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**MANAGEMENT INFORMATION SYSTEMS**

**(AN APPLICATION CONCERNING HUMAN RESOURCES MANAGEMENT)**

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**Industrial Engineer Özlem YILDIRIM**

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**Supervisor : Asc.Prof. Füsün ÜLENGİN**

**Commit Members : Prof. Gönül YENERSOY**

**: Asc.Prof. Bülent DURMUŞOĞLU**

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**Tez Danışmanı : Doç.Dr. Füsun ÜLENGİN**

**Diğer Jüri Üyeleri : Prof.Dr. Gönül YENERSOY**

**: Doç.Dr. Bülent DURMUŞOĞLU**

## FOREWORD

Basic problems have not changed in business. Business must be managed in the way to answer conflicting questions of the competitive and changing environment. Managers' time is limited to collect and process data. Although knowledge and variety of practices in functional areas of business are developed and increased, the answer to this sophisticated and challenging environment is given by the help of information technology. This demand can be met by " Management Information Systems " that is a systems approach to managing requires.

Since a complete treatment about the subjects involved in MIS design and operation would require a very long time, in this study only basics about concepts and lyfe cycle of a MIS study is provided. This study aims to point out main objectives and phases of an MIS study, and fundemental information problems that consist of determining what information managers need. It is an implementation study concerning " Human Resources Management " system and its subsystems.

Finally, I wish to express my gratitude to Associate Prof. Dr. Füsün ÜLENGİN for providing the support, and to OTOSAN A.Ş for providing the environment to implement my study. In particular I would like to thank to my family and to my friends, Jaklin GÜNER ( Systems Director ) and Selmin VURAL ( Investment Engineer ), and to all my friends who helped me during my whole study.

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## SUMMARY

The computer and telecommunication are completely changing the way people work and live. It is difficult to predict even a few years ahead the nature of the information society because of rapid changes. The rise of information technology ties in with the need to manage large systems.

Management information systems ( MIS ) are the practical application of management theory, information generation, and systems design to practice of management. A requirement for survival in modern business is superior management of information and the technology of operations. Management information systems ( MIS ) are directed toward these objectives.

Modern MIS provides a system that acts upon the data and information supply to match the information demand. MIS collects data, processes data and identifies information that are useful to achieve goals and objectives. It interprets information by putting it in a format useful to managers.

In this study, basic concepts and phases in a management information system ( MIS ) study is explained. An implementation concerning human resources management is done in a private firm and a new model of this function is produced by setting the general model of the system and its subsystems, and determining data and information flow between these subsystems.

## ÖZET

### YÖNETİM BİLİŞİM SİSTEMLERİ

Yönetim Bilişim Sistemleri işletme içi fonksiyonlar arası veri ve bilgi akışını işletme hedeflerine uygun olacak şekilde düzenleyen bir sistemdir. İşletmenin kısa ve uzun dönemdeki hedefleri, yönetimdeki kişilerin davranış ve tutumları, kullanıcıların sistemden beklentileri önemli bileşenlerdir.

Yönetim Bilişim Sistemlerinde amaç; istenilen bilgiye, istenildiği zaman, istenilen şekilde ve istenilen kişi tarafından ulaşılmasını sağlamaktır. Sistem kurulmadan önce ilk adımda şirket gereksinimleri belirlenmelidir. Kurulacak sistem yeni bir sistem mi olacaktır, yoksa var olan sistemdeki aksaklıkları gidermeye yönelik bir sistem mi olacaktır, buna karar verilmelidir. Her iki durum için ikinci derecede yapılması gereken, sistem analizi yaklaşımını kullanarak problemin ne olduğunu belirlemek, buna uygun hedefleri ortaya koymak, hedef değerlere ulaşıp ulaşılmadığını ölçmeye yönelik performans ve kriter değerleri saptamak ve hangi verileri kullanarak hangi bilgilere ulaşılabileceğini belirlemektir.

Genel amacı yukarıda özetlenmeye çalışılan bir " Yönetim Bilişim Sistemi " çalışması şu başlıklardan oluşmaktadır:

1. Planlama,
2. Kontrol,
3. Tasarım,
4. Uygulama.

Yapılan uygulamada "İnsan Kaynakları Yönetimi" sistemi ele alınmış ve bu sistem yukarıda sözü edilen adımlar izlenerek irdelenmiştir. Sistemde ele alınan şirket A ve B alanında kurulu olan iki ayrı işletmeden oluşmaktadır. Çalışan kişiler işçi (hourly-waged employee) ve memur (salaried employee) olmak üzere iki sınıfa ayrılmıştır. İşletme içi fonksiyon yada departmanlar da " Genel Fonksiyonlar " ve genel fonksiyonları oluşturan " Alt Fonksiyonlar " olmak üzere, ana fonksiyonlar " Fonksiyon A ", " Fonksiyon B ",...; alt

fonksiyonlar da " Fonksiyon A1 ", " Fonksiyon A2 ",... diye sınıflandırılmışlardır.

Planlama aşamasında var olan sistem irdelenmiş ve sistemin aksayan yönleri belirlenmiştir:

1. Var olan işgücü verimli olarak kullanılmıyor,
2. Sistem bilgilerin tamamının depolanmasına ve yöneticiye karar verme sırasında destek olmaya olanak vermiyor,
3. Gereksiz bilgi tekrarı.

Aksayan bu yönler sıralandıktan sonra planlama aşamasında hedefler belirlenmiş ve bu hedeflere ulaşmak için gerekli olan bilgi türleri sıralanmıştır. Hedefler aşağıdaki ana maddelerden oluşmaktadır:

1. İşgücü verimliliğini artırarak birtakım yeni alt sistemlerin sisteme dahil edilmesini sağlamak (Eleman seçim testleri gibi),
2. Yeni bir yazılım paketi (Excel 4.0) kullanarak bilgi depolanmasını sağlıklı hale dönüştürmek ve bu bilgilerin periyodik analizlerinin yapılmasına olanak tanımak,
3. Alt sistemler arası veri ve bilgi akışını etkinleştirip, bilgi tekrarına engel olmak.

Hedeflere ulaşıp ulaşılmadığının belirteci olan performans kriterleri de belirlendikten sonra sistemin kontrol aşamasına geçilmiştir. Bu çalışmada kontrolü, genelde üst yönetimden gelen bilgi isteği ve bu ilginin formatı şekillendirecektir. Çünkü ele alınan sistem genelde başka birimler için gerekli verileri üreten bir fonksiyon olarak düşünülebilir.

Çalışmanın en önemli kısmını tasarım oluşturmaktadır. Tasarım üç ayrı başlıkta irdelenebilir:

- Genel tasarım,
- Kavramsal tasarım,
- Ayrıntılı tasarım

olmak üzere üç aşamadan oluşmaktadır.

Genel tasarımda sistemdeki tüm veri ve bilgi gereksinimi belirlenmiş ve bunlar kendi aralarında sınıflandırılmıştır. Buradan yola çıkarak sistem birtakım alt sistemlere ayrılmıştır ve sistemin genel modeli çıkarılmıştır. Sistemi oluşturan alt sistemler aşağıdaki şekilde sıralanabilir:

1. Tahakkuk-puantaj alt sistemi,
2. Personel alt sistemi,
3. Maliyet analiz alt sistemi,
4. İşgücü, maaş ve organizasyon alt sistemi,
5. Performans alt sistemi,
6. Başvaru takip alt sistemi,
7. İş kazaları alt sistemi,
8. Eğitim alt sistemi.

Herbir sistemin sorumluluğuna giren fonksiyonlar ve bunlar hakkındaki özet bilgi şu şekilde tanımlanabilir:

#### 1. Tahakkuk ve Puantaj Alt Sistemi

Tahakkuk ve puantaj alt sistemi çalışan kişilerin puantörlük bilgilerinin ( işe giriş-çıkış, fazla mesai ve devamsızlık saatleri ) tutulmasından ve bordronun çıkarılmasından sorumludur. Kart basma işlemi yardımı ile her bir kişiye ait giriş-çıkış saatleri bilgi işlemdeki ana sisteme girilmiş olmakta ve ay sonunda bu dataların departman bazında dökümleri alınmakta, bu bilgi de diğer alt sistemlerde ( iş kazaları, insan gücü – maaş - organizasyon,vb. ) veri olarak kullanılmaktadır.

#### 2. Personel Alt Sistemi

Personel alt sistemi işe yeni giren veya işten çıkan personelin giriş / çıkış evraklarını doldurmaktan, bunları dosyalamaktan, ilgili dataları ana sisteme girmekten, hukuki evrakları hazırlamaktan ve zam dönemleri sonrasında beyaz yakalı çalışanın ücretlerini ana sisteme girmekten, çalışan kişinin herhangi bir bilgisinde ( ünvan, adres, çalıştığı yer, vb. ) değişiklik olduğunda bunları güncel halde tutmaktan sorumludur.

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Program : ENGINEERING MANAGEMENT

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### 3. Maliyet Alt Sistemi

Maliyet alt sistemi heray mavi ve beyaz yakalı personele ait ait işgücü maliyetlerini çıkarmaktan, yıl sonunda insan kaynakları bütçesini hazırlayıp üçer aylık dönemler sonunda da bütçe bilgileri ile değerleri karşılaştırmaktan ve gerekli önlemleri almaktan sorumludur. Ayrıca sözleşme dönemlerinde altışar aylık dönemler bazında saat ücretli çalışana ait giydirilmiş ücretleri ( çalışan bir kişinin işverene maliyeti ) hesaplamakta ve bunlarla ilgili maliyet analizleri yapmaktadır.

### 4. Analiz Alt Sistemi

Analiz alt sistemi dönem dönem yapılması gereken ücret analiz çalışmalarını yürütmekten sorumludur. Bu çalışmaların bir çoğu işçi - memur ücretlerinin karşılaştırılması temeline dayanmaktadır. Çalışmalar genellikle işçi yada memur zam dönemleri ( Ocak, Mart, Temmuz, Eylül ) sonrası yapılmaktadır. Bu çalışmalardan ilki, mevcut durumun analiz edilmesi ile birlikte kademelere göre yeni alternatif ücret eğrilerinin oluşturulması ve bu herbiri için maliyet analiz çalışmalarının yapılıp, optimum ücret eğrisinin belirlenmesidir. Bir diğer çalışma memur statüsünde görülen " Ustabaşı " ünvanında çalışan kişilerle, işçi statüsünde olup da " Postabaşı " ünvanı ile çalışan kişilerin herbir fonksiyon ( atölye veya müdürlük ) bazında aylık ücret karşılaştırmalarının yapılması ve gerekli önlemlerin alınması konusunda raporlar hazırlanarak bu raporların üst yönetime sunulmasıdır.

### 4. İşgücü Planlama, Ücret ve Organizasyon Alt Sistemi:

İşgücü planlama, ücret ve organizasyon alt sistemi, çalışan işgücünün nitel ve nicel özelliklerini izlemekten ve bu değerleri güncel halde tutmaktan, kademe ve ünvan bazında ücretlerle ilgili istatistiki çalışmalar yapmaktan, zam dönemlerinde üst yönetimin karar vermesine destek sağlayabilecek bilgileri üretmekten, yıl sonuna doğru mevcut kadro yapısını belirleyip bir sonraki yıl için gerekli işgücünü iş ünvanlarına göre belirlemekten ve yılda iki kez detay organizasyon şemalarını hazırlayıp, diğer dönemlerde de organizasyon yapısı hakkında kararlar alınmasında üst yönetime destek sağlayacak bilgileri hazırlamaktan sorumludur.

## 5. Performans Alt Sistemi

Performans alt sistemi, beyaz yakalı personelin yılda iki kez performans değerlendirmesini yapmakla sorumludur. Performans değerlendirilmesi yapılmadan önce var olan işgücünün herbir müdürlük bazında ad, soyad, iş ünvanı bilgilerini içeren listeler alınır. Herbir kişinin bağlı olduğu yönetici kişi ile ilgili değerlendirmeyi yapar, bir başka deyişle daha önceden belirlenmiş herbir özellik için uygun olan puan kişiye verilir. Bilgisayara girilen veriler yardımı ile herbir kişinin o döneme ilişkin performans değeri hesaplanır. Performans değerlerinin kademeler arası dağılımı ve işletmenin belli bir fonksiyonu içerisindeki dağılımı grafik ve raporlar yardımı ile çıkarılır ve üst yönetimin görüşüne sunulur.

## 6. Başvuru Takip Alt Sistemi

Başvuru takip alt sistemi, şirkete başvuran beyaz yakalı ve mavi yakalı personelin başvuru formlarını izlemekten ve gerektiğinde istenen bilgiye en hızlı şekilde ulaşmaktan sorumludur. yakalı personel başvuru takibi için Excel 4.0'da bir veri tabanı yapısı oluşturulmuştur. Bu yapı içerisinde şirket içinde en çok gereksinim duyulan elemanlar için işlemi otomatize eden macrolar yazılmıştır. Oluşturulan kodlama sistemi yardımı ile de istenildiği anda istenilen niteliklerdeki elemanların listelerinin alınması işi kolaylıkla yürütülmektedir.

## 7. İş Kazaları Alt Sistemi

İş kazaları alt sistemi, şirket içinde meydana gelen iş kazalarının departmanlar bazında takibinden, aynı endüstri alanındaki diğer kuruluşlar içerisindeki yerini belirlemekten ve gerekli önlemleri almaktan, zaman zaman bu konu ile ilgili anketleri doldurmaktan sorumludur.

Her ay çıkarılan iş kazası raporu, şirketin herbir fonksiyonu için hesaplanan kaza parametrelerini ( Kaza frekansı (F), kaza ağırlık oranı (V), kayıp saat oranı (K), genel kazalanma oranı (GKO), kaza rizikosu (R) ), o yılın hedef değerleri ile gerçekleşen değerleri arasındaki sapmaları, kümüle değerleri, olay türlerinin dağılımını ve bu olaylar sonucu hangi uzuvların zarar gördüğünü gösteren bilgileri içermektedir. Bu bilgiler kapsamında kaza rizikosu fazla olan atölyelerde zaman zaman teknik analizler yapılmakta ve iş kazalarını azaltmaya yönelik önlemler alınmaktadır.

## 8. Eğitim Alt Sistemi.

Eğitim alt sistemi, şirkete yeni giren personele ve stajyerlere oryantasyon eğitimi vermekten, şirket içi ve şirket dışı yapılan eğitimleri planlamaktan ve eğitimlerin daha verimli olmasına yönelik katılımcı fikirlerini alıp değerlendirmekten sorumludur.

Ne tür bilgilerin hangi kullanıcılar tarafından istendiği, bunların sıklıkları, hangi yöneticilerin hangi bilgilere gereksinim duyduğu, her türlü bilginin kaynağı, alt sistemler arası veri ve bilgi akışı şekil ve tablolar yardımı ile gösterilmiş ve alt sistemlerle ilgili detay çalışmalar yapılmıştır. Ayrıca sistem kısıtları da belirlenmiştir. Detay çalışmalar olarak adlandırılacak bu çalışmalar tasarım bölümünün içeriğini oluşturmaktadır.

Tasarım bölümünde dikkat edilmesi gereken şudur: Genel ve kavramsal tasarımda genel çizgileriyle ortaya konan sistem, ayrıntılı tasarımda alt sistem hedefleri, akış diyagramları, sistemin işleyişi hakkında genel bilgi, kullanılan bilgisayar programları açısından irdelenmiştir. Herbir alt sisteme ilişkin akış diyagramları, gerekli prosedürler, raporlar hakkında bilgi ve program çıktıları ekte yer almaktadır.

Sonuç ve öneri bölümünde, yapılan çalışma sonucu elde edilen bulgular ve ileriye yönelik bir yönetim bilişim sistemi çalışmasında var olması gereken nitelikler vurgulanmaya çalışılmıştır.

Yapılan bu çalışma sonucunda, insan kaynakları yönetimi kapsamı içerisine giren birçok fonksiyon irdelenmiş, sistem alt sistemlerine ayrılarak genel bir çerçeve çizilmiş ve daha sonra herbir alt sistemin gereksinimi olan bilgiye ulaşılmasını sağlayacak yapı sistemin kullanacağı veriler de dikkate alınarak bilgisayarda kurulmuştur.

Sayısallaştırılması çok güç olan, fakat üst yönetime karar almasında çok önemli destek veren insan kaynakları yönetiminin ve içerdiği fonksiyonların sistem analizi çalışması sonucunda gerçek boyutları çizilmiş, içerdiği alt sistemler arası veri ve bilgi akışı ortaya konulmuştur.

Bilgisayarda kurulan raporlama düzeni yardımı ile periyodik bilgilere hemen ulaşma olanağı doğmuş, her türlü analize olanak tanıyan bu yapı

yardımı ile sistemin işlevsel etkinliği arttırılmıştır. Sistem içi işlevsel etkinliğin artması ile birlikte istenilen bilgiye, istenildiği zaman ve istenen şekliyle ulaşmak olanağı doğmuştur. Böylelikle insan kaynakları yönetiminin gerçek boyutunu ortaya koyan eleman seçimi işlevinde psikoteknik testler uygulanmaya başlanmış ve verimli olabilecek insan gücü seçiminde bir adım daha atılmıştır. İş değerlendirme sistemi güncelleştirilmeye başlanmış ve daha etkin olabilecek işgücü planlarını oluşturma olanağı yakalanmıştır. Bütün bunlar sistemin verimliliğinin artmasına birer örnektir.

İşletme içi tüm fonksiyonları içeren "Yönetim Bilişim Sistemleri" çalışmasında işletme problemlerini çözümlenebilmek için sistem ve bilgi sistemleri irdelenmelidir. Ancak gerçek yaşamda doğru olan tam bunun tersidir. Bir yönetim bilişim tasarımcısı işletmenin organizasyonel yapı ve karar verme yapısını olduğu gibi kabullendikten sonra bu yapıya hizmet verecek sistemi kurmalıdır. Sistemin sağlıklı bir yapıya ulaşmasını ve kabul görmesini kolaylaştırabilmek için herbir uygulayıcı bölümün elemanlarından oluşan bir sistem kurulmalı ve çalışma böylelikle yürütülmelidir.

## CHAPTER I      OUTLINE OF THE STUDY

### 1. Introduction

Whether you have a system or not, whether your needs are computer operated programs or not, whether your company is large or small, if you need an updated and accurate information, and use this information in your decision process, MIS will provide this in an efficient way.

An organisation is a whole that is made up of systems and subsystems. These systems and subsystems work together to achieve the organisation's goals. Information flows in this organisation through several levels. At the top, management planning and control stage takes place. The goals of the organisation are set in this stage. Then the functional areas as selling, production, marketing are set to achieve these goals at the functional level. The last one is the operating and control level. Detailed plans, policies and procedures are defined in order to meet the goals in this stage.

In general, data are processed and information is gathered. The information that is gathered after these stages generally gives idea about the cost and selling prices of products, the competition ability of the firm in the market, the inventory level and etc.

Some firms are small and they only require the most basic informational data, some are of big size and the management's needs spread at each level of the organisation. These levels are operating, functional and strategic. So, it can be seen that a management information system may vary from one company to another. The requirements of the organisation and its size will shape MIS.

In this study, Human Resources will be analysed in detail in Chapter :4. Due to the fact that a complete study of an MIS takes so long time. In this

study only one of the organisation functions considering all the steps of MIS procedure is investigated.

It would be better to talk about the general content of the chapters in order to customise the outline of the study. In Chapter 1 general meaning of MIS and different ideas about its definition is discussed. The basic concepts of MIS are also included. Then challenges of MIS are taken into consideration, because MIS study is influenced by the organisational behaviour and the strategic planning of the firm.

In Chapter 4 an application concerning human resource management takes place. First of all general features of the existing system are told and the problem is defined. Solution is done by taking into consideration the steps in the MIS life cycle; that is planning, controlling, designing, and implementation.

Since some of the resources are limited, and as is mentioned before MIS study is influenced by organisational behaviour, the things that would be done to have a more effective system is argued in " Further Suggestions ". It is also talked about the new technological improvements ( Local Area Networks ) in Further Suggestions.

## CHAPTER 2 WHAT IS MIS & ITS CHALLENGES ?

### 2.1 What is MIS?

MIS is derived from information needs of managers and depends on capturing internal and external data. The system that monitors and retrieves data from the environment, captures data from transactions and operations within the firm, filters, organises and selects data and presents them as information to managers to generate as an information is called MIS [1]. Another definition is by Alexander Hamilton Institute [2] : " MIS is not one system, but a series of interrelating operational subsystems that support the ongoing process of the business. Three threads of historical development have interviewed to bring about the modern MIS. These are;

1. The development of accounting theory,
2. The development theory of management theory,
3. The introduction of the electronic computer.

Three changes occurs;

- Management has become system-oriented and more sophisticated in management techniques.
- Information is planned for and made available to managers as needed.
- A system of information ties planning and control by managers to operational systems of implementation. The combined result of these concepts is the MIS.

Managers have always had the "sources" of information, but MIS provides a system for information. Because it is a network of data and information flows, reporting on both internal and external conditions and facilitating appropriate responses to those conditions.

If it is thought broadly, it can be seen that an MIS system in an organisation is composed of four subsystems which are Transaction Processing Systems, Information Reporting Systems, Decision Support Systems, and Office Systems.

Transaction Processing Systems includes day-to-day operations such as inventory control, receivable, accounts payable, and these operations builds up an important part of firm's computer processing.

Information Reporting Systems are the by-products of transaction processing systems. They are the preplanned reports for decision-making purposes and consist of routine summary.

Decision Support Systems provides decision makers easy-to-use modelling and reporting abilities so that the decision makers can easily choose the useful information they can use in making decisions.

Office Systems which can be defined as office automation, includes the use of computer based technologies and is not homogeneous for every firm.

## 2.2 Basic Meaning of MIS

" Why do people need MIS in their firms? " and " What is aimed by putting MIS into use in the firms? ".

First of all MIS provides an operational efficiency which refers to doing routine tasks faster and more cheaply. For example; word processors have the potential to increase typing efficiency. It is said that MIS help managers make better decisions. This is the functional effectiveness of MIS. It can also help organisations provide better service to customers and clients.

MIS is related to three components: Managers, process systems and information. The system that takes external and internal data and converts them to information for management decision making is MIS. Managers make decisions on no longer-term and brooder-scale than do other individuals in a firm.

This system not only provides information to assist managers in making decisions, but it can also be designed to provide decisions for repetitive classes of problems. The modern MIS provides a system that acts upon the data and information supplies to match the information demand. It interprets information by putting it in a format useful to managers.

As a result, a management information system, or information system is to be considered of any system that provides to people either data or information relating to an organisation's operations [3]. It is perceived as an area that can generate opportunities for the firm instead of only problems.

### 2.3 Challenges Underlying MIS

MIS is a difficult study even after defining a problem, finding the solution and implementing it. It is not exactly known that this is the best action that is done since there are various functional areas in business and the problems of these areas are different. The other field that influence MIS study are the organisational behaviour, computers and communications, and strategic planning of the firm. Every week many new technological developments end new products are announced and many new terms are included.

This is the computer and communication side of influence. Due to the organisational behaviour, so many people in the organisation may show different rejections or actions to new system. This is another handicap. Another one is the strategic planning of the firm. most of the time, nobody wants a brief information about the strategic planning of the firm.

The last difficulty in MIS study is that some MIS problems are not easy to define or structure. Because, it is generally so difficult to set the main problem and find the solutions, since the problems are dynamic in nature and the environment of the problems may change till the solution is found. It is also difficult to quantify the solutions in terms of money.



## CHAPTER 3 MIS IN MANAGEMENT

### 3.1 MIS for Management Support

In business, information is needed in every phase of decision making process and management. The managers want the information to be accurate, on time and efficient. MIS is effectively used by managers to achieve these goals. In this chapter the stages during which MIS can provide management support are analysed. By this way, it can be seen how MIS will be useful in management in terms of planning, controlling, reporting, problem solving and decision making. That will be useful for the reader to have a general idea of management systems and is used later in Chapter 4 in detecting the problems, planning and designing the new system to solve these problems.

### 3.2 Planning with MIS

First step of an MIS is planning phase. If an MIS is well-planned it can adapt itself quickly to the changing demands of management. Planning is generally deciding the things to be done, deciding the way of doing these things and choosing the most appropriate time to do these things. The last step of planning is choosing the right person to plan.

Planning process, supported by an effective MIS, provides the means for companies to adapt before disaster strikes. Plans are guidelines and directions that co-ordinate efforts.

The need for planning is constantly increasing, since the adapting time of the firms to the environment is shortening. So, plans should be described very well, in terms of purpose, level, scope, time span and information requirement.

The first process in planning is defining the objectives of the company for the short and long term. The next step is defining the information requirements that are needed to achieve these goals. The third step is the feasibility study. Here, it is determined if the organisation has the resources to support the goals and is learned if the planned system is operationally efficient. After the feasibility study has been approved detailed design stage of the system can begin.

### 3.3 Controlling with MIS

Even if planning phase is very well designed, a controlling system is also needed in order to measure deviations from the goals that have been set in planning phase. Here, general meaning of control is investigated, and some controlling systems used in management information systems are analysed.

If it is thought broadly, control is bringing or maintaining the performance or characteristics of a group, individual, machine or facility [ 4 ]. The role of MIS in controlling is to inform management whether the limits have been exceeded or are likely to be exceeded. In other words, standards of performance should be set, performance against standards should be measured, and corrective action to deviations from standards should be taken in order to control a system.

There are some basic concepts of control such as open & closed loops, feedback control systems, yes-no control and some other statistical analysis. In this study these systems are investigated in order to give an idea about how they are used in business.

#### 3.3.1 Open & Closed Loops:

An open-loop system is one with just inputs, processes and outputs, with no connection or information from the process or outputs back to the inputs. In the open-loop system, the control depends upon the inputs and the processes being correct. Nobody gathers data to compare.

In closed-loop systems, information about the process and the outputs is fed back to a controller, who adjusts the inputs and system when necessary.

### 3.3.2 Feedback Control Systems:

Feedback control is commonly used in business. A major objective of any MIS is to feed information on results back to managers.

The process of feedback control consists of;

1. Setting a standard of performance from the standard.
2. Measurement of performance against standards.
3. Reducing deviations of performance from the standard.

### 3.3.3 Yes-No Control:

All business operations, transactions, and decisions should be bounded. All the top level of management, suppose that a vice-president is considering authorising the construction of a 2 million TL. plant. The company's policy guide states that he can spend only up to 500.000.TL His desired action is no-go, because it exceeds control limits.

### 3.3.4 Reporting Systems:

Feedback on performance is contained in reports. The higher the level of management, the more likely it is that graphic or visual displays are used instead of tables of data. Such graphics allow easy comparison of present performance with past performance. It is also possible to add bars or curves to show planned values for comparison with actual ones or to show the plan for the future.

MIS control system should provide a hierarchy of controlling reports, starting with complete detail at the lowest level. At each higher level the information becomes more aggregated or summary in nature.

A characteristic of the hierarchy of reports is the frequency of reports. At the lowest level of management weekly or even daily reports are necessary. At the top level monthly, quarterly and annual reports are adequate for controlling purposes.

### 3.3.5 Statistical Analysis For Control:

MIS can classify, combine, and summarise masses of data to provide valuable information for control at middle and first line management levels. One of the most useful type of information is the control of extreme values of variables. For example, perhaps the statistical analysis shows that 10 percent of the items in the number of deadlines represent the 70 percent of the frequency of deadlines. Then management will be able to exercise careful procedural control over these items and spend very little on the control of other items.

## 3.4 Designing with MIS

Designing is the third phase of MIS. After controlling is done, key data are gathered and are processed in order to produce a model. Conceptual design, documenting the conceptual design and detailed design are basic concepts of this phase. These concepts will be analysed in detail in this chapter in order to make reader understand the application better.

Designing depends upon the quality of planning. During this stage it must be decided whether to implement a manual or a computer-based system or a combination of the two.

It would be better to think about if the system operates effectively with or without a computer. It is also important if a manual system is sufficient to provide the information in the required formats and if the response time will be adequate to support the objectives of the organisation.

The first step in systems design is to gain the organisation support. Members of the organisation should be informed of the objectives and nature of the study. If not, when final system is announced, it may be met with shock.

In the design phase it is important to decide the kind and the form of information that should be provided, and the person that the information should be given.

First, every kind of key data needed are gathered from each of the operating functions of the firm. Then the subsystems of the system are set. Now, the designer's aim is to describe the information requirements of each function and to develop the relationship between the other areas of business. At the end a model will be produced for each function and then these models will be merged into to achieve the total information system.

In this study as mentioned before only the human resources function and its subsystems will be analysed in detail, in Chapter 3.

### 3.4.1 Conceptual Design of MIS

Conceptual design is the description of MIS by means of narrative, flow charts, layouts and lists.

In this phase, an idea about;

1. The company organisation,

2. Processing system of the company,
3. Responsibilities,
4. Information needed
5. Sources of information gathered
6. List of reports obtained
7. Characteristics of database,
8. Computer and software requirements.

Following the identification of the managers' as well as the establishment of the organisation and operations structures are established, the sources for the information supplied should be determined. Procedures that should be followed are as follows:

1. Internal records and external documents received should be analysed. Internal records are generally the forms and document files. External data may be located in government reports, in economic and competitive statistics.
2. Input / Output analysis of data to systems and from systems should be done.
3. In order to depict the existing design of a subsystem multidimensional flow-charting is used [1].

As it is understood, information needed by managers can be derived from the sources. When need and sources of information are known, the flow of data and information may be described by means of block diagrams or matrixes. Information received by a manager comes from other managed groups within the company; directly from outside agencies, or from computer-produced reports. The purpose of the block diagram is to present an overall picture of MIS information flow. Difficulty is that, such diagrams get more complex as they get more detailed. Within each cell, information originating from the source at the left and received by the receptor at the top is written out or listed by code.

Generally it is thought about linking inputs, databases, reports and computer support systems.

This is the conceptual design of subsystems. Now, a list of files may be prepared. Files may be simply listed and then a matrix may be prepared that relates the files to usage in subsystems. Here comes the system outputs. System outputs can be detailed or summarised. So, it is important to decide the kind of form the output reports to take and the structure of the information.

### 3.4.2 Documenting the Conceptual Design:

For recording the design, it would be useful to prepare a formal report that includes need for the MIS, objectives of the MIS, constraints and conceptual design.

Conceptual design includes,

- a. List of managers, responsibilities, and information requirements,
- b. Information flow charts,
- c. Subsystems: Input and outputs,
- d. General description of the database and list of files,
- e. General description of the report system,
- f. General description of the computer system,
- g. Cost estimate for detailed design and implementation.

Another important thing is the output-data. This definition includes where data go, what form they take, and who is responsible for receiving them. Here, the distribution of output,(who gets what, how many copies, and by what means), the frequency with which output will be called for and its timing, and the form of the output is important. At this point, the designer should have to answer what form the output reports are to take, if the information should be detailed or summarised, how many copies of the output are needed, if the reports are generated on demand, by exception or on schedule and at what frequency these reports are published.

### 3.4.3 Detailed Design of MIS

Whereas gross design gives overall specifications for MIS, detailed design yields the construction and operating specifications. This qualification needs project management of detailed design. Therefore, planning and organising step is the first step in detailed design. Then, responsibility for each subsystem must be identified and the person responsible for each subsystem must obtain the information to manage it.

During detailed design, aim is to develop gross MIS design into more detailed form and describe how to document this detailed design.

This description consists of drawings, flow charts, equipment and personnel specifications, procedures, specification of information files, organisation and operating manuals to run the system. Another part of the design is the documentation of analysis and testing that justifies the design.

