

**THE ROLE OF INFORMATION AND COMMUNICATION
TECHNOLOGY IN PUBLIC SERVICE DELIVERY AND
URBAN ADMINISTRATION**

By

Nayab Khan

(NUST201463371MSCEE15814F)

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This is to certify that the
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Nayab Khan

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Dr. Abdul Waheed, PhD

Department of Urban & Regional Planning

National Institute of Transportation

NATIONAL UNIVERSITY OF SCIENCES AND TECHNOLOGY, ISLAMABAD

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Signature: _____

Name of Supervisor: Dr. Abdul Waheed

Date: _____

Signature (HOD): _____

Date: _____

Signature (Dean/Principal): _____

Date: _____

Dedication

To Baba, Ammi & Yasir

(My three pillars of support and belief)

Abstract

The development of information and communication technologies (ICT) is interlinked with the development of urban service delivery and urban administration. From the development of high-tech knowledge zones, interactive installations or the digital screens, the ICT infuses the urban planning that mediates the urban service delivery and digital and physical networks of the people. In the current age of technology, people all over the world are connected via technology. Consumers with the use of various devices can now interact with different commercial and business operations. Even though the study of ICT services and its adoption is mostly related only to developed countries, just a few types of research are based on developing countries. The primary objective of this research is to explore the relationship of ICT in the context of ICT and urban technologies and its impact on the public service delivery and administration of two public organizations of Pakistan. The objectives of the study were to determine the level of ICT processes in terms of ICT penetration and ICT infrastructure, as well as to find the barriers in the implementation of ICT in public service delivery in these organizations. This research aims to answer of how the opportunities created by the ICT and urban technologies can be used in the city transformation in regard of public service delivery and its user's engagement in different cities of Pakistan.

Mix method research was adopted for the research design. The population of CDA and PDA was targeted from which a sample size of 87 was derived for both the organizations. The questionnaire was the main instrument for data collection for this study. Field observations and interviews were conducted to gain the knowledge about existing and proposed uses and views about ICT and its role in enhancing urban services delivery of Islamabad and Peshawar city; therefore, data collection method also

included interviews with local citizens and professionals. Expert comments on the data were analyzed and overall conclusions were drawn. Data analysis was done with the SPSS for quantitative data and thematic analysis was done for qualitative data. Results were presented in the form of frequency distribution charts and tables.

The findings of the study show that most of the employees agreed that they would shift to the use of ICT to make services more efficient, thus ensuring better services delivery to the customers. Data analysis also reveals that the factors of ICT infrastructure and ICT penetration influence the ICT use in public service delivery in contrast to user's elements such as customers knowledge and demand. The study concluded that mostly respondent's both organizational and customers viewed the use of ICT services as positive. Nevertheless the degree of assertiveness differed.

TABLE OF CONTENTS

Dedication	iii
Abstract.....	iv
TABLE OF CONTENTS	vi
Acknowledgments	xi
Chapter 1. Introduction.....	1
1.1 Importance of ICT in Public service delivery	3
1.2 Profile of the organizations	5
1.3 Problem statement	5
1.4 Objectives.....	9
1.5 Research Questions	10
1.5 Scope of the study	10
1.6 Significance of the Study	11
Chapter 2. Literature Review	12
2.1 Impacts of ICT adoption on Service Delivery (International context).....	15
Issy-Les Moulineaux (France).....	15
SMG (SEOUL metropolitan government)	17
2.2 Impacts of ICT adoption on Service Delivery (Regional context).....	17
ICT in Urban Service Delivery in INDIA	17
2.3 ICT in Pakistan.....	18
2.4 Framework	20
2.5 Variables definition	21
2.5.1 Dependent variable	21
2.5.2 Independent Variables	22
Chapter 3. Research Methodology	24
3.1 Research Design.....	24
3.2 Research Method.....	25
3.3 Steps in the Research.....	25
3.3.1 Population.....	26
3.3.2 Sample Size	26
3.4 Data Collection.....	29
3.4.1 Primary Data Collection	29
3.4.2 Secondary Data Collection	29

3.4.3	Data Analysis.....	30
3.4.4	Methodology flow chart	31
Chapter 4.	Data Analysis.....	32
4.1	Introduction	32
4.2	Organizational Data.....	32
4.2.1	Background Information.....	32
4.3	Demographic Characteristics of the organizational data.....	33
4.3.1	Respondents by Gender	34
4.3.2	Respondents by Age	34
4.3.3	Level of Education	34
4.3.4	Respondent’s experience	35
4.4	Organizational Factors	35
4.4.1	Change in Urban administration.....	35
4.5	ICT penetration	36
4.5.1	Preferred Service Delivery Channels.....	38
4.5.2	Handling of Complaints/Demands	39
4.5.3	Percentage of Digitized data.....	40
4.5.4	Satisfaction level of respondents with ICT services delivery	41
4.6	Human Resources.....	42
4.6.1	Employing criteria	44
4.6.2	Performers of the ICT functions.....	45
4.7	ICT connectivity & Infrastructure.....	46
4.7.2	ICT network solutions	47
4.7.3	Purchasing of Software Applications	48
4.7.4	ICT measures.....	49
4.7.5	The extent of ICT adoption	50
4.7.6	Rating of ICT services.....	50
4.8	Impact of ICT on service delivery.....	52
4.8.1	Improvement of ICT services	53
4.8.2	Perception of respondents about ICT effectiveness in service delivery	55
4.9	User’s Factors.....	57
4.9.1	Respondents by Gender	58
4.9.2	Respondents by Age	58
4.9.3	Respondents by Education.....	58
4.9.4	Respondents by Occupation	58
4.9.5	Respondents by Working sector	59

4.9.6	Respondents by Area of residence.....	59
4.10	The frequency of Use of ICT tools.....	59
4.11	User’s knowledge about internet services.....	62
4.12	User’s Awareness.....	68
4.13	Perception Of users towards effect of ICT services delivery.....	69
4.14	Satisfaction level of users with the delivery of services through ICT	71
4.15	Barriers.....	74
4.15.1	Challenges/factors deterring the use of ICT systems	74
4.16	One Way ANOVA	75
Chapter 5. Conclusions and Recommendations.....		77
5.1	Conclusions.....	77
5.2	Recommendations	81
Chapter 6. REFERENCES.....		83
Chapter 7. ANNEXURE.....		87

List of Tables

Table 1:Networked Readiness Index 2016	8
Table 2:Framework	23
Table 3: Sample size (Organization).....	28
Table 4:Sample size(Customers)	29
Table 5 : Demographics of the organizational data	33
Table 6 :ICT penetration in CDA & PDA	36
Table 7: Network characteristics	37
Table 8 :Official use of the internet	37
Table 9 :Satisfaction level of respondents with ICT services delivery.....	41
Table 10: Characteristics of ICT usage.....	43
Table 11 :Performers of the ICT functions	45
Table 12:Availability of online facility.....	46
Table 13: ICT network solutions	47
Table 14: Purchasing of Softwares	48
Table 15: ICT measures	49
Table 16: Extent of ICT adoption	50
Table 17: Rating of ICT services	51
Table 18: Impact of ICT On Service Delivery.....	52
Table 19: Perception of respondents about ICT effectiveness in service delivery	55
Table 20 :Demographic data of users	57
Table 21: Cross tabs of Frequency of Use of ICT tools	61
Table 22: Perception Of users towards ICT services delivery.....	71
Table 23: Satisfaction level of users with the delivery of services through ICT.....	73
Table 24:Challenges/Factors Deterring the Use Of ICT Systems	74
Table 25 :One way ANOVA.....	75

Table of Figures

Figure 1 Themes of ICT in urban services.....	4
Figure 2:Ranking of Pakistan for freelance development in the world	20
Figure 3:Relationship between the dependent and independent variables	21
Figure 4 :Methodology Framework	31
Figure 5:Change in Urban administration (In percentages).....	35
Figure 6:Preferred Service Delivery Channels (In percentages)	38
Figure 7: Handling of Complaints/Demands (In percentages)	39
Figure 8:Percentage of Digitized data (In percentages).....	40
Figure 9: Satisfaction Level of Respondents with ICT Services Delivery (In Percentages)	42
Figure 10:Employing criteria (In percentages)	44
Figure 11:Improvement of ICT services (PDA) (In percentages)	53
Figure 12:Improvement of ICT services (CDA) (In percentages).....	54
Figure 13:Perception of respondents about ICT effectiveness in service delivery (In percentages)	56
Figure 14: Frequency of Use of ICT tools(PDA) (In percentages)	59
Figure 15:Frequency of Use of ICT tools(CDA) (In percentages)	60
Figure 16:Knowledge about internet services (In percentages).....	63
Figure 17:Usage of internet services (in percentages).....	64
Figure 18:Satisfaction with The Agent (In Percentages).....	65
Figure 19:Timely Delivered Services (In Percentages)	66
Figure 20:Satisfaction with the agent (In percentages).....	67
Figure 21:Sufficiency of electronic services (In percentage)	67
Figure 22:Publicity of Services.....	68
Figure 23:Perception Of users (In percentages).....	70
Figure 24:Satisfaction level of users with the delivery of services through ICT (IN percentages).....	72
Figure 25:Factors involved in Public service delivery	80

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Chapter 1. Introduction

With the rise of the internet, the practices and explosion of e-business and commerce models, digital connectivity models in the private sector are forcing the public sector to re-think bureaucratic and hierarchical models of the organizations (Ndou, 2004). Furthermore, the options of better service delivery and the increasing expectations of the citizens from the private sectors are challenging public organizations to be time responsive. As a result, recent decades had experienced the paradigm shift in the role of public organizations where the role of citizen is to shift from hierarchy to participation and team work and to empower rather than serve customers, to be customer focused and mission oriented, more emphasis on prevention rather than cure (Osborne & Gaebler 1992). The need to reform the bureaucracy was highly debated around the world in the early 1980's. As a result, the governments of developing and developed countries faced the need to modernize management systems and administrative practices as well as the challenge of transformation (Tapscott, 1996). In this regard ICT can be used as an effective tool to increase inclusivity, accessibility and flexibility of public services, increased productivity and improved value for money.

With the start of a contemporary period, it provided with the new era of consumerism leading to the urban lifestyle and societal transformation in all aspects. With the advent of information and communication technologies, the perception of space and time had almost been purged in terms of different means of interaction and transportation. These interactions include the third and fourth generation mobile and other digital information and communication technologies (ICT) via the World Wide Web. Per the statistics there are about 2.32 billion people which are presently using third generation mobile around the world and is projected to reach around 2.87 by 2020 (Smartphone users worldwide

2014-2020 | statistic, 2015). In today's contemporary world where technologies and science had nurtured to its best, where service sector is a lot more demanding and influential than the manufacturing, industrial sectors and had resulted in the growth and productivity of many cities around the world. The development of digital and communication technologies (ICT) is interlinked with the development of urban service delivery. From the development of high-tech knowledge zones, interactive installations or the digital screens, the ICT infuses the urban form that mediates the urban infrastructure and digital and physical networks of the people. This includes the physical and spatial distributions in the form of centers of digital growth, silicon valleys, and multimedia clusters, the transformation of the social interaction networks, telecommuting impacting travel flows and movements of people as well as information (Houghton, 2010).

ICT is now considered as the base of success in every aspect of the economy globally. Information and communication technology offers an important role in improving productivity in terms of reducing transaction costs and immediate connectivity (visual, voice and data). ICT has also replaced more expensive means of organizational operations including communication and economic transactions. These include a variety of choices in the market place, access to unavailable goods and services, channeling knowledge and information, and widening the geographic scope of potential markets. Several countries are now providing a lot of information and knowledge about their delivery of services at central, provincial/regional, and district level in the form of online two-way communication for its citizens (Talvitie, 2004). ICT is a tool to support the work of governmental institutions and agencies with the objective of delivering

public services and information in a more convenient, citizen centric and cost-effective manner.

1.1 Importance of ICT in Public service delivery

ICT processes have provided corporate institutions with comprehensive knowledge and management (Bryson, 2006). Information services have the dual responsibility of managing/planning as well as adding value to organizations strategy and policy. ICT systems and processes enable an effective and flexible service infrastructure, which provides organizations with accomplishing competitive prospects in terms of management resources, innovations and improved service delivery. ICT integrates and connects the roles of technology and organizational management and service delivery.

Public service delivery plays an important role in transparent transactions reducing economic inequality boost the human and social capital of the countries. An effective public service delivery is a significant concern for the socio-economic development of the countries. Also, numerous studies had claimed that there is a strong relationship between economic development and effective public service delivery (Shah, 2005). South Asian countries such as India, Pakistan, Bangladesh are far behind in the progression as compared to the countries of Asia like the Philippines and Indonesia in the context of public service delivery.

ICT had been used as a tool for solving urban problems and developing efficient and effective governance mechanism in terms of the multitude of newly developed hardware and software technology advancements in the field of urban and regional planning. There are five main themes of ICT in urban services



Figure 1 Themes of ICT in urban services

The focus of this research would be upon understanding the ICT role in public service & urban administration. Clearly the role of ICT cannot be neglected since they had become vital ingredients of urban life via various networks and communication systems. The dual nature of the urban service delivery had causes various transformations in urban administration & services delivery and had redefined the demands of communications, technology and society aspects. REAL-TIME information enables better decisions, through integrated hardware, software and network technologies for engagement and management.

This thesis is based on the basic trends in ICT in public service delivery. It will critically analyze and discuss various approaches for its role in the public service sector and how it implies the diverse formulations of managing and connecting citizens through the adoption of ICT in the public service sector.

1.2 Profile of the organizations

Capital Development Authority

Capital Development Authority (CDA) is a public organization and public benefit corporation responsible for municipal services in Islamabad. It was established in June 1960, under the CDA Ordinance 1960. To enhance the productivity of the organization, CDA had embraced ICT technologies in terms of adopting new IT systems at its one window operations department in October 2014. The main objectives of one window operations are to streamline public dealings with CDA office, decrease chances of fraud, save the time of citizens and officials, increased monitoring and supervision of officials and provide guaranteed response time to owners/applicants to reduce inconvenience.

Peshawar Development Authority

The Greater Peshawar Metropolitan Authority (PMA) was created under Urban Planning Act 1975. It was renamed as PDA (Peshawar development authority in 1978 under the Provincial Government promulgated Urban Planning Ordinance (UPO) & under its Section-17 Local Area Authorities (LAAs) were established. PDA strives to transform Peshawar into an “attainable city” in the collective context of citizens. Private sector and different governmental levels, where majority of its citizens enjoy conveniently, satisfied and healthy

1.3 Problem statement

The growing demand and use of digital information and communication technologies had an implicit impact on all the realms of life. Hence, its likely effects on the urban service delivery and administration had developed a focus area for planners and city

management. The use of ICT in public sector and how its affect the service delivery of authorities/ departments have been commonly debated among scholars by looking at what different technologies and their applications do by enabling them to do what it does in term of service delivery. The purpose and visualization of the cities based on an apparent style or concept can be reflected in their societies and its urban dynamics. E.g. the ventures of the modernist visions during 1900's, radical or post-modernist during mid-late of the 20th century (Olivera, 2016) and now the age of digital revolution and communication technologies.

This thesis will investigate the role of ICT (digital information and communication technologies) in urban administration and services delivery of public organizations and how the city can be visualized in terms of ICT's as the means of engaging, communicating, interacting societies and cultural representations. It also aims to review what role can ICT play to fill these gaps and examine this with the context of public sector innovation and how can ICT contribute to the much needed institutional and procedural reforms and to more efficient control mechanisms, with the aim of improving urban delivery of services.

Consumers with the use of various devices can now interact with different commercial and business operations. Even though the study of ICT services and its adoption is mostly related only to developed countries, only a few types of research are based on developing countries. The main objective of this research is to explore the relationship of ICT in the context of urban technologies and its impact on the urban service delivery and administration in the context of two public organizations of Pakistan. The objectives of the study were to determine the level of ICT processes in terms of ICT penetration and ICT infrastructure, and to found barriers to the implementation of ICT

in these organizations. This research aims to answer of how the opportunities created by the ICT and urban technologies can be used in the city transformation in regard of public service delivery and its user's engagement in different cities of Pakistan.

Many of the developing countries are lacking digitized mechanism of ID cards, voting, community participation, social audit and community score cards which enhance transparent processing of the systems. Due to the absence of digitization/ICT, these systems and processes are manipulated and provide excessive advantage or control to the public authority. ICT helps in preventing these manipulations via control and symmetrical information in every step. Effective management and public services of resources lead to the improved quality of the decentralization (Azfar, Kähkönen, Lanyi, Meagher & Rutherford, 1999).

In 1976 – 97, Pakistan Public Administration Research Center formulated and submitted more than 200 recommendations to the committee for improving the quality of services and to modernize the public administration by use of ICT. The government of Pakistan has come up with different administrative reforms, such as the use of “e-Office Suite” in public institutes. As one of the administrative reform initiatives can be taken as the use of ICT in the government departments. Or in other words, Government of Pakistan has recognized the importance of ICT in public sectors and it has the potential to transform not only the way in which public services are delivered but also the vital relationship between citizens and government (Shaikh, Shah & Wijekuruppu, 2016). Despite the ICT attempts, Pakistan ranked low regionally and internationally as

supported by Networked Readiness Index¹ in 2016 Global information technology report.

Table 1: Networked Readiness Index 2016

Country	Rank	Score
Taiwan, China	1	7.0
United States	5	7.0
Japan	14	6.6
China	90	3.3
Iran	101	3.0
Sri Lanka	103	3.0
Bangladesh	107	2.8
India	114	2.6
Pakistan	126	2.1

Source: Global Information Technology Report 2016

There might be various factors affecting the use of ICT in public service delivery. International Monetary Fund² states that internet penetration to be 22.2% of the country. It is evident from this data profile that the internet usage in the country is somewhat growing. Moreover, an organization is faced with a distinct administrative set up and limited by the quality and quantity of skilled human resources coupled with the financial constraints, all these can shape the effectiveness of ICT in the organization

¹ The NRI (Networked Readiness Index) examines how prepared countries are to use ICT effectively based on five variables including the mobile network coverage, International Internet bandwidth, secure internet servers or electricity production) as well as the availability of digital content.

See <http://reports.weforum.org/global-information-technology-report-2016/networked-readiness-index/> Accessed 5th January 2018

² <https://www.internetworldstats.com/stats3.htm> Accessed 8th January 2017

(Upadhyaya, 2011). Thus, the government of Pakistan has recognized the importance of ICT to modernize the institutions while on the other hand it is faced with the distinct supply (organizational) and demand (customers) set up which may affect the effectiveness of ICT in service delivery. Based on this scenario the statement arises that which factors influence the use of ICT in public organizations.

In Pakistan, many of the projects concerned with the local bodies take a lot of time, and cost to implement and complete any of the projects. And there are considerable gaps between the authorities at the provincial capital and district capital level. The biggest cities of Pakistan such as Peshawar and Islamabad with its population increasing at the fastest rate required the need to accommodate the ICT to enhance and maintain its urban and regional planning. What role can ICT play to fill these gaps and examining this with the context of public sector innovation?

How can ICT contribute to the much needed institutional and procedural reforms and to more efficient control mechanisms, with the aim of improving urban delivery of services? This research also examines the need to enhance the practices of urban and regional planning in context of the emerging needs of the information, interactive society and its impacts on societal transformation.

1.4 Objectives

The main objective of the research is as follow;

- To review the current penetration and application (connectivity and Infrastructure) of ICT in selected development authorities.
- To analyze the impacts of (non)application of ICT in public service delivery in selected development authorities.

- To investigate the opportunities and challenges in the application of ICT in selected development authorities.
- To recommend strategies to promote the role of ICT towards better public service delivery and administration.

1.5 Research Questions

The main research questions of this research are;

- What are the characteristics and modern using of the ICT in urban services? Functions, policies, characteristics etc.
- What are the policies interventions to promote ICT in urban administration? Public service delivery, e.g. functionality, management, user's engagement.
- How ICT affects the urban service delivery? Impact questionnaire and expert opinion in terms of time, productivity, cost etc.
- What are the perceptions of users towards ICT in public offices?
- How ICT affect the use of urban public offices users?
- How new uses of ICT contribute in better service delivery and administration in public offices?

