

ROLE OF INFORMATION COMMUNICATION TECHNOLOGY (ICT) IN 21ST CENTURY

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ABSTRACT

Role of ICT and knowledge among professionals of organizations directly affects the quality of output. In this study the levels of aspect for utilization of ICT resource at workplace among professionals from different organizations in Karachi has assessed. These organizations belong from different sectors including public and private.

Data was obtained from the employees of different organizations through online questionnaire. Survey was conducted from October 15 – December 4, 2015. Questions were asked about its effect on their lives and work. Sampling of 24 was responded to the questionnaire and was completed for analysis.

A total of 24 employees were assessed for frequency distribution of ICT Knowledge factors and descriptive analysis test was used to see the association of online system, computer exposes organization works, usage of latest technology, internet, E-commerce and different statistical software's related to ICT knowledge.

The study has few recommendations on the basis of data analysis and findings. Although the knowledge of ICT is good but some professionals and organizations are not utilizing the ICT resources completely to achieve the better results. They should improve and enhance their staff skills and knowledge through different trainings and upgrade their systems for fulfillment their requirements and productive outputs.

In addition, the Government of Pakistan has established the Ministry of Information Technology and Tele-Communication Division in March 2000. The Ministry of IT is building Pakistan's IT competency to meet the challenges of 21st Century. Similarly IT Departments are created in all Provinces for taking initiative for development of IT as per requirement of 21st century and promotion of IT education and development.

The local institutions and universities do not seem to produce highly skilled people in the field of IT, especially, in certain required fields, such as programming and hardware engineering.

The strength of IT education and proper trainings in relevant field are essential. However, it seems that the focus of our educations institutions is on quantity of the number of students being awarded degrees each years rather than imparting quality education. Thus the challenges of the 21st century cannot, undoubtedly, be met with the present human resource.

We strongly suggest taking serious measures and reforms in the education system, support IT industry in order to create a good job market, and attract investors from around the globe by providing subsidized business environment to flourish IT industry.

KEYWORDS: IT industry, ICT, Tele-Communication Division, Government

Jel Classification: L10,L11 ,L13

*The material presented by the author does not necessarily portray the view point of the editors and the management of the Ilma University – Formerly IBT

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1. INTRODUCTION

Mr. Federico Faggin is an American citizen, who originally developed the silicon gate technology (SGT) in 1968 and designed the world's first commercial microprocessor in 1971. The microprocessor has brought a revolution in the field of IT".

The important role of Information technology started when Microprocessor was invented, it comprise memory, rationale and control circuits in a whole Central Processing Unit, on a single chip, thereafter I.B.M and apple Co. introduced their PCs. Apple II released to public in 1977 and IBM PC introduced in 1981 since then IT has been growing very fast.

Due to invention of computer the barriers to communication have been finished and distances have been surmounted to a great scope through the Information communication technology. In 21st Century Information Technology has become integral part of all kinds of business. There is no any field in which IT is not involved.

All those things associated to information technology, for example, equipment, software-programming, systems-network administration, the Internet, or the general population who work with these advances are the piece of Information Technology. The PC programming, system-network organization, PC building, Web advancement Engineer, specialized supporter, and numerous other related occupations are the piece of Information Technology.

1.1 Scope of study

In all developed countries a major focus is always given on timely deliverables, research and development and planning, and for that updated data is used. In this regard, a number of universities have been established which are preparing experts, qualified engineers, doctors and other required people.

Information technology is being used in some organizations which are producing fruitful results such as Pak Telecommunication Corporation of Pakistan. There are certain fields and organizations where we need to organize and prepare data so that future plans can be made on the basis of correct data. There are certain fields and organizations in Pakistan where we have required qualified data analyst hardware software engineers and other experts of IT.

1.2 Problem Statement

The Government of Pakistan has established Ministry of Information Technology and Telecommunication Division in March 2000. The Ministry of IT is building Pakistan's IT competency to meet the challenges of 21st Century. Similarly IT Departments are created in all Provinces for taking initiative for development of IT as per requirement of 21st century and promotion of IT Education and development.

