	% 49.29 Ataer Company % 3.08 Erdemir Portfolio % 47.63 Others
Total Employee	15,213 people
Market Share	% 28

Table 2.3 Erdemir Profile

2.1.6. Financial Review of Erdemir and Sales Policy

In 2007, Erdemir Group has produced 5,37 million tons of crude steel. By doing so, it has taken 57th place globally and 17th Europe-wide along with 8th position within EU-27. In 2008, there has been an increase of 11,3%, compared to 2007 with a crude steel production of 5,98 million tons. By the

end of 2008, the crude steel production at Ereğli Plants has been around 2007 level; approximately 3.124 thousand tons.

In 2008, depending on the raw material cost increases and strong demand, flat product prices keep upwards approximately 70-100% on various product groups in different regions and reached a record level in July 2008. when the economic crisis in the USA and rapidly spread with an enormous influence on world economies, steel users face up to cash shortages, production cuts and market tailspin caused contraction in steel demand. Under these circumstances, flat product prices slipped away 45-70% from July 2008 to the end of the year. As a result, to balance supply and demand, world steelmakers began production cuts to slow down price declines.

As the financial crisis arose in the domestic market, cash discount practice began in July in Erdemir. At the beginning of August, blockage rate on the letter of guarantee was set to 10%, a decrease from 12%, and discounts from list prices were done to keep taking precautions against crisis. In order to maintain company's market share in contracted market, stock sales were boosted in September and reached to a record level throughout the year. Customer relationships have been emphasized to perceive customer satisfaction, monitor client requirements closely and to respond in increasing retrogressive effect of crisis. Consequently, many planned visits to the clients were paid in total, in September-December period, to take orders so as to

keep production. Feedbacks were concerned within the market conditions and for the contracted clients, that kept going to giving orders were given discounts. However, payment shortage arose because of demand contraction and effect of financial crisis. In order to raise cash flow, 15% discount on 17th September 2008 and 40% discount on 23 October 2008 to list prices were applied. By the help of those sales policy changes, Erdemir's competitive strength was maintained.

Depending on contraction in flat steel demand, Erdemir's sales in 2008 decreased 9% as compared to 2007. On the other hand, export of Erdemir plant increased 18% as compared to 2007 and export sales share in whole sales raised from 15% to 20%.

In this period, Erdemir Group reviewed sales policies to respond customer demands quickly and resiliently, continued investments with Advanced Planning and Scheduling System (APASS) and Enterprise Resource Planning (ERP) projects and long-term and efficient relations with our customers were maintained.

The sales amount of the Erdemir, Isdemir and Ermaden are illustrated for the years 2006, 2007, and 2008 in Table 2.4.

Final Products (000 Tons)	01 Jan. - 31 Dec.2008	01 Jan. - 31 Dec.2007	01 Jan. - 31 Dec.2006
Erdemir	3.902	4.295	3.904
Isdemir	2.785	2.479	22.137
Ermaden	1.615	1.865	1.772

Table 2.4 Sales (quantity) Source: (http://en.erdemir.com.tr/Investors/)

Selected Balance sheet and Income Statement of Erdemir are illustrated in Table 2.5.

(TL)	**31/12/2008**	**31/12/2007**
Current Assets	4.655.988.376	3.233.086.753
Non-current Assets	7.285.155.391	6.396.159.397
Total Assets	11.941.143.767	9.629.246.150
Current Liabilities	3.362.674.982	1.541.797.583
Non-current Liabilities	2.474.840.646	1.924.192.642
Shareholders' Equity	6.103.628.139	6.163.255.925
Total Liabilities	11.941.143.767	9.629.246.150
Selected Income Statement Items (TL)		
(TL)	**31/12/2008**	**31/12/2007**
Net Sales	6.808.694.806	5.356.861.465
Operating Profit	516.873.558	724.310.390
Profit for the Period	284.792.922	822.512.903
Net Profit for the Period*	227.693.594	704.225.737
Earnings Per Share	0,1841	0,5914
Parent Company's Interest is 211.4		08. (2007: 679
Key Ratios		

(%)	**31/12/2008**	**31/12/2007**
Operating Profit Margin	7,6	13,5

Net Profit Margin	3,3	13,1
EBITDA Margin	13,2	20,6

2.5 Table of Financial Statements Source: Erdemir finacial Report 2008 (http://en.erdemir.com.tr/Investors/)

The main scope of business and the participation ratios of the affiliates are subject to consolidation are illustrated in Table 2.6.

Name of the Company	**Operation**	**2008 Share %**
İskenderun Demir ve Çelik A.Ş .	Iron and Steel	92,91
Erdemir Madencilik San. ve Tic. A.Ş.	Iron Ore and Pellet	90
Erdemir Çelik Servis Merkezi San. ve Tic. A.Ş.	Iron and Steel	100
Erenco Erdemir Müh. Yön. ve Dan. Hiz. A.Ş.	Management and Consultancy	100
Erdemir Romania S.R.L.	Iron and Steel	100
Erdemir Çelbor Çelik Çekme Boru San. ve Tic. A.Ş.	Iron and Steel	100
Erdemir Lojistik A.Ş.	Logistics Services	100
ArcelorMittal Ambalaj Çeliği San. ve Tic. A.Ş. (**)	Steel for Packaging	25

(*) Financial statements of Erdemir Gaz San. ve Tic. A.Ş. is not consolidated as its effect on
accompanying consolidated financial statements is immaterial.
(**) Arcelor Mittal Ambalaj Çeliği San. ve Tic. A.Ş.'s financial statements are consolidated by
the equity pick-up method.
(***)Group's participation ratio in Borçelik as of 31 December 2008 is 9,34%.