1.5 Scope of the study

This research is an effort to study the efficiency and impact of ICT usage in public service delivery of Pakistan, using public organizations of CDA and PDA as a case study. This study also aims to investigate the relationship between ICT usage and service delivery. It covers the management as well as the staff of both the organizations. It is hoped that using these organizations as a case study will give insight to the digital operations of the organizations.

1.6 Significance of the Study

In many organizations of the world either Public or private, various steps are being taken to improve service delivery to its customers/users/citizens (as the case may be). Thus, the study is relevant to both private and public organizations (local and capital level) who are involved in the provision of services to its citizens (end users of the services). This research will offer a theoretical base on which consequent researchers in this area will build as well as it will correspondingly contribute meaningfully to the growing literature in this area of the research.

Chapter 2. Literature Review

One of the most important concerns of modern era is the need to communicate and associate different set of fields more vigorously and therefore having too many options to handle. ICT is an important tool for addressing these concerns in terms of providing more effective and intelligent solutions in urban service delivery. Over the last few decades' internets had become an important means of communication in all fields of society and its effect on the public sector cannot be neglected (Vintar, Dečman & Kunstelj, 2001). ICT has impacted various areas/fields and the public sector cannot be exempted from it because of its nature of activities.

ICT had a variety of functions and purposes regarding urban service delivery and administration. Even though public sector had a lot of similar needs compared to other organizations, their functions and roles can be stimulated with the use of ICT especially in ensuring the basic rights such as privacy, transparency, democracy, openness and to improve the quality of life of its citizens (Jansen, 2012). It is considered as a tool to support the governmental authorities and agencies in terms of public service delivery and knowledge in a cost-effective, convenient and citizen centric (Ibeto, Justine & Barry, 2016).

The urban service delivery had a close association with the use of information and technologies of transport, communications and production. In this regard, many of the projects had been made to plot the ideal urban planning based on the association of technology and the urban environment. The importance of the ICT is well recognized and is assumed as an important tool of the production in the private sector around the world. On the other hand, the public sector lacks from ICT due to the absence of its knowledge and research required for its understanding. It has only been regarded as the

enhancement tool in the processes and activities of the public sector (Arfeen, 2009). ICT practices and skills are not commonly deliberated in the public-sector organizations contrary to the private sector which procures internal stability and sharing knowledge experiences among citizens and businesses. The amalgamation of the ICT in any of the organization requires a different set of approach, knowledge, skills, resources and capabilities for its contribution in organizational productivity. The role of ICT in public service delivery and administration is very imprecise as it covers a wide range of activities. Both service and administration exist in all of the sectors of any organization, difficult to store in one place as well as sharing with citizens/others and potential clients (Gallouj & Toivonen, 2011).

ICT had an enormous impact on the urban development in the form of reshaping cities and evolving their economic and social bases significantly. In comparison to the industrial development which transforms the whole spatial, economic structure of the cities in the agricultural society, ICT is the main key of contribution in transformation and development of the modern cities and is the main driver in providing a choice of a better life in a future city (ICT and Urban Development, 2010). ICT in the form of computer and internet had grown to be a vital part of our daily life, work and study. Also, it provides the role for equal access to communication/knowledge in the form of exchange and acquisition of information. ICT had made possible in assessing general information in various areas to the public to make a progressive social and economic growth of a society. In contrary, the previous technology which offered only basic services such as self-service, tax return statements via the internet, use of forms for transactions, relying more on technology and not on the organization, the ICT integrates and connects the roles of technology and organizational management. It allows for more

focus on integrating back office, service delivery through multiple channels, customization and portals, and effective engineering process (Berntzen, 2012).

ICT offers a limitless range of opportunities in the field of public service delivery. Many of the authorities now offer online services, telecommunication and smart transactions are evolving rapidly. The authoritarian offices will help in improving their service delivery standards via ICT, most importantly in the cases of rural areas and small communities. It can also help in reducing travel and time costs, and upgradation of the services will be equally availed and served to all the customers/ citizens.

ICT can be used to improve performance at the departmental level by deploying:

- Mobility.
- Utilities.
- Governmental e-services.
- Community engagement/Public Participation.

Many of the developed and under developed cities are implicating low cost and readily available technologies in the form of sensor networks, smart meters, smartphones, consoles and broadband wireless internet, notebooks and tablets to improve the connection between authorities and citizens. And hence by upgrading the system, transparency, efficiency and ultimately transformation of a city is achieved.

Most of the countries in Europe, Australia, Singapore, USA had already established the most u ICT enabled infrastructure for urban administration and service delivery. In the case of developing countries various initiatives had been taken in this regard in the past two decades. However, adopting information systems in developing countries requires careful decisions as the technology costs could be far greater than the costs of labor.

Hence the best cases of the technological initiatives could be followed in both resources poor as well as resource rich environments in terms of their adaptability with the environment.

There are many articles, papers and books written on the use of ICT in public organizations. These include the main focal perspectives of internal administrative processes as well as more attention on understating the role of ICT in public service delivery. They also cover the challenges in terms of application, management and implementation of ICT in public sectors especially in developing countries. This is an attempt made to learn about the related literature in the national and international context to have the clear overview of the research concern.

2.1 Impacts of ICT adoption on Service Delivery (International context)

The pertinent example is of the South Korea, where most of the public service provided are digitized and electronically processed. This transformation increases the transparency and reduces the scope of nepotism and corruption in South Korea.

Issy-Les Moulinaux (France)

A suburb of Paris, Issy-Les-Moulinaux (ILM) has approx. 60000 inhabitants and the town unemployment rate is less than 4%. ILM had been transformed from a worker's city to information driven society in the last 20 years. The city's main development force since the 80's was blooming and significant attraction of enterprises from the media industry. In the 90's, the integration of information and communication technology with the city administration emerged. At the beginning of the 21st century, the upsurge of the internet started, along with the processes of digitization of public services and linking up the citizens with government organizations and public administration.

These services simplify the access of citizens as well as industries to administration to reduce the complexity of the procedures of the administration. Since then it had housed many of the high-tech companies to invest in its services of the municipality. For the administration of the city, electronic services are not just about replacing a shelf/counter with the screen but to transform citizens relation with the city organization work sand procedures. ILM has regularly developed new services including two main priority areas of the development i-e Provision of more innovative services and access to administrative data since 1996. And has accomplished this goal in the form online availability of these services by 2003. These services include the following.

- Ordering a birth, marriage or death certificate
- Constituting a wedding file
- Indicating a change of domestic situation for the school file
- In case of relocation, Making a reservation for a parking spot
- Making reservations for hotel room, books, and for the multi-media library
- Receiving publications from the city
- Paying parking fee using a mobile phone
- Getting access to the deliberations of the City Council
- Online training and workshops for continuing education.

In terms of participation of the citizens, the city administration frequently asks for their views about the ICT development in the city and services quality. Besides improving the communication with the citizens and public organizations, it also provides with the opportunity to participate during city administration meeting since 1997. Around 650 people constitute a representative group of “Citizen Panel” who were accessed through

the internet to involve in the decision-making process/ issues of local relevance including local urban development and ICT, associations and safety.

SMG (SEOUL metropolitan government)

SMG (SEOUL metropolitan government) is directing the use of smart technologies in local authorities and administration based on transparency, collaboration, sharing and communication to have fast, easy and reliable communications instead of large range of problems. It currently focuses upon mobile administrative services (across the board), municipal administration (data based) to create a scientific, innovative and interactive culture in the city.

ICT Tools for Urban Services in SEOUL	Transparency & Communication	Renewal of SMG website Information Open Plaza. Mobile Seoul. M-Voting.
	Sharing Benefits	Free WiFi networks. Free Mobile Recharging facilities.
	Smart Administration based upon collaboration and sharing	Digitized data for administrative issues and public facilities Map tracking administrative services.

2.2 Impacts of ICT adoption on Service Delivery (Regional context)

ICT in Urban Service Delivery in INDIA

The development of the process of ICT in India had been evolved from the computerization of the authoritarian departments of the Government to programs initiatives that comprise the best practices of urban service delivery and administration such as transparency, citizens centric and service oriented. NeGP, (National e-governance Plan) had been established and it comprises of the mission mode projects

MMP's which directs at digitization of records, the evolution of infrastructure, to allow easy and reliable access over the internet. It includes applications such as

- Online delivery of services.
- Land information system, Geo portal, Digitized mapping SDI.
- GIS based property records, plans and transactions.
- Online approval of building plan.
- Management of broad band.
- Citizens/consumers participation and feedback program.
- Electronic billing. Digital communication, mass short message system

2.3 ICT in Pakistan

Government of Pakistan has provided considerate attention to the implementation of ICT in the country. However, the country remains in lower levels of world's e-government ranking despite all endeavors of government for developing ICT systems and digitization. Nevertheless, the least improvement in the sector of ICT, Public service delivery has now become on the major concerns of the citizens of Pakistan.

Like other developing countries, the government of Pakistan also has recognized the importance of ICT. Pakistan stepped into ICT world in October 2002, and till now it's still in its initial phases. Under the control of the Ministry of Science and Technology, a unit called the Electronic Government Directorate (EGD) was founded. The aim of the unit was to manage e-government projects and setting the standards for infrastructure and software in the information and technology (IT) field. Several significant steps were taken for modernizing the economic and social conditions to improve ICT services of the country. According to the annual report 2014 of Pakistan

Telecommunication Authority (PTA), the tele density has been reached at 79.8% in the Financial Year (FY) 2014 against 75.2% in FY 2013, where the cellular sector is a major contributor. Many infrastructure and application development projects were completed in the public sector. One of such applications is “e-Office Suite” implemented in public institutes. Meanwhile, in the FY 2014, the number of broadband users reached 3.79 million against 2.72 million in FY 2013 showing a growth of 39%. The PTA announced 3G / 4G Mobile Services in 2014 through auction and ended with a total of US\$1.11 billion at the end of FY 2014. The PTA (Pakistan Telecommunication Authority) report states that there are 37.57 million smartphone users in Pakistan with access to 3G/4G services at the end of 2016 (Pakistan Telecommunication Authority | 3G/4G Subscribers, 2017).

The progress of ICT trend in Pakistan had been supported and commended by different independent global institutes. The IT sector of Pakistan has made a distinguished position as the preferred source for programmers, designers, developers and BPO (Business Process Outsourcing). Pakistan was ranked at 4th position³ for freelance development in the world in 2017.

³ See <http://ilabour.oii.ox.ac.uk/online-labour-index/> Accessed 10th October 2017

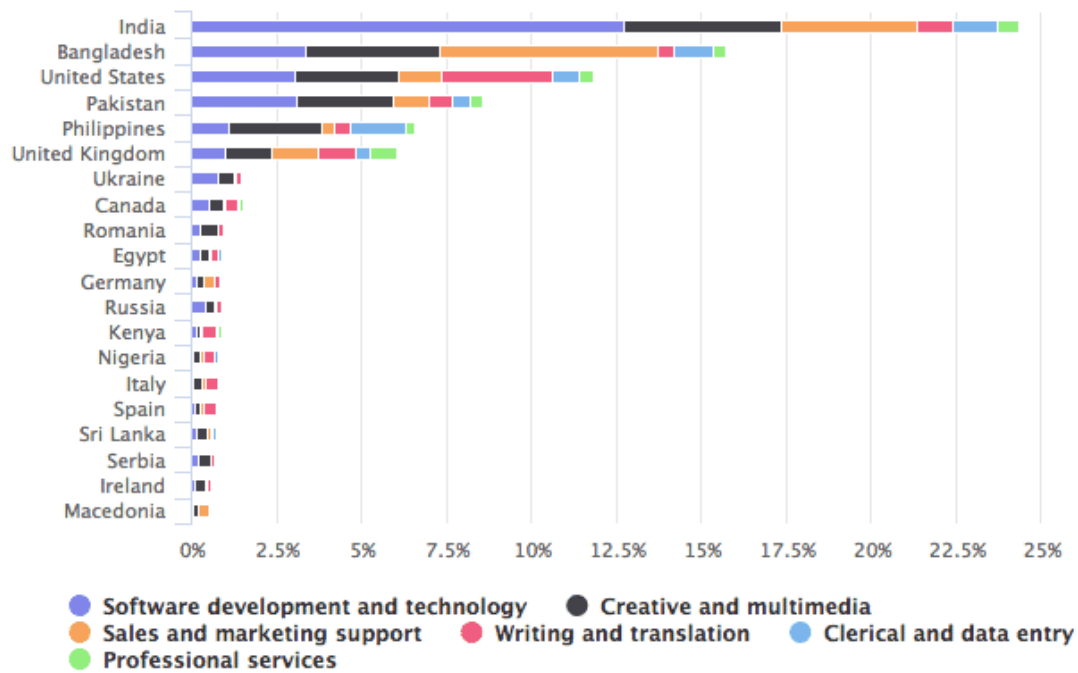


Figure 2: Ranking of Pakistan for freelance development in the world

Source: Online Labor Index top 20 worker home countries, 1-6 July 2017

In the case of Pakistan, there had been rapid awareness of the ICT among the state policy makers and stakeholders. Information and technology had remained as one of the main focal area during military government. Following the footsteps, the present civilian government is contributing in use of ICT in all aspects, in terms of planned investment both in application and infrastructure of these technologies (Rizvi, 2003).

2.4 Framework

This research focuses upon the degree of effective and efficiency of ICT applications in urban service delivery in government offices in Pakistan. The importance of ICT is highlighted through the relationship between governmental services and customers attitudes and opinions.

Impact of ICT on urban services delivery and urban administration is identified as the dependent variable. Other variables which impact the dependent variable are divided

into demand and supply categories. The demand side includes User's/Customers factors and the supply side include organizational factors (Management and Staff).

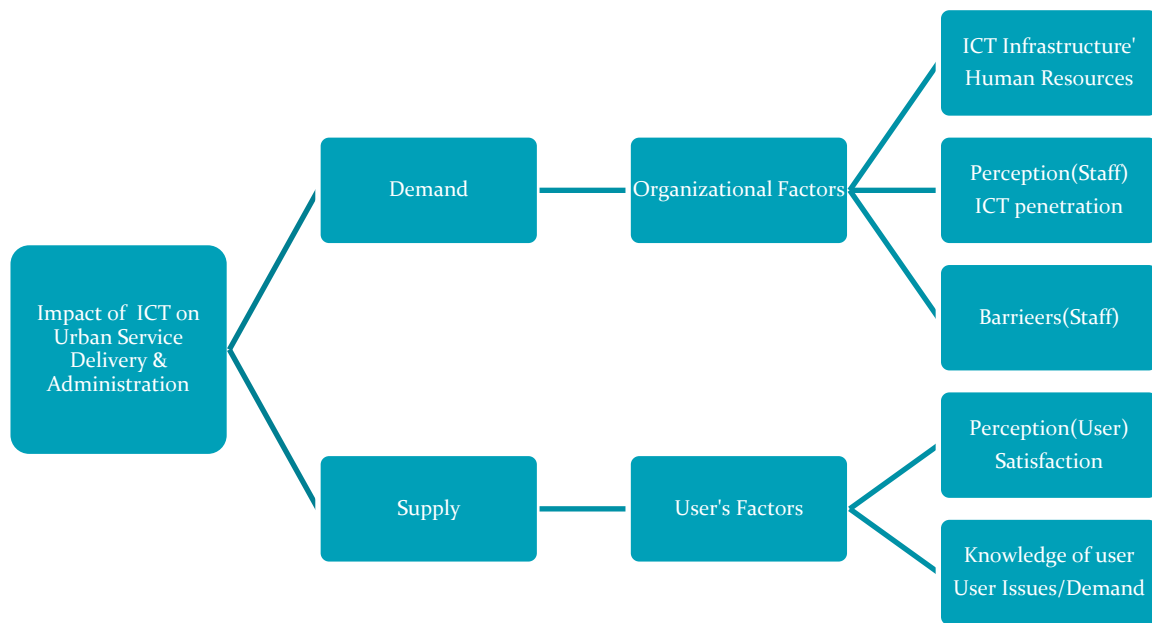


Figure 3: Relationship between the dependent and independent variables

2.5 Variables definition

The basic definition of the variables used in the study is described as follows.

2.5.1 Dependent variable

ICT in urban services delivery and administration had been identified as dependent variable. Organizational effectiveness and user satisfaction are closely related, but different at the same time. Quality and efficiency of an organization is a continuing or long-term process while user satisfaction is based on the immediate delivery of a service (Bolton and Drew,1991). On the other hand, some studies do not agree with this view and state that the quality and marketing of the organizational service are the main factors which influence customer's decision to reobtain service from the organization,

(Getty & Getty, 2003). According to the theory of people's satisfaction, the only organization which is more efficient and effective is which fulfill the needs of its citizens. Contrarily, the theory of goal attainment implies that each organization is formed on several goals, the efficiency and effectiveness of organization must be focused on the ultimate accomplishments of its goals in a right manner (Ates, 2003).

Based on the above discussion the definition of ICT effectiveness and efficiency is stated as to achieve the goals of ICT in terms of Initiatives of ICT. These are implied to provide better services delivery to the user in terms of increasing efficiency of administration. Hence the efficiency and effectiveness of ICT services delivery is understood as the dependent variable and is indicated by following factors.

2.5.2 Independent Variables

Two sets of independent variables were identified as follows:

2.5.2.1 Organizational Factors

Organizational factors comprise descriptive, tangible and exploratory research which is necessary for better service delivery. It includes the categories of studying the impact of ICT, ICT penetration human resource, ICT applications, ICT connectivity and Infrastructure, Perceptions and Challenges for the implication of ICT services. The responses had been recorded through questionnaire survey to service provides of the organization.

2.5.2.2 Users factors

Users factors are taken in the form of "knowledge about ICT services" and their perception and satisfaction with the acquired services from the organization. The responses had been recorded via a questionnaire survey to service seekers.

Table 2: Framework

Type	Indicators		Source
Impact of ICT on urban service delivery (Dependent Variable)	Impact/Improvement in service delivery	Time factor. Procedures Streamlining. Accessibility. Cost factor. Extent of improved services Perception Survey	(Upadhyaya, 2011)
Organizational factors (Independent variable)	Human resources	Type of degree related, Training, ICT expertise,	(Egila, Agbola & Babatunde, 2012)
	ICT penetration	Usage of ICT services, Percentage of digitized data, Satisfaction survey Preferred service delivery channels	(Mshanga, 2014), (Augustine, Joseph & Sunday, 2015)
	ICT connectivity & Infrastructure	Internet facility, Maintenance and update of eservices, ICT measures	
	Barriers	Challenges/factors deterring the use of ICT systems	(Mwai & Muriithi, 2013)
User's Factors (Independent variable)	User's Knowledge	Use of internet services, knowledge, Awareness, Publicity of services	(Mshanga, 2014),
	Demand of users	Issues, complaints, demands, sufficiency with services	
	Perception about ICT services delivery	Perception and satisfaction survey	(Cohen & Nijkamp, 2004)

Chapter 3. Research Methodology

Research methodology section identifies the structure, designs and the steps that are used in the research. The methods of research that are used for collecting, processing and analyzing information and data used in research is explained on. The elaboration and perception, methods of data collection, research design selection, as well as analysis tools of data, is also described in this chapter.

The descriptive data will be obtained from the literature review in the context of developed and developing countries. Studying of the impacts of ICT of different cities and how its different approaches towards urban service delivery are being delivered by local authorities. Also, the prospects of ICT for urban service delivery in the context of Pakistan is rather a new topic for research therefore it will be mostly based on the case studies from other regions of the world comparative to case situation.

3.1 Research Design

This is the research case study based upon the role of ICT and its advancements in urban and regional planning. It starts with the literature review to obtain knowledge and information on the theories and concepts about ICT in urban services and urban administration.