Unfortunately, the local institutions and universities do not seem to produce highly skilled people in the field of IT, especially, in certain required fields, such as programming, hardware engineering. The strength of IT education and proper trainings in relevant field are essential. However, it seems that the focus of our educations institutions is on quantity of the number of students being awarded degrees each years rather than imparting quality educations. Thus the challenges of the 21st century cannot, undoubtedly, be met with the present human resource.

Consequently, the computers are being used as typing-machine/typewriter in different organizations of Pakistan, and internet is being used for entertainment channels, because of non-availability of qualified persons, whereas Information Technology should be used for collection of data and research work.

2. REVIEW OF LITERATURE

2.1 Literature review

Looking at the present scenario, one can easily predict the dominance of Information Technology in daily life. Despite of hectic schedules and lots of burdens, IT always wins in the long run. Globalization and Liberalization has expanded their wings in the world and even beyond that in terms of bringing the global space on to a common platform.(2)

Information Technology, throughout history, has allowed people to complete more tasks in less time and with less energy. Many herald this as a way of making life easier. However, work has continued to be proportional to the amount of energy expended, rather than the quantitative amount of information or material processed. Technology has had profound effects on lifestyle throughout human history, and as the rate of progress increases, society must deal with both the good and bad implications.

IT innovation is changing the way we live, work, learn, and speak with one another. Progresses in IT innovation can enhance the way we teach our youngsters, permit individuals with incapacities to lead more free lives, and enhance the nature of social health care. Since the role of IT has been tremendously increased in every field and Department so it is necessary for us to get advance education and spread IT in all our institution so that they may get progress as per requirement of 21st century.

2.2 Hypothesis

H1: The weakness of IT industry is causing different factors which are affecting the IT Professionals and organizations of Pakistan.

H2: The non-meritorious job environment are the main technical reasons why overseas Pakistani, especially those who were awarded scholarships from HEC, does not want to come back to the country to give strength to the industry.

2.3 Role of Information Technology in 21st century

The Important need of any business is information technology. The information technology system has brought revolution in business. Now a day it is impossible to do a successful international business without use of IT. The barrier to communication has been over come to a great extent. Time and distance has been conquered to a great extent by the system.

Information Technology is only a system which cans more effectively managing the business, but does not solve the problem unless it is tied through programming for business and governance objectives. There is an urgent need for IT in underdeveloped areas where access to even the smallest bits of knowledge can have far-reaching, long term effects”.

Management Information System will see how all organizations today, vast and little, nearby and worldwide, use ICT frameworks to accomplish critical business targets, for example,

operational effectiveness, client and supplier closeness, better choice making and new items and service administrations.

Information Data Management by utilizing databases and information apparatuses you can spot patterns and settle on business choices. Humankind has advanced from farming upheaval to the modern insurgency and is presently moving to an information data revolution. Not only the commercial businesses are being carried out through IT but also it is being utilized almost in every field. It is being used in all Government organizations and Non- Governmental Organization. A successful institution or organization cannot be imagined without IT. It is necessary to for us to enhance IT in all our institutions/organizations with experts and technical persons so that we could get required achievements.

The computer system power in the couple of smaller scale processors currently in a vehicle is a great deal additional than totally the PC control that remained placed in the space vehicles that took care of the first men on the moon and brought them back. In today's finish more-with-less business environment, with expanding requests from clients, shareholders, and controllers, the IT organizations is requested that work harder and more quick witted, as well as is being solicited to tackle the part from guaranteeing the business.

Humankind has advanced from horticultural insurgency to the modern transformation and is presently moving to data unrest. It is this great figuring force at persistently falling costs and the PCs being masterminded over overall telecom interstates that is inciting the use of Information Technology in every piece of human development is it correspondence, sparing cash, trading, learning and teaching, diversion, blending, government, organization and administrator. By and large as machines have increased man's mechanical power and his convenience and comfort, Information Technology as commonly sanitized by PCs, is enhancing man's mind or cerebrum or academic force. The term data innovation has swollen to incorporate a considerable measure of parts of PC's and advancement, and the term is extra well known than at any other time prior.