Table 2.6 Scope of business and the participation ratios (Source: 2008 Financial Report; www.erdemir.com.tr /yatirimcilar/)

The consolidated financial statements incorporate the financial statements of the Group and its subsidiaries controlled by the Group. Adjustments are

made to eliminate inter-company sales and purchases, inter-group receivables and payables, and inter-group equity investments. Entities in the Group, directly or indirectly, has above 50% shareholding or interest of voting rights or otherwise has power to exercise control over operations, are fully consolidated. Control is achieved where the Group has the power to govern the financial and operating policies of an investor's enterprise so as to obtain benefits from its activities. The accounting policies of the subsidiaries included in consolidation are changed and adapted to the Group's accounting policies where necessary. All significant transactions and balances between the Company and its consolidated subsidiaries are eliminated for consolidation purposes. On acquisition, the assets and liabilities of the relevant subsidiaries are measured at their fair values at the date of acquisition. The interest of minority shareholders is stated at the minority's proportion of the fair values of the assets and liabilities recognised. The results of subsidiaries acquired or disposed of during the year are included in the consolidated income statement from the effective date of acquisition or up to the effective date of disposal, as appropriate.

2.1.7. Erdemir's Organisation Chart

The organisation chart of Erdemir includes six main Vice Presidencies (Figure 2.2). All of them have many departments.

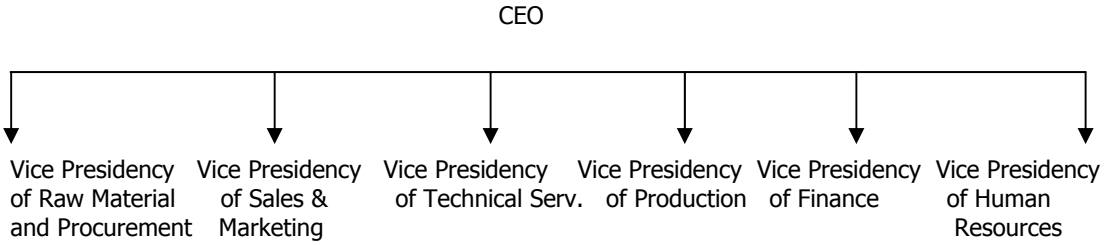

Figure 2.2 Organisation Structure of Erdemir

The Vice Presidency of Technical Services and Investments have five departments (Figure 2.3); the department of Computer Technology, the Laboratory department, the Technical Services, the Quality Control department, and Research and Development department. Their fundamental task is to provide all technical needs of company. This presidency can be called as a support unit.

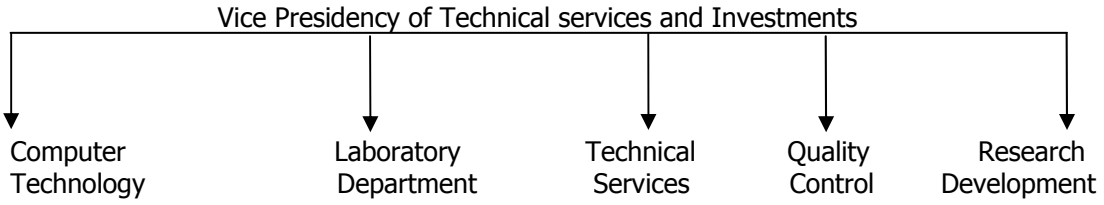

Figure 2.3 Vice Presidency of Technical services and Investments's organisation structure

The Vice Presidency of Finance has three departments (Figure 2.4). These are Accounting department, Budget and Finance department, and Cost Accounting department. These departments make all payments to the firms and the personnel.

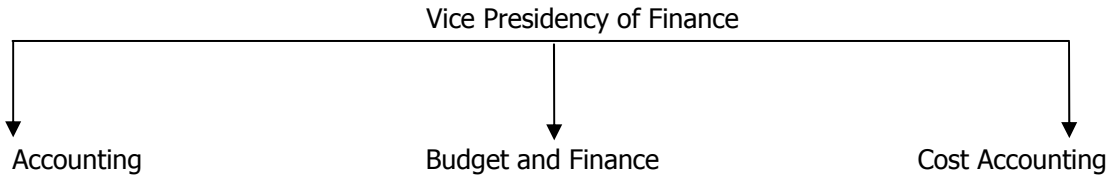

Figure 2.4 Vice Presidency of Finance's Organisation Structure

The Vice Presidency of Production has fifteen departments (Figure 2.5). Some of these departments are: Production Planning department, Hot Rolling department, Cold Rolling department, Blast Furnaces department, Coke plant, Sinter factory, Continuous Casting department, and Transportation department. The production facilities are realised by these departments.

The Production Planning department is one of the important departments of the company. It makes the monthly and yearly capacity planning of the company. It also coordinates the order of the products which are produced. This is a key unit for the Marketing and Sales departments. This department and Sales and Production Coordination department cooperates for the orders. Production Planning department determines the monthly capacity according to the existing unmet orders and the factory's production performance, and informs the Sales and Production Coordination department for the next month. The Sales and Production department collects the demands according to this capacity amount from the customers.