#### 3.4.3.1 Obtaining Information:

In order to analyse information, first it should be gathered. There are four principal sources to gather information. These are;

1. Task force meetings,
2. Personnel interviews,
3. Internal and external source documents,
4. Personnel observations of operations and communications.

Here, it would be adequate to describe these sources shortly.

### 3.4.3.1.1 Task Force Meetings:

Task force meetings should consist of both managers and key specialists. The designer's function is to draw out ideas and information, synthesise ideas, represent these ideas in diagrams and documents, make synthesis for evaluation and modification.

### 3.4.3.1.2 Interviews:

Instead of task force meetings, or in addition to task force meetings, the designer may have an interview with key managers, key specialists and operating employees.

In interviews with managers, designer should have information about;

- a. Objectives of the firm or organisational component,
- b. Major policies,
- c. The categories of information managers desire,
- d. Speed of access to various categories of information,
- e. Intervals of time desired between receipt of various types of information,
- f. Format desired for information represented,
- g. Degree of manager involvement in classes of decisions: individual decision making, participate decision making, or partially routine decision making.

### 3.4.3.1.3 Internal & External Source Documents

The number of internal source documents may be great depending on the size of the company. Some of them are organisation and policy guides, procedures' manuals, master budgets and account structure, functional reports of departments. External source document provide economic, marketing, industry and financial information.

### 3.4.3.1.4 Direct Observation:

Direct observation is important in decision making in action. The designer should record the relevant data he is gathering. He should make notes of points that are important during his study and at the end of certain phases. Then, he should organise this gathered data in order to use effectively during finding out relations between these data and future information needs.

In this study, task force meetings, interviews and direct observation is done in order to obtain information.

### 3.3.3.2 Detail the Information Needs of Managers

The objective of MIS is to give managers chance of getting information when they need that is most important. As it can be seen from Figure: 3.1 below, the upper right should be as possible as large, besides the upper left

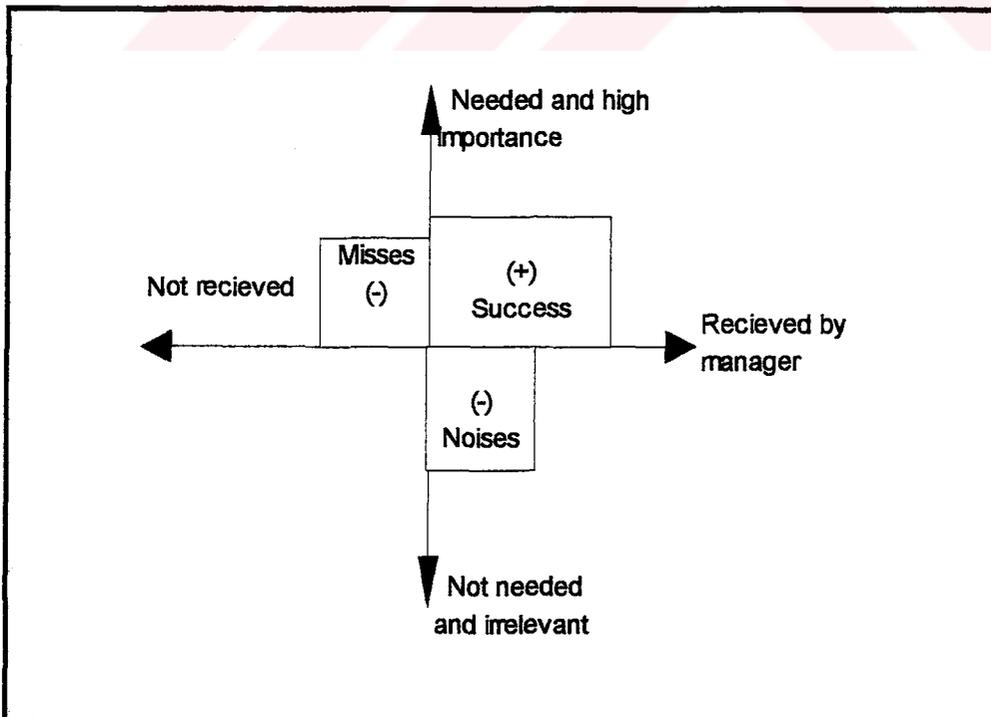


Figure 3.1: Measure of Information need Satisfaction [ 1, page 563 ]

square should be as small as possible. This means that, managers should not receive reports and data unless they have a need for them at some particular time. So, they may always obtain available data upon their own requests if they need it.

#### 3.4.3.2.1 Procedure for Developing Information Needs:

In order to develop the information needs of a manager, first of all the position and the responsibility of the manager should be and both the kind of decisions and information needed to make decisions should be identified. Detailed information specifications for the manager should be developed and the source of each information element should be signified.

Generally, it is very difficult for the managers to identify these information needs. So, the system designer should take on a big task. He must explore;

1. Objectives of the manager's position,
2. His relationships with other company activities,
3. The kinds of problems and decisions he himself is actually involved with.

Now, it is suitable to describe each item of manager's information.

This involves specifying;

- Level of detail and frequency of the report,
- Media of the report (It means if the report is written, oral, or display device.)

- The format or the organisation of the report with its timing is also important.

As a result, each designer should get details of information needs of each manager.

#### 3.4.3.2.2 Information Sources

Now, it is time to determine the sources of information when a need is given. There are some kinds of sources that managers obtain their information. These may be external sources, superiors or subordinates, reports issued from other organisations in the company or files (Databases).

External sources may be casual conversations, publications or meetings. Specific publications could be sent to manager or information request forms could be developed to seek information from outsiders and weekly staff meetings should be done in order to make sure that a good system of files is established.

#### 3.4.3.2.3 Develop the Database

A database should be developed in order to guard total business system. It is wise to start with the study of management's problems and information needs and then detail the data requirements of the system.

### 3.5 Installation and Implementation of MIS

Converting design concepts into a working system may be more difficult. This conversion is usually called implementation of the design. Implementation consists of organisational change and technical change. Technical implementation consists of acquiring facilities, equipment, and

personnel; conversion from the old to the new MIS; testing the new MIS, evaluating the project, and maintaining the system.

Training is given to the members of the company about the new system and it is thought what kind of reports can be taken from the system, which input should be entered and generally how the system works.

Testing is the final process before activating the system. When a new computer-based system replaces a manual system, the most frequently used testing tool is the parallel testing method. The old system continues to operate as a control against the performance of the new mechanical system. When the new system operates satisfactorily then the old manual system is discontinued.



## **CHAPTER 4 AN MIS APPLICATION IN A PRIVATE FIRM**

### **4.1 Human Resources Information System**

Before human resource management system is analysed, it would be better to give an idea about basic information systems. The major operating systems are;

- 1. Engineering,**
- 2. Manufacturing operations,**
- 3. Marketing,**
- 4. Finance,**
- 5. Human resource services,**
- 6. Administration,**
- 7. Public and stockholder relations,**
- 8. Technical services units of various kinds.**

The information system for each of these operations are, in large modern computerised companies, tied to all others through a central database. Since all retrieve data from the same source, it is possible to avoid duplication and considerable cost.

When human resource management information system is taken into consideration, it can be seen that this system deals with the flow of information about people working in the organisation as well as future personnel needs. In most organisations, the system is concerned primarily with the five basic subsystems of the human resource functions. These are;

- 1. Recruiting,**
- 2. Placement,**
- 3. Training,**
- 4. Compensation,**

## 5. Maintenance.

Human resource management should be considered a total system that interacts with the other major system of the organisation - marketing, production, finance - as well as the external environment.

It is a buffer between manufacturing management and the labour element in the environment. It must cultivate sources of the labour resource-employment agencies, colleges and universities, trade schools, government agencies, and the local community. It processes the termination and the resource is returned to its environment-the local community, a competitor, organised labour, or some other environmental element.

One of the most difficult duties of human resource department is to supply the applied manpower in desired quality and quantity and on the desired time.

The personnel database gives the opportunity to classify the existing manpower according to line and staff managers, salary groups, educational levels and backgrounds, working groups and functional responsibilities. This database shortens the time to get any kind of information about manpower because it is so difficult to follow up the records of man-power without a computer.

In many firms the human resource is organised as labour unions. A contract or agreement is established between the firm and those employees who belong to the union. The contract provides the basic information describing the expectations and obligations of both the firm and the union members. The firm's industrial relations department can play a vital role in this information flow.

The two-way formal flow between the manufacturing management and the personnel department consists of written requests for personnel and data sheets on applications. A formal flow can also exist from manufacturing

management to upper-level corporate management. This flow consists of reports detailing the degree to which the contractual terms are being followed up.

Shortly, forecasting and planning the manpower needs of the organisation, maintaining an adequate and satisfactory work force, and controlling the human resource policies and programs of the company are the major responsibilities of human resource management.

To achieve the above goal, a manpower system is necessary. Like any system, it consists of a number of inputs and outputs, and a number of related subsystems, processes and activities, all operating through the medium of information.

Manning tables, job specifications, and other personnel data are also useful in this subsystem.

Placement system is maybe the most important of all personnel functions. Because this system matches available personnel with requirements, and the effective use of manpower a resource that takes place within this system. A well designed placement information system takes into account the latest behavioural tools and techniques ensure that the capabilities of people are identified and placed with properly organised work requirements.

The task of training and development system is to update the work force in new techniques and developments. Because, technological changes and demands for new skills grow up rapidly and companies must necessarily develop much of their talent requirements from internal sources. Basic information requirements include a continuing skills inventory of company personnel matched against a forecast of current and estimated needs for improved skills.

The basic function of the compensation system is the pay and other values for the satisfaction of individual wants and needs. Information needs of this subsystem is generally the traditional payroll and other financial records.

Maintenance system is largely for the benefit of operating managers and it should be designed to ensure that personnel policies and procedures are achieved.

Safety system is concerned with the health of personnel and the analysis of job accidents.

Human resource requirement plans (documents) become inputs to job analysis (documents). Job descriptions (documents) and job specifications are generally used as working papers or stored in the database.

## 4.2 Overview of the Existing System

After general responsibilities of human resource management are explained, and duties of the system are analysed according to its subsystems, it would now be appropriate to talk about the need for this application.

During the process of deciding to implement an MIS, information needs should first be described. There are two different ways for the systems analyst to follow that differ according to the firm's orientation. If the firm follows an objective orientation, the analyst can start with the objectives and then convert the findings into responsibilities, decisions and information needs. But when a firm follows a problem orientation, the analyst focuses initially on problems, subsequently on decisions necessary to solve those problems, and finally on the information needed for decision making.

In this study, the firm is assumed to be problem oriented. Because there is an existing information system and some data are included in this system, but this system is not sufficient and not used effectively.

The system is not sufficient, because there is not enough hardware and software. There are two computers one of which is working under the system named A6, and the other B20. In the computer A6, some constant data about every employee are input by the personnel expert. Only input process is executed by this computer. Outputs are taken from systems department. In B20 existing software are multiplan, office designer and office spreadsheet. A multiplan sheet consists of 255 rows and 63 columns. So, the study is restricted by this area. Another drawback is that one can not to draw graphics due to insufficient memory size. Office designer is a kind of software generally used by secretaries. Office spreadsheet looks like a Lotus application, but insufficient memory is also a problem in this software.

Data existing in this system are;

1. Constant personnel data, such as name, surname, date of birth, place of birth, education, etc.
2. Execution data, such as salary information form, in and out hours for every employee, distribution of unworked hours and overtime hours according to organisational codes.
3. Information about titles. This includes how many employee in every title (such as industrial engineer, project engineer, or driver) both in blue and white-collar workers exist, what their minimum, maximum, average salaries and what their average working years in the firm are.
4. Information about annual holidays. These are the data and information that exist in the computerised system. There are also some data in manually operated system, such as application forms, salary research questionnaires, employee performances, job evaluation forms and job accidents.

So, the existing problems are:

1. Tasks are executed slowly,
2. Data can not be converted into information that helps the manager reach better decisions,

### 3. Insufficient utilisation of man-power.

The designer or systems analyst, should aim to solve these problems by defining the objectives of the company for short and long terms. This is the study of the planning phase.

#### 4.2.1 Planning Phase

It is easy to define the objectives of a company for short term, but this is not true for long term objectives, since people in the strategic level of management don't want to give information much about companies' objectives. So, objectives of Human Resource Function should be assumed for short term only. They are;

1. Increase operational efficiency:
2. Increase functional effectiveness:
3. Make information storage easier and make information available in the desired time and format.

For each objective the system's analyst aim is:

1. Increase operational efficiency:
  - a. To do some routine tasks (such as periodical reports) faster,
  - b. To increase the speed of information flow by the help of efficient and summarised reports.
2. Increase functional effectiveness:
  - a. To enable to store specific data over periods,
  - b. Analyse these data during these periods in order to help manager to make better decisions.
3. Make information storage easier and make information available in the desired time and format.

Information requirements to achieve these goals are;

1. Personnel database which gives us opportunity to classify existing man-power,
2. Personnel needs and skills,
3. Manning tables, job specifications, job analysis and job descriptions,
4. Education requirements,
5. Analysis of job accidents,
6. Financial reports that includes budget, pay and other values, man-power costs,
7. Work attendance and overtime information,
8. Personnel performance values,
9. Periodical reports send to holding,

These information requirements can be detailed as given below:

1. Personnel database which gives us opportunity to classify existing man-power according to,
  - a. Salary groups,
  - b. Education levels and backgrounds,
  - c. Working groups,
  - d. Functional responsibilities,
  - e. Hierarchy,
  - f. Status.
2. Personnel needs and skills:
  - a. Skills required for company programs and processes,
  - b. Inventory of skills available in the organisation,
  - c. A database about skills tests.
3. Manning tables, job specifications, job analysis and job descriptions,
4. Education requirements,
5. Analysis of job accidents,
6. Financial reports that includes budget, pay and other values, man-power costs,
7. Work attendance and overtime information,

8. Personnel performance values:
  - a. Grades taken during the first half of the year,
  - b. Overall performance of an employee during the whole year.
9. Periodical reports sent to top managerial staff:
  - a. Detailed organisation charts,
  - b. Personnel data during new entries or exits,
  - c. Cost analysis during new labour union agreements periods,
  - d. Employee numbers and their distributions,
  - e. Changes in the organisation.

#### 4.2.2 Controlling Phase

During this phase standards of performance should be set and performance against standards should be measured.

Constraints of the system are:

- a. Manpower,
- b. Working time,
- c. Hardware and software.

Performance criteria are;

- a. Number of new subsystems included in the system by increasing productivity of man-hour used.
- b. Number of new reports designed to be used effectively in decision making processes.

In this system, basic concepts (Analysed in Part 3.2: Controlling with MIS) of control such as feedback control systems, yes-no control and reporting systems are used to control the deviations from system's standards.

After reading an application form, the manager may decide to invite or not to invite the application to the interview by matching his or her specifications with that of the firm's vacant position. This is an example of yes-no control.

An example can be given about reporting systems, since feedback on performance is contained in reports. Exceeded limits can easily be seen by the help of graphics or visual displays.

### 4.2.3 Designing Phase

In this study, it is wise to implement a system that is a combination of both manual and computer-based system. Because a manual system itself is not sufficient to provide the information in the required formats. Steps in design phase are general design, conceptual design and detailed design.

In the beginning general design of the system will be analysed. Here procedures are as follows:

1. Data gathering,
2. Classification of data and information, setting subsystems of the system
3. Setting a model of the system.

#### 4.2.3.1 General Design

##### 4.2.3.1.1 Data Gathering

There are so many data in this system. But, to make it easier to classify these data and to decide about subsystems, it can be considered that nearly all the data are gathered on the basis of organisational codes, for

salaried and hourly-waged employee, for plant A and B and for the whole firm.

Information gathering is a complex process. It does not consist of simply asking questions and receiving complete answers. It needs patience in order to piece together system views.

At the beginning of a project, the analyst will be trying to learn what is being done, why it is being done, how it is being done, who is doing it, and major problems associated with what is being done.

For major systems, the analyst will gather data at the following levels:

1. Environment of the industry and the company,
2. The industry in which the company is competing,
3. The company and top management,
4. Middle management,
5. First-line management and operating systems.

Since this study is a small project, it is only about one function of a private firm, so only lower levels of the company is taken into consideration. So, data about this function can be listed as follows:

1. Number of hourly-waged employees,
2. Number of salaried employees,
3. Salaries of the title (for hourly-waged employee),
4. Salaries of the title (for salaried employee),
5. Salaries of the grade (for hourly-waged employee),
6. Salaries of the grade (for salaried employee),
7. Salaries of the status (for salaried employee),
8. Average working year of the hourly-waged employee (Plant A, plant B, for the whole firm),

9. Average working year of the salaried employee (Plant A, plant B, for the whole firm),
10. Average age of the hourly-waged employee (Plant A, plant B, for the whole firm),
11. Average age of the salaried employee (Plant A, plant B, for the whole firm),
12. Paid absence,
13. Unpaid absence,
14. Lost hours due to health problems,
15. Annual holiday,
16. Unclassified absenteeism,
17. Lost hours due to strike,
18. Overtime for hourly-waged employee,
19. Overtime for salaried employee,
20. Budget values of overtime hours (hourly-waged employee),
21. Budget values of overtime hours (salaried employee),
22. Must working hours,
23. Cost of labour for lunch,
24. Cost of material for lunch.
25. Service cost,
26. Working hours with zero absenteeism,
27. Working hours value for weekends,
28. Working hours value for general holidays,
29. Reasons of overtime hours (for hourly-waged and salaried employee),
  - Increase in production,
  - Projects,
  - Subcontracting works,
  - Power shortage,
  - Customer services,
  - Cumulative values of these items.

These values are for assembly, paint-shop, welding, light production, FRP production, Manufacturing Engineering (F+M), Manufacturing Engineering (P+K), CAD/CAM, Maintenance, Production Planning and Control, Quality Control, Production Improvement and Design, Purchasing, Quality Engineering, values for Plant B.

30. The cost of labour union proposal to the company,
  - Naked hourly wage
  - Normal working hour,
  - Average overtime hours per employee,
  - Number of days lost during annual holidays,
  - Number of unworked days to be paid,
31. Applications form of hourly-waged employee,
32. Applications form of salaried employee,
33. Performance values of salaried employee,
34. Manning tables,
35. Market values of salaries for specified titles,
36. Constant data for every employee,
  - Firm number,
  - Function code,
  - Status code,
  - Name,
  - Surname,
  - Plant status,
  - Employee status (If the employee is salaried or hourly-waged.)
  - Date of entry,
  - Kind of salary,
  - Blood type,
  - Marital status,
  - Number of children,
  - Sex,
  - Education code,
  - Graduated school,
  - Date of birth,
  - ID data,
  - Address.
37. Data about job accidents;
  - Date of accident,
  - Name of the employee,
  - Surname of the employee,
  - Short description of the accident,
  - Hurt body part due to accident,
  - Total working hours in departmental basis,

- Number of accidents in departmental basis,
  - Lost man-power per hour,
  - Lost man-power per day,
38. Data about education,
  39. Job descriptions,
  40. Job evaluation formats,
  41. Entrance salary on the basis of grades (for hourly-waged employee)
  42. Entrance salary on the basis of grades (for salaried employee)
  43. Organisation charts.

#### 4.2.3.1.2 Setting Subsystems of the System

Data expressed above can be classified in eight groups:

##### 1. Execution Data:

These data include in and out hours of the employee, worked and unworked hours, their distribution according to reasons such as paid absence, unpaid absence, lost hours due to health problems, annual holidays, unclassified absenteeism, lost hour due to strike, overtime for hourly-waged employee, overtime for salaried employee, budget values of overtime hours (hourly-waged employee), budget values of overtime hours (salaried employee), must working hours, working hours when no absenteeism exists, salaries and deductions for every employee, memorandum information, existing number of hourly-waged and salaried employee.

##### 2. Personnel Data :

Personnel's birth of date, name, surname, birth of year, salary, his grade, his functional code, his social security number, his marital status, his number of children, address, telephone number, plant status (if he is working

in plant A or plant B), entrance date to the firm, graduated school with its branch.

### 3. Cost Data :

Expenses about different items and their actual values (periodical), service costs, cost of labour for lunch, cost of material for lunch, entrance salary of a new employee per hour for hourly-worked and salaried employee according to grades.

### 4. Man-power, Salaries and Organisation Data:

The data include salaries of titles and grades. This means values of salaries of every title both for salaried and hourly-waged employee exist in the system. Salaries of status, average age, average working year in the company also exist in this system. Some data about execution such as paid absence, unpaid absence, lost hours due to health problems, annual holidays, unclassified absenteeism, lost hour due to strike, overtime for hourly-waged employee, overtime for salaried employee, budget values of overtime hours (hourly-waged employee), budget values of overtime hours (salaried employee), must working hours, working hours when no absenteeism exists also exists in this system. The others are reasons of overtime, salaries for main salaries in the automotive market, manning tables, job evaluation forms, job descriptions. Organisation data are about line and staff managers, their working year in existing status, their holding grade, date of entrance to the firm.

### 5. Performance Data :

They are the grades given by employee's manager to the employee by taking into consideration his productivity, his absenteeism, his knowledge about his work, his will to learn new things, his attitude towards his colloquies. If this person is a manager, then other criteria such as his ability to manage his subordinates is also graded by his manager.

## 6. Applications Data :

These data include applicant's surname, name, birth of year, code (if he is engineer, economist, etc.), graduated school, his status (university graduated, has master's degree or not, etc.), degree of foreign language, status of military service, telephone number, test scores and others.

## 7. Job Accidents Data :

These data include number of accidents, lost man-power per day, lost man-hour per day, working hours, kind of accident, hurt body part during the accident.

## 8. Training and Skills Data :

This includes kind of training ( This means if the training is for students or employees), total quality training, name of the speaker in total quality training, training in the firm, training outside the firm, code of the training, name of the training, date of the training, functional code of the employee who has attended to the training, name of the students, surname of the students, branch of the students, grades of the students, functional code of the student in the firm, name of the teacher of the students, personality profile of every employee.

So, eight subsystems can be set for Human Resource Management main system:

1. Execution subsystem,
2. Personnel subsystem,
3. Cost analysis subsystem,
4. Man-power, salaries and organisation subsystem,
5. Performance subsystem,
6. Applicants subsystem,

7. Job accidents subsystem,
8. Training and skills development subsystem.

#### 4.2.3.1.3 General Model of the System

Figure 4.1 shows the general model of Human Resources Management System. This model consists of eight subsystems and shows data and information flow between these subsystems. Some of the data are gathered from internal sources ( Internal sources means subsystems of the system or functions of the firm), and some are gathered from external sources, such as other firms in the same industry. This figure shows that human resources is a buffer between top management and manufacturing. Information of subsystems existing in human resources management function are generally becoming data or raw-data for other functions of the firm and top management.

#### 4.2.3.2 Conceptual Design

Conceptual design explains and shows the principal components and their relationships within MIS. If MIS is to be designed in great detail without first conceptualising the system as a whole, the design might be poor.

It consists of four phases:

1. Development of performance specifications: This is the careful description of the comparison criteria for the users of the system.
2. System analysis. This phase is about describing and analysing the current organisation, its decision making process, the present MIS and shortcomings of the present system.
3. Feasibility analysis of the new system,



### 4.2.3.2.1 Information Needs of Managers

What is really needed in MIS is the availability of information that can increase the perceptions of managers in critical areas such as problem identification, alternative solutions, opportunities, planning and controlling. Information needs of managers and related functions can be seen in Table 4.1

### 4.2.3.2.2 Identifying System Constraints

Constraints are the limitations. All performance specifications represent constraints. Internal and external constraints of this system can be seen in Figure 4.2. Internal constraints are top management, organisation and policy, man-power and cost. External constraints can be summarised as labour union agreements, laws and government policies.

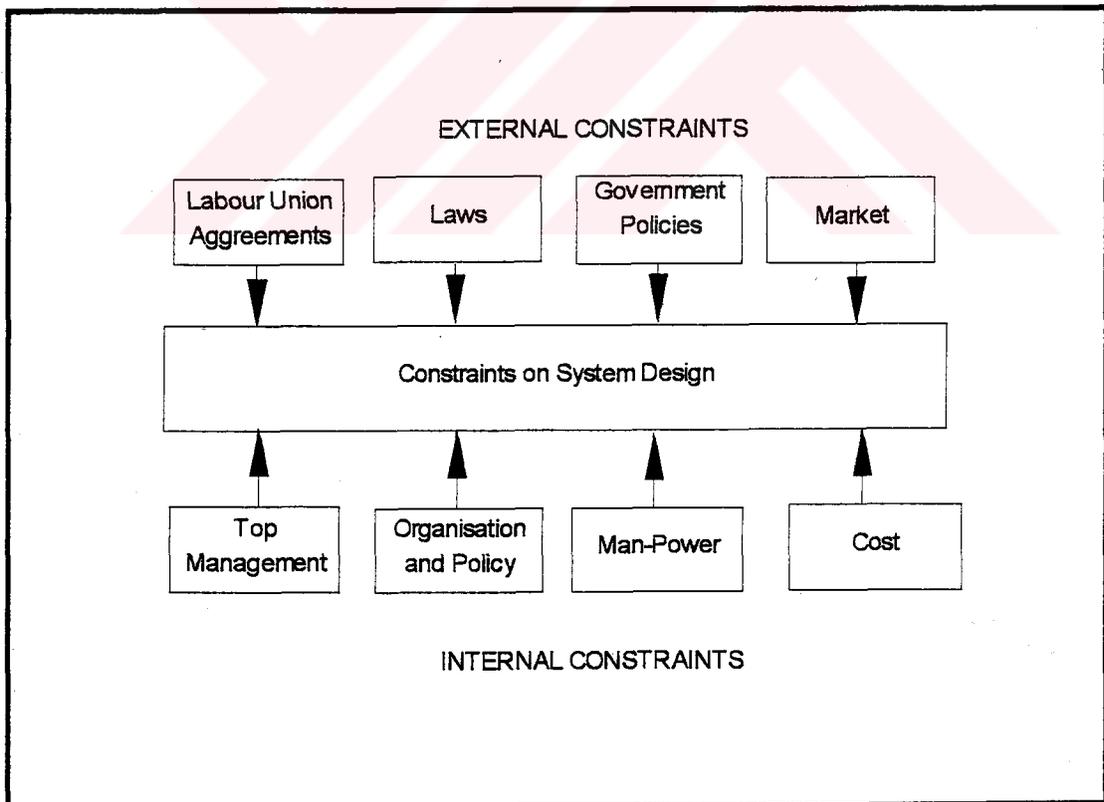


Figure 4.2: Constraints of the System [ 1, page 517 ]

Table 4.1 : Information Needs of Managers

MANAGER	FUNCTION OR OBJECTIVES	PRINCIPAL INFORMATION NEEDS
Chief of Execution	<ul style="list-style-type: none"> <li>• Following up absenteeism hours and annual holidays,</li> <li>• Paying salaries before 10<sup>th</sup> of the month.</li> </ul>	<ul style="list-style-type: none"> <li>• Total worked and unworked hours,</li> <li>• Bordro.</li> </ul>
Chief of Personnel	<ul style="list-style-type: none"> <li>• Choosing the most appropriate person for needed position.</li> </ul>	<ul style="list-style-type: none"> <li>• Specifications of the employee.</li> </ul>
Manager of Industrial Relations	<ul style="list-style-type: none"> <li>• Directs man-power planning, budgeting, sendikal relations and organisational relations,</li> <li>• Reducing working man-power costs.</li> </ul>	<ul style="list-style-type: none"> <li>• Organisation charts,</li> <li>• Annual budget of the department,</li> <li>• Overtime reports,</li> <li>• Manning tables,</li> <li>• Salary reports,</li> <li>• Absenteeism reports,</li> <li>• Total agreement.</li> </ul>
Manager of Industrial Relations and Top Managers	<ul style="list-style-type: none"> <li>• Increasing the motivation of man-power,</li> <li>• Increasing the performance of man-power.</li> </ul>	<ul style="list-style-type: none"> <li>• Performance graphics according to grades and functions of the firm.</li> </ul>
Health and Safety	<ul style="list-style-type: none"> <li>• Putting target values of the future year (decreasing number of job accidents by % 25),</li> <li>• Being the first in automotive industry,</li> </ul>	<ul style="list-style-type: none"> <li>• Values of job accidents of other firms,</li> <li>• Comparison of values with that of other firms,</li> <li>• Computed values about job accidents.</li> </ul>
Chief of Training	<ul style="list-style-type: none"> <li>• Directs all training functions by conducting training seminars in the field.</li> </ul>	<ul style="list-style-type: none"> <li>• Determining the training requirements of man-power,</li> <li>• Increasing mesleki bilgi level of man-power.</li> </ul>

At this stage, MIS objectives can be redefined as:

- a. Doing some routine tasks (such as periodical reports) faster,
- b. Increasing the speed of information flow by the help of efficient and summarised reports,
- c. Enabling to store specific data over periods,
- d. Analysing the data during these periods in order to help the managers to make better decisions.
- e. Making information storage easier and make information available in the desired time and format.

#### 4.2.3.2.3 Determining Information Sources

After principal information needs of managers is identified, then sources for the information supplied should be determined. Table 4.2 shows information needs of managers.

Chief of execution system is responsible for following up absenteeism hours and annual holidays and needs total worked and unworked hours as information. the other hand, manager of industrial relations function is responsible for directing man-power planning, controlling annual human resources budget, labour union relations and helping top management in reorganisation studies of the firm. Principal information needs of manager of industrial relations manager are organisation charts, annual budget of the department, overtime reports, manning tables, total agreement, salary and absenteeism reports.

Table 4.2 shows distribution of information among managers, in other words, which manager needs what kind of form, report, analysis and shortly information or what kind of information will be distributed to which manager.

Table 4.2 : Information Needed &amp; Recieved

Information needed/recieved	Quarterly wage analysis	Salaried-hourly worked wage analysis	Monthly overtime report	Monthly işgücü devam report	Monthly job accident report	Salary form	Performance reports	Budget expenditures	Monthly man-power cost report	Job analysis	Job descriptions	Reasons of overtimes	Daily personnel report	Forms during new entrance	Organisation charts	Salary quastinares	Test scores	Application forms	Leave request	
Department managers																				
General Manager		X			X	X	X		X	X	X		X		X			X	X	
VP of Administration			X	X	X	X	X		X	X	X		X		X			X	X	
VP of Purchasing							X								X			X		
VP of Technique							X								X			X		
VP of İşletmeler					X		X						X		X			X		
Manager of Industrial Relations					X	X				X	X		X		X			X		
Director of the factory (Plant A)			X	X	X		X		X				X		X					
Director of the factory (Plant B)				X	X		X		X				X		X					
Chief of Workshops					X		X						X		X					
Chief of Industrial Engineering					X				X				X		X					
Chief of Personnel					X								X		X			X		
Managers of all the Functions					X								X		X			X		
Chief of Education					X								X		X			X		
Manager of Safety and Health					X								X		X			X		
Manager of Budgeting					X			X					X		X			X		

#### 4.2.3.2.4 Flow Charts of Subsystems

In Figure 4.3 below, the conceptual design of the subsystems that make up the system can be seen.

Salary forms, application forms and salary questionnaires are manually operated. Constant data of hourly-waged and salaried employee are input in the main system from A6. Human resources should have three databases which are named as personnel database, application database and education database. Statistics about wages of the employees, personnel outputs and organisation charts are some of the examples of reports and formats needed by managers. Overtime hours, absenteeism hours, job accidents, personnel records and man-power reports are monthly reports of this system. Human resources system shows general processing activity in this system.

