GAINS OF PROGRESSION OF A PERSONNEL MANAGEMENT SYSTEM TO E-GOVERNMENT ENVIRONMENT

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ABSTRACT

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In many countries the main reason to turn towards the e-government applications is the increase on public expectations. Citizens want to do their governmental procedures day and night, 24 hours a day without leaving their homes and offices, without losing any time. These expectations force the managers of public organizations to deal with e-government applications. Because of the e-government requirements, changes on information management methods of government organizations become mandatory. Like in every reform, there are managers, which resist to the changes and want to continue with the traditional methods. These managers cause delays while e-government applications are emerging. Educational program needs have occurred, for the users, who are at the management level, to use the new application effectively. With transparency, security issues have been arisen and new applications were developed in order to obtain security and new mechanisms were constructed. This study is prepared to guide people about the gains of progression of a personnel management system to e-government environment and to give the opportunity to have an initial estimation for the process. This thesis reviews the differences when a personnel management system moved to the e-government environment by means of, duration, service quality and error correction. SERVQUAL method is used to measure the service quality. Results of this study show that; e-government applications simplify the information sharing between citizens and the government, increase the trust of the citizens to government, preserve time, cost losses and increases the information currency and reliability.

Keywords: E-government, SERVQUAL method

ÖZ

BİR PERSONEL YÖNETİM SİSTEMİNİ E-DEVLET ORTAMINA TAŞIMANIN KAZANIMLARI

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Birçok ülkede e-devlete yönelmenin arkasındaki en önemli faktör kamudan bu yöndeki beklentilerin artmış olmasıdır. Vatandaşlar gündüz-gece, günün 24 saatinde, evinden veya işyerinden ayrılmayarak, dolayısıyla zaman kaybetmeksizin işlemlerini yapmak istemektedirler. Bu beklentiler kamu kesimindeki yöneticileri e-devlet uygulamaları ile ilgilenmeye zorlamaktadır. E-devlet uygulamaları kurumların bilgi işleme yöntemlerinde değişiklik yapılmasını zorunlu hale getirmiştir. Her reform hareketinde olduğu gibi bu değişiklere karşı çıkan ve eski alışkanlıklarından vazgeçmek istemeyen yöneticiler olmuştur. Bu yöneticiler e-devlet uygulamalarının hayata geçirilmesinde gecikmelere sebep olmuştur. Yeni uygulamaların aktif bir şekilde kullanılması için yönetici seviyesindeki kullanıcılara eğitim verme ihtiyacı doğmuştur. Bazı yöneticiler şeffaflaşmaya karşı direnç göstermiştir. Şeffaflıkla birlikte güvenlik önlemleri de gündeme gelmiş ve güvenlik için yeni uygulamalar geliştirilerek, denetim mekanizmaları kurulmuştur. Bu tez bir personel yönetim sisteminin e-devlet ortamına taşınmasının süreç, servis kalitesi ve hata iyileştirmesi anlamındaki farklılıklarını incelemektedir. Hizmet kalitesinin ölçümü için SERVQUAL yöntemi kullanılmıştır. Bu çalışmanın sonuçları göstermektedir ki; e-devlet uygulamaları vatandaşla devlet arasındaki bilgi paylaşımını kolaylaştırmakta, vatandaşların devlete olan güvenini arttırmakta, zaman, para kaybını önlemekte ve bilginin güncelliğinin ve güvenilirliğinin artmasını sağlamaktadır.

Anahtar kelimeler: E-devlet, SERVQUAL yöntemi

To My Wife & My Daughter

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ASP		Active Server Pages
D&M	-	DeLone & McLean
eGov.	-	Electronic Government
ePublic	-	Electronic Public
eService	-	Electronic Service
FAQ	-	Frequently Asked Questions
HTML		Hypertext Markup Language
HPD	-	Headquarters Personnel Department
ICT	-	Information & Communication Technologies
IS	-	Information System
IT	-	Information Technology
MERNIS	-	Central Population Management System
OECD	-	Organization for Economic Co-operation and Development
OMR	-	Optical Mark Reader
PIF	-	Personnel Information Form
PIP	-	Personnel Information Portal
SERVQUAL	-	Servis Quality
SERVPERF	-	Service Perfectness

SQL		Structured Query Language
TUIK	-	Turkish Statistics Institution
UG	-	User Guide
URL	-	Uniform Resource Locator

CHAPTER 1

INTRODUCTION

Use of Information & Communication Technologies (ICT) in government activities has become a common phenomenon in recent years. In the late 1990s, ICT introduced a new concept named "e-government" in public administrations. With this new concept, organizations started to change their legacy system with new IT developments. Of course information technology cannot by itself change the inherent nature of the tools of government policy. However, by using information technology, organizations may change the way that they use these tools in two ways; first, by reengineering the way that existing tasks are carried out, second, by creating new tasks and opening up policy opportunities that were not previously possible [5]. Organizations use these developments to contact with their citizens to get information, which are used to generate judgments, solve problems and make decisions.

In the literature, there are not many studies guiding the developers while moving to the e-government structure. Here the guidance is referred as the expected improvements in the sense of service quality, process durations and error rates. This study is a descriptive case study, which aims to analyze these three factors in an actual case.

A government organization in Turkey is used as a case to e-government applications in this study. Our *government model* has an intra-net area and this intra-net area has become widespread, too fast, and radical with revolutionary changes over recent years in the directions of innovations in information technologies. According to these developments in 2006, mobile platforms gain the possibilities to reach the

organization's intra-net, with wireless access by using their satellite systems. Indeed this change is still in progress and the *organization* is planning to enlarge its intra-net. Nowadays *organization's* departments are replacing old legacy systems with new ICT systems. With this trend, *organization's* Headquarters Personnel Department (HPD) decided to change old legacy personnel information collection method (optical forms & printed documents) with a web-based personnel information portal (PIP) application by using information management standards. The fact that a high percentage of staff was charged with a duty in mobile platforms, forced the HPD to continue to use legacy data collection methods, until new ICT developments and huge intra-net area make web-based applications possible. A powerful way of managing information variety is to involve as many organization members as possible in the gathering of information process; in effect, creating an organization-wide information collection network. In any organization, people, not printed sources or electronic databases, will always provide the most valuable information. Also e-government application's goals continue to impact organizations and help customers to save time and decrease costs.

Our organization always tries to reach the correct, updated, reliable, and trustable information as fast as possible. HPD hopes to increase efficiency, effectiveness, and organizational performance by developing PIP. PIP was developed in order to keep personnel information more reliable, updated and correct and also enabling members of the staff to follow their own records with web-based services. With this development HPD has reorganized the processes of back-offices.

The web and other technologies have shown potential as effective and efficient managerial tools that collect, store, organize, and manage voluminous information. Effective information systems (IS) service has been expanding to the areas that assist and train IS users in their use of information technology in problem solving and analyzing data to produce information for decision makers.

Increasing importance of IS services, triggers quality of IS services in enabling IS users to accomplish their work more efficiently to add value to their activities and organizational performance. While there have been efforts to study service quality, there has been no general agreement on the measurement of the concept. PBZ (Parasuraman,

Berry, Zeithaml) research group put forward a method to measure service quality as SERVQUAL [2]. Based on the SERVQUAL instrument, this article re-designed the criteria and data analysis methods of the instrument in order to adapt it to evaluate the service quality distinctions of HPD legacy personnel management system and new developed web-based personnel information portal (PIP) services.

This study examines the gains according to the differences between legacy personnel management system and new PIP services, by means of duration, service quality and error correction. In the literature part of this study e-government application effects on the *organization* and IS service quality measurement methods are also analyzed. During the eight months, the present system data manipulation processes are analyzed and duration and error ratios of present system are detected. Also new developed PIP data manipulation process is analyzed and duration and error ratings are measured during three months period for the new system. In the result part of this study both systems' data manipulation durations and error ratings are compared. SERVQUAL method is applied to measure both systems' service qualities.

CHAPTER 2

BACKGROUND INFORMATION

Under the global pressure of information and communication technology (ICT), web-based applications have become a global trend. The popularity of e-government, to deliver and conduct government services in public administration, increases interaction between government and citizens through web-based technologies [1]. More government transparency allows citizens to monitor the performance of public organizations easily through the increase in the availability of information [1]. At the same time e-government applications are developed to shorten the durations of government bureaucracy. Interactivity refers to the quality of communication between organizations.

In this chapter, we are summarizing the relationship between organizations, information technologies and e-government environments. We also investigate how should be the information management, information system success models and the gains of the e-government environment.

2.1 Organizations, Information Technologies, and Environment

Organizations are replacing old legacy systems with new IT systems, which are using information collected by the environment. The new systems allow organizations to communicate with each other and interact with customers more efficiently. However; the construction of the relationship between organizations and IT systems must be determined in a more detailed way. In this subject we summarize these relations.

2.1.1 Information

Gregory Bateson gives the definition of information in his book Mind and Nature as; "Any difference that makes a difference." According to Bateson's approach, in order for it to generate pattern, thought, and learning, information must be created, processed, and acted upon in an environment of interconnected social and biological reforms [2]. He also reports that information creation, acquisition, storage, analysis, and use support the growth of an organization [2]. In the following section, we have summarized the relationship between IT and organizations.

2.1.2 Organizations and Information Technologies

Local governments are replacing old legacy systems with new IT systems. Although the reactions were not quite positive at the beginning, organizations prefer to use e-government applications while getting more comfortable with the computers [3]. Governments do not have to be limited by physical and institutional boundaries. People are now using government web sites to make transactions instead of visiting government buildings. Also governments all around the world contact with their citizens by using mobile phones, digital televisions, Internet and emails. The USA is the first country, which activates e-government initiatives in 1993 reforms [4]. After a couple of years the United Kingdom and the other European countries have followed these reforms. Also the European Commission has its first step for the E-Europe in year 2000 at the Lisbon Summit meeting. The focal point of all these reforms is to make the online reach to the governmental services possible for the citizens [4].

TUIK's (Turkish Statistics Institution) reported statistics on Information Technology use in Turkish initiatives that report declares the usage of computers as 87.76% and usage of Internet as 80.43% [5]. Internet usage rates increases with the size of the organization. Organization members $\geq$ 250 => Internet usage ratio = 99.22% and 49 $\geq$ Organization members $\geq$ 10 => Internet usage ratio = 77, 97% [5].

In the same report, it is shown that, in January 2005, 40.15% of members of computerized organizations used computer at least once a week. At the same interval

35.83% of members use Internet at least once a week at organizations, which have Internet access [5].

This study shows that, computer and Internet usage at the organizations increases while the size of the organization increases. Also *our organization* reached a huge intra-net system in 2006. Employees' computer and intra-net usage is increasing every day. All these opportunities drive *our organization* to use online systems more efficiently.

By itself, Information Technology is considered as an environment. Information technology cannot change the Internet nature of the tools of government policy. However, by using information technology, organizations may change the way that they use these tools in two directions: by reengineering the way that existing tasks are carried out, and by creating new tasks and opening up policy opportunities that were not previously possible [6].

2.2 Organizational Information Processing

Organizational information processing has three phases according to its goals; first, organizations use the information as processing systems, the approach of this system is seeking to understand and predict how organizations perceive stimuli, interpret them, store, retrieve, and transmit information, generate judgments, and solve problems [7].

Second, organizations as decision-making systems; theoretically organizational decision-making must consist of the theory of search and theory of choice [2]. Decision makers must identify problems, search for solutions, and develop methods to generate and evaluate alternatives to solve problems and new choices. Briefly decision makers must actively search for the required information, since such information is not readily available. Spending less time to collect the information to shortens the decision-making period [7].

Turkey is a developing country with limited resources. According to Yıldız [8], it would be interesting to examine how political and administrative top decision makers make policy. He agrees that developing of e-government projects increase towards making government work better. According to him, "they are also partial results of

conforming to isomorphic tendencies such as being on the cutting edge, keeping up with other government agencies and conforming to European Union standards [8]".

Third, organizations as interpretation systems; according to this approach organizations are information processing systems, in the first instance, purpose of processing information is not decision making or problem solving [2]. Instead, the focus is on reducing the ambiguous of information about the organization's external environment. Managers as information processors receive information about the external environment and then create or enact the environment to which they will attend [2]. Organization's external environment is being interpreted, and interpretation depends on analyzable perceptions of environment and how actively it is introduced into the environment to understand it [2].

2.3 Information Management

Organizations which use the information for progression, decision generation or interpretation need an information management cycle. Figure 2-1 shows a process model of information management, which is closely related with six items. These are information needs, information acquisition, information organization and storage, information products and services, information distribution and information use [2].

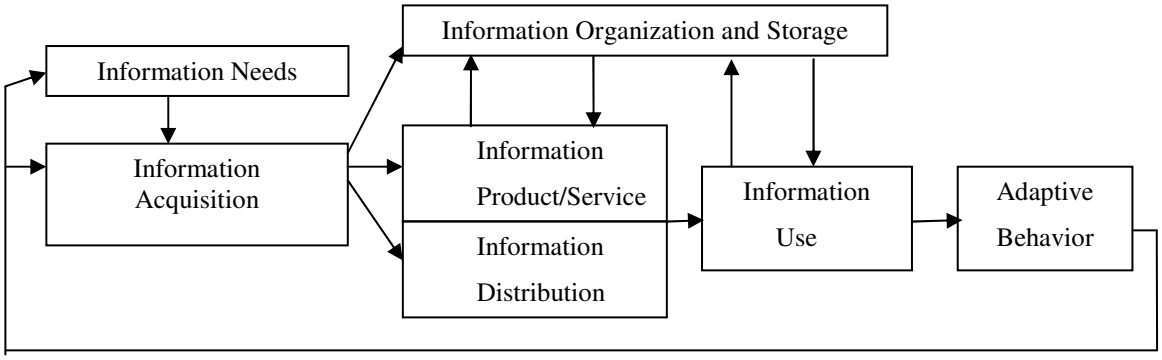


Figure 2.1 Information management cycle [2]

2.3.1 Information Needs

Information needs arise from the problems, indefiniteness, and ambiguities in specific organizational situations and experiences [7]. Organizations analyze the

environment and seek information in order to make sense of the situation and have the necessary information to make decisions and solve problems. Government's capacity to gather information is a function of social relationships rather than technology and has not necessarily increased through technological advances [6].

The common reasons for people to contact government are ranging from trying to influence public policy, to solve their problems, which are related by governmental affairs, execute a government related transaction, to get information about government services and benefits, among other reasons [9].

Information needs will not stop, people and organizations always ask, "What do I want to know?" "What do I need to know?" "How do I need to know?" According to MacMullin and Taylor "information needs are contingent, dynamic, and multifaceted, and a sufficient complete specification is only possible within a rich representation of the total information-use environment [2]."

2.3.2 Information Acquisition

According to Kohen, to get information acquisition, technological innovations, government policies, economic trends, demographic patterns, lifestyle changes, political transitions and international trade must be monitored by the organizations [9]. Nowadays Internet may reduce the cost of many information collection processes. With less effort and spending less money, organizations collect so much information from their environments. Internet reduces time and cost and greater convenience may affect satisfaction with the contact experience. Kohen agrees that, if people employ a cost-benefit assessment in evaluating their contact experience with government, then the reduction of cost of contact may lead to marginally higher solution rates, if the benefit side of the equation does not rise [9].

A powerful way of managing information variety is to involve as many organization members as possible in the gathering of information; in effect, creating an organization-wide information collection network. In any organization, people, not printed sources or electronic databases, will always provide the most valuable information. E-government integrated services not only bring together services but also integrate them into more complex units that match citizens' needs and problems. Integrated services

characteristics are created on the basis of users' needs and not of internal requirements and structure of the administration [7].

2.3.3 Organizational Information Storage

Managers can look at the history of an organization to find ways it adapted in the past [10]. Systematically organized and stored history of a company contains its heritage and traditions, which managers try to understand if they are to see the present as part of a process rather than as a collection of accidental happenings. Perceiving a company in this way can enhance a manager's ability to plan for the future. Managers need to learn how to develop historical resources and how to put them to use. E-government offers potential solutions to leaders across the whole body of government. Many OECD countries have found that sustained leadership is important at all levels of the e-government cycle. At the early stages of e-government implementation, leadership can articulate and promote acceptance of vision and strategy, and set frameworks to facilitate electronic service delivery and structure implementation efficiently [10]. Optimized file structures and access methods in the database systems can maximize use of computer resources and yield fast response times, and at the same time ensure accurate, up-to-date records that can be processed to complete transactions without error and delay [2].

2.3.4 Information Products and Services

Users require information to find answers for questions. However, at the same time they also are partnership of solutions to problems. Information products and services should be designed to address not only the subject matter of the problem but also the specific problem or each class of problems [2].

According to Taylor, "Information products and services, and information systems should be developed as a set of activities that add value to information being processed in order to assist users to make better decisions and better sense of situations, and ultimately to take more effective action [2]." Taylor classified value-added activities into six categories with more than twenty items. These value-added activities are; ease of use, noise reduction, quality and adaptability, time savings and cost savings [2].

Taylor declared that the ease of using product and services could let users browse information, arrange and format data, assist users to get answers and to gain understanding and experience with the system interface. Also dividing or grouping, ordering and making physical access becomes easier [2]. Noise reduction deals with the intellectual access, linkage, precision, and selectivity. These are value-added activities like indexing, database management systems, reference to other related information, ranking output, detailed description of items, and selective input of information.

Quality is a user criterion, it deals with accuracy (error free transfer), comprehensiveness (complete coverage), currency (access vocabulary reflects current usage), reliability (trust in consistent performance of service), validity (soundness of data provided) [11].

Adaptability is an ability to give service to user needs in their work environments. Ability related with closeness to problem, which covers specific needs of a person in a particular situation with a particular problem. Flexibility is a part of adaptability that indicates multiple ways of manipulating data. Another item is simplicity, it represents lucid data selected or presented. Last item for adaptability is stimulatory which covers activities that raise the profile of the service [2].

Time saving and cost saving are the perceived values of the service based on the speed of its response and the amount of money saved for the users. If governments do not keeping track of the new technological developments, they pay for information rather than receiving it by its outstanding position [7]. As well as reducing the cost of producing the same information, widespread use of information technology has increased the potential for collecting information and has therefore increased the cost in general. Information distribution can be as expensive as its collection [6].

In the last two decades, Internet-based applications have been developed, using online filing to cut down the costs of data re-entry and checking, to save on communications cost with customers and within government, to use limited resources such as skilled staff or facilities more efficiently by improving booking arrangements, to replace paper-based application processes and to reform payment and procurement [2].

According to the paragraphs mentioned above, information service design and management principles could be listed as below:

1) Information services need to be flexible and multifaceted [2] [11] [7].
2) Information services need to develop both competitive and collaborative strategies [2] [11].
3) Intermediary roles need to be translated at the micro level into transparent systems that empower users, and at the macro level to be expanded to perform training and education functions [6].
4) The information service needs to accept responsibility for performance of some monitoring functions and to assist gatekeepers and their relatives in the performance of others [6].
5) The information service must be client-centered rather than collection – centered or system-centered, be continually aware of user needs, and have a marketing orientation [2] [7].
6) The information service itself needs to be constantly innovating [2].

2.3.5 Information Distribution

Information distribution can be performed with the sharing and disseminating of different sources of information of organizations. Information sharing and distribution can yield many positive results. Organizational learning becomes more broadly based and more frequent; retrieval of information becomes more reliable; and piecing together the separated items can create new information [2]. Distribution is, in the first instance, about the dissemination or routing of information according to that famous phrase, "the right information to the right person in the right time, place, and format [2]." Information sharing must be done easily without loss of quality [2].

Nowadays, most companies and governments use Internet or on-line applications for online data collection to reduce data entry costs, the use of e-procurement and distribution cost and data through online publication. Sharing of common data within and between agencies to reduce collection and data reconciliation cost is emerging as

major focus of efforts to reduce costs within government. It also provides considerable benefit to customers of government services [2].

If information that would be distributed has confidentiality, than firstly security standards need to be defined. OECD council suggested nine principles for security of information systems and networks in July 2002. These principles are listed below;

1) Knowledge; It must be known that information systems need security.
2) Responsibility; everybody is responsible for the security of information systems and networks.
3) Reaction; Reaction over security problems must be done all together and on time.
4) Moral rules; Respect the others' legal rights.
5) Democracy; Security systems and network security must be suitable with public values.
6) Risk Analysis; Risk analysis must be done according to the weaknesses and risks.
7) Security planning and operations; Security is mandatory for information systems and networks.
8) Security management; Detailed approach must ensure security management.
9) Recheck; Security systems, security policies, applications and methods over information systems and networks, must be rechecked all the time [12].

2.3.6 Information Use

As Chun describes, organizational information sustains multiple meanings. Each one is the result of individuals or groups interpretations [2]. The use of information for knowledge production is unfurled through social interactions dispersed over space and time. Information used for making of meaning and understanding needs, processes and methods. These methods and processes provide for high degree of flexibility in information representation that facilitate the vigorous exchange and evaluation of multiple representations among individuals [2].

Also categories of information usage are discussed before in organizations information processes section of this study.

2.4 Information System Success

According to Laudon and Laudon, within the Information System (IS) literature, there are many models proposed to assess the quality of IS. An IS can be defined technically as a set of interrelated components that collect or retrieve, process, store and distribute information to support decision making, coordination, control, analysis and visualization in an organization [13].

2.4.1 DeLone and McLean Information System Success Model (1992)

In 1992 for the first time DeLone and McLean broadcasted their Information System (IS) Success Model as a framework and model for measuring the complex dependent variable in IS research [14]. The main purpose of their first model was to synthesize the IS success into coherent body of knowledge and to provide guidance to future researchers [14]. In the D&M IS Success Model, technical success is measured by "system quality"; semantic success is measured by "information quality" and effectiveness success is measured by "use, user satisfaction, individual impacts", and "organizational impacts" [14]. According to D&M IS Success Model first of all an IS must be created which can be described as exhibiting various degrees of system and information quality; second step is users and managers experience these features by using the IS and get satisfied or dissatisfied with the information products of the system; third the use of the system impacts or influences the individual user in the conduct of his/her work, and the last one is these individual impacts result in organizational impact. Figure 2.2 indicates the D&M IS Success Model [14].

There are so many studies related to the relations between D&M IS Success Model items. These studies are based on the fact that; they use multidimensional success constructs and they measured the association among the success constructs. Paragraphs listed below summarize the empirical results that were tested by several studies.

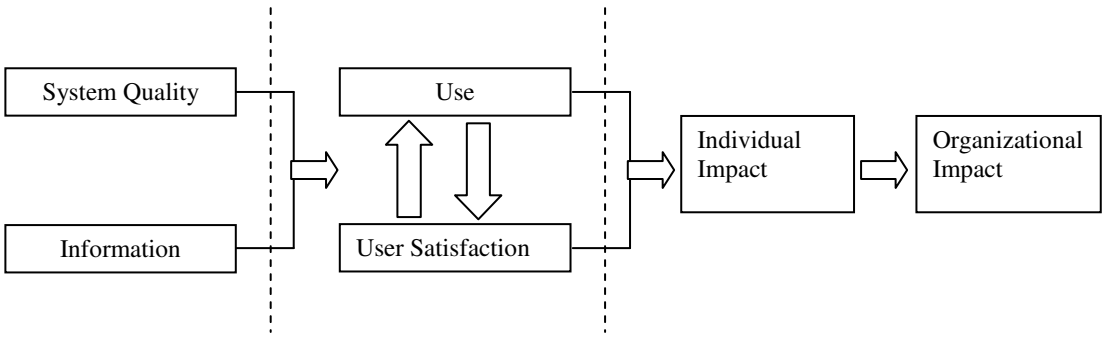


Figure 2.2 DeLone and McLean IS success model (1992) [14].

The association between System Use and Individual Impact was tested before. System use was typically voluntary and was measured as frequency of use, time of use, number of accesses, usage pattern, and dependency. Individual impacts were measured in terms of job performance and decision-making performance [14].

Relationship between System Quality- Individual Impacts can be explained with the terms of functionality, reliability, flexibility, data quality, portability, integration, ease of use, and importance as measurement criteria of system quality. Individual impacts were measured as quality of work environment and job performance [14].

The measurement items of information quality are accuracy, timeliness, completeness, relevance, and consistency. The relationship between information quality and individual impacts can be tested over these items. Individual impact can be measured in terms of decision-making performance, job effectiveness, and quality of work [14].

The widening of end user computing in the mid-1980s placed IS organizations in the dual role of information provider and service provider. Pitt et al observed that "commonly used measures of IS effectiveness focus on the products rather than the services of the IS function. Thus there is a danger that IS researchers will mismeasure IS effectiveness if they do not include in their assessment package a measure of IS service quality" [15]. Other researchers have agreed with this idea, mentioning the need for a service quality measure to be a part of IS success [14].

2.4.2 A Study on Service Quality - User Satisfaction Relationship

"One that is commonly used defines service quality as the extent to which a service meets customers' needs or expectations" [16] [17]. With this definition the difference between customer expectations of service and perceived service can be a definition for service quality. If expectations are greater than performance, then perceived quality is less than satisfactory and hence customer dissatisfaction occurs [18].

There has been a debate in IS (information system) literature about the measurement of IS service quality. Several studies are concerned with the conceptual and empirical relevance of the measures of service quality such as SERVQUAL and SERVPERF. Some researchers contend with the terms of convergent and predictive validities that perception only measures are better than confirmation/disconfirmation measures because the perception measures readily reflect users' complex cognitive evaluation processes [19]. According to Kettinger and Lee, service quality dimensionality varies from one to eight dimensions [20]. With the terms of the dimensionality of service quality and the role of expectation in determining the gap score (i.e., service quality) Kettinger and Lee call for research that experimentally proves the strength and weakness of those two measures of IS service quality [20].