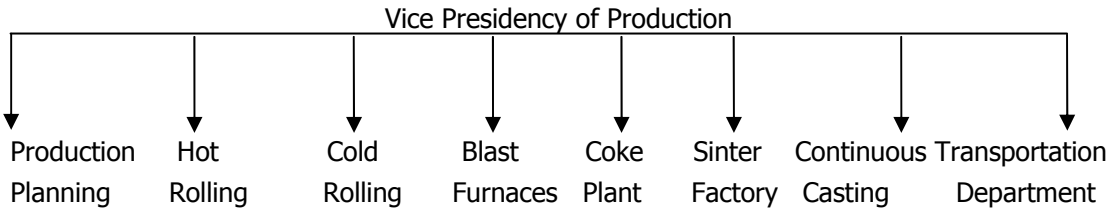

Figure 2.5 Vice Presidency of Production's Organisation Structure

The Vice Presidency of Raw Material and Procurement have five departments (Figure 2.6). These departments are: Foreign Purchasing Department, Domestic Purchasing department, Raw Material Purchasing department, Transport Coordination department, and Service Purchasing department.

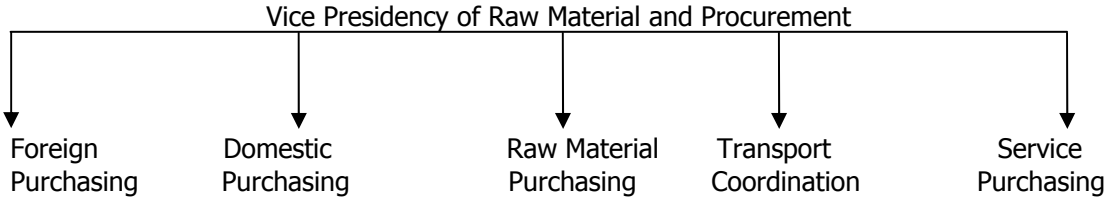

Figure 2.6 Vice Presidency of Raw Material and Procurement's organisation structure

Foreign Purchasing department has five subunits and there are thirty personnel in this department. Foreign purchases department supplies the partial equipments and the raw material from foreign countries.

Domestic Purchasing department have six subunits and there are thirty five personal in this department. This department buys the partial equipments from Turkey.

Raw Material purchasing department has three subunits and fifteen personnel works in this department. They supply the raw material from Turkey.

Service purchasing department has two subunits and ten personnel works in there. They buy all services or rent services for production department. For instance; they buy services for the maintenance for the production units.

Transport Coordination department contributes two subunits and there are fourteen personnel in this department. First subunit is sea transport and other one is roadway transport. There is a manager at the top of the department and this manager has two chiefs. One of the chiefs manages sea transport other one manages roadway transport. There are four specialists at the unit of sea transport and five specialists at the unit of roadway transport.

Transport Coordination department works with the order of other departments. These departments are; foreign purchasing department, domestic purchasing, raw material purchasing department and Service purchasing department.

The Vice Presidency of Human Resources Department has two units (Figure 2.7). These departments are: Human Resources Department, and

Industrial Relations department. Human resources department is responsible for employee hiring and firing facilities. Industrial relations department is responsible for organisational changes in the company.

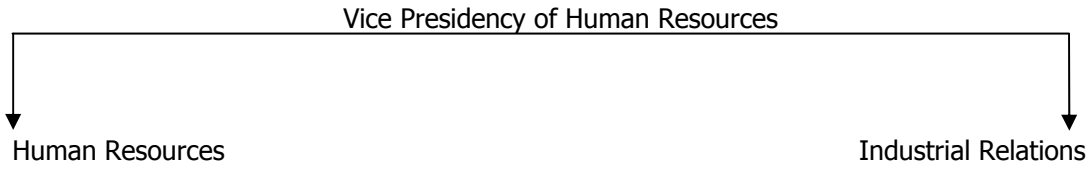

Figure 2.7 Vice Presidency of Human Resources' Organisation Structure

The Vice Presidency of Sales and Marketing Department has four units (Figure 2.8). These departments; department of Sales & Production Coordination, Domestic Sales Department, Foreign Sales Department, and Marketing Analysis Department. Vice Presidency of Sales and marketing coordinates the selling, marketing and the customer relations. Sales and marketing process starts from the collecting demand and continues until the services after the selling.

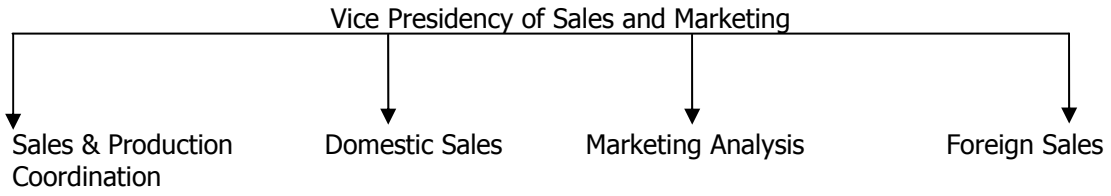

Figure 2.8 Vice Presidency of Sales and Marketing's Organisation Structure

2.1.8. OrganiSational Structure of Vice Presidency of Sales and Marketing

The Vice Presidency of Sales and Marketing has four departments. These departments are the department of Sales & Production Coordination, the Domestic Sales Department, the Foreign Sales Department, and the Marketing Analysis Department.