An appropriate research design is essential for any of the study. This study focuses on the impacts of ICT on services delivery and urban administration as well as the exploring the ICT penetration and Connectivity based on organizational and customers factors. For this descriptive survey had been used for the research design.

3.2 Research Method

There are three approaches in conducting any scientific research which includes quantitative, qualitative and Mixed Approach (Nayem, 2010). Quantitative research is composed of research in which data analysis is done in the context of numbers, while qualitative research is research in which data is mostly describing persons and events scientifically without the use of numerical data. Mixed approach is the research approach which combines both the approaches of quantitative and qualitative.

Mixed method approach had been adopted in this research because it signifies the advantages as well as overcomes the disadvantages of quantitative and qualitative methods. This approach assists in minimizing the shortcomings of single methods and ensures the validity of the gathered data. Regarding this case, questionnaire survey is considered as the quantitative data while interviews are the qualitative methods which were adopted in the process of data collection.

3.3 Steps in the Research

Following are the steps that are used in the research.

- The concepts about exploring and association of ICT and urban service delivery will be based on case studies of the related cities will be obtained through literature review.
- Field observations and interviews conducted to gain the knowledge about the impacts of ICT, current penetration, connectivity, infrastructure and its role in enhancing service delivery.
- Therefore, the data collection method will include interviews with employees of the organizations, customers and professionals.
- An outline of the findings of the research will be undertaken.

- Analysis of the findings and its comparison between the present urban service delivery and its potential for adaptation of ICT with the case studies and theories from the literature will be made.
- Data analysis was done with the SPSS for quantitative data and thematic analysis was done for qualitative data. Results were presented in the form of frequency distribution charts and tables.
- Overall conclusions drawn from the research problem and questions will be examined.

3.3.1 Population

The study population includes the employees and customers of both the organizations of CDA and PDA. The population of customers is considered as indefinite as an exact number of customers cannot be traced, while the population of employees were sampled to 87. It is further explained below.

3.3.2 Sample Size

According to Sarantakos (2007) sampling is the process of choosing the units of the target population that are to be included in the study. It enables the researcher to study a small number of units of population, so it represents the whole target population. In this study, sampling was done to select limited number of respondents from the whole population. Sampling is generally done in two methods i.e. Probability and non-probability sampling (Sarantakos, 2007).

3.3.2.1 Non-probability sampling

This approach is based on less strictness and makes no claim for representativeness. According to Sarantakos (2007), in this approach, the researcher/interviewer gets to decide to choose the sample units from the targeted population and is utilized in

observational, qualitative or exploratory research. This method can be also defined as the approach in which elements have unequal chances of being selected (Dooley, 1995). It is further divided into different sampling types including quota sampling, judgmental or purposive, haphazard (convenience or accidental sampling), sequential, deviance case, snowball and theoretical sampling.

In this research, non-probability sampling was used, specifically the purposive or judgmental sampling technique to select respondents at organizations of PDA and CDA. According to Neuman (2006) it is an acceptable kind of sample for special situations. The researcher gets all possible cases that fit criteria by using different approaches in purposive sampling. In this technique, the selection of subjects which or who, are done in terms of their relevance to the study topic. It is also used to choose members of specialized and difficult to reach population. Once the respondents were selected, a sample from all staff and customers were selected.

A sample size of 100 staff was selected from different departments using non-probability sampling while 100 customers were selected through accidental sampling. Five relevant departments of the public organizations such as building control authority, planning, design & construction, Information and communication technology, Municipal Authority, as well as One window department of the CDA were involved in the survey. These departments were chosen because of their relevance of ICT tools to their daily administrative purposes.

100 copies of the questionnaire were distributed among the staff of the organization, who constituted the sample of the study. Out of a hundred respondents, 87 were filled. Each of the department of CDA and PDA had 8 respondents except one window which comprised of 5 respondents.

Since the study was designed to understand the role of ICT in public service delivery from the view of citizens and organization, two sets of questionnaires were prepared, One for the staff of the organizations (service providers) and one for citizens(citizens). About 100 copies of questionnaire were distributed among citizens using an accidental sampling technique to confirm the organizational claims and to conduct correlation tests afterwards. 90 copies were retrieved from the citizens and were used for the computing percentage distribution analysis and correlation. Thus, the size of the sample was 177. The population that was surveyed includes the following departments of both the organizations.

Table 3: Sample size (Organization)

S/N	Title of departments (PDA, CDA)	No of respondents (Management + Staff)
1	Building Control Authority	6+10
2	Housing & Estate Management	6+10
3	Planning, Design & Construction	6+10
4	Municipal Authority	6+10
5	ICT	6+10
6	One Window (CDA only)	5
7	Total	87

The 90 questionnaires were distributed among the specific department's users where most of the communication among organization and the chosen departments users take place i.e. Building Control Authority, Housing and Estate management and Municipal Authority.

Table 4: Sample size (Customers)

S/N	Title of departments (PDA, CDA)	No of respondents (Customers/Users)
1	Building Control Authority	15+15
2	Housing & Estate Management	15+15
4	Municipal Authority	15+15
7	Total	90

3.4 Data Collection

The data collection procedure is carried out in terms of primary sources including questionnaire, interviews and field observations. Secondary sources include scientific journals, books, maps, documents and online and electronic sources.

3.4.1 Primary Data Collection

It includes field observations, questionnaires and interviews that will be conducted to collect qualitative data in this research. Most of the questions will be given multiple choice options as well as open ended questions to record the views and questions of the citizens.

3.4.2 Secondary Data Collection

These include electronic and online sources, documents complimenting the data obtained from interviews and questionnaires. Search engines such as springer link, academia, science direct and wiley online library will be used for thorough research of literature for this research, as these provide facts which are based on scholarly and empirical studies evaluated by different authors about this subject and will be effective to findings in the research.

Therefore, the collective combination of both primary and secondary sources will be useful to provide multiple bases of evidence thus making the analysis of research more comprehensive.

3.4.3 Data Analysis

Data analysis was done on both qualitative and quantitative data using SPSS (Statistical package of social science) and thematic analysis. Cross tabs were used to find a relationship between dependent and independent variables. Correlation analysis was used in terms of One Way ANOVA to analyze the correlation of variables for research questions which guide this study. Results are presented in the form of frequency distribution charts and tables.

3.4.4 Methodology flow chart

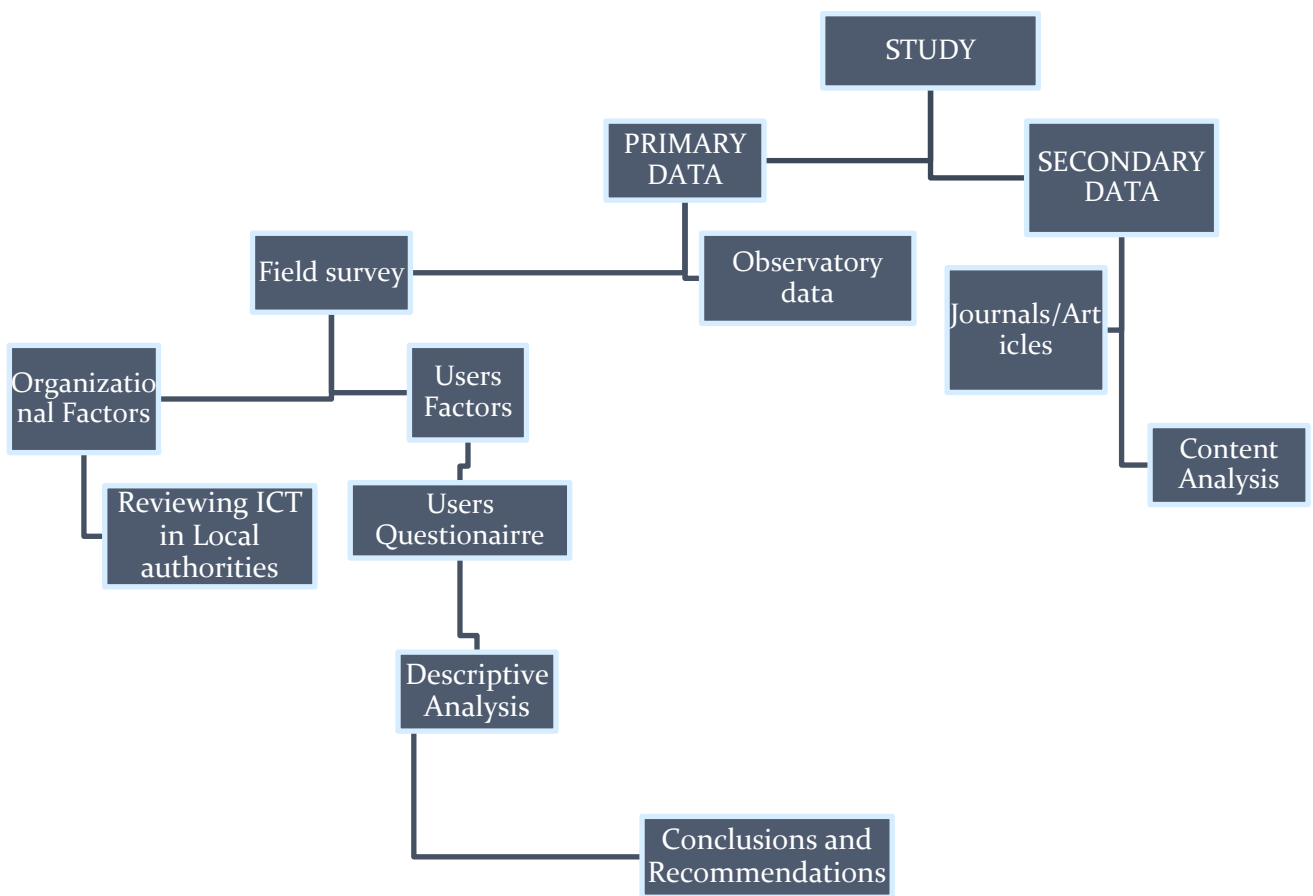


Figure 4 :Methodology Framework

Chapter 4. Data Analysis

4.1 Introduction

This section of the research refers to the analysis of data which were gathered during the process of data collection. The first half of the section deals with the facts and figures derived from the data, and the second half represents detailed data to meet research objectives in the form of findings and results of the study. This section also provides the details about the importance of ICT in service delivery through making associations between different variables and the comprehensive understanding of ICT services from the view of service providers and seekers.

4.2 Organizational Data

4.2.1 Background Information

This research is administered on the survey of 87 questionnaires from both the organization and the analysis is based upon the returned instruments for the provision of reliable information for the study.

4.3 Demographic Characteristics of the organizational data

Table 5 : Demographics of the organizational data

Variables	Categories of variable	PDA		CDA		Mean	SD
		Frequency	%	Frequency	%		
Gender	Male	34	82.93%	33	71.73%	1.23	0.423
	Female	7	17.07%	13	28.27%		
Age	20-30 years	7	17.1%	8	17.4%	3.53	1.010
	31-40 years	11	26.8%	18	39.1%		
	41-50 years	9	22%	16	34.8%		
	Above 50	14	34.01%	4	8.7%		
Education	Secondary/Diploma/IT	8	19.51%	2	4.35%	4.09	0.984
	Graduation(UG)	4	9.76%	4	8.69%		
	Post-Graduation(PG)	17	41.46%	16	34.78%		
	Higher than PG	12	29.27%	24	52.18%		
Experience	1-5 years	4	9.8%	8	17.4%	2.84	1.055
	6-10 years	9	22%	11	23.9%		
	11-15 years	12	29.3%	13	28.3%		
	Above 15 years	16	39%	14	30.4%		
Experience in organization	1-5 years	16	39%	17	37%	2.13	1.119
	6-10 years	12	29.3%	14	30.4%		
	11-15 years	3	7.3%	9	19.5%		
	Above 15 years	10	24.4%	6	13%		

4.3.1 Respondents by Gender

The study population was composed of 83% males and 17% females from the PDA and 72% male and 28% female from CDA. This indicates that gender gap in both the organizations and cities is evidently visible. This can be ascribed to numerous educational, economic and social norms of the cities. This factor can also be explained in terms of male dominance of our society and the difference of role. The security issue is another concern related to the threats of terrorist attacks, but the main cause of this gender gap can be attributed to the lack of awareness and misconception about the role of women in the society as well as in work force (Nisa, 2017).

4.3.2 Respondents by Age

The data obtained shows the majority (34%) of Above 50 years of age in PDA, while in CDA majority of the respondents (34.8%) fall in the category of 31-40. The reasons for the majority of seniors in PDA is related to experience in more manual work and experience in general throughout the years by the organization. Contrarily CDA allows more opportunities for more fresh employees to compete with the needs of the present day in terms of the work force for more innovative, and creative solutions.

4.3.3 Level of Education

From the results of the survey, it is indicated that 41.4% of the respondent held post graduate degrees as their highest level of education in PDA which shows that most people in this organization had attained professional knowledge in enabling them to perform their duties. While CDA had the majority of Higher than Post-Graduate employees which shows more qualified staff in each sector.

4.3.4 Respondent's experience

From the survey it was found that majority of the respondent's, 39% had been employed at PDA for a period of 1-5 years, similarly in case of CDA majority (37%) of the respondents were employed for a period of 1-5 years. But the data clearly shows very little difference between the employment period of 1-5 and 6-10 in both the cases which shows that most of the employees working experience ranges from 1-10 years.

4.4 Organizational Factors

4.4.1 Change in Urban administration

This variable was studied through the view point of organization respondents in terms of transforming atmosphere for urban administration and services delivery and to examine the level of ICT currently being applied in improving local and public-sector organizations of both the cities of Peshawar and Islamabad.

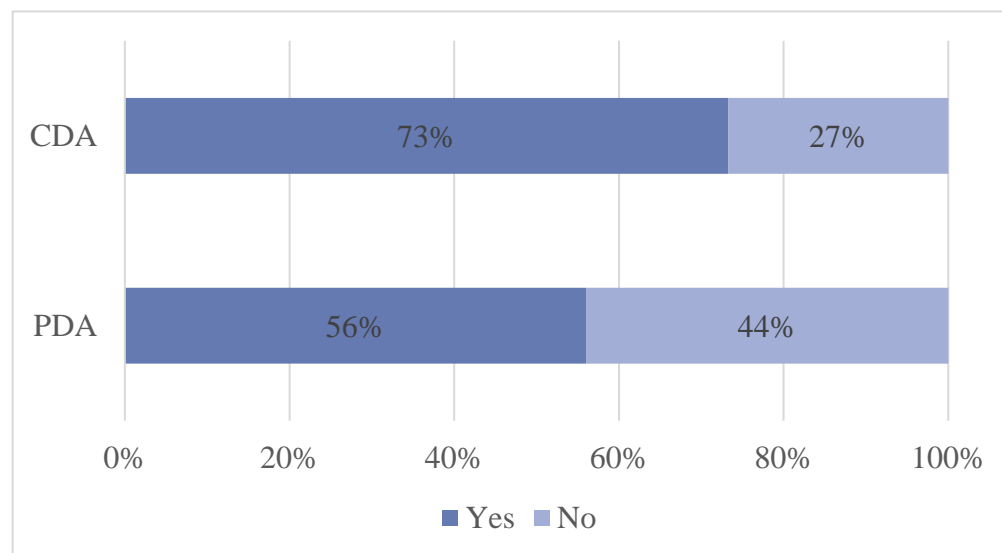


Figure 5: Change in Urban administration (In percentages)

The data shows overwhelming responses in case of Islamabad that 73% of the respondent's agreed that ICT can play an important role in the change in urban

administration and online public services delivery. These changes are in the form of improved infrastructure, connectivity and availability of ICT facilities. It also shows that in Peshawar, the rate is gradually increasing, and the city is in the process of acquiring ICT facilities.

4.5 ICT penetration

Table 6 :ICT penetration in CDA & PDA

Activities	PDA					CDA				
	BCA	P&D	H&EM	MA	ICT	BCA	P&D	H&EM	MA	ICT
Use of computers	○	●	●	●	●	●	●	●	●	●
Cable Technology	○	●	●	●	●	●	●	●	●	●
Radio (Wi-Fi)	○	○	●	○	●	●	●	●	●	●
Telephone	●	●	●	●	●	●	●	●	●	●
● Means "YES" ○ Means "NO"										

The above table shows the use of ICT activities in PDA & CDA. From the table it can be found that computers or personal PC's are in use in almost all the departments of both the organizations except BCA of PDA, where the operations are handled manually. Similarly, the cable technology is used in the majority of the departments. In the case of WIFI, the most use incurs in the departments of CDA, and the departments of H &EM and ICT of PDA. The telephone hotline is also used in the departments of both the organizations.

Table 7: Network characteristics

	PDA	CDA
INTERNET PROVIDERS	PTCL	PTCL & NTC both
BANDWIDTH	4MB/s	4MB/s & 3.1 MB/s, 1500 N

The above table shows the network characteristics of both the organizations. Main provider of the internet in PDA is PTCL while in CDA the providers are PTCL and NTC with the bandwidth of 4MB/s and 3.1 MB/s, functional at 1500 nodes of the organization.

Table 8 :Official use of the internet

Official use of the internet	PDA					CDA				
	BCA	P&D	H&EM	MA	ICT	BCA	P&D	H&EM	MA	ICT
Emails	●	●	●	●	●	●	●	●	●	●
Visiting websites	○	●	●	●	●	●	●	●	●	●
Search for information	○	●	●	●	●	●	●	●	●	●
● Means "YES" ○ Means "NO"										

Table 8 shows the official use of the internet in the organizations, it includes the sharing of information through official emails, obtaining information from different websites as well as participation in different forums through the official website.

4.5.1 Preferred Service Delivery Channels

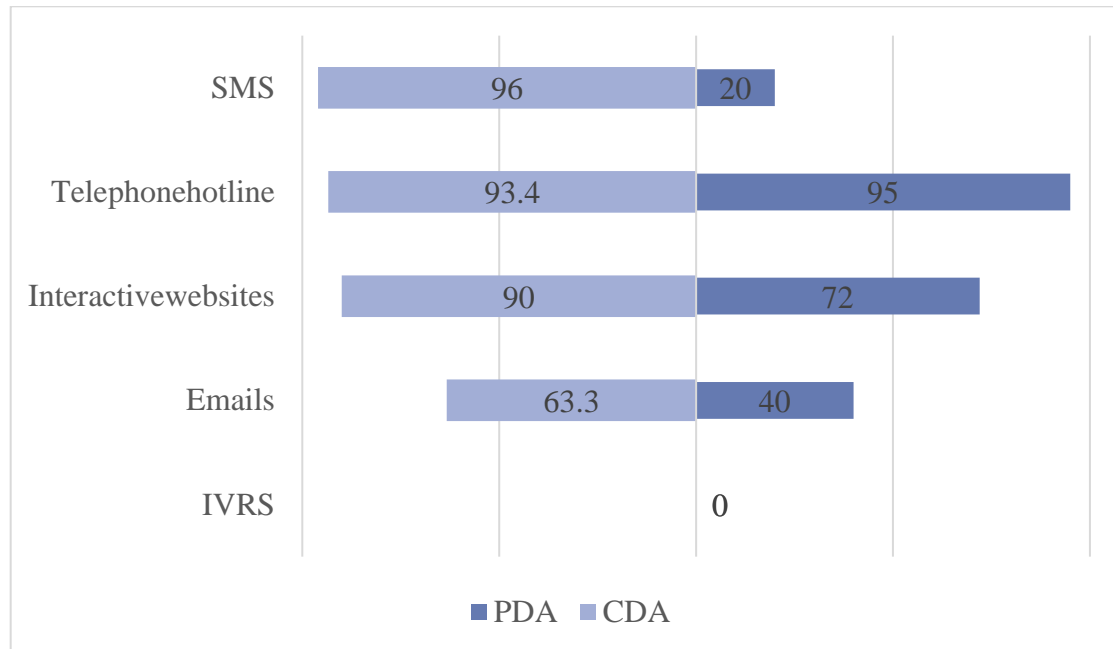


Figure 6: Preferred Service Delivery Channels (In percentages)

The factors that were used for determining preferred service delivery channels included SMS, Telephone hotline, Interactive websites, emails, and IVRS (Interactive voice response). These factors were ranked on the scale of least preferred to most preferred delivery channels. For the ease of analysis, the above table shows the combination of preferred and most preferred scale. It can be found from the data the most preferred service delivery channel used in CDA is through SMS (96%). Customer's/ users interact with the one window department of the CDA through SMS, and the message is forwarded to the concerned department in a timely manner. In PDA, the telephone hotline is the preferred channel of service delivery (95%), where the issue/ demand is filed in a manual manner and is delivered accordingly.