#### 4.2.3.2.5 List of Files

When all such subsystems have been conceptualised, a list of files may be prepared. Table 4.3 shows frequency of files, in other words, frequency of the information that should be produced. Managers need some of these information periodically. Budget is prepared annually, detailed organisation charts and information concerning employee performance values are prepared two times in a year, salaries and cost about salaries, overtime and man-power absenteeism hours are reported monthly as job accident report.

#### 4.2.3.2.6 Hardware and Software Configurations

Many possible combinations of equipment may be appropriate for a particular MIS. User needs; locations of users; type of data, files and information involved; quantity of data; currency and frequency of information desired; and security all are considerations. But, in this study it is not possible to change the configuration of the system, since all the machines in human

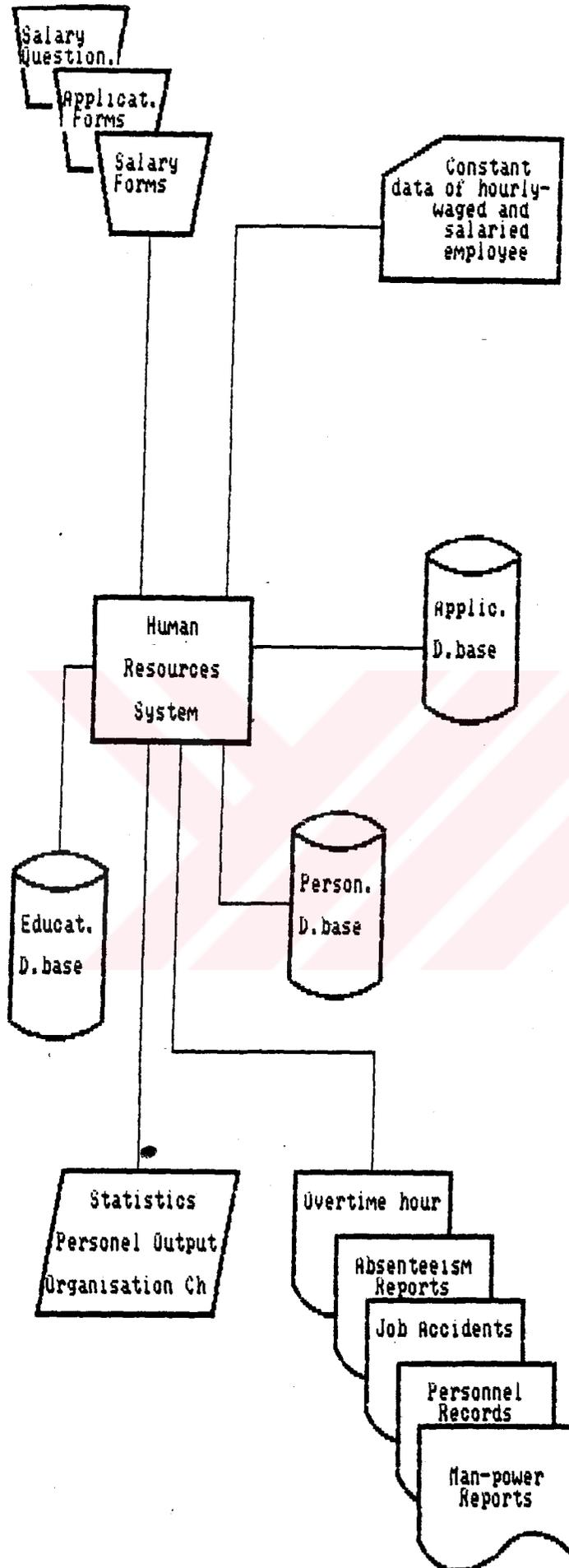


Figure 4.3 Conceptual Design of Subsystems

Table 4.3 : List of Files

	Periodically	Annually	2 Times in a Year	Monthly	Weekly	Daily	Quarterly
Application for Employment						X	
Test scores of Applicants					X		
Employee Grievances	X						
Salary/Salary Cost Information				X		X	
Employee File Maintenance				X		X	
Job Descriptions & Specifications		X					
Leave Request						X	
Budget Information		X					
Overtime & Man-Power Information				X			
Job Accidents Information				X			
Organisation Charts	X						
Detailed Organisation Charts			X				
Wage Analysis							X
Labour Information in the Market	X						
Labour Relations Information	X						
Performance Information			X				
Employed personnel/The number of should be employees						X	

resource function are working on common network. As it was explained in the " Introduction of the Existing System ", there is a PC working on the network. two B20 and a A6 working in the main system. There are two printers one of which is dot-matrix.

Software are enough to give the chance of analysing and representing every kind of data in the files. It is also easy to use every software that is new for the firm by the help of network.

#### 4.2.3.3 Detailed Design

The detailed design of an information subsystem consists of the following:

1. System objectives,
2. System flow charts,
3. System narratives detailing each function of the system,
4. Record layouts,
5. Source data for every program used by the system,
6. Programs used,
7. Procedures manual with easy-to-follow operating instructions.
8. Output reports, formats, distribution, and retention.

The objectives of a fully implemented Human Resource Management System can be summarised briefly as follows:

1. Increase operational efficiency:
  - a. To do some routine tasks (such as periodical reports) faster,
  - b. To increase the speed of information flow by the help of efficient and summarised reports.
2. Increase functional effectiveness:
  - a. To enable specific data of functions to be stored over periods,

- b. Analyse these data during these periods in order to help manager to make better decisions.
3. Make information storage easier and make information available in the desired time and format.

In order to meet the specific requirements of the firm, Human Resource Management System has been subdivided into eight subsystems. These are;

1. Execution subsystem,
2. Personnel subsystem,
3. Cost analysis subsystem,
4. Man-power, salaries and organisation subsystem,
5. Performance subsystem,
6. Applications subsystem,
7. Job accidents subsystem,
8. Training and skills development subsystem.

In this study, first of all objectives of the subsystems are defined. Then, input and output data for each subsystem are determined, general flow of information and data are shown by the help of figures. A narrative explanation is made about each subsystem. Besides, (if it is permitted to explain), the name of the programs in these subsystems, field names in these programs, source data for every program are determined and explained in detailed design. Procedures of subsystems, description of forms, examples of reports and flow charts of subsystems can be seen in the Appendix.

#### 4.2.3.3.1 Execution Subsystem

Objectives of execution subsystem are;

- Preparing the memorandum,
- Following up in and out hours of the employees, reporting absenteeism hours for employees.

This system is responsible for following the entry & exit hours of employees. At the end of every month, after memorandum is computed list of unusual hours are taken from the main system and used as data in Man-power, Salaries and Organisation Subsystem. Also, distribution of job accidents and lost hours because of job accidents are determined by the help of this subsystem.

The programs used in this subsystem are working under A6 system. They are private programs of the firm, so can not be summarised in detail in this study. But data and information of the subsystem can be summarised as follows:

#### Data of the execution subsystem:

- In and out hours of the employee,
- Worked and unworked hours,
- Salaries of every employee,
- Salaries of every title,
- Salaries of every status,
- Salaries of every grade,
- Annual holidays.

#### Information of the execution subsystem:

- Total worked and unworked hours on the basis of functional codes,
- Memorandum,
- Wage deduction information,
- Hours of weekends,
- Hours of general holidays,
- Overtimes,
- Maximum, average and minimum salaries for every title, status and grade,
- Number of accidents,

- Distribution of unworked hours because of job accidents,
- Lost man-power per hour,
- Lost man-power per day.

Flow chart of data and information in this subsystem can be seen in Figure: 4.4

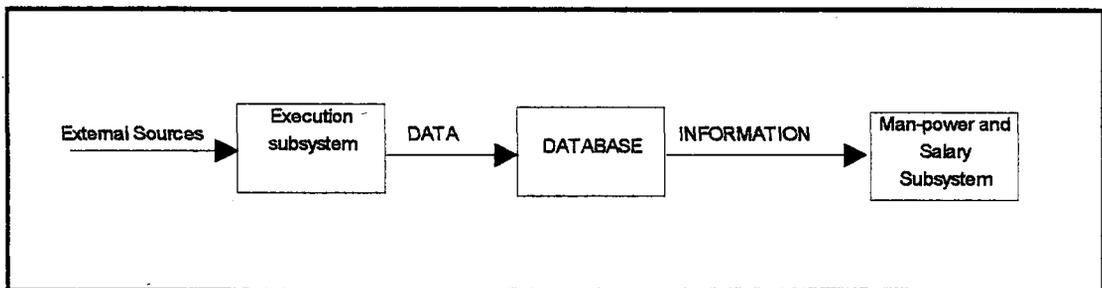


Figure: 4.4 Information and data flow of execution subsystem.

#### 4.2.3.3.2 Personnel Subsystem:

Objectives of personnel subsystem are;

- Updating the data of personnel in the database in the main system enable the users to make accurate analysis,
- Following up the legal forms such as "Insurance Form", "Police Form" and "New Entry Form" for every employee.

This system is responsible for following the new entries, exits, and status changes of employees and preparing forms of these employees. Every day if an event of this kind happens the personnel expert take notes and prepares documents for other subsystems, such as execution, Man-power, salary and organisation. This subsystem also provides every kind of information about every employee when needed by external or internal sources.

The forms used when new employee enters the firm can be seen in Appendix A1. Figure A.1.1 shows insurance entry form, Figure A.1.2 police form, and Figure A.1.3 new entry form. Besides, Table A.1.1 includes new employee data table used to make inputting data in the data file easier. Forms are structured in Winword 2.0 by using data file command. First step is to define data and header documents. Header document contains record headings which are the same as the field names in Table A.1.1 ( manually input ), and data document is a kind of table that data are input. Then, all the files explained above are opened and when merge command is chosen from the file menu, each form is prepared for every employee. This data file structure is very important in order to teach the performance criteria that was defined in the planning phase. Because, each data for every employee is written only once and then they are used in every form and can be used in the design of other forms when needed.

In order to use data in the analysis took place in man-power, salary and organisation subsystem, personnel database that is in PC should also be updated periodically. This database contains only salaried employee. The database consists of 17 fields. Field names are as follows:

1. Code,
2. Status code,
3. Employee number,
4. Surname,
5. Name,
6. Grade,
7. Working years,
8. Foreign Language,
9. Title,
10. Salary,
11. Date of entry,
12. Date of exit,
13. Reason for exit,
14. Graduated school
15. Plant code,
16. Date of birth,

## 17. Age.

Personnel database 1 is for employee records. Any kind of database command can be chosen from the menu bar (especially; extracting data for a given criteria, sorting data numerically or alphabetically, adding or deleting records, updating records, etc.) The structure of this database will be analysed in detail in man-power, salary and organisation subsystem.

The programs used in this subsystem are working under A6 system. They are private programs of the firm, so can not be summarised in detail in this study. But, data and information of the subsystem can be summarised as follows:

### Data of the personnel subsystem:

- Employee's name,
- Employee's surname,
- Firm number,
- Function code,
- Status code,
- Plant status,
- Employee status (If the employee is salaried or hourly-waged.)
- Date of entry,
- Kind of salary,
- Blood type,
- Marital status,
- Number of children,
- Sex,
- Education code,
- Graduated school,
- Date of birth,
- ID data,
- Address.

### Information of the personnel subsystem:

After first input records are made for every personnel, they can be gathered as information from system A6 and PC when needed and necessary. PC is generally used for analysis.

Flow chart of data and information in this subsystem can be seen in Figure: 4.5.

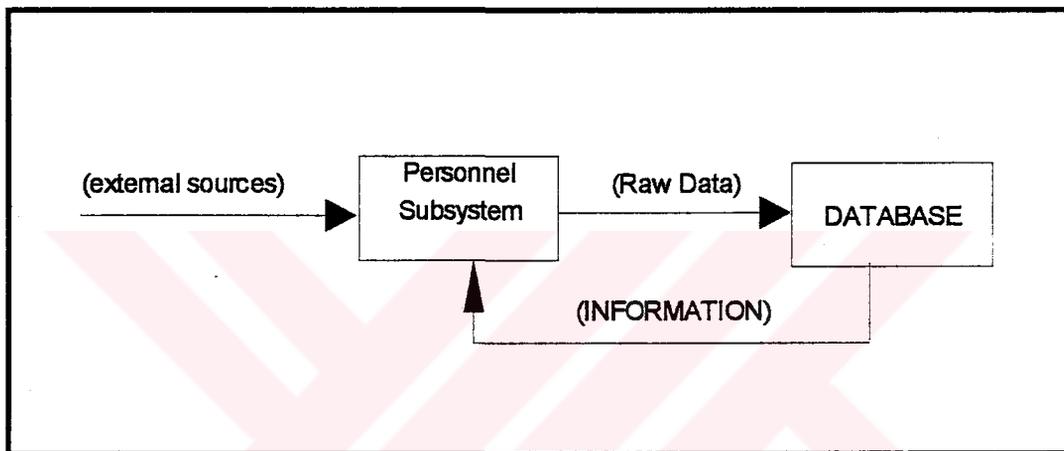


Figure: 4.5 Information and data flow of personnel subsystem.

#### 4.2.3.3.3 Cost Analysis Subsystem:

Objectives of cost analysis subsystem are;

1. Estimating values for annual budget and following it,
2. To achieve clarity in calculating costs and store these values to use in further analysis.

This system is responsible for preparing annual budget of human resources function at the end of year, and preparing man-power costs report both for salaried and hourly-waged employee for every month. Reports are for plant A, plant B and for the whole firm.

The programs used in this subsystem are working in PC. File named "1" ( Table B.1.1) is used as an data entry table. This table is divided into special parts by using "Formula Define Name" command in Excel 4.0 [ 5 ]. This command of the software gives user ability of following data easily and prevents mistakes during data entries. File is divided into 7 parts by using "Formula Define Name" command:

1. Salaried employee (Plant A),
2. Salaried employee (Plant B),
3. Salaried employee (Plant A + Plant B),
4. Hourly-waged employee (Plant A),
5. Hourly-waged employee (Plant B),
6. Hourly-waged employee (Plant A + Plant B),
7. Status distribution for the whole firm.

Table B.1.2 and Table B.1.3 shows minimum, average and maximum value of salaries for a given grade, that is I, II, III, ..., XIII. These values are input in this table by the help of program output lists taken from Computer Information Systems. File "Cost 1" and "Cost 2" are linked to file "1". After data input is completed, they can be seen in files "Cost 1" and "Cost 2" distributing according to months. Only number of employees in every grade and total working year in the firm are input manually. Then, average salaries are computed. Average salaries per hour are raw data used in another table (This is a secret table for the firm) to compute salary costs.

"Cost 1" and "Cost 2" are also divided into parts taking into consideration months and plants using "Formula Define Name" command. Then, by choosing "Formula Go to" command from the file menu, the reports that will be printed out can easily be reached or manual inputs can be made.

Human resources annual budgets ( Table A.2.4 ) are prepared by the help of budgeting and control department. Information and data flow of this subsystem can be seen in Figure: 4.6 below.

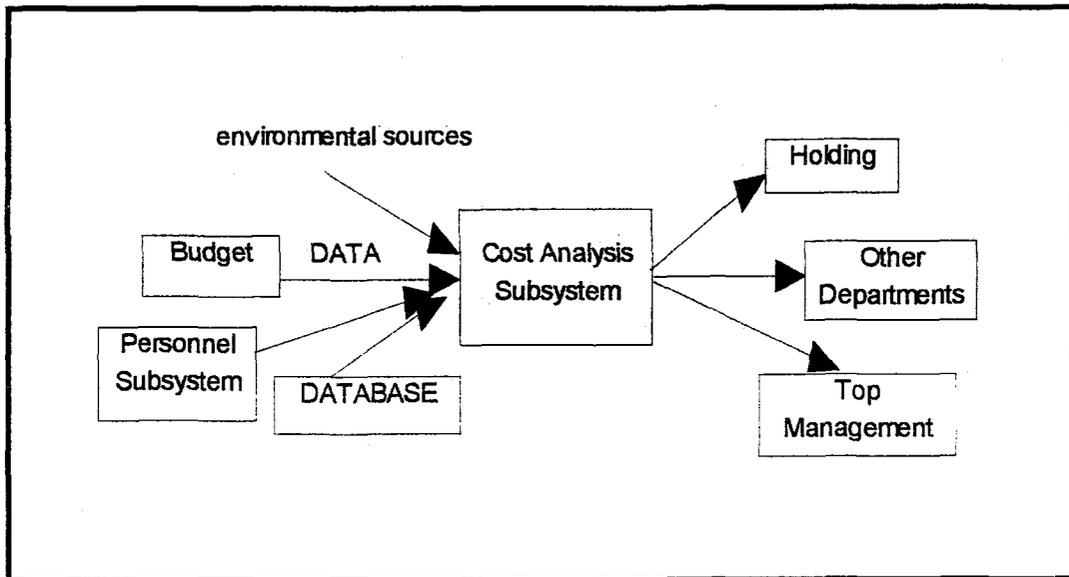


Figure: 4.6 Information and data flow of cost analysis subsystem.

#### Data of the cost analysis subsystem:

- Maximum, minimum, average value of salaries for every grade both for hourly-waged and salaried employee, for plant A, B and for the whole firm,
- Number of existing man-power according to grades both for hourly-waged and salaried employee, for plant A, B and for the whole firm,
- Working year in plant A, B and for the whole firm both for hourly-waged and salaried employee,
- Maximum, minimum and average value of salaries according to status in for the whole firm,
- Hour cost for salaried employee in plant A, B and for the whole firm,
- Hour cost for hourly-waged employee in plant A, B and for the whole firm,
- Total working hour,
- Hours of weekend,
- Hours of general holidays,
- Expenses about different items and their actual values,
- Cost of labour and cost of material for lunch,
- Service costs,

- Entrance salary per hour for a new employee,
- Normal working hour,
- Overtime hours per employee,
- Number of annual holidays' days,
- Number of unworked days to be paid.

Information of cost analysis subsystem:

- The cost of an employee to the firm,
- Total labour union agreement costs and its projections,
- Salary costs both for salaried and hourly-waged employee.

#### 4.2.3.3.4 Man-power, Salary and Organisation Subsystem

Objectives of man-power, salary and organisation subsystem are;

1. Choosing the most appropriate appliance for the needed position,
2. To achieve clarity in calculating overtime values, salaries and absenteeism hours and use them in further analysis,
3. Following up man-power data and organisational structure of the firm.

This system is responsible for preparing monthly report of overtime values and absenteeism hours, general and detailed organisation charts of the firm two times in a year, updating personnel records, and make salary comparisons between wages of salaried and hourly-waged employee. Table C.2 shows hourly waged employee / foreman wage analysis, Appendix C.2 shows analysis of hourly-waged employee and foreman salaries, Appendix C.3.1 is about computing data, Appendix C.3.2 shows computed data for every alternative on the basis of grades. Figure C.3.2 shows the result of these analysis, and is concerning graphical representation of every alternative's cost. Another duty of this subsystem is to make man-power planning.

The programs used in this subsystem are working in PC. There are five directories in this subsystem. These are; " Overtime ( Fazlames ) ", " Absenteeism ( Devam ) ", " Analysis ( Analiz ) ", " Reason ( Fmnedden ) ", " Per ". Files in directory " Absenteeism ( Devam ) " and " Overtime ( Fazlames ) " all includes monthly values of absenteeism hours and overtimes. Files in directory " Reason ( Fmnedden ) " includes monthly distribution of kind of absenteeism hours such as paid absence, unpaid absence,..., on the basis of organisational codes. Sub directories in directory " Overtime ( Fazlames ) " are "Fmay1" and "Fmay2" . Files in sub directories "Fmay1" and files in directory " Absenteeism ( Devam ) " are linked to this file. As soon as data input is made by using the lists taken from systems department, total values in main functions and sub functions of the firm are transferred to related files in these directories. Reasons of overtimes ( overtime due to new projects, electric shortage, etc.) can be seen in file " reason ( messeb ) " in directory " Overtime ( Fazlames ) " ( Table C.1.5 ). Files in directory " Fmay1 " are also linked to file " reason ( messeb ) ". Total monthly values of overtimes, their distribution on the basis of basic functions of the firm, comparison with budget values, deviation from target values, cumulative values and distribution of overtime hours according to main reasons can be seen in this report ( Table C.1.4 ). Sub directory " Overtemp ( Fmtemp ) " includes template formats of these reports, files in directory " Absenteeism ( Devam ) " includes distribution of absenteeism hours and computes total ratio with cumulative values each month ( Table C.1.3). "Per" consists of two files and four sub directories. "Per1" ( Table C.4.1 ) is a Excel database file, "Perkad" is a temporary file used when running macros. Macros can be seen in sub directories ( Appendix C.5). These are used when an information about salary is needed on the basis of titles, functions, grades of employees. Macros aim to repeat routine tasks user needs periodically or generally. The structure of macros used in this directory is based generally on database commands and statistical functions. Generally aim is sorting data on the basis of grades or status, computing maximum, average and minimum values of salaries taken place in this title or status and finding out standard deviation. List of employees existing in database can also be printed out on functional basis by using these macros.

" Analysis " directory consists of two directories ( "March","September") and two files. This directory is generally used for studies about analysis. File " manning " ( Table C.1.1 ) is a kind of manning-table, and " Form " ( Table C.1.6 ) is a kind of form used during employee demands.

Salary increase periods are generally January and July for salaried employee, March and September for hourly-waged employee. Especially, during periods after hourly-waged employees' salary increases, an analysis has to be made taking into consideration salaries. Files in directories " March " and " September " are about this analysis. Other files in analysis are about wage curves. These curves are determined after several computations. Then costs are determined for every alternative on the basis of grades and a report is prepared to be used in further decisions of salary increases ( Appendix C.3.1, Appendix C.3.2 )

Files taking place in directories " Overtime ( Fazlames ) " and " Absenteeism ( Devam ) " are about overtime values, their reasons, man-power attendance and data entry sheet for these reports. Some of the fields in files Fmay1,..., Fmay12; Dev1,..., Dev12; Faz1,..., Faz12 are all linked to files " Overtimmel ( Fmimmemur ) ", " Overtime2 ( Fmişçi ) ", " Employee ( Mevişçi ) ", " Normal ( Nistir ) ", " Unpaid ( Ücretsiz ) ", " Accident ( İşkaz ) ", " Noreason ( Sebiz ) ", " Paid ( Üciz ) ", " Doctor ( TIS ) ". ( In this subsystem some of the files names are also written in Turkish, since their names used in Excel files are Turkish. These files ( names in Turkish ) are linked to some other files during running the programs, so if another name is given to the file, other files linked to this file could not find the wanted file and program will not run).

Man-power planning and organisation are other functions of this system. Manning-tables are prepared taking into job titles and job descriptions. Then, number of existing employees are determined for every function of the firm. These values are compared with that of must value of employees and difference between them is computed by the help of manning table ( Table C.1.1). This table is used as a decision making tool by human resources manager when deciding to make an employee entrance to the firm or

not. Organisation charts also exist in this subsystem, but they can not be given here since they are secret data of the firm. Procedures, reports, and analysis about salaries of this subsystem are in Appendix C.6.

Figure 4.7 below shows data and information flow of man-power, salaries and organisation subsystem.

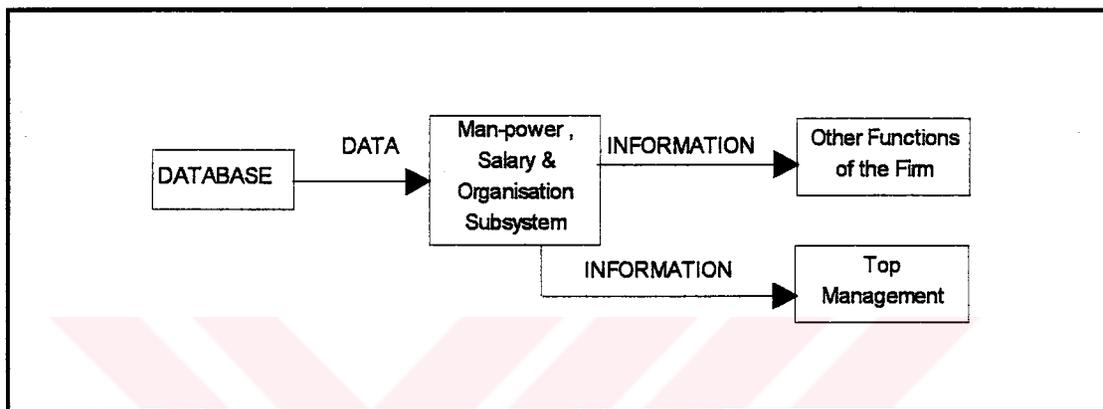


Figure 4.7: Information and data flow of man-power, salary and organisation subsystem.

Data of man-power, salary and organisation subsystem:

- Worked and unworked hours on the basis of functional codes,
- Total working hour,
- Hours of weekends,
- Hours of general holidays,
- Overtimes,
- Maximum, minimum, and average salaries for every title, status and grade,
- Absenteeism hours on the basis of functional codes.
- Personnel data of line and staff managers.

Information of man-power, salary and organisation subsystem:

- Organisation charts,
- Reports about overtime,

- Man-power report,
- Salary research in automotive industry,
- Monthly salary report,
- Distribution of employees according to salaries,
- Distribution of employees according to titles,
- Distribution of employees according to status,
- Distribution of employees according to functional codes.

These distributions include statistical variants such as maximum, minimum, average values and standard deviation of the population and number of records in these populations.

#### 4.2.3.3.5 Performance Subsystem:

Objectives of performance subsystem are;

- Storing of data about performance of every employee,
- Following up increases and decreases in performance levels on the basis of grades and functional codes, and for the whole firm.

This system is responsible for following the performance grades given to the employee by his/her manager. Before grading is done, list of employees in functional codes are sent to top managers of divisions. After these lists are distributed to managers, grading is made by the managers. Lists are gathered. Performance program is a COBOL program and exists in the main system. Before performance values are input in the system, records are opened for every function and for every employee. There are six major functions in the firm.

- Finance and administration,
- Purchasing,
- Technique,
- Project Planning and CAD-CAM,
- Factory in plant A,

- Factory in plant B,

First of all records about departments are opened by inputting departmental codes, functional codes, plant code and number of employee under this sub organisation. Then, employee records are opened by inputting employee's name, surname, his grade, title, age and beginning values for every performance criteria. (Performance criteria cannot be written here in detail, because they are the firm's private and secret data.) Beginning values of performances are the least value for every performance criteria. After the records are opened for every employee, program is run and then controlled very carefully for every employee record. Then, actual grades are input after the lists are taken from the Human Resource Manager. The program is run again. Now, the actual performance grade for every employee can be seen in these lists. This is the general description of the procedure of this system, but the aim is arranging these data in order to help top management in their decision making process, for example when deciding about the policies of increasing employee performance.

Computing programs used in this subsystem is working under B20 system. But reports for decision making are taken by the help of programs existing in PC and planned in Excel 4.0. Reports contain data for six major functions of the firm, for twelve grades (II, III,..., XIII) and for five factors (A, B, C, D, E). Information and data flow of this subsystem is in Figure 4.8. Procedures, reports, information flow and file structure of this subsystem can be seen in Appendix D.1 and D.2. Appendix D.1 shows performance subsystem tables and figures. Figure D.1.1 is concerning distribution of factors on basis of grades for a specified function, Figure D.1.2 is concerning distribution of factors in functional basis and Figure D.1.3 distribution of factor A according to grades. On the other hand Table D.1.1 shows distribution of performance values overall the firm, and Table D.1.2 distribution of performance values in a specified function. Figure 4.8 below is concerning information and data flow of performance subsystem.

### Data of performance subsystem:

Grades about every employee gathered from every function of the firm are the data for the performance subsystem.

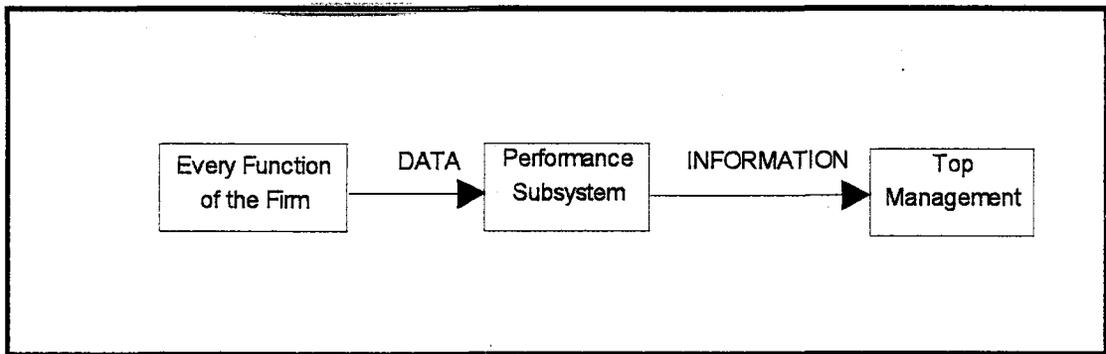


Figure 4.8: Information and data flow of performance subsystem.

### Information of the Subsystem:

- List of employees and their performance values taken both in the first and second term of the year, and their average performance.
- Distribution of performance values on the basis of functional codes, status, skills and grades.

### 4.2.3.3.6 Applications Subsystem:

Objectives of applicants and skills subsystem are;

- To store data about application forms,
- To store data about test scores of applicants,
- Choosing the most appropriate employee among applicants.

This system is responsible for interviewing with applicants who are willing to take a job in the firm. During the first interview personnel supervisor asks some questions to the applicant, then applicant has an other

interview with human resources manager. If applicant is thought to be appropriate for the vacant position he would have an opportunity to make an interview with the manager of the related department. If the result is positive, then tests are applied to applicant. Every applicant should pass through this exam and should achieve minimum points for the applied position to take the job. More detailed description of the procedures of this function can be seen in Appendix.

Data that take place on application forms are named as " Application Forms Data ". Application forms data are analysed and a coding system is done for the user to give him a chance of storing these major data. Codes of related data and their name can be seen in Table E.1. Application forms data are followed by the help of a database in Excel 4.0. Table E.2 shows application database structure. There are 12 fields named as surname, name, birth of year, job code, school code, foreign language, military service, telephone number, sheet code, date of appliance, and others. It is determined that the firm is generally in need of a secretary, a mechanical engineer, an industrial engineer, a technical employee, or an economist. In order to make it easier to reach related data about suitable candidates, 5 macros are written for this database (Macros can be seen in Table E.3 ). The structure of all macros are the same. Macro is searching for records that are suitable to the given criteria and arranging the list in a format that is ready for print out directly. Information and data flow of this subsystem is in Figure 4.9.

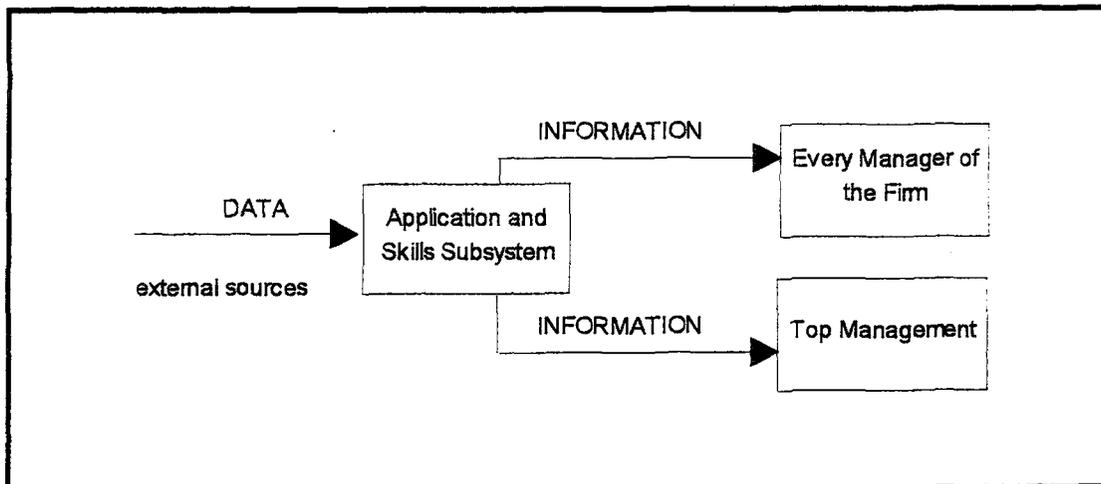


Figure 4.9 : Information and data flow of application and skills subsystem.