Like other science claims to fame, for example, substance or metallurgical or electrical innovations empower the preparing of crude materials into usable merchandise, also does data innovation (IT) offer the stockpiling, some assistance with processing, transmission and misuse of data to fulfill a human's, institution's, association's or government's requirements for information. The primary leap forward In Information Technology was creation of printing. The printing development empowered proficiency and instruction to go up from 10% to more than 80% inside of 50 years by making accessible endless measure of perusing material. The printing material provoked the Reformation in Europe. The other basic manifestations were show, telephone, remote or radio, TV, TV, PCs (from room size to work range top to tablet to palm top and soon, wearable ones)

The optical fiber and correspondence satellite transmissions, jar and digitization of all data information, stockpiling and show contraptions and the vehicle of stimulated information on general telecom frameworks, continuously under the control of the sender and the beneficiary. Information data spreads voice as in telephony, content as in fax, pictures as in video and data as between PCs. The requirement for transmission and social occasion of data information just from instruments connected with wires and thusly just from particular spots has been radically overcome by earth-based cell convenient, radio telecoms and now by satellite based globe wide flexible systems like the Iridium (Lewis D., Hodge N., Gamage D., 2012).

Information Technology gadgets, for example, micro-chips are getting to be mass machines, pace producers for the heart, amplifiers, and productivity enhancers in car motors and gadgets to control space vehicles on the moon.

Information Technology is viably dealing with each sort of business of every field, except it can't take care of the issue or it can't think unless it is fixed straightforwardly to business and administration targets. There is a dire requirement for Information Technology in under creating zones where access to even the littlest bits of learning may have expansive, long haul impacts. The usage of data innovation impacts the estimations of a general public by changing desires and substances. Information Technology, all through history, has permitted individuals to finish more undertakings in less time and with less energy (Bottino, R. M., 2003).

In many countries such as India, Pakistan and Bangladesh which embraced government-focused advancement since their Independence government requires to develop unsystematically, taking in the biggest division of the GDP as Taxes and the biggest measure of their reserve funds as credits. While in these Countries' Government ought to be restricted to their essential part of defense, interior security, justice, essential training, essential health, watering system and streets, however they grasps creation, commercial enterprises, administrations and organizations. The greater part of government's money is spent inefficiently and a considerable measure of it, on the pay and foundation of the common workers themselves yet every organization is inefficient. Discussion about Information technology, as clear by the International Air Transport Association (IATA) is, "The study, the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware." IT manages the implantation of electronic Computer and PC Software's to alteration above, stock, ensure, procedure, communicate and carefully retrieve data (Chandra, S. & Patkar, V., 2007).

A study of human history reveals that information Technology has effect affected way of life, and as advancement builds, society must manage both the great and awful ramifications. Information Technology dependably empowers hierarchical and bureaucratic gathering structures. Information Technology enables all those human being who are interested in it great knowledge of international about issues, values, and cultures and almost in every field.

Now days the term information technology is known by everyone and it has encompassed many aspects of computing. Besides we may say that information technology and the terms are more familiar than any time in recent. The ICT innovation umbrella has been very expansive, covering numerous fields. Information Technology performs an variety of works that range from managing installation applications to arranging complex PC frameworks system and data information databases. Two or three vocations that IT specialists perform may fuse data and organization, frameworks system organization and planning system. A few individuals say that when workstation and data interchanges advances (ICT) are consolidated, the outcome is data innovation. Data Technology (IT) is utilized as a general term that depicts any innovation that creates, control, store, convey, and/or show data. Presently it has been further broadened its definition and every one of those contraption which are used with PC in addition to individuals who works in Information Technology are likewise some portion of the Information Technology. There are sure consequences of IT on environment. As once talked about, each rush of innovation makes a gathering of waste aforesaid obscure by people. Discussing life, concerning fifty years ago no one knew about what's known as

Cyber Waste, in any case we tend to region unit as of now completely mindful. Most cutting edge information innovative procedures produce undesirable by stock also to the predetermined stock, that square measure called modern waste and contamination. While most material waste is re-utilized inside of the procedure, a few structures square measure free into the surroundings, with negative natural aspect impacts, similar to contamination and absence of property. Absolutely {different totally different} social and political frameworks build up diverse equalizations between the value they put on additional stock versus the disvalues of waste stock and contamination (Lim, C. P. & Chai, C.S., 2004).