The Domestic Sales department has six units. These are; Marmara Region Sales, Aegean Region Sales, South East Region Sales, Anatolia Region Sales, Order Management, Services after Sales.

The Marketing Analysis department has three units. These units are; Customers Technical Services, Market Development, Management of Product Group.

The Foreign Sales department has only one unit, which is Foreign Sales unit. This unit sells the products to the abroad via consultants.

The Sales and Production Coordination department has two units. These are: Sales Coordination unit and Coordination unit.

2.1.8.1. Vice Presidency of Sales and Marketing

The Vice Presidency of Sales and Marketing is responsible for all sales facilities in Erdemir. As mentioned before, it has four departments. One of them is Sales and Production Coordination department. Sales and Production Coordination department has two subunits; these are Coordination unit and Sales Coordination unit. Coordination unit has one chief and six employees. This unit makes the coordination between the customer and the operational

units. For each month Coordination unit takes the monthly production capacity and production limits from the Production Planning department, then it collects the demands from the customers via Marmara Region Sales, Aegean Region Sales, South East Region Sales, and Anatolia Region Sales which are the parts of Domestic Sales department. After collecting all demands, this unit makes the allocation at the end of month according to the monthly production capacity. Allocation means creation of the orders. There are two employees who manage this process in the Coordination unit and these employees are engineer staff. After taking orders, all of the orders are planned by the Production Planning unit. Coordination unit follows the state of orders according to the customer's wishes. There are four employees in the Coordination unit who are responsible for the process and these employees are administrative staff. When the customers want to review their orders, they contact with the Coordination unit. Other subunit of Sales and Production Coordination department is Sales Coordination unit. Sales Coordination unit sells the products through erdemironline which is out of order. This method of sales is applied for the weekdays. Customers see the products via erdemironline and buy the products whatever they wanted.

Sales and Production Coordination department interacts with all sale units, customers, and with Production Planning department which is a department of Vice Presidency of Production. The coordination between the Sales and Production Coordination unit and Production Planning department is

significant for the company. As mentioned before, the monthly and yearly capacity planning is realised by Production Planning unit. According to these capacities Sales and Production Coordination unit collects the demands from the customers. Production Planning department also coordinates the production schedule for each week and month. So it decides which orders will be produced primarily. Production Planning department does not contact with the customers directly. Sales and Production Coordination department interacts with the customers. When the customers ask their orders' states they contact with the Sales and Coordination unit. But sometimes the oscillations occur between the Production Planning department and Sales and Production unit about the orders. Some orders are not produced on time by the production units. Because these orders have special quality and dimensions so in order to produce them planning schedule has to be changed and this leads to less production. It means Production Planning department does not arrange these orders to produce, so they delay. Customers contact with the Sales and Production unit and want to have their delayed orders sent immediately. But Production Planning department thinks of reaching monthly production amount which is given as a goal by the CEO of the company. If they cannot reach this goal they can get in trouble. Thus, they often choose mass production. These delayed orders give rise to a decrease in the number of customers. This is an unpleasant situation that should be solved for the company.

Domestic sales department includes six units. Four units of them are regional sales units. These are Marmara Region Sales, Aegean Region Sales, South East Region Sales, and Anatolia Region Sales. All of them are responsible for customers in their own region. Regional sales units' primary task is to load the data regarding customers' orders to the production control system. In order to materialise this transaction they cooperate with the Sales and Production Coordination department. Firstly, Sales and Production Coordination unit allows the regional sales units to load data concerning orders data, and then they realise it. They also receive the customers' payment invoices and transfer the payment information to the production control system. After this stage, the shipping department sees the customers' payment data so that it ships products to customers. Regional sales units gather the information about the goods production process from the Sales and Production Coordination department. When the production of orders finishes, the Sales and Production Coordination department informs the regional sales units and then regional sales units forward this information to the customers. Regional sales unit does not interact with the production units directly, they contact with them through Sales and Production Coordination unit. Order management is another domestic sales unit. It provides support to the customers about production limits and dimensions when the customers demand orders. The final unit of the Domestic Sales department is the Services after Sales. They evaluate customer satisfaction and gather

customer complaints. This unit tries to solve customer complaints about products.

Foreign Sales department has only one unit. They export the products to the foreign countries. They take the capacity from the Sales and Production Coordination department and then load the data regarding orders to the production control system. After this stage, the production process starts and then Sales and Production Coordination department informs the Foreign Sales department that the products are ready.

Marketing Analysis department has three units. These units are; Customers Technical Services, Market Development, and Management of Product Group. Customer Technical Services receive the complaints from customers via Services after Sales unit and evaluate them. They visit customers and decide whether the product damaged or not. In the light of their decision about product, it can be taken back to the factory and a new production can be made for the customer. Market Development unit researches the prices in the iron and steel industry. They prepare the report that shows the changes in prices. They inform the vice presidency of Sales and Marketing about the prices. In the light of these reports the company determines the price policy. Market Development unit also follows the actions of rivals in the market. It investigates the cost-cutting techniques, strategic alliances of the rivals, and informs the upper level management.