#### Data of application subsystem:

- Applicant's name,
- Applicant's surname,
- Applicant's year of birth,
- Applicant's job code,
- Applicant's education,
- Applicant's degree of foreign language,
- Applicant's status,
- Applicant's status of military service,
- Applicant's telephone number,
- Test scores.

#### Information of application subsystem:

- List of applicants according to desired specifications,
- Distribution of applicants according to most wanted job status,
- Education needs of employees.

#### 4.2.3.3.7 Job Accidents Subsystem:

Objectives of this subsystem are;

1. To report job accidents that occur every month,
2. Evaluating target values of every accident ratio and comparing target values with realised values,
3. Taking preventive measures on the basis of results obtained from item 2 for the workshops.

This subsystem is responsible for putting forward target values of every parameter (frequency, lost hour ratio, the ratio of accident seriousness, ratio of having an accident, risk of accident) and reporting job accidents every month. Number of accidents and lost hours due to accidents are reported by

execution subsystem. These values help expert in classifying job accidents according to kind of event (cuts, bruises, wounds, etc.) and body part hurt during these job accidents. These data are all analysed on the basis of workshops.

There are six Excel worksheets and four Excel macro sheets in job accidents subsystem. "Acc1", "Acc2" and "Acclink" are worksheets including tables. Number of accidents and hour lost because of these accidents are input in first table in "Acc1". There are two more tables in this sheet. One is for representing distribution of job accidents and hurt organs during these accidents for every workshop, the other table represents cumulative values of these accidents. "Macro1", "Macro2", "Macro3" and "Macro4" are macro sheets that are used in evaluating formulas. These macros are command macros. This means that they can be used as a formula whenever wanted by the user since they can be seen in "Paste Function Command" in the menu. After data are input in the first and second table, macros run automatically and evaluation is completed in a very short time. "Acc2" is linked to sheet "Acc1" and is used to show summary information about job accidents.

For graphic representation of data and to see deviations from target values clearly, result of formulas for frequency, ratio of accidents' seriousness, ratio of having an accident, risk of accidents, lost hours ratio are summarised in a sheet named as "Acclink" that is linked to sheet "Acc2". "Acclink" gives user the chance of reaching information about cumulative and monthly values of every ratio for plant A, plant B and A+B. Data inputs of ratios are made monthly in sheets "Graph1", "Graph2" and "Graph3" and graphic representation is completed.

Appendix F.1 shows reports, tables and graphics of job accident subsystem, Appendix F.2 cumulative and monthly values of plant A, Appendix F.3 distribution of job accident parameters, Appendix F.4 cumulative distribution of job accident parameters, Appendix F.5 distribution of job accident parameters for the whole firm and Appendix F.6 shows procedure table of job accident subsystem. Table F.1.1 concerns accident report, Table F.1.2 distribution of accidents among functions, Table F.1.3 cumulative distribution of accidents among functions, Table F.1.4 macros used in job

accidents subsystem, Table F.1.5 number of accidents ( manually filled in by execution subsystem ), and Table F.1.6 concerns body part injured on departmental basis. Figures of this subsystem are Figure F.2.1 ( Job accident frequency distribution ), Figure F.2.2 ( Cumulative distribution of F ), Figure F.2.3 ( Job accident frequency distribution for the whole firm ). Figure 4.10 below shows the data and information flow of job accidents subsystem.

Periodical questionnaires about job accidents are filled out and these data are used in these questionnaires. Result of these questionnaires are taken and information is used in comparing the firm with its competitors.

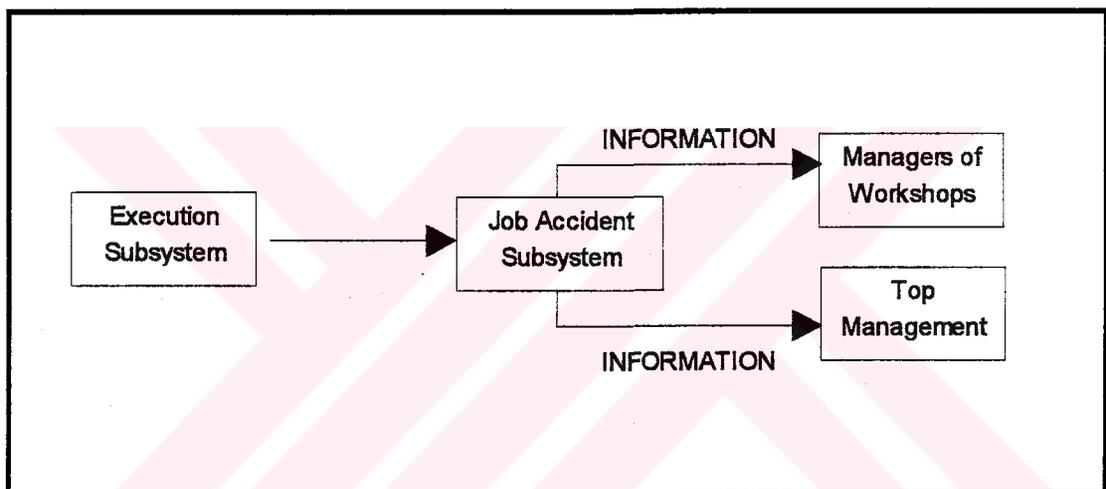


Figure 4.10 : Information and data flow of job accidents subsystem.

Data of job accidents subsystem:

- Number of accidents,
- Lost man-power per day,
- Lost man-power per hour,
- Must working hours,
- Kind of accident,
- Number of employee in plant A and in plant B,
- Hurt body part during the accident.

#### Information of job accidents subsystem:

- Frequency of job accidents,
- Lost hours ratio,
- Risk of accidents,
- General probability of having an accident
- Ratio of accident seriousness,
- Distribution of values in plant A, plant B and for the whole firm,
- Cumulative values,
- Comparison of target values with that of realised values.

#### 4.2.3.3.8 Training Subsystem:

Objectives of training subsystem are;

- Determine education need of employees,
- Prepare education programs to improve man-power skills,
- Follow education programs.

This system is operated manually. It is responsible for giving a general idea about the firm and talk about the duties o employees to reach these objectives. An orientation program is made during every employee entrance to the firm. More detailed information can be seen in Appendix G. Figure 4.11 shows information and data flow of training subsystem.

From time to time managers in each level of the organisation are sent to seminars or training programs done in firm's private training centre. Training subsystem is also responsible for informing people of every kind of education programs both done in holding's centre and in other education centres. On the other hand, students practising in the firm are also under the responsibility of this subsystem. Training supervisor plans how many students will be employed in every workshop or department.

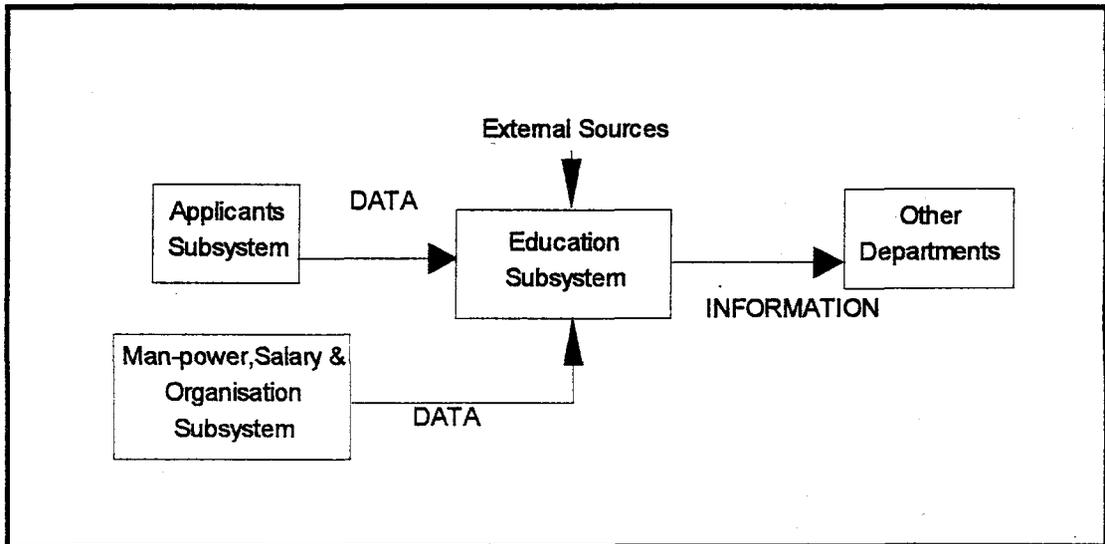


Figure 4.11: Information and data flow of training subsystem

#### Data of training subsystem:

- Kind of training ( This means if the training is for students or employees),
- Total quality training,
- Name of the speaker in total quality training,
- Training in the firm,
- Training outside the firm,
- Code of the training,
- Name of the training,
- Date of the training,
- Functional code of the employee who is attended to the training,
- Name of the students,
- Surname of the students,
- Branch of the students,
- Grades of the students,
- Functional code of the student in the firm,
- Name of the teacher of the students,
- Personality profile of every employee.

**Information of training subsystem:**

- Determining the training needs of employees,
- List of the employees attended to an specified training,
- List of employees between a given time interval,
- Determining the contents of orientation programs of new employees,



## CHAPTER 5 FURTHER SUGGESTIONS

### 5 Conclusion And Further Suggestions

In this thesis, an overview of MIS is given and an application about " Human Resources Management " is executed, and this system is analysed deeply taking into consideration its subsystems. It would be better to remember the objectives set during planning phase of the study. They were;

1. Increasing operational effectiveness,
2. Increasing functional effectiveness,
3. Making information storage easier.

Increasing operational effectiveness means that speed of data and information flow in human resources management system would be increased. Due to faster data and information flow, managers in all levels of the organisations would be able to reach information they need whenever they want. On the other hand, increasing functional effectiveness means to enlarge the contents of the functions that human resource management includes. Human resources is a buffer between manufacturing and top management. So, this system should have to produce data to be used in decision making procedures of top management, and give answer to employee demand of all functions of the firm.

On the other side human resources management is responsible for making wage analysis in automotive industry and inside the firm or fill in questionnaires other firms sent to concerning wages.

In the beginning some data were processed in main system and in multiplan. As it was explained in previous chapters, multiplan didn' t give the user chance of manipulating data effectively because of unavailable memory size and capabilities. Subsequently, information system has been changed in

the firm. By the help of new personnel computers working on network, everyone had the chance of preparing his or her own reports.

After system has been changed in the firm, the functions of human resources management system have been analysed again, and general outline of this system had been determined by setting and detailing subsystems of the system. A computerised human resources management system is structured in PC that enabled to reach any kind of information. Reporting structure in computerised system shortens time to produce and process data and provides the desired format of every report. Operational effectiveness of the system was increased by this way.

Time spent during execution of routine tasks was saved, and users had the chance of studying on more important subjects that human resources management included afterwards. These were updating job descriptions and describing new job titles in the firm, implementing new employee selection techniques such as psychotechnique tests. Employee selection techniques, gathered data and information as a result of implementing these tests should be systematised, too. This would probably be the responsibility of a new subsystem, maybe named as " Employee Skills " or " Skills Inventory ". By this way, human resources management would gain a new subsystem that should aim to make a pool of man-power that is believed to be productive after selection procedure is completed.

A MIS study aims to integrate all of the functions of a firm. But, this study takes a long time. Due to restriction, in this study only one function of the firm is analysed deeply. Since the purpose of MIS is to serve managers and key decision makers, systems designer should determine who these people and what their roles are. This can be achieved by studying formal and informal structure of the company.

Ideally, systems and information systems should be developed to solve company problems. Subsequently managers of systems should first be determined. In real situations, however the opposite is true. The MIS designer

must usually accept the organisation and decision structure as given and then design MIS to serve it.

For an MIS to be cost effective, a commitment by each department of the organisation and a detailed definition of the primary needs of these departments are required. Ideally, a system committee should consist of a management member from each of the operating units of the company. The committee should also include an independent member who is trained and educated in data processing, system analysis and planning.

The response time for data is a very important consideration in a competitive industry. Therefore the decision to implement a more expensive computer-based system may actually result in considerable savings as the company may act immediately. The same is true for report formats. When the data is presented in an action oriented way management can eliminate much detailed work and concentrate entirely on decision making.

In this chapter it would be convenient to talk about Local Area Networks, that shortens response time for data and information.

Nowadays, most of the companies interconnected several micro computers with one another and set up LANs in their office. This provides the company a complete management information program.

The LAN technology is very simple. A cable is installed in an office building. This cable connects various computers and other devices together. A typical LAN might connect 10 computers, two printers and two hard disk drives. A company that is processing a high volume of accounts receivable information might be interested in using a LAN.

Each operator may use his or her own computer to enter data and to retrieve information. The cost is much lower, and the efficiency is much higher than equipping each operator with his or her own complete system.

LANs offer distinct advantages over multi-user computer system. It allows users to have their own computer workstations, and yet still share data and hardware with other users.

Software is also important in a MIS study. For example, a well-designed database provides with convenient access to the information wanted. Designing a database takes time and effort, but in the long run, the process saves more time than it takes. A carefully constructed plan provides a database causing accurate results, and anyone else may use this database effectively.

Key to understanding the database design process lies in understanding the difference between the way data and the way a relational database management system used, such as Microsoft Access [ 6 ], stores data. Data used as information facts in a useful manner. The same fact might be combined with another set of facts for a number of purposes. So, in this study, if databases were organised in Access, it would have caused more effective results. The power in a relational database management system such as Microsoft Access comes from its ability to quickly search for, find, and bring together information stored in separate tables.

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- [ 5 ] 1990 " Microsoft Excell User's Guide ", Microsoft Corporation, United States of America.
- [ 6 ] 1992 " Microsoft Access User's Guide ", Microsoft Corporation, United States of America.



**APPENDIX**

Appendix A.1 : Forms Used During New Employee Entry

<b>INSURANCE</b>		<table border="1" style="margin: auto;"> <tr><td style="text-align: center;">FIRST</td></tr> <tr><td style="text-align: center;">AGAIN</td></tr> </table>		FIRST	AGAIN	<b>ENTRY FORM</b>		
FIRST								
AGAIN								
				<table border="1" style="margin: auto;"> <tr><td style="text-align: center;">Insurance Number «number»</td></tr> </table>		Insurance Number «number»		
Insurance Number «number»								
<b>1</b>	Surname	«surname»	<b>5</b>	Date of birth	«dateofbirth»			
<b>2</b>	name	«name»	<b>6</b>	Sex	«sex»			
<b>3</b>	Father's Na.	«fathersname»	<b>7</b>	Nationality	«nationality»			
<b>4</b>	B.of Place	«birthofplace»	<b>8</b>	ID Data	City «city» Home Other Page «hom» «oth» «page»			
If employee is insured before hired in this firm write name of your previous firm								
<b>9</b>	City	Name of the firm	Address					
	«cityofjob»	«nameoffirm»	«adressoffirm»					
Description 1								
Description 2								
«hiredate»								
Signature								
<b>10</b>	Hire Date	«hiredate»	<b>11</b>	Description 3				
<b>12</b>	City	Name of the firm	Address					
Description 4								
...../...../199...								
Signature of the employer								
Description 6								

Figure A.1.1 : Insurance Entry Form

## POLICE FORM

A

B	C	D	E
	X		

F	G	H	I	J	K	L
---	---	---	---	---	---	---

## EMPLOYEE'S

Surname Name	«surname»,«name»		ID Data			
Father's Name	«fathersname»		City-Country	«city»,«country»		
B. of pla. date of b	«birthofplace»	«dateofbirth»	Village	«village»		
Marital Status	«maritalstatus»		Other 1	Others:«oth» Page:«page»		
Nationality	«nationality»		Other 2	Home:«hom»		
Previous job's	Name	Place	Address			Exit Date
			«address»			
Job			Hire Date	Question 1		N
			«hiredate»			

## FORM DESIGNER

Surname Name	xxxxxx	Status			
Father's Name		Description 1	Description 4		
			Description 5		
B. of pla. date of b			Description 6		
Nationality		Description 2	Description 7		
Home Address & Telephone Num.	xxxxxx xxxxxx	Description 3	Description 8		
		Description 9			

I confirm the information I have given above

...../...../19...

Signature

Description 10

Description 11

Description 12

Description 13

Description 14

Description 15

Job:

Signature:

/ /19

Date

## DESCRIPTION 16

Name, Surname		Address	
Father's Name		Date	
Birth of Place		Signature	

Figure A.1.2 : Police Form

NAME OF FIRM

FORM OF EMPLOYEE ENTRANCE

Hire Date	: «hiredate»	Insurance Number	: «number»
Code/Number	: «function»-«code» / «number»	Date of Birth	: «dateofbirth»
Name, S.name	: «name», «surname»	Place of Birth	: «placeofbirth»
Place of funct.	: «functionplace»	Nationality	: «nationality»
Job Title	: «title»	Marital Status	: «maritalstatus»-«children»
Salary	: «salary»	Responsibilities	:
Salary /Hour	: «salaryperhour»	Sex	: «sex»
Background	: «school»	Blood Type	: «bloodtype»

If employee has an work experience write time : / .....till.....

Entrance time : ..... Exit time : .....

Address : «address»

Employee's Signature : Signature of human resources expert

Figure A.1.3 : Employee Entrance Form

Table A.1.1 : Data Entry Table of New Employee

EMPLOYEE NUMBER	:	
FUNCTION CODE		
GROUP CODE		
NAME	:	
SURNAME	:	
DATE OF ENTRANCE	:	
INSURANCE NUMBER	:	
BRUT SALARY	:	
TITLE	:	
GRADE	:	
BLOOD TYPE	:	
MARITAL STATUS	:	
NUMBER OF CHILDREN	:	
DEPARTMENT	:	
SALARY PER HOUR	:	
SEX	:	
EDUCATION LEVEL	:	
DATE OF BIRTH	:	
DATE OF PLACE	:	
FATHER'S NAME	:	
ID INFORMATION	:	
CITY	:	
COUNTRY	:	
VILLAGE	:	
HOME	:	
PAGE 1	:	
PAGE 2	:	
NATIONALITY	:	
ADRESS	:	
LAST INSURED JOB DONE;	:	
CITY	:	
TITLE	:	
ADRESS	:	

## Appendix A.2 Procedure Tables of Execution Subsystem

Table A.2.1 Preparing Memorandums

PROCEDURE:	Personnel and Memorandum Activities		Date
FUNCTION:	Preparing of Memorandums		
Code	Procedures	Duty	Responsibility
P1-01	Execution subsystem is responsible for making memorandums.	Making memorandums	Execution department (Salaried employee)
P1-02	Execution prepares memorandum and salary forms at the end of every month.		
P1-03	Data about deductions are inputted in the database.		
P1-04	<p>The employee prepares reports that include following information (P-RPT1)</p> <ul style="list-style-type: none"> <li>-Name and surname,</li> <li>-Salary per month, salary per hour,</li> <li>-Total monthly working hour,</li> <li>-Brut salary,</li> <li>-Net salary,</li> <li>-Cumulative brut salary,</li> <li>-Deductions,</li> <li>-Total deductions,</li> <li>-Net salary</li> </ul>	Preparing of memorandums.	Execution department (Salaried employee)
P1-05	Memorandums cannot be copied. It is strictly forbidden to decelerate anything about memorandums.	Protecting information in memorandums.	Human Resource Department (All the employees).

Table A.2.2 : Preparing Absenteeism Hours

PROCEDURE:	Personnel Execution Activities		Date
FUNCTION:	Preparing of Absenteeism Hours		
Code	Procedures	Duty	Responsibility
P2-01	Execution is responsible for following absenteeism hours.	Preparing list of absent employees.	Execution department (Manager)
P2-02	It reports absent employees to their managers.		Execution department (Manager)
P2-03	Execution follows absenteeism profile by the help of time recording system.		Salaried Employee
P2-04-01	Execution is responsible for analysing distribution of unusual hours taking into consideration the firm's policies.		
P2-04-02	Execution decides to except or not to except the declared working hours.		
P2-04-03	Execution reports the faults.		Salaried Employee
P2-05	Execution updates memorandum information.		Salaried Employee
P2-06-01	Execution determines unworked hours because of job accidents.		
P2-06-02	The employee prepares reports that includes following information (P-RPT2),  -Number of accidents occurred in functions,  -Total man-power lost (hours) in functions,  -Total man-power lost (days) in functions	Preparing of Table F.1.5.	Salaried Employee

Code	Procedures	Duty	Responsibility
P2-06-03	<p>The employee prepares reports that includes following information (P-RPT3),</p> <ul style="list-style-type: none"> <li>-Functional code,</li> <li>-Name and surname</li> <li>-Employee number,</li> <li>-Body part injured,</li> <li>-Lost hours,</li> <li>-Lost days</li> </ul>	Preparing of Table F.1.6.	Salaried Employee
P2-06-04	Controls the report P-RPT2 and P-RPT3.		

## Appendix A.3 : Procedures and Tables of Personnel Subsystem Activities

Table A.3.1 : Preparing of Forms During New Entrance

PROCEDURE:	Personnel Subsystem Activities		Date
FUNCTION:	Preparing of Forms During New Entrance		
Code	Procedures	Duty	Responsibility
P3-01	Personnel subsystem is responsible for getting needed forms of new employees.		Personnel Subsystem (Salaried Employee)
P3-02	Personnel prepare table that includes following information (P-FRM1) <ul style="list-style-type: none"> <li>• Personnel data,</li> <li>• Salary data,</li> <li>• ID data.</li> </ul>	Preparing of entry forms.	Personnel Subsystem (Salaried Employee)
P3-03-01	Personnel is responsible for printing out all the forms that are needed (Appendix B1, B2, B3, B4, B5, B6)	Inputting data in the data file in Winword 2.0	Personnel Subsystem (Salaried Employee)
P3-03-02	Controlling forms.		Personnel Subsystem (Salaried Employee)
P3-03-03	Making employees sign all the forms		Personnel Subsystem (Salaried Employee)
P3-04	Controlling all the forms and signing them.		Human Resources Supervisor.
P3-05	Putting these forms in every employee's private file.		Personnel Subsystem (Salaried Employee)
P3-06	Personnel is responsible for protecting these forms.		Personnel Subsystem (Salaried Employee)

Table A.3.2 : Getting New employee Acquainted with the Firm

PROCEDURE:	Personnel Subsystem Activities		Date
FUNCTION:	Getting the New Employee Acquainted with the Firm		
Code	Procedures	Duty	Responsibility
P4-01	Personnel subsystem is responsible for showing the employee the place of time-card machine.	Getting employee to the time-card machine.	Personnel Subsystem (Salaried Employee)
P4-02	Personnel subsystem is responsible for showing the place of doctor in the firm.		Personnel Subsystem (Salaried Employee)
P4-03	Personnel is responsible for showing where the firm's services take place during exit hours.		Personnel Subsystem (Salaried Employee)
P4-04	Making new employee learn how to use time-card machines.	Practicing on the time-card machine.	Personnel Subsystem (Salaried Employee)
P4-05	Getting new employee to his own department.		Personnel Subsystem (Salaried Employee)

Table A.3.3 : Updating Information in the Main System

PROCEDURE:	Personnel Subsystem Activities		Date
FUNCTION:	Updating Information in the Main System		
Code	Procedures	Duty	Responsibility
P5-01	Personnel subsystem is responsible for inputting data in form B7.		Personnel Subsystem (Salaried Employee)
P5-02	Personnel subsystem is responsible for controlling of data in form B7.		Salaried Employee
P5-03	Personnel is responsible for inputting data in the main system.		Salaried Employee
P5-04	Personnel is responsible for getting lists of inputted data.		Salaried Employee
P5-05	Personnel is responsible for making periodical controls of these lists.		Salaried Employee
P5-06	Personnel is responsible for protection of the lists of the files both for plant A and for plant B.		Salaried Employee
P5-07	Personnel is responsible for updating data in personnel database in PC (P-RPT4).	Inputting data from the files for both plant A and plant B.	Expert
P5-08	Personnel is responsible for controlling of these data.		Expert



Table B.1.2 : Hourly waged employee monthly costs.

**PLANT A**  
**HOURLY-WORKED EMPLOYEE**  
**Feb-93**

GRADE	NUMBER OF EMPLOYEES	NAKED SALARY PER HOUR		
		MINIMUM	AVERAGE	MAXIMUM
I		0,00	0,00	0,00
II		0,00	0,00	0,00
III		0,00	0,00	0,00
IV		0,00	0,00	0,00
V		0,00	0,00	0,00
VI		0,00	0,00	0,00
VII		0,00	0,00	0,00
VIII		0,00	0,00	0,00
IX		0,00	0,00	0,00
<b>GENERAL</b>	<b>0</b>	<b>0,00</b>	<b>0,00</b>	<b>0,00</b>

<b>BRUT WORKING HOURS</b>	225 TL HOUR/MONTH
<b>AVERAGE WORKING YEARS</b>	8,9 YEARS
<b>AVERAGE NAKED SALARY</b>	0,00 TL/HOUR
<b>TOTAL AVERAGE MAN-POWER COSTS</b>	63.339 -TL/BRUT HOUR
	14.251.275 -TL/BRUT MONTH
	172.915.470 -TL/BRUT YEARS
<b>COST ACC.TO ACTUAL WORKING HOURS</b>	181 TL HOUR/MONTH
<b>AVERAGE NAKED SALARY</b>	0 -TL/NET HOUR
<b>AVERAGE MAN-POWER COSTS</b>	78.954 -TL/NET HOUR

Table B.1.3 : Salaried Employee Monthly Costs

**PLANT A**  
**SALARIED EMPLOYEE**  
**Feb-93**

GRADE	NUMBER OF EMPLOYEES	NAKED SALARY PER MONTH		
		MINIMUM	AVERAGE	AZAMI
I		0,00	0,00	0,00
II		0,00	0,00	0,00
III		0,00	0,00	0,00
IV		0,00	0,00	0,00
V		0,00	0,00	0,00
VI		0,00	0,00	0,00
VII		0,00	0,00	0,00
VIII		0,00	0,00	0,00
IX		0,00	0,00	0,00
X		0,00	0,00	0,00
XI		0,00	0,00	0,00
XII		0,00	0,00	0,00
XIII		0,00	0,00	0,00
<b>GENERAL</b>	<b>0</b>	<b>0,00</b>	<b>0,00</b>	<b>0,00</b>

**AVERAGE WORKING YEAR**

**COST PER MONTH**

**COST PER YEAR**

Table B.1.4 : Human Resources Annual Budget

HUMAN RESOURCES BUDGET ( 1994 )															
	ACTUAL JAN- OCTOBER	ESTIMATED JAN-DEC 83	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL
EXPENDITURE 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 2	20,000	200,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	1,800,000
EXPENDITURE 3	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 4	20,000	10,000	0	0	0	0	0	0	0	0	0	0	0	50,000	50,000
EXPENDITURE 5	35,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	7,000	117,000
EXPENDITURE 6	58,000	10,000	0	5,000	0	5,000	0	5,000	0	5,000	0	5,000	0	5,000	30,000
EXPENDITURE 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 8	250,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	33,930	143,930
EXPENDITURE 9	35,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	4,300	114,300
EXPENDITURE 10	150,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	32,000	142,000
EXPENDITURE 11	502,539	2,735,000	90,000	90,000	90,000	90,000	190,000	90,000	1,390,000	90,000	90,000	90,000	90,000	90,000	2,480,000
EXPENDITURE 12	502,539														0
EXPENDITURE 13	502,539														0
EXPENDITURE 14	502,539														0
EXPENDITURE 15	0	0													0
EXPENDITURE 16	5,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	550	110,550
EXPENDITURE 17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 19	1,665	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 21	68,053	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	0	110,000
EXPENDITURE 22	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 23	25,500														0
EXPENDITURE 24	2,250														0
EXPENDITURE 25	194,973	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	30,000	140,000
EXPENDITURE 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 29	4,972														0
EXPENDITURE 30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 34	41,000	96,603	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	144,000
EXPENDITURE 35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE 37	250,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	76,000	186,000
EXPENDITURE 38	510,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	62,000	172,000
EXPENDITURE 39	1,500,000	11,455,000													0
EXPENDITURE 40	0	470,000													0
EXPENDITURE 41	1,500,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	1,100,000	1,210,000
EXPENDITURE 42	45,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	20,000	130,000
EXPENDITURE 43	2,500,000	1,186,000	54,000	106,000	120,800	100,800	142,400	94,400	48,400	0	43,400	122,400	69,800	64,000	966,400
EXPENDITURE 44	0	150,000	0	0	910,000	0	0	810,000	0	0	0	0	810,000	0	2,530,000
TOTAL	9,222,829	16,422,603	416,000	473,000	1,392,800	467,800	604,400	1,271,400	1,710,400	367,000	405,400	489,400	1,241,800	1,736,780	10,676,180

## Appendix B.2 : Procedure Table of cost analysis subsystem

PROCEDURE:	Cost Analysis Subsystem Activities		Date
FUNCTION:	Preparing Human Resources Budget		
Code	Procedures	Duty	Responsibility
P8-01	Human resources budget is done during annual budget studies of the firm.		
P8-02	Human resources is responsible for gathering data about the following year's budget.	Gathering data about budget.	Human resources (Expert)
P8-03	Human resources is responsible for computing conjective values for service costs, lunch costs, doctors, etc. taking into consideration employee number, salaries and net working days in a year.	Determining cost values for every kind of expenditures.	Human Resources (Expert).
P8-04	Human resources budget is prepared by filling in standard budget forms distributed by budgeting and control department.	Preparing personnel budget forms (P-FRM3).	Budgeting and Control Supervisor
P8-05	Human resources is responsible for preparing standard budget report (Form: Appendix. published by budgeting and control department.	Preparing human resources budget.	Human resources (Expert).
P8-06	Human resources is responsible for controlling annual budget of human resources function.		Human Resources (Manager).
P8-07	Human resources confirms human resources' budget.	Confirming the budget.	Human Resources (Manager).
P8-08	One copy of human resources budget is given to human resources and other copy remains in budgeting and control department.	Sending a copy of human resources budget to human resource manager.	Budgeting and Control (Salaried Employee).