Theoretical Background and the Information System Service Quality Measurement Models

Confirmation/disconfirmation between expectation and perception, or perceived quality itself, is a method to measure IS service quality. The differences between SERVQUAL and SERVPERF are the typical measures of service quality, and introduce an aggregate measure of service quality [20].

According to Parasuraman, Zeithaml, and Berry, "SERVQUAL is based on the confirmation/disconfirmation model (gap between expectation and perception) widely adopted in the customer satisfaction literature [20]."

One of the superlative instruments for measuring quality of IS service is SERVQUAL, which has continuously proven its instrumental usefulness in IS service quality research across industries including services, finances, and manufacturing. Moreover, for the analysis of expectation gap between IS professionals and users,

SERVQUAL instrument in the information systems area is a good tool [20]. According to Parasuraman, Berry and Zeithamal, "SERVQUAL instrument consists of two parts with 22 statements in each, measuring respondents' expectations and perceptions of actual service provided, each consisting of five generic dimensions or factors and are stated as follows in Table 2.1 [20]:

(1) Tangibles. Physical facilities, equipment and appearance of personnel.

(2) Reliability. Ability to perform the promised service dependably and accurately.

(3) Responsiveness. Willingness to help customers and provide prompt service.

(4) Assurance. Knowledge and courtesy of employees and their ability to inspire trust and confidence.

(5) Empathy. Caring and individualized attention that the firm provides to its customers [19]."

Table 2.1 The measurement items [20]

Dimensions	Items
Tangibles	IS has up-to-date equipment IS' physical facilities are visually appealing Employees of IS are well dressed and appear neat The appearance of the physical facilities of IS is in keeping with the type of services provided
Reliability	When these IS units promise to do something by a certain time, they will do so When user has a problem, these IS units will show a sincere interest in solving it These IS units will be dependable They will provide their services at the times they promise to do so They will insist on error-free records
Responsiveness	They will tell users exactly when services will be performed Employees will give prompt service to users Employees will always be willing to help users Employees will never be too busy to respond to user' requests
Assurance	The behavior of employees will instill confidence in users User will feel safe in their transactions with these IS units' employees Employees will be consistently courteous with users Employees will have the knowledge to do their job well
Empathy	These IS units will give users individual attention These IS units will have operating hours convenient to all their users These IS units will have employees who give users personal attention These IS units will have the users' best interest at heart The employees of these IS units will understand the specific needs of their users

Service quality for each dimension is captured by a difference score G representing the perceived quality gap for the item, where G = P – E. P and E represents average ratings of a dimension's corresponding perception and expectation statements respectively [20].

Using SERVQUAL method for measuring service quality, needs fastidious study because the understanding and interpretation of expectation is critical [20]. The ill-defined "expectation" construct may lead to varying interpretations of the expectation construct on the part of a customer [20]. SERVPERF method consists of the same five dimensions (tangibles, reliability, responsiveness, assurance, and empathy) to measure perception of performance, but this method focuses only on user perception of service quality [20].

Both SERVQUAL and SERVPERF literature address many publications in measuring service quality [20]. Yong, Mike, and Joong (2005) yielded limitations in two areas of these publications in their paper [20]. First one is the substantive relationship between service quality and user satisfaction, and the second one is the empirical test for alternative measures of service quality, "i.e., confirmation / disconfirmation, perception-only, and overall assessment of service quality" [20].

Yong, Mike, and Joong (2005) have focused on the relationship between service quality and user satisfaction, through three ways of measuring service quality. These are;

Model 1: SERVQUAL (gap measure) → user satisfaction,

Model 2: Perception → overall service quality → user satisfaction,

Model 3: Perception only service quality → user satisfaction [20].

They tried to measure which method is more effective in predicting user satisfaction [20].

Model 1: Confirmation/Disconfirmation for Service Quality

Figure 2.3 shows Model 1. It represents a disconfirmation framework featuring SERVQUAL as a distinctive construct that will predict user satisfaction. It is expected that service quality will positively increase user satisfaction. If "P" perception exceeds

"E" expectation then user satisfaction increases. If "E" exceeds "P" than dissatisfaction will occur [20].

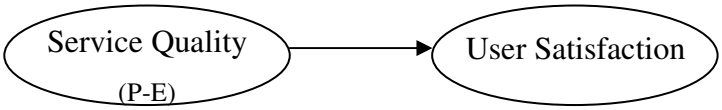


Figure 2.3 Model 1 Service quality as confirmation/disconfirmation

Model 2: Service Quality as the Overall Assessment of Service Quality

Figure 2.4 shows Model 2. It features perception of service quality and overall assessment of service quality as distinct constructs. Model 2 is structured to assess attribute-level perception influences the overall perception of service quality which in turn affects user satisfaction. Model 2 is useful to compare the effect of attribute-level evaluation and the overall evaluation and the impact of perception-only measures on user satisfaction [20].

Figure 2.4 Service quality as overall assessment of service quality

Model 3: Perception as Service Quality

Figure 2.5 shows Model 3. It forms perception of service quality as a main antecedent to user satisfaction. As SERVPERF studies claimed, this model may have the potential to provide an explanation for a complex cognitive process of user satisfaction toward IS service quality [20].

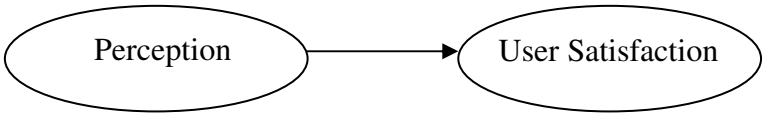


Figure 2.5 Perception-only construct as service quality

Yong, Mike, and Joong (2005) have also compared three different structural models of IS service quality and relationship between service quality and user satisfaction in their study named "Measuring IS Service Quality in The Context of The Service

Quality–User Satisfaction Relationship" [20]. They focus on the role of service quality in predicting user satisfaction and that of perception in shaping the service quality perception, instead of analyzing the dimensionality of service quality.

Although all three ways of measuring service quality appear to be statistically significant, perception only and overall assessments of service quality seem to be better than the confirmation/disconfirmation perspective [20].

We believe that the SERVQUAL metric needs continued development and validation and also we believe that "service quality", properly measured, deserves to be added to "system quality" and "information quality" as components of IS success. Although a claim could be made that "service quality" is merely a subset of the DeLone and McLean IS Success First Model [14].

Yang, Yan-ping, and Jie applied SEVQUAL method to Chinese Higher Education [21]. They used six dimensions to measure service quality, these are, tangibles, competence, attitude, content, and delivery. They applied 5-point Likert scale in their study (it could be adopted as 7-point or 9-point scale). They made item (questions) analysis, dimension analysis, total analysis of satisfaction. The results of their study helped to understand; "how are the students to define the education service?", "which aspects of service quality are important to students?", "how can be discover the existent problems, and find out the weakness.", and "how can be improve service quality in a efficient way [21]." Therefore application of SERVQUAL method may enable organizations to identify dimensions of services [21].

2.4.3 The Updated DeLone and McLean Information System Success Model

According to changes in the role of management of information systems, DeLone and McLean have updated their first model with the new one in Figure 2.6 [14].

Quality has three major dimensions: "information quality," "system quality," and "service quality." Each should be measured or controlled separately, because singularly or jointly, they will affect subsequent "use" and "user satisfaction" [14].

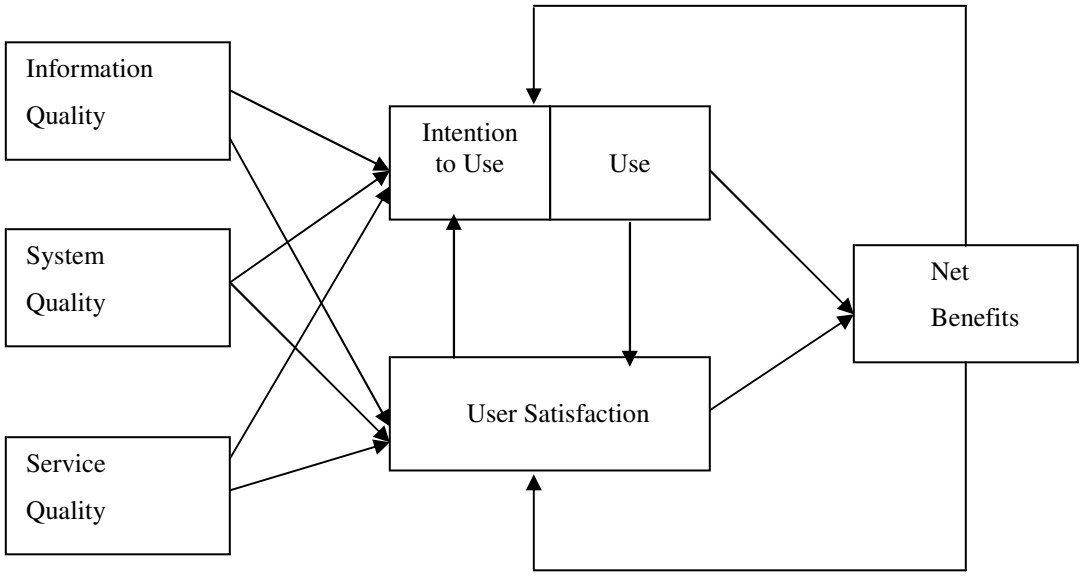


Figure 2.6 Updated D&M IS success model [14]

In the DeLone and McLean first and second models "use" and "user satisfaction" are closely related with each other. In a process sense "use" must precede "user satisfaction," but in a causal sense positive experience with "use" will lead to greater "user satisfaction." Similarly, increased "user satisfaction" will lead to increased "intention to use," and thus "use" [14].

Certain "net benefits" will occur as a result of "use" and "user satisfaction." While IS or service is to be continued, from the perspective of the owner or sponsor of the system, positive "net benefits" are assumed, thus influencing and reinforcing subsequent "use" and "user satisfaction." These feedback loops are still valid, however, even if the "net benefits" are negative. Mystery of positive benefits is likely to lead to decrease of use and possible discontinuation of the system or of the IS department itself [14].

"The updated D&M IS Success Model includes arrows to demonstrate proposed associations among success dimensions in a process sense, but does not show positive or negative signs for those associations in a causal sense. The nature of these causal associations should be hypothesized within the context of a particular study. For example, in one instance a high-quality system will be associated with more use, more user satisfaction, and positive net benefits. The proposed associations would then all be

positive. In another circumstance, more use of a poor quality system would be associated with more dissatisfaction and negative net benefits. The proposed associations would then be negative" [14].

With the dramatic impact of Internet over business operations, companies start to spend more money for e-commerce applications. IS researchers have started to deal with the development, test, and e-commerce success measuring applications. Several researchers proposed an e-commerce success model based on the D&M IS Success Model, in their studies. The updated D&M IS Success Model can be adapted to the measurement challenges of the new e-commerce world [14].

Customers and suppliers are the primary system users within the e-commerce context. Customers and suppliers use the system to make buying or selling decisions and execute business transactions. Individual users, organizations, industries, and even national economies will be impacted by these electronic decisions and transactions. This communications and commerce process fits nicely into the updated D&M IS Success Model and its six success dimensions. Table 2.2 shows how the six dimensions of the updated D&M IS Success Model can be used as a parsimonious framework to organize the various success metrics identified in the IS and e-commerce literature [14].

Table 2.2 E-commerce success metrics [14]

Systems quality	**Use**
Adaptability Availability Reliability Response time Usability	Nature of use Navigation patterns Number of site visits Number of transactions executed
Information quality	**User satisfaction**
Completeness Ease of understanding Personalization Relevance Security	Repeat purchases Repeat visits User surveys
Service Quality	**Net benefits**
Assurance Empathy Responsiveness	Cost savings Expanded markets Incremental additional sales Reduced search costs Time savings

2.5 E-Government

In the late 1990s, ICT introduced a new concept named "e-government" in public administrations. ICTs could help create a networked structure for interconnectivity, service delivery, efficiency and effectiveness, interactivity, decentralization, transparency and accountability. E-government has emerged as a popular catch phrase in public administration to cover all of these functions [22]. While still it is in early stages of development, a clear definition of e-government has come out. United Nations Division for Public Economics and Public Administration and the American Society for Public Administration defined e-government as "utilizing the internet and the world-wide-web for delivering government information and services to citizens" [23].

Brown and Brudney made a definition for e-government as use of web based application to enhance access to and efficiently deliver government information and services [22]. They categorize e-government efforts into three broad categories and Yıldız was added extra two categories in their list [22]. These categories, with their characteristics, definition, and examples are displayed in Table 2.3. According to the Table 2.3, it is possible to perceive the concept of e-government very differently depending on one's focus.

Table 2.3 Subcategories of e-government [22]

Parties of communication	Content	Dominant characteristics	Definition	Example
Governmnet - to - Government (G2G)	Government information and services	Communication, coordination, standardization of information and services	E-administration	Establishing and using a common data warehouse
Government - to- Citizens (G2C)		Communication, transparency, accountability, effectiveness, efficiency, standardization of information and services, productivity	E-government	Government organization Web Sites, e-mail communication between the citizens and government officials
Government - to- Business (G2B)		Communication, collaboration, commerce	E-government e-commerce e-collaborate	Posting government bids on the Web, e-procurement

				e-partnerships
Government - to- Civil Society Organizations (G2SC)		Communication, coordination, transparency, accountability	E-governance	Electronic communication and coordination efforts after a disaster
Citizens - to - Citizens (C2C)		Communication, coordination, transparency, accountability, grassroots organization	E-governance	Electronic discussion groups on civic issues

2.5.1 Models of e-government development

Yıldız was studied two e-government development models by its bulding stages in his "E-government researh: Reviewing the literature, limitations, and ways forward (2003)" paper [22]. The first model is Layne and Lee (2002) model. This model has four stages of development; first stage is cataloguing, providing government information by creating government agency Web sites. One-way communication between the government and the governed is possible in this stage. Second is transaction stage. Agencies can provide online transactions with government agencies. Two-way communication is possible in this stage. The third stage is the integration of government operations within functional areas in government. Government organizations working in the same area integrate their online operations. The last stage is horizontal integration stage. Different functional areas are integrated within the same electronic system and put to use through a central portal [22].

Second model of e-government development was introduced in a study conducted by the United Nations and the American Society for Public Administration (Un and ASPA 2002). This model has five development stages. The first stage is 'emerging' stage, official online government presence is established in this stage. Second 'enhance' stage, number of government sites increase and become more dynamic in this stage. Third one is 'interactive' stage, enables the users interact with officials and download forms through the web. The fourth stage is 'transactional' stage, online payment and transactions can be done by the users. The final stage is 'seamless' stage makes the integration of electronic services across government organizations possible [22].

Kunstelj and Vintar developed a model for monitoring the development of e-government focusing on evaluating integrated e-services [7]. Table 2.4 shows this model as environment maturity, back-offices, front-offices, impacts of e-services on government organizations and customers.

Table 2.4 A model for monitoring the development of e-government [7]

ENVIRONMENT MATURITY		
	GOVERNMENT	**CUSTOMER (CITIZENS & BUSINESSES)**
general	• adoption and use of information infrastructure • adoption and content of strategic documents • trust and security issues • knowledge and skills issues • motivation and barriers to implementing e-government • financing the development of e-government	• adoption and use of information infrastructure • opinions on strategic documents • trust and security issues • knowledge and skills issues • motivation and barriers to using e-government • digital divide issues
spec	• motivation and barriers to the development of integrated services	• motivation and barriers to the development of integrated services
BACK-OFFICE		
gen	• availability and use of information systems and databases • methods of cooperating within and between individual administrative bodies	
spec	• level to which a processes is carried out electronically • level of integration of processes within life-events • level of process standardization • the number of different employees and institutions involved in the execution of the processes and life-events • the number of processes within particular life-events	
FRONT OFFICE		
	SUPPLY	**DEMAND**
gen	• public administration's online presence • website characteristics and functionality • information content of websites	• use and quality of websites • use and quality of information content • needs, wants, demands, opinions
specifi	• amount and development level of e-services • amount and development level of integrated services • level of integration of services within life-events • level of services standardization • the number of services within particular life-event	• use and quality of e-services • demand for integrated services • use and quality of integrated services
IMPACT		
	GOVERNMENT	**CUSTOMERS**
gen	• cost, time, complexity performing processes and services	• time, convenience, simplicity, accuracy

Kunstelj and Vintar model shows that; cost and time are positive impacts of evaluation results of e-government applications for government organizations, and time, convenience, simplicity and accuracy are positive impact for citizens [7].

2.5.2 The e-government imperatives

ICTs enable "efficiency improvements" in mass processing tasks and public administration operations. Savings on data collection and transmission, provision of information and communication with customers can be generated by Internet based applications. Significant future efficiencies are likely to occur through greater sharing of data within and between governments [24].

E-government improves services

According to the users' view, Information and Communication Technologies (ICTs) have made it easier to integrate the services of individual agencies. Until then, this has been intensively concerned with Web-based information services, such as overall government portals and sub-portals focused on a particular subject or customer group. Such services require co-ordinated activity between individual agencies, with agreement on standards for metadata, for example. Integrated cross-agency transaction services are starting to emerge, and are under active consideration in many member countries [24].

The OECD 2003 study declares that improvement of government services is an objective of all e-government policy statements. According to this study, online service issues and online service targets can be evaluated as sole objectives of e-government [25]. In the same report, it is declared that, online service targets have also been effective in mobilizing public administrations to examine the potential of the Internet and related technologies by applying them to existing services [25].

OECD member countries' reform agendas include adopting customer focus developments as a core element. Successful services (both online and off line) are built on perspectives of user requirements. A customer focus approach declares that a system user should not have to understand complex government structures and relationships in order to interact with the government. The Internet can help to manage this goal, by giving possibilities to governments to appear as a unified organization and provide "seamless online service" [25]. As with all services, e-government services must be

developed in light of demand and user value, as part of an overall service channel strategy [25]. Development of e-government, particularly on the World Wide Web, has four characteristic stages [7].

1) Web Presence- publishing basic information;
2) Interaction- more information, search engines, saving and printing of forms, communicating with employees via e-mail, links to other websites;
3) Transaction – offering transaction ranging from the triggering of processes (which corresponds to a particular service) using electronic forms to full electronic implementation of services and corresponding processes, including the case handling, receipt of the final product, and electronic signatures and payment if required.
4) Transformation – the long term objective of e-government, allowing integrated services to be offered on the 'one-stop-shop' principle, may allow processes occurring without customer having to be involved, making administrative operations more transparent and improving customer satisfaction.

E-Government improves service quality

Lots of researchers have agreed with updated DeLone & McLean IS Success Model 2003 idea, mentioning the need for a service quality measure to be a part of IS success. Internet, forces to make huge developments to provide a cross-government customer focus, and OECD countries are working on initial developments that draw together information and services for specific customer groups [24]. Citizens in these countries use online services since they can follow policy changes that may affect them or specific community activities or proposals at local level and can manage routine transactions with government, such as payments [24].

Specific online initiatives adopted to improve customer focus include; development of online portals focused on particular topics or groups, which bring together information and transactions relating to that particular topic or group. Use of e-mail listings to provide information, for example released by national statistical agencies of new statistical information customized for specific groups of customers [25]. Measures that provide targeting within customer groupings, such as the ability to select

information by the size of business from a business portal, helps small businesses to find relevant information more readily, or access to information by geographical area [24].

In Turkey, the Central Population Management System (MERNIS) project transfers all the identification information of Turkish citizens to electronic environment. It aims information to be shared in a secure way. In the scope of this project, different numbers used by the public institutions, which represent the citizens, were made unique, and by this, usage of different numbers in different institutions ended (Turkish Identification Number). Not only this project makes public work faster, it also becomes a gateway key to the other electronic government projects [26].

Services allow individual identified users to access customized information and services. This could involve, for example, access to targeted information and capacity to submit taxation or other forms, to apply for assistance and to file compliance-returns online. Such services require some form of authentication related to the confidentiality and security requirements of the transaction involved [25].

E-Government helps achieve specific policy outcomes

Use of the Internet can help stakeholders to share information and ideas and thus assist to specific "policy outcomes". For example, online information can boost the use of an educational or training program; sharing of information in the health sector can improve resource use and patient care; and sharing of information between central and sub-national governments can facilitate environmental policies. However, sharing of information on users, will propose the privacy protection issues, and the potential trade-offs need to be carefully evaluated [24]. Because there can be considerable delays before benefits occur, timeframes for initiatives need to be realistic.

E-Government can contribute to economic policy objectives

E-government help to reduce corruption, greater openness and trust in government contributes to "economic policy objectives"[25]. Specific impacts include the reduced government call on funds through more effective programs, and efficiencies and improvements in business productivity (through ICT enabled administrative simplification and enhanced government information). With the opportunity of the reach and influence given by government, e-government initiatives act to promote Information Society and e-commerce objectives. Government consumption of ICT products and

services can also support local ICT industries. However, impacts in these areas are difficult to measure [25].

E-Government can be a major contributor to reform

All OECD governments are facing the issue of public management modernization and reform. Developments – globalization, new financial requirements, changing societies and increasing customer expectations – mean that the "reform process must be continuous" [25]. ICTs have constructed reforms in many areas, for example by improving transparency, facilitating information sharing and highlighting internal inconsistencies.

Reform agendas and e-government strategies of OECD countries cover the adoption of a customer focus, with the specific objective of providing citizens and businesses with a coherent interface with government, which reflects their needs, rather than the structure of the government [25]. This customer focus is a part of broader public management reform, and it speeds up the generalized use of the Internet as a service delivery mechanism. There is an attempt to bring together information and services from different governmental organizations, like one-stop offices, advice bureaus, whole of government telephone call centers and services such as information kiosks [25].

E-Government can help build trust between government and citizens

Building trust between government and citizens is fundamental to good governance. "ICT can help build trust" by enabling citizen engagement in the policy process, promoting open and responsible government and helping to prevent corruption. Additionally, if limits and challenges are properly overcome, e-government can help an individual's voice to be heard in the mass debate. This can be done by harnessing ICT to encourage citizens to think constructively about public issues, applying technology in the policy process and adopting policies on information quality and responsibility. Integration with offline tools is required, and few expect e-government arrangements to completely replace traditional methods of information provision, consultation and public participation in the foreseeable future [9].

Cohen analyzed the citizen's satisfaction on online government contacts [9]. His study results show that citizens' satisfaction, which is related about time, is listed below;

- 87,1% over less time than expected.

- 85,9% about the time expected
- 57,2% more time than expected.

These results are guides for us to understand that e-government applications save time and shorten the information collection process of government organizations. Citizens' satisfaction issue scores over time is high enough for the success.

From the literature review we understand that organizations always need updated and reliable information to generate judgments, make decisions, solve problems and give quality services to their customers, which are the citizens. Because of the importance of the reliable, up to date, available, usable information for the organizations, information, needs to be managed with professional methods parallel with the new ICT developments. Also technological developments like internet, e-mail applications, mobile phones, and digital televisions etc. force the organizations to change their bureaucratic operations with new methodologies. To achieve these organizational needs, e-government is the current available platform for the public organizations.

2.5.3 Limitations of e-government concept

Yıldız has together the limitations of e-government concept in four ways [22]. The first limitation is still no standard definition of the e-government concept. Hence many definitions of e-government are rather loose and gloss over the multiple meanings e-government might have depending on the specific context, regulatory environment, dominance of a group of actors in a given situation, different priorities in government strategies [22].

Second, e- government is a concept that means a lot of different things to a lot of different groups. For example some researchers identify different parts of e-government as e-service delivery, e-democracy, and e-governance. Hence, technology changes rapidly, there are many alternatives to define these relationships under subtitles like accountability, transparency, interactivity, participation, cost effectiveness etc [22].

Third, e-government contains much high and promotional efforts/literature as well, similar to the concept of "knowledge management" or "management by objectives" [22].

The last one is how great amount of change is required for a government organization project to be named as e- government project. Is there any interaction required? In section 2.5.1 of this study answers these questions with the stages of e-government development [22].

Literature review part of this study shows the general and specific impacts of e-government applications on the organizations and citizens. E-government applications' main effects on organizations are cost and time savings in bureaucratic operations. E-governments positive effects for the citizens are time saving, convenience, simplicity and accuracy, which are achieved by improving the service quality taken from government. Literature review shows that SERVQUAL method is the most popular and reliable method to measure IS service quality and this method is selected to measure both present system and new PIP system success in this study.

During the literature review, there are not too many studies about the impacts of e-government applications in the public organizations by means of duration, service quality and error correction.

CHAPTER 3

RESEARCH PROCEDURE

This chapter summarizes the research procedure for this study. This is a descriptive case study, which aims to analyze service quality, error correction and duration changes when a personnel management system moves to e-government environment. *Our organization* uses many local personnel affair services that are not connected with each other. Local databases store their own personnel information. Storage of all staff information is done with a central database in the current system. Central database is constructed to collect, retrieve, process, store and distribute information to support decision making, coordination, control, analysis and visualization. It is placed only in the Headquarter Personnel Department offices. However, the sub-units also need the same information according to the sub-units' requirements. Accordingly, a web-based personnel information portal (PIP) was developed to give service for these needs. During this process, we have measured the new system's success by taking a pool, collecting data and analyzing user satisfaction. Accordingly our main research question is formed as below. There are not enough studies at the literature, which shows the differences between such kinds of two different data manipulation systems, by means of duration, system quality and error correction.

3.1 Research Question

What will change by means of duration, service quality, and error correction when a personal management system moves to an e-government environment?