2.4 Impacts of Information Communication Technology

The Information Communication technology has numerous social plus economic impacts on the environment and society which are required to be seriously considered and investigated in order to manage its risks and dangers. The progress of Information Technology is going very fast. If we purchase any latest computer or it's any other gadget for use, within a period of about six month that technology has changed and our gadget and computer become old technology. Moreover each wave of Information technology creates a previously unknown by humans: radioactive waste, electronic waste (Littlejohn, et.al, 2002).

Information Technology all through history, has allowed people to complete more assignments in less time and with less imperativeness. Various flag-bearer this as a technique for making life more straightforward. Then again work has continued being near to the amount of essentialness used, rather than the quantitative measure of data information or material prepared. Data Technology has effects affected way of life all through individual the past, and as the rate of improvement expand, progress need to manage together the great and awful recommendation (Okoli C., Pawlowski S. D., 2004).

From multiple points of view, information technology simplifies life:

- i) An informed society may take quick reply to occasions and styles
- ii) The knowledge can sets the additional complex education assignment
- iii) Expanded multi-tasking
- iv) worldwide networking
- v) Makes denser social circles
- vi) low-priced

In additional method, information technology confuses life:

- i) Contamination is a difficult issue in a technologically higher society.
- ii) Latest kinds of hazard accessible as a importance of latest kinds about hi-tech innovation, like the primary procreation of nuclear reactors.
- iii) Modern kinds of amusement, for example, computer highly graphical games and internet access could have conceivable community image on range such as intellectual presentation.
- iv) Rises likelihood of maladies and sicknesses, for example fatness.
- v) Common partition of solitary social association. Innovation has expanded the required to be conversation to further community faster.

2.5 Information Technology in USA

USA has spent in the sector of Information Technology about US\$559.000 billion in 2012, and annually increasing at the rate of 5.5% per year. Meanwhile, Information Technology procurements remained strained thanks to the budget constraints featured by several government entities". There are 12 the most biggest companies in world which are producing

Information Technology items (such as P.C. hardware, software and different gadgets of computer internet) almost all over the world, out of these companies, 8 companies are from USA and their annual business are in billions of US dollars(Barron, A., 1998).

The National Aeronautics and Space Administration (NASA) is the agency of the United States Government that is responsible for the nation's civilian space programme and for aeronautics and aerospace research. In fact NASA has been working on Information Technology and through the IT all progress achieved. The National Aeronautics and Space Act was passed on July 29, 1958. The agency became operational on October 1, 1958. Since then most U.S. space exploration efforts have been led by NASA, including the Apollo moon-landing missions, the Skylab space station, and later the Space Shuttle etc. Currently, NASA is supporting the International Space Station and is overseeing the development of the Orion Multi-Purpose Crew Vehicle and Commercial Crew vehicles. The agency is also responsible for the Launch Services Programme (LSP) which provides oversight of launch operations and countdown management for unmanned NASA launches. Most recently, NASA announced a new Space Launch System that it said would take the agency's astronauts farther into space than ever before and provide the cornerstone for future human space exploration efforts by the U.S"(Berge, Z, 1998).