Table C.1.2 : Overtime hours

<b>FEBRUARY 1993 OVERTIME HOURS</b>				
<b>DEPARTMENTS</b>	<b>SALARIED EMPLOYEE</b>	<b>HOURLY- WAGED EMPLOYEE</b>	<b>TOTAL</b>	<b>CUMULATIVE</b>
SECTION 1	0,0	3,0	3,0	34,0
SECTION 2	0,5	0,0	0,5	12,0
SECTION 3	185,5	13,5	199,0	428,0
SECTION 4	4,0	1,0	5,0	16,0
SECTION 5	429,0	0,0	429,0	1269,5
SECTION 6	1,0	0,0	1,0	19,5
SECTION 7	0,0	0,0	0,0	0,0
SECTION 8	1,5	0,0	1,5	1,5
SECTION 9	128,5	1327,5	1456,0	3032,5
<b>TOTAL</b>	<b>750,0</b>	<b>1342,0</b>	<b>2092,0</b>	<b>4779,0</b>
SECTION 10	0,0	0,0	0,0	0,0
SECTION 11	333,5	20,5	354,0	674,0
SECTION 12	36,5	0,0	1,5	1,5
<b>TOTAL</b>	<b>370,0</b>	<b>20,5</b>	<b>390,5</b>	<b>755,0</b>
SECTION 13	0,0	624,0	624,0	624,0
SECTION 14	837,0	0,0	837,0	2195,5
SECTION 15	66,0	0,0	66,0	396,5
<b>TOTAL</b>	<b>903,0</b>	<b>624,0</b>	<b>2447,5</b>	<b>5454,5</b>
SECTION 16	0,0	0,0	0,0	0,0
SECTION 17	0,0	94,5	94,5	166,5
SECTION 18	0,0	0,0	0,0	0,0
SECTION 19	91,5	0,0	91,5	240,0
SECTION 20	153,0	2882,0	3035,0	4670,0
SECTION 21	195,5	3999,0	4194,5	6939,5
SECTION 22	83,0	2119,5	2202,5	3045,0
SECTION 23	234,0	924,0	1158,0	2821,0
SECTION 24	77,5	469,0	546,5	695,5
SECTION 25	55,0	2289,0	2344,0	4700,0
SECTION 26	47,5	1329,5	1377,0	2156,0
SECTION 27	0,0	114,5	114,5	235,0
SECTION 28	475,0	1990,0	2465,0	2416,0
SECTION 29	371,5	1443,0	1814,5	4695,5
SECTION 30	172,5	1213,0	1385,5	3220,0
SECTION 31	279,5	416,0	695,5	1248,0
SECTION 32	23,5	0,0	23,5	32,0
<b>TOTAL</b>	<b>2259,0</b>	<b>19283,0</b>	<b>21542,0</b>	<b>40280,0</b>
<b>TOTAL (PLANT A)</b>	<b>4282,0</b>	<b>21272,5</b>	<b>25554,5</b>	<b>49064,0</b>
<b>TOTAL (PLANT B)</b>	<b>2164,5</b>	<b>13678,0</b>	<b>15842,5</b>	<b>30262,0</b>
<b>TOTAL (PLANT A+B)</b>	<b>6446,5</b>	<b>34950,5</b>	<b>41397,0</b>	<b>79326,0</b>
<b>TOTAL (OTHERS)</b>	<b>229,0</b>	<b>904,5</b>	<b>1133,5</b>	<b>2563,0</b>
<b>GENERAL TOTAL</b>	<b>6675,5</b>	<b>35855,0</b>	<b>42530,5</b>	<b>81889,0</b>



Table C.1.4 : Dist. of overtime hours and its reasons.

07/01/1984

MONTHLY ACTUAL OVERTIME VALUES AND BUDGET ANALYSIS

FEBRUARY 1993

TOTAL CUMULATIVE

SALARIED

HOURLY-WAGED

DEPARTMENT/ANLAR	SALARIED			HOURLY-WAGED			TOTAL			CUMULATIVE				
	BUDGET	INCREASE D BUDGET	DIFFER. (%)	BUDGET	INCREASE D BUDGET	DIFFER. (%)	BUDGET	INCREASE D BUDGET	DIFFER. (%)	BUDGET	INCREASE D BUDGET	DIFFER. (%)		
FUNCTION 1	9,0	0,0	-9,0	3,0	3,0	-6,0	18,0	0,0	-83,3	36,0	0,0	34,0	-2,0	-5,6
FUNCTION 2	504,0	750,0	246,0	1342,0	1000,0	292,4	-848,0	0,0	147,3	1692,0	0,0	4779,0	3087,0	182,4
FUNCTION 3	432,0	370,0	-62,0	20,0	11,0	122,2	441,0	0,0	-11,8	882,0	0,0	755,0	-127,0	-14,4
FUNCTION 4	387,0	903,0	516,0	624,0	489,0	382,2	522,0	0,0	192,5	1044,0	0,0	3216,0	2172,0	208,0
FUNCTION 5														
FUNCTION 6	1206,0	984,0	2259,0	6478,0	19283,0	3105,0	10808,0	7460,0	17,3	21411,0	12948,0	40280,0	5921,0	17,2
FUNCTION 7	758,0	836,0	2164,5	4000,0	13878,0	5448,0	4888,0	4838,0	61,3	9827,0	8438,0	30262,0	11897,0	64,8
FUNCTION 8	531,0	229,0	-302,0	900,0	875,0	300,0	756,0	0,0	49,3	1512,0	0,0	2558,0	1046,0	69,2
TOTAL	3825,0	1820,0	6675,5	10478,0	35850,0	10722,0	18477,0	12286,0	38,2	38504,0	21388,0	81884,0	23894,0	41,4

PS : TO THE OVERTIMES ABOVE ITEMS DUE TO FOLLOWING FACTS ARE INCLUDED;

	FEBRUARY		CUMULATIVE	
	SALARIED	HOURLY-WAGED	SALARIED	HOURLY-WAGED
INCREASE IN PRODUCTION PROJECTS	1648,0	15864,0	2801,0	25086,0
OTHER FIRMS ITEMS	2570,0	5339,0	5981,0	12853,0
EXPORT	27,0	213,0	284,0	1664,0
ELECTRIC SHORTAGE	182,0	1038,0	264,0	1592,0
CUSTOMER SERVICES	0,0	0,0	0,0	0,0
	0,0	142,0	78,0	709,0



Table C.1.6 : Employee Demand Form

<b>NAME OF FIRM</b>			<b>EMPLOYEE DEMAND FORM</b>		
NAME OF DEPARTMENT:			DATE:		
STAFF:	# OF EMPLOYEES:	DIFFERENCE:			
<b>DEMAND PROPERTIES</b>					
JOB TITLE:		<input type="checkbox"/> MALE	<input type="checkbox"/> CONTINUOUS		
		<input type="checkbox"/> FEMA.	<input type="checkbox"/> NOTCONT.		
SUMMARIZE MAIN FUCTIONS OF THE JOB AND ITS CONTENTS.		HIRE DATE WANTED (*) ...../...../19....		IF NOTCONT.DURATION .....MONTHS	
		KIND OF BACKGROUND WANTED			
		EXPERIENCE			
		FOREIGN LANGUAGE LEVEL			
		SPECIAL CAPABILITIES FOR JOB			
		OTHER PROPERTIES WANTED EXCEPT STANDART JOB DESCRIPTION			
		REASON FOR DEMAND			
IF INSTEAD OF EMPLOYEE WHO QUIT WRITE THE NAME OF HIM					
IF IT IS ADDED TO STAFF WRITE REASON FOR IT					
EXPLAIN IF THIS EMPLOYEE CAN BE EMPLOYED IN THE FIRM					
<b>CONFIRMATION</b>					
SUPERVISOR	MANAGER	PLANT MANAGER			
HUMAN RESOURCES MANAGER	ASSISTANT OF GENERAL MANAGER (FINANCE AND ADMI.)	GENERAL MANAGER			

## Appendix C.2 : Analysis of hourly waged employee and formen salaries.

Table C.2.1 : Hourly-waged Employee/Formen wage Analysis.

## Hourly-Waged Employee / Formen Wage Analysis ( September 1993 / Plant A )

Departments	Number of		Average Salary		Minimum Salary		Maximum Salary		Min(F)/Max(E) (%)
	Employee	Formen	Employee	Formen	Employee	Formen	Employee	Formen	
A	2	1	12,572.775	14,047.000	11,805.300	14,047.000	13,340.250	14,047.000	5
B	2	3	9,703.298	12,182.580	9,476.550	12,182.580	9,930.045	12,182.580	18
C	17	4	11,361.376	13,418.078	8,919.711	12,578.450	12,367.864	15,043.060	2
D	12	4	10,303.074	12,472.033	8,665.545	12,259.200	12,059.220	12,706.150	2
E	6	2	10,688.595	13,057.325	9,991.920	12,450.760	11,323.245	13,663.900	9
F	6	1	10,320.338	12,706.150	10,089.450	12,706.150	10,560.825	12,706.150	17
G	5	1	12,399.639	13,727.750	11,111.175	13,727.750	13,560.975	13,727.750	1
H	5	2	10,943.010	12,131.500	10,242.225	12,131.500	11,757.375	12,131.500	3
I	6	2	11,300.595	12,594.413	10,318.845	12,482.675	12,244.170	12,706.150	2
J	22	6	12,028.667	13,642.617	9,461.595	12,259.200	13,539.600	14,391.790	-10
K	7	2	12,846.026	13,711.788	12,056.295	13,695.825	13,478.850	13,727.750	2
L	6	7	10,577.908	12,018.394	9,629.100	11,109.900	12,479.295	12,897.700	-12
M	41	5	11,231.747	13,749.459	8,824.725	12,923.240	12,538.350	16,996.870	2

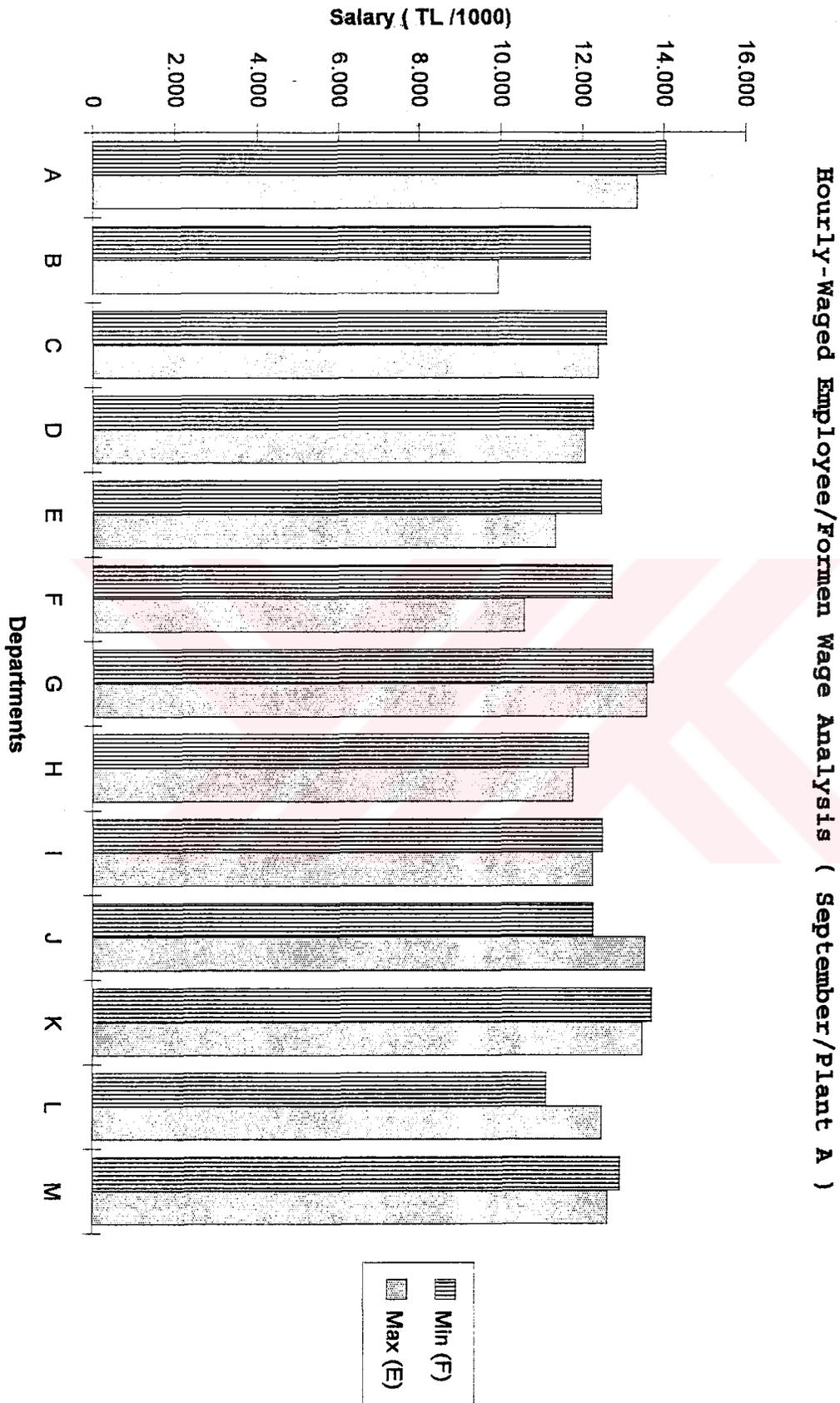


Figure C.2.1 : Hourly-waged Employee/Formen Wage Analysis.

## Appendix C.3 : Analysis of salary curves and alternative costs.

## Appendix C.3.1: Computing data

## ANALYSIS OF SALARIES

Situation 1: Analysis of current salaries

Minimum salary : 5.000.000  
 Maximum salary : 22.740.000

Ratio = 4

1. Alternative : Let 's say that distribution is exponential ( $y=e^x$ )
$$5000000 * e^x = 22740000$$

$x_1 = 0,00$   
 $x_2 = 1,51$

Increase  $\frac{x_2 - x_1}{13} = 0,12$

				Employee Number	
Average salary for the 1st. grade	1	*	5000000	5000000	
Average salary for the 2 nd. grade	1,1	*	5000000	5637484	2 11274969
Average salary for the 3 rd. grade	1,3	*	5000000	6356246	1 6356246
Average salary for the 4 th. grade	1,4	*	5000000	7166647	16 114666353
Average salary for the 5 th. grade	1,6	*	5000000	8080372	44 355536368
Average salary for the 6 th. grade	1,8	*	5000000	9110594	27 245986038
Average salary for the 7 th. grade	2,1	*	5000000	10272166	93 955311443
Average salary for the 8 th. grade	2,3	*	5000000	11581835	35 405364221
Average salary for the 9 th. grade	2,6	*	5000000	13058482	7 91409377
Average salary for the 10 th. grade	2,9	*	5000000	14723398	74 1089531434
Average salary for the 11 th. grade	3,3	*	5000000	16600585	12 199207015
Average salary for the 12 th. grade	3,7	*	5000000	18717107	46 860986917
Average salary for the 13 th. grade	4,2	*	5000000	21103479	4 84413916
				361	4420044297
				Average Cost	12.243.890 23.041.870 TL / Month 276.502.440 TL / Year

2. Alternative : Let's say that distribution is like  $y=ax$ 

$$5000000 * x = 22740000$$

Increase =  $\frac{\text{Max.} - \text{Min.}}{13} = 1364615$

				Employee Number	
Average salary for the 1st. grade	1	*	5000000	5000000	
Average salary for the 2 nd. grade	1364615	*	5000000	6364615	2 12729230
Average salary for the 3 rd. grade	2729230	*	5000000	7729230	1 7729230
Average salary for the 4 th. grade	4093845	*	5000000	9093845	16 145501520
Average salary for the 5 th. grade	5458460	*	5000000	10458460	44 460172240
Average salary for the 6 th. grade	6823075	*	5000000	11823075	27 319223025
Average salary for the 7 th. grade	8187690	*	5000000	13187690	93 1226455170
Average salary for the 8 th. grade	9552305	*	5000000	14552305	35 509330675
Average salary for the 9 th. grade	10916920	*	5000000	15916920	7 111418440
Average salary for the 10 th. grade	12281535	*	5000000	17281535	74 1278833590
Average salary for the 11 th. grade	13646150	*	5000000	18646150	12 223753800
Average salary for the 12 th. grade	15010765	*	5000000	20010765	46 920495190
Average salary for the 13 th. grade	16375380	*	5000000	21375380	4 85501520
				361	5301143630
				Average Cost	14.684.608 27.062.911 TL / Month 324.754.932 TL / Year

3. Alternative : Distribution is like  $y=a(x^x)$

5000000 \* (x<sup>x</sup>) = 5000000                      x1 = 1

5000000 \* (x<sup>x</sup>) = 22740000                    x2= 2,1

Increase =        x2-x1        0,08  
                                 13

		Employee Number			
Avarage salary for the 1st. grade	1	*	5000000	5000000	
Avarage salary for the 2 nd. grade	1,1664	*	5000000	5832000	2    10000000
Avarage salary for the 3 rd. grade	1,3456	*	5000000	6728000	1    5832000
Avarage salary for the 4 th. grade	1,5376	*	5000000	7688000	16   107648000
Avarage salary for the 5 th. grade	1,7424	*	5000000	8712000	44   338272000
Avarage salary for the 6 th. grade	1,96	*	5000000	9800000	27   235224000
Avarage salary for the 7 th. grade	2,1904	*	5000000	10952000	93   911400000
Avarage salary for the 8 th. grade	2,4336	*	5000000	12168000	35   383320000
Avarage salary for the 9 th. grade	2,6896	*	5000000	13448000	7    85176000
Avarage salary for the 10 th. grade	2,9584	*	5000000	14792000	74   995152000
Avarage salary for the 11 th. grade	3,24	*	5000000	16200000	12   177504000
Avarage salary for the 12 th. grade	3,5344	*	5000000	17672000	46   745200000
Avarage salary for the 13 th. grade	3,8416	*	5000000	19208000	4    70688000
					361   4065416000

Average                    11.261.540  
Cost                         21.423.470 TL / Month  
                                  257.081.640 TL / Year

Situation 2: Minimum salary=Average hourly-waged's salary=6800000

Max salary / Minimum salary = 3,25

1. Alternative : Let 's say that distribution is exponential (  $y= e^x$  )

6800000 \* e<sup>x</sup> =                    22100000

x1=        0,00

x2 =        1,18

Increase =        x2-x1        0,09  
                                 13

		Employee Number			
Avarage salary for the 1st. grade	1	*	6800000	6800000	
Avarage salary for the 2 nd. grade	1,1	*	6800000	7440385	2    14880770
Avarage salary for the 3 rd. grade	1,2	*	6800000	8141078	1    8141078
Avarage salary for the 4 th. grade	1,3	*	6800000	8907758	16   142524132
Avarage salary for the 5 th. grade	1,4	*	6800000	9746640	44   428852161
Avarage salary for the 6 th. grade	1,6	*	6800000	10664523	27   287942117
Avarage salary for the 7 th. grade	1,7	*	6800000	11668847	93   1085202740
Avarage salary for the 8 th. grade	1,9	*	6800000	12767752	35   446871318
Avarage salary for the 9 th. grade	2,1	*	6800000	13970146	7    97791021
Avarage salary for the 10 th. grade	2,2	*	6800000	15285774	74   1131147299
Avarage salary for the 11 th. grade	2,5	*	6800000	16725301	12   200703614
Avarage salary for the 12 th. grade	2,7	*	6800000	18300394	46   841818143
Avarage salary for the 13 th. grade	2,9	*	6800000	20023821	4    80095284
					361   4.765.969.677

Average                    13.202.132  
Cost                         24.620.559 TL / Month  
                                  295.446.708 TL / Year

2. Alternative : Let's say that distribution is like  $y=ax$

$5000000 * x = 22100000$

Increase = max -min  
13 1315385

			Employee Number	
Avarage salary for the 1st. grade	1	* 6800000	6800000	
Avarage salary for the 2 nd. grade	1315385	* 6800000	8115385	2 16230770
Avarage salary for the 3 rd. grade	2630770	* 6800000	9430770	1 9430770
Avarage salary for the 4 th. grade	3946155	* 6800000	10746155	16 171938480
Avarage salary for the 5 th. grade	5261540	* 6800000	12061540	44 530707760
Avarage salary for the 6 th. grade	6576925	* 6800000	13376925	27 361176975
Avarage salary for the 7 th. grade	7892310	* 6800000	14692310	93 1366384830
Avarage salary for the 8 th. grade	9207695	* 6800000	16007695	35 560269325
Avarage salary for the 9 th. grade	10523080	* 6800000	17323080	7 121261560
Avarage salary for the 10 th. grade	11838465	* 6800000	18638465	74 1379246410
Avarage salary for the 11 th. grade	13153850	* 6800000	19953850	12 239446200
Avarage salary for the 12 th. grade	14469235	* 6800000	21269235	46 978384810
Avarage salary for the 13 th. grade	15784620	* 6800000	22584620	4 90338480
				361 5824816370

Average 16.135.225  
Cost 29.452.776 TL / Month  
353.433.312 TL / Year

3. Alternative : Distribution is like  $y=a(x*x)$

$5000000 * (x * x) = 5000000$   $x1 = 1$

$5000000 * (x * x) = 22100000$   $x2 = 2,1$

Increase =  $x2-x1$   
13 0,08

			Employee Number	
Avarage salary for the 1st. grade	1	* 6800000	6800000	
Avarage salary for the 2 nd. grade	1,1664	* 6800000	7931520	2 13600000
Avarage salary for the 3 rd. grade	1,3456	* 6800000	9150080	1 7931520
Avarage salary for the 4 th. grade	1,5376	* 6800000	10455680	16 146401280
Avarage salary for the 5 th. grade	1,7424	* 6800000	11848320	44 460049920
Avarage salary for the 6 th. grade	1,96	* 6800000	13328000	27 319904640
Avarage salary for the 7 th. grade	2,1904	* 6800000	14894720	93 1239504000
Avarage salary for the 8 th. grade	2,4336	* 6800000	16548480	35 521315200
Avarage salary for the 9 th. grade	2,6896	* 6800000	18289280	7 115839360
Avarage salary for the 10 th. grade	2,9584	* 6800000	20117120	74 1353406720
Avarage salary for the 11 th. grade	3,24	* 6800000	22032000	12 241405440
Avarage salary for the 12 th. grade	3,5344	* 6800000	24033920	46 1013472000
Avarage salary for the 13 th. grade	3,8416	* 6800000	26122880	4 96135680
				361 5528965760

Average 15.315.695  
Cost 28.102.615 TL / Month  
337.231.380 TL / Year

3. Alternative : Distribution is like  $y=a(x^*x)$

5000000 \* (x\* x )= 5000000                      x1 = 1  
 5000000 \* (x\* x )= 23800000                    x2= 2,2

Increase =        x2-x1            0,09  
                                  13

			Employee Number	
Avarage salary for the 1st. grade	1	* 6800000	6800000	
Avarage salary for the 2 nd. grade	1,1881	* 6800000	8079080	2      13600000
Avarage salary for the 3 rd. grade	1,3924	* 6800000	9468320	1      8079080
Avarage salary for the 4 th. grade	1,6129	* 6800000	10967720	16     151493120
Avarage salary for the 5 th. grade	1,8496	* 6800000	12577280	44     482579680
Avarage salary for the 6 th. grade	2,1025	* 6800000	14297000	27     339586560
Avarage salary for the 7 th. grade	2,3716	* 6800000	16126880	93     1329621000
Avarage salary for the 8 th. grade	2,6569	* 6800000	18066920	35     564440800
Avarage salary for the 9 th. grade	2,9584	* 6800000	20117120	7      126468440
Avarage salary for the 10 th. grade	3,2761	* 6800000	22277480	74     1488666880
Avarage salary for the 11 th. grade	3,61	* 6800000	24548000	12     267329760
Avarage salary for the 12 th. grade	3,9601	* 6800000	26928680	46     1129208000
Avarage salary for the 13 th. grade	4,3264	* 6800000	29419520	4      107714720
				361    6008788040

Average            16.644.842  
 Cost                30.292.360 TL / Month  
                          363.508.320 TL / Year



## Appendix C.3.2 : Computed data for every alternative on the basis of grades.

Min.	4500000	5073736	5720621	6449982	7272335	8199535	9244949	10423652	11752634	13251058	14940527	16845396	18993131
Average	5000000	5637484	6356246	7166647	8080372	9110594	10272166	11581835	13058482	14723398	16600585	18717107	21103479
Max.	5750000	6483107	7309683	8241644	9292428	10477183	11812991	13319110	15017254	16931908	19090673	21524673	24269001
<b>Salary Analysis of Current Situation and Situation 1,1</b>													
Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Average	5000000	5720000	6200000	6489375	6577954	7988518	8682688	9801429	14048571	11578784	15557500	16220217	19357500
New Average	5000000	5637484	6356246	7166647	8080372	9110594	10272166	11581835	13058482	14723398	16600585	18717107	21103479
<b>Cost Analysis of Current Situation and Alternative 1,1</b>													
Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Cost	11107698	12293884	13004674	13561414	13707348	16031225	17174857	19017965	26031527	21946123	28500903	29592797	34761413
New cost	11107698	12157940	13342088	14677208	16182553	17879823	19793494	21951149	24383899	27128815	30219448	33706378	37637882
<b>Salary Curve for Situation 1,2</b>													
Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Min.	4500000	5728154	6956307	8184461	9412614	10640768	11868921	13097075	14325228	15553382	16781535	18009689	19237842
Average	5000000	6364615	7729230	9093845	10458460	11823075	13187690	14552305	15916920	17281535	18646150	20010765	21375380
Max.	5750000	7319307	8886615	10457922	12027229	13596536	15165844	16735151	18304458	19873765	21443073	23012380	24581687
<b>Salary Analysis of Current Situation and Situation 1,2</b>													
Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Average	5000000	5720000	6200000	6489375	6577954	7988518	8682688	9801429	14048571	11578784	15557500	16220217	19357500
New Average	5000000	6364615	7729230	9093845	10458460	11823075	13187690	14552305	15916920	17281535	18646150	20010765	21375380
<b>Cost Analysis of Current Situation and Alternative 1,2</b>													
Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Cost	11107638	12293884	13004674	13561414	13707348	16031225	17174857	19017965	26031527	21946123	28500903	29592797	34761413
New cost	11107638	13355877	15604053	17852233	20100409	22348588	24596768	26844944	29093123	31341299	33589479	35837655	38085834
<b>Salary Curve for Situation 1,3</b>													
Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Min.	4500000	5248800	6055200	6919200	7840800	8820000	9856800	10951200	12103200	13312800	14580000	15904800	17287200
Average	5000000	5832000	6728000	7688000	8712000	9800000	10952000	12168000	13448000	14792000	16200000	17672000	19208000
Max.	5750000	6706800	7737200	8841200	10016800	11270000	12594800	13993200	15465200	17010800	18630000	20322800	22089200
<b>Salary Analysis of Current Situation and Situation 1,3</b>													
Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Average	5000000	5720000	6200000	6489375	6577954	7988518	8682688	9801429	14048571	11578784	15557500	16220217	19357500
New Average	5000000	5832000	6728000	7688000	8712000	9800000	10952000	12168000	13448000	14792000	16200000	17672000	19208000
<b>Cost Analysis of Current Situation and Alternative 1,3</b>													
Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Cost	11107638	12293884	13004674	13561414	13707348	16031225	17174857	19017965	26031527	21946123	28500903	29592797	34761413
New cost	11107638	12478403	13954546	15536129	17223150	19015611	20913510	22916046	25025623	27239836	29559491	31904583	34515116

**Salary Curve for Situation 2,1**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Min.	6120000	6696346,5	7326970,2	8016982,2	8771976	9598070,7	10501962,3	11490976,8	12573131,4	13757196,6	15052770,9	16470354,6	18021438,9
Average	6800000	7440385	8141078	8907758	9746640	10664523	11668847	12767752	13970146	15285774	16725301	18300394	20023821
Max.	7820000	8556442,75	9362239,7	10243921,7	11208636	12264201,45	13419174,05	14682914,8	16065667,9	17578640,1	19234096,15	21045453,1	23027394,15

**Salary Analysis of Current Situation and Situation 2,1**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Average	6800000	7200000	8200000	6489375	6577954	7988518	8682688	9801429	14048571	11578784	15557500	16220217	19357500
New Average	6800000	7440385	8141078	8907758	9746640	10664523	11668847	12767752	13970146	15285774	16725301	18300394	20023821

**Cost Analysis of Current Situation and Alternative 2,1**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Cost	14073164	12293884	13004674	13561414	13707348	16031225	17174857	19017965	26031527	21946123	28500903	29592797	34761413
New cost	14073164	15128189	16282567	17545659	18927700	20439895	22094500	23904925	25885849	28053320	30424914	33019850	35859166

**Salary Curve for Situation 2,2**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Min.	6120000	7303846,5	8487693	9671539,5	10855386	12039232,5	13223079	14406925,5	15590772	16774618,5	17958465	19142311,5	20326158
Average	6800000	8115385	9430770	10746155	12061540	13376925	14692310	16007695	17323080	18638465	19953850	21269235	22584620
Max.	7820000	9332692,75	10845385,5	12356078,25	13870771	15383463,75	16896156,5	18408849,25	19921542	21434234,75	22946927,5	24459620,25	25972313

**Salary Analysis of Current Situation and Situation 2,2**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Average	6800000	7200000	8200000	6489375	6577954	7988518	8682688	9801429	14048571	11578784	15557500	16220217	19357500
New Average	6800000	8115385	9430770	10746155	12061540	13376925	14692310	16007695	17323080	18638465	19953850	21269235	22584620

**Cost Analysis of Current Situation and Alternative 2,2**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Cost	14073164	12293884	13004674	13561414	13707348	16031225	17174857	19017965	26031527	21946123	28500903	29592797	34761413
New cost	14073164	16240235	18407309	20574383	22741453	24908527	27075602	29242672	31409746	33354406	35743980	37910961	40078035

**Salary Curve for Situation 2,3**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Min.	6120000	7136368	8235072	9410112	10663488	11995200	13405248	14893632	16460352	18105408	19828800	21630528	23510592
Average	6800000	7931520	9150080	10455680	11848320	13328000	14894720	16548480	18289280	20117120	22032000	24033920	26122880
Max.	7820000	9121248	10522592	12024032	13625568	15327200	17128928	19030752	21032672	23134688	25336800	27639008	30041312

**Salary Analysis of Current Situation and Situation 2,3**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Average	6800000	7200000	8200000	6489375	6577954	7988518	8682688	9801429	14048571	11578784	15557500	16220217	19357500
New Average	6800000	7931520	9150080	10455680	11848320	13328000	14894720	16548480	18289280	20117120	22032000	24033920	26122880

**Cost Analysis of Current Situation and Alternative 2,3**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Cost	14073164	12293884	13004674	13561414	13707348	16031225	17174857	19017965	26031527	21946123	28500903	29592797	34761413
New cost	14073164	15937324	17944878	20095031	22390179	24627926	27409068	30133606	33001542	36012873	39167603	42465729	45907253

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Min.	6120000	6763645,8	7474985,1	8261136	9129967,2	10090174,5	11151367,2	12324166,2	13620310,2	15052770,9	16635884,4	18385496,1	20319115,5
Average	6800000	7515162	8305539	9179040	10144408	11211305	12390408	13693518	15133678	16725301	18484316	20428329	22576795
Max.	7820000	8642436,3	9551369,85	10555896	11666069,2	12893000,75	14248969,2	15747545,7	17403729,7	19234096,15	21256963,4	23492578,35	25963314,25

**Salary Analysis of Current Situation and Situation 3,1**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Average	6800000	5720000	6200000	6489375	6577954	7988518	8682688	9801429	14048571	11578784	15557500	16220217	19357500
New Average	6800000	7515162	8305539	9179040	10144408	11211305	12390408	13693518	15133678	16725301	18484316	20428329	22576795

**Cost Analysis of Current Situation and Alternative 3,1**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Cost	14073164	12293884	13004674	13561414	13707348	16031225	17174857	19017965	26031527	21946123	28600903	29592797	34761413
New cost	14073164	15251381	16553514	17992588	19583016	21340708	23283259	25430109	27802745	30424914	33322861	36525584	40065142