In this report new PIP system refers to the newly developed personnel information portal, which is an e-government implementation. Present system refers to existing personnel management system that was developed just to respond to the needs of the headquarter personnel department offices.

To find the answers to our research question, and the bureaucratic differences, gains of the new PIP, we have analyzed duration, service quality, and error correction as described below.

3.2 Duration of the new PIP processes and Present System

In the present system, headquarter personnel department uses optical forms and hard-copy documents (Personnel Information Form - PIF) to collect the personnel information, which takes some time and work force to manipulate documental information to the central database. With the new portal, every staff will be able to update his/her own information. Accordingly, central database data manipulation and data processes will be changed. There are some necessities of data collection with optical forms, which are defined with a queue order that has to be done one after the other. Also using the PIF documents for data collection takes a serious time and manpower. In this study, we will measure the duration and manpower of both data collection methods.

As mentioned before, with the activation of new PIP, bureaucratic operations and data collection processes will be changed. Changing the habits of members would be hard, however, a user-friendly web application facilitates the duration of user adaptations to the new PIP. In this study, the durations of the same data collection processes done by means of PIP and optical forms or PIF documents will be compared. With the activation of the new portal, data collection will start automatically. Measuring the updated or inserted record count over the PIP will show the duration of reaching the last fresh information. Comparison of both data collection methods will show the gains of organization and it would be the interior of development of the new e-government applications.

Development of PIP has to be controlled over the managers' wishes and organization needs. During these developments the service quality has to be measured

day by day and new necessities have to be determined over the results of the service quality.

On this study, data collection period about present system started at October 2006 and has ended at June 2007. The amount of insert, update and delete operations on database records, which is related by personnel information (marriage, child, address, new person, appointment requests) was measured daily and monthly for this period. Additionally; the manpower spent by the staff, which are responsible to manipulate *organization* members records, collected by PIF documents, was measured daily and monthly. Also the manipulation time and manpower to collect data from optical forms, which is used to collect appointment request of the staff, was measured daily and monthly in terms of cost and time. Error counts of PIF and optical forms were taken into account in this period. Between March 2007 and June 2007, with the activation of PIP services data collection cycle was started for the new system. The amount of web based insert, update, delete operations on database records and errors which is performed by the information owner herself/himself was measured daily and monthly for this period and also the time spent by the users is measured for the same intervals.

3.3 Measuring PIP Service Quality

As discussed in the literature review section of this study, there are so many different "definitions" as to what is meant by service quality. One of the aims of this study involves the use of SERVQUAL instrument in order to ascertain users' perception of service quality of both the new system and current systems. In the SERVQUAL instrument, 22 statements (Appendix A and Appendix B) measures the performance across tangibles, reliability, responsiveness, assurance and empathy dimensions, using a seven point likert scale measuring both user expectations and perceptions. These five SERVQUAL dimensions are used to measure the gap between users' expectations for excellence and their perception of actual service delivered. Statements of Appendix A and Appendix B were divided into five groups to measure the dimensions of SERVQUAL, these groups and their mappings are listed below;

- Statement 1-4 → Tangibles,
- Statement 5-9 → Reliability,

- Statement 10-13 → Responsiveness,
- Statement 14-17 → Assurance,
- Statement 18-22 → Empathy

In this study, the original SERVQUAL questionnaire is adopted to Turkish as shown in Appendix A.

Appendix A used to measure the new system service quality. Appendix B also used to measure current service quality. Both of them include the same questions. The measurement procedures are listed below.

1. We computed the gap for each statement pair for each user.

SERVQUAL score = Perceptions score – Expectations score

2. We computed the dimensions scores for each respondent by averaging the gap score over the relevant number of statements (either 4 or 5 statements)

3. We derived SERVQUAL respondent's scores by following Un-weighted scored sum the scores for the 5 dimensions and divide by 5.

- Weighted scores
- Tangibles (Tangibles weight/100)
- Reliability (Reliability weight/100)
- Responsiveness (Responsiveness weight/100)
- Assurance (Assurance weight/100)
- Empathy (Empathy weight/100)

4. We derived total SERVQUAL scores by summing the scores and dividing by the number of respondents.

Appendix A and Appendix B research questionnaire was applied to 39 HPD office staff who have been used both the PIP and present systems. They are all male and their age is between 24 and 43 with at least an educational level of vocational school and university.

3.4 Error Correction

After duration and service quality analysis of the PIP and present systems, the data reliability of the present system and new PIP are also analyzed. Collection of the data with the optical forms causes many errors during data manipulation process. Error handling also takes a lot of time in the organization. The error types and information faults of the current system are measured by collection of data with the optical forms and PIF documents. The new system's failures over the records are also measured. By comparing both results we expect to better understand the improvement in the error correction processes.

Optical form errors were detected over 17,000 pieces of forms during scanning process, which takes one month. Additionally; HPD staff's errors during handling the PIF documents between October 2006 and June 2007 was measured.

The goal of the comparison of the present system and the new PIP is to show the gains of what will change when a personal management system moved to an e-government environment?

3.5 Researcher's Role

Researcher role was separated in two parts, first is the role on the present system and second is the role on the new PIP development.

Present system database administration such as creation of database functions, procedures, tables, indexes, foreign-keys, primary-keys, check constraints, database table triggers, table grants, user roles, views, synonyms was created by the researcher. In the present system identification records, family records, appreciation and punishment records, medical records, post official work records, appointment questionnaire records and address & communication records were manipulated by Oracle Forms and Reports applications and all these applications have developed by the researcher.

Optical forms are scanned by the optical mark reader (OMR). Also OMR uses a software application and researcher developed the application according to optical form structure using this software. Scan results of optical forms is generated by OMR as text

file. Optical forms data manipulation steps also use Oracle Forms applications and the researcher developed these applications.

In PIP development group, researcher has two important roles;

Researcher have played database administrator role, PIP' database tables, database triggers, new database functions & procedures, database views were developed by the researcher. Structural design of PIP's workflow, user roles, user grants and design of present system adaptation to new database structure were settled by the researcher.

Another important role of the researcher is web-pages development role. Database query statements (SQL statements), HTML and ASP codes of web pages of PIP has been coded by the researcher. New applications forced the back-offices to be reconstructed and researcher has worked on the solutions for this subject with the managers.

CHAPTER 4

HPD PERSONNEL INFORMATION MANAGEMENT SYSTEMS

4.1 Present System

Headquarters Personnel Department (HPD) uses the personnel information records, for career planning and matters pertaining to their own personnel. It is clear that information creation, acquisition, storage, analysis and use supports the growth of an intelligent organization. HPD offices also store, analyze, process, and use, the personnel information for organization necessity and especially information distribution for the other departments of *our government organization* and other government organizations requests. It is very important to serve qualified services to the other *organization* departments.

There are four groups of people in the *government organization,* which is used in this study. HPD divided into four independent offices, according to employee's type. These are;

- Staff type1 office,
- Staff type2 office,
- Staff type3 office,
- Staff type4 office.

Main groups of information is currently used for data processing are listed below.

- Identification records,

- Family records (wife/husband, children),
- Appreciation & punishment records,
- Medical records,
- Past official work records,
- Appointment questionnaire records,
- Address records.

Mobile platforms and sub-units have to store the same information as staff's personnel affairs records. Some sub-units use a computerized database, others store the same information using the personnel information form (PIF) documents in their folders. There are many separate local databases for personnel information storage in the mobile platforms and sub-units. Also personnel information of every staff on *our organization* has to be stored in the central database of HPD, which was located in Ankara. There is no link between local databases and central database. Figure 4.1 shows the local databases of *organization* sub-units. Local and central databases have to be managed by at least one staff and also records have to be kept properly correct and present.

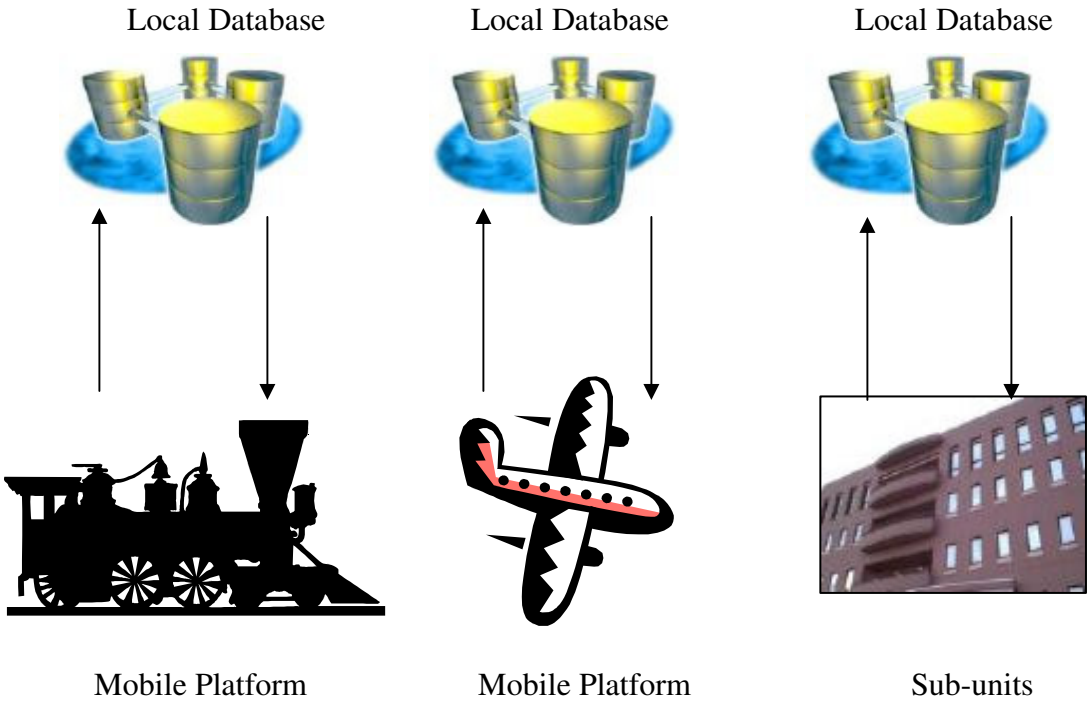


Figure 4.1 Local personnel databases.

Staffs have several appointments during their work periods. These appointments are planned and declared by the HPD. HPD uses personnel records for future planning and personnel affairs. If a staff has an appointment, when he/she would join the new mobile platform or new sub-unit, he/she would have to arrange a PIF document. Local databases are kept properly with this PIF documents. For every appointment the same process for all local databases should be repeated. *Our organization* has many mobile platforms and sub-units, approximately 25000 members of the *organization* are exposed to arrange a PIF document.

While having the same data collection method using PIF documents, local personnel databases generally have the same infrastructure. These databases store the main information about the staff's name, surname, rank, age, birthday, birthplace, occupation, specialization, picture, etc. Also wife/husband, children, address, phone number, email records are accommodated in these databases.

If any of the staff's information is needed by the administrators, then these databases are used for query. HDP is also responsible to store and serve the other departments' personnel information needs.

Oracle 9i Database is used for data processing of HPD. There are many applications designed and developed by Oracle Forms & Reports tools to collect, store, analyze and processes the personnel information of the *organization*.

Central database is divided into four private schemas for the usage of each HPD offices. Database administration role was given staff type 1 office, which is a part of the HPD offices. Each schema has the same characteristic, database table names, database views, indexes, and constraints that have almost the same structure (%90). HPD offices operators are responsible to keep the records present, correct and reliable.

Information technology can raise the efficiency and reliability of the organization's operational activities. In the existing system, there is no web-based application to collect and share personnel information with sub-units. There are some procedures followed during collection and modification of personnel information. Information collection methods are clarified in next sections.

4.1.1 Personnel Department Information Collection Methods

Two types of data collection methods are used to prepare the personnel records. First; collection with optical forms, second; usage of hard copy form, named as Personal Information Form (PIF). Next section describes the methods of data processing of *organization* sub-units and HPD offices.

4.1.1.1 Data Collection Method with Optical Forms

Data collection by using optical forms needs specific hardware and software infrastructures. Hardware infrastructure is;

- The optical mark reader (NCS 7000),
- One PC with at least Windows 3.1x systems,

Software infrastructure is;

- Scan Tools software (Figure 4.2), to design the optical forms,
- An Oracle Forms application for data (that was generated by the scanner) processing.

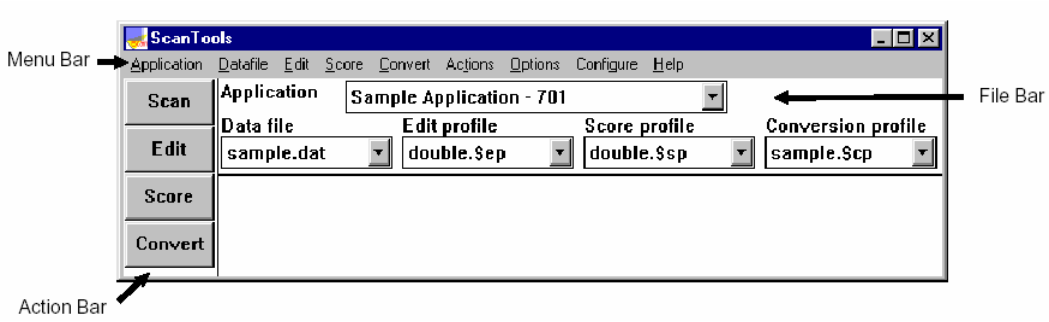


Figure 4.2 Optical form design software (Scan Tools) [27]

The Optical Mark Reader

The Optical Mark Reader (OMR) is a device, which reads pencil marks on optical forms. Optical forms are designed for collection of data, which cannot be collected by online systems. Optical form was designed to collect staff's appointment requests. Optical forms read by the scanner are checked, and the results are saved to a file. This data file can be converted into an output file of several different formats, depending on

the desired type of output. The OMR compatible scan form is the blue scan form as seen in Figure.4.3.

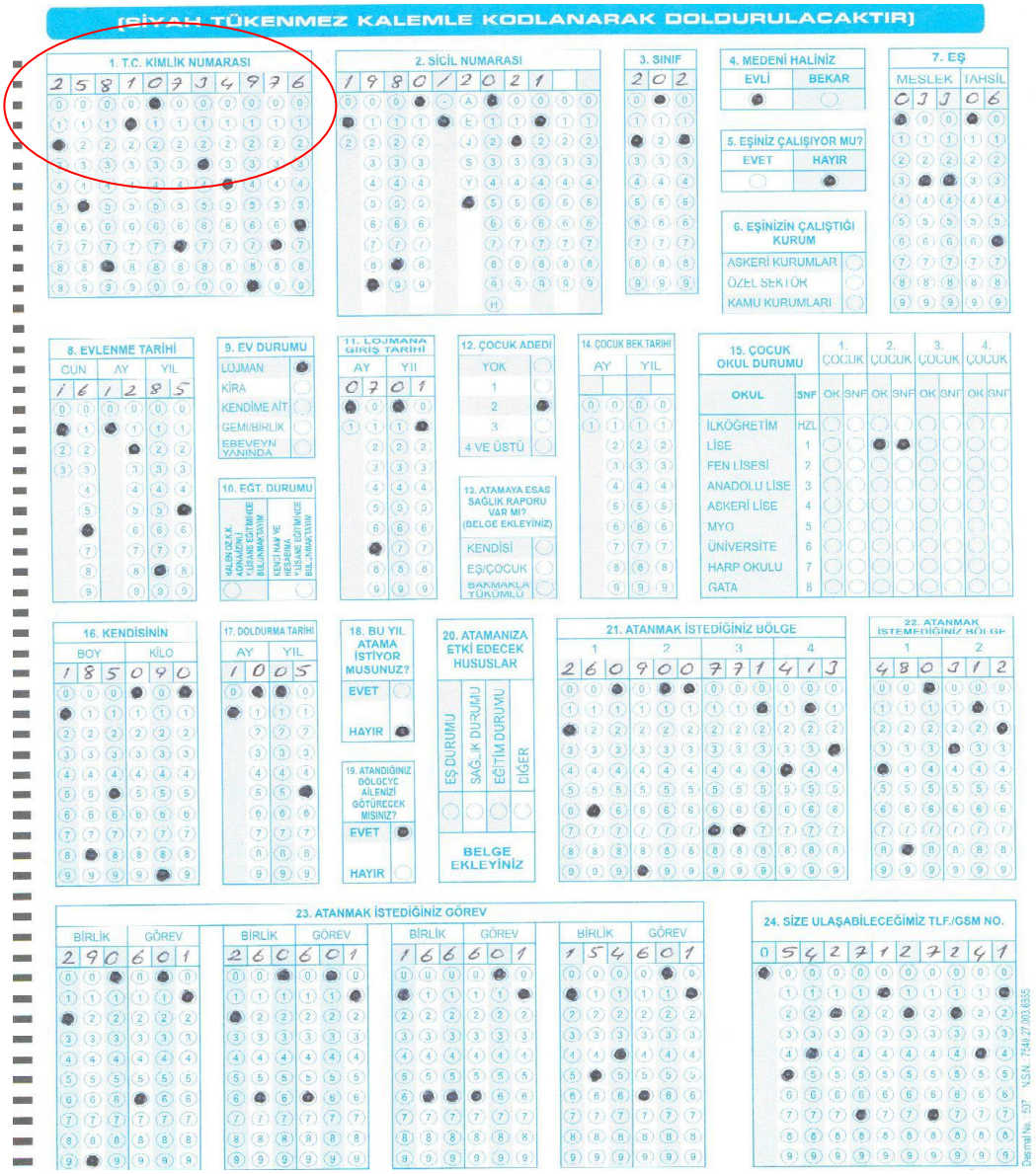
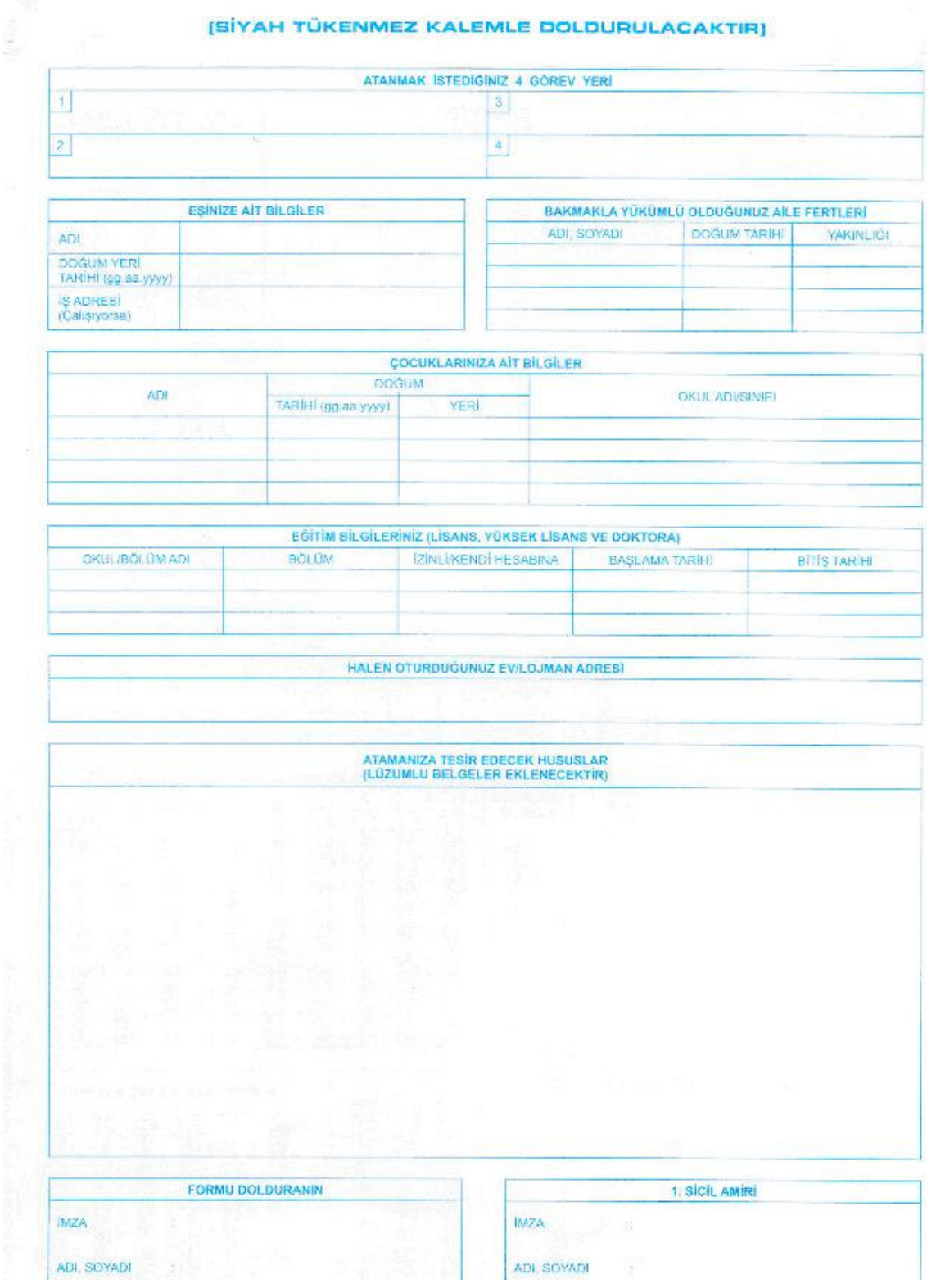


Figure 4.3a Optical form front side



[SİYAH TÜKENMEZ KALEMLE DOLDURULACAKTIR]

ATANMAK İSTEDİĞİNİZ 4 GÖREV YERİ

1 | 3

2 | 4

EŞİNİZE AİT BİLGİLER

ADI	
DOĞUM YERİ TARİHİ (gg.aa.yyyy)	
İŞ ADRESİ (Çalışıyorsa)	

BAKMAKLA YÜKÜMLÜ OLDUĞUNUZ AİLE FERTLERİ

ADI, SOYADI	DOĞUM TARİHİ	YAKINLIĞI

ÇOCUKLARINIZA AİT BİLGİLER

ADI	DOĞUM		OKUL ADI/SINIFI
	TARİHİ (gg.aa.yyyy)	YERİ	

EĞİTİM BİLGİLERİNİZ (LİSANS, YÜKSEK LİSANS VE DOKTORA)

OKUL/BÖLÜM ADI	BÖLÜM	İZİNLİ/KENDİ HESABINA	BAŞLAMA TARİHİ	BİTİŞ TARİHİ

HALEN OTURDUĞUNUZ EV/LOJMAN ADRESİ

ATAMANIZA TESİR EDECEK HUSUSLAR
(LÜZUMLU BELGELER EKLENECEKTİR)

FORMU DOLDURANIN

İMZA :

ADI, SOYADI :

1. SİCİL AMİRİ

İMZA :

ADI, SOYADI :

Figure 4.3b Optical form back side

There are a few things that should be known about the Optical Mark Reader that will help to understand how to scan the forms. Figure 4.4 is a guide for the terms when you come across terms referring to the parts of the scanner.

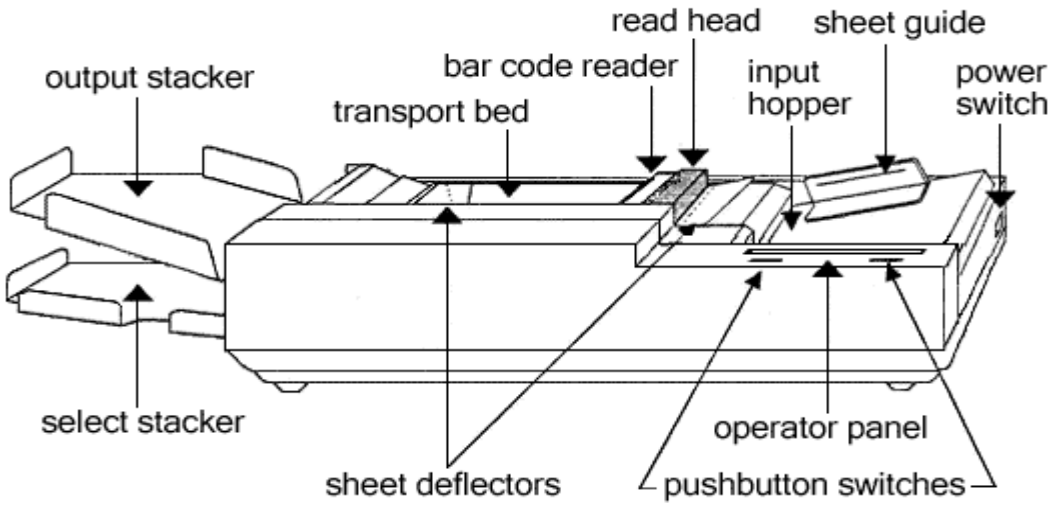


Figure 4.4 The Optical Mark Reader (OMR) [27]

The input hopper holds the optical forms to be scanned. The sheet guide is used to keep forms aligned in the hopper. This is important, as forms not properly aligned will become jammed in the scanner. Actual scanning occurs on the Transport Bed. Once a form is scanned it comes to rest in the Output Stacker. The Operator Panel displays the scanner status and any error messages. If the scanner stops scanning in the middle of reading period, check the Operator Panel for information. If the marks on the appointment form are not identified by the read head then a star (*) sign is put for that mark point. Figure 4.5 shows example of scanned data.

```
506000001001120710001    432 #000 1    150679062401987 221173211E H      020890B     C     0803
506000002001120710001    432 #000 1    146001801781987/21143 211E H 33*6 150289CA    c     310402
506000003001120710001    432 #000 1    224835404461987/21137 211E H 03304180694A 0902B     05
506000004001120710001    432 #000 1    122693002721987/A21177211E H   *07220491D     C     0803
506000005001120710001    432 #000 1    151939237221986/21141 211E H 03306270890AA0804C     0108
506000006001120710001    432 #000 1    286609110921986/21144 211E H   * 1260589CB  9 C   * 3108
506000007001120710001    432 #000 1    184666619181986/211450211E EC  9 9260890B   9 C   * 3101
```

Figure 4.5 Example of scanned data

Forms are scanned to a text file, which contains the raw data collected from the scanner. OMR uses Scan Tools software for scanning process.