1.6 Information Technology has become an important part of the U.S. Economy, in the 21st century

1. Data innovation has represented third of U.S. monetary procedure from 1995 to 1997.
2. The worldwide information and interchanges business is as of now generally \$2 trillion in size.
3. In 1996, 7.4 million Americans worked in IT innovation commercial enterprises and information innovation related occupations, winning, on the ordinary, just about \$46,000 per annum, sixty percent over the average non-open division compensation of \$28,000.
4. Data innovation at present records for forty five percent of individual instrumentality venture, up from three percent inside of the Nineteen Sixties. All organizations square measure exploitation IT innovation to scale back the time expected to grow new item, build profitability, convey "in the nick of time" honing to their staff, fashion closer associations with suppliers, and tailor item and administrations to the needs of individual clients. Data innovation is not just imperative for its effect on America's monetary development, work creation, profitability, and worldwide intensity. Data innovation is an intense apparatus to accomplish for all intents and purposes each essential national objective:
5. A solid barrier: U.S. military relies on upon information prevalence, that is plot as "the ability to accumulate, process, and partner degreed proliferate a continuous stream of information..
6. Enhancing the standard of lifetime of incapacitated people: New advancements like discourse acknowledgment and savvy mechanical gadgets will make it less demanding for individuals with disabilities to move with PCs, lead a ton of independent lives, and increase new job opportunities.
7. Insurance of life and property: Through higher gauges of dangerous climate and a great deal of auspicious and powerful correspondences, Americans region unit higher ready to keep away from genuine tempests and to shield property.
8. A considerable measure of financially savvy and undeveloped government: higher utilization of information innovation is at the guts of the Admin's endeavors to

"reevaluate government" by making it a great deal of caution to its social orders (Collis, B., 2002).

1.7 Information technology will revolutionize USA national science and engineering

There has been close phenomenal increment inside the office of PCs with paces and limits pretty much multiplying at regular intervals for more than a quarter century. We have a slant to unit nearly relate degree time where investigative calculation is on a standard with research facility test and numerical hypothesis as an instrument for examination in science and building. The PC is just about giving an inventive, fine expound search of the life (Duffy, T., & Cunningham, D., 1996)

1.8 Funding for research and lack of information technology professional

Many ICT corporations area unit involved that they cannot employed enough skillful staff particularly, engineering graduates. Enlarge ICT analysis activities in institutions and universities can produce a lot of opportunities for student participation and enhance the talents levels of graduating students.

1.9 Information Technology in China

China ICT trade is doing a huge business of knowledge Technology. In 2000 China's electronic and knowledge technology trade had recorded an output of 1 trillion yuan and export value fifty five billion U.S. greenbacks for extraordinary the set target for the ninthty five year strategy ending 2000. The China's ICT trade has not solely big into China's biggest trade, however has additionally worked as a multiplier factor within the country's economic limiting. China's trade spent seventy five billion yuan on 2000 technical upgrading comes between 1996 and 2000, and over sixty % of the production's added-value was produced by new technologies(Freeman, M. ,1997).

1.10 Literature Review in Context of ICT in Pakistan

If we take a review of Pakistan with reference to IT, then we come to know that a few organizations are utilizing IT facility in true sense whereas majority of institutions have computer net and other facilities but they are not getting the benefits/advantages of IT, the reason is that we have not experts and qualified persons who could make our institutions fully computerized. In several Departments computer as being used as type writer and keeping their files and playing games, and similarly the inter-net is being utilized for taking some relevant papers and sometime for entertainment (Jonassen, D. & Reeves, T. ,1996).

2.11 Status of Information Technology in Pakistan

Some Institutions have adopted the role of IT and they are now in a very strong position comparatively to other institutions in Pakistan. The I.T. Industry is getting progress but very slow. The government had already formulated I.T. policy in 2000. These include policy like human resource development, I.T. infrastructure development and improve service to citizens.

The first and for most important need is to develop human resources in the field of I.T., There is a need of producing highly qualified I.T. graduates every year. There is a strong need to

build a power infrastructure of I.T. in Pakistan. Many companies are still struggling to increase the number of cities where internet would be available.

There are few hundred software houses in Pakistan and their count is increasing. There are providing products which have modernized the process of traditional industries and also increase their productivity. It has enabled our IT industry to become more competitive in international market.