**Salary Curve for Situation 3,2**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Min.	6120000	7421538,6	8723077,2	10024615,8	11326154,4	12627693	13929231,6	15230770,2	16532308,8	17833847,4	19135386	20436924,6	21738463,2
Average	6800000	8246154	9692308	11138462	12584616	14030770	15476924	16923078	18369232	19815386	21261540	22707694	24153848
Max.	7820000	9483077,1	11146154,2	12809231,3	14472308,4	16135385,5	17798462,6	19461539,7	21124616,8	22787693,9	24450771	26113848,1	27776925,2

**Salary Analysis of Current Situation and Situation 3,2**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Average	6800000	5720000	6200000	6489375	6577954	7988518	8682688	9801429	14048571	11578784	15557500	16220217	19357500
New Average	6800000	8246154	9692308	11138462	12584616	14030770	15476924	16923078	18369232	19815386	21261540	22707694	24153848

**Cost Analysis of Current Situation and Alternative 3,2**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Cost	14073164	12293884	13004674	13561414	13707348	16031225	17174857	19017965	26031527	21946123	28600903	29592797	34761413
New cost	14073164	16455676	18838188	21220703	23603214	25985726	28368237	30750749	33133260	35515772	37898283	40280795	42663306

**Salary Curve for Situation 3,3**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Min.	6120000	7271172	8521488	9870948	11319552	12867300	14514192	16260228	18105408	20049732	22093200	24235812	26477568
Average	6800000	8079080	9468320	10967720	12577280	14297000	16126880	18066920	20117120	22277480	24548000	26928680	29419520
Max.	7820000	9290942	10888568	12612878	14463872	16441550	18545912	20776958	23134688	25619102	28230200	30967982	33832448

**Salary Analysis of Current Situation and Situation 3,3**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Average	6800000	5720000	6200000	6489375	6577954	7988518	8682688	9801429	14048571	11578784	15557500	16220217	19357500
New Average	6800000	8079080	9468320	10967720	12577280	14297000	16126880	18066920	20117120	22277480	24548000	26928680	29419520

**Cost Analysis of Current Situation and Alternative 3,3**

Grade	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Cost	14073164	12293884	13004674	13561414	13707348	16031225	17174857	19017965	26031527	21946123	28600903	29592797	34761413
New cost	14073164	16180425	18469172	20939406	23591126	26424333	29436027	32635207	36012073	39572026	43312666	47234792	51388405

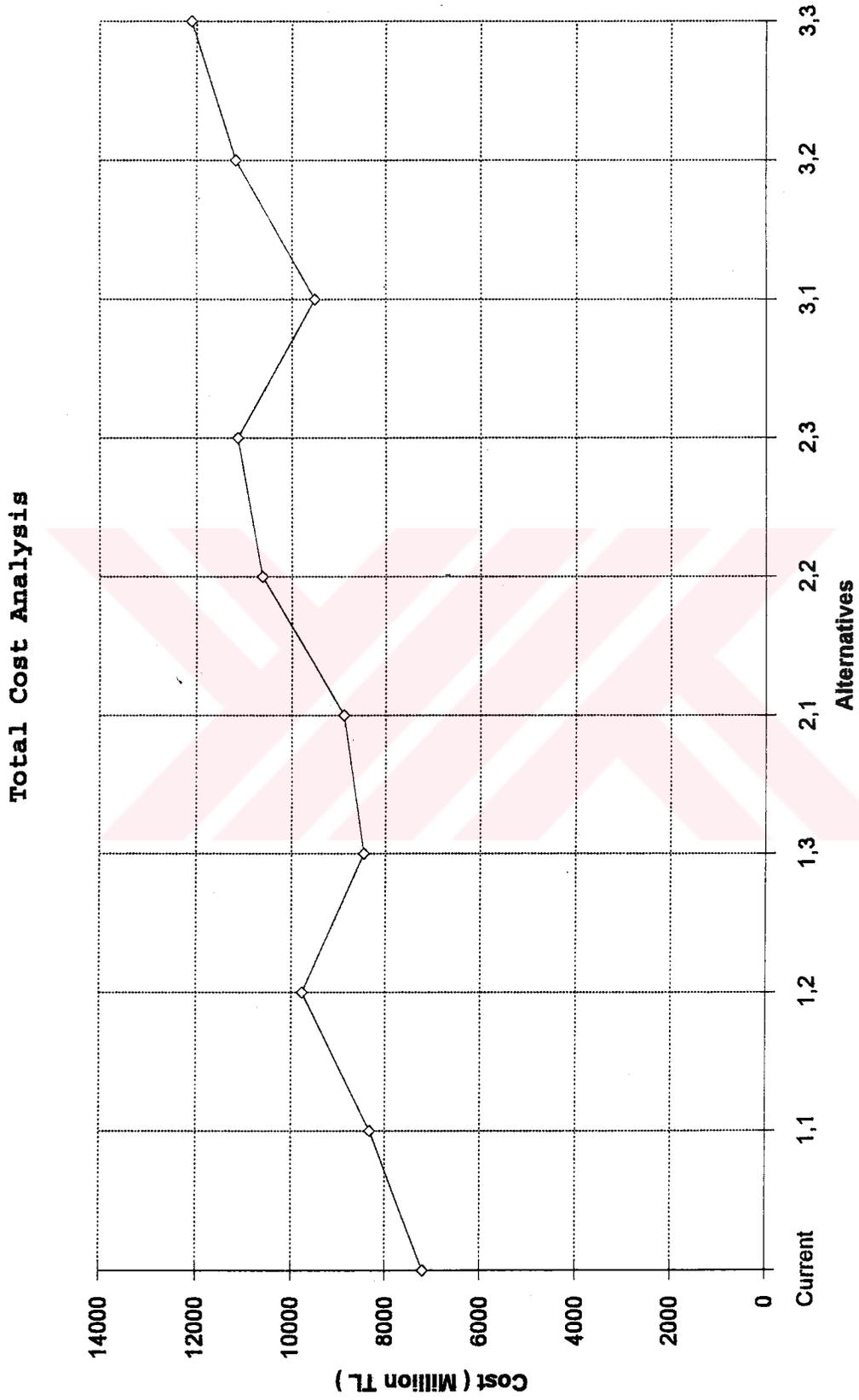


Figure C.3.2.1 : Graphical representation of every alternative's cost.

Appendix C.4 : Personnel Database

Table C.4.1 : Personnel Database Structure

Surname	Name	Grade	Working Years	Foreign Language	Title	Salary	Date of Entry	Date of Exit	Reason for Exit	Graduated School	Plant Code	Date of Birth	Age
S	T	5	1		Technical Employee	7,900	02/11/1992		MYO		1	29/11/1970	23
K	N	5	1		Technical Employee	7,500	23/11/1992		MYO		1	29/11/1961	32
U	V	5	3		Technical Employee	7,300	17/04/1990		MYO		1	29/11/1965	28
D	Q	8	8	English	Maintenance Supervisor	15,000	11/03/1985		Economy		1	29/11/1966	27
Q	Y	8	14	English	Maintenance Manager	25,000	01/08/1981		ODTU Electric		2	29/11/1960	33
E	K	7	11		Systems Operator	8,500	15/11/1982		Economy		1	29/11/1945	48
F	G	9	3		Systems Analyst	13,200	09/04/1990		Industrial Engineering		1	29/11/1970	23
S	R	10	7	English	Budget Control Expert	13,000	14/10/1986		Economy		1	29/11/1963	30
R	P		17	English	Budget Control Manager	25,000	24/02/1986		Business Administration		1	29/11/1965	28
K	R		11	French	Cad - Cam Project Manager	25,000	15/03/1982		Mechanical Engineering		1	29/11/1966	27
M	K	4	0		Secretary	48,000	01/07/1993		Business Administration		1	29/11/1960	33
N	G	4	7		Secretary	7,200	04/12/1986		Business Administration		1	29/11/1945	48
W	U	10	0	English	Purchasing Expert	11,000	28/07/1993		Industrial Engineering		1	29/11/1970	23
Q	V	10	1	English	Purchasing Expert	11,000	01/07/1992		Mechanical Engineering		1	29/11/1961	32
K	Y	10	3	English	Purchasing Expert	11,000	12/02/1990		Economy		1	29/11/1963	30
N	S	10	2	French	Industrial Engineer	12,000	01/08/1991		Industrial Engineering		1	29/11/1965	28
Z	C	10	1	English	Industrial Engineer	13,000	20/05/1992		Industrial Engineering		1	29/11/1966	27
Y	D	12	7	English	Industrial Engineer Supervisor	20,000	01/11/1986		Industrial Engineering		1	29/11/1960	33
V	U	10	6	English	Industrial Relations Manager	15,000	01/01/1988		Business Administration		1	29/11/1945	48
L	Q	10	17	English	Industrial Engineer	25,000	01/04/1976		Business Administration		1	29/11/1970	23
T	S	7	0	English	Industrial Engineer	8,500	02/08/1993		Industrial Engineering		1	29/11/1961	32
V	R	10	6	English	Finans Expert	13,200	12/11/1987		Industrial Engineering		1	29/11/1963	30
K	W	6	17	German	Ass.Gen Manager of Purchasing	18,000	15/03/1976		Mechanical Engineering		1	29/11/1965	28
Y	V	6	25		Accounting Manager	13,000	10/05/1968		Economy		1	29/11/1966	27
Y	V	6	18		Accounting Expert	25,000	02/05/1975		Economy		1	29/11/1960	33
J	Z	12	5	English	Marketing Supervisor	25,000	05/02/1988		Economy		1	29/11/1945	48
Z	Y	9	6		Personnel Supervisor	48,000	25/11/1987		Economy		1	29/11/1970	23
S	T		26	English	Production Engineering Manager	7,200	25/10/1967		Mechanical Engineering		1	29/11/1961	32

## Appendix C.5 : Examples of macros used in personnel database structure.

```

Record1 (h)
=SELECT("R1C20:R3C36")
=HPAGE(-2)
=SELECT("R1C20:R6C36")
=CLEAR(3)
=HPAGE(-3)
=SELECT("R4C1:R4C17")
=COPY()
=HPAGE(2)
=SELECT("R8C20")
=PASTE()
=HPAGE(-2)
=SELECT("R4C2")
=COPY()
=HPAGE(2)
=SELECT("R2C20")
=PASTE()
=ALIGNMENT(2;FALSE;3;0)
=SELECT("R3C20")
=FORMULA("6")
=HPAGE(-2)
=SELECT("R4C1:R591C17")
=SET.DATABASE()
=HPAGE(2)
=SELECT("R2C20:R3C20")
=SET.CRITERIA()
=SELECT("R8C20:R225C36")
=SET.EXTRACT()
=EXTRACT(FALSE)
=SELECT("R9C20:R15C21")
=HPAGE(-1)
=SELECT("C20:C36")
=COLUMN.WIDTH(;;;3)
=SELECT("C20")
=ALIGNMENT(3;FALSE;3;0)
=ACTIVATE("PERKAD.XLS")
=SELECT("R4C2:R25C15")
=CLEAR(1)
=HPAGE(-1)
=VLINE(-15)
=SELECT("R11C2")
=FORMULA("^Status")
=SELECT("R11C3")
=FORMULA("^Minimum Salary")
=SELECT("R11C4")
=FORMULA("^Average Salary")
=SELECT("R11C5")
=FORMULA("^Maximum Salary")
=SELECT("R11C6")
=FORMULA("^Average working Years")

```

```
=SELECT("R11C7")
=FORMULA("^Deviation")
=SELECT("R11C2:R11C7")
=FORMAT.FONT(;;TRUE)
=SELECT("R13C2")
=FORMULA("^Engineer")
=SELECT("R13C3")
=FORMULA("=MIN(PER.XLS!Salary)")
=SELECT("R13C4")
=FORMULA("=AVERAGE(PER.XLS!Salary)")
=SELECT("R13C5")
=FORMULA("=MAX(PER.XLS!Salary)")
=SELECT("R13C6")
=FORMULA("=AVERAGE(PER.XLS!Working Years)")
=FORMAT.NUMBER("0,0")
=SELECT("R13C7")
=FORMULA("=STDEV(PER.XLS!Salary)")
=FORMAT.NUMBER("#.##0")
=SELECT("R13C3:R13C5")
=FORMAT.NUMBER("#.##0")
=SELECT("C2:C7")
=COLUMN.WIDTH(;;3)
=ACTIVATE("PER.XLS")
=SELECT("R5C20")
=FORMULA("Salary Analysis of Engineers")
=VPAGE(-1)
=HLINE(6)
=HPAGE(-3)
=RETURN()
```

```

Record1 (e)
=HPAGE(-3)
=SELECT("R4C1:R580C17")
=SET.DATABASE()
=CALCULATION(3;FALSE;100;0,001;TRUE;FALSE;FALSE;TRUE;TRUE;FALSE;FALSE)
=SELECT("R4C1:R4C17")
=COPY()
=HPAGE(2)
=SELECT("R8C20")
=PASTE()
=HLINE(2)
=SELECT("R8C20:R200C36")
=VPAGE(-10)
=SET.EXTRACT()
=HLINE(3)
=SELECT("R8C25")
=COPY()
=SELECT("R3C21")
=PASTE()
=SELECT("R4C21")
=CANCEL.COPY()
=FORMULA("7")
=ALIGNMENT(3;FALSE;3;0)
=EXTRACT(FALSE)
=HPAGE(-2)
=SELECT("R21C7")
=HPAGE(2)
=HLINE(-5)
=SELECT("R3C21:R4C21")
=SET.CRITERIA()
=EXTRACT(FALSE)
=HLINE(1)
=SELECT("R6C20")
=FORMULA("List of Employees in Grade 7")
=FORMAT.FONT(;;TRUE)
=FORMAT.FONT(;;;TRUE)
=ACTIVATE("PERKAD.XLS")
=SELECT("R4C2:R14C7")
=CLEAR(1)
=SELECT("R4C2")
=FORMULA("Grade")
=SELECT("R4C3")
=FORMULA("Minimum Salary")
=SELECT("R4C4")
=FORMULA("Average Salary")
=SELECT("R4C5")
=FORMULA("Maximum Salary")
=SELECT("R4C6")
=FORMULA("Average Working Years")
=SELECT("R4C7")

```

```
=FORMULA("Deviation")
=SELECT("R4C2:R4C7")
=FORMAT.FONT(,TRUE)
=COLUMN.WIDTH(,3)
=SELECT("R6C2")
=FORMULA("=PER.XLS!R4C21")
=SELECT("R6C3")
=FORMULA("=MIN(PER.XLS!Salary)")
=FORMAT.NUMBER("#.##0")
=SELECT("R6C4")
=FORMULA("=AVERAGE(PER.XLS!Salary)")
=FORMAT.NUMBER("#.##0")
=SELECT("R6C5")
=FORMULA("=MAX(PER.XLS!Salary)")
=FORMAT.NUMBER("#.##0")
=SELECT("R6C6")
=FORMULA("=AVERAGE(PER.XLS!Working Years)")
=FORMAT.NUMBER("0,0")
=SELECT("R6C7")
=FORMULA("=STDEV(PER.XLS!Salary)")
=FORMAT.NUMBER("#.##0")
=SELECT("C2:C7")
=ALIGNMENT(1;FALSE;3;0)
=ALIGNMENT(3;FALSE;3;0)
=COLUMN.WIDTH(,3)
=SELECT("R4C8")
=RETURN0
```

**Record3 (a)**

```

=HPAGE(1)
=VPAGE(-2)
=SELECT("R1C20:R350C36")
=CLEAR(3)
=HPAGE(-3)
=SELECT("R4C1:R4C17")
=COPY()
=HPAGE(2)
=SELECT("R9C20")
=PASTE()
=HLINE(2)
=SELECT("R9C20")
=COPY()
=SELECT("R3C20")
=PASTE()
=FILL.AUTO("RC:RC[1]";FALSE)
=SELECT("R4C20")
=FORMULA("<^>=2600")
=SELECT("R4C21")
=FORMULA("<^<2800")
=SELECT("R3C20:R4C21")
=SET.CRITERIA()
=SELECT("R9C20:R350C36")
=SET.EXTRACT()
=EXTRACT(FALSE)
=SELECT("R10C20:R350C36")
=SORT(1;"R10C20";1;"R10C21";1;"R10C25";1)
=HPAGE(-1)
=FORMULA.GOTO("Extract")
=COPY()
=ACTIVATE("PERKAD.XLS")
=SELECT("C2:C15";"R19C2")
=CLEAR(3)
=SELECT("R19C4")
=ACTIVATE("PER.XLS")
=FORMULA.GOTO("Extract")
=COPY()
=ACTIVATE("PERKAD.XLS")
=SELECT("R22C2")
=PASTE()
=SELECT("C2:C18";"R19C2")
=COLUMN.WIDTH(;;3)
=SELECT("R20C2")
=CANCEL.COPY()
=FORMULA("Budget and Control ")
=FORMAT.FONT(;;TRUE)
=FORMAT.FONT(;;;TRUE)
=RETURN()

```

**Record3 (a)**

```
=HPAGE(1)
=VPAGE(-2)
=SELECT("R1C20:R350C36")
=CLEAR(3)
=HPAGE(-3)
=SELECT("R4C1:R4C17")
=COPY()
=HPAGE(2)
=SELECT("R9C20")
=PASTE()
=HLINE(2)
=SELECT("R9C20")
=COPY()
=SELECT("R3C20")
=PASTE()
=FILL.AUTO("RC:RC[1]";FALSE)
=SELECT("R4C20")
=FORMULA(">=7000")
=SELECT("R4C21")
=FORMULA("<8000")
=SELECT("R3C20:R4C21")
=SET.CRITERIA()
=SELECT("R9C20:R350C36")
=SET.EXTRACT()
=EXTRACT(FALSE)
=SELECT("R10C20:R350C36")
=SORT(1;"R10C20";1;"R10C21";1;"R10C25";1)
=HPAGE(-1)
=FORMULA.GOTO("Extract")
=COPY()
=ACTIVATE("PERKAD.XLS")
=SELECT("C2:C15";"R19C2")
=CLEAR(3)
=SELECT("R19C4")
=ACTIVATE("PER.XLS")
=FORMULA.GOTO("Extract")
=COPY()
=ACTIVATE("PERKAD.XLS")
=SELECT("R22C2")
=PASTE()
=SELECT("C2:C18";"R19C2")
=COLUMN.WIDTH(;;3)
=SELECT("R20C2")
=CANCEL.COPY()
=FORMULA("Plant A")
=FORMAT.FONT(;;TRUE)
=FORMAT.FONT(;;TRUE)
=RETURN()
```

Appendix C.6 : Procedure tables of man-power, salary and organisation subsystem.

Table C.6.1 : Salary Management

PROCEDURE:	Man-power, Salary and Organisation Subsystem		Date
FUNCTION:	Salary Management		
Code	Procedures	Duty	Responsibility
P10-01	Salary management includes determining increases in salaries. Holding is responsible for this duty.	Determining increase ratios in salaries.	Holding
P10-02	Human resources is responsible for giving information to holding about performances of employees, current salaries of employees.	Giving information about performance values and salaries.	Human Resources Manager
P10-03	Top management determines general ratios of salaries.		Top Management
P10-04	Human resources is responsible security of data about salaries and informing people about their new salaries.		Human Resources Manager and Expert
P10-05	Human resources is responsible for updating employee records files.	Updating employee records and files.	Human Resources Expert

Table C.6.2 : Reporting Absenteeism hours and overtime values

PROCEDURE:	Man-power, Salary and Organisation Subsystem		Date
FUNCTION:	Reporting Absenteeism Hours and Overtime Values.		
Code	Procedures	Duty	Responsibility
P11-01	Human resources is responsible for reporting absenteeism hours of employees. This report includes absenteeism hours on the basis of functions, their percentage, total and cumulative values.	Reporting absenteeism hours.	Human Resources Expert
P11-02	Human resources is responsible for distributing absenteeism hours report (P-RPT6) to related functions and top managers of the firm.	Distributing report to related functions of the firm.	Human Resources Expert
P11-03	Human resources is responsible for reporting overtime values of employees. This report includes overtime values on the basis of functions, their percentage, budget, total and cumulative values and also distribution of reasons.		
P11-04	Human resources is responsible for distributing overtime report (P-RPT7) to related functions and top managers of the firm.		Human Resources Expert

Table C.6.3 : Analysis of man-power planning

PROCEDURE:	Man-power, Salary and Organisation Subsystem		Date
FUNCTION:	Analysis of Man-power Planning		
Code	Procedures	Duty	Responsibility
P12-01	Aim of analysis of man-power planning is to inform top management about quality and quantity of present man-power.		
P12-02	Human resources is responsible for preparing a plan taking into consideration following items: <ul style="list-style-type: none"> <li>- Enlargement of functions,</li> <li>- Enrichment of functions,</li> <li>- Demand analysis of man-power on the basis of quality and quantity.</li> </ul>	Preparing main ma-power plan.	Human Resources Manager and Expert
P12-03	Every function is responsible for filling in an employee demand form (P-FRM4) when necessary.	Filling in employee demand form.	Every manager of the functions in the firm.
P12-04	Some of the managers are responsible for confirming man-power plan.	Confirming man-power plan.	General manager, Assistant of General Manager
P12-05	Human resources is responsible for updating main man-power plan periodically.		

Appendix D.1 : Performance Subsystem. Tables and Figures.

Table D.1.1 : Distribution of performance values overall the firm.

DISTRIBUTION OF PERFORMANCE VALUES IN FIRM....

I-DEPARTMENTAL BASIS	PERIOD					TOTAL
	A	B	C	D	E	
FUNCTION 1	-	-	-	-	-	0
FUNCTION 2	6	11	22	10	5	54
FUNCTION 3	5	9	19	9	5	47
FUNCTION 4	4	8	17	8	5	42
FUNCTION 5						
FUNCTION 6	4	7	14	7	3	35
PLANT A	9	21	39	20	8	97
PLANT B	8	16	32	16	7	79
<b>TOTAL</b>	<b>36</b>	<b>72</b>	<b>143</b>	<b>70</b>	<b>33</b>	<b>354</b>
<b>PERCENTAGE</b>	<b>10,2</b>	<b>20,3</b>	<b>40,4</b>	<b>19,8</b>	<b>9,3</b>	<b>100</b>
I-IN THE BASIS OF GRADES	FACTORS					TOTAL
	A	B	C	D	E	
XIII	3	-	-	1	-	4
XII	14	8	16	7	1	46
XI	3	1	4	3	1	12
X	9	16	35	7	5	72
IX	1	3	3	-	-	7
VIII	1	5	15	11	3	35
VII	3	29	35	16	8	91
VI	1	3	12	8	2	26
V	1	5	20	10	7	43
IV	-	2	3	6	4	15
III	-	-	-	-	1	1
II	-	-	-	1	1	2
<b>TOTAL</b>	<b>36</b>	<b>72</b>	<b>143</b>	<b>70</b>	<b>33</b>	<b>354</b>
<b>PERCENTAGE</b>	<b>10,2</b>	<b>20,3</b>	<b>40,4</b>	<b>19,8</b>	<b>9,3</b>	<b>100</b>

Table D.1.2 : Distribution of performance values in a specified function.

## FUNCTION 2

## DISTRIBUTION OF PERFORMANCE VALUES (199 )

GRADES	FACTORS					TOTAL
	A	B	C	D	E	
XIII	-	-	-	-	-	0
XII	1	-	1	1	-	3
XI	-	-	-	-	-	0
X	2	6	2	-	-	10
IX	1	3	2	-	-	6
VIII	1	1	2	1	-	5
VII	1	1	1	1	1	5
VI	-	-	9	4	1	14
V	-	-	5	2	1	8
IV	-	-	-	-	1	1
III	-	-	-	-	1	1
II	-	-	-	1	-	1
TOTAL	6	11	22	10	5	54
PERCENTAGE	11,1	20,4	40,7	18,5	9,3	100

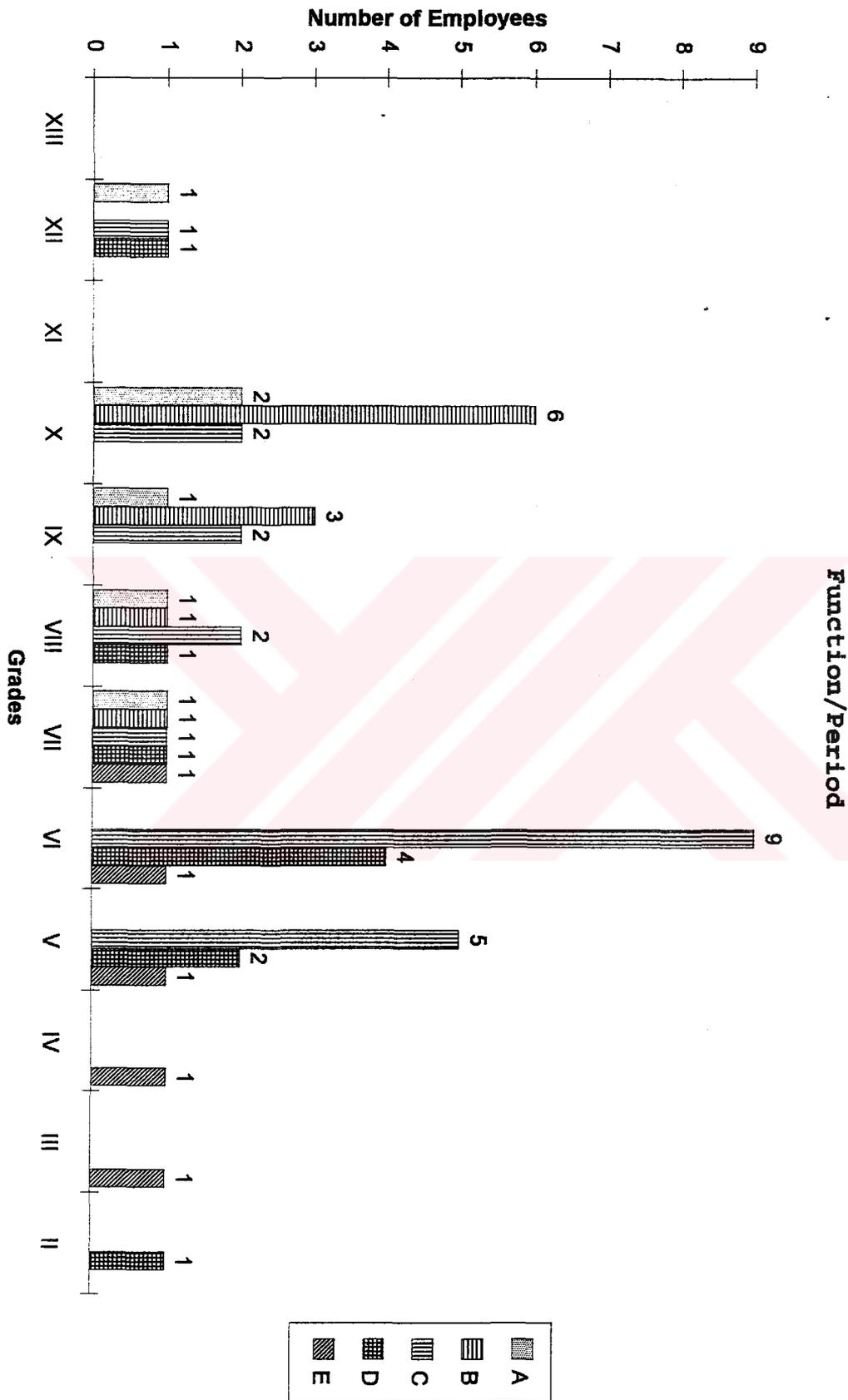


Figure D.1.1 : Distribution of factors on basis of grades for a specified function.

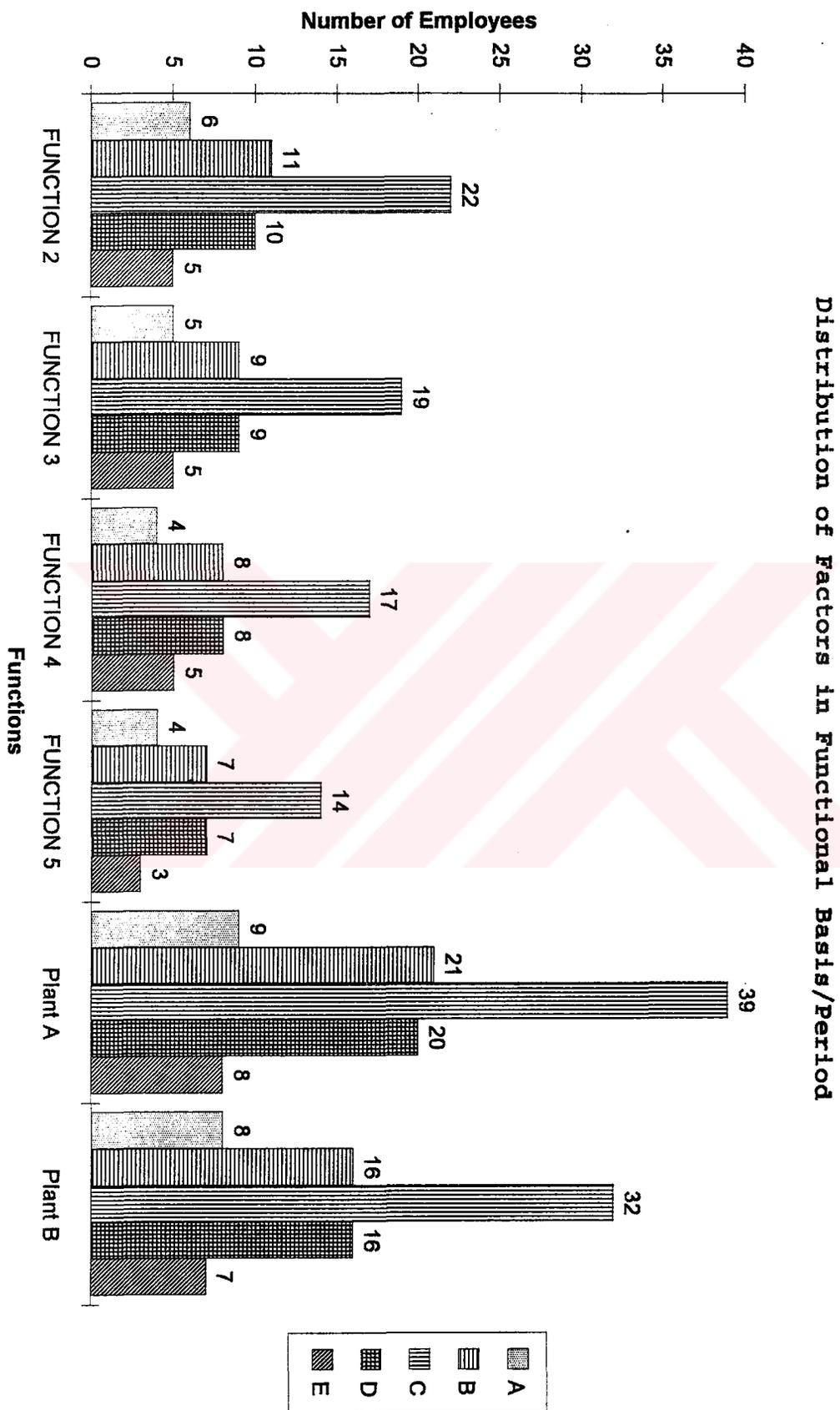


Figure D.1.2 : Distribution of factors in functional Basis.

Appendix F.2 Cumulative and monthly data values of Plant A.