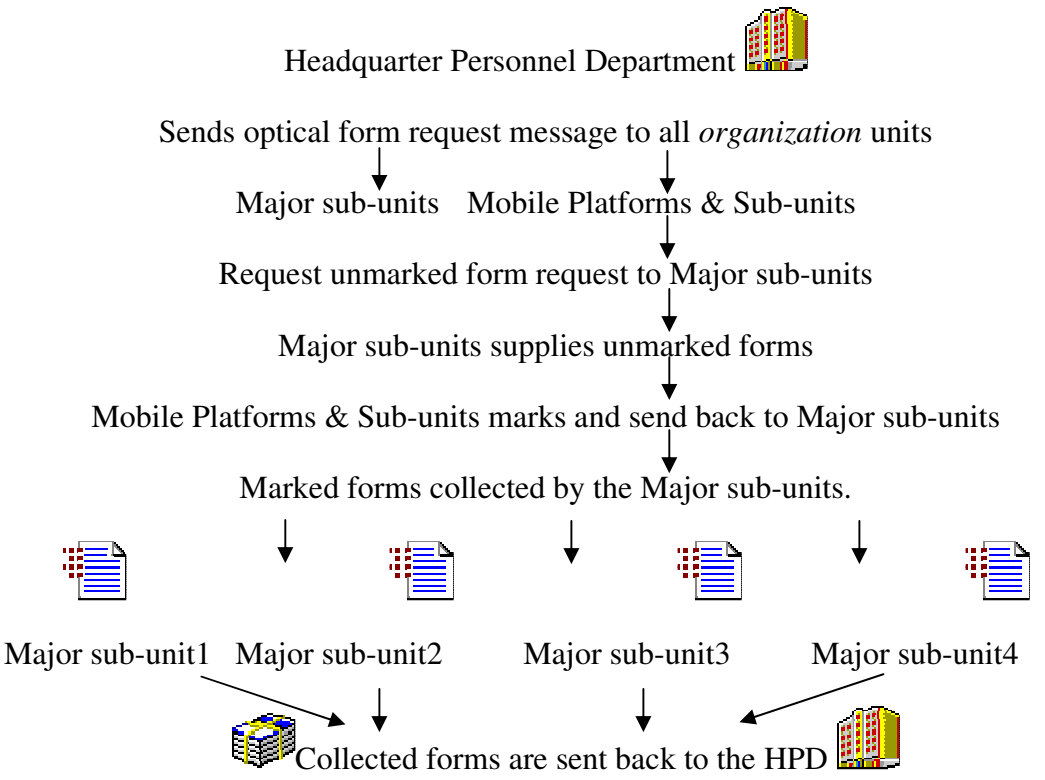
Appointment Request Collection Process

Every year *our organization* collects the requests of the staff to see if they want to be commissioned to a new office or keep up their work position. During, the collection of appointment requests some processes have to be done. These processes are defined below.

Optical Form Request & Collection Process:

Headquarter personal department sends optical form request messages to the staff of the organization units with expiration period from September until November. With this request, major sub-units supply the optical forms, as shown in Figure-4 to the sub-units & mobile platforms, which are located in different cities. Staff of sub-units and mobile platforms requests these forms from major sub-units among their needs plus 5% for wrong marking, and unexpected damages.

Major sub-units collect the optical forms to send back to the *organization* headquarter personal department. This traffic is very high. For example, 18,000 optical forms are sent to the Personal Department in two months.



Optical Form Scanning Process**:**

Optical scan process begins after optical form request and collection process is completed. Two employees are commissioned to the scanning process as an operator. Process steps are defined below.

a. Separation of forms with attachments: Some optical forms have an attachment document that is related with health, education, wife/husband job records. These documents are necessary for notification for appointment plan of the staff. Operators separate the attachments of the forms and staples the attachment to the same forms after scan process is completed.

b. Separation of damaged forms: Approximately 2% of the collected forms is damaged because of they were torn for some other reasons. So OMR cannot be able to scan these forms. Operators separate these forms for manual insertion in the data manipulation process.

c. Scanning of forms: After separation of the problematic forms, the others takes one week (5 work days) to complete the scanning process. Tools software generates a text file during the scanning process Tools data files can be converted into some other formats as well.

From dots to data; Figure 4.6 shows the flow of data in a Scan Tools OMR system.

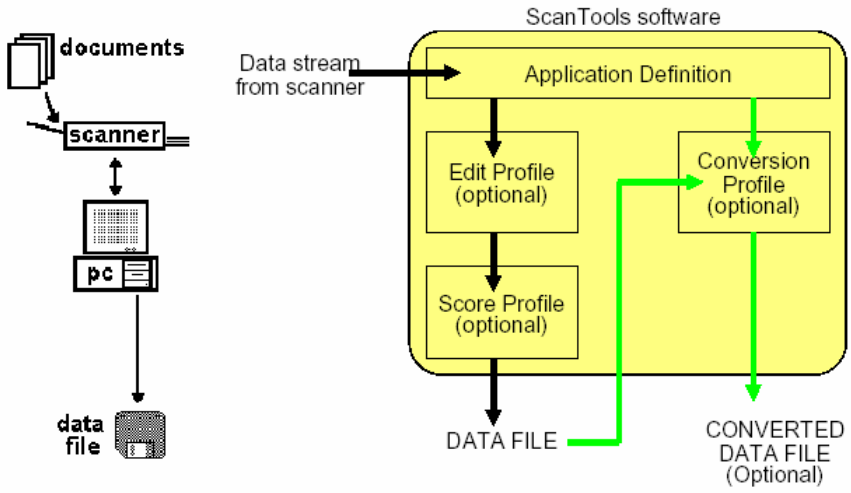


Figure 4.6 Flow chart of optical form data collection methodology [27]

Data Manipulation & Error Handling Process:

First step is insertion of the text file to a temporary database table. As shown in Figure 4.7 an Oracle Forms application is used for this. This application fills the temporary database table for the second step.

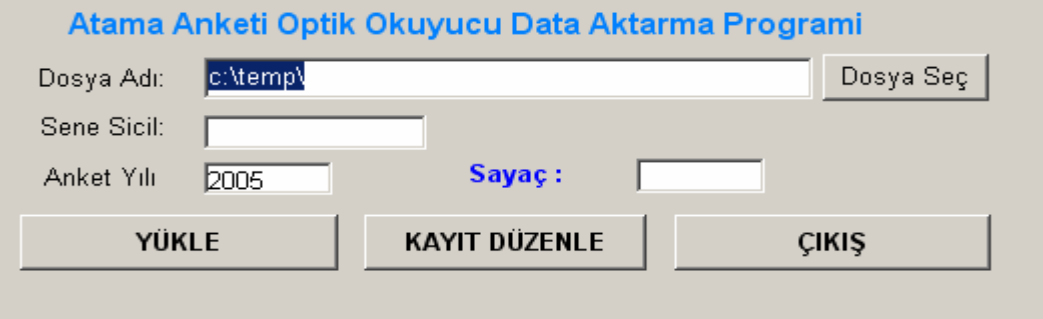


Figure 4.7 Data insertion

Second step is the error handling mechanism. Personal Department members use another Oracle Form application as shown in Figure 4.8. Star in a row filed shows an error. Correction of stored data can only be made by comparison between the marked optical form data and error handling program data that was generated by the OMR. This operation needs much care. Therefore, to prevent operator errors, it is advised to take a short break at every hour. A lot of effort and time is needed to manipulate the form check. Eight operators have been assigned to this process also the routine works have to be done by the same operators.

It is very important to handle the optical forms as soon as possible because the information that was collected by the forms is used for future planning of the staff. So operators prefer to check without taking a break and this causes errors to happen during the data manipulation. After data of a staff was corrected then it is transferred to the original place in the database.

Backside of the optical form (in Figure 4.3b) also includes education knowledge, wife/husband, father/mother/child information and explanations about appointment limitations, and also chief of the owner of the form. If database does not contain the optical form backside information than operators have to manually update or insert these

information to appropriate filed of the database. In that case for all of the staff's optical forms have to be manipulated one by one.

If the optical form has an attachment, the attached documents have to be manipulated manually. Health, marriage, education, and occupation documents are attached to the optical forms. So this information has a manipulation period.

Third step is damaged forms data manipulation: The separated forms which were collected in Data Scanning Process period have to be manually inserted to the original location of the database by using the application in Figure 4.9. Manual insertion of one form takes four minutes. Every year 2% of the forms are damaged. This means, 360 forms have to be inserted to the database manually. This process also takes effort and time. Completion of data manipulation and error handling of all the forms takes one month.

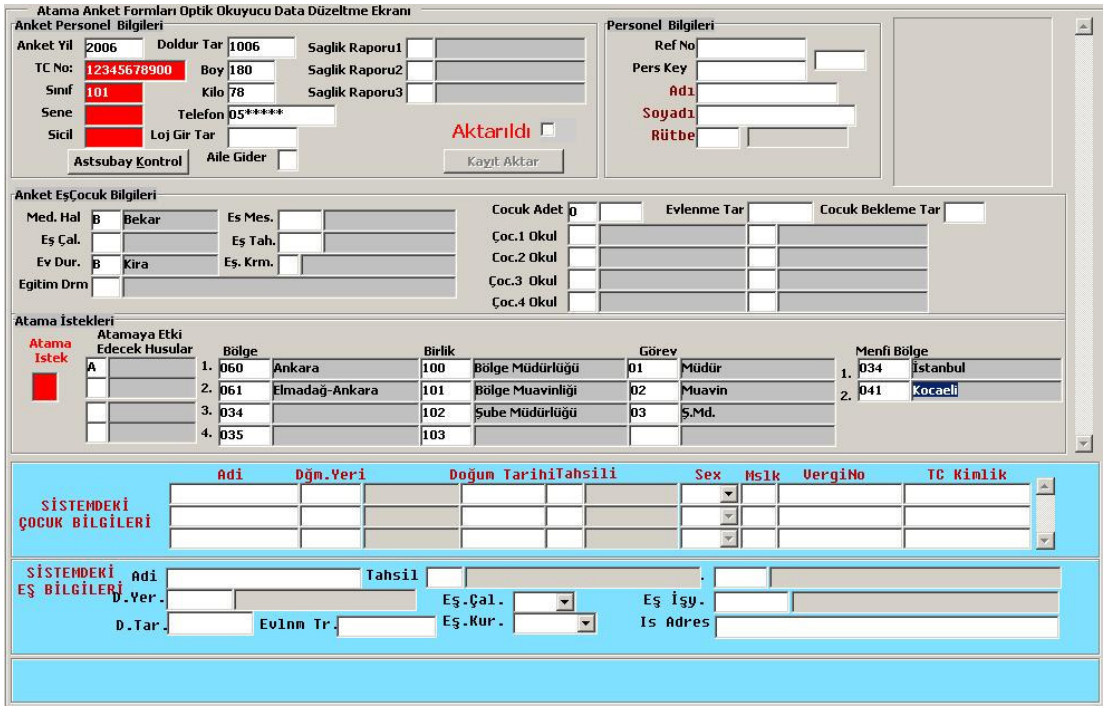


Figure 4.8 Error handling application

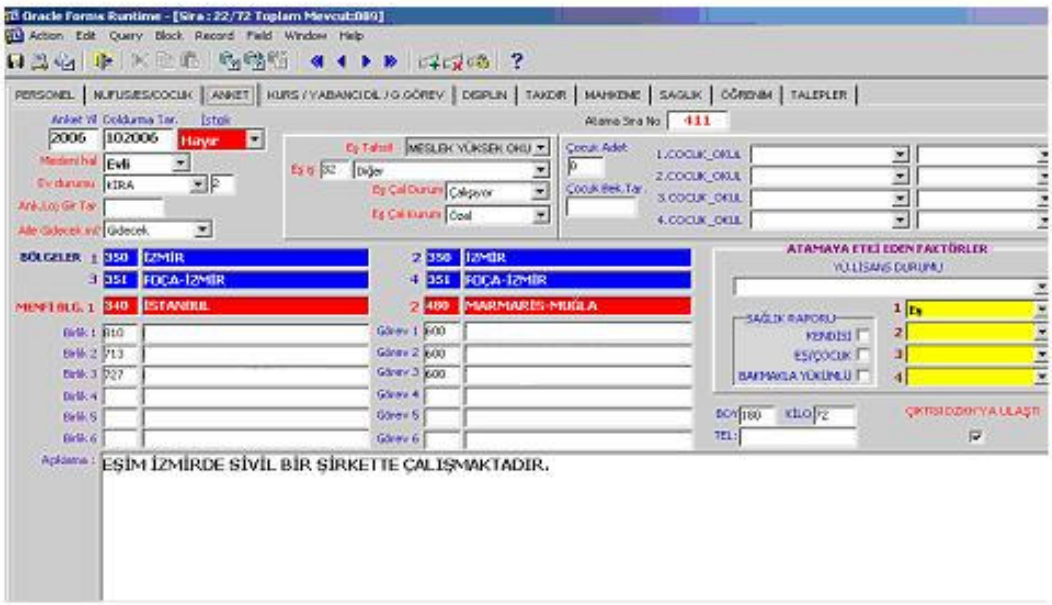


Figure 4.9 Appointment requests application

Optical Form Storage Process:

After collection, scan and manipulation processes of the optical forms are finished, than storage process begins. Optical forms are used for future planning of the staffs. Every staff has a personal folder for judicial correspondence reports. Optical forms have to be saved in their personal folder for judicial procedures. Putting inside the folder process (storage) takes four weeks. Only two employees have to deal with this process.

4.1.1.2 Data Collection Method with Printed Documents

The second data collection method uses a form as shown in Figure 4.10 that is named Personal Information Form (PIF). PIF contains limited information of the personal, his/her wife/husband, children, address and identification information. If the information which is collected by PIF, especially the address, marital status or children information, wife/husband job information of a staff was changed than he/she must organize a new PIF and has to send the updated information to the Headquarter Personal Department.

Figure 4.10 Personal Information Form (PIF)

Collections of data by using PIFs need another manipulation process. Personal department staff manipulates the forms manually. Operators need to pick the updated data from the new PIFs. All the necessity of data manipulation is shown in data flow chart in Figure 4.11

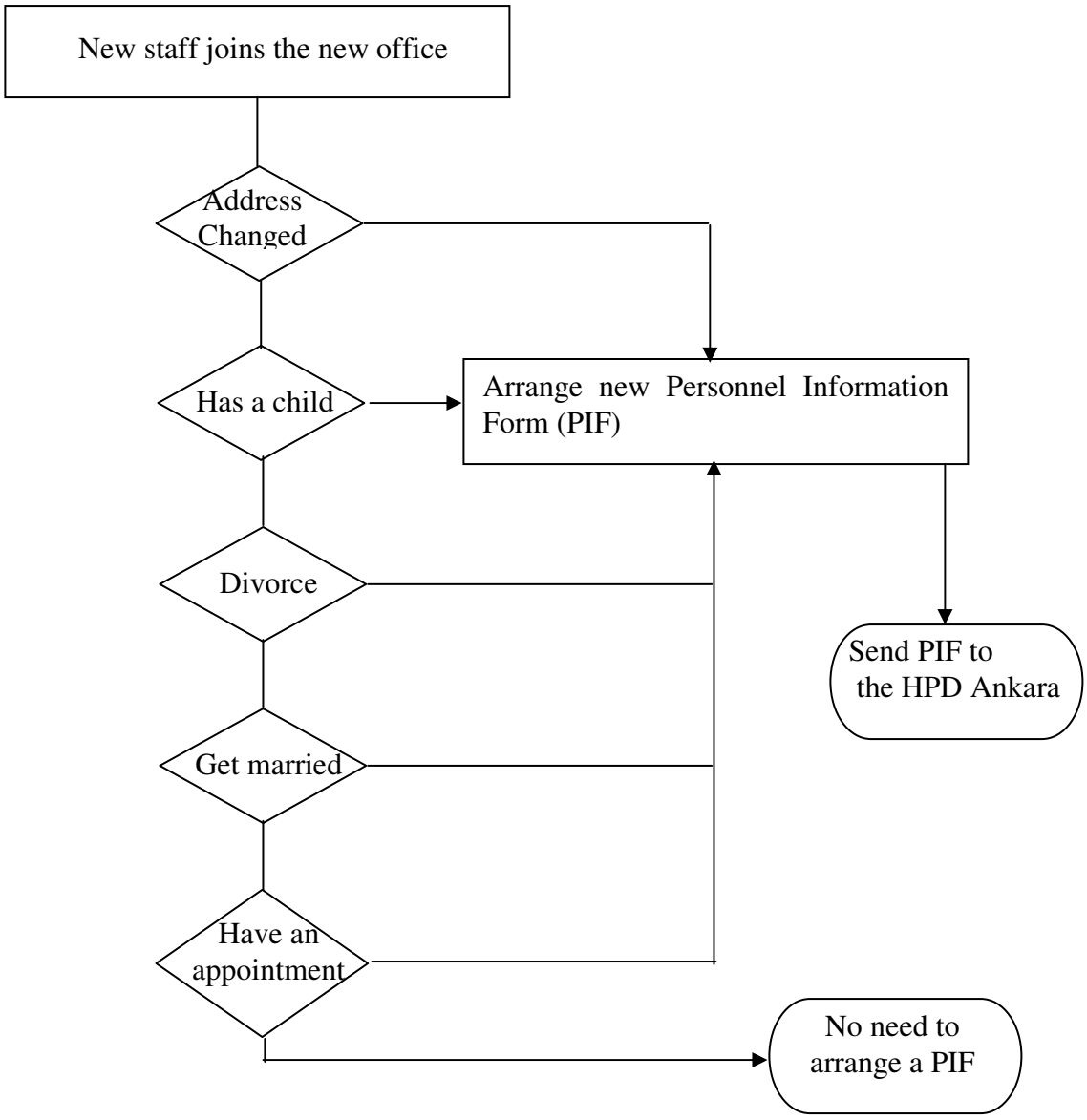


Figure 4.11 PIF Data flow chart

4.1.2 Problems of Present System

Even if the requested information of another office member is basic, there is no permission to reach other personnel records between offices. For example, if one office needs work place information about a member who is out of scope, there is no online infrastructure for this request. To get the requested information, operators need a phone call communication or face-to-face communication between sections (Staff Type1 section, Staff Type2 section, Staff Type3 section, Staff Type4 section).

When information request deals with all type of personnel then all four sections have to prepare the requested information. After the graduation, staff cannot keep abreast of the other staff's work place. They try to contact each other by phone calls. People wonder who works where? Collection of information with PIF documents and optical forms cause the following problems:

- repetition of the same information,
- incompatibility between local and central database records,
- information reliability problems,
- time lose,
- cost lose.

There is no online personnel information share infrastructure between the neighboring organizations. When sub-units need information about a staff out of their scopes, they request this information from the HPD offices with a hard copy document, but response would not be just in time because of the bureaucracy. Staffs use agendas for their primary information needs, like Turkish Identification numbers or tax numbers, education records, past official work records, etc. There is no online service to serve this information to staff's him/her.

4.1.3 Concluding Remarks of Present System

Whether data collection with the optical forms takes four months so we have to consider collection of data with optical forms is effective or not. Also we have to consider the cost of the processes that was explained from appointment request process to storage process of the forms. These processes present an overview picture of personnel information system (IS) enterprise cycle.

Collection of appointment request with optical form started in 1998. During the last two decides *our organization* spent a budget to get huge intra-net. In 2004 60% of the mobile platforms have an intra-net network system. Last year this percentage reach to 95%. Nowadays o*ur organization* has a large intra-net network system that contains mobile platforms and all sub units. With this opportunity, we have to use intra-net more

productive and we have to search for cheaper solutions to reach the information by using optical forms. Also we have to reach better information system service quality and user satisfactory points. Approximately 60% staffs are commissioned to the mobile platforms.

A powerful way of managing information variety is to require as many organization members as possible in the collection of information; in effect, creating an organization-wide information collection network. People, will always provide the most valuable information, rather than printed sources or electronic databases [2].

Concerning ePublic services, an architecture, which distinguishes front offices from back offices, paves the way for a situation, which could be likened to a "service retail trade". Before online services entered the stage, we acted as if we had to go to the farm to buy eggs or to the mill to buy flour, instead of considering grocery stores or supermarkets – these times are now over. While internet-enabled online connections with citizens have opened the way for this new situation, it is important to note that online access will not remain the only modern way of delivering Public eServices. Physical neighborhood "service retail shops" can be set up to make services easily available. Assisted service will profit from e-government opportunities in the same way as self-service online possibilities. Front offices may materialize as inter-net portals, as call centers with internal IT support, or as physical one-stop-shops, equally with internal IT support. From these front offices, typically several back offices can be addressed. In the case of a fully fledged "single-window" access, the back offices of all public administrations and possibly also of non-profit organizations and commercial service providers could be accessed from any front office.

A new architecture of public service delivery is emerging. Front offices (internet portals, call centers, neighborhood service shops) come closer to citizens and enterprises, while back offices can be located anywhere. Service production and service delivery are split in location, but linked via networks [28].

We have to change old-fashioned personnel information collection processes with modern technological online applications.

4.2 New Personnel Information Portal (PIP)

4.2.1 Evaluating and Creating a PIP as an E-Government Environment

According to Huber, information distribution is the process by which the organization disseminates and shares information from different sources. He reports that "A vast distribution of information can come to the conclusion as many positive consequences: Organizational learning becomes more broadly based and more frequent; retrieval of information becomes more likely; and new information can be created by piecing together separated items" [2].

In our new web based Personnel Information Portal (PIP) model, information share and distribution is an unavoidable precondition of perception and interpretation. The dissemination or routing of information distribution is, in the first instance, according to that famous credo, "the right information to the right person in the right time, place, and format" [2].

4.2.2 What can we do for Effective PIP

There are some fundamental rules to design an effective web page. These are listed below;

Content: Usable information should be put forward to the user.

Reliability: Page must work all the time and information always has to be correct.

Easy of Use: Obtaining the information must be easy and easy to read.

Attractiveness: Page colors and type styles must be effective.

4.2.3 Key Points of Evaluating a Government Web Portal

a. We have to know our objective: No need to design a web page if it will not solve a specific problem. Web sites provide information for the visitor. Some questions to ask may include,

1) Is there a new project that member of organization must know about?
2) Are there any changes in government policy regarding employee benefits?

3) Remember, e-government can be used to increase communication within government as well as between its citizens and government organization.

b. We have to know our audience:

1) Who will surf our web site?

2) How will they use it?

These are critical questions to the overall development as well as to identify how the site should be initialized. How our portal will look and be used is an important issue but also there should be guidance development over the next several years. We have to take into consideration about the network speed for the slow connections. The first goal is to reach as many member of the *organization* as possible.

c. We have to know our communication environment:

We use the organization's intra-net for; instant access and dynamic interaction, customer customization, existing huge intra-net client base [11]. Information is meaningful if it is instantly accessible. Interaction between organizations and members grow up the state of belonging to the organizations. For *our organization*, state of belonging is very important. Every year *our organization* spends a budget to get huge client based intra-net. Mobile platforms and sub units computer inventory increases everyday.

Information acquired and information from memory, are packaged into different levels of information according to the personnel organization types of *our organization*, we have to customize the interface for special groups. We define three types of user group for Personnel Information Portal (PIP). These groups are;

Normal users: Persons who are authorized to update, insert their specific personnel affairs records that was collected by PIF or optical forms. All staff of organization is included to this group. They can reach public information and their own database records.

Group users: This group was designed for sub-unit's personnel department's information needs. Sub-unit departments store the same information like HPD central personnel database. Group users have the same authorization like normal users, with this

authorization some special part of them have authorized to manage the records of the members who are under their scopes and other parts can manipulate extra information except personal affairs, they can reach the information but cannot change the reachable information. Group users have been authorized to reach extra web page applications, which were designed to help their personal affairs. They can only authorized by administrators.

Admin users: They are limited users who are responsible to develop web pages of PIP and administrators of the database and PIP. Figure 4.12 shows user types and their scopes.

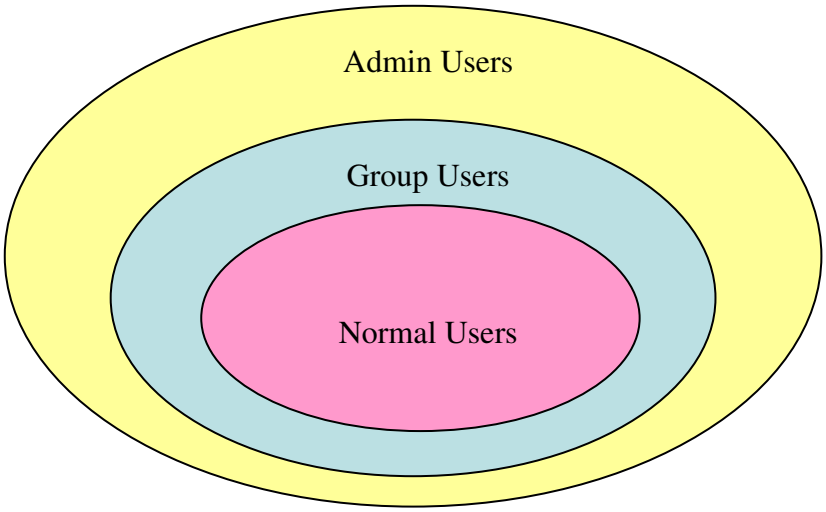


Figure 4.12 User groups of PIP.