The worldwide financial droop inside of the post – 9/11 universes has left no business, business or exchange untouched. Though the flying and protection businesses are the most noticeably awful hit casualties of the overall monetary impediment genuine presentation a few difficulties for a creating nation like Islamic Republic of Pakistan. From one perspective, the fares began hinting at decay in the midst of a pointy decrease in retail deals inside of the US most importantly, et al typically, and on the inverse debilitating rupee-dollar equality implied uneconomical global expenses of all stock and items. Local bundle homes griped a couple decrease in fares and through genuine has been enhanced sources inside of the bundle business yet in light of the fact that the officialdom say that there would be the greatest sum as fifty for every penny diminish inside of the value of bundle fares this year. Droop inside of the post – 9/11 universes has left no business, business or exchange untouched. Though the flight and protection commercial ventures are the most exceedingly bad hit casualties of the overall financial hindrance genuine showcase a few difficulties for a creating nation like Islamic Republic of Pakistan. From one viewpoint, the fares began hinting at decrease in the midst of a pointy decrease in retail deals inside of the US most importantly, et al regularly, and on the inverse debilitating rupee-dollar equality implied uneconomical universal expenses of all stock and wares. Local bundle homes grumbled a couple decrease in fares and through genuine has been enhanced sources inside of the bundle business yet on the grounds that the officialdom say that there would be the greatest sum as fifty for every penny diminish inside of the value of bundle fares this years(Kennedy, D. & McNaught, C., 1997).

2.12 Education & Human Resource Development

The most fundamental consider maintainable development of information innovation in any nation is that the human asset. an effective spend significant time in quality IT instruction will be awfully valuable for not exclusively taking care of the local demand however also to provide food for the global needs following the prepared human asset is an eminent supply of outside settlements. The nature of Pakistani instructional framework is that the fundamental reason of under-accomplished IT improvement Pakistan's. West Pakistan should rapidly and methodically build the base of essential, auxiliary and tertiary training as far as sum still as quality. Partner practical and focused on instructional framework must be place in situ amid which considering; advancement and innovative speculation is enlivened and advanced. For instilling these attributes inside of the understudies, scholastics ought to be prepared inside of the most recent showing philosophies still. Likewise, motivators inside of the type of grants got the opportunity to be offered to the capable understudies for advancing IT training. The activity like National ICT Scholarship system being supported by Ministry of it's a stage inside of the right course. Foundation of coaching} habitats for creating abilities in human asset is required for meeting the necessities however some system for inward control of the preparation organizations must be place in suit. Likewise, the comes foil up IT aptitudes with swelled stretch of IT foundations must be constrained to be authorized.

With a specific end goal to supply outside contract to the talented IT specialists, IT Placement Centers will assume a critical part. Along these lines, situation focuses should be built up particularly for business IT hands looking for abroad open doors.

2.13 History of Information Technology in Pakistan

Information communication technology in Pakistan is a developing and rising industry that has a huge potential. Matters identifying with the IT business are supervised and managed by the Ministry of Information Technology of the Govt of Pakistan. The IT business is viewed as an effective division of Pakistan monetarily, even in economic emergency, yet there is awesome space for further advance. The govt of Pakistan has given various favors to IT sector investment in the Pakistan since a decade ago, that brought about the advancement of the Information Technology zone. In the years 2003-2005 the Pakistan's IT sector trade saw an ascent of around fifty percent and produced a sum of around fourty eight million USD. The global Economic Environment, evaluating the advancement of Information and Communication Technology in the Pakistan positioned 102nd among 144 nations in the Global Information Technology report of 2012.

Starting 2011, Pakistan has additional than 20 million internet- web users and is positioned as one of the top Pakistan that has enrolled a high growth rate in web entrance. Generally speaking, it has the fifteenth biggest populace of internet-web users on the planet. In the monetary year 2012-2013, the Government of Pakistan means to burn through Rs.4.6 billion on data innovation ventures, with accentuation on e-government, human asset and foundation improvement.