**Accident Values (In the basis of months)**

**Plant A**

	Number of Accidents	Manp.Lost (Hours)	Manp.Lost (Days)	Working Hours	(F)	(V)	(K)	GKO F*V/1000	(R) (%)
Jan-92	10	907	113	258659	38,66	0,44	0,35	0,017	9,3
Feb-92	6	860	95	252635	23,75	0,38	0,34	0,009	5,7
Mar-92	15	1353	180	267584	56,06	0,67	0,51	0,038	13,4
Apr-92	7	760	94	227281	30,80	0,41	0,33	0,013	7,4
May-92	8	655	85	284673	28,10	0,30	0,23	0,008	6,7
Jun-92	6	574	62	223145	26,89	0,28	0,26	0,007	6,4
Jul-92	4	883	112	260205	15,37	0,43	0,34	0,007	3,7
Aug-92	9	507	65	203636	44,20	0,32	0,25	0,014	10,6
Sep-92	9	837	110	294470	30,56	0,37	0,28	0,011	7,3
Oct-92	11	701	93	307002	35,83	0,30	0,23	0,011	8,6
Nov-92	10	930	113	293379	34,09	0,39	0,32	0,013	8,2
Dec-92	13	1414	184	307666	42,25	0,60	0,46	0,025	10,1
92 Total	108	10381	1306	3180335	33,96	0,41	0,33	0,014	8,1
Jan-93	4	639	82	281135	14,23	0,29	0,23	0,004	3,4
Feb-93	5	366	47	272507	18,35	0,17	0,13	0,003	4,4
Mar-93	10	612	79	257253	38,87	0,31	0,24	0,012	9,3
Apr-93	7	754,5	91	283425	24,70	0,32	0,27	0,008	5,9
May-93	4	614,5	84	289878	13,80	0,29	0,21	0,004	3,3
Jun-93	7	586,5	73	240204	29,14	0,30	0,24	0,009	7,0
Jul-93	1	758,5	100	287013	3,48	0,35	0,26	0,001	0,8
Aug-93	1	437,5	58	124112	8,06	0,47	0,35	0,004	1,9
Sep-93	9	842,5	106	275431	32,68	0,38	0,31	0,013	7,8
Oct-93	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Nov-93	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Dec-93	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

**Cumulative Values ( Plant A )**

	Number of Accidents	Manp.Lost (Hours)	Manp.Lost (Days)	Working Hours	(F)	(V)	(K)	GKO F*V/1000	(R) (%)
Jan-92	127	10917	1388	2662036	47,71	0,52	0,41	0,025	11,4
Feb-92	126	10935	1374	2714761	46,41	0,51	0,40	0,023	11,1
Mar-92	137	11837	1495	2833881	48,34	0,53	0,42	0,026	11,6
Apr-92	135	12021	1519	2869509	47,05	0,53	0,42	0,025	11,3
May-92	127	11718	1483	2908264	43,67	0,51	0,40	0,022	10,5
Jun-92	118	11363	1431	2953635	39,95	0,48	0,38	0,019	9,6
Jul-92	110	11062	1389	2969028	37,05	0,47	0,37	0,017	8,9
Aug-92	104	10409	1305	2958867	35,15	0,44	0,35	0,016	8,4
Sep-92	103	10032	1254	3036436	33,92	0,41	0,33	0,014	8,1
Oct-92	108	10045	1263	3118395	34,63	0,41	0,32	0,014	8,3
Nov-92	106	10103	1263	3153610	33,61	0,40	0,32	0,013	8,1
Dec-92	108	10382	1306	3180335	33,96	0,41	0,33	0,014	8,1
Jan-93	102	10113	1275	3202811	31,85	0,40	0,32	0,013	7,6
Feb-93	101	9619	1227	3222682,5	31,34	0,38	0,30	0,012	7,5
Mar-93	96	8878	1126	3212351	29,88	0,35	0,28	0,010	7,2
Apr-93	96	8872,5	1123	3268495	29,37	0,34	0,27	0,010	7,0
May-93	92	8832	1122	3273699,5	28,10	0,34	0,27	0,010	6,7
Jun-93	93	8844,5	1133	3290758,5	28,26	0,34	0,27	0,010	6,8
Jul-93	90	8720	1121	3317566,5	27,13	0,34	0,26	0,009	6,5
Aug-93	82	8650,5	1114	3238042,5	25,32	0,34	0,27	0,009	6,1
Sep-93	82	8656	1110	3219003,5	25,47	0,34	0,27	0,009	6,1
Oct-93	71	7955	1017	2912001,5	24,38	0,35	0,27	0,009	5,8
Nov-93	61	7025	904	2618622,5	23,29	0,35	0,27	0,008	5,6
Dec-93	48	5611	720	2310956,5	20,77	0,31	0,24	0,006	5,0

## Appendix F.2 Cumulative and monthly data values of Plant A.

## Accident Values (In the basis of months)

Plant A

	Number of Accidents	Manp.Lost (Hours)	Manp.Lost (Days)	Working Hours	(F)	(V)	(K)	GKO F*V/1000	(R) (%)
Jan-92	10	907	113	258659	38,66	0,44	0,35	0,017	9,3
Feb-92	6	860	95	252635	23,75	0,38	0,34	0,009	5,7
Mar-92	15	1353	180	267584	56,06	0,67	0,51	0,038	13,4
Apr-92	7	760	94	227281	30,80	0,41	0,33	0,013	7,4
May-92	8	655	85	284673	28,10	0,30	0,23	0,008	6,7
Jun-92	6	574	62	223145	26,89	0,28	0,26	0,007	6,4
Jul-92	4	883	112	260205	15,37	0,43	0,34	0,007	3,7
Aug-92	9	507	65	203636	44,20	0,32	0,25	0,014	10,6
Sep-92	9	837	110	294470	30,56	0,37	0,28	0,011	7,3
Oct-92	11	701	93	307002	35,83	0,30	0,23	0,011	8,6
Nov-92	10	930	113	293379	34,09	0,39	0,32	0,013	8,2
Dec-92	13	1414	184	307666	42,25	0,60	0,46	0,025	10,1
92 Total	108	10381	1306	3180335	33,96	0,41	0,33	0,014	8,1
Jan-93	4	639	82	281135	14,23	0,29	0,23	0,004	3,4
Feb-93	5	366	47	272507	18,35	0,17	0,13	0,003	4,4
Mar-93	10	612	79	257253	38,87	0,31	0,24	0,012	9,3
Apr-93	7	754,5	91	283425	24,70	0,32	0,27	0,008	5,9
May-93	4	614,5	84	289878	13,80	0,29	0,21	0,004	3,3
Jun-93	7	586,5	73	240204	29,14	0,30	0,24	0,009	7,0
Jul-93	1	758,5	100	287013	3,48	0,35	0,26	0,001	0,8
Aug-93	1	437,5	58	124112	8,06	0,47	0,35	0,004	1,9
Sep-93	9	842,5	106	275431	32,68	0,38	0,31	0,013	7,8
Oct-93	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Nov-93	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Dec-93	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

## Cumulative Values ( Plant A )

	Number of Accidents	Manp.Lost (Hours)	Manp.Lost (Days)	Working Hours	(F)	(V)	(K)	GKO F*V/1000	(R) (%)
Jan-92	127	10917	1388	2662036	47,71	0,52	0,41	0,025	11,4
Feb-92	126	10935	1374	2714761	46,41	0,51	0,40	0,023	11,1
Mar-92	137	11837	1495	2833881	48,34	0,53	0,42	0,026	11,6
Apr-92	135	12021	1519	2869509	47,05	0,53	0,42	0,025	11,3
May-92	127	11718	1483	2908264	43,67	0,51	0,40	0,022	10,5
Jun-92	118	11363	1431	2953635	39,95	0,48	0,38	0,019	9,6
Jul-92	110	11062	1389	2969028	37,05	0,47	0,37	0,017	8,9
Aug-92	104	10409	1305	2958867	35,15	0,44	0,35	0,016	8,4
Sep-92	103	10032	1254	3036436	33,92	0,41	0,33	0,014	8,1
Oct-92	108	10045	1263	3118395	34,63	0,41	0,32	0,014	8,3
Nov-92	106	10103	1263	3153610	33,61	0,40	0,32	0,013	8,1
Dec-92	108	10382	1306	3180335	33,96	0,41	0,33	0,014	8,1
Jan-93	102	10113	1275	3202811	31,85	0,40	0,32	0,013	7,6
Feb-93	101	9619	1227	3222682,5	31,34	0,38	0,30	0,012	7,5
Mar-93	96	8878	1126	3212351	29,88	0,35	0,28	0,010	7,2
Apr-93	96	8872,5	1123	3268495	29,37	0,34	0,27	0,010	7,0
May-93	92	8832	1122	3273699,5	28,10	0,34	0,27	0,010	6,7
Jun-93	93	8844,5	1133	3290758,5	28,26	0,34	0,27	0,010	6,8
Jul-93	90	8720	1121	3317566,5	27,13	0,34	0,26	0,009	6,5
Aug-93	82	8650,5	1114	3238042,5	25,32	0,34	0,27	0,009	6,1
Sep-93	82	8656	1110	3219003,5	25,47	0,34	0,27	0,009	6,1
Oct-93	71	7955	1017	2912001,5	24,38	0,35	0,27	0,009	5,8
Nov-93	61	7025	904	2618622,5	23,29	0,35	0,27	0,008	5,6
Dec-93	48	5611	720	2310956,5	20,77	0,31	0,24	0,006	5,0

Distribution of Factor A According to Grades/Period

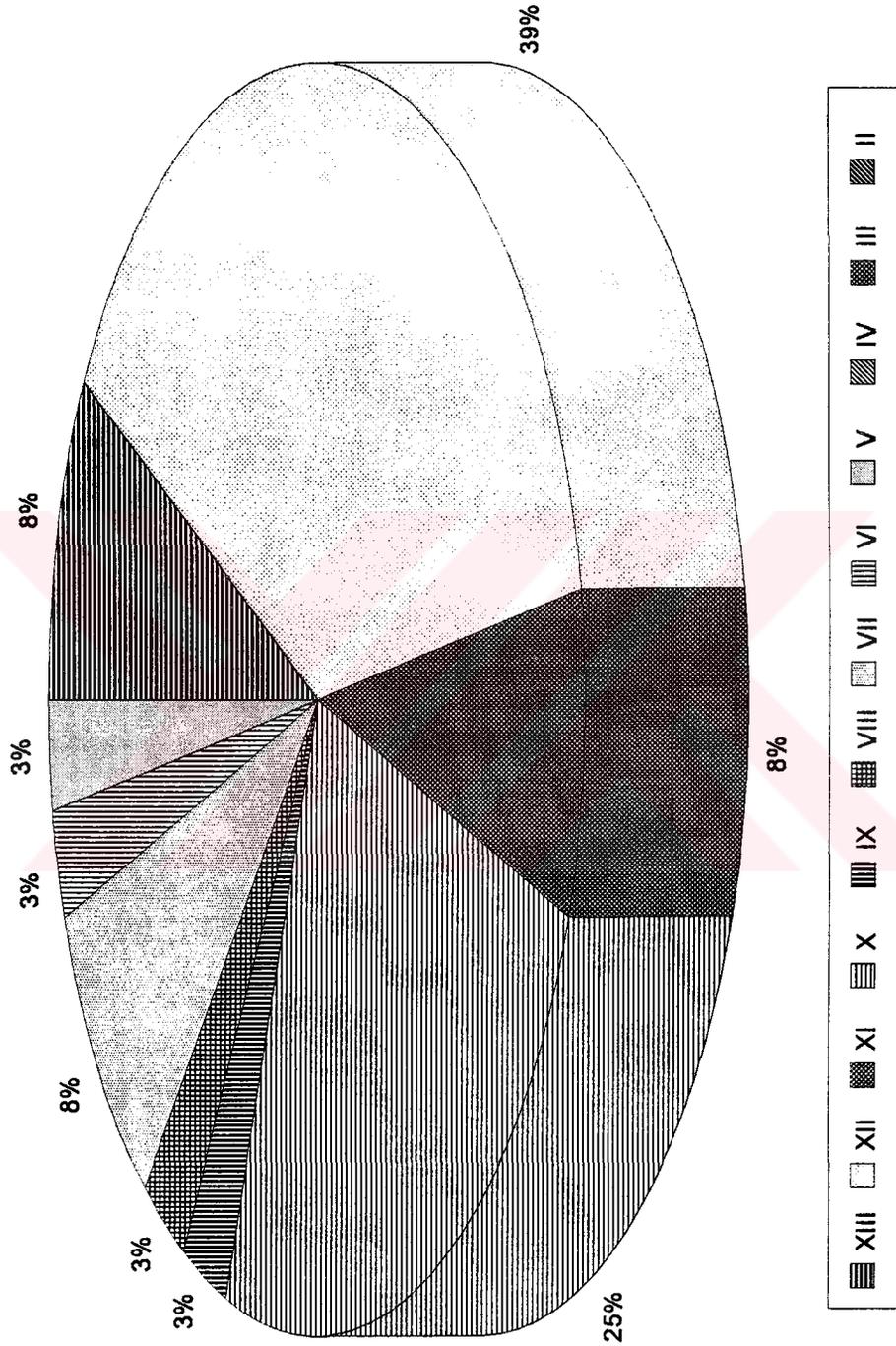


Figure D.1.3 : Distribution of Factor A according to grades.

## Appendix D.2 : Procedure Table of Performance Subsystem.

PROCEDURE:	Performance Subsystem Activities		Date
FUNCTION:	Performance Evaluation		
Code	Procedures	Duty	Responsibility
P6-01	<p>Performance evaluation is an important element for salary management, employee motivation and productivity. Human resource management is responsible for doing the followings:</p> <ol style="list-style-type: none"> <li>1. Determining the criteria for evaluation.</li> <li>2. Determining periods.</li> <li>3. Preparing forms.</li> <li>4. Sending forms to essential levels of management.</li> </ol>	Preparing the main rules for performance evaluation.	Human Resources (Manager)
P6-02	<p>Criteria for evaluation can be summarised as follows:</p> <ol style="list-style-type: none"> <li>1. Criteria that can changed by employee performance,</li> <li>2. Technical abilities,</li> <li>3. Personnel profiles,</li> <li>4. Time management,</li> <li>5. Level of productivity.</li> </ol>		
P6-03	Other departments are informed of the performance evaluation.	Informing other departments.	Assistant of the supervisor.
P6-04	Human resources is responsible for preparing lists of employees according to main functions of the firm.		Systems Department (Supervisor).

PROCEDURE:	Performance Subsystem Activities		Date
FUNCTION:	Performance Evaluation		
Code	Procedures	Duty	Responsibility
P6-05	Human resources is responsible for distributing performance evaluation forms to assistants of general manager and to top managers (P-FRM2).	Distribution of performance list tables.	Assistant of supervisor.
P6-06	Every top manager is responsible for determining the performance value of his subordinates and sending signed performance lists back to human resource department.	Distribution of performance evaluation lists to human resources department.	Managers of every function.
P6-07	Human resources is responsible for protecting performance evaluation lists. this function does the followings after lists managers send are received:		
P6-07-01	Human resources is responsible for controlling performance lists in order to be certain about that all the employees are included in the evaluation.	Controlling performance evaluation forms in terms of completeness.	Supervisor assistant and expert.
P6-07-02	If there is a mistake human resource department is responsible for informing related department about the subject.	Reporting faults.	Human resources (Manager).
P6-08	Human resources is responsible for sending performance evaluation lists to general manager for his confirmation.		Human resources (Manager).
P6-09	Confirming lists.		General manager.

PROCEDURE:	Performance Subsystem Activities		Date
FUNCTION:	Performance Evaluation		
Code	Procedures	Duty	Responsibility
P6-10	<p>Human resources is responsible for preparing a performance evaluation report including following information (Reports can be seen in Appendix E):</p> <ol style="list-style-type: none"> <li>1. Distribution of factor (A, B, C, D, E) according to grades.</li> <li>2. Distribut. of performance values for basic functions.</li> <li>3. Distribut. of performance values overall the firm.</li> <li>4. Distribut. of factors in basis of functions.</li> <li>5. Distribut. of factors in basis of grades in a function.</li> </ol>	Reporting and preparing graphic representation.	Expert.
P6-11	Human resource management is responsible for sending general report and performance evaluation lists to top managers of the firm.	Informing top management about the result.	Human resources (Manager).
P6-12	Human resource management is responsible for protection of lists.	Protecting the results.	Assistant of supervisor.

## Appendix E.1 : Tables of Applicat Subsystem.

Table E.1.1 : Codes used in following Application Forms.

<b>CODES USED IN FOLLOWING APPLICATION FORMS</b>									
<b>Foreign Language</b>		<b>Job</b>		<b>Name of School</b>		<b>Military Service</b>		<b>Education Level</b>	
Code	Meaning	Code	Meaning	Code	Meaning	Code	Meaning	Code	Meaning
0	English	0	Mechanical Engineer	0	Boğaziçi	0	Will not do	0	Secondary School
1	German	1	Industrial Engineer	1	Bilkent	1	Completed	1	High School
2	French	2	Economist	2	ODTÜ	2	Not completed	2	University Degree
3	Italian	3	Technician	3	I.T.Ü			3	Master's Degree
4	No Language	4	Secretary	4	Yıldız				
		5	Others	5	Marmara				
				6	Istanbul				
				7	Technical School				
				8	Others				

Table E.1.2 : Application Database Structure

Surname	Name	Date of Birth	Job Code	School Code	Education Code	Language Code	Military service	Telephone	File Code	Date of Appiance	Information
A S W	F V E R A S W	1965	0	3	2	0	1	1	M1	08/01/1993	
E R T A S W	F V E R A S W	1968	5	3	3	1	4	2	D30	10/05/1993	
E R T A S W	F V E R A S W	1968	3	3	2	0	2	3	D14	24/02/1993	
E R T A S W	F V E R A S W	1968	4	8	1	4	0	4	S61	01/04/1993	
E R T A S W	F V E R A S W	1969	5	6	2	0	-	5	D83	05/07/1993	Continuing master
E R T A S W	F V E R A S W	1966	4	8	1	4	0	6	S73	13/05/1993	
E R T A S W	F V E R A S W	1974	4	8	1	0	0	7	S56	30/04/1993	
E R T A S W	F V E R A S W	1960	0	8	2	0	0	8	M35	17/03/1993	
E R T A S W	F V E R A S W	1970	5	8	2	4	1	9	D1	06/01/1993	
E R T A S W	F V E R A S W	1970	0	8	2	4	2	10	M9	18/01/1993	
E R T A S W	F V E R A S W	1968	4	8	1	0	4	11	S49	04/05/1993	
E R T A S W	F V E R A S W	1969	0	4	2	4	1	12	M100	17/09/1993	
E R T A S W	F V E R A S W	1954	4	8	1	0	0	13	S32	21/05/1993	
E R T A S W	F V E R A S W	1968	0	4	2	4	1	14	M43	19/04/1993	
E R T A S W	F V E R A S W	1963	5	8	3	1	1	15	D87	28/07/1993	
E R T A S W	F V E R A S W	1956	2	8	3	0	1	16	I22	01/06/1993	
E R T A S W	F V E R A S W	1966	1	2	2	0	1	17	E15	28/04/1993	
E R T A S W	F V E R A S W	1971	4	8	2	4	0	18	S8	16/02/1993	
E R T A S W	F V E R A S W	1967	5	8	2	4	2	19	D59	19/08/1993	Elektric-Elektronic
E R T A S W	F V E R A S W	1961	4	8	1	4	0	20	S2	24/02/1993	
E R T A S W	F V E R A S W	1970	4	8	1	4	0	21	S84	19/04/1993	
E R T A S W	F V E R A S W	1970	1	0	2	0	2	22	E41	12/07/1993	
E R T A S W	F V E R A S W	1965	0	3	3	0	1	23	M28	16/04/1993	
E R T A S W	F V E R A S W	1970	2	0	2	0	0	24	I15	11/06/1993	
E R T A S W	F V E R A S W	1957	4	8	1	0	0	25	S29	29/03/1993	

Table E.1.3 : Examples of macros used in application database

<b>maschine (m)</b>	<b>Industrial (e)</b>	<b>Business (j)</b>
<pre>=HPAGE (-2) =SELECT ("R5C2:R750C13") =SET. DATABASE () =HLINE (13) =SELECT ("R6C19") =FORMULA ("0") =SELECT ("R5C16:R6C27") =SET. CRITERIA () =SELECT ("R9C16:R175C27") =SET. EXTRACT () =EXTRACT (FALSE) =SELECT ("R7C16") =FORMULA ("Application List of Mechanical Engineers") =FORMAT. FONT (, ; TRUE) =RETURN ()</pre>	<pre>=HPAGE (-2) =SELECT ("R5C2:R750C13") =SET. DATABASE () =HLINE (17) =SELECT ("R6C19") =FORMULA ("1") =HLINE (-3) =SELECT ("R5C16:R7C27") =HLINE (-4) =SELECT ("R5C16:R6C27") =SET. CRITERIA () =SELECT ("R9C16:R175C27") =SET. EXTRACT () =EXTRACT (FALSE) =SELECT ("R7C16") =FORMULA ("Application List of Industrial Engineer") =RETURN ()</pre>	<pre>=SELECT ("R5C2:R750C13") =SET. DATABASE () =HLINE (13) =SELECT ("R6C19") =FORMULA ("2") =SELECT ("R5C16:R6C27") =SET. CRITERIA () =SELECT ("R9C16:R175C27") =SET. EXTRACT () =EXTRACT (FALSE) =SELECT ("R7C16") =FORMULA ("Application List of Economists") =RETURN ()</pre>
<b>Secretary (s)</b>	<b>Others (d)</b>	<b>Technician (t)</b>
<pre>=SELECT ("R5C2:R751C13") =SET. DATABASE () =HLINE (16) =SELECT ("R6C19") =FORMULA ("4") =HLINE (-2) =SELECT ("R5C16:R6C27") =SET. CRITERIA () =SELECT ("R9C16:R175C27") =SET. EXTRACT () =EXTRACT (FALSE) =SELECT ("R7C16") =FORMULA ("Application List of Secretaries") =RETURN ()</pre>	<pre>=HPAGE (-2) =SELECT ("R5C2:R750C13") =SET. DATABASE () =HPAGE (2) =SELECT ("R6C19") =FORMULA ("5") =SELECT ("R5C16:R6C27") =SET. CRITERIA () =SELECT ("R9C16:R300C27") =SET. EXTRACT () =EXTRACT (FALSE) =SELECT ("R7C16") =FORMULA ("Application List of Others") =RETURN ()</pre>	<pre>=SELECT ("R5C2:R750C13") =SET. DATABASE () =SELECT ("R2C4") =HLINE (13) =SELECT ("R6C19") =FORMULA ("3") =SELECT ("R9C16:R175C27") =SET. EXTRACT () =EXTRACT (FALSE) =SELECT ("R7C16") =FORMULA ("Application List of Technicians") =RETURN ()</pre>

Appendix F.1. : Reports, tables and graphics of job accident subsystem.

Table F.1.1. Accidents report

nt A rkshops	Number of Accidents	Manp.Lost (Hours)	Manp.Lost (Days)	Working Hours	(F)	(V)	(K)	GKO F*V/1000	(R)
embly	1	12	2	31578,5	31,67	0,06	0,04	0,002	7,6
lding	5	417,5	54	36502,5	136,98	1,48	1,14	0,203	33
rtshop	1	27	4	18205	54,93	0,22	0,15	0,012	13
.Eng.(F+M)	0	0	0	6954,5	0,00	0,00	0,00	0,000	0
it Production	0	0	0	7655	0,00	0,00	0,00	0,000	0
'	0	72	9	16545	0,00	0,54	0,44	0,000	0
ss	0	0	0	14331	0,00	0,00	0,00	0,000	0
achinery	1	45	6	14771,5	67,70	0,41	0,30	0,027	16
Eng.(P+K)	1	19	2	27049	36,97	0,07	0,07	0,003	9
ntenance	1	19,5	2	13895	71,97	0,14	0,14	0,010	17
d.Plan.	0	0	0	16474	0,00	0,00	0,00	0,000	0
ility Control	0	0	0	12528,5	0,00	0,00	0,00	0,000	0
nan Res.	0	0	0	9958	0,00	0,00	0,00	0,000	0
ar Dept.	0	0	0	30805	0,00	0,00	0,00	0,000	0
<b>TOTAL</b>	<b>10</b>	<b>612</b>	<b>79</b>	<b>257252,5</b>	<b>38,87</b>	<b>0,31</b>	<b>0,24</b>	<b>0,012</b>	<b>9</b>

(F) FREQUENCY OF ACCIDENTS =  $\frac{\text{NUMBER OF ACCIDENTS}}{\text{TOTAL WORKING HOURS}} \times 10^6$

(V) ACCIDENT SERIOUSNESS RATIO =  $\frac{\text{LOST DAYS}}{\text{TOTAL WORKING HOURS}} \times 10^3$

(K) LOST HOURS =  $\frac{\text{TOTAL MAN-POWER LOST}}{\text{TOTAL WORKING HOURS}} \times 100$

(GKO) RATIO OF HAVING AN ACCIDENT =  $\frac{F \times V}{1000}$

RISK OF ACCIDENT =  $F \times 100$   
417

Table F.1.2 : Distribution of accidents among functions.

1993 APRIL	Assembly	Welding	Paintshop	Pro.Eng.(F+H)	Mahta.	FRP	Production	Press	Machinery	Pro.Eng.(P+K)	Purc.	PPC	Qual.Cont.	Human Res.	Others	PLANT B TOTAL		
																A	B	
# OF DEATH BECAUSE OF JOB ACCIDENTS																	0	0
BODY PART LOST																	0	0
INJURIES		5	1					1								2	7	2
BODY PART INJURED																		
HEAD																	0	0
EYES																2	0	2
BODY		1															1	0
INTERNAL ORGANS																	0	0
ARMS								1									1	0
FINGERS		4															4	0
LEGS																	0	0
FOOT			1														1	0
ACCIDENTS DUE TO																		
FALLING DOWN, INJURY, CRUSHING		4	1					1									6	0
FALLING DOWN OF AN OBJECT		1															1	0
BURR JUMPING																1	0	1
PATHETIC																	0	0
MACHINES																	0	0
LIFTING																	0	0
JOB ITSELF																	0	0
ELECTRIC SHORTAGE																	0	0
OTHERS																1	0	1



Table F.1.4 : Macros used in job acc. subsystem.

<p>ratio.of.having.an accident            =ARGUMENT("f")            =ARGUMENT("v")            =(f*v)/1000            =RETURN(B5)</p>	<p>hours.lost            =ARGUMENT("manp.lost_hours")            =ARGUMENT("working_hours")            =(manp.lost_hours/working_hours)*1000            =RETURN(E5)</p>
<p>seriousness.of.accident            =ARGUMENT("manp.lost_days")            =ARGUMENT("working_hours")            =(manp.lost_days/working_hours)*1000            =RETURN(B12)</p>	<p>frequency.of.accident            =ARGUMENT("number.of_accidents")            =ARGUMENT("working_hours")            =(number.of_accidents/working_hours)*1000000            =RETURN(E12)</p>

Table F.1.5 : Number of job accidents.

PLANT A	NUMBER OF ACCIDENTS	TOTAL MAN-POWER LOST (HOURS)	TOTAL MAN-POWER LOST (DAYS)	TOTAL WORKING HOURS
Assembly Shop				
Welding Shop				
Paint Shop				
Manufacturing Engineering (1)				
Light Production				
FRP Production				
Press Shop				
Machinery Shop				
Manufacturing Engineering (2)				
Maintanance				
Production Planning				
Quality Control				
Human Resources				
Other Departments				
TOTAL				



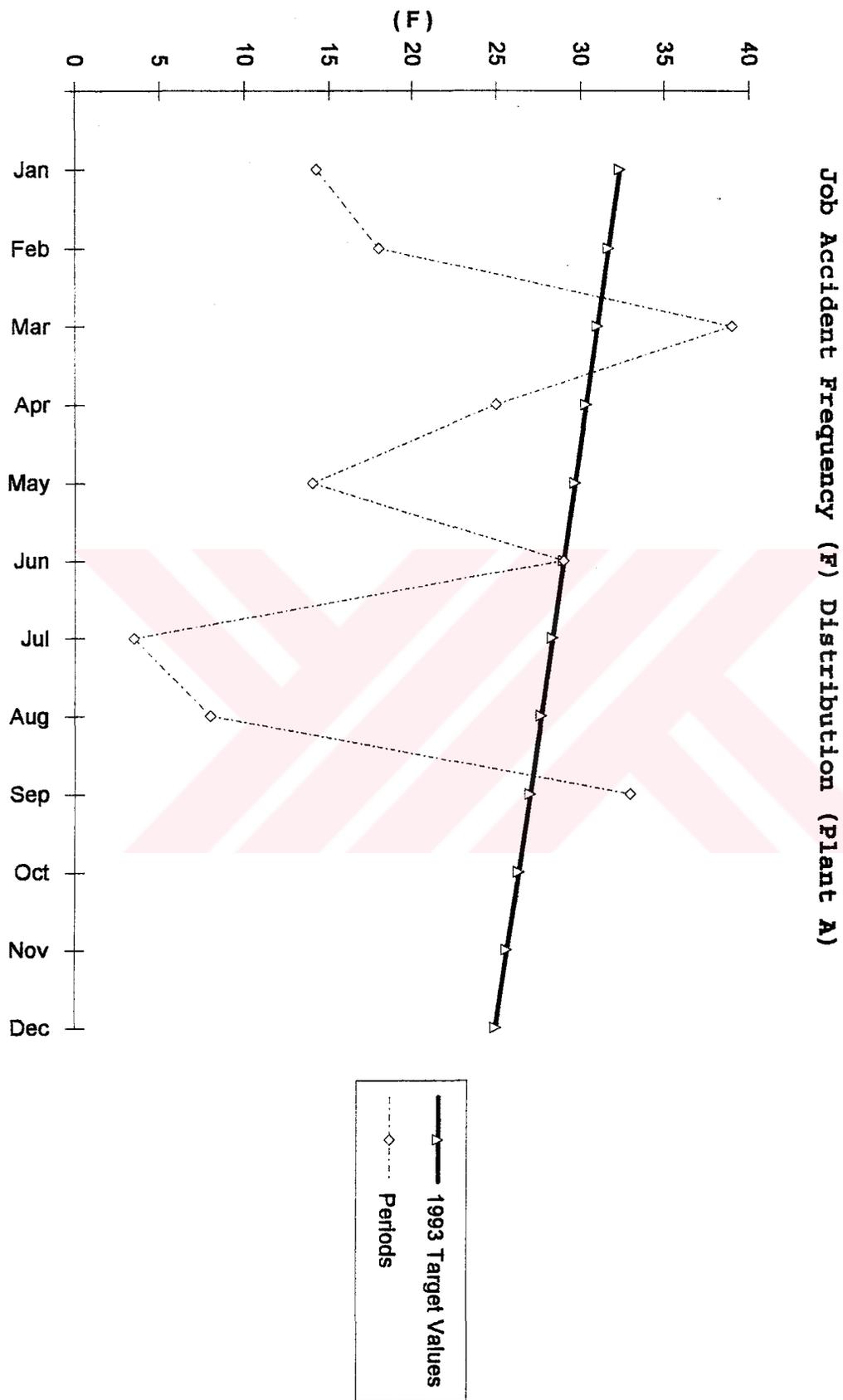
## Appendix F.2 Cumulative and monthly data values of Plant A.