4.2.4 Infrastructure of the PIP

HPD central database was divided into four private schemas according to the needs of HPD offices. Many applications were developed over this infrastructure so it limits us to develop a new database structure. We have to create a new infrastructure over the existing structure. At the top of the four schemas of central database, a new schema named by personnel was created. Figure 4.13 shows the infrastructure of the PIP.

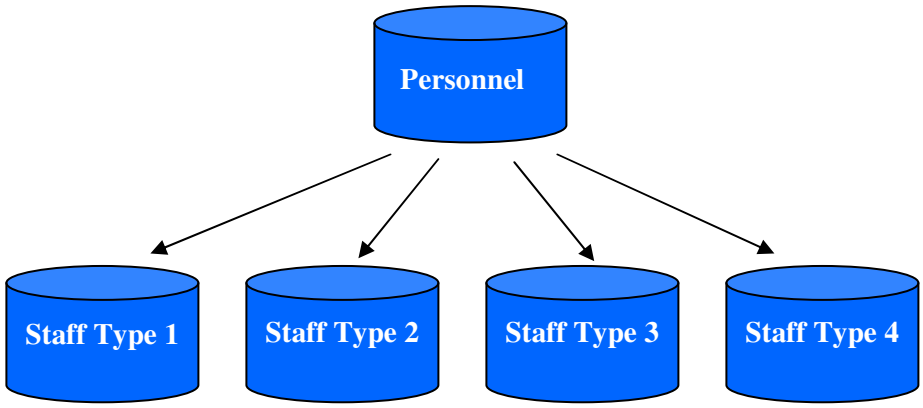


Figure 4.13 Infrastructure of PIP

Personnel schema has limited grants options for update, insert, delete over the tables of the four private schemas. At the same time its own DB tables were developed for common and new web applications. PIP web pages have a unique id. PIP groups were developed according to the page ids. Other groups can associate a page, which is under a group. PIP groups can be listed as news group, sub-unit personnel department user group, personal information report group, data manipulation group, frequently asked questions (FAQ) group etc.

4.2.5 Organization Chart of PIP

Organization chart logic of *our organization* is a tree structure, which has a special coding. Codes were defined with hierarchical order. Group user authorization limits are defined with hierarchical order, over the codes of the organization tree structure. Each staff has a code on tree structure. With this way of system authorization, given to the group users gives the rights to reach and manipulate the information of the users under their scope. A group user may cover other group users. There can be more than one group user at the same office. Also group user may be placed at the root of the tree notwithstanding at the top. From root to parent-child, relationship can limit the scope of the group user. Every node can see only its children and children branches.

For example, in Figure 4.14 HPD group users (*Office 1*) are not placed at the root of the tree at level 0, but their authorization level may be defined like the root node with this authorization office1 group user may reach all staff information of each node. *Major*

sub-unit2 has an authorization level over sub-unit1 and sub-unit2 and their sub branches. *Mobile Platform 2* group user has only rights to manipulate its own staff information.

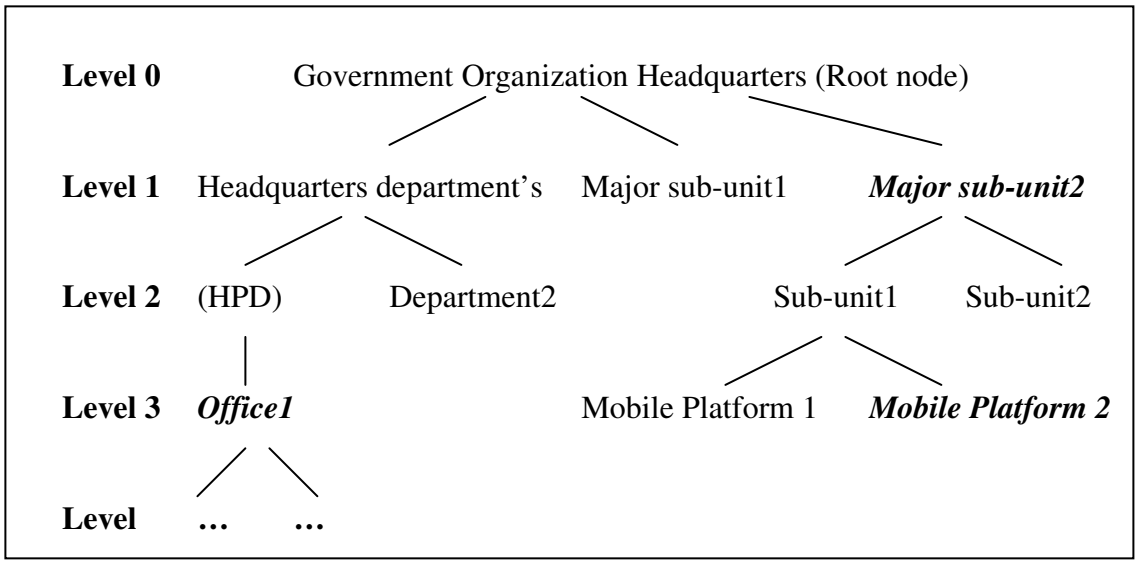


Figure 4.14 Structure of scooping

4.2.6 System Security

Personnel information is private and personal, so web based applications need to be secure. Users must login to the portal with their username and passwords like inter-net banking applications. Figure 4.15 shows login application.

Office of prime minister announced a directive to public institutions about obligation of usage Turkish Identification Number in their all applications. According to this directive we decide to use Turkish Identification Numbers (T.C.Kimlik No) as user names. In the future, this will be helpful to adapt information databases with other government organizations.

Begin mandatory usage of user name and password; force users not to forget their passwords. Help desk members give services according to the password problems. To decrease density of help desk members, researcher developed a new web page that was named by "I forget my password" to initial usage of visitors. If users forget their passwords, this page could be use, as guides to remind passwords, without need an external help. We constitute a call center for the worst case. Call center members are separated by staff types (staff type1, staff type2**,** staff type3, staff type4)**.** They are

responsible to serve help for password and other procedural problems. Everybody is responsible for the security of information

Figure 4.15 PIP. Login application

4.2.7 Content of PIP

Personal Information Portal (PIP) was designed according to two types of information. First, is the information that deals with personnel affairs published by the *organization*, second is the information which will be inserted, updated or deleted by the users.

4.2.7.1 Information that will be published by *our organization*

PIP is divided into three main parts;

First one is **Top Page**; it was designed to inform the user about last login time, user photo, user name, and icon of the *organization*. Figure 4.16 shows top page**.**

Figure 4.16 Top page

Second one is the **Link Page**; it changes according to the user type. To distinguish the user group type of PIP, we have to check the staff type right within login. Three link types can be seen in Figure 4.17. If user is an admin type then he/she can reach all the related links else if the user is a group user than he/she can reach only group links page. The last one is if the user is a normal user than he/she can reach limited links.

Figure 4.17 User groups link pages

Third one is the **Main Page;** all link pages were designed to be loaded on the main page.

Home Page

Our organization always informs and makes announcements to persons by using hard copy documents. Documents have to changed hands many times, and sometimes the staff cannot show documents because they have out of office for a while. We have to prevent the blank spaces of information share. Staff should be aware of last announcements and news right after login to the PIP (Announcements page), so the main page is the first page for all users. Figure 4.18 shows the main page that was designed for news and to inform the members of the *organization*.

Figure 4.18 Main page

NEWS Page

News and announcements can be inserted by the news group users. Figure 4.19 shows the News Page. News group users can only be authorized by admin users. News group users can insert local news or general news, they can select icons for news & announcements, also they can add related URLs for the news and they have to define a activation and duration period for the news, but they cannot directly publish these news, there is an approval mechanism for illegal news. Admin users have to certify these news, approved news and announcements can be seen by the PIP visitors.

Figure 4.19 News page

Who-Where Page

Staff might want to learn about the others office addresses, positions and contact information. Then Who-Where page is useful for the users to inform, search and contact with other users. Search criterions are; by names, surnames, with classification/ranks or with registration numbers (Every staff has a organizational registration number). Search results can be more than one person so staff can filter search criteria by wanted staff type (Staff type1, Staff type2**,** Staff type3, Staff type4) or search criterions. Figure 4.20 shows who-where page.

Figure 4.20 Who where page.

Search results are also shown in Figure 4.20**.** Staff's office address, positions, photos, email address, phone numbers are shown in the results page and also there is a link to send a message to the related person. If user would like to send a message to related person, they can do it with just one click to the message send link in who-where result page.

Message Page

Messages Page can help the users to contact with each other. If there is a new message in user mail box than a warning would be seen in PIP main page like shown in Figure 4.21**.** User would see new message warning until it is read.

Figure 4.21 Message alert page

To read the message just one click is needed to message icon. Figure 4.22 shows the message list.

Figure 4.22 Message list page

If somebody wants to send a new message to another user, s/he can use the application in Figure 4.23.

Figure 4.23 Message send page

Graduation Group Page

In newsgroups, information is posted onto what is essentially an electronic bulletin board that is seen by everyone in the group [2]. The electronic bulletin board serves as the shared collaboration space in which participants actively create shared understanding. Sometimes users need to contact with their graduation friends. It is very hard to send message one by one to all friends. If somebody wanted to send a message to the graduation friends than graduation group page can be used as seen in Figure 4.24**.** With sending only one message to the graduation group, others can reach the message easily.

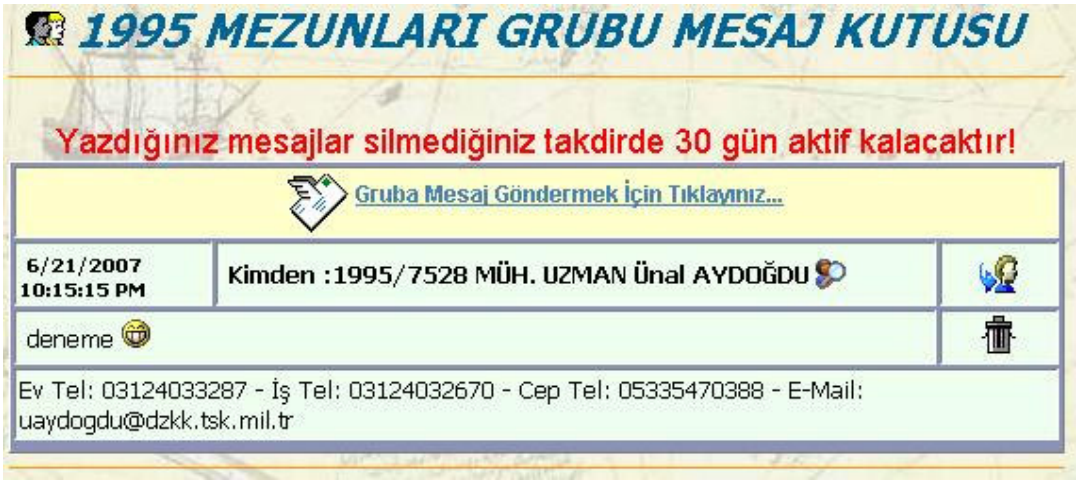


Figure 4.24 Graduation group page

In graduation group page (Figure 4.25) people can also send images/animated images to each other but these images are never attached to the message content. Instead of using attachments, a formulation was generated to send images. For example; if a user want to send a smiling face with message text body, than (☺) →":)" code would be inserted to the message text body. When others open the same message, automatically a decoder ":)" →(☺) put into use to show the smiling face. There are limited image icons put into service but these are the mostly used icons.

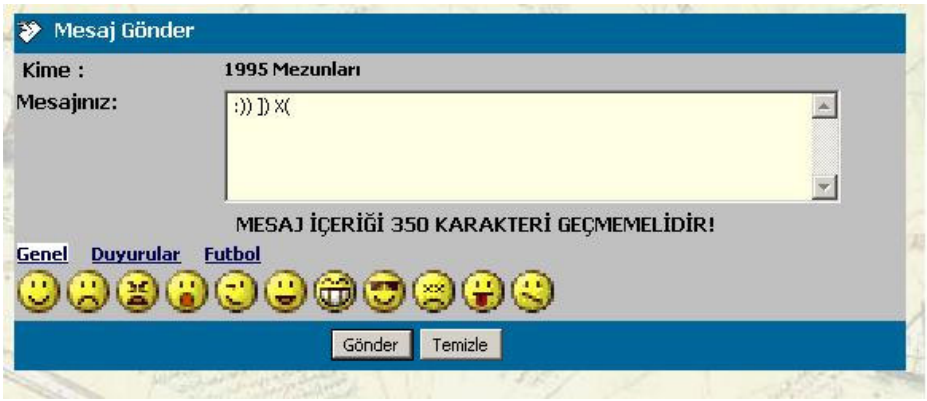


Figure 4.25 Send message to graduate page

Vote Page

Vote Page; is designed to measure the preferences of the members according to the voting topics. To reach a large amount of participation to the vote, it must be seen after user login process at the main page of the PIP so if there is a voting than it would seen in the main page. Also users who join the voting can see the vote ratios right after his/her vote. Figure 4.26 shows the vote result page.

Figure 4.26 Show vote page

Vote topics, publication periods, are decided by leaders of the *organization* departments. Vote can be multiple choice as shown in vote create page at Figure 4.27. Only administrators of the PIP can arrange a vote. Votes, which were voted in past, are stored in the vote page in Figure 4.28 for statistics and can be reachable by every one.

Figure 4.27 Vote add page

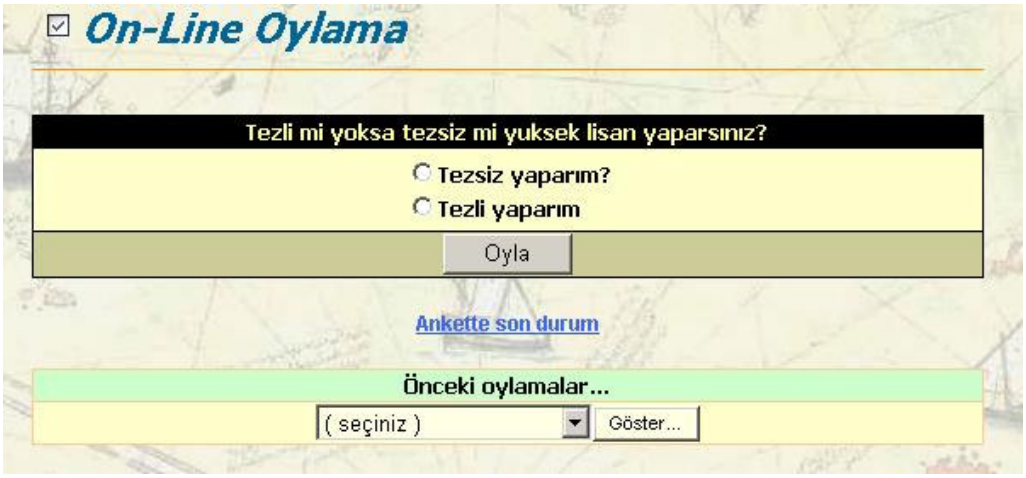


Figure 4.28 Vote page

Appreciation and Punishment Records Page

The rules in *our organization,* says that; if somebody shows an extra high effort or performance for a special official work then his/her chief appreciates him/her with letter of comandation. This appreciation records is sent to the HPD. These records are useful for staff's career planning. Staff is appreciated many times during their profession life. These records are stored in the HPD folders and HPD central database. Also sub-units and the personnel departments store these records and finally one copy of letter of comandation is given to the person himself/herself. *Organization* publishes these records to users him/herself and group users of PIP. Figure 4.29 shows appreciation records.

Figure 4.29 Appreciation records

In the present system these records have to be manipulated by HPD operators but innovation of PIP was changing this process. With a new Add Appreciation Page application in Figure 4.30, group users are authorized to manipulate appreciation records

of staff that are under the scope of group users. Group users have responsibilities about the reliability of the records and they have to collect and send letter of comandation documents monthly to the HPD. With this new application HDP member's process was changed. Instead of insertion of records, their new responsibilities are just to check and approve the records. If a record was not approved then group user can make changes on that record, but if the same record was approved than group user cannot change or delete the record.

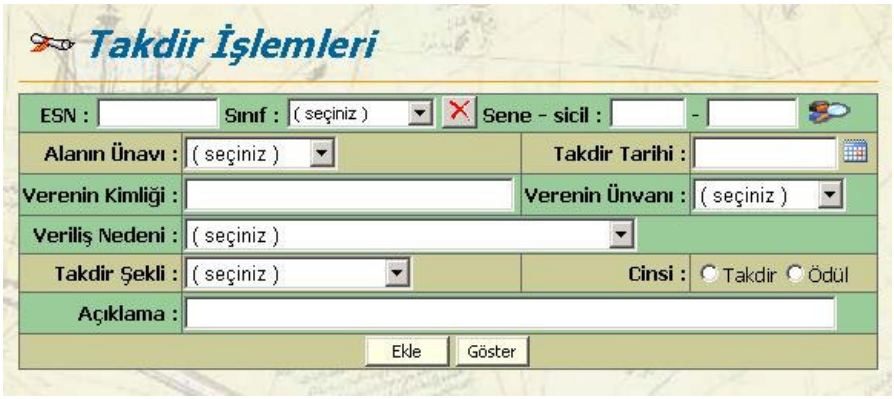


Figure 4.30 Add appreciation page

However, there are punishments as appreciations. Like appreciation records process, same process is valid for punishment records. *Our organization* publishes these records to users and group users as shown in Figure 4.31

Figure 4.31 Punishment records page

Group users have another responsibility to manipulate the punishment records of HPD central database by using the new application in Figure 4.32. Group users have to collect and send punishment documents to the HPD monthly. Group user can only change, delete, and update the non-approved records.

Figure 4.32 Punishment insertion application page

Medical Records Page

Periodically, every three years staff has to get a checkup in hospitals. Hospital's medical records about the patients are sent only to the HPD for archive and personal affairs. If someone has a health problem, HPD must know detailed information about his/her health problem. Sometimes staff has to be retired according to their health problems. Also place of employment of some patients have to be change according to their health records. Hospitals never deliver the health reports to their patients; they only declare limited information to their patients. There was no mechanism to publish health reports of hospital to the users, therefore we developed medical records page to publish health records to users and groups. Sub-unit personnel departments also need to know patient records of staff that were under scope of group. Users can reach the medical records of themselves like shown in Figure 4.33.

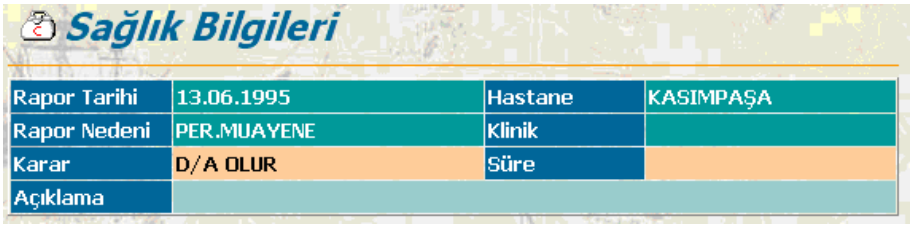


Figure 4.33 Medical records page

Foreign Language Page

Because of the duty requirements, staff of our organization has to have an excellent English knowledge. There are education programs to progress the staff's pronunciation, grammar, speaking levels. After all these education programs staff would have a

language level-fixing exam. These exam records are also sent to the HPD to be need for manipulation of central database and election of staffs for special operations. PIP also serves these records to the normal and group users in Figure 4.34. Past English level exam records are stored in the central database, but this information was not shared with the sub-units and staffs up to now. With the new foreign language application page users and group users can check and freshen up their memories.

Figure 4.34 Foreign language page

Past Official Work Records Page

Staff, would have many appointments throughout their work life. HPD four offices (Staff type 1 office, Staff type 2 office, Staff type 3 office, Staff type 4 office) appoint the staffs that are in their scopes. To make an appointment, past official work records are very important because career planning of a staff directly deals with past official works. Sometimes sub-unit commanders need to commission a staff for special office works. Human resources members try to select to best person for the specific duties but there were no on-line mechanism to help their request. They tried to find the suitable person with examining the hard-copy personnel folders of the staff. With the new application in Figure 4.35 group users and also user could reach the past official work records of their staff.

Organizational information sustains multiple meanings, each representation being the result of the subjective cognitive and effective interpretations of individuals or groups.

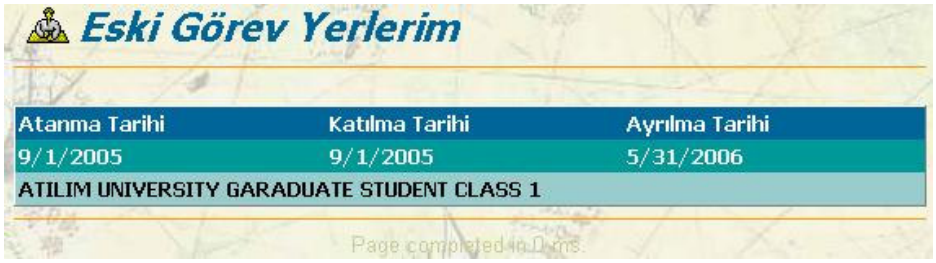


Figure 4.35 Past official work records

Appointment Questionnaire Page

Staff arranges an optical form (Figure 4.3a, 4.3b) to inform their request about their appointments once in a year. Marked forms were sent back to HPD offices to be scanned. Optical forms contain whether staff wishes to change their office/mobile platforms or not and some other information. Some of them take a photocopy of the arranged form not to forget their request but some do not. Before the Appointment Questionnaire page applications in Figure 4.36**,** users could forget their request about the past years.

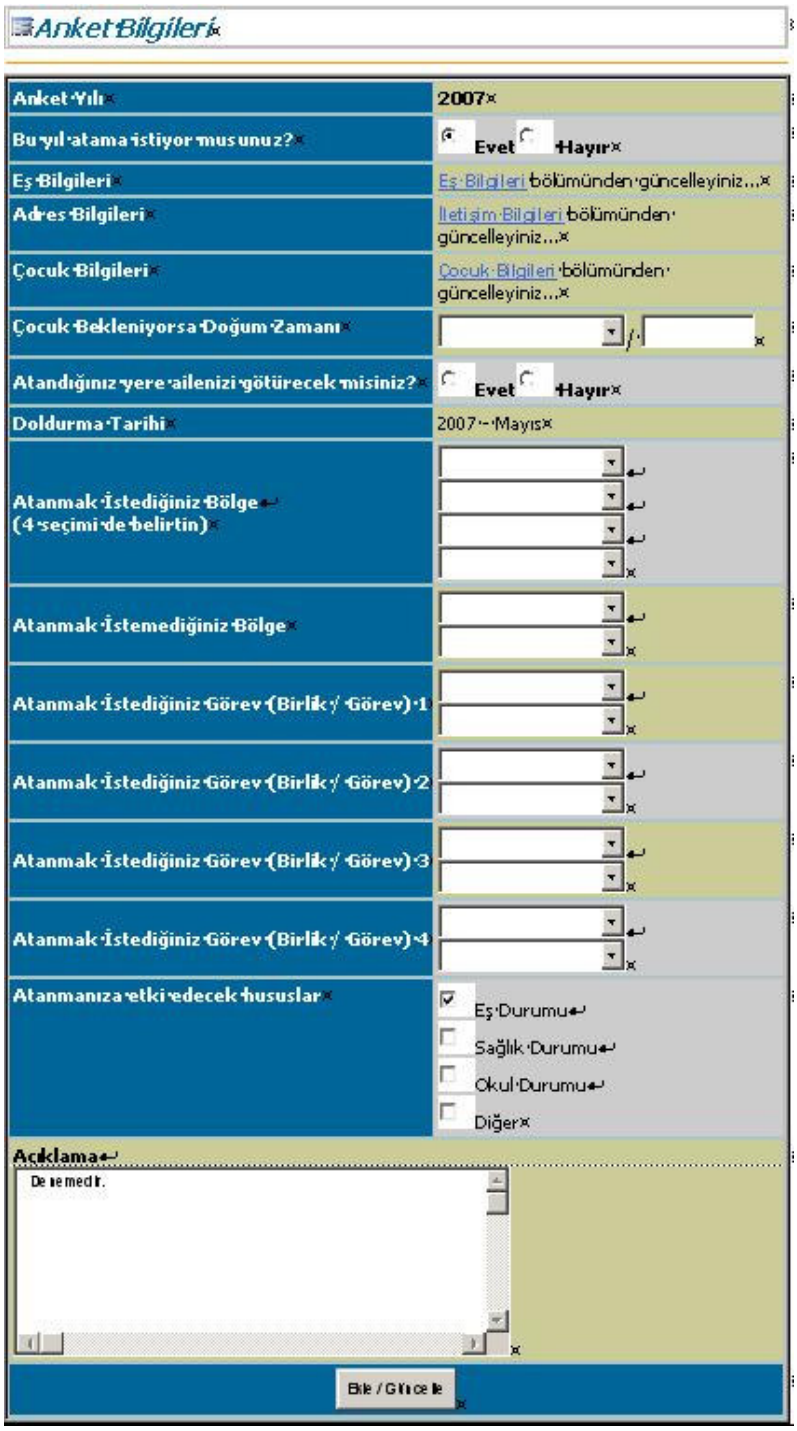


Figure 4.36 Appointment requests page

With the new web application page, users meet to arrange the new appointment questionnaire request whenever they want. Also they can easily check the past appointment request records of themselves. Reaching past appointment request and past official work records is useful for the analysis of the ratio of fulfillment of their wishes.