The wages are above the average (compared to those operating in the same industry in the country) in the company. All employees are satisfied with their pay but there is a conflict among the white colour employees due to the level system for wages used in the company. The level starts from five and goes up to fourteen. The engineer staff can be promoted up to fourteenth level but the administrative staff can reach up to ten or eleven levels. For each level, the employee takes ten percent extra wages. The engineer staff deserves the level for each year, but the administrative staff deserves the level at the end of every two year. This discrimination between employees gives rise to a conflict between the white colour employees. In Sales and Production Coordination department it is possible to see this conflict, because there are two engineer staffs and six administrative staffs in the same unit. Employees are aware that there is not so much difference between the engineer staff's job and the administrative staff's job as being qualitative or quantitative.

The management style of the company is basically autocratic but it may change at the lower level of management. Some of the managers' style liberated and democratic, but in Sales and Production Coordination department the autocratic approach is dominant. Communication with the subordinate lacks in the department. Staff does not trust their chief. Some of the staff faces to mobbing by their chief. So there is a motivation gap for the staff in this department.

CHAPTER 3

3.1. VIABLE SYSTEM DIAGNOSIS IN ACTION

In this chapter by using Viable System Model we will provide for Erdemir's Sales and Marketing department an overview and a diagnosis (VSD) of where the problems lie. Our analysis will not consider the whole company; rather focus on the Sales and Marketing department. In the process of using the Viable System Model, it is initially necessary to determine system identification and system diagnosis.

3.1.1. System Identification

Erdemir is a big organisation. It has many departments and many units. As emphasised before, the different nature of departments generate different behaviours in the company. The departmental characteristics are shaped by the philosophy of managers. Erdemir has six Vice Presidencies. They are vice presidency of sales and marketing, vice presidency of production, vice presidency of finance, vice presidency of raw material and procurement, vice presidency and technical services and investment and vice presidency of human resources. Our concern will be the Vice Presidency of Sales and Marketing to which we apply our cybernetic model.

In system identification we should specify the purpose(s) to be pursued. The purposes of the Vice presidency of Sales and Marketing are to raise sales

amount and provide customer satisfaction. This is the system in focus which is at recursion level 1 (Figure 3.1). The tasks of increasing sales amount and providing customer satisfaction are carried out by System 1, which is system in focus. System in focus includes four subunits: Sales and production coordination, marketing analysis, domestic sales, and foreign sales. The Sales and Production Coordination aims to ensure proper orders to the company and try to reduce order delays. The Domestic Sales' purpose is to increase sales amount in Turkey. The Foreign Sales' aim is to reach sales quota which is given by the higher level management for foreign countries. Marketing Analysis aims to search for the market secretly, reach new customers, and raise market share.

3.1.2. System Diagnosis

In light of the organisation's purposes we can look at the viability of the Vice Presidency of Sales and Marketing. We have identified the system in focus as vice presidency of Sales and Marketing and its goals are to increase sales amount and ensure customer satisfaction. We now study System 1-5 of Vice Presidency of Sales and Marketing according to the cybernetic model (Figure 3.2).