**Accident Values (In the basis of months)****Plant A**

	Number of Accidents	Manp.Lost (Hours)	Manp.Lost (Days)	Working Hours	(F)	(V)	(K)	GKO F*V/1000	(R) (%)
Jan-92	10	907	113	258659	38,66	0,44	0,35	0,017	9,3
Feb-92	6	860	95	252635	23,75	0,38	0,34	0,009	5,7
Mar-92	15	1353	180	267584	56,06	0,67	0,51	0,038	13,4
Apr-92	7	760	94	227281	30,80	0,41	0,33	0,013	7,4
May-92	8	655	85	284673	28,10	0,30	0,23	0,008	6,7
Jun-92	6	574	62	223145	26,89	0,28	0,26	0,007	6,4
Jul-92	4	883	112	260205	15,37	0,43	0,34	0,007	3,7
Aug-92	9	507	65	203636	44,20	0,32	0,25	0,014	10,6
Sep-92	9	837	110	294470	30,56	0,37	0,28	0,011	7,3
Oct-92	11	701	93	307002	35,83	0,30	0,23	0,011	8,6
Nov-92	10	930	113	293379	34,09	0,39	0,32	0,013	8,2
Dec-92	13	1414	184	307666	42,25	0,60	0,46	0,025	10,1
92 Total	108	10381	1306	3180335	33,96	0,41	0,33	0,014	8,1
Jan-93	4	639	82	281135	14,23	0,29	0,23	0,004	3,4
Feb-93	5	366	47	272507	18,35	0,17	0,13	0,003	4,4
Mar-93	10	612	79	257253	38,87	0,31	0,24	0,012	9,3
Apr-93	7	754,5	91	283425	24,70	0,32	0,27	0,008	5,9
May-93	4	614,5	84	289878	13,80	0,29	0,21	0,004	3,3
Jun-93	7	586,5	73	240204	29,14	0,30	0,24	0,009	7,0
Jul-93	1	758,5	100	287013	3,48	0,35	0,26	0,001	0,8
Aug-93	1	437,5	58	124112	8,06	0,47	0,35	0,004	1,9
Sep-93	9	842,5	106	275431	32,68	0,38	0,31	0,013	7,8
Oct-93	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Nov-93	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Dec-93	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

**Cumulative Values ( Plant A )**

	Number of Accidents	Manp.Lost (Hours)	Manp.Lost (Days)	Working Hours	(F)	(V)	(K)	GKO F*V/1000	(R) (%)
Jan-92	127	10917	1388	2662036	47,71	0,52	0,41	0,025	11,4
Feb-92	126	10935	1374	2714761	46,41	0,51	0,40	0,023	11,1
Mar-92	137	11837	1495	2833881	48,34	0,53	0,42	0,026	11,6
Apr-92	135	12021	1519	2869509	47,05	0,53	0,42	0,025	11,3
May-92	127	11718	1483	2908264	43,67	0,51	0,40	0,022	10,5
Jun-92	118	11363	1431	2953635	39,95	0,48	0,38	0,019	9,6
Jul-92	110	11062	1389	2969028	37,05	0,47	0,37	0,017	8,9
Aug-92	104	10409	1305	2958867	35,15	0,44	0,35	0,016	8,4
Sep-92	103	10032	1254	3036436	33,92	0,41	0,33	0,014	8,1
Oct-92	108	10045	1263	3118395	34,63	0,41	0,32	0,014	8,3
Nov-92	106	10103	1263	3153610	33,61	0,40	0,32	0,013	8,1
Dec-92	108	10382	1306	3180335	33,96	0,41	0,33	0,014	8,1
Jan-93	102	10113	1275	3202811	31,85	0,40	0,32	0,013	7,6
Feb-93	101	9619	1227	3222682,5	31,34	0,38	0,30	0,012	7,5
Mar-93	96	8878	1126	3212351	29,88	0,35	0,28	0,010	7,2
Apr-93	96	8872,5	1123	3268495	29,37	0,34	0,27	0,010	7,0
May-93	92	8832	1122	3273699,5	28,10	0,34	0,27	0,010	6,7
Jun-93	93	8844,5	1133	3290758,5	28,26	0,34	0,27	0,010	6,8
Jul-93	90	8720	1121	3317566,5	27,13	0,34	0,26	0,009	6,5
Aug-93	82	8650,5	1114	3238042,5	25,32	0,34	0,27	0,009	6,1
Sep-93	82	8656	1110	3219003,5	25,47	0,34	0,27	0,009	6,1
Oct-93	71	7955	1017	2912001,5	24,38	0,35	0,27	0,009	5,8
Nov-93	61	7025	904	2618622,5	23,29	0,35	0,27	0,008	5,6
Dec-93	48	5611	720	2310956,5	20,77	0,31	0,24	0,006	5,0



Figures F.2.1 : Job accident frequency disk.

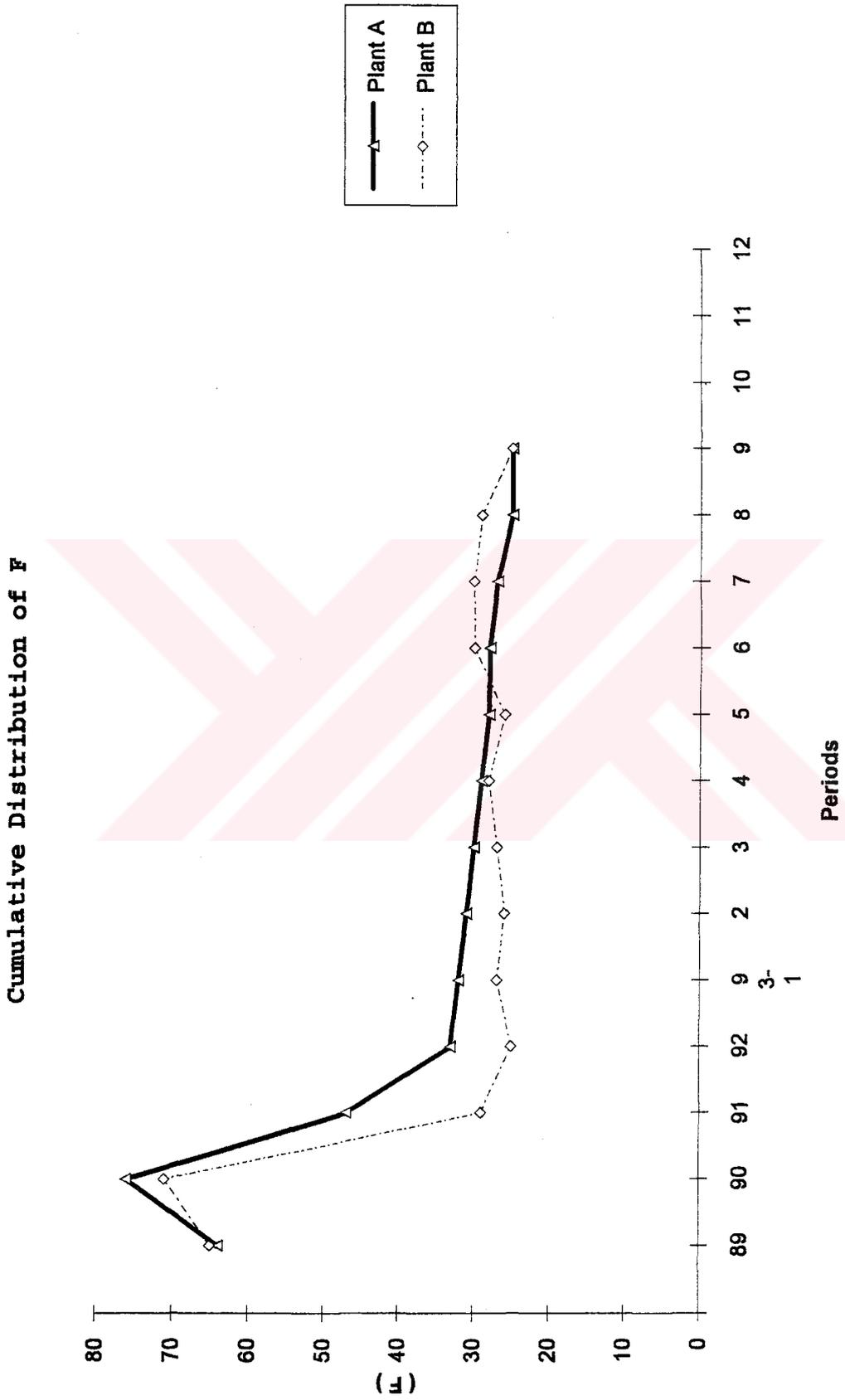


Figure F.2.2 : Cumulative dist. of F

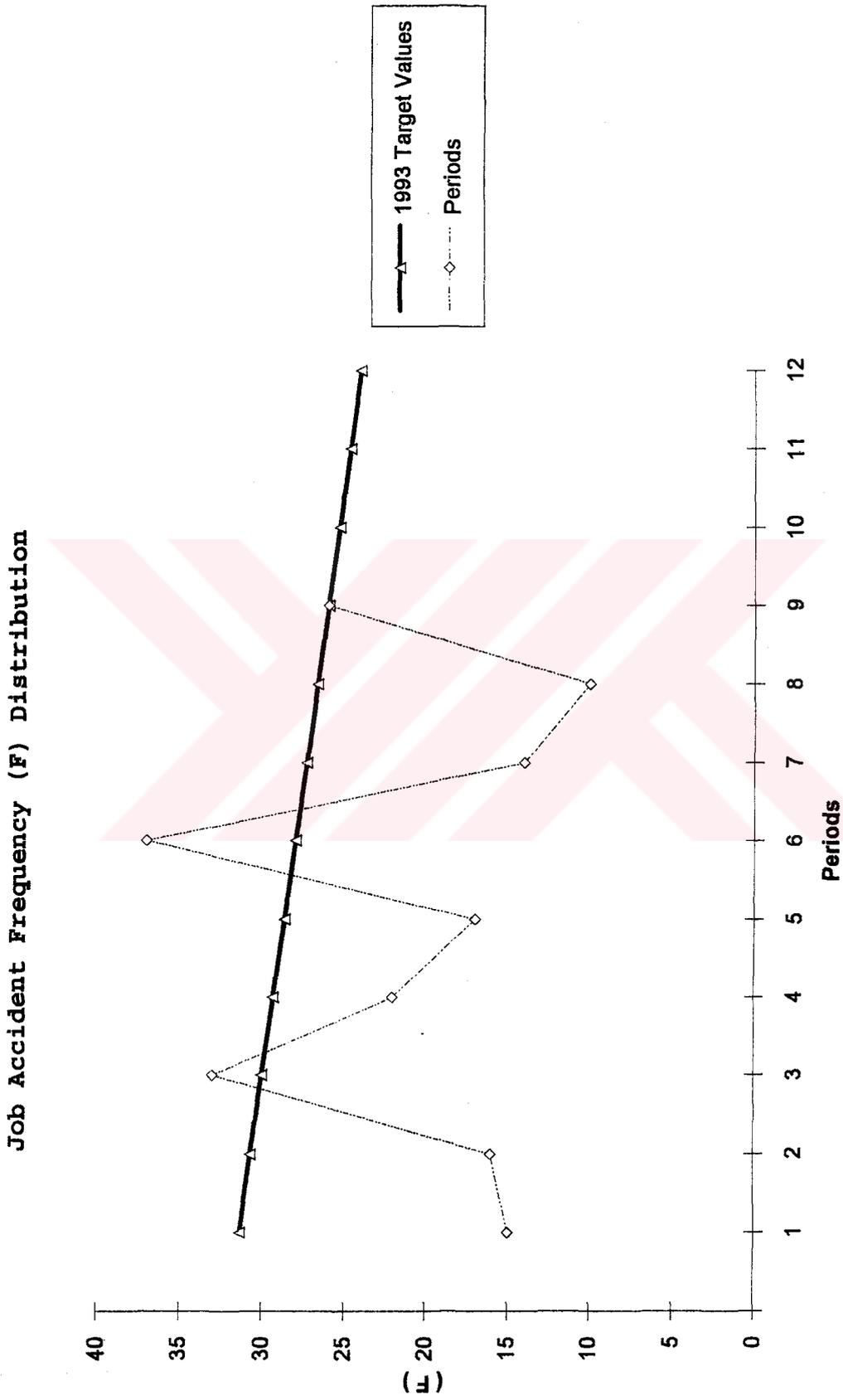


Figure F.2.3 : Job accident frequency dist. for the whole firm.

## Appendix F:3 : Dist. of job accident parameters.

Distribution of Job Accident Parameters*(Distribution of F ) Plant A*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1993 Target Values	32,33	31,67	31,00	30,33	29,67	29,00	28,33	27,67	27,00	26,33	25,67	25,00
Periods	14,2	18,0	39,0	25,0	14,0	29,0	3,5	8,0	33,0			

*(Distribution of F ) Plant B*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1993 Target Values	24,42	23,83	23,25	22,67	22,08	21,50	20,92	20,33	19,75	19,17	18,58	18,00
Periods	17	9	18	17	26	53	34	14	16			

*(Distribution of V ) Plant A*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1993 Target Values	0,40	0,39	0,38	0,37	0,36	0,36	0,35	0,34	0,33	0,32	0,31	0,30
Periods	0,29	0,17	0,31	0,32	0,29	0,3	0,34	0,467	0,38			

*(Distribution of V ) Plant B*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1993 Target Values	0,20	0,19	0,19	0,18	0,18	0,17	0,17	0,16	0,16	0,15	0,15	0,14
Periods	0,1	0,08	0,16	0,07	0,17	0,41	0,32	0,05	0,05			

*(Distribution of K ) Plant A*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1993 Target Values	0,32	0,32	0,31	0,30	0,29	0,29	0,28	0,27	0,26	0,26	0,25	0,24
Periods	0,23	0,13	0,24	0,27	0,21	0,24	0,26	0,35	0,31			

*(Distribution of K ) Plant B*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1993 Target Values	0,15	0,14	0,14	0,13	0,13	0,13	0,12	0,12	0,11	0,11	0,10	0,10
Periods	0,08	0,06	0,12	0,05	0,13	0,3	0,24	0,05	0,04			

*( Distribution of GKO ) \* 1000 Plant A*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1993 Target Values	13,550	13,100	12,650	12,200	11,750	11,300	10,850	10,400	9,950	9,500	9,050	8,600
Periods	4,0	3,0	12,0	8,0	4,0	9,0	1,2	4,0	12,6			

**( Distribution of GKO ) \* 1000 Plant B**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1993 Target Values	4,908	4,817	4,725	4,633	4,542	4,450	4,358	4,267	4,175	4,083	3,992	3,900
Periods	2,000	1,000	3,000	1,000	4,400	21,700	11,100	1,000	1,000			

**( Distribution of R ) Plant A**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1993 Target Values	7,8	7,7	7,5	7,3	7,2	7,0	6,8	6,7	6,5	6,3	6,2	6,0
Periods	3,4	4,4	9,3	5,9	3,3	6,9	0,8	1,9	7,8			

**( Distribution of R ) Plant B**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1993 Target Values	5,8	5,7	5,5	5,3	5,2	5,0	4,8	4,7	4,5	4,3	4,2	4,0
Periods	4,0	2,1	4,3	4,0	6,1	12,6	8,2	3,3	4,0			



## Appendix F.5 : Distribution of Job Accident Parameters for the Whole Firm.

**Distribution of Job Accident Parameters for the Whole Firm**

<b>Job Accident Frequency</b>		1	2	3	4	5	6	7	8	9	10	11	12
1993 Target Values	31,33	30,67	30,00	29,33	28,67	28,00	27,33	26,67	26,00	25,33	24,67	24,00	
Periods	15	16	33	22	17	37	14	10	26				
<b>Job Accident Seriousness</b>		1	2	3	4	5	6	7	8	9	10	11	12
1993 Target Values	0,34	0,34	0,33	0,32	0,31	0,31	0,30	0,29	0,28	0,28	0,27	0,26	
Periods	0,23	0,15	0,26	0,25	0,26	0,34	0,34	0,31	0,25				
<b>Hours Lost</b>		1	2	3	4	5	6	7	8	9	10	11	12
1993 Target Values	0,32	0,32	0,31	0,30	0,29	0,29	0,28	0,27	0,26	0,26	0,26	0,25	0,24
Periods	0,18	0,11	0,2	0,2	0,19	0,26	0,26	0,24	0,2				
<b>Probability of Having an Accident</b>		1	2	3	4	5	6	7	8	9	10	11	12
1993 Target Values	10,77	10,54	10,31	10,08	9,85	9,63	9,40	9,17	8,94	8,71	8,48	8,25	
Periods	4	2	9	5	4	12	5	3	7				
<b>Risk of Accident</b>		1	2	3	4	5	6	7	8	9	10	11	12
1993 Target Values	7,44	7,28	7,13	6,97	6,81	6,65	6,49	6,33	6,18	6,02	5,86	5,70	
Periods	3,6	3,7	7,8	5,4	4,1	8,8	3,3	2,4	6,2				

## Appendix F.6 : Procedure Table of job accident subsystem.

<b>PROCEDURE:</b>	Job Accident Subsystem Activities		<b>Date</b>
<b>FUNCTION:</b>	Preparing Reports of Job Accidents		
<b>Code</b>	<b>Procedures</b>	<b>Duty</b>	<b>Responsibility</b>
P9-01	Human resources is responsible for gathering data about job accidents.	Gathering data about job accidents.	Expert
P9-02	Human resources is responsible for inputting data in related sheets and reporting these data.		
P9-03	Human resources is responsible for controlling computed ratios, graphics and comparing these values with that of the previous month.	Controlling tables and reports.	Expert
P9-04	Human resources is responsible for confirming this report.		Human resources (Manager)
P9-05	Human resources is responsible for distributing job accidents report (RPT5) to top managers and workshop supervisors.		Expert

Appendix G : Procedure table of training subsystem.

PROCEDURE:	Training Subsystem Activities		Date
FUNCTION:	Orientation and Training		
Code	Procedures	Duty	Responsibility
P7-01	<p>An orientation program includes following information:</p> <ul style="list-style-type: none"> <li>• Organisation structure, functions and general policies of the firm.</li> <li>• Description of the job done in every function or workshop of the firm.</li> <li>• Explaining relationships between departments.</li> </ul>		
P7-02	Policies and procedures are main references for orientation programs.		
P7-03	Human resources is responsible for arranging orientation programs.	Giving orientation training to new employees.	Human Resources (Training Supervisor).
P7-04	Human resources is responsible for determining weaknesses of man-power and preparing training programs to improve man-power.	Analysing weaknesses of man-power and improving training programs.	Human resources (Manager).
P7-05	Training supervisor is responsible for finding suitable training programs that will answer man-power needs.	Analysing training program alternatives and choosing the most appropriate one.	Human Resources (Training Supervisor).
P7-05-01	Training supervisor is responsible for informing managers of training programs.		
P7-05-02	Training supervisor is responsible for preparing training programs and follow them.		

Appendix H : Example of reports of subsystems.

EXAMPLE OF REPORTS OF EXECUTION PROCEDURES

REPORT NAME :Memorandum

REPORT NUMBER :P-RPT1

DEFINITION :This report is used in reporting time, brut paying, net paying and deductions for every employee.

This report includes the following:

1. Name and surname of the personnel,
2. Salary per month, salary per hour,
3. Brut salary,
4. Cumulative brut salary
5. Deductions,
6. Total deductions,
7. Net Salary

PERIOD :It is published at the end of every month.

DISTRIBUTION :Execution function

REFERENCE :P1-04

## EXAMPLE OF REPORTS OF EXECUTION PROCEDURES

REPORT NAME :Report 1 (Job accidents' data table)

REPORT NUMBER :P-RPT2

DEFINITION :This report is used in reporting the distribution of job accidents in the basis of basic functions of the firm, lost man-power and total working hours.

This report includes the following:

1. Number of accidents
2. Man-power lost in terms of hours,
3. Man-power lost in terms of days,
4. Working hours.

PERIOD :It is sent to job accidents subsystem till second week of the month.

DISTRIBUTION :Execution function

REFERENCE :P2-06-02

## EXAMPLE OF REPORTS OF EXECUTION PROCEDURES

REPORT NAME :Report 2 (Body parts injured)

REPORT NUMBER :P-RPT3 .

DEFINITION :This report is used in reporting the distribution of body parts injured, number of lost hours and lost days during job accidents.

This report includes the following:

1. Employee number of the person who had an accident.
2. Name and surname of the employee,
3. Functional code of the employee,
4. Injured body part,
5. Lost hours,
6. Lost days,

PERIOD :It is sent to job accidents subsystem till second week of the month.

DISTRIBUTION :Execution function

REFERENCE :P2-06-03

## EXAMPLE OF REPORTS OF PERSONNEL PROCEDURES

REPORT NAME :Personnel Database for Salaried Employee  
(Appendix C)

REPORT NUMBER :P-RPT4

DEFINITION :This database (report) is used when updating of records, adding and deleting records and includes following information:

1. Employee number and status code,
2. Employee's name and surname,
3. Employee's grade,
4. Employee's title,
5. Graduated school,
6. Plant code,
7. Date of entrance,
8. Number of working years.

PERIOD :It is used two times in a month.

DISTRIBUTION :Personnel function

REFERENCE :P5-07

## EXAMPLE OF REPORTS OF PERSONNEL PROCEDURES

REPORT NAME :Job Accidents.

REPORT NUMBER :P-RPT5

DEFINITION :This report is used in every month to show accident distribution, reason of these accidents and deviations from target values. It includes the following information:

1. Ratio values,
2. Distribution of ratios for every basic function of the firm,
3. Cumulative values of these distribution in months,
4. Graphic representation of ratios.

PERIOD :It is used once in a month.

DISTRIBUTION :Job accidents function

REFERENCE :P9-05

EXAMPLE OF REPORTS OF SALARY AND ORGANISATION  
PROCEDURES

REPORT NAME : ABSENTEEISM HOURS

REPORT NUMBER : P-RPT6

DEFINITION : This report is used in every month to show distribution of absenteeism hours on the basis of functional codes, their cumulative and total values. It includes the following information:

1. Percentage values,
2. Distribution of percentage values for every basic function,
3. Cumulative values of these distribution in months,

PERIOD : It is used once in a month.

DISTRIBUTION : Man-power, salary and organisation function

REFERENCE : P11-01

## EXAMPLE OF REPORTS OF SALARY AND ORGANISATION PROCEDURES

REPORT NAME :OVERTIME VALUES

REPORT NUMBER :P-RPT7

DEFINITION :This report is used in every month to show distribution of overtime values on the basis of functional codes, their cumulative and total values and reasons of overtime. It includes the following information:

1. Percentage values,
2. Budget values,
3. Cumulative values of these distribution in months,
4. Total values.

PERIOD :It is used once in a month.

DISTRIBUTION :Man-power, salary and organisation function

REFERENCE :P11-03

Appendix I : Example of forms of subsystems.

EXAMPLE OF FORM OF PERSONNEL PROCEDURES

FORM NAME :Data entry form for every new employee.

FORM NUMBER :P-FRM1

DEFINITION :This form is used in when new employee entrance exits and includes 31 kind of records. These data can be classified in 3 groups:

1. Personnel data,
2. Organisation and salary data,
3. ID data.

PERIOD :At any time when new entry exits.

DISTRIBUTION :Personnel function

REFERENCE :P3-02

## EXAMPLE OF FORMS OF PERFORMANCE PROCEDURES

FORM NAME :Performance Evaluation Forms.

FORM NUMBER :P-FRM2

DEFINITION :This form is used in determining performance evaluations taking into consideration performance criteria.

This form includes following information:

1. Name of the department,
2. Name of the manager responsible for doing evaluation,
3. Name of the employees to be included in the evaluation,
4. Date,
5. Evaluation results.

PERIOD :Prepared before performance evaluations are made. (Two times in a year.)

DISTRIBUTION :Human resources department.

REFERENCE :P6-05

## EXAMPLE OF FORMS OF BUDGET PROCEDURES

FORM NAME :Annual Budget

FORM NUMBER :P-FRM3

DEFINITION :This form is filled in during annual budget preparations taking into consideration expenditures made, projected costs for the following year.

This form includes the following information:

1. Actual values between January and September,
2. Projected values for January-December,
3. Conjective values for every month of the following year,
4. Total values for every month of the following year,
5. Total values for every kind of expenditure of the following year,

PERIOD :Prepared during annual budget studies in every year.

DISTRIBUTION :Human resources and budgetting & control department.

REFERENCE :P8-04

## EXAMPLE OF FORMS OF SALARY AND ORGANISATION PROCEDURES

REPORT NAME : EMPLOYEE DEMAND FORM

REPORT NUMBER : P-FRM4

DEFINITION : This form is used to demand employee any time when needed. It includes the following information:

1. Job title ,
2. Special data about employee demand ( Age, experience, sex , etc.)
3. Responsibilities of job,
4. Special features of the job.

PERIOD : It is used whenever wanted.

DISTRIBUTION : Man-power, salary and organisation function

REFERENCE : P12-03

Appendix J: Files' Structure in Subsystems

FILE STRUCTURE OF PERFORMANCE SUBSYSTEM						
DIRECTOR Y	SUB DIRECTORY	FILE NAME	INFORMATION	PERIOD	TABLE/GRAPH	
Performans	-	preport	Distribution of performance values in firm.	M, N, G	Tab.	
Performans	-	pgraph	Distribution of factors on the basis of grades.	M, N, G	Tab.	
Performans	graph / factors	perga.xls perg.xlt	Distribution of factor A on the basis of grades. Template form of the sheet	M, G	Gr.	
Perfromans	graph / grades	perg2.xls pergg.xlt	Distribution of factors on the basis of grades in a specified function. Template form of the sheet.	M, G	Gr.	
Performans	report	per2a.xls per.xlt	Distribution of performance values in a specified function. Template form of the sheet.	M, N, G	Tab.	

M : May

Gr : Graph

N : November

Tab.: Table

FILE STRUCTURE OF ANALYSIS & COST SUBSYSTEMS					
DIRECTOR Y	SUB DIRECTORY	FILE NAME	INFORMATION	PERIOD	TABLE/GRAPH
Analysis	-	wage.xls	Drawing alternative salary curves using current salaries as data.	M	Tab.
Analysis	-	wage2.xls	Graphical representation of cost of alternative salary curves.	M	Gr.
Analysis	September	wagean.xls foreman.xls	Wage analysis of salaried and hourly-worked employee. Wage analysis of foreman--hourly waged employee.	S	Tab, Gr.
Analysis	March	wageana.xls foremana.xls	Wage analysis of salaried and hourly-worked employee. Wage analysis of foreman--hourly waged employee.	M	Tab, Gr.
Analysis	Manning	manning.xls	Example of manning table for functions in the firm.	D	Tab.
Cost	-	budget.xls cost1.xls cost2.xls l.xls	Human resources annual budget. Man-power cost for salaried employee. Man-power cost for hourly-waged employee. Data entry table for man,power costs.	D E.Month E.Month E.Month	Tab. Tab. Tab. Tab.

D : December      Gr : GRGraph    Tab.: Table      S: September      M:March      E.Month:      Every month

FILE STRUCTURE OF JOB ACCIDENTS & APPLICATION SUBSYSTEMS					
DIRECTORY	SUB DIRECTORY	FILE NAME	INFORMATION	PERIOD	TABLE/GRAPH/LIST
Accident	-	acc1.xls	Distribution of job accidents among functions.		Tab.
		acc2.xls	Link file for computing monthly data.		Tab.
		acclink.xls	Distribution of cumulative data and parameter		Tab.
		graph1.xls	Dist. of job accident parameters for the firm.		Gr.
		graph2.xls	Dist. of job accident paramet. for every plant	Every Month	Gr.
		graph3.xls	Cumulative distribution of parameters.		Gr.
		macro1.xlm	Command macro for accident frequency.		L.
		macro6.xlm	Command macro for accident seriousness.		L.
		macro7.xlm	Command macro for lost hours ratio.		L.
		macro8.xlm	Command macro for probability of having a job accident.		L.
Application	-	Applic.xls	Database structure used for application forms.	When needed	L.
		Macro1.xlm	Macro sheet for extracting needed applicants' forms.		L.

FILE STRUCTURE OF MAN-POWER, SALARY AND ORGANISATION SUBSYSTEMS (1)						
DIRECTOR Y	SUB DIRECTORY	FILE NAME	INFORMATION	PERIOD	TABLE/LIST	
Absenteeism (Devam)	-	Dev1,.....,Dev12	Monthly man-power report.	Every Month	Tab.	
Absreason (messeb)	-	Overtime1	Monthly overtime values for salaried employee.	Every Month	L.	
		Overtime2	Monthly overtime values for hourly-waged employee.			
		Employee	Number of hourly waged employee on functional basis.			
		Unpaid	Number of unpaid absenteeism hours.			
		Accident	Number of hours lost because of job accidents.			
		Noreason	Number of hours lost without taking any permission.			
		Paid	Number of paid hours.			
		Doctor	Number of hours lost because of illness.			
Overtime	Overtime	Fm1,.....,fm12	Overtime monthly report (1).	Every Month	Tab.	
Overtime	Over	Faz1,.....,faz12	Overtime monthly report (2).	Every Month	Tab.	
Overtime	Overtemp	Denfaz.xlt fazmes.xlt	Template structure of overtime and absenteeism hours report.	When Needed	Tab.	
Overtime	-	Reason.xls	Distribution of overtime hour values according to main reasons.	Every Month	Tab.	

Tab.: Table

L.: List 1,2,....,12 : Represents months in a year.

<b>FILE STRUCTURE OF MAN-POWER, SALARY AND ORGANISATION SUBSYSTEMS (2)</b>						
<b>DIRECTOR Y</b>	<b>SUB DIRECTORY</b>	<b>FILE NAME</b>	<b>INFORMATION</b>	<b>PERIOD</b>	<b>REPORT/LIST</b>	
Per	-	Per1 Perkad	Personel database of salaried employee. Contemporary file that should be open when running macros.	When needed	L.	
Per	genmud	function1, function2,...	List of employees on the basis of basic functions in the firm.	When needed	L.	
Per	mud	function1, function12,...	List of employees on the basis of every function in the firm.	When needed	L.	
Per	Perkad	Grade1, grade2,...	Computing statistical values ( max., min., average ) of salaries on the basis of grades. Report os salaries on the basis of grades.	Every Month	L. R.	
Per	Perstat	Engineer, supervisor,...	Computing statistical values ( max., min., average ) of salaries on the basis of statuses. Report of salaries on the basis of statuses.	Every Month	L. R.	

Tab.: Table      L.: List

## CURRICULUM VITAE

Özlem Yıldırım was born on 29<sup>th</sup>, November, 1968. Having completed primary school education in Mersin, in 1987, she was graduated from Adana Anatolian School. In 1991, she has been graduated from Istanbul Technical University, Industrial Engineering Department of Business Administration Faculty with a good degree. During her last year of industrial engineering education, she prepared an announcement to be announced in "Operations Research Congress" concerning "Analysing Difficulties Occurred During Implementation of Operations Research Models in Turkish Industry by Using Cognitive Map Model". At the same year she began to pursue her master of science education in Istanbul Technical University natural & Applied Sciences, Industrial Engineering Department, Engineering Management Program.

Since September 1992, she has been working as an Industrial Engineer in industrial relations department in OTOSAN A.Ş. Especially, she has experiences on programs like Excel 4.0, Lotus, Word 2.0, Harvard Graphics, ABC and she continues on studying Microsoft Access. Her areas of interest are Management Information Systems, Product Planning & Control, and Marketing. She can both write and speak English in a very good degree.