Also with another application page in Figure 4.37 users can print their appointment request records

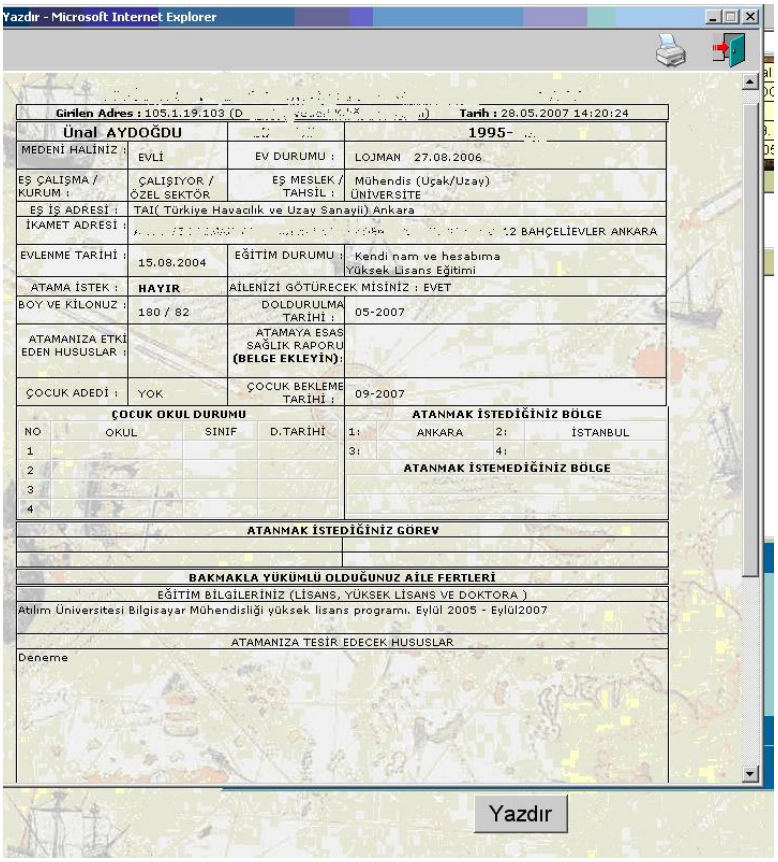


Figure 4.37 Print page of appointment requests

Frequently Asked Questions Page

HPD offices have a responsibility to feedback over requested personal affairs question, which were demanded by the staff. These questions are related with medical, judicial, appointment procedures and general topics of personal affairs. With the new FAQ page application in Figure 4.38 users can search the questions, which were asked before, and answers that were inserted by the offices of the HPD or group users who have authorization to give answers to related questions, by entering related search words. Also users can filter the search criteria by the search topics.

Figure 4.38 Frequently asked questions (FAQ) page

4.2.7.2 Information Manipulated by the Staff Herself/Himself

Wife/Husband Record Page

In the present system when a staff got married, he/she has to be arranged and send a PIF document (Figure 4.10) to the HPD to be updated his/her personnel affair records of central database and local database of his/her office. But with Wife/Husband record page application (Figure 4.39) users do not need to arrange a PIF document. Users can insert, delete and update their marriage record with login to the PIP. No need to arrange and send a PIF to HPD because user directly updates the central database of HPD.

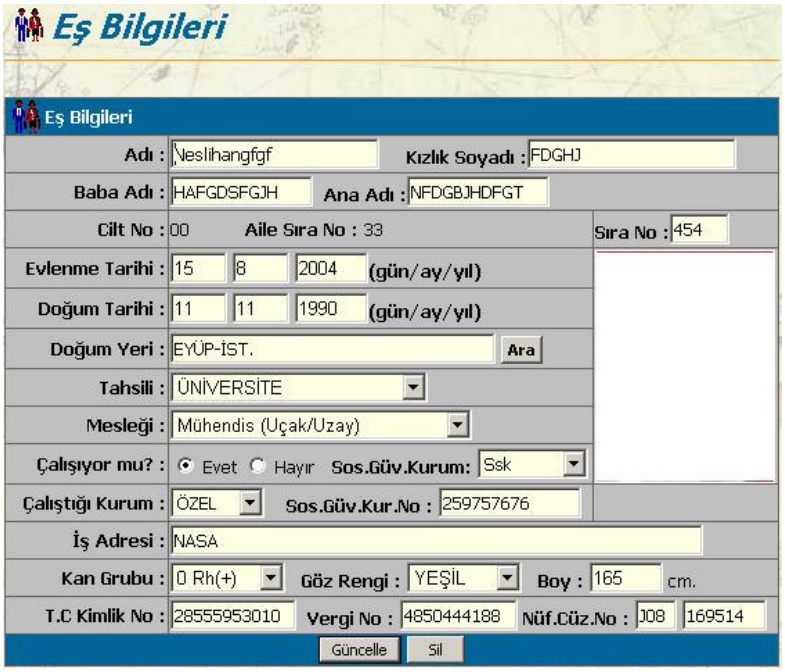


Figure 4.39 Wife/husband record page

Child Record Page

The process is the same infrastructure with the wife/husband records page process. People arrange a PIF documents when they have a child. All the possibilities of arranging PIF were represented in Figure 4.11 data flow chart. Using the new web application in Figure 4.40 and Figure 4.41 staff can add, delete and update their child information. People use a hard copy documents or agendas to store the detailed information. PIP works like an online agenda for the user

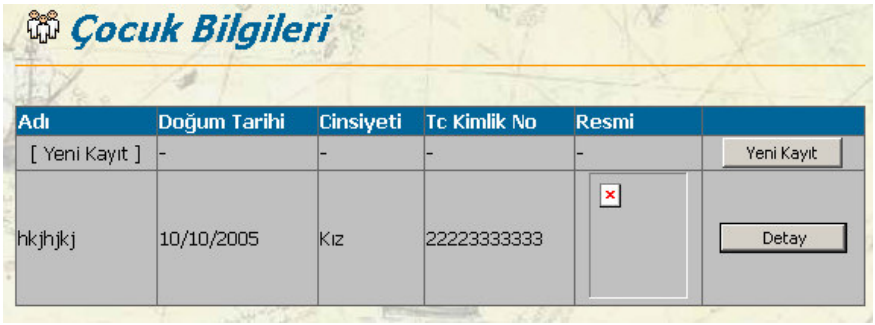


Figure 4.40 Child information record page

Figure 4.41 Child information record update page

Address and Communication Page

HDP and sub-units always need to reach their staff by phone call or need to know their house addresses. In some critical situations HPD members and sub-unit personnel department would have not enough time to reach staff quickly. With the new application page in Figure 4.42, all address & communication records are collected in the central database. The users can update these records at all the times. Also these records are shared with sub-units.

Figure 4.42 Address and communication page

Vehicle Record Page

There are many auto parks in sub-unit buildings with security guards. These security guards check the car's license plates match with a hard copy parking cards. Also they control whether the car is a staff car or not. Staff can record his/her car to the central database by using the application in Figure 4.43. Centralist control of the records prevented data manipulation again and again.

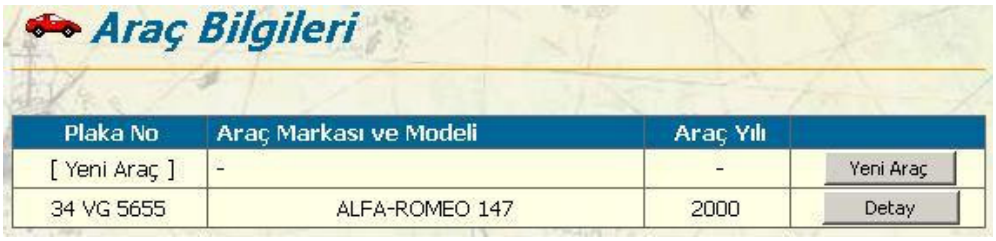


Figure 4.43 Vehicle record page

Personnel Information Report Page

All detailed information about a person can be seen with this application. With using who-where application in Figure 4.20 query person can be find and with the new application in Figure 4.44 all the information, which was mentioned upside could be seen as a report. Also report can be filtered by the application in Figure 4.45**.**

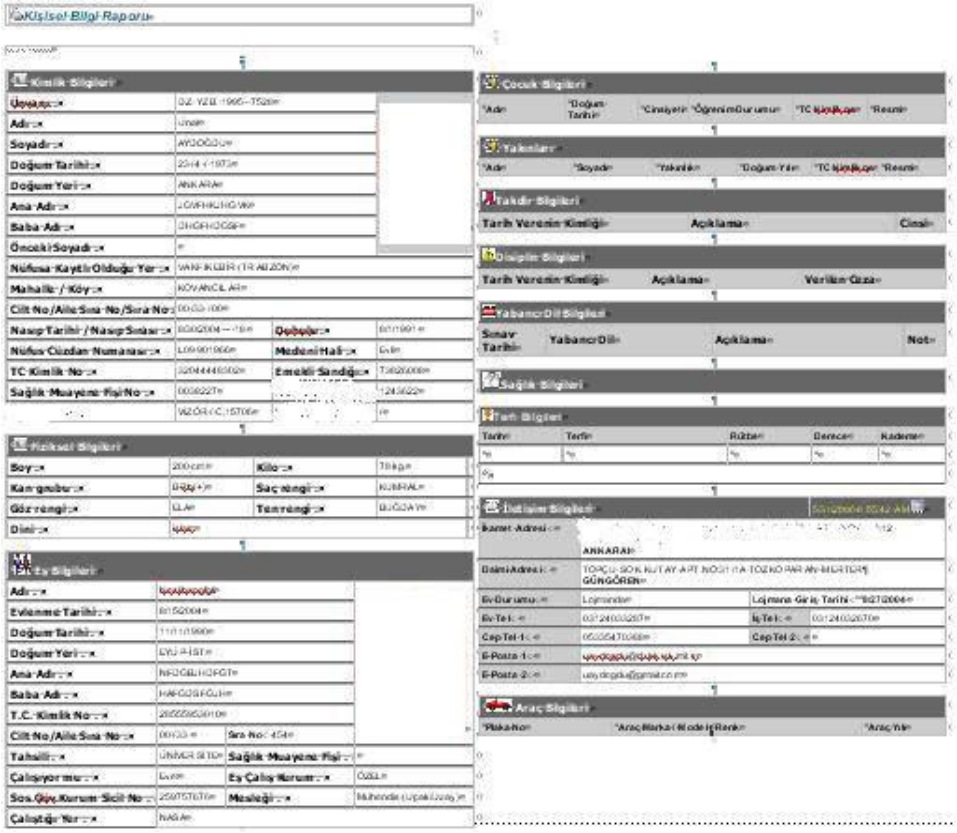


Figure 4.44 Personal information report page

Figure 4.45 Personal information report filter page

CHAPTER 5

RESULTS

This chapter summarizes the results of the study as an e-government application impacts on the government organization as duration, service quality and error correction result. General impacts of this study on organization are cost and time saving. The impacts on customers are time saving, simplicity, convenience, and accuracy. The detailed analysis of the study is shown below.

5.1 Duration Results

We have analyzed the present and new PIP system by comparing duration and cost of reaching the same information.

5.1.1 Duration & Cost of Data Collection with Optical Forms & PIFs

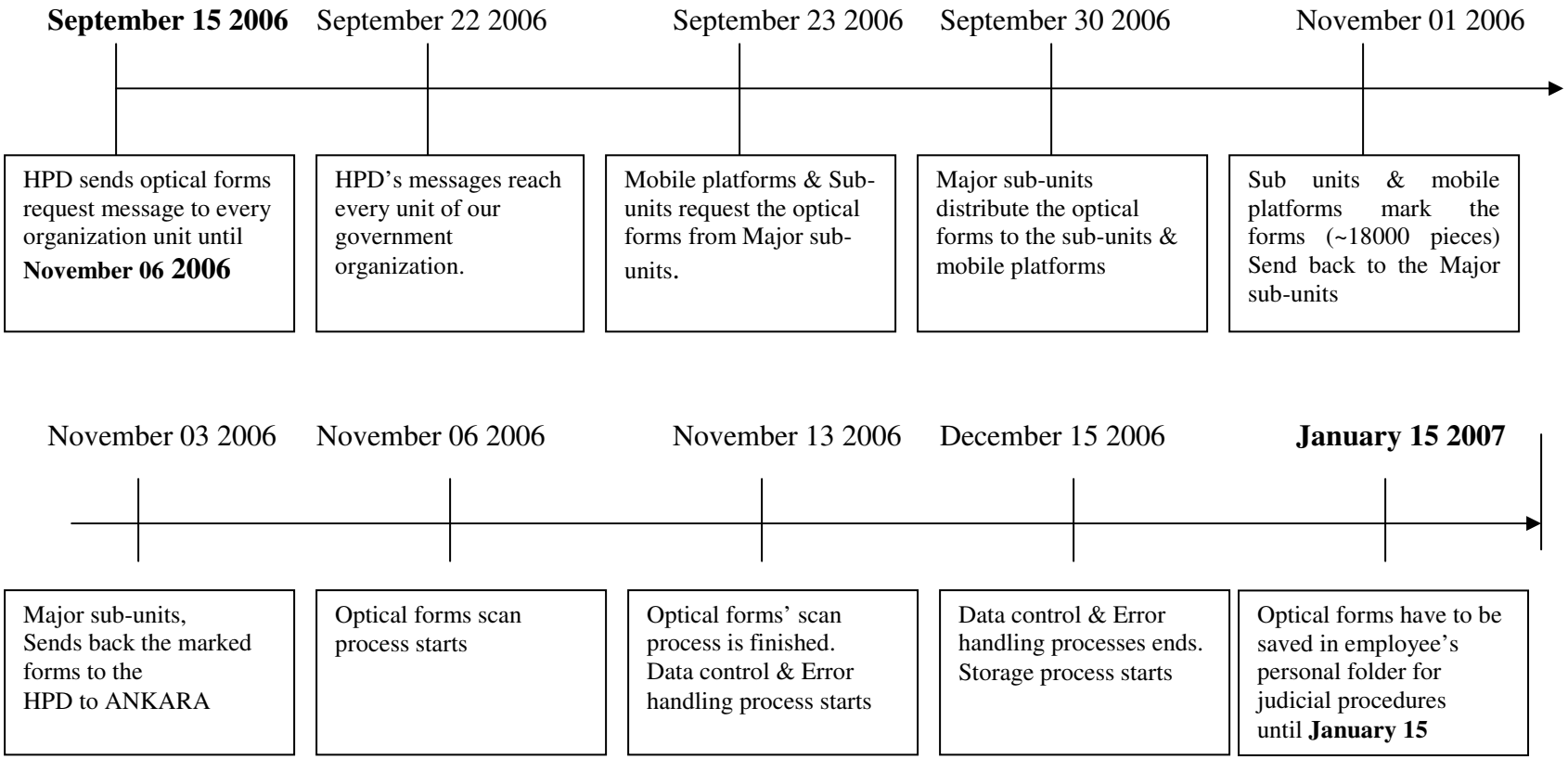
Our organizational model, always tries to reach the correct, updated, reliable, and trustable information as fast as possible. In the present system optical forms and PIF documents were designed to collect personnel information. Of course it costs money and time to reach the most reliable information. On the next page, duration and cost of information that is collected by optical forms is shown. Approximately 18,000 staff members arrange optical forms every year. We have to know unit prices of all items and process steps costs before calculating the total price. These are;

- One employee salary = 850$/month (22 workday) => 38.64 $/day => 4.8 $/hour.
- One optical form cost = (100 pieces = 20.7$) => one optical form = 20.7 cents.

- One marking user guide (UG) of optical form = 1.38 $ => 300 * 1.38 = 414 $.
- Error ratio is defined as 5%.
- One person spends 10 minutes to arrange an optical form.
- Also Optical Mark Reader (OMR) has a cost with an acceptance of 1000$/year.
- One employee works 8 hours a day.

Data Collection Cycle with Optical Forms

Optical form manipulating process steps is shown in below with the time horizon. These processes and cost of the steps is shown in Table 5.1.



- 18,000 * 105% = 18,900 pieces of optical forms is;

18,900 * 20.7 cents = 3,912$.

- 10 minutes/employee * 18,000 employee=3,000 hours;

3,000h * 4.83$/hour (one employee salary) =14,490$.

Total cost of the optical form request and collection process;

4,14$(UG) + 3,912$(Optical forms) + 14,490$(Manpower) + 1,000$(OMR) = **19816$**

Two employees were charged to scan the optical forms. During five days these two employees just dealt with the scanning process of 18,000 optical forms.

After scanning process, another process started, eight employees were charged for data manipulation and error handling. This control period takes twenty-five workdays of the employees.

The last process cost is to deal with the storage of the optical forms, and during this process two employees were charged for folder arrangement. All these processes steps and their duration and costs are shown in Table 5.1.

Table 5.1 Duration & costs of data collection with optical forms

Processes Name	Duration	Man Power	Cost
Optical Form Request & Collection Process	Sep 15 2006←→Nov 06 2006 50 work days	18000 Employees	19,816$
Optical Form Scanning Process	Nov 06 2006←→Nov 13 2006 5 work days	2 Employees	368$
Data Manipulation & Error Handling Process	Nov 13 2006←→Dec 15 2006 25 work days	8 Employees	7,728$
Optical Form Storage Process	Dec 15 2006←→Jan 05 2007 25 work days	2 Employees	1,932$
Total	**105 days**	---	**29,862$**

As a result, duration of the data collection with optical forms is *105 days/year* and its cost was calculated as *29,862$*/year.

Data Collection Cycle with PIF Documents

The other data collection method with printed PIF documents can be seen according to the situations that were shown in the section 4.1.1.2 of this study. So we measured the

data manipulation cycle according to the numbers of PIF documents that were sent to the HPD. Table 5.2 shows the number of PIF and types of data manipulation cost of the information collected by PIFs. Approximately every year 800 pieces PIF are send cause of marriage and divorces, 1700 pieces for to new address and communication information, 800 pieces for new members joining the *organization*, and 580 for newborn children. Operators of HPD, who are responsible for data handling, spend 3 minutes for update or inserting information sent as PIF documents.

Table 5.2 Cost of information collected by PIF documents

Data Type	Records / Year	Duration of Data Manipulation	Cost (38.64$/day)
Marriage Records	≈ 800	5 days	≈ 193$
Address Records	≈ 1700	10.6 days	≈ 410$
New Staff	≈ 800	5 days	≈ 193$
Child Records	≈ 580	3.6 days	≈ 139$
Total	**3880**	**24.2 workdays**	**≈ 935$**

5.1.2 Data Collection with PIP as an E-Government Environment

With the new PIP service in Figure 4.36, staff easily arranges their appointment requests without the need for any user guide or optical form. The duration cycle of collection appreciation requests with PIP is shown in below. Also with the new service users can see past appointment requests. We test this service with satellite communication systems of a mobile platform of *organization*. Members of the mobile platform arranged their appointment request on sail by using *Organization* intra-net, and the arrangement period of ≈180 staff takes just one day with only three computers. It was quite fast to reach the appointment requests of members. No need to wait until the sail ends to collect marked forms and no need to mark appointment request like optical forms. There is no scan process, data manipulation process, error handling process except storage processes. Because of the legal rules HPD requests the printed format of the appointment request just with in one month and HPD members just deal with the storage procedures of the printed appointment requests. The results show that there is no coding error in the appointment request records, and the explanation part of the appointment request form was filled in electronically so no need to handle this part. Another gain of the new PIP service is there is no limitation for the arrangement time of

the new appointment request. *Our organization* requests these appointment requests between "01-31" October of every year. However staffs need to arrange their requests during this period, they can change their request whenever they want. *Organization* accepts their requests at every time.

- One person spends 2 minutes to arrange an optical form.
- A4 paper 1000 pages = 6.92$ => one page 0.69 cents.
- 18000 * 105% = 18900 pieces of printed pages is; 18900 * 0.69 cents = 130$.
- 2 minutes/employee * 18000 employee = 600 hours;

600h * 4.83$/hour (one employee salary) =2898$.

Total cost of the appointment requests with new PIP service;

0$(UG) + 130$(printed page) + 2898$(Manpower) + 0$(OMR) = **3028$**

Our organization spent a budget to get huge intra-net for general purposes. There is a hardware and software cost for this structure. But we take this cost out because the network structure was developed not only for new PIP system.

IT personnel salary also was taken out because PIP was developed by the organization members itself.

The cost & duration of the new appointment request with PIP service is shown in Table 5.3.

Table 5.3 Cost & duration of PIP' appointment request service

Processes Name	Duration	Man Power	Cost
Online Appointment Request & Collection Process	No limit (October 01 - 31) 30 days	18,000 Employees	3028$
No Scanning Process	0 days	0 Employee	0$
Data Manipulation & Error Handling Process	0 days	0 Employee	0$
Storage Process	(November 01 – 25) 25 days	2 Employees	1932$
Total	**55 days**	---	**4960$**

With the new applications of PIP some data manipulation methods were changed. For example marriage, children, and address records can be manipulated by the record owner. HPD members do not try to follow these records. Data is manipulated from the first hand so it prevents the errors. New abilities of the PIP also prevent the misuse of

the services with the group user application. Group users have to control their member, which is defining in their scopes. Shortly collection data with online forms of PIP was changed the organizational workflow, and cost of information collection with PIP has been decreased.

We can easily see the differences and gains of two systems in Table 5.4

Table 5.4 Gains of the new PIP services as an e-government application

Process Name	Present System Cost	Present System Duration	PIP Cost	PIP Duration	Gains
Appointment Requests Information	29,862 $	105 days	55 days	4,960 $	50 days 2,4902$
Marriage-Children-Address Information	935 $	24.2 days	0 days	0 $	24.2 days 935$
Totally	**30,797 $**	**129.2 days**	**55 days**	**4,960 $**	**74.2 days 2,5837$**

Gains of the new system at every year are;

- 30,797$ - 4,960$=**25,837$**
- 129.2 days - 55 days=**74.2 days**.

5.2 Service Quality Results

As discussed in the research study section of this study, SERVQUAL instrument with 22 statements (Appendix A and Appendix B is adopted to Turkish) is used to measure the service quality between present system and new PIP, across tangibles, reliability, responsiveness, assurance and empathy dimensions, using a seven point Likert scale. Appendix A is used to measure present system service quality. Appendix B is also used to measure the new PIP service quality. Both of them include the same questions. Ranging of the questionnaires items is from 1 to 7, between the strongly agree and strongly disagree scale. Just 39 members of HPD offices have joined these questionnaires. The questionnaires results are shown in Appendix C and Appendix D.

We used two software packages, SPSS and Excel to analyze questionnaire results. First we analyzed reliability of two questionnaires by using SPSS reliability test. To measure the reliability factor in Likert scale we calculated Cronbach Alpha Reliability

Coefficients of 22 items. These reliability test results are shown in Table 5.5 and Table 5.6. Criterions of reliability of Alpha coefficient are shown in below.

- $0{,}00 \leq \alpha < 0{,}40$ than not dependable.
- $0{,}40 \leq \alpha < 0{,}60$ than less dependable.
- $0{,}60 \leq \alpha < 0{,}80$ than rather dependable.
- $0{,}80 \leq \alpha < 1{,}00$ than high dependable [29].