4.5.2 Handling of Complaints/Demands

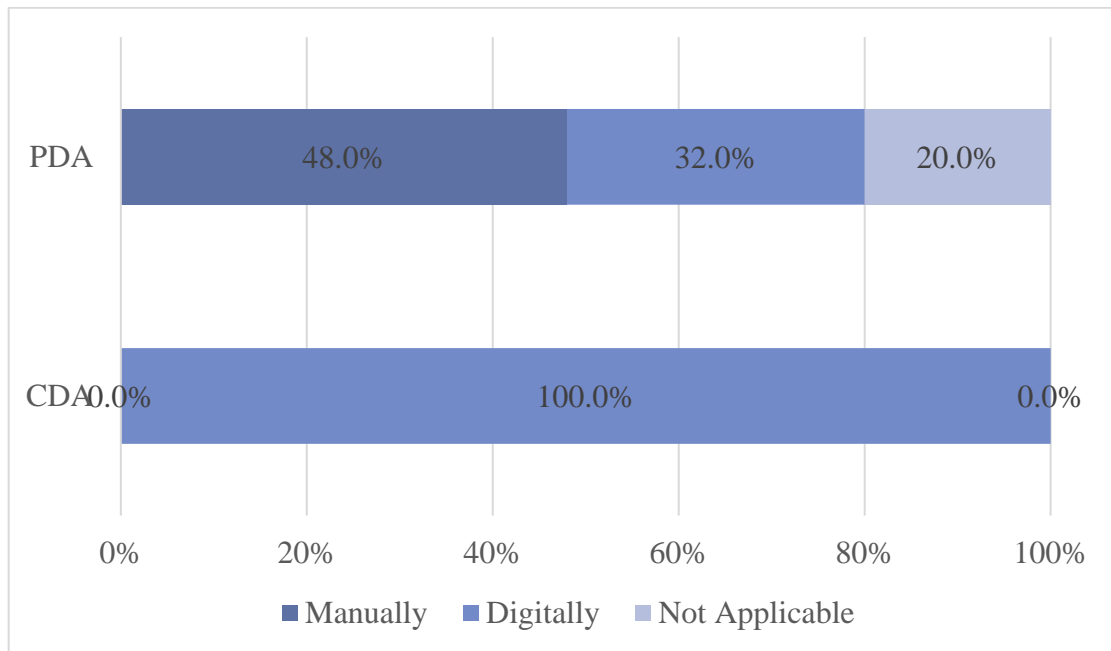


Figure 7: Handling of Complaints/Demands (In percentages)

The above figure shows that in PDA most of the complaints/demands are handled manually (48%), while in CDA these are handled digitally through one window services.

4.5.3 Percentage of Digitized data

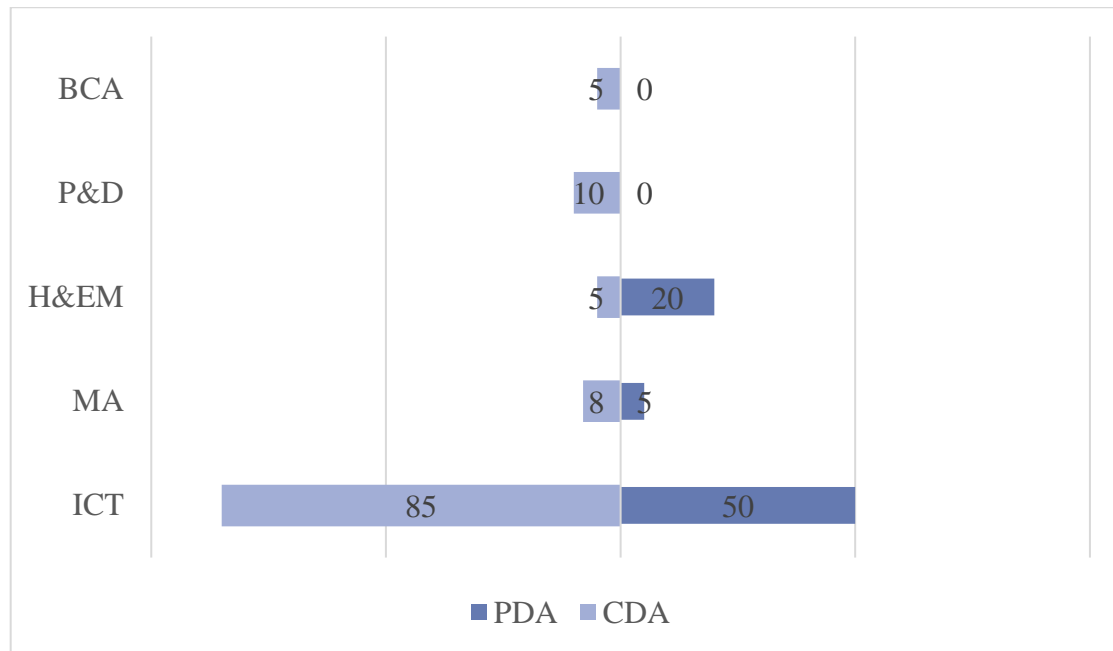


Figure 8: Percentage of Digitized data (In percentages)

From the analysis it can be found that a high percentage of digitized data is available in both the ICT departments of both the organizations. In PDA, ICT & Housing & Estate Management had acquired ICT facilities than its departments and are still in the process of organizing, storing of the data. While in CDA the process of digitization has been started such as in BCA (5%), P&D (10%), but it will take some time in completion of automation of processes.

4.5.4 Satisfaction level of respondents with ICT services delivery

For analyzing the satisfaction of employees with ICT services delivery in terms of the relationship with the customers, the factors of accurate response, feedback response, timely information, the participation of customers, transaction cost, services reliability, chances of bribery and transparency in procedures were considered.

Table 9 :Satisfaction level of respondents with ICT services delivery

	Ranking in a scale 1-5					Mean	SD
	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied		
Accurate Response	0%	1.80%	1.80%	60.00%	36.40%	4.29	.685
Feedback response	0%	1.80%	9.10%	47.30%	41.80%	4.27	.781
Timely Information	0%	1.80%	5.50%	50.90%	41.80%	4.31	.742
Participation of customers	0%	1.80%	21.80%	49.10%	27.30%	4.00	.816
Transaction cost	1.80%	18.20%	23.60%	34.50%	21.80%	3.56	1.085
Services reliability		1.80%	7.30%	54.50%	36.40%	4.24	.744
Chances of Bribery	3.60%	16.40%	30.90%	29.10%	20.00%	3.45	1.102

It can be found from the data that employees were satisfied in terms of accurate response, feedback response from customers (Mean=4.27, SD=0.78), Participation of customers had been increased in availing online services (Mean=4.00, SD=0.81). The transaction cost and overall cost of the attaining the service had been decreased

(Mean=3.56, SD=1.085). Reliability of services had been increased (Mean=4.24, SD=0.744). Also, there is no impact on the chances of bribery according to the respondents (Mean=3.45, SD=1.102). The factor of transparency in procedures had been increased.

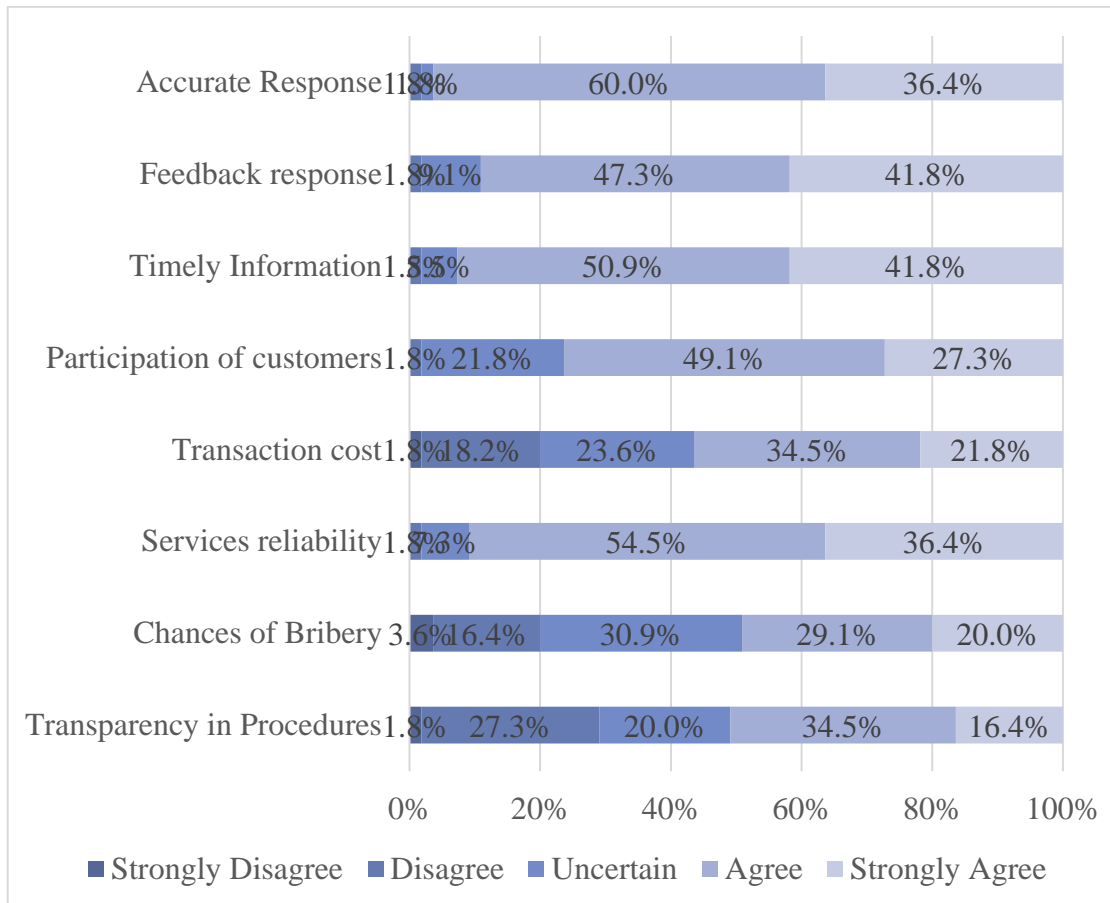


Figure 9: Satisfaction Level of Respondents with ICT Services Delivery (In Percentages)

4.6 Human Resources

For determining human resources, factors of ICT specialists, training programs, employing criteria were studied through the survey. From the table 10 CDA employ ICT specialists in every department and one window is linked with the departments that were under study. Contrarily the PDA lack ICT specialists in the departments of BCA and P&D.

Also, in CDA most of the departments organize ICT training, which includes different software workshops such as MS Office, photoshop, data entry, IT solutions/trainings and other documentation softwares.

Table 10: Characteristics of ICT usage

Activities	PDA					CDA				
	BCA	P&D	H&EM	MA	ICT	BCA	P&D	H&EM	MA	ICT
ICT specialists	○	○	●	●	●	●	●	●	●	●
ICT training programs	○	○	○	○	●	●	○	●	○	●
● Means "YES" ○ Means "NO"										

In PDA the training programs are organized by the ICT department, in collaboration with NAVTAC (National Vocational and Technical Training Commission) and other software training programs in Peshawar.

4.6.1 Employing criteria

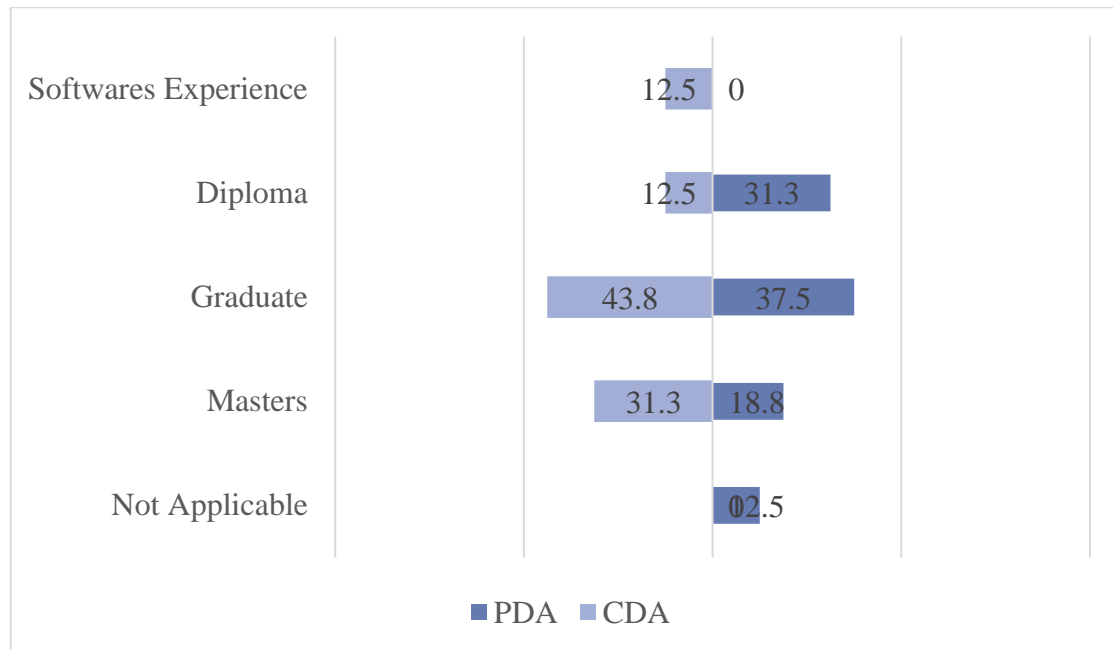


Figure 10: Employing criteria (In percentages)

For determining employing criteria, the analysis was based on factors of software's experience, diplomas(DIT), Graduate (IT/CS), Masters(IT/CS). The findings show that most of the employees (43% in CDA & 37% in PDA) were employed based on graduate degree in both the organizations, followed by the master's degree (31.3%) in CDA. The data also shows preference to diploma holders in PDA (31.3%). As well as in CDA the employing criteria also included software's experience which include program developers and system operators.

4.6.2 Performers of the ICT functions

Table 11 :Performers of the ICT functions

Performers of the ICT functions	PDA					CDA				
	BCA	P&D	H&EM	MA	ICT	BCA	P&D	H&EM	MA	ICT
Maintenance of ICT infrastructure by own employees	○	○	○	●	●	●	●	●	●	●
Office software by own employees	○	●	○	●	●	●	●	●	●	●
management software/system by external supplier	○	●	●	●	●	○	○	○	○	○
Web solutions by own employees	○	○	○	●	○	●	●	●	●	●
Interconnection with another departments	○	○	○	●	●	●	●	●	●	●
● Means "YES" ○ Means "NO"										

The main performers of the ICT functions in the studied departments of both the organizations can be found from the table 11. The public offices are typically assumed for mismanagement and not utilizing the available infrastructure. To understand the maintenance of ICT infrastructures like internet facilities, digital devices and its performers were studied. It was found from the survey that these services were regularly maintained by own employees in the departments of CDA, while in case of PDA, the service was only operated in the ICT department and MA.

In case of performing the activities of MS office software, the respondent's agreed that these activities were carried out mainly by own employees of the department concerned

in case of CDA, While in PDA it was carried out by own employees in the departments of P&D, ICT and MA only.

From the analysis it was found that data management software's/systems were developed by own employees in CDA, while in PDA these activities are mostly carried out by an external supplier. The category of web solutions is related to the development of websites, e commerce solutions, from the table 10 it can be found that these functions were carried out mostly by external suppliers in case of PDA, while in case of CDA these activities were mostly carried out by own employees. Theses external suppliers include local private software companies/contractors in carrying out these tasks.

4.7 ICT connectivity & Infrastructure

ICT connectivity & infrastructure was measured by the indicators of availability of the online facility, ICT applications, performers of the ICT functions, ICT measures used in the organization and ICT network solutions.

4.7.1.1 Availability of online ICT facility

Table 12: Availability of online facility

	PDA					CDA				
	BCA	P&D	H&EM	MA	ICT	BCA	P&D	H&EM	MA	ICT
Availability of online ICT facility	○	○	●	○	●	●	○	●	●	●
<p>● Means 'YES'; ○ Means 'NO'</p>										

Through the survey conducted it was found that only the respondents of CDA had the online facility available for service delivery in its departments in the form of one window services. Also its planning and design department did not have ICT facility and where file work was still used as a main tool. Regarding PDA its department of H&EM had been started operating online services in terms of digitizing records and file transfers a few years ago and its other departments are lacking online ICT facility. Although access to online facility among respondents was not even, as the complaints and demand handling personnel had more access to usage of online services rather than other employees. Thus, it can be analyzed from the data that there is a relationship between a respondent's positions and their access to online facilities.

4.7.2 ICT network solutions

Table 13: ICT network solutions

ICT network solutions	PDA					CDA				
	BCA	P&D	H&EM	MA	ICT	BCA	P&D	H&EM	MA	ICT
CUA	○	○	○	●	○	●	●	●	●	●
EDMS	○	○	●	○	●	○	●	○	●	●
LAN	○	○	○	●	●	○	○	○	○	○
WAN	○	○	○	○	○	●	●	●	●	●
Electronic payment systems	○	○	○	○	○	●	○	●	○	○
Databases	○	○	●	●		○	○	●	●	●
● Means 'YES'; ○ means 'NO'										

For the analysis of ICT network solutions, the factors of Central user authentication(CUA), Electronic document management system(EDMS), Local area

network(LAN), Wide area Network(WAN), electronic payment system and the presence of databases was studied. From the table it can found that CUA was authenticated in all departments of CDA, while in Peshawar it was only present in MA. EDMS was available in IT, MA and P&D department of the CDA while in PDA it was in its initial phases in the H&EM department.

From the table it can be found that LAN services were available only in the MA and IT department of the PDA, contrarily CDA had the availability of WAN. The electronic payment system was functionally operated in the BCA department of the CDA for the payment of taxes and online billing etc. The databases were found in the H& EM, MA and IT departments of both the organizations. Before the digitization the data was stored in the form of a stack of files and records were handled manually.

4.7.3 Purchasing of Software Applications

Table 14: Purchasing of Software

Software's	PDA					CDA				
	BCA	P&D	H&EM	MA	ICT	BCA	P&D	H&EM	MA	ICT
Email	●	●	●	●	●	●	●	●	●	●
Office software	○	●	○	●	●	●	●	●	○	●
Databases	○	○	○	○	○	○	○	○	○	●
● Means 'YES'; ○ Means 'NO'										

In the ICT sector, softwares play an important role in increasing productivity. To study the purchasing of softwares over online services (cloud computing), it was analyzed from the data that only Email and office software were purchased in both the organizations. While the other softwares such as databases, storage of files, customer relationship management (CRM) were in the process of attaining in case of both the organizations.

4.7.4 ICT measures

From the table 15 it can be found that the use of ICT measures in the form of ICT security, biometric features, IDS, Antivirus and Protection/Privacy of client data were studied. ICT security refers to measures, controls, systems to ensure integrity and confidentiality of the customer's data. From the analysis it can be found that it was not

Table 15: ICT measures

ICT measures	PDA					CDA				
	BCA	P&D	H&EM	MA	ICT	BCA	P&D	H&EM	MA	ICT
ICT security	○	○	○	○	○	○	○	○	○	○
Biometric features	●	●	●	●	●	●	●	●	●	●
IDS	○	○	○	○	○	○	○	○	○	○
Antivirus	○	●	●	●	●	○	●	●	●	●
● Means 'YES'; ○ Means 'NO'										

available in both the organizations. The biometric features in terms of biometric attendance were available in both the organizations. There was no specific security software like IDS (intrusion detective software) in both the organizations.