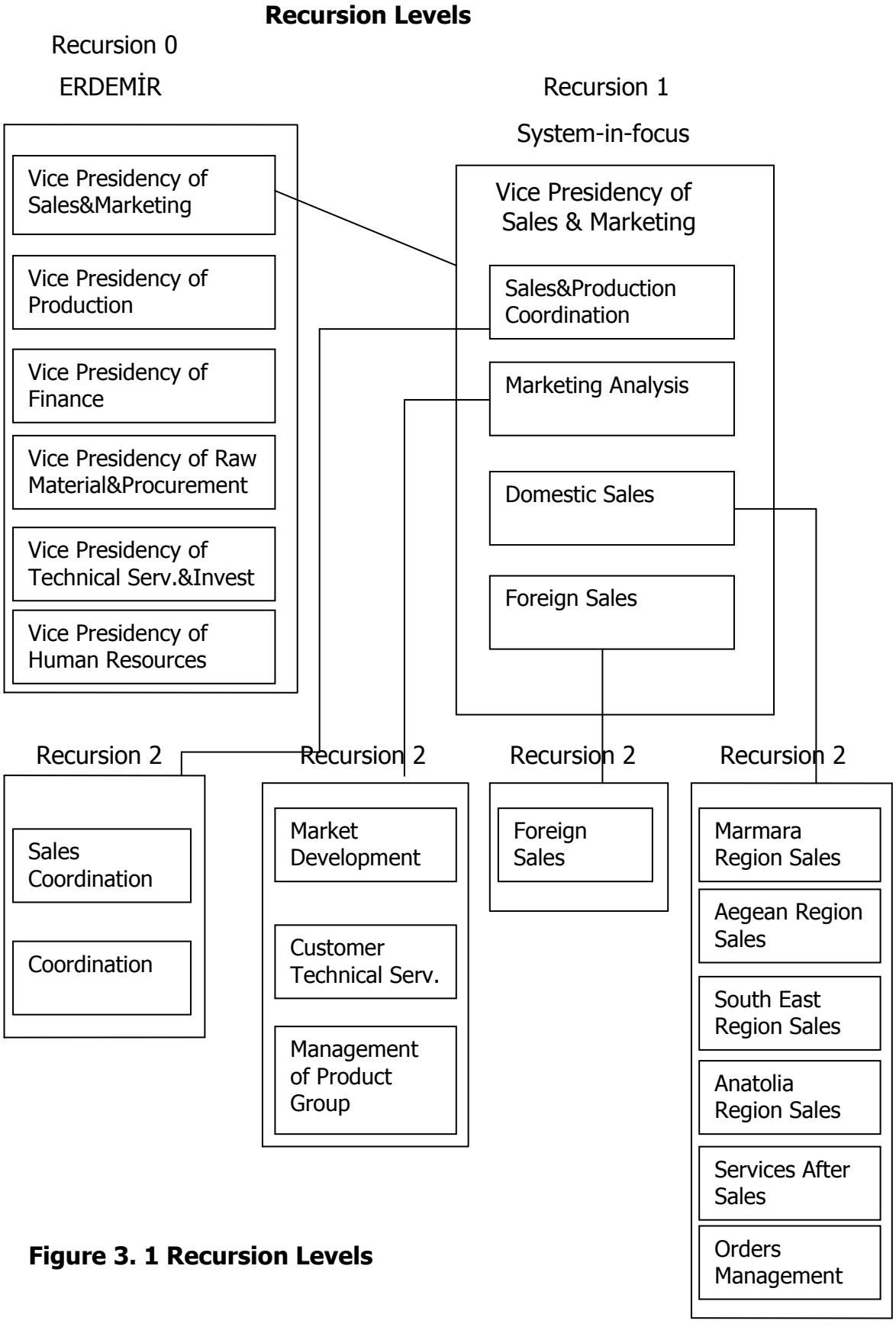

Figure 3. 1 Recursion Levels

System One includes two operational units; which are domestic sales department and foreign sales department. System 1a is domestic sales department. The Domestic Sales department includes six subunits. Four subunits of them are regional sales units. These are Marmara Region Sales, Aegean Region Sales, South East Region Sales, and Anatolia Region Sales. Other subunits are Order Management and Services after Sales. The Domestic Sales department is viable in its own right. It is autonomous but this autonomy is not strong. The Domestic Sales department is responsible for the company's all sales facilities in Turkey. It searches for new customers, collects demands from the existing customers, and gives support to the customer after sales. The Domestic Sales department via regional sales units informs the Sales and Production Coordination department about the amount of orders and takes information about production process for the customers' orders from the same operational unit. After that it forwards the information that obtained from the Sales and Production Coordination department to the customers. The limitation on the Domestic Sales department from higher level management is about the excess products. The local management of System 1a should be the domestic sales manager, all regional sales unit managers, services after sales unit manager, and orders management unit manager. The local environment of System 1a includes customers in Turkey. The Domestic Sales department gives reports to the senior management in the management meeting which is organised at least once a week. The

indicators of performance of Domestic Sales department are sales amount and shipping amount.

Another part of system one is Foreign Sales department which is System 1b. It is viable in its own right. The Foreign Sales department has strong autonomy. The local management of System 1b should be the foreign sales manager. The Local environment of System 1b includes foreign customers. The Foreign Sales department realises the export facilities of the organisation. It takes bids from the customers and evaluates the prices, and then specifies customers who place orders to the company. After deciding the capacity and customers, it takes the capacity from the Sales and Production Coordination department, and then the production process starts. The export orders have priority over domestic orders in the company. So, the production units initially produce products for the export orders. One constraint that is placed on the Foreign Sales department from the higher management is sales quota. The Foreign sales amount is approximately 10 percent of total sales amount. The reason for this is that the export prices are lower than the domestic sales prices. However, in crisis this limitation is not given much attention. The Foreign Sales department gives reports to the senior management in the management meeting which is organised at least once a week. The indicators of performance of foreign sales department are sales amount and shipping amount.

System Two in vice presidency of Sales and Marketing is undeveloped. The conflicts arise among the System one parts, but there is not a unit which is developed to solve these possible conflicts. One of the possible conflicts is about the sales of excessively produced products. These remaining products are sold through erdemironline or by the sales people. When the sales people offer the same products both to foreign and domestic customers simultaneously, a conflict between Domestic Sales department and Foreign Sales department may emerge. Another possible conflict is about the delayed orders. The Vice Presidency of Sales and Marketing wants to deliver the delayed orders to the customers, but the Vice Production Planning department says that they cannot produce products that are channelled to the delayed orders, because they have specific production goal for each month they have to reach. If they produce products that are directed to the delayed orders, they cannot reach their monthly goal. The Domestic Sales department forwards the urgent product demand to the Sales and Production Coordination department. This department tries to ensure the customer satisfaction and to raise sales income, but the Production Planning department aims to reach monthly production amount. There is a conflict between the Domestic Sales department and Production Planning department which is under the control of Vice Presidency of Production. There must be a regulation that deals with these conflicts by the company; otherwise the company will lose customers in the future. So there is a need

to have 'corporate regulatory centre' for this organisation which receives information about operations of System 1. In order to solve these conflicts there must be procedures. For instance; if two customers want to purchase the same product that the company has limited number, the product will be sold to the customer who has more business transaction with the company.
In order to prevent conflicts from arising in the system that all created by the parts of System1, a new department is necessary which carries out the tasks of System 2. System 2 is responsible for making rules and regulations determining legal restrictions that must be obeyed (e.g., governance, financial, human resource, etc).