Table 5.5 Reliability analysis of Appendix A

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

		Mean	Std Dev	Cases
1.	VAR00001	4.5897	2.1116	39.0
2.	VAR00002	4.2308	2.0833	39.0
3.	VAR00003	4.2821	1.9460	39.0
4.	VAR00004	4.3590	1.8423	39.0
5.	VAR00005	4.1026	2.0364	39.0
6.	VAR00006	4.3590	2.0582	39.0
7.	VAR00007	4.6667	1.9512	39.0
8.	VAR00008	4.4615	1.6990	39.0
9.	VAR00009	4.2308	1.8131	39.0
10.	VAR00010	3.8205	1.9039	39.0
11.	VAR00011	4.6923	2.0539	39.0
12.	VAR00012	5.0513	1.8346	39.0
13.	VAR00013	2.7692	1.7085	39.0
14.	VAR00014	4.8205	1.8761	39.0
15.	VAR00015	4.8462	1.9539	39.0
16.	VAR00016	4.7949	2.0024	39.0
17.	VAR00017	5.2821	1.6214	39.0
18.	VAR00018	4.7436	1.9018	39.0
19.	VAR00019	4.6923	1.9756	39.0
20.	VAR00020	4.4615	2.2106	39.0
21.	VAR00021	5.4359	1.8180	39.0
22.	VAR00022	4.6667	2.0943	39.0

C

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

N of Cases = 39.0

Statistics for Scale	Mean	Variance	Std Dev	N of Variables
	99.3590	823.7625	28.7013	22

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	4.5163	2.7692	5.4359	2.6667	1.9630	.2925

Item Variances	Mean	Minimum	Maximum	Range	Max/Min	Variance
	3.7521	2.6289	4.8866	2.2578	1.8588	.3203

Inter-item Covariances	Mean	Minimum	Maximum	Range	Max/Min	Variance
	1.6044	-.5965	3.5911	4.1876	-6.0204	.5884

Inter-item Correlations	Mean	Minimum	Maximum	Range	Max/Min	Variance
	.4291	-.1422	.8858	1.0281	-6.2275	.0380

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
VAR00001	94.7692	741.0243	.6809	.8046	.9394
VAR00002	95.1282	735.5358	.7424	.9108	.9384
VAR00003	95.0769	740.7045	.7484	.9292	.9384
VAR00004	95.0000	742.2632	.7781	.8807	.9380
VAR00005	95.2564	727.9852	.8338	.8672	.9369
VAR00006	95.0000	726.0000	.8432	.8776	.9367
VAR00007	94.6923	742.0081	.7333	.8456	.9386
VAR00008	94.8974	739.0945	.8853	.9255	.9368
VAR00009	95.1282	740.5884	.8095	.9152	.9376
VAR00010	95.5385	771.3603	.4612	.6075	.9426
VAR00011	94.6667	742.9649	.6839	.7591	.9393
VAR00012	94.3077	748.5344	.7159	.8077	.9389
VAR00013	96.5897	773.6694	.4963	.6126	.9419
VAR00014	94.5385	763.7287	.5450	.7812	.9414
VAR00015	94.5128	762.4669	.5327	.7560	.9416
VAR00016	94.5641	782.4103	.3334	.5387	.9446
VAR00017	94.0769	768.3360	.5874	.6011	.9408
VAR00018	94.6154	771.9798	.4558	.8167	.9426
VAR00019	94.6667	756.5965	.5821	.8271	.9409
VAR00020	94.8974	724.8313	.7901	.9127	.9375
VAR00021	93.9231	775.4939	.4441	.6161	.9427
VAR00022	94.6923	780.2186	.3347	.7001	.9448

C

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

Analysis of Variance

Source of Variation	Sum of Sq.	DF	Mean Square	F	Prob.
Between People	1422.8625	38	37.4437		
Within People	1953.4091	819	2.3851		
Between Measures	239.5536	21	11.4073	5.3114	.0000
Residual	1713.8555	798	2.1477		
Total	3376.2716	857	3.9396		

Grand Mean 4.5163

Reliability Coefficients 22 items

Alpha = .9426 Standardized item alpha = .9430

Table 5.6 Reliability analysis of Appendix B

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

		Mean	Std Dev	Cases
1.	VAR00001	6.1282	1.3215	39.0
2.	VAR00002	6.0000	1.2773	39.0
3.	VAR00003	5.7436	1.2715	39.0
4.	VAR00004	6.0000	1.3377	39.0
5.	VAR00005	5.7179	1.3755	39.0
6.	VAR00006	5.8974	1.1875	39.0
7.	VAR00007	6.1026	1.4472	39.0
8.	VAR00008	5.9744	1.0634	39.0
9.	VAR00009	5.6667	1.3829	39.0
10.	VAR00010	5.0000	1.7014	39.0
11.	VAR00011	5.6667	1.5784	39.0
12.	VAR00012	6.1795	1.0481	39.0
13.	VAR00013	3.5641	2.0235	39.0
14.	VAR00014	5.4359	1.7136	39.0
15.	VAR00015	5.9231	1.5111	39.0
16.	VAR00016	6.0769	1.4027	39.0
17.	VAR00017	5.9744	1.4233	39.0
18.	VAR00018	5.1026	1.9708	39.0
19.	VAR00019	5.1026	1.9841	39.0
20.	VAR00020	5.4872	1.8620	39.0
21.	VAR00021	6.1026	1.1875	39.0
22.	VAR00022	5.6410	1.7694	39.0

N of Cases = 39.0

Statistics for Scale	Mean	Variance	Std Dev	N of Variables
	124.4872	371.3617	19.2707	22

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	5.6585	3.5641	6.1795	2.6154	1.7338	.3405

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
VAR00001	118.3590	346.2362	.4754	.7342	.9011
VAR00002	118.4872	339.3090	.6465	.9514	.8977
VAR00003	118.7436	341.9852	.5903	.9510	.8989
VAR00004	118.4872	337.2564	.6577	.9051	.8973
VAR00005	118.7692	337.0769	.6413	.8894	.8975
VAR00006	118.5897	338.3536	.7233	.9128	.8966
VAR00007	118.3846	335.1903	.6431	.9357	.8973
VAR00008	118.5128	339.8354	.7752	.9319	.8964
VAR00009	118.8205	348.0459	.4148	.7703	.9024
VAR00010	119.4872	346.1511	.3525	.6266	.9046
VAR00011	118.8205	328.5196	.7052	.8827	.8955
VAR00012	118.3077	347.9555	.5705	.8778	.8999
VAR00013	120.9231	347.9676	.2557	.5871	.9089
VAR00014	119.0513	343.3657	.3946	.6091	.9035
VAR00015	118.5641	332.2524	.6685	.9388	.8965
VAR00016	118.4103	343.7746	.4925	.9523	.9007
VAR00017	118.5128	340.2564	.5538	.9299	.8993
VAR00018	119.3846	343.8219	.3237	.8621	.9066
VAR00019	119.3846	341.1903	.3579	.8814	.9056
VAR00020	119.0000	323.8947	.6565	.9230	.8964
VAR00021	118.3846	344.9271	.5673	.8260	.8995
VAR00022	118.8462	330.7126	.5830	.8937	.8985

Analysis of Variance

Source of Variation	Sum of Sq.	DF	Mean Square	F	Prob.
Between People	641.4429	38	16.8801		
Within People	1569.5000	819	1.9164		
Between Measures	278.8403	21	13.2781	8.2097	.0000
Residual	1290.6597	798	1.6174		
Total	2210.9429	857	2.5799		
Grand Mean	5.6585				

C

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

Reliability Coefficients 22 items

Alpha = .9042 Standardized item alpha = .9164

Alpha coefficient of our two questionnaires is found as 0,94 for Appendix A and 0,90 for Appendix B. These results show that two questionnaires are highly dependable.

Second we used a “Wilcoxon Signed Ranks Test” for item analysis, because Wilcoxon test were developed to analyze data from studies with similar designs. The result of this test is show in Table 5.7.

Table 5.7 Appendix A- Appendix B Items Test Results

Wilcoxon Signed Ranks Test

Ranks

		N	Mean	Sum of
P1 - Y1	Negative	7	10.79	75.50
	Positive	24	17.52	420.50
	Ties	8		
	Total	39		
P2 - Y2	Negative	7	11.07	77.50
	Positive	26	18.60	483.50
	Ties	6(f)		
	Total	39		
P3 - Y3	Negative	8	11.81	94.50
	Positive	24	18.06	433.50
	Ties	7(i)		
	Total	39		
P4 - Y4	Negative	8(j)	9.88	79.00
	Positive	25(k)	19.28	482.00
	Ties	6(l)		
	Total	39		
P5 - Y5	Negative	8(m)	12.31	98.50
	Positive	26	19.10	496.50
	Ties	5		
	Total	39		
P6 - Y6	Negative	8	9.75	78.00
	Positive	25	19.32	483.00
	Ties	6(r)		
	Total	39		
P7 - Y7	Negative	6	15.25	91.50
	Positive	25(t)	16.18	404.50
	Ties	8		
	Total	39		
P8 - Y8	Negative	5	10.90	54.50
	Positive	28	18.09	506.50
	Ties	6(x)		
	Total	39		
P9 - Y9	Negative	5	14.20	71.00
	Positive	26(z)	16.35	425.00
	Ties	8		
	Total	39		
P10 -	Negative	8	14.88	119.00
	Positive	23	16.39	377.00
	Ties	8		
	Total	39		
P11 -	Negative	8	13.94	111.50
	Positive	21(ff)	15.40	323.50
	Ties	10		
	Total	39		
P12 -	Negative	9	8.72	78.50
	Positive	20(ii)	17.83	356.50
	Ties	10(jj)		
	Total	39		
P13 -	Negative	10(kk)	11.70	117.00
	Positive	20(ll)	17.40	348.00
	Ties	9(mm)		
	Total	39		
P14 -	Negative	11	17.73	195.00
	Positive	21	15.86	333.00
	Ties	7		
	Total	39		
P15 -	Negative	7	10.07	70.50
	Positive	20(rr)	15.38	307.50
	Ties	12		
	Total	39		
P16 -	Negative	8(tt)	9.81	78.50
	Positive	23	18.15	417.50
	Ties	8		
	Total	39		
P17 -	Negative	8	9.38	75.00
	Positive	17(xx)	14.71	250.00
	Ties	14		
	Total	39		
P18 -	Negative	13(zz)	16.58	215.50
	Positive	20	17.27	345.50
	Ties	6		
	Total	39		
P19 -	Negative	10	14.75	147.50
	Positive	17	13.56	230.50
	Ties	12		
	Total	39		
P20 -	Negative	10(fff)	8.35	83.50
	Positive	16	16.72	267.50
	Ties	13		
	Total	39		
P21 -	Negative	10(iii)	12.55	125.50
	Positive	18(jjj)	15.58	280.50
	Ties	11(kkk)		
	Total	39		
P22 -	Negative	6(lll)	13.33	80.00
	Positive	19(mmm	12.89	245.00
	Ties	14		
	Total	39		

Descriptive

	N	Mean	Std.	Minimum	Maximum
Y1	39	4.5897	2.11160	1.00	7.00
Y2	39	4.2308	2.08325	1.00	7.00
Y3	39	4.2821	1.94596	1.00	7.00
Y4	39	4.3590	1.84230	1.00	7.00
Y5	39	4.1026	2.03644	1.00	7.00
Y6	39	4.3590	2.05820	1.00	7.00
Y7	39	4.6667	1.95116	1.00	7.00
Y8	39	4.4615	1.69901	1.00	7.00
Y9	39	4.2308	1.81313	1.00	7.00
Y10	39	3.8205	1.90390	1.00	7.00
Y11	39	4.6923	2.05393	1.00	7.00
Y12	39	5.0513	1.83459	2.00	7.00
Y13	39	2.7692	1.70852	1.00	7.00
Y14	39	4.8205	1.87605	1.00	7.00
Y15	39	4.8462	1.95392	1.00	7.00
Y16	39	4.7949	2.00236	1.00	7.00
Y17	39	5.2821	1.62138	1.00	7.00
Y18	39	4.7436	1.90177	1.00	7.00
Y19	39	4.6923	1.97556	1.00	7.00
Y20	39	4.4615	2.21057	1.00	7.00
Y21	39	5.4359	1.81796	1.00	7.00
Y22	39	4.6667	2.09427	1.00	7.00
P1	39	6.1282	1.32147	3.00	7.00
P2	39	6.0000	1.27733	1.00	7.00
P3	39	5.7436	1.27151	1.00	7.00
P4	39	6.0000	1.33771	1.00	7.00
P5	39	5.7179	1.37551	2.00	7.00
P6	39	5.8974	1.18754	3.00	7.00
P7	39	6.1026	1.44723	1.00	7.00
P8	39	5.9744	1.06344	4.00	7.00
P9	39	5.6667	1.38285	1.00	7.00
P10	39	5.0000	1.70139	2.00	7.00
P11	39	5.6667	1.57836	2.00	7.00
P12	39	6.1795	1.04810	3.00	7.00
P13	39	3.5641	2.02348	1.00	7.00
P14	39	5.4359	1.71364	1.00	7.00
P15	39	5.9231	1.51109	1.00	7.00
P16	39	6.0769	1.40272	1.00	7.00
P17	39	5.9744	1.42325	1.00	7.00
P18	39	5.1026	1.97071	1.00	7.00
P19	39	5.1026	1.98408	1.00	7.00
P20	39	5.4872	1.86197	1.00	7.00
P21	39	6.1026	1.18754	2.00	7.00
P22	39	5.6410	1.76944	1.00	7.00

Test Statistics(b)

	P1 - Y1	P2 - Y2	P3 - Y3	P4 - Y4	P5 -	P6 -	P7 -	P8 -	P9 -	P10 - Y10	P11 - Y11	P12 - Y12	P13 - Y13	P14 - Y14	P15 - Y15	P16 - Y16	P17 - Y17	P18 - Y18	P19 - Y19	P20 - Y20	P21 - Y21	P22 - Y22
Z	-3.408 (a)	-3.650 (a)	-3.191 (a)	-3.627 (a)	-3.422 (a)	-3.644 (a)	-3.088 (a)	-4.078 (a)	-3.494 (a)	-2.549	-2.309	-3.029	-2.402	-1.305	-2.879	-3.380	-2.406	-1.177	-1.006	-2.347	-1.781	-2.232
Asymp. Sig. (2-tailed)	.001	.000	.001	.000	.001	.000	.002	.000	.000	.011	.021	.002	.016	.192	.004	.001	.016	.239	.314	.019	.075	.026

a Based on negative ranks.

b Wilcoxon Signed Ranks Test

Test result shows that there is no statistical result in the 14th, 18th, 19th and 21st items. This means the service quality of PIP services and present system could not be measured for these items. To generate a statistically meaning, test results must be closer to 0,00, but for 14th item it was measured 0,192 , for 18th item it was 0,239, for 19th item it was 0,314 and for the 21st item it was 0.075. These results show that there was no statistical meaning between present and new PIP service quality for these four items.

When we look at 14th, 18th, 19th and 21st items;

- Item 14th shows that the information confidence encourages degree of new and old systems are the same.
- Item 18th shows that PIP new services still do not care about personal requests like present system.
- Item 19th shows that PIP new services still do not care about uncommon personal requests like present system.
- Item 21st shows that the level of interest of PIP services and present system services did not change.
- Other item results show that PIP services are better than present system services.

Third, we compare the two questionnaires groups with each other. We used the same "Wilcoxon Signed Ranks Test" for the groups. And the result of this test is shown in Table 5.8. Groups test result shows that as a service quality of PIP services are better than present system services. Figure 5.1, Figure 5.2, Figure 5.3, Figure 5.4 and Figure 5.5 shows APA style representation of both system service quality measurement groups. Finally, service quality changes with the new PIP services can be observed in detail in figures listed below.

Table 5.8 Appendix A - Appendix B Groups Test Results

Descriptive

	N	Mean	Std.	Minimun	Maximun
YBSG1	39	4,3654	1,82710	1,25	7,00
YBSG2	39	4,3641	1,68952	1,60	7,00
YBSG3	39	4,0833	1,38642	1,75	7,00
YBSG4	39	4,9359	1,43925	1,50	7,00
YBSG5	39	4,8000	1,49244	1,60	7,00
PBSG1	39	5,9679	1,02306	2,50	7,00
PBSG2	39	5,8718	1,08238	3,40	7,00
PBSG3	39	5,1026	1,06177	3,25	7,00
PBSG4	39	5,8526	1,24038	1,00	7,00
PBSG5	39	5,4872	1,30246	2,60	7,00

a PBSG1 < YBSG1
b PBSG1 > YBSG1
c YBSG1 = PBSG1
d PBSG2 < YBSG2
e PBSG2 > YBSG2
f YBSG2 = PBSG2
g PBSG3 < YBSG3
h PBSG3 > YBSG3
i YBSG3 = PBSG3
j PBSG4 < YBSG4
k PBSG4 > YBSG4
l YBSG4 = PBSG4
m PBSG5 < YBSG5
n PBSG5 > YBSG5
o YBSG5 = PBSG5

Wilcoxon Signed Ranks Test

Ranks

		N	Mean	Sum of
PBSG1 -	Negative	9	10,72	96,50
	Positive	28	21,66	606,50
	Ties	2		
	Total	39		
PBSG2 -	Negative	7	11,43	80,00
	Positive	29	20,21	586,00
	Ties	3(f)		
	Total	39		
PBSG3 -	Negative	9	14,67	132,00
	Positive	27	19,78	534,00
	Ties	3(i)		
	Total	39		
PBSG4 -	Negative	10(j)	15,80	158,00
	Positive	28(k)	20,82	583,00
	Ties	1(l)		
	Total	39		
PBSG5 -	Negative	13(m)	15,69	204,00
	Positive	24	20,79	499,00
	Ties	2		
	Total	39		

Test Statistics

	PBSG1 -	PBSG2 -	PBSG3 -	PBSG4 -	PBSG5 -
Z	-3,850	-3,978	-3,161	-3,088	-2,227
Asymp. Sig. (2-	,000	,000	,002	,002	,026

a Based on negative ranks.
b Wilcoxon Signed Ranks Test

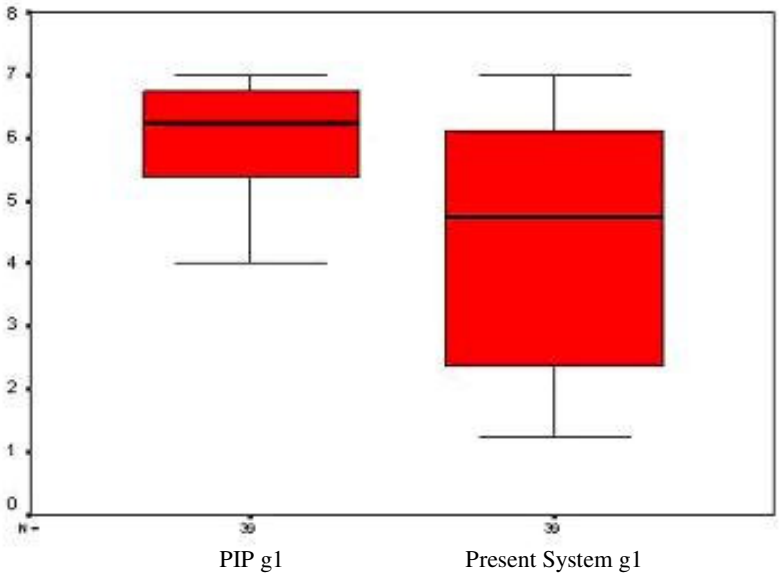


Figure 5.1 Comparison of PIP and present system tangible ratings

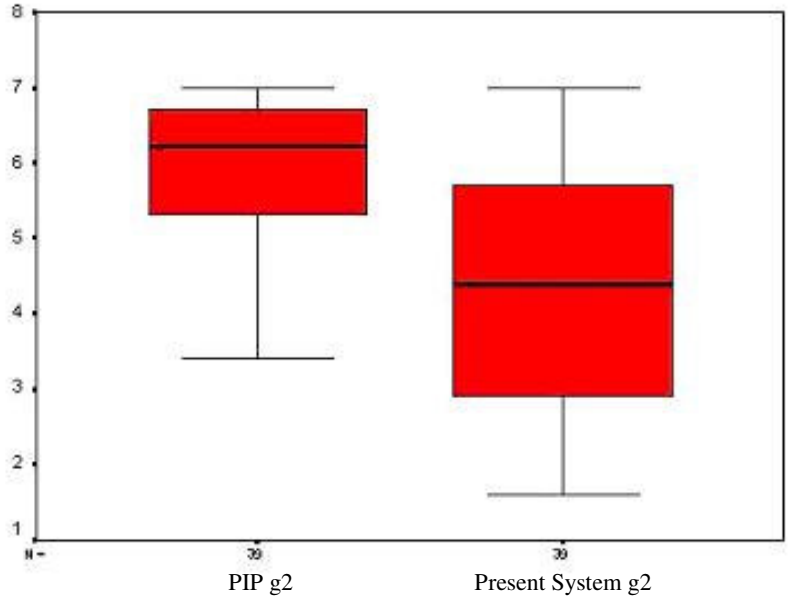


Figure 5.2 Comparison of PIP and present system reliability ratings

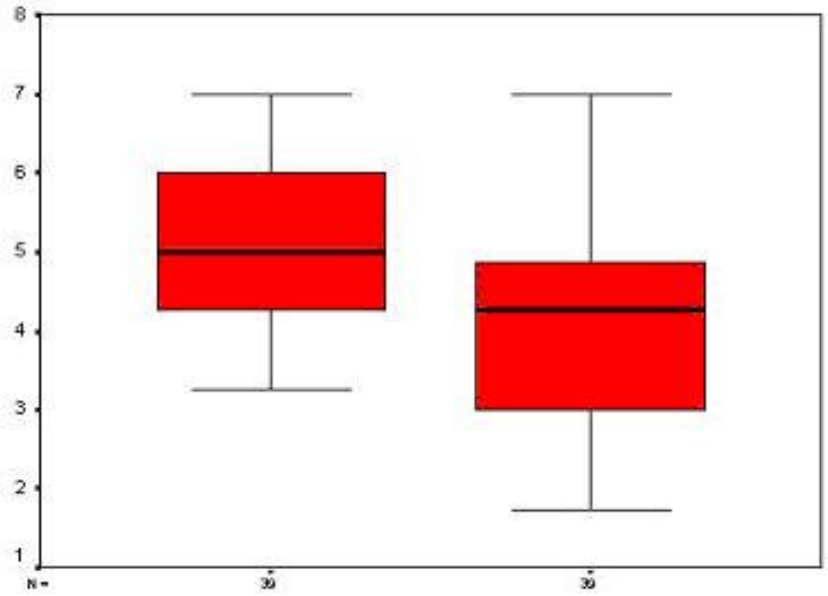


Figure 5.3 Comparison of PIP and present system responsiveness ratings

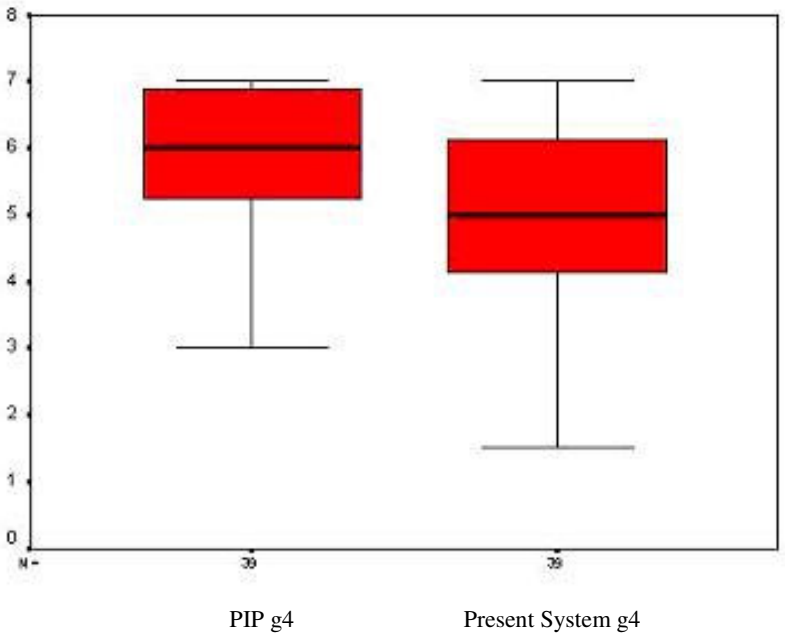


Figure 5.4 Comparison of PIP and present system assurance ratings

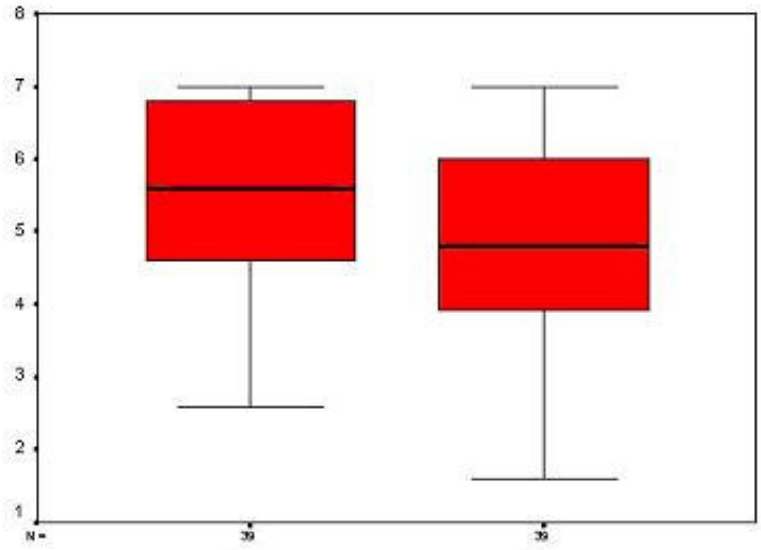


Figure 5.5 Comparison of PIP and present system empathy ratings

We measured total SERVQUAL of two systems according to the steps as explained in research study part of this study and the summary scores for each dimension are shown in Table 4.4, with the weighted average scores per dimension having been totaled to achieve the overall SERQUAL score. As can be seen from the Table 5.9, the highest gap score were for tangibles and reliability; this shows that best improvements occurred at physical facilities, equipment, appearance and ability to perform the promised service dependably and accurately. On the other hand the least improvement occurred in caring and individualized attention that the PIP provides to its users.

Table 5.9 SERVQUAL scores for new PIP services

DIMENSION	PRESENT SYSTEM	PIP	GAP SCORES	WEIGHTINGS	WEIGHTED AVERAGE
TANGIBLES	4,37	5,97	1,60	20,34	0,33
RELIABILITY	4,36	5,87	1,51	20,12	0,30
RESPONSIVENESS	4,08	5,10	1,02	18,06	0,18
ASSURANCE	4,94	5,85	0,91	21,23	0,19
EMPATHY	4,80	5,49	0,69	20,24	0,14
OVERALL AVERAGE WEIGHTED SERVQUAL SCORE =					**1,15**

5.3 Error Correction Results

Organization's number of employees is approximately 18,000 people and approximately 1000 staff members do not arrange an appointment request form. So error correction results can be measured just only for the arranged forms. Analysis results that have been done on 17,000 pieces of optical forms, shows the marking errors, the blank fields and their quantity. This analysis shows the size of the data manipulation bound. Table 5.10 indicates the field-by-field analysis of optical forms.