4.7.5 The extent of ICT adoption

Table 16: Extent of ICT adoption

	PDA					CDA				
	BCA	P&D	H&EM	MA	ICT	BCA	P&D	H&EM	MA	ICT
Very great Extent					●					●
Moderate Extent			●			●		●	●	
Low Extent	●	●		●			●			
● Means "YES"										

From the table 16, it is clearly stated that level of ICT adoption is much high in CDA compared to PDA, with most of their departments are in the process of digitization in the form of data management, ICT facilities in the form of one window services department which is linked with most of the departments of the organization.

4.7.6 Rating of ICT services.

To understand the improvement and usefulness of ICT services, Organization employees were surveyed to rate the ICT services on the scale of very poor to excellent (see table 17). Many dispersed responses were found in the range, if very good and excellent are the combined majority (52%) of the respondents ranked it in terms of its effectiveness in PDA as well as in CDA, almost entire respondents (76.7%) viewed the ICT services to be useful and effective.

Table 17: Rating of ICT services

Rating of ICT services							
	Very Poor	Poor	Good	Very Good	Excellent	Mean	SD
PDA	8.0%	20.0%	20.0%	32.0%	20.0%	3.36	1.254
CDA	6.7%	3.3%	13.3%	50.0%	26.7%	3.87	1.074

If the mean value of both the organizations is compared, it can be found that the mean value of PDA is 3.36 while that of CDA is 3.87. It means that both the respondents of the organizations rated ICT to be very effective and useful. The respondents were further surveyed to give reasons for improving ICT services, and the responses include a website as an effective factor, also infrastructure and ICT human capacity, and in case of user's, their knowledge, and demand for ICT services were the factors which make the ICT services effective.

The value of the t-test represented that there is no significant difference in the mean values and the variability is about the same. It means that both the sections of the respondents rated ICT services to be effective. The rating was the same, meaning both the organizations “moderately” agreed on the ICT effectiveness in service delivery. Thus, the responses show that they agreed on the fact that ICT services are effective.

4.8 Impact of ICT on service delivery

Table 18: Impact of ICT On Service Delivery

Impacts	PDA					CDA				
	BCA	P&D	H&EM	MA	ICT	BCA	P&D	H&EM	MA	ICT
Positive impact on achieving goals	○	●	●	●	●	●	●	●	●	●
Negative impact on service operations	●	●	○	○	○	●	○	○	○	○
Eased Working procedures	○	●	●	●	●	●	●	●	●	●
● Means "YES" ○ Means "NO"										

From the analysis, it was found that ICT applications had brought a positive impact on achieving goals at CDA compared to PDA, as the BCA department of the PDA, lacked ICT facilities. The reasons were their more preference for manual data over the years and a lot of data was in the form of stacks of files, also the reason of lack of funds to support ICT applications. Another impact is the improved operations at both the organizations in the form of efficient reporting, fast services delivery and improved management of customer relations etc. The P&D department of PDA had a positive response to the indicator as they didn't deal with the services delivery of the organization as they were more concerned with the departmental work. The table 16 also shows that ICT had eased working procedures in both the organizations in terms of fast tracking, systematic working systems, quick responses etc.

4.8.1 Improvement of ICT services

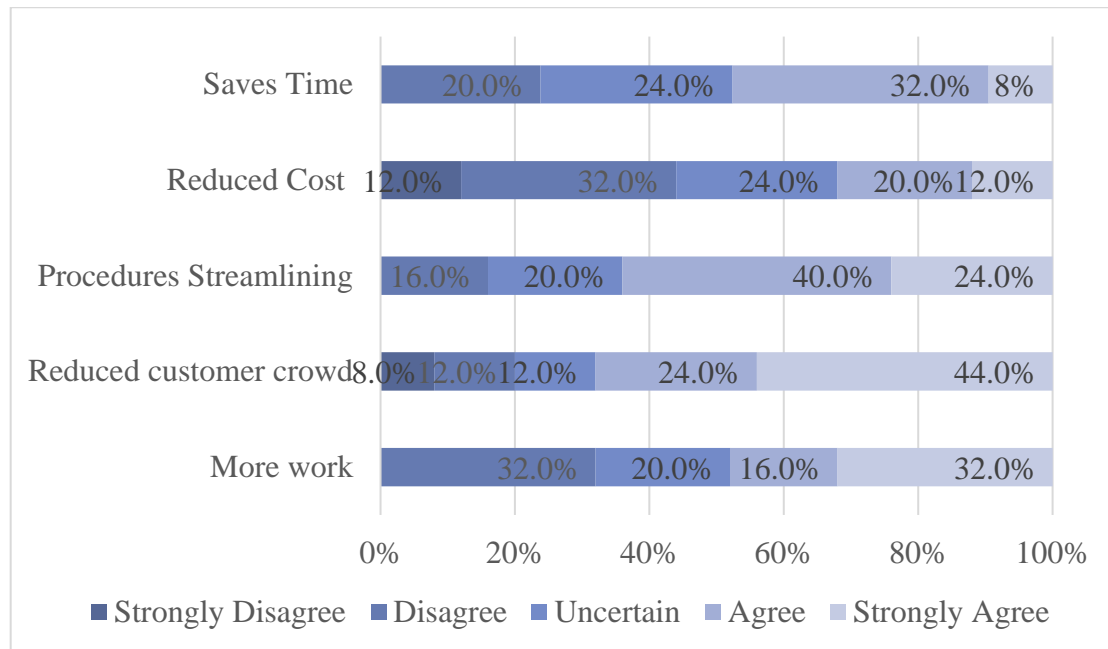


Figure 11: Improvement of ICT services (PDA) (In percentages)

To understand the improvement of services in both the organization the respondents were interviewed based on the factors of, Time savings in system operations, reduced cost, streamlining of the procedures, reduced customer congestion and more work.

From the figure 11, it is clearly shown that ICT service had a strong impact on easing the working procedures in PDA, which proves that ICT systems are time effective as the majority of the respondent's (32%) agreed on this fact. 32% of the respondents disagreed on the fact that ICT had helped in reducing the cost of getting services. As many of the departments of the PDA used manual methods for service delivery, therefore it didn't have any impact on the cost factor. Majority of the respondent's agreed on the fact that ICT had helped them in streamlining procedures of the services. 44% of the respondent's agreed that ICT have facilitated in reducing customer crowds in the organization.

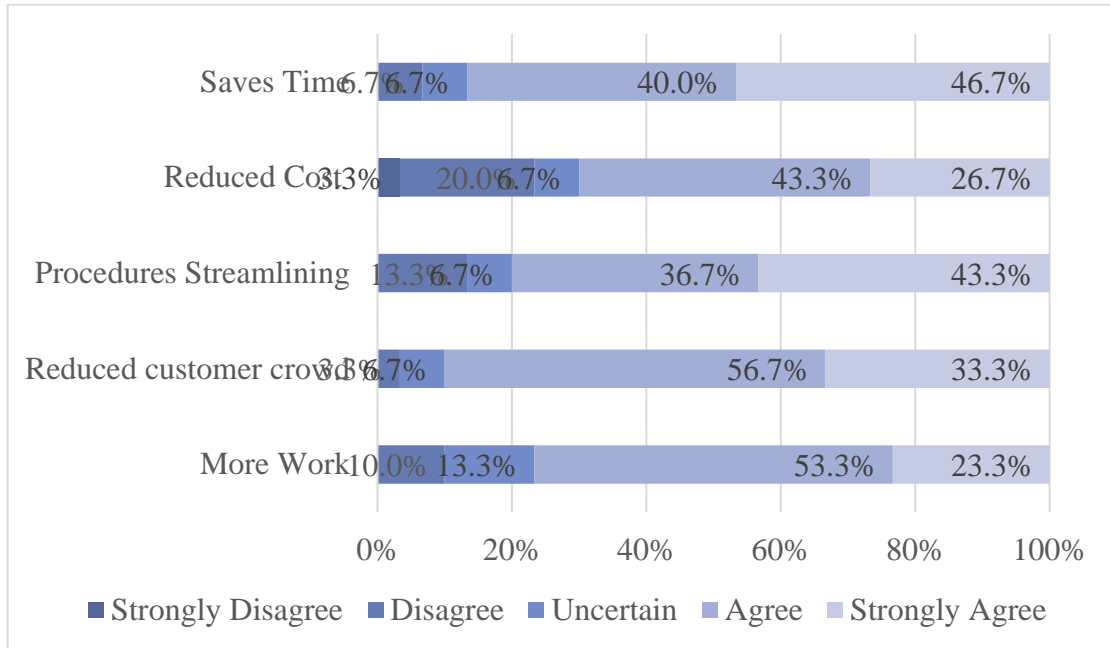


Figure 12: Improvement of ICT services (CDA) (In percentages)

For the ease of analysis if agreed and strongly agreed are combined it shows that 86.7% of the respondents agreed that ICT service had a strong impact on easing the working procedures in CDA, which proves that ICT systems are time effective. Similarly, 70% of the respondents agreed on the fact that ICT had helped in reducing the cost of getting services as well reduced customer crowd due to the presence of one window services department which is linked with the other departments and shares communication digitally. Majority of the respondent's (43.3%) strongly agreed with the fact that ICT had helped them in streamlining procedures of the services. 53.3% of the respondent's agreed that ICT has facilitated in reducing customer crowds in the organization. For the ease of analysis if agreed and strongly agreed are combined, 76.6% of the respondents agreed that because of ICT Applications they could work more, in terms of that the cost and time of doing work had been decreased.

4.8.2 Perception of respondents about ICT effectiveness in service delivery

Table 19: Perception of respondents about ICT effectiveness in service delivery

	The scale of ranking 1-5					Mean	SD
	SD	D	U	A	SA		
Reliable efficient service delivery		5.50%	9.10%	47.30%	38.20%	4.18	.819
Facilitated the timely delivery of services.	1.80%		3.60%	58.20%	36.40%	4.27	.706
Facilitated efficient access to services.	1.80%		7.30%	58.20%	32.70%	4.20	.730
Led to improved quality of services.	1.80%		10.90%	47.30%	40.00%	4.40	1.011
Effective means of communication within the organization.		5.50%	7.30%	61.80%	25.50%	4.07	.742
Effective means of communication outside organization.	5.50%	21.80%	10.90%	45.50%	14.50%	3.47	1.200
Improved on reporting.		1.80%	14.50%	58.20%	25.50%	4.07	.690
Convenient customer feedback		3.60%	12.70%	63.60%	20.00%	4.00	.694
Boosted staff morale		10.90%	18.20%	56.40%	14.50%	3.75	.844
Improved staff work relationships		10.90%	21.80%	45.50%	21.80%	3.78	.917

Note: SD (Strongly Disagree), D(Disagree), U(Uncertain), A(Agree), SA (Strongly Agree)

It can be analyzed from the findings, that the respondents were agreed to the fact that ICT has provided reliable service delivery (Mean=4.18, SD=0.8). Also, for the ease of

analysis if agree and strongly agree are combined it can be found that ICT had resulted in timely, efficient access, and improved quality of services.

It can also be analyzed from the data that ICT had provided effective means of communication within organizations (Mean=4.07, SD=0.7) in comparison to the outside (Mean=3.47, SD=1.42). Also, it can be found that ICT applications had improved in the reporting of complaints/demands (Mean=4.07, SD=0.69), as well as it provides convenient customer feedback and improved staff customer relationships.

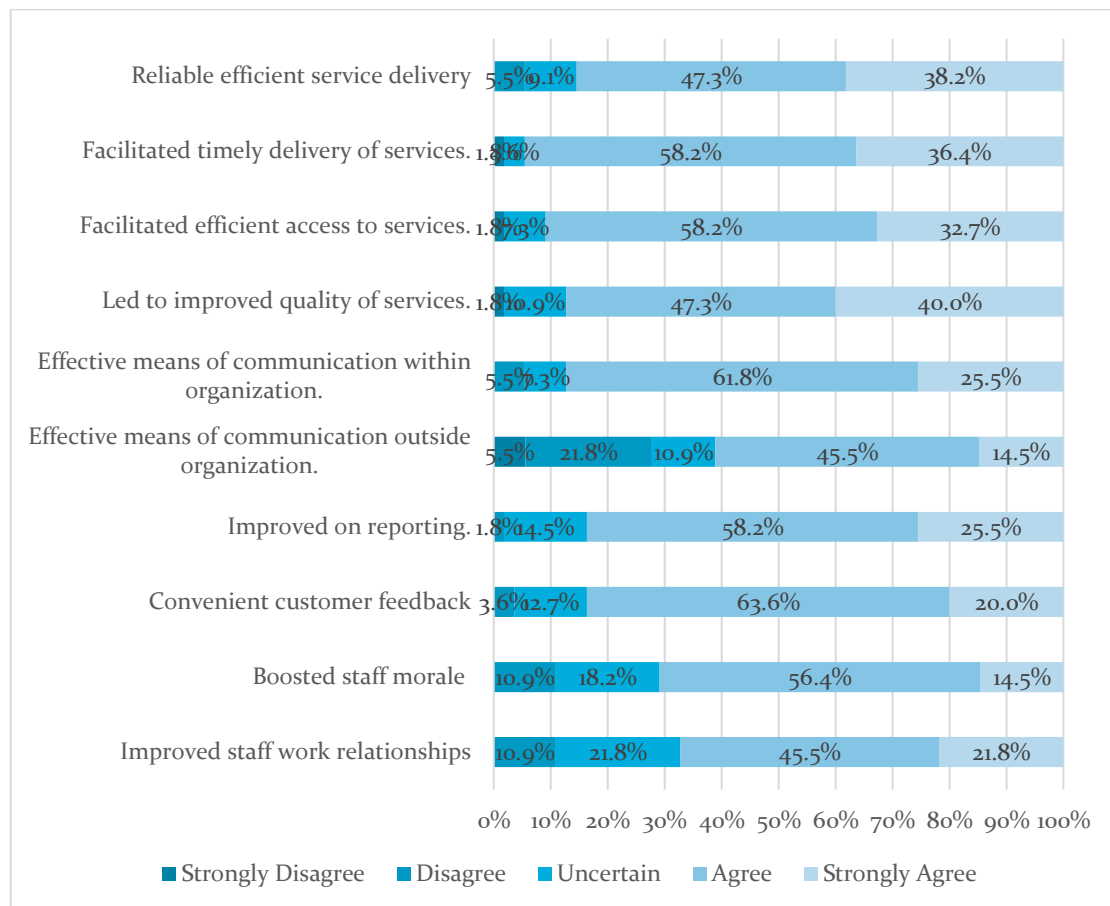


Figure 13: Perception of respondents about ICT effectiveness in service delivery (In percentages)

4.9 User's Factors

Table 20 :Demographic data of users

ORGANIZATION		PDA		CDA		ME AN	SD
VARIABLES	Categories of variable	Freque ncy	%	Frequ ency	%		
GENDER	Male	41	91.10%	28	62.20%	1.23	0.43
	Female	4	8.90%	17	37.8%		
AGE	20-30 years	16	35.60%	13	29.50%	1.88	0.73
	31-40 years	19	42.20%	21	47.70%		
	41-50 years	9	20.00%	10	22.70%		
	Above 50 years	1	2.20%	1	0.1%		
OCCUPATION	Business	20	44.4%	15	33.3%	1.78	0.72
	Employed	15	33.3%	23	53.3%		
	Unemployed/St udents	10	22.2%	6	13.3%		
WORKING SECTOR	Private	18	40.0%	18	40.0%	1.76	0.73
	Government	17	37.8%	21	46.7%		
	Not applicable	10	22.2%	6	13.3%		
EDUCATION	Primary Education	5	11.1%			4.64	1.14
	Secondary/Dipl oma/IT	7	15.6%	3	6.7%		
	Graduation(UG)	10	22.2%	10	22.2%		
	Post- Graduation(PG)	10	22.2%	22	48.9%		
	Higher than PG	12	26.6%	10	22.2%		
	No Education	1	0.02%				
AREA OF RESIDENCE	Urban	40	88.90%	45	100%	1.06	0.23
	Rural	5	11.1%				

4.9.1 Respondents by Gender

Regarding this aspect 91% respondent's/customers were males and 9% respondents were females in PDA, while 62% of customers were males and 38% females in CDA. This aspect also shows the gender gap in both the cities and the participation rate of females in public offices in terms of acquiring services/demands and other social/official interactions.

4.9.2 Respondents by Age

From the survey conducted it can be found that the majority of the customers (40 out of 90) were aged among 31-40.

4.9.3 Respondents by Education

From the results of the survey it is indicated that most of the respondent's/customers (26%) held a higher degree of education in terms of PDA, although the data is homogenous among its respondent's in terms of other levels of education. Contrarily in case of this CDA, 49% of its customers held post graduate degrees and shows the high level of difference among other categories.

4.9.4 Respondents by Occupation

Regarding the analysis of this aspect, the factor was divided into three categories namely Business, Employed and Unemployed/Students. The business categories included private businesses/ companies/contractors, while the employed category consists of teachers/doctors/Govt servant/ Nurses/Bank and other job categories. From the table it can be found that most of the customers (44%) were among the category of Business in PDA while in CDA most of the users were among the category of employed (53%). This factor indicates the major difference of job opportunities in both the cities in terms of more private and government job opportunities in the capital city.

4.9.5 Respondents by Working sector

From the results of the survey it is indicated that most of the respondents (40%) were employed in the private sector/businesses in PDA, while the majority of the customers (46.7%) in CDA were employed in the Government sector.

4.9.6 Respondents by Area of residence

From the results of the survey it is indicated that most of the customers belonged to an urban area in terms of both the cities (89% in PDA and 100% in CDA).