The Government of Pakistan has joined incredible significance to ICT innovation, as a major aspect of its goings-on to add to a "information-data age" in the Pakistan. In such manner, an intricate Pakistan's IT strategic policy has been defined. Through an emphasis on the mechanical advancement of information-data innovation, the policy maker's plans to expand efficiency in people in general area, enhance the models of IT base in the Pakistan and use it as an administration device for the advancement of good administration when all is said in done. There has been striking advancement in making compelling modernized electronic government frameworks in Pakistan for real offices, for example, police, law implementation organizations and local bodies of society. The National Database and Registration Authority (NADRA) has likewise presented modernized registration system for issuing very important archives, for example, computerized national identity cards, travel permits (passport), and changeless residency cards. IT has likewise been fundamentally vital in enhancing work methods of the common public services and other government-related fields.

As indicated by a study distributed by the "UN Economic and Social Commission for Asia and the Pacific (ESCAP)" Pakistan has been profoundly presented to information-data innovation while seeking after the ideas of e-governance and e-trade:

Pakistan's correspondence framework is additionally solid. This has now completely graduated into the email, Internet and IT society. The Pakistan is quick investigating the daring new universe of information-data innovation and distinctly absorbing the prerequisites of e-government and e-business. Information-data technology innovation has opened another business wilderness for Pakistan. The authorities is relegating high need to information-data innovation both regarding arrangement spotlight and asset assignment (Laffey J., Tupper, T. & Muss., 2015).

2.14 Local language computing

There is an increasing requirement for software and programmer development in national language Urdu. Computer software like In Page were among the first computer programmers developed in local market in Pakistan that specially catered to creating pages in various native-local languages using local scripts and fonts (Frascara J., 1997).

More than 128 recognized universities in Pakistan that supply upto Doctor of Philosophy rank awards. Additionally thereto there are sixty non-public luxurious institutes in main cities in Islamic Republic of Pakistan that supply world category degrees (such as university of London External degrees, Sunderland University and plenty of different Great Britain universities demand through affiliations). Out of 128 universities seventy universities are state institutes whereas remainder of them is non-public schools and universities however are absolutely accepted and therefore the facilities they propose are up to any native university (Higher Education Commission of Islamic Republic of Pakistan – HEC – provides that official approval). There are around five hundred universities in numerous states of Asian country.

It is very important for Pakistan to establish IT universities which are of high standard and recognized in all over the world. A few universities of IT cannot fulfill our requirements of experts and IT relevant engineers. Thus we will have to establish IT universities and Information Technology institutions in which all required specialties/trades of IT are existed if we have to go with rest of world in 21st century (Shih T., Fan X., 2009).

2.15 Institutions of Pakistan which utilized IT

Pakistan Telecommunication Company restricted (PTCL) may be a super enterprise and a main telecommunication power within the State of Pakistan West Pakistan Asian country Asian nation. The organization provides and upholds ways to the telecom administrations across the state and is that the spine for nation's telecommunication foundation in spite of entry of handfuls different telecommunication partnerships, together with Telenor Corps and China Mobile Ltd. The enterprise oversaw and works around 2000 phone Exchange the state over, giving the largest altered line system. Info and spine administrations, for instance, GSM (Global System for Mobile Communication), CDMA (Code division multiple access), Broadband net, IPTV (Internet Protocol Television), wholesale are an increasing some of its business

From the earliest place to begin Posts and Telegraph Department in 1947 and foundation of West Pakistan phone and Telegraph Department in 1962, PTCL has been a key-player in telecommunication in West Pakistan. In spite of getting started a system of tremendous size, PTCL workings and approaches have force in customary feedback from different very little operators and therefore the common society of West Pakistan

Pakistan Telecommunication Corporation (PTC) assumed management operations and capacities from Islamic Republic of Pakistan phone and Telegraph Department below Pakistan Telecommunication Corporation Act 1991. This corresponded with the Government's aggressive approach, empowering personal sector investment and conveyance regarding recompense of licenses for cellular, card-worked pay-telephones, paging and, recently, knowledge data correspondence service.

Seeking when a dynamic arrangement, the Government of Pakistan in 1991, according its arrangements to privatize PTCL, and in 1994 issued six million vouchers expendable into 600

million shares of the longer term PTCL in two separate placements. Every had a customary estimation of Rupees ten for each provide. These vouchers were modified over into PTCL offers in mid-1996.