Table 5.10 Optical forms field by field analysis

Field name	Empty	"*"	Mismarked
T.C. Kimlik No	0	201	68
Sicil numarası	246	357	0
Anket doldurma tarihi	171	309	217
İstek	51	0	0
Medeni hal	24	0	0
Eş çalışıyor mu?	6354	0	0
Eş meslek	30	1182	0
Eş tahsil	0	118	0
Evlenme tarihi	0	84	802
Ev durumu	1209	6	0
Lojmana giriş tarihi	0	81	216
Çocuk bekleme tarihi	0	15	98
Çocuk adet	0	30	0
Çocuk okul durumu	0	9	0
Çocuk okul sınıf	0	3	0
Sağlık raporu	0	112	0
Boy	60	86	61
Kilo	75	75	64
Telefon	0	447	16
Bölge 1	0	474	0
Bölge 2	0	537	0
Bölge 3	0	351	0
Bölge 4	0	21	0
Menfı Bölge 1	0	195	0
Menfı Bölge 2	0	45	0
Görev 1	0	354	0
Görev 2	0	471	0
Görev 3	0	276	0
Görev 4	0	502	0
TOTAL	**8220**	**6341**	**1542**
GRAND TOTAL	**16103**		

Analysis results shows that collection of data with optical forms is not effective, since there has been 16,103 errors detected on 17,000 optical forms. Correcting these errors manually causes extra time and money loss. As shown on Table 5.1, data manipulation and error handling process costs 7,728$ at every year.

With the new PIP appointment request service, these errors are totally eliminated. One of the gains of the new PIP service is, accelerating the more reliable and correct data collection. At the same time, information acquisition cost is decreased. Just from error correction process *organization* saves 7,728$ at every year.

5.4 Additional Services

And also there are new services that have developed according to user needs. Some of them and their usage ratio are shown in Table 5.11.

Table 5.11 New services of PIP and their usage ratio

Service Name	**Usage ratio**
News & Announcements	12389 person/month
Messages	11062 pieces/month
Graduation Group Messages	1847 pieces/month
Frequently Asked Questions (FAQ)	83 pieces/month
Personnel Information Report	1100 print/month
Vote page	800 vote/day
Group user services	2180 records/month

New services usage ratio shows us the popularity of PIP and performance of new service. For example News & Announcements page was visited 12,389 times in a month; during this period *Organization* put forward many announcements that are related personnel affairs. New message and graduation group message services were used a lot; this shows that communication needs of staff are satisfied. Also Personnel information report service was used 1,100 times in a month; this service is used from group users and results shows that it is a starting point to standardized local and central databases. HPD changed back office progresses by replacing group user services, as a result of new group user services 2,180 records was inserted and updated by group users. This means HPD members' responsibility was changed.

CHAPTER 6

CONCLUSION

In this study, duration of information collection, service quality, error correction of newly developed PIP and present system is compared. Results of the study show that web-based applications, electronic forms and client-based system are a powerful way of managing information variety. Creating an organization wide information collection network increases information reliability, save costs, assurance, quality response time and relevance.

Information sharing between our *organizational model* and its staff with online services increase flexibility and trust. Also this study shows that e-government applications (internet & intranet portals, call centers, online forms) changes back-offices progresses and forces organizations to re-organize back-offices. So with the development of PIP, back-offices of our organizational model were changed and new work and responsibilities were structured like call-center members, help desks, group user offices.

Study results show that duration of data collection with optical forms and printed documents takes 129.5 workdays however with new PIP services the period has been shortened to 55 workdays. The cost differences between optical forms data collection process and web-based PIP services is 25,837$ at every year. So our model of government organization starts to save time and money by using new PIP.

Also our questionnaire results show that the service quality between present system and new PIP services are positively increased with the degree of 1.15 in 7 Likert scale. The criteria on which this increase occurs are tangibles, reliability, responsiveness, assurance and empathy. The questionnaires results of Appendix A, B underlines that

there is no difference between the present system and new developed PIP services about increasing the information confidence encourage degree. It is normal because the security level of both systems is high level. The same questionnaire proves that new PIP services and present systems services still do not care about uncommon personal requests. This case makes sense, since the main purpose of PIP development is to cover the organizational requirements. The questionnaire also shows that the interest level of PIP services and present system services are the same so to increasing the interest of PIP is taken as a further objective for the system. The structure does not allow the user's proposals to be realized to get feedbacks about the system will help to increase the service quality and user interest. Because of these reasons; system improvements dealing with this subject is a further undertaking for the system development.

This study can be used as guide for the other government organizations which collects information with optical forms or hard copy printed documents. This study aims to discuss possible solutions for the organizational information collection problems in the e-government literature. As mentioned above the most important gains of e-government applications by simplify the government bureaucracy, are cost and time for both the citizens and organizations.

REFERENCES

[1] Wilson W., Eric W., *Does E-Government Promote Accountability? A Comparative Analysis of Website Openness and Government Accountability,* An International Journal of Policy, Administration, and Institutions, Vol.17,2, April 2004

[2] Chun W. C., *Information Management for the Intelligent Organization (The Art of Scanning the Environment),* American Society for Information Science and Technology, Medford, New Jersey, 3th Ed, 2002

[3] O'Connell K. A., *Computerizing government: The Next Generation* ,American City and County, July 2003

[4] Şenyücel Z. *Türkiye'deki e-Devlet Anlayışı Üzerine*, Bilim Eğitim ve Düşünce Dergisi, Haziran 2003

[5] *TUIK Internet Kullanım İstatistiği*, 2005, (Available at http://www.tuik.gov.tr)

[6] Helen M. *Information Technology in Government,* London, Routledge, 1999

[7] Mateja K., Mirko V., *Evaluating the progress of e-government development: A Critical Analysis,* Information Polity, Vol. 9, 2004

[8] Yıldız M. *Examining the Motivations for E-Government from an Institutional Theory Perspective: Evidence from TURKEY*

[9] Jeffry E. K., *Citizen Satisfaction with Contacting Government on The Internet*, Information Polity, Vol. 11, 2006

[10] *Checklist for e-Government Leaders,* OECD Observer, September 2003

[11] Christine L., *The ABC's of e-government:* New Mexico State University, 2001, (Available at www.nmtabcs.org)

[12] Demirel İ., *Hukuk Elektronik Yaşam ve Ticaretin Hizmetinde veya Siber Uzayda Hukukun Yükselişi*, (Available at http://www.dtm.gov.tr)

[13] Özkan S., *A Process Capability Approach to Information Systems Effectiveness Evaluation,* The Electronic Journal of Information Systems Evaluation, Vol. 9, 2006 (Available at www.ejise.com)

[14] DeLone W. H., McLean E. R. *The DeLone and McLean Model of Information Systems Success: A Ten-Year Update*, Journal of Management Information Systems, Vol. 19, Spring 2003

[15] Pitt L. F., Watson R. T., and Kavan C. B., *Service Quality: A measure of information system effectiveness.* MIS Quarterly, Vol. 19, 2, 1995

[16] Lewis B. R., Mitchell V. W., *Defining and measuring the quality of customer services.,* Marketing Intelligence & Planning, Vol. 8, 6, 1990

[17] Dotchin J. A., Oakland J. S., *Total quality management in services: Part 2 Service quality,* International Journal of Quality & Reliability Management, Vol. 11, 3, 1994

[18] Parasuraman A., Zeithaml V. A., Berry, L. L., *Refinement and Reassessment of The SERVQUAL Scale,* Journal of Retailing Vol. 67, 1991

[19] Arash S., *SERVQUAL and Model of Service Quality Gaps: A Framework for Determining and Prioritizing Critical Factors in Delivering Quality Services* (Available at http://www.surveyz.com)

[20] Yong J. K., Mike E., Joong H. A., *Measuring IS Service Quality in the Context of the Service Quality-User Satisfaction Relationship,* Journal of Information Technology Theory and Application, Vol.7, 2, 2005

[21] Zhao Y., Liu Y., Tan J., *The Research of SERVQUAL Instrument Applying in Chinese Higher Education*, IEEE, 2006

[22] Yıldız M. *E-government research: Reviewing the literature, limitations, and ways forward,* Government Information Quarterly Vol. 24, 2007, (Available at www.sciencedirect.com)

[23] Hasan S., *Introducing e-government in Bangladesh: Problems and prospects*, International Social Science Review, Vol. 78

[24] OECD Policy Brief, *The e-government imperative: main findings,* March 2003

[25] The E-Government Imperative OECD 2003,
(Available at http://www.edevlet.net/raporveyayinlar/eGov2003.pdf)

[26] Nüfus ve Vatandaşlık İşleri Genel Müdürlüğü,(Available at http://www.nvi.gov.tr)

[27] OMR User Guide. Published by National Computeer System Ins, USA 1999

[28] Christine L., *E-Government in Europe: The State of Affairs Imperative OECD 2003*

[29] Tavşancıl E., *Tutumların Ölçülmesi ve SPSS ile Veri Analizi,* Nobel, Ankara, 2002

APPENDIX A

Açıklama: Aşağıdaki anket optik ve personel bilgi formları ile idame ettirilen **Yönetim Bilgi Sistemi (YBS)** hakkındaki düşüncelerinizi öğrenmek için hazırlanmıştır. Sistemin servis kalitesinin doğru ölçülebilmesi amacıyla, cevaplarınızı düşüncelerinize en yakın olan şıkları işaretleyerek vermenizi rica ederiz. Aşağıdaki ifadeleri tamamen katılıyorum ile kesinlikle katılmıyorum aralığında değerlendiriniz. Her ifadeye TEK cevap veriniz. Ankette doğru ya da yanlış cevap olmayıp, ifadeler tamamen sizin düşüncelerinizi ölçmeye yönelik hazırlanmıştır.

Kesinlikle Katılmıyorum						**Tamamen Katılıyorum**
1. YBS'de bilgilerim sürekli güncel halde tutulur.						
☐	☐	☐	☐	☐	☐	☐
2. YBS'nin görsel olarak başarılı olduğunu düşünüyorum.						
☐	☐	☐	☐	☐	☐	☐
3. YBS ara yüzlerinin kullanıcı uyumlu olduğunu düşünüyorum.						
☐	☐	☐	☐	☐	☐	☐
4. YBS'nin görsel yapısı sağlanan servislerle uyumludur.						
☐	☐	☐	☐	☐	☐	☐
5. YBS'de işlemler planlanan / vaad edilen süre içerisinde gerçekleşir.						
☐	☐	☐	☐	☐	☐	☐
6. YBS'de problem ile karşılaştığınızda sistem elemanları çözüm için en seri şekilde çalışırlar.						
☐	☐	☐	☐	☐	☐	☐
7. YBS güvenilirdir.						
☐	☐	☐	☐	☐	☐	☐
8. YBS'de hizmete girmesi planlanan uygulamalar vaad edilen zamanda gerçekleştirilir.						
☐	☐	☐	☐	☐	☐	☐
9. YBS'de kayıtlar hatasız tutulur.						
☐	☐	☐	☐	☐	☐	☐
10. YBS'de kullanıcılara uygulamaların ne zaman aktif hale geleceği söylenir.						
☐	☐	☐	☐	☐	☐	☐
11. YBS destek görevlileri anında/gecikmesiz hizmet verir.						
☐	☐	☐	☐	☐	☐	☐
12. YBS destek görevlileri kullanıcıya destek vermeye isteklidirler.						
☐	☐	☐	☐	☐	☐	☐
13. YBS uygulamalarında sıksık yoğunluk nedeniyle yavaşlama yaşanmaz.						
☐	☐	☐	☐	☐	☐	☐
14. YBS uygulamaları, kullanıcıları bilgi gizliliği konusunda teşvik eder.						
☐	☐	☐	☐	☐	☐	☐
15. YBS kayıtlarımda yaptığım değişikliklerin sisteme emniyetli bir şekilde aktarıldığına						

güvenirim.						
☐	☐	☐	☐	☐	☐	☐
16. YBS destek elemanları kibardır.						
☐	☐	☐	☐	☐	☐	☐
17. YBS'nin aktif /güncel tutulmasından sorumlu kişiler işlerini yapma konusunda bilinçlidir.						
☐	☐	☐	☐	☐	☐	☐
18. YBS kullanıcılara bireysel destek verir.						
☐	☐	☐	☐	☐	☐	☐
19. YBS destek elemanları nadir karşılaşılan kullanıcı ihtiyaçlarını dikkate alır.						
☐	☐	☐	☐	☐	☐	☐
20. YBS yöneticileri kullanıcı ihtiyaçlarının farkındadır.						
☐	☐	☐	☐	☐	☐	☐
21. YBS ilgi alanlarınız içinde ilk sıradadır.						
☐	☐	☐	☐	☐	☐	☐
22. YBS'nin aktif olma zamanları kullanıcılar için uygun olacak şekilde planlanmıştır.						
☐	☐	☐	☐	☐	☐	☐

APPENDIX B

Açıklama: Aşağıdaki anket **Personel Bilgi Sistemi (PBS)** hakkındaki düşüncelerinizi öğrenmek için hazırlanmıştır. Sistemin servis kalitesinin doğru ölçülebilmesi amacıyla, cevaplarınızı düşüncelerinize en yakın olan şıkları işaretleyerek vermenizi rica ederiz. Aşağıdaki ifadeleri tamamen katılıyorum ile kesinlikle katılmıyorum aralığında değerlendiriniz. Her ifadeye TEK cevap veriniz. Ankette doğru ya da yanlış cevap olmayıp, ifadeler tamamen sizin düşüncelerinizi ölçmeye yönelik hazırlanmıştır.

Kesinlikle Katılmıyorum						**Tamamen Katılıyorum**
1. PBS'de bilgilerim sürekli güncel halde tutulur.						
☐	☐	☐	☐	☐	☐	☐
2. PBS'nin görsel olarak başarılı olduğunu düşünüyorum.						
☐	☐	☐	☐	☐	☐	☐
3. PBS arayüzlerinin kullanıcı uyumlu olduğunu düşünüyorum.						
☐	☐	☐	☐	☐	☐	☐
4. PBS'nin görsel yapısı sağlanan servislerle uyumludur.						
☐	☐	☐	☐	☐	☐	☐
5. PBS'de işlemler planlanan / vaad edilen süre içerisinde gerçekleşir.						
☐	☐	☐	☐	☐	☐	☐
6. PBS'de problem ile karşılaştığınızda sistem elemanları en seri şekilde çözüm için çalışırlar.						
☐	☐	☐	☐	☐	☐	☐
7. PBS güvenilirdir.						
☐	☐	☐	☐	☐	☐	☐
8. PBS'de hizmete girmesi planlanan uygulamalar vaad edilen zamanda gerçekleştirilir.						
☐	☐	☐	☐	☐	☐	☐
9. PBS'de kayıtlar hatasız tutulur.						
☐	☐	☐	☐	☐	☐	☐
10. PBS'de kullanıcılara uygulamaların ne zaman aktif hale geleceği söylenir.						
☐	☐	☐	☐	☐	☐	☐
11. PBS destek görevlileri anında/geçikmesiz hizmet verirler.						
☐	☐	☐	☐	☐	☐	☐
12. PBS destek görevlileri kullanıcıya destek vermeye isteklidir.						
☐	☐	☐	☐	☐	☐	☐
13. PBS uygulamalarında sık sık yoğunluk nedeniyle yavaşlama yaşanmaz.						
☐	☐	☐	☐	☐	☐	☐
14. PBS uygulamaları, kullanıcıları bilgi gizliliği konusunda teşvik eder.						
☐	☐	☐	☐	☐	☐	☐
15. PBS kayıtlarımda yaptığım değişikliklerin sisteme emniyetli bir şekilde aktarıldığına						

güvenirim.						
☐	☐	☐	☐	☐	☐	☐
16. PBS destek elemenları kibardır.						
☐	☐	☐	☐	☐	☐	☐
17. PBS'nin aktif /güncel tutulmasından sorumlu kişiler işlerini yapma konusunda bilinçlidir.						
☐	☐	☐	☐	☐	☐	☐
18. PBS kullanıcılara bireysel destek vermez.						
☐	☐	☐	☐	☐	☐	☐
19. PBS destek elemanları nadir karşılaşılan kullanıcı ihtiyaçlarını dikkate alır.						
☐	☐	☐	☐	☐	☐	☐
20. PBS yöneticileri kullanıcı ihtiyaçlarının farkındadır.						
☐	☐	☐	☐	☐	☐	☐
21. PBS ilgi alanlarınız içinde ilk sıradadır.						
☐	☐	☐	☐	☐	☐	☐
22. PBS'nin aktif olma zamanları kullanıcılar için uygun olacak şekilde planlanmıştır.						
☐	☐	☐	☐	☐	☐	☐

APPENDIX C

PRESENT SYS	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22
per 1	6	7	7	6	7	7	7	6	5	6	7	7	2	6	7	6	6	5	6	7	7	6
per 2	7	6	6	6	5	5	6	5	5	5	6	5	2	5	5	5	5	6	6	6	5	6
per 3	7	7	7	7	7	7	7	6	6	7	7	6	5	6	7	6	7	2	2	7	6	6
per 4	7	6	6	6	6	6	4	4	6	4	6	6	4	4	7	7	7	4	5	5	5	1
per 5	7	1	1	4	4	3	1	4	4	2	5	5	1	4	2	6	5	7	7	1	7	2
per 6	6	5	3	4	6	6	6	6	6	2	6	7	2	6	6	7	6	6	7	7	7	7
per 7	6	6	6	6	1	6	6	4	5	1	1	7	4	4	4	4	6	5	6	6	7	6
per 8	5	6	6	6	5	6	6	5	6	2	4	4	3	5	5	4	6	6	6	6	7	6
per 9	5	5	6	3	3	3	6	3	4	2	2	7	1	6	4	2	3	5	5	5	6	4
per 10	5	6	5	5	6	6	5	6	4	5	7	7	2	6	6	6	7	6	5	7	7	7
per 11	2	3	6	6	6	6	6	7	7	4	6	6	6	6	2	6	6	6	6	6	6	6
per 12	7	7	7	7	7	7	7	7	7	4	7	7	3	7	7	7	7	7	7	7	7	1
per 13	7	6	6	6	7	7	7	7	7	7	7	7	6	7	7	7	7	7	7	7	7	7
per 14	7	6	6	6	7	7	7	7	6	7	7	7	7	7	7	1	7	7	7	7	7	7
per 15	7	7	6	7	7	6	7	7	7	2	7	7	3	7	7	4	6	3	2	6	7	6
per 16	5	4	4	4	3	2	2	3	3	1	2	3	1	7	3	7	5	3	2	2	2	2
per 17	4	4	4	3	2	5	3	5	2	5	5	6	1	3	4	7	6	7	6	6	7	4
per 18	7	6	6	6	3	2	7	4	6	7	5	6	1	7	7	7	6	6	6	1	4	2
per 19	3	4	3	4	3	3	2	3	2	3	3	4	2	4	6	4	4	2	2	3	2	2
per 20	1	2	3	3	2	3	3	3	2	2	2	3	3	3	4	4	4	5	3	3	6	4
per 21	2	3	2	2	3	3	3	4	3	4	5	4	4	4	4	7	6	2	6	6	5	5
per 22	5	6	6	6	5	6	5	5	6	2	3	3	4	5	6	6	6	3	5	5	5	6
per 23	1	1	1	3	1	1	4	1	2	6	1	7	1	3	1	1	1	7	6	1	7	7
per 24	2	3	3	2	3	2	1	3	2	2	3	4	2	6	5	5	5	7	2	2	3	4
per 25	3	3	4	3	2	4	5	4	3	4	6	6	2	5	5	5	5	4	3	4	3	3
per 26	1	1	1	2	2	3	2	3	3	5	3	3	2	5	6	5	5	3	5	4	3	6
per 27	4	3	3	3	2	2	6	4	4	1	7	3	6	3	6	5	3	1	1	2	2	3
per 28	2	2	3	2	2	3	2	2	2	5	1	3	2	2	2	4	4	3	2	3	7	7
per 29	3	2	2	2	5	1	4	5	3	5	5	6	1	7	7	7	7	7	5	7	6	6
per 30	5	1	1	1	4	4	5	5	5	3	5	4	1	2	3	4	4	4	4	1	6	3
per 31	5	5	5	4	2	4	3	3	4	2	5	2	1	4	3	3	3	4	5	2	4	2
per 32	3	2	2	2	2	1	2	2	1	3	1	2	1	1	2	1	7	2	1	2	1	2
per 33	7	7	7	7	7	7	4	7	4	7	7	7	4	1	1	1	7	7	7	7	7	7
per 34	7	2	5	6	5	5	6	6	6	3	4	3	3	7	7	3	2	6	6	3	7	7
per 35	5	6	5	5	5	7	7	6	6	6	7	7	6	7	7	7	7	6	6	7	6	7
per 36	1	1	2	2	1	1	6	2	2	2	6	2	2	6	6	2	6	2	2	2	7	7
per 37	4	6	4	6	4	5	4	3	2	4	5	5	3	2	4	6	4	4	5	3	5	4
per 38	6	5	5	5	6	6	6	5	5	5	5	7	2	6	5	6	6	6	7	6	3	2
per 39	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	6	2
	4,6	4,23	4,28	4,36	4,10	4,36	4,67	4,46	4,23	3,82	4,69	5,05	2,77	4,82	4,85	4,79	5,28	4,74	4,69	4,46	5,44	4,67
	4,37				4,36					4,08				4,94				4,80				

APPENDIX D

PIP	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22
per 1	7	6	5	5	6	5	6	6	6	4	6	6	2	3	7	7	6	5	6	6	7	6
per 2	7	7	7	7	7	7	7	7	7	4	7	7	3	7	7	7	7	7	7	7	7	7
per 3	7	7	6	7	6	7	7	7	7	6	7	7	6	7	7	7	7	7	7	7	7	7
per 4	7	7	6	7	7	7	7	6	6	6	7	7	7	7	7	7	7	7	7	7	7	7
per 5	7	7	7	7	7	7	7	7	7	6	7	7	5	1	7	7	7	7	7	7	7	7
per 6	6	7	7	7	7	7	7	7	7	7	7	7	3	7	7	7	7	7	7	7	7	7
per 7	7	6	6	6	6	5	6	6	6	6	6	6	3	5	7	7	7	7	6	6	5	6
per 8	6	6	6	5	7	6	7	7	7	6	6	6	2	6	6	6	6	5	6	6	5	6
per 9	3	6	6	6	5	4	3	4	4	2	3	5	3	4	5	5	5	5	5	5	7	5
per 10	6	7	6	6	6	7	7	7	6	5	7	7	4	6	6	7	7	7	7	7	7	7
per 11	6	6	6	7	5	4	6	5	6	5	3	3	3	6	6	6	6	5	4	5	4	6
per 12	5	4	5	5	5	5	4	5	4	4	3	6	2	4	5	6	6	4	6	5	6	3
per 13	6	6	5	5	4	6	7	6	7	2	5	7	7	5	6	6	6	1	3	3	4	4
per 14	6	5	4	6	4	6	7	6	6	2	3	7	7	6	6	6	6	1	2	6	6	6
per 15	7	7	6	7	7	6	7	7	7	2	7	7	3	7	7	5	7	2	2	6	7	6
per 16	7	5	5	6	7	6	6	7	5	6	7	7	4	4	5	6	6	5	5	5	7	5
per 17	3	6	6	7	7	7	7	6	6	2	6	6	2	6	7	7	5	3	4	2	6	1
per 18	4	5	5	5	3	3	2	4	5	6	5	5	1	5	5	5	5	7	3	6	7	7
per 19	6	6	4	4	7	6	7	6	6	6	3	3	4	7	4	5	4	5	4	2	5	4
per 20	4	4	4	4	4	5	5	4	4	4	4	5	1	3	3	3	3	4	4	5	2	4
per 21	3	7	7	7	3	5	6	4	4	4	3	7	3	5	6	6	6	3	7	6	6	6
per 22	6	4	4	4	5	5	6	5	6	3	2	6	6	6	6	7	7	6	6	5	5	1
per 23	7	1	1	1	2	4	1	4	6	4	4	6	1	4	1	6	6	7	6	1	5	5
per 24	6	6	5	4	6	6	6	6	6	2	6	6	2	6	6	7	6	7	7	7	7	7
per 25	7	7	7	7	7	7	7	6	6	7	7	6	5	6	7	6	7	2	2	7	6	6
per 26	7	6	5	5	5	5	5	6	6	6	6	5	1	6	6	6	5	2	2	1	6	2
per 27	7	7	6	7	6	7	7	6	7	6	6	6	6	7	7	7	6	4	1	7	7	7
per 28	7	6	6	7	6	6	7	7	6	7	7	7	6	7	7	7	7	6	6	7	7	7
per 29	7	7	7	7	7	7	7	7	7	6	7	7	3	4	7	7	7	4	7	7	7	7
per 30	6	7	7	7	6	7	7	6	5	4	6	6	4	5	5	7	7	6	6	6	6	6
per 31	7	7	7	7	6	7	6	6	6	6	7	7	4	7	7	7	7	6	6	6	6	6
per 32	7	7	7	7	7	7	7	7	7	7	7	7	1	7	7	7	7	7	7	6	6	7
per 33	7	4	4	7	4	7	7	7	4	7	7	7	1	7	7	7	7	7	7	7	7	7
per 34	7	7	7	7	7	7	7	7	4	4	7	7	1	7	7	7	7	7	7	7	7	7
per 35	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
per 36	7	6	6	6	6	4	5	6	3	7	6	6	6	7	6	2	2	6	2	7	7	7
per 37	3	5	6	5	5	5	5	5	4	5	5	5	3	5	5	5	5	5	5	5	4	5
per 38	7	6	6	6	4	4	6	4	1	5	5	5	1	2	6	6	6	5	5	4	5	2
per 39	7	7	7	7	7	7	7	7	7	7	7	7	6	1	1	1	1	1	1	1	7	7
	6,13	6,00	5,74	6,00	5,72	5,90	6,10	5,97	5,67	5,00	5,67	6,18	3,56	5,44	5,92	6,08	5,97	5,10	5,10	5,49	6,10	5,64
	5,97				5,87					5,10				5,85				5,49				