4.10 The frequency of Use of ICT tools

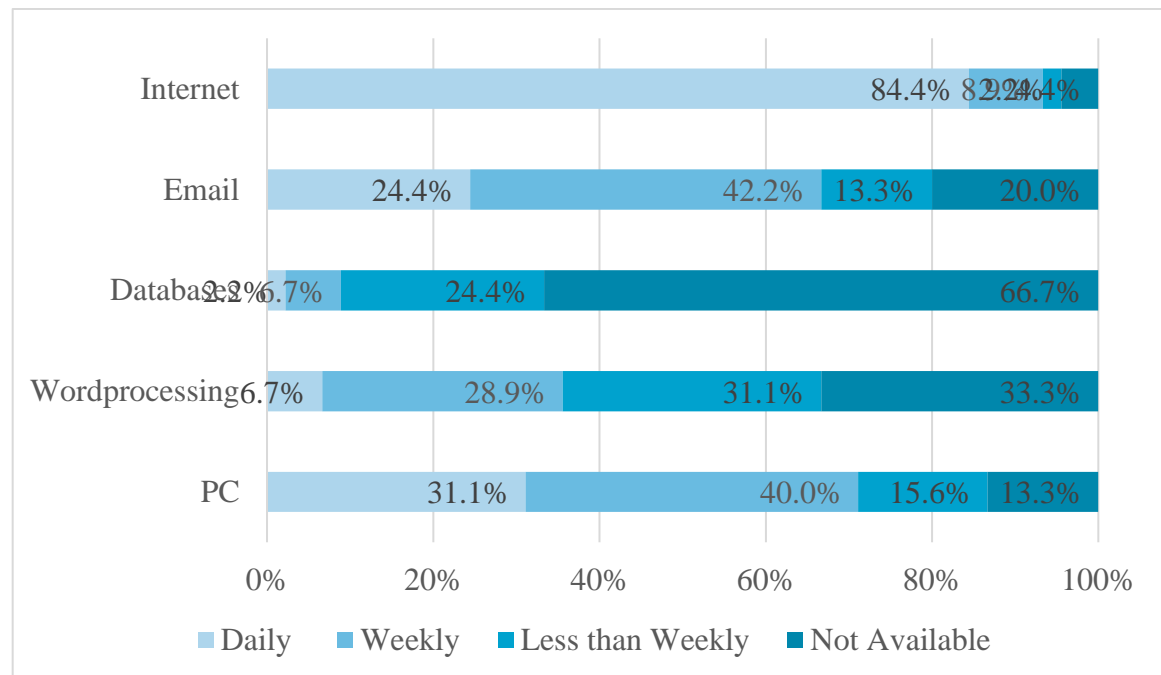


Figure 14: Frequency of Use of ICT tools(PDA) (In percentages)

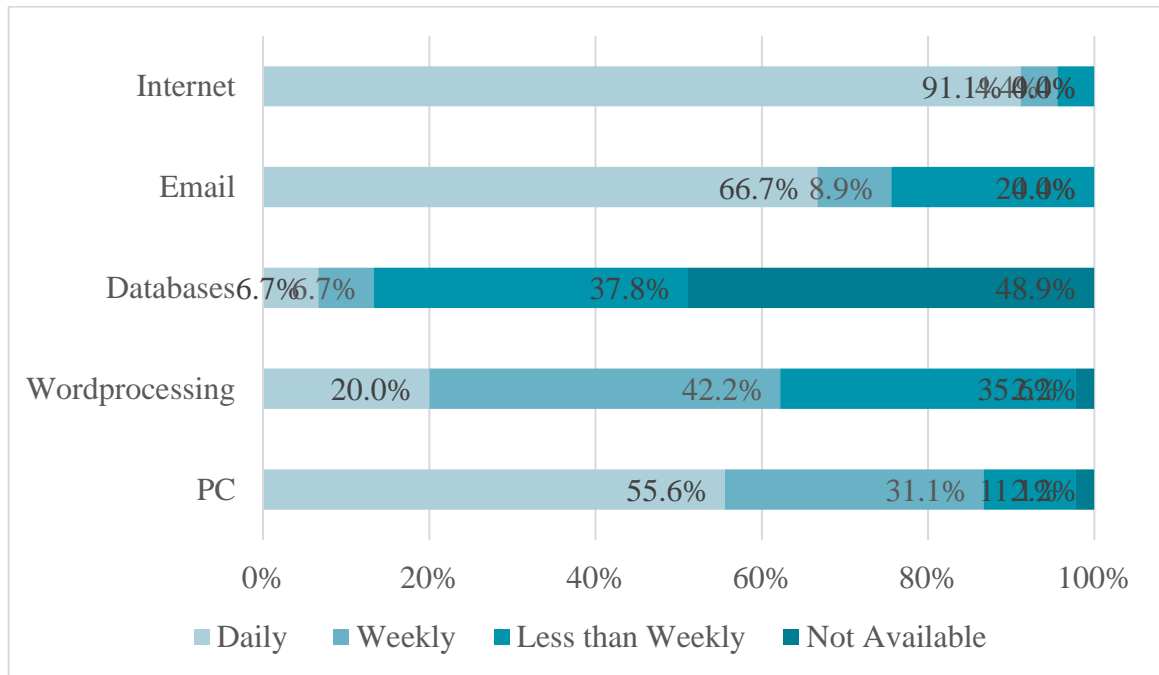


Figure 15: Frequency of Use of ICT tools(CDA) (In percentages)

Table 21: Cross tabs of Frequency of Use of ICT tools

ICT Tools	Frequency	PDA		Mean	SD	CDA		Mean	SD
		N	%			N	%		
PC	Daily	14	31.1%	2.11	1.0	25	55.6%	1.60	.78
	Weekly	18	40.0%			14	31.1%		
	Less than Weekly	7	15.6%			5	11.1%		
	Not Available	6	13.3%			1	2.2%		
Word processing	Daily	3	6.7%	2.91	.94	9	20.0%	2.20	.78
	Weekly	13	28.9%			19	42.2%		
	Less than Weekly	14	31.1%			16	35.6%		
	Not Available	15	33.3%			1	2.2%		
Data bases	Daily	1	2.2%	3.56	.73	3	6.7%	3.29	.86
	Weekly	3	6.7%			3	6.7%		
	Less than Weekly	11	24.4%			17	37.8%		
	Not Available	30	66.7%			22	48.9%		
Email	Daily	11	24.4%	2.29	1.1	30	66.7%	1.58	.86
	Weekly	19	42.2%			4	8.9%		
	Less than Weekly	6	13.3%			11	24.4%		
	Not Available	9	20.0%			0	0.0%		
internet	Daily	38	84.4%	1.27	.72	41	91.1%	1.13	.45
	Weekly	4	8.9%			2	4.4%		
	Less than Weekly	1	2.2%			2	4.4%		
	Not Available	2	4.4%			0	0.0%		

To identify the usage of ICT among customers, they were asked to provide the frequency of usage of tools of ICT, and for that they were a number of options and categories in terms of frequency (Daily, Weekly, Less than Weekly, Not Available). In both strata of respondent's, the use of the internet was high in terms of daily usage. Mean and Standard deviation of the internet in case of PDA is (1.27 ± 0.72) and CDA is (1.13 ± 0.45) . This indicates that the data is close together in this category or most of the customers had access to internet easily, values of Standard deviation indicates that the data is closely placed and there is no significant difference in views of the customers. The other ICT tool that was mostly used by the customers was PC. Mean and Standard deviation of PC in case of PDA is (2.11 ± 1.0) and CDA is (1.60 ± 0.78) . This also implies that usage of PC was high among CDA respondents on a daily basis, while usage of PC was high among PDA respondents on a weekly basis. Regarding the aspect of email, the use was high among CDA respondent's (1.58 ± 0.86) on a daily basis, in contrast to PDA (2.29 ± 1.1) where the usage was on a weekly basis.

The other aspects of data basis and word processing software's were used less than weekly among the respondents of both the organizations.

4.11 User's knowledge about internet services

The customer's knowledge about internet services was analyzed through the factors of customer's awareness, usage of internet services, the sufficiency of electronic services and their perception about internet services delivery.

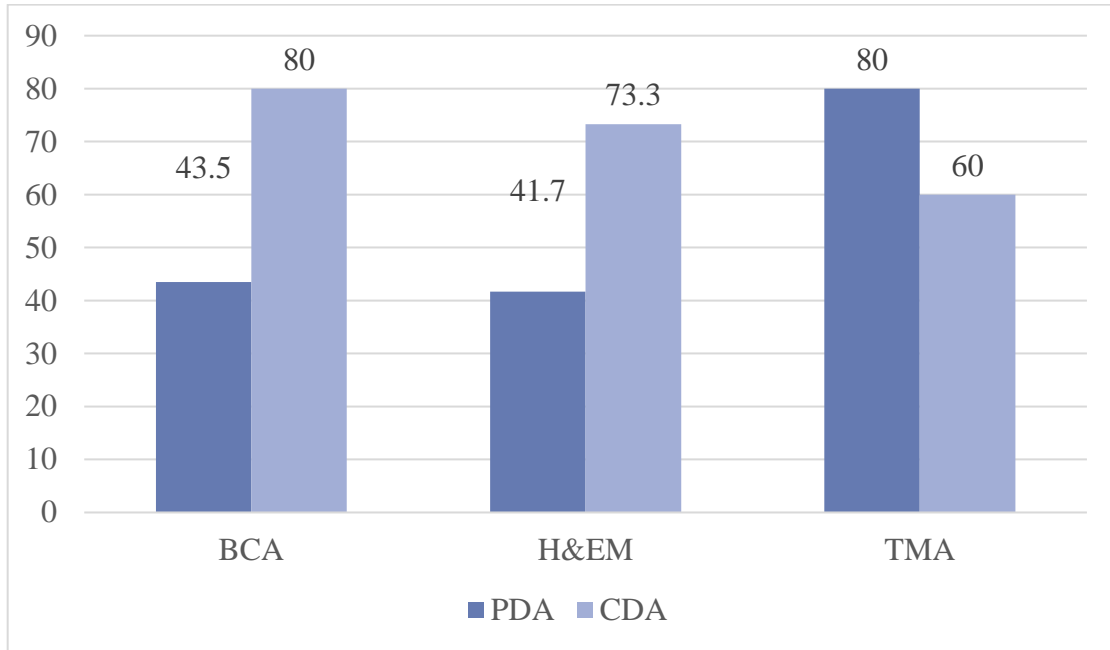


Figure 16: Knowledge about internet services (In percentages)

Regarding the aspect of user's knowledge, this factor was understood in terms of their experience of usage of internet services, and their perception based upon them. As the users were particularly chosen to obtain the objectives of the research, it was essential to know the user's awareness about the internet facilities and it was found that the CDA's respondents were more knowledgeable and aware than the PDA about the electronic services that organization was providing. Their knowledge was based on the sources of social media, advertisements, newspapers etc.

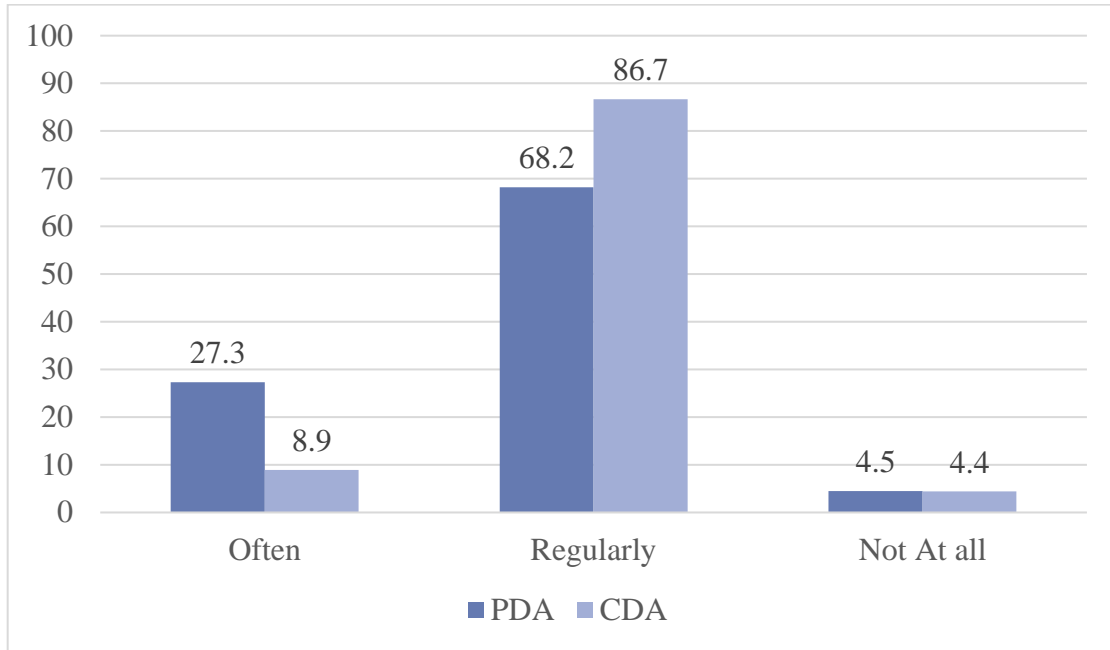


Figure 17: Usage of internet services (in percentages)

From the figure 17 it can be found that the customers of CDA, use more internet services on a regular basis than the users of PDA. As there is a more prevailing atmosphere for online/services, therefore the use of internet services is more than Peshawar. These services include online tendering, social media, online records and complaints, tax paying services.

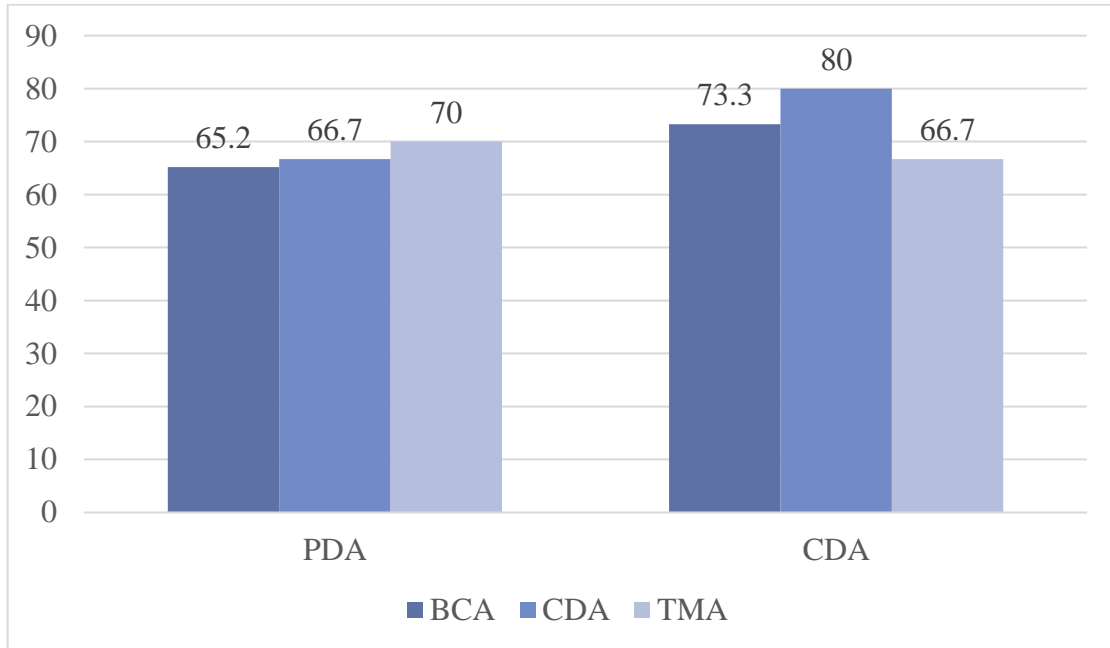


Figure 18: Satisfaction with The Agent (In Percentages)

From the figure 18, it can be found that the customer's satisfaction is higher in CDA with respect to resolved issue/complaint/demand from the agent. In CDA, these demands/issues consist of revised approvals, certificates, transfers, possession forms, NOC's, file records, file transactions, registration of properties, record checking etc. In case of PDA, these demands included revised approvals, certificates, online transfer, possession forms, NOC's, Plan and revised approvals, file records and transactions, registration of shops, file tracking, registration of home, Cleaning of streets, broken street lights, sewerage issues. Given the fact that respondents were satisfied with the delivery of services, it is necessary to understand their response towards the timely delivery of services, and their views about the agents of the organization.

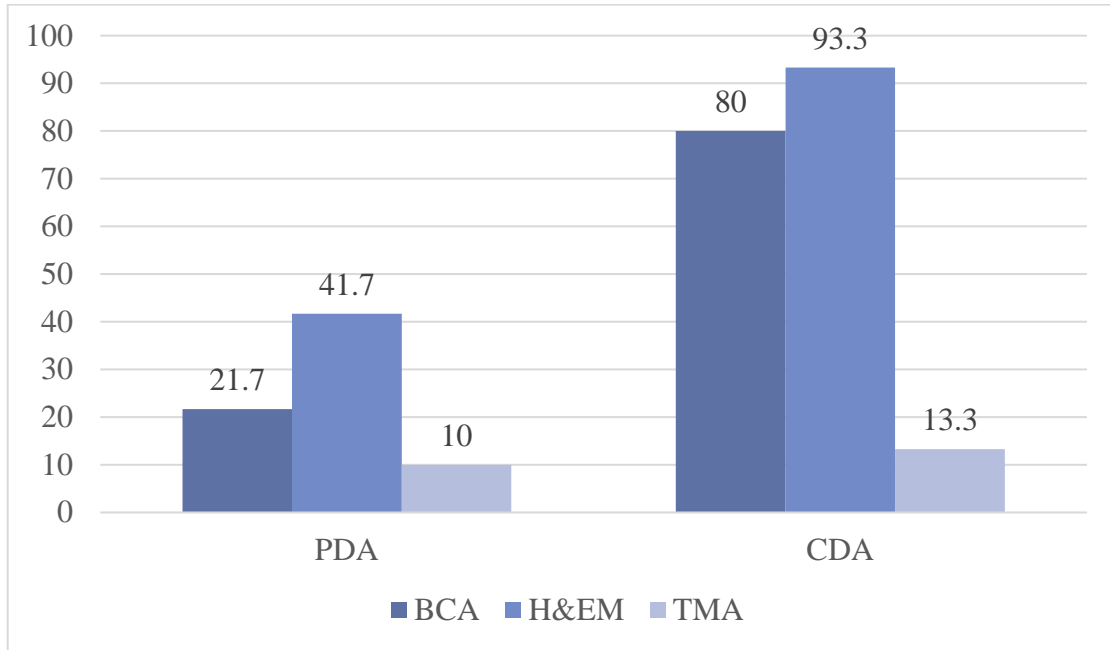


Figure 19: Timely Delivered Services (In Percentages)

From the figure 19, it can be found that users of the BCA, H&EM department of CDA were more satisfied with the timely delivery of the services (80% & 93 %). In comparison it took more time in resolving the issue as the process was lengthier.

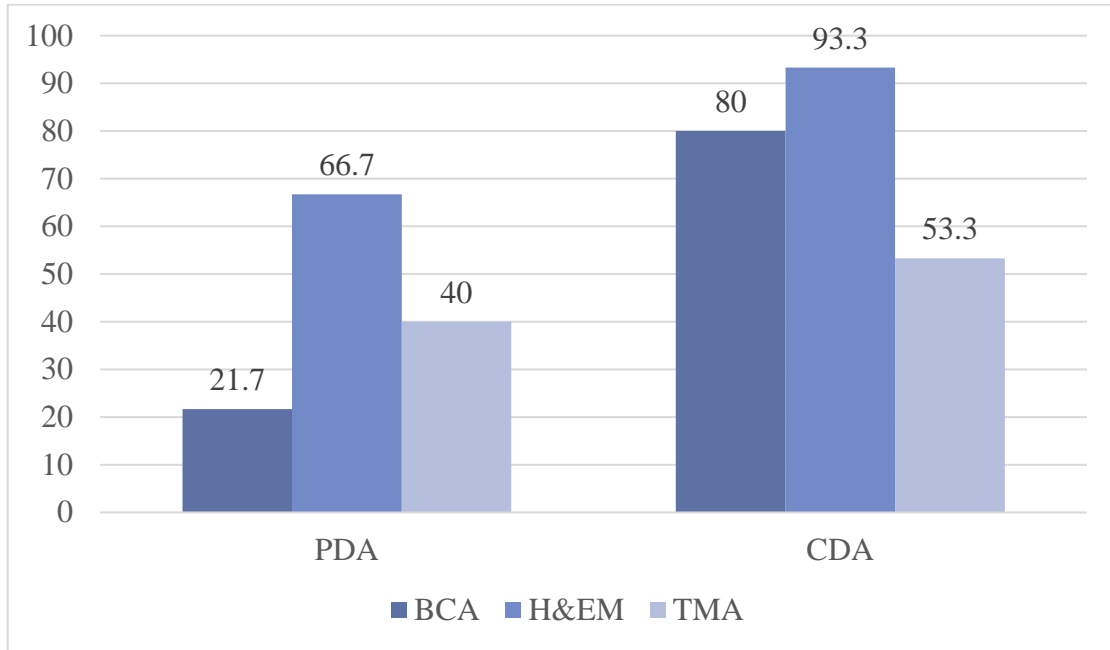


Figure 20: Satisfaction with the agent (In percentages)

From the figure 20, it can be found that the users of H&EM of PDA viewed the agents more knowledgeable about ICT (66% & 40%). In the case of CDA the percentages were higher (80%,93.3%,53%) in the case of concerned three departments.