System Three should be performed by the Sales and Production Coordination department. It does not exactly realise the functions of System 3, but it should be informed about its tasks as System 3. Also, the whole company should be informed that the system three functions are carried out by the Sales and Production Coordination department. The exercise of authority by System 3 which is responsible for the internal stability via controlling and monitoring is questionable because there is no suitable control mechanism the is set up in the Vice Presidency of Sales and Marketing. There is resource bargain with the parts of System 1. Especially, the main subject of resource bargaining is about the capacity allocation in each month. Sales and Production Coordination makes the production capacity allocation for each month. System 1a and System 1b sell the

products according to these monthly capacity allocations. So, the resource bargain exists between the System 1 parts and System 3. The Sales and Production Coordination department should be responsible for the performance of the parts of System 1, because the total sales reports, daily stock reports, and regional sales reports are prepared by the Sales and Production Coordination department. It warns the Domestic Sales department when the shipping amount goes down. It follows the sales amount and shipping amount daily. Audit enquiries are not conducted by System 3 properly; the inquiries include only report questions. In fact, the reason for this is that the parts of System 1 do not give attention to the audit function of System 3. If parts of System 1 believe in the functions of System 3, System 3 can easily conduct audit enquires. However, parts of system 1 do not accept the authority of System 3 although they give the information to System 3 continuously. Sales and Production Coordination department should undertake the responsibility of System 3 and fulfil the following activities: direct access to the affairs of System 1 units, checking, performance guiding, maintenance of System 1 units, and the appropriate implementation of policy.

System Four is the intelligence function of the system. The intelligence function exists, but underdeveloped in the company and it is carried out by the Marketing Analysis department. It has three units. These units are; Customers Technical Services, Market Development, and Management of

Product Group. The main activities of System 4 are to monitor the rivals' positions, follow the prices in the market, and offer new marketing strategies to the higher level management. It also makes predictions about the future of market and investigates the different segments of industries. These activities enable the Vice Presidency of Sales and Marketing to predict the future and prepare itself. The System 4 investigates the new ways for marketing regarding the market position. As being a global firm, there is a natural pressure on the Marketing Analysis department that has to prepare a well thought out plan for the future. System 4 should monitor the rivals both in the local market and in the global market, gather internal and external data, and ensure a management centre room. System 4 currently prepares the regular bulletin about the market such as market shares, and product prices, raw material prices, and then distributes to the sales, production and financial departments. In addition, it alerts the system 5 to urgent developments. For instance; as global steel prices goes up, the Marketing Analysis department warns the System 5 and advices to take some precautions.

System five is represented by the Vice President of Sales and Marketing. System 5 is responsible for the direction of Sales and Marketing. System 5 should provide a suitable identity for the system-in-focus. The ethos, beliefs, and values are set by System 5 parallel to the company's overall ethos, beliefs, and values which affect the System 4. Cooperating with the

customers and saving in all operations are the values of System 5. System 5 evaluates the information which passed to it by System 4 and makes necessary decisions. System 5 tries to adapt the organisation to the environment by giving much importance to the customer relations. The regional sales departments visit the customers periodically. It appreciates customer loyalty. System 5 represents the departments against the higher level management and the customers. It behaves as an ambassador against the customers and as a leader of the its vice presidency against the higher level management. System 5 has difficulties to solve internal and external problems. It makes authorisation to departments but there is not adequate control mechanism. So, conflicts cannot be under control. System 5 should not be disturbed by surrendering power to some extent and respect the control function.