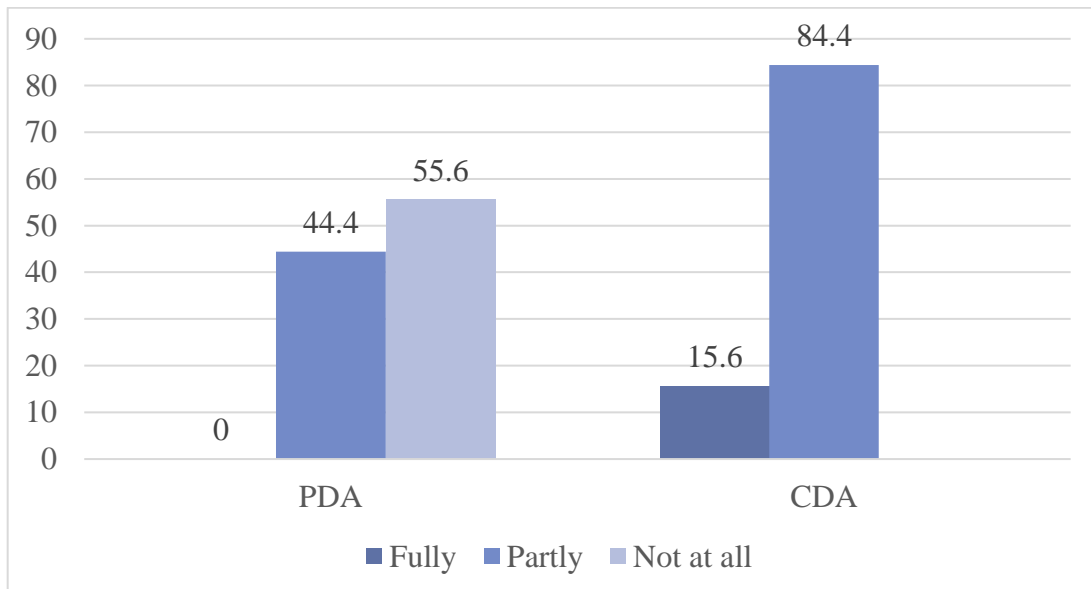


Figure 21: Sufficiency of electronic services (In percentage)

Regarding the aspect of the sufficiency of internet services, this factor was ranked in terms of fully, partly or not at all sufficient. In PDA none of the customers viewed the services to be fully sufficient, many of the customers viewed it as not at all sufficient (55.6%). In case of CDA very few customers (15.6%) viewed the services to be fully sufficient, while remaining 84% viewed it as partly sufficient. This indicates that there is more demand for electronic services and customers want organizations to provide more internet/electronic services.

4.12 User's Awareness

The awareness of users was chosen to meet the objectives of the study; it was important to know about the internet facilities provided by the organization. Thus, the respondents were questioned that they were aware of the internet services provision by organizations.

Publicity of Services

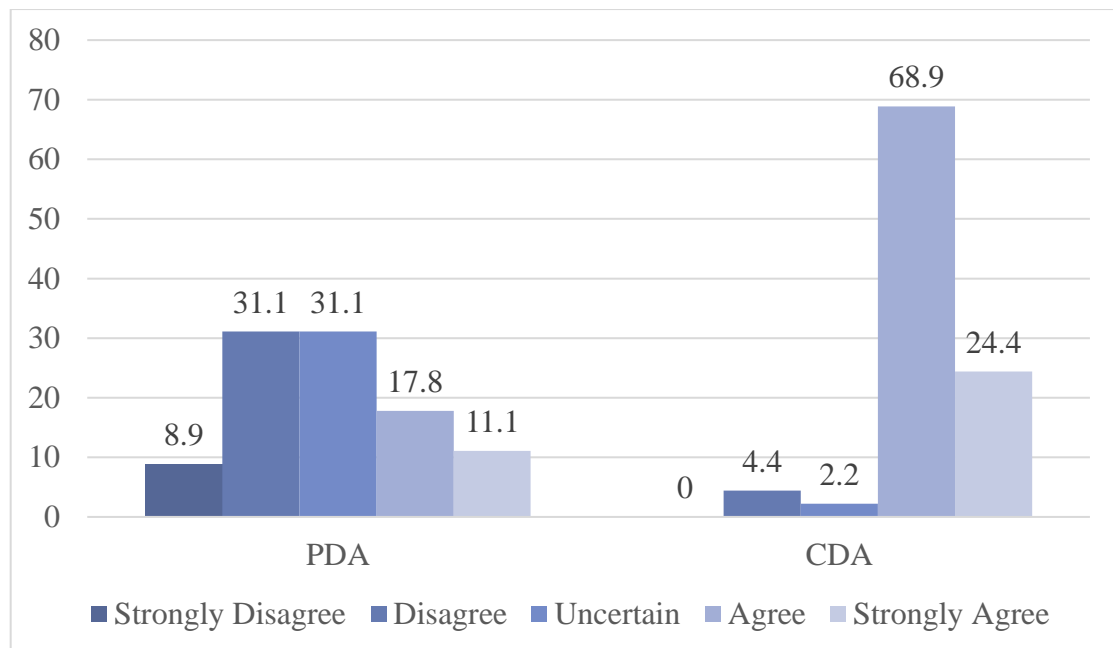


Figure 22: Publicity of Services

As per the responses collected, thy study reveals that as mostly respondents were aware of the presence of internet services on the website of the organizations, it was necessary to know how well the services were publicized. The data shows the contrasting difference of both the organizations as most agreed that internet services were well publicized in CDA (68.9%) in comparison to PDA (17.8%) as they viewed that services were not well publicized.

4.13 Perception Of users towards effect of ICT services delivery

This aspect was studied regarding the views of service seekers towards ICT use in service delivery. It can be found from the table that they were mostly of the view point that it ICT will have positive effects on urban administration. However, few of the citizens agreed with the statements related to effect of ICT on policy making and political processes than those which suggest public access and communications. Therefore, it can be concluded that ICT processes are more likely to affect administrative processes rather than political processes.

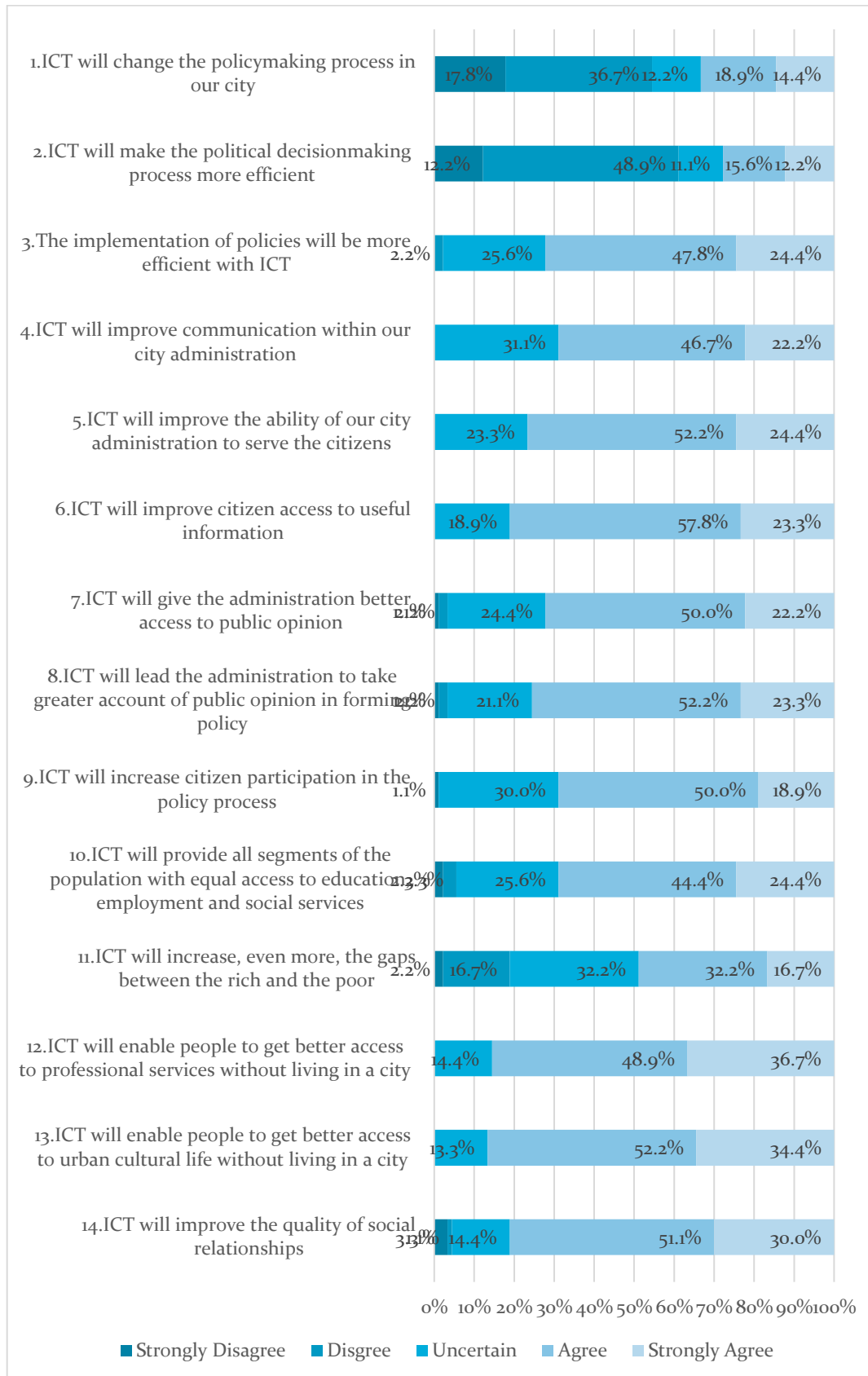


Figure 23: Perception Of users (In percentages)

Table 22: Perception Of users towards ICT services delivery

The scale of rating 1-5								
Categorie s	Strongly Disagree				Strongly Agree		Mean	SD
	Disagree	Disagree	Uncertain	Agree	Agree			
1	0.00%	4.40%	11.10%	43.30%	41.10%	2.76	1.343	
2	0.00%	0.00%	15.60%	42.20%	42.20%	3.94	.770	
3	0.00%	2.20%	25.60%	47.80%	24.40%	3.94	.770	
4	0.00%	0.00%	31.10%	46.70%	22.20%	3.91	.729	
5	0.00%	0.00%	23.30%	52.20%	24.40%	4.01	.695	
6	0.00%	0.00%	18.90%	57.80%	23.30%	4.04	.652	
7	1.10%	2.20%	24.40%	50.00%	22.20%	3.90	.808	
8	1.10%	2.20%	21.10%	52.20%	23.30%	3.94	.798	
9	1.10%	0.00%	30.00%	50.00%	18.90%	3.86	.758	
10	2.20%	3.30%	25.60%	44.40%	24.40%	3.86	.906	
11	2.20%	16.70%	32.20%	32.20%	16.70%	3.44	1.029	
12	0.00%	0.00%	14.40%	48.90%	36.70%	4.22	.683	
13	0.00%	0.00%	13.30%	52.20%	34.40%	4.21	.662	
14	3.30%	1.10%	14.40%	51.10%	30.00%	4.03	.893	

4.14 Satisfaction level of users with the delivery of services through ICT

It can be found from the table that the consumers were more satisfied with the transparency of rules and procedure as well as simplified procedures because of ICT in public service delivery.

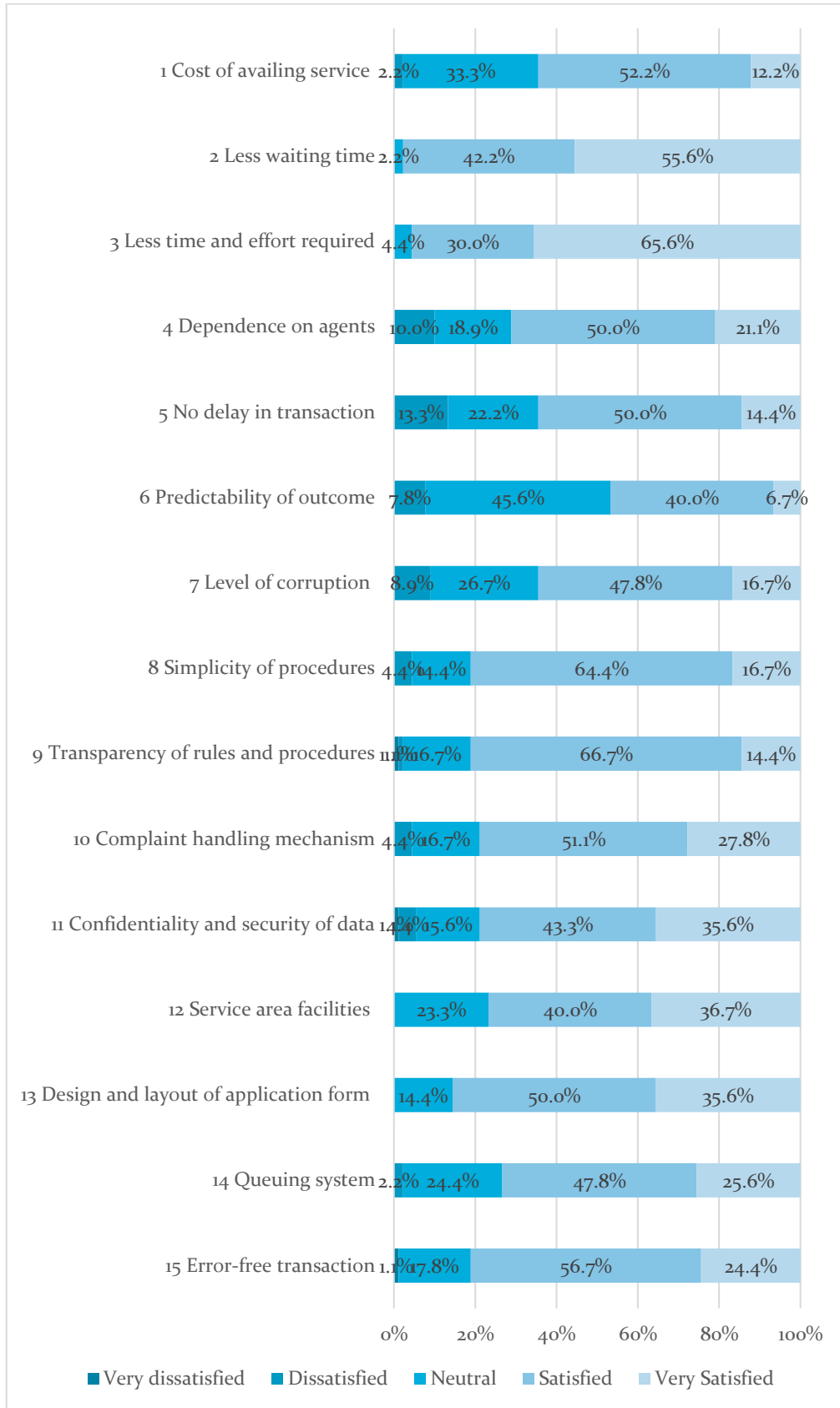


Figure 24: Satisfaction level of users with the delivery of services through ICT (IN percentages)

Table 23: Satisfaction level of users with the delivery of services through ICT

The scale of rating 1-5							
Categories	Very			Very		Mean	SD
	dissatisfied	Dissatisfied	Neutral	Satisfied	Satisfied		
1	1.10%	0.00%	17.80%	56.70%	24.40%	3.74	.696
2	0.00%	2.20%	24.40%	47.80%	25.60%	4.53	.545
3	0.00%	0.00%	14.40%	50.00%	35.60%	4.61	.575
4	0.00%	0.00%	23.30%	40.00%	36.70%	3.82	.881
5	1.10%	4.40%	15.60%	43.30%	35.60%	3.66	.889
6	0.00%	4.40%	16.70%	51.10%	27.80%	3.46	.737
7	1.10%	1.10%	16.70%	66.70%	14.40%	3.72	.848
8	9	4.40%	14.40%	64.40%	16.70%	3.93	.700
9	0.00%	8.90%	26.70%	47.80%	16.70%	3.92	.674
10	0.00%	7.80%	45.60%	40.00%	6.70%	4.02	.793
11	0.00%	13.30%	22.20%	50.00%	14.40%	4.08	.890
12	0	10.00%	18.90%	50.00%	21.10%	4.21	.679
13	0.00%	0.00%	4.40%	30.00%	65.60%	4.13	.767
14	0	0.00%	2.20%	42.20%	55.60%	3.97	.771
15	0.00%	2.20%	33.30%	52.20%	12.20%	4.03	.726

4.15 Barriers

4.15.1 Challenges/factors deterring the use of ICT systems

Table 24: Challenges/Factors Deterring the Use Of ICT Systems

Barriers	PDA		CDA	
	Mean	SD	Mean	SD
Factor of technology resistance	3.04	1.428	3.67	1.093
Lack of skills by customers	4.00	1.080	4.03	.999
Unstable infrastructure	3.72	1.021	3.20	1.243
System Failures	4.12	.600	2.77	1.382
Funds insufficiency	2.72	1.137	3.20	1.215
Poor Implementation of systems	3.04	1.274	2.63	1.159
ICT security threats	3.08	1.256	3.17	1.262

This indicator was studied on a scale of 1-5 through agreement/disagreement view of the respondent's in terms of ICT challenges and how they are associated with the service delivery. From the table it can found that lack of skills by customers (Mean=4, SD=1.08), unstable infrastructure (Mean=3.72, SD=1.02), and system failures (Mean=4.12, SD=0.60), were the main challenges faced by PDA. In case of CDA lack of skills by customers (Mean=4.03, SD=0.99), is the main challenge, followed by resistance to technology (Mean=3.67, SD=1.09). However, the respondent's showed uncertainty in case of other factors such as poor implementation and deployment of systems, ICT security threats and funds insufficiency in both the organizations.

4.16 One Way ANOVA

Table 25 :One way ANOVA

		Sum of Squares	DF	Mean Square	F	Sig.
ICT penetration	Between Groups	.500	4	.125	9.000	.000
	Within Groups	.625	45	.014		
	Total	1.125	49			
Services Delivery channels	Between Groups	1.483	4	.371	2.965	.029
	Within Groups	5.628	45	.125		
	Total	7.111	49			
ICT connectivity	Between Groups	.519	4	.130	3.494	.014
	Within Groups	1.671	45	.037		
	Total	2.190	49			
ICT infrastructure	Between Groups	38.600	4	9.650	32.407	.002
	Within Groups	13.400	45	.298		
	Total	52.000	49			
Impact of ICT on services delivery	Between Groups	2.778	4	.694	7.827	.000
	Within Groups	2.395	27	.089		
	Total	5.173	31			
Human resources	Between Groups	1.027	4	.257	1.797	.147
	Within Groups	6.289	44	.143		
	Total	7.316	48			
Satisfaction with ICT services	Between Groups	1.323	4	.331	2.597	.049
	Within Groups	5.732	45	.127		
	Total	7.055	49			
ICT Functions/ Performers	Between Groups	.157	4	.039	.403	.806
	Within Groups	4.395	45	.098		
	Total	4.552	49			
Internet usage & Knowledge	Between Groups	.759	4	.190	.973	.432
	Within Groups	8.775	45	.195		
	Total	9.534	49			
Users knowledge	Between Groups	.369	4	.092	1.079	.378
	Within Groups	3.844	45	.085		
	Total	4.213	49			

Results from the above table shows that the significance value for ICT penetration is 0.000 which is less than 0.05. Thus null hypothesis is rejected. It means that ICT penetration had a considerable impact on the service delivery. Similarly, the $p < 0.05$ in terms of service delivery channels, ICT connectivity, ICT infrastructure, ICT functions and the satisfaction with the use of ICT in services delivery. There is the difference in the results of the above-mentioned variables and cannot be considered the same. It also shows that which indicator had a significant difference between their variables. Also, it shows that there is no significant difference between the means of variables of human resources and the ICT functions/performers as all the results were almost the same in both the organizations for these variables.

Chapter 5. Conclusions and Recommendations

5.1 Conclusions

The findings of the study are based upon the evolution of the city's authority's administration and urban service delivery through the lens of digital information and communication technologies to make them more transparent, citizens centric, service oriented, inclusive, interactive and communicative, as well as more adaptable, reliable and accessible experiences online

The primary assumption of the study was that processes of ICT infrastructure, penetration, as well as the associated users/customers, impact the ICT in public service delivery. Therefore, the study was related to understanding the role of ICT in public services to make them more effective and efficient in terms of time and cost effective.

The findings of the study show that most of the employees agreed that they would shift to the use of ICT to make services more efficient, thus ensuring better services delivery to the customers. Also, most of the customers of both CDA and PDA agreed that ICT helps in saving time to get the services as well as reduced visit to the offices. There is more demand for ICT use in public services from the customers, as well as the demand for expansion of ICT services from the employees.

The data also shows overwhelming responses in case of Islamabad that most of the respondent's agreed that ICT can play an important role in the change in urban administration and online public services delivery. These changes are in the form of improved infrastructure, connectivity and availability of ICT facilities. It also shows that in Peshawar, the rate is gradually increasing, and the city is in the process of acquiring ICT facilities.

Data analysis also reveals that the factors of ICT infrastructure and ICT penetration influence the ICT use in public service delivery in contrast to user's factors such as customers knowledge and demand. It means that if the role of an organization is more strengthened and emphasized, it would make the use of ICT in public services more effective. The study concluded that mostly respondent's both organizational and customers viewed the use of ICT services as positive. Nevertheless the degree of assertiveness differed.

As according to the analysis, the user's factors had a very small role to play in the improved public service delivery through ICT. The reasons constitute poor right consciousness, staff-client relationship. As the study more, asserts the role of organizational effectiveness which is more necessary for improving ICT services delivery. According to observatory and questionnaire survey with the users, the study had identified basic reasons of customers complaints such as lack of publicity of services through advertisement/campaigns to educate the customers about the ICT services provided by the organization, online provision of services is not sufficient, services like online payments, access to personal account were still not provided electronically which would in result reduce the visits to offices.

The prior areas of their complaints need to be handled properly as to ensure effective online services delivery. The challenge is towards organization to meet the demands of citizens effectively. Different organizations had different setups, the requirements always differ and might not go well with other organizations, i-e effective ICT use, and strong aspects might not be available in other organizations. One study conducted on Municipalities of Kathmandu Valley pointed that those organizations have poor human resources and financial allocation for ICT (Shrestha 2009).

From the thesis, various factors had been concluded which impact the role of ICT in public service delivery and administration. These factors make the map for the adoption and implementation of ICT in public organizations. These factors include:

- ICT penetration
- ICT infrastructure
- ICT perception
- ICT functions
- ICT opportunities
- ICT challenges

These factors play an important role in the effective delivery of the services in terms of improving the relationship of an organization-citizen relationship through focusing on the main aspects of accessibility, Ease, and communication of information.

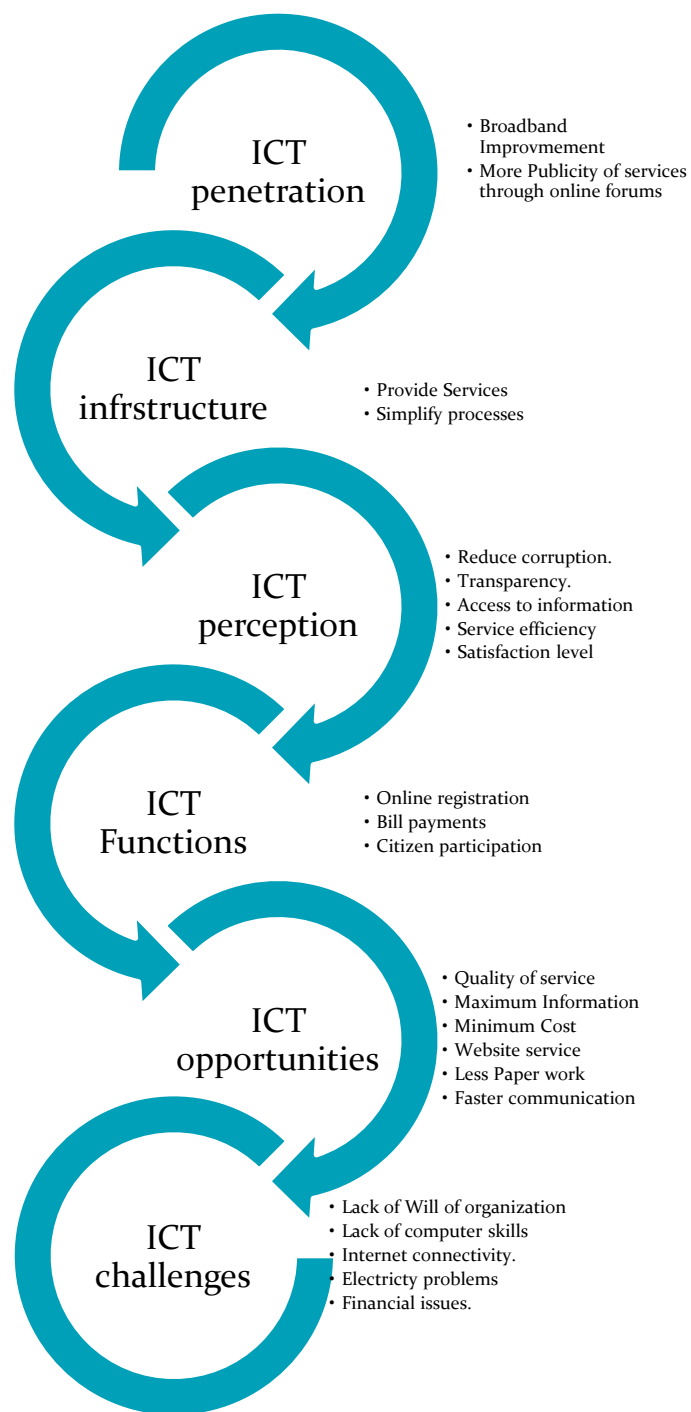


Figure 25: Factors involved in Public service delivery

5.2 Recommendations

The main objective of the thesis was to enhance the role of ICT in public organizations in terms of public service delivery. The analysis of the study shows clearly the availability of ICT facilities in service delivery. It can thus be recommended in the context of different public organizations of Pakistan that:

1. ICT should be implemented in all public organizations of Pakistan at local as well as district level. It can help in bridging the gap between institutions and citizens. The public/private partnership should be considered as an effective solution to finance the ICT infrastructure and its operations.
2. The government at the state level should fund both the organizations as a priority matter as according to Digital policy of Pakistan, 2017,” Promote an Open Digitization infrastructure for shared services including cloud technologies to achieve synergies and economies of scale in both the public and private sectors” and to enhance services delivery to citizens through innovative use of ICT through the development of technology platforms and solution for making organization more productive and effective in terms of service delivery.
3. ICT services should be made sufficiently available by administrations of public organizations such that citizens can utilize them effectively.
4. The ICT skills should be acquired through ICT training at the organization level to enable them to enhance new skills, knowledge and the growth of outcome of the organizations.
5. The organizations should more focus upon best practices regionally and internationally of managing ICT while transforming to digital.

6. All the public organization s should be facilitated with high seed internet bandwidth, advance systems of hardware and software to improve the performance of ICT systems.
7. All organization should improve their online services and web portals with updated institutional data.

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Chapter 7. ANNEXURE

Questionnaire to Organizational staff and employees

This study attempts to understand the impact of ICT services provided by the organizations. The study has hypothesized that the human resources, ICT infrastructure, improved services are organizational factors. This questionnaire survey to the organizational staff is, thus, an attempt to understand the impact of ICT services as seen and perceived through the organizational lenses

1. Gender

Mark only one oval.

- Male
 Female

2. Age

Mark only one oval.

- 0-18
 19-35
 36-Above

3. Which division do you work for?

Mark only one oval.

- Design & Construction
 Building control
 Housing societies
 Civic management(solid waste)
 Directorate of Municipal Administration (DMA)
 Estate Management
 ICT department
 Other: _____

4. Education Level

Mark only one oval.

- Primary Level
 Secondary Level
 Tertiary / College Level
 University Level

5. Overall Work Experience in years?

6. Work experience in this organization? Kindly mention the years

7. Is there any ICT facility available for effective service delivery and administration in your department?

Mark only one oval.

- Yes
 No

8. If Yes, Please mention the ICT facility available in your department.

9. If No, Please mention the reasons for the lack of ICT facilities.

10. In your experience, have you witnessed significant 'change' in Urban Administration & service delivery from the application of ICT in the department?

Mark only one oval.

- Yes
 No

11. If yes, how can you explain those changes from ICT applications in your department? (For example, efficient data organization, effective resources utilization, "mention those resources")

12. If YES, rate it on a scale of 1 to 5 (where 1= Very Poor and 5 = Excellent). Mark only one oval.

	1	2	3	4	5	
Very Poor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Excellent

13. What are the ICT work-related activities performed? For example, Access to professional e-mail, Access to documents on enterprise's servers

14. What are the dedicated department software applications? Mention those of your department only.

ICT Applications, connectivity & Infrastructure

15. Does your department use computers? (Personal Computers, portable computers, tablets, other portable devices such as Smartphones)

Mark only one oval.

- Yes
 No

16. If YES, what is the mode for the internet access? *Mark only one oval.*

- Radio (wifi)
 Fibre optics
 Cable technology
 Others (please specify)

17. What is the capacity (bandwidth)?

18. Who is your service provider for the internet?

19. What is the website of your organization?

20. Is there a dedicated team for up gradation of the website? *Mark only one oval.*

- Yes
 No

21. **If yes, how frequently is the website updated?** *Mark only one oval.*

- Daily
- Weekly
- Monthly
- Quarterly (every 3 months)
- Others (Please specify)

22. **If yes, Does the team fall under ICT department or another department?** *Mark only one oval.*

- Yes
- No

23. **Name the department**

24. **Mention the approximate internet users for the past year using the ICT services and processes?**

25. **Do you have the following in your organization** *Mark only one oval per row.*

	Yes	No
Centralized User Authentication	<input type="radio"/>	<input type="radio"/>
Electronic Document Management System (EDMS)	<input type="radio"/>	<input type="radio"/>
Local Area Network (LAN)	<input type="radio"/>	<input type="radio"/>
Wide Area Network (WAN)	<input type="radio"/>	<input type="radio"/>
Electronic Payment System	<input type="radio"/>	<input type="radio"/>
Database(s)	<input type="radio"/>	<input type="radio"/>

26. **Are there institutional arrangements for protection and privacy of client data in your department?** *Mark only one oval.*

- Yes
- No

27. If yes, mention those arrangements.

28. Do you have the following ICT security measures in your department *Mark only one oval per row.*

	Yes	No
ICT Security	<input type="radio"/>	<input type="radio"/>
Use of biometric security features	<input type="radio"/>	<input type="radio"/>
Intrusion Detection System (IDS)	<input type="radio"/>	<input type="radio"/>
Anti-virus	<input type="radio"/>	<input type="radio"/>
Others	<input type="radio"/>	<input type="radio"/>

29. In case of others, please specify

30. How does your organization facilitate its staff to have access to their internal staff e-mails when outside the work place?

31. Is your organization ICT system interconnected with those of other relevant organizations?

Mark only one oval.

- Yes
 No

32. If YES, which organization(s) and for what purpose was the interconnection done?

33. In your opinion, which priority areas in your organization do you feel need to be integrated with other organizations?

Impact of ICT on Service delivery and Urban Administration

34. What is your view on the impact of ICT on departmental operations and service delivery? *Mark only one oval per row.*

	Yes	No
ICT has brought positive impact on business achievements at organization	<input type="radio"/>	<input type="radio"/>
ICT adoption has led to negative impacts on the services at organization	<input type="radio"/>	<input type="radio"/>
ICT Systems have eased working procedures	<input type="radio"/>	<input type="radio"/>

35. To what extent has ICT adoption had improved operations of the department? *Mark only one oval.*

- Very great extent.
- Great extent.
- Moderate extent.
- Low extent.

36. Indicate your level of agreement with the following statements by ticking at the appropriate box

Mark only one oval per row.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
IT systems have enabled reliable efficient service delivery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT has facilitated timely delivery of services.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT has facilitated efficient access to services.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT systems has led to improved quality of services.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT systems have provided effective means of communication within organization.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT systems have provided effective means of communication outside organization.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT has improved on reporting.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT systems provide convenience customer feedback	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT Systems has reduced congestion at the halls.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IT systems have facilitated decision making at all levels of management.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT has boosted staff morale	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT has improved staff work relationships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

37. What are you reasons of agreeing/disagreeing with the above statements?

38. What are the internal processes which are automated in departmental service delivery and administration

39. **What are the internal processes which are not automated in departmental service delivery and administration**

40. **Does your department buy any of the following cloud computing services used over the internet?**

Mark only one oval per row.

	Yes	No
E-mail (as a cloud computing service)	<input type="radio"/>	<input type="radio"/>
Office software (e.g. word processors, spreadsheets, etc.) (as a cloud computing service)	<input type="radio"/>	<input type="radio"/>
Hosting the database(s) (as a cloud computing service)	<input type="radio"/>	<input type="radio"/>
Storage of files (as a cloud computing service)	<input type="radio"/>	<input type="radio"/>
Finance or accounting software applications (as a cloud computing service)	<input type="radio"/>	<input type="radio"/>
Customer Relationship Management (CRM, software application for managing information about customers) (as a cloud computing service)	<input type="radio"/>	<input type="radio"/>
Computing power to run the organization's own software (as a cloud computing service)	<input type="radio"/>	<input type="radio"/>

41. **How does your department share information electronically?** *Mark only one oval.*

- websites.
- web portals.
- electronic transmission suitable for automated processing.

42. **Mention the sources for the electronic sharing of information.**

43. How does your department plan to utilize ICT to enhance service delivery?

44. What is the preferred service delivery channel in your organization? *Mark only one oval per row.*

	Not Preferred	Least Preferred	Preferred	Most Preferred
SMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Telephone hotline	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interactive websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
E-mails	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Portal services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interactive Voice Response Services (IVRS)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

45. if any other source, please specify

46. Which ICT system applications are you planning to utilize in designing in specific departments?

47. In your opinion, what percentage of your department's data has been digitized and is accessible against the total number of manual records kept?

48. How does your department handles the complaints and what are the solutions provided on the basis if ICT?

49. Which ICT database solutions do you use in your department?

50. How do you use ICT in detecting and deterring fraud?

51. How do you use ICT in payment of claims?

52. What factors are considered in your department when deciding on an ICT investment (automation, hardware acquisition etc)

53. In your opinion, what benefits do you think have accrued to your department from the utilization of ICT in your organization processes?

54. What challenges does your department face in using ICT for service delivery?

55. How do you plan to overcome these challenges?

56. In your opinion, how can the utilization of ICT in service delivery in the urban planning industry be enhanced?

57. Indicate your level of agreement that ICT had a positive impact on effective services of delivery and administration with the following statements by ticking at the appropriate box.

Mark only one oval per row.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
Accurate Response	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feedback Response	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Timely Information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participation of clients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transaction cost	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Services Reliability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chances of bribery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discretion reduction and transparency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

58. What are you reasons of agreeing/disagreeing with the above statements?

59. Indicate your level of agreement that ICT had a positive impact on efficient services of delivery and administration with the following statements by ticking at the appropriate box.

Mark only one oval per row.

Strongly Disagree		Disagree	Uncertain	Agree	Strongly Agree
Waiting time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost factor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Procedures streamlining	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

60. What are you reasons of agreeing/disagreeing with the above statements?

61. Indicate your level of agreement that ICT had a positive impact on equity in services of delivery and administration with the following statements by ticking at the appropriate box.

Mark only one oval per row.

Strongly Disagree		Disagree	Uncertain	Agree	Strongly Agree
Accessibility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Affordability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Procedures streamlining	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

62. What are you reasons of agreeing/disagreeing with the above statements?

Factors deterring use of ICT systems

63. Do you think your department staff experience challenges while using ICT systems? Mark only one oval.

- Yes
 No

64. If Yes, what are these challenges

65. Indicate your level of agreement with the following statements by ticking at the appropriate box

Mark only one oval per row.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
Resistance to change due to technology is one challenge at the organization.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of skills by users has posed a challenge.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unstable infrastructure poses a challenge in use of ICT systems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
System failures are a challenge in use of ICT systems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insufficient funds hinder continuity of system operations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poor implementation and deployment of the systems have created problems on the business operations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT security threats area challenge in use of ICT systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

66. What are you reasons of agreeing/disagreeing with the above statements?

67. According to you, what are the possible solutions to the above challenges?

Questionnaire to Users

The study has hypothesized that the knowledge and the demand for the ICT services from the users is one of the determining factor for understanding the role of the ICT services. thus, this questionnaire survey to users is an attempt to understand the role of the ICT services as seen and perceived through the lenses of citizens.

1. Gender

Mark only one oval.

- Male
 Female

2. Working sector

Mark only one oval.

- Private
 Government

3. Age

Mark only one oval.

- 0-18
 19-35
 36-Above

4. Education

Mark only one oval.

- Primary School
 Secondary School
 Graduate
 Others

5. Area of Residence

Mark only one oval.

- Rural
 Urban

6. Kindly mention your field of activity.

7. Usage of ICT applications:

Mark only one oval per row.

	Daily %	Weekly %	Less than weekly %	Not available %
PC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Word processing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Databases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
E-mail	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GIS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. How many times do you use internet services? *Mark only one oval.*

- Option 1
- Often
- Regularly
- Not at all

9. Do you know about internet in services delivery/urban administration? *Mark only one oval.*

- Yes
- No

10. How do you know about internet in services delivery/urban administration?

11. For how long have you known about internet in services delivery/urban administration?

12. What services do you prefer getting from the internet?

13. Do you think internet helps in acquiring, exercising and accessing departmental services? (Explain)

14. To what extent, do you agree that there has been well publicity of e-services? *Mark only one oval.*

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

15. How can ICT services be better advertized? *Mark only one oval.*

- TV, radio, FM
- Print media
- Internet
- Campaign
- Other: _____

16. Are you satisfied with how your agent handled your inquiry? *Mark only one oval.*

- Yes
- No

17. What is the purpose of visiting the organization?

18. Was your solution/answer delivered in a timely manner in terms of using ICT in delivering your service?

Mark only one oval.

- Yes
- No

19. If Yes, what was the ICT process and how did it handle your problem?

20. Overall, did you feel that your agent was knowledgeable about the ICT processes? *Mark only one oval.*

- Yes
 No

21. Indicate your level of agreement with the following statements by ticking at the appropriate box using the rating criteria below
Mark only one oval per row.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
ICT will change the policy-making process in our city	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT make the political decision-making process more efficient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The implementation of policies is more efficient with ICT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT improve communication within our city administration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT improve the ability of our city administration to serve the citizens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT improve citizen access to useful information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT give the administration better access to public opinion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT will lead the administration to take greater account of public opinion in forming policy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT will increase citizen participation in the policy process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT provide all segments of the population with equal access to education, employment and social services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT increase, even more, the gaps between the rich and the poor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT enable people to get better access to professional services without living in a city	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT enable people to get better access to urban cultural life without living in a city	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT improve the quality of social relationships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. Do you use or plan to use ICT services of the department? *Mark only one oval.*

- Yes
 No

23. Do you think you can benefit if ICT expands its services to its customers by means of digital communication??

Mark only one oval.

- Yes
 No

24. Indicate your level of agreement with the following statements by ticking at the appropriate box using the rating criteria below.

Mark only one oval per row.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
Cost of availing service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Less waiting time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Less time and effort required	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dependence on agents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No delay in transaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Predictability of outcome	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Level of corruption	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Simplicity of procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transparency of rules and procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Complaint handling mechanism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Confidentiality and security of data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Design and layout of application form	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Service area facilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Queuing system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Error-free transaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

25. What are your reasons for disagreeing with the above statements?

26. Which services would you advice organization/development authority to offer/ or expand through ICT, and in which places (explain)?

27. Do you think ICT helps you to participate better in decision making, and in making the administrative and development authorities more accountable to its citizens?

Mark only one oval.

Yes

No

28. What are your suggestions for making effective ICT services? Please specify any three suggestions