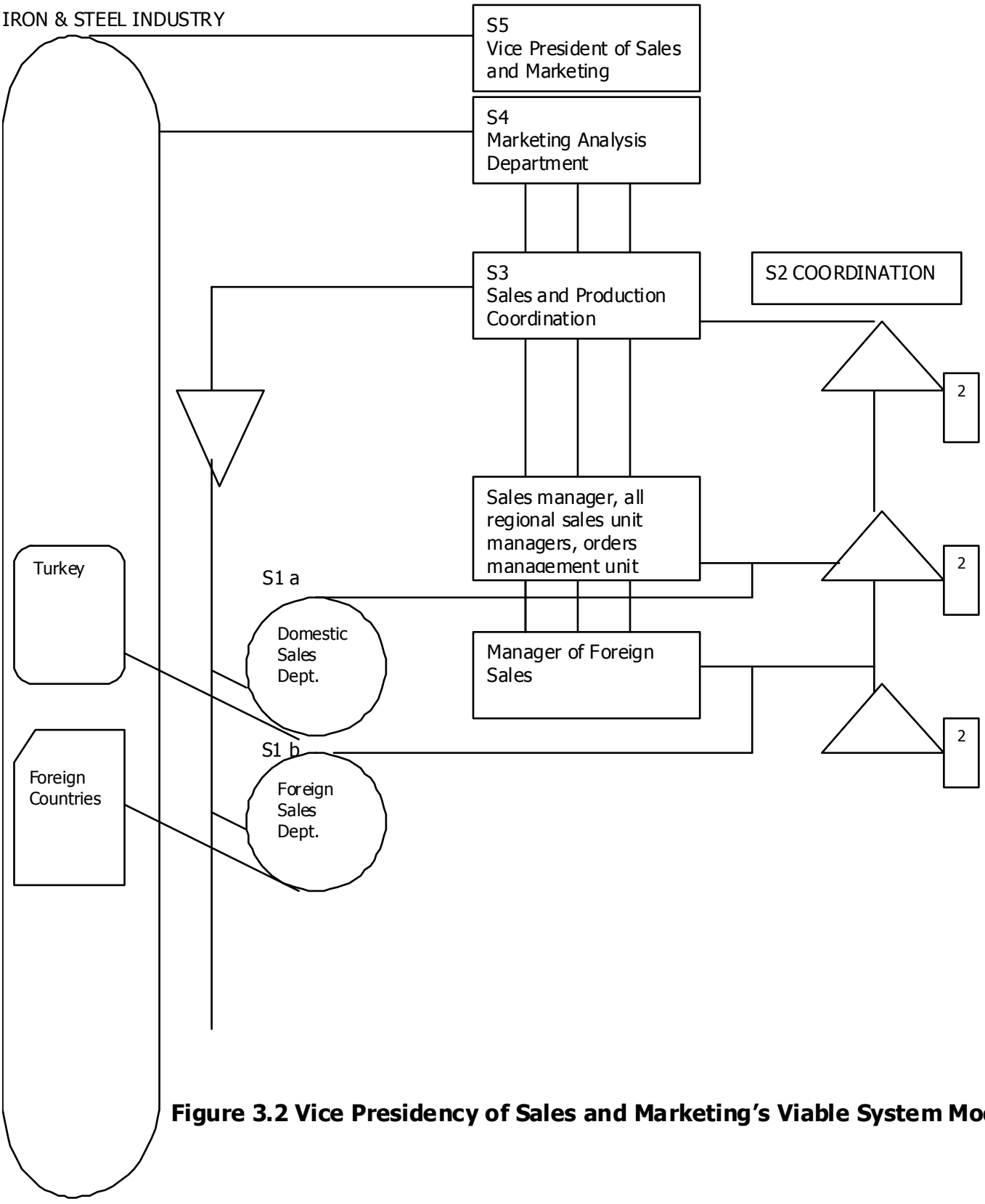

Figure 3.2 Vice Presidency of Sales and Marketing's Viable System Model

CHAPTER 4

CONCLUSION

In this study we have applied the Viable System Diagnosis which is a cybernetic model in management system field to Erdemir. Firstly, we have given a description of philosophy, principles, and methodology of Viable System Model, and then detailed background information about Erdemir is provided. The reason for this is that Erdemir is a large sclae organisation; we have made our application to be focused on the Vice Presidency of Sales and Marketing which is one of the six Vice Presidencies in Erdemir.

Viable System Model has been much used both within the individual organisation and in the administration of governments as being large-scale applications around the world. In this application in Turkey we have applied it to a leading large scale organisation in its sector. Although there are many studies which are concerned with Viable System Diagnosis in the world, there are few case studies in Turkey.

Viable System Diagnosis can be used to design the structure of an organisation that enables it to survive in the rapidly changing and exceedingly complex environments. It provides a recursive structure that can accommodate distribution of policy and responsibility, yet clearly defines the role of support services and information feedback. It requires each

viable group in the organisation to understand its own risks and sub-environments. It is useful for managers to respond the environmental threats and opportunities.

In this study in the application of Viable System Model we have recognised that the model should be understood by all members of the organisation who are within the system-in-focus. Therefore, the all functions of five systems should be taught to people who are concerned and involved. In the use of VSM in the Vice Presidency of Sales and Marketing at Erdemir some difficulties arose. Some people did not understand this model and it became a hard task for the practitioner to explain this sophisticated model to people who are concerned. This was a time consuming and a tedious task.

However, in this application we have also observed some benefits. We experienced that there was not a unit which carries out the task of System 2. Therefore, in the Vice Presidency of Sales and Marketing there was not a coordination mechanism or corporate regulatory centre where the possible conflicts are determined in the system. So, we advised that the Vice Presidency of Sales and Marketing should establish a new unit that prevents the oscillations or conflicts among the parts of the operational units Domestic Sales and Foreign Sales departments and determines the restrictions that must be obeyed. If the Vice Presidency of Sales and Production sets up a corporate regulatory centre, it can prevent the conflict

about the sales of excess products. The reason for this is that there are no procedures in the unit that provides the legal prescriptions and regulations dealing with conflict. So, when System 2 ensures that the various parts of System 1 of the organisation function in harmony, the possibility of having conflict for the organisation will be low. We also observed that System 3 functionally exists in the Vice Presidency of Sales and Marketing, but it should be improved. Especially, the functions of System 3 should be identified to the whole system and it should be recognised that the Sales and Production Coordination department accomplishes the task responsibility of System 3 for the whole system. In addition, System 3 should exactly conduct the audit enquiries and check the reports periodically which are obtained from the Domestic and Foreign Sales departments. The Vice Presidency of Sales and Marketing had System 4 which is intelligence function and it is represented and performed by the Marketing Analysis department, but it is underdeveloped. One of the functions of System 4 is to provide a management centre via bringing internal and external information together in the organisation. In the Vice Presidency of Sales and Marketing, System 4 gathers external information, but it does not gather internal data and bring them together. So we advised them that they should absorb internal information deriving from lower levels.

In our concluding remarks, we may state that Viable System Diagnosis is a significant systems approach that ensures a restructuring of an

organisation to achieve viability. The use of VSM at Erdemir provided to our client a proposal of a sophisticated organisational structure and a stylish arrangement of information flow for the Vice Presidency of Sales and Marketing department of Erdemir.

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