In 1995, Pakistan Telecommunication (Reorganization) Ordinance formed the premise for PTCL imposing business model over essential telephone within the nation. The procurance of the Ordinance were loaned uninterrupted quality in Gregorian calendar month 1996 through Pakistan Telecommunication (Reorganization) Act. That year, Islamic Republic of Pakistan Telecommunication Company restricted was formed and recorded on each single stock trade exchange of Pakistan.

Pakistan Telecommunication Corporation introduces its mobile and knowledge data service subsidiaries in 2001 by the name of Ufone and PakNet severally. None of the brands created it to the highest openings within the individual rivalries these days, be that because it might, Ufone had dilated its piece of the pie within the mobile phone sector. The PakNet whole has adequately lessened over the timeframe. Late line (Digital subscriber Line) services introduce by PTCL mirrors this by the presentation of another brand and operation of the service being specifically directed by PTCL

PTCL is that the biggest data communication transfers provider in Islamic Republic of Pakistan. PTCL to boot keeps on being the most important CDMA service within the nationwide with zero.8 million V-fone purchasers. The organization keeps up a main position in Islamic Republic of Pakistan as a base provider to different telecommunication services and company purchasers of the country. It will presumably be instrumental operators in Pakistan's financial development. PTCL has set associate degree optical fiber Access Network within the real metropolitan focuses of Islamic Republic of Pakistan associate degreeed regionally loop services have begun to be progressive and overhauled from copper to an optical system. On the Long Distance and International foundation aspect, the limit of two SEA-ME-WE (South-East Asia - middle east - Western Europe submarine links is being extended to require care of the increasing demand of International activity(Lefever S., Dal M., Matthiasdottir A.,2007).

2.16 Increased necessity of IT in Pakistan in 21st century

When all is said in done, IT (Information Technology) has prompted indispensable improvements in Business operations and inside of the whole human life as entirety.

Talking concerning monetary procedure, it's not singularly brought the globe closer along, in any case it's permitted the world's economy to end up one commonality framework. This proposes we won't exclusively share data rapidly and speedily, notwithstanding we will moreover cut down obstructions of etymological and geographic limits. The globe has formed into a world town as a result of the help of learning innovation allowing nations like World Health Organization don't appear to be singularly isolated by separation however furthermore by dialect to impart ideas and information to each other.

In correspondence, it's shaped correspondence less expensive, speedier, and extra practical. We will as of now correspond with partner degree one round the globe by only content electronic informing them or bringing about them partner degree email for an almost moment reaction. The net has moreover opened eye to eye direct correspondence from totally distinctive parts of the globe because of the helps of video conferencing.

IT has furthermore prompted esteem Effectiveness by serving to mechanize business forms so streamlining business to make them extremely esteem compelling money making machines. This progressively will build efficiency that at last offers ascend to benefits meaning higher pay and less strenuous working conditions.

IT has moreover made it potential for organizations to be open twenty four x7 all over the place. This suggests a business will be open at whatever time wherever, making buys from totally diverse nations less demanding and a ton of advantageous. It also implies you'll have the capacity to have your stock conveyed right to the doorstep with maneuvering one muscle.

Finally, it's aided inside of the formation of late and intriguing employments like programing, Systems breaking down, Hardware and code creating and net arranging. Since business has turned out to be frightfully aggressive, there's the necessity to utilize IT to stay ahead and in business. Sensible IT use will get you sooner than contenders. As far as common sense and versatility, inside IT will encourage enhance base execution so expanding reasonableness and consequently the shift of decisions that may be sought after. Remotely, it will encourage produce partner degree sparing, adaptable online/disconnected from the net stage for working with clients, suppliers and partners line channels. In business, IT will inside encourage enhance inward in operation intensity and quality. Remotely, it will encourage form and incorporate channels to advance, create new channels and coordinate numerous online/disconnected from the net channels.IT also can encourage enhance the execution of data information staff and improve structure learning. Remotely, it will enhance the execution of data staff in customer, supplier and accomplice associations; add information worth to existing stock and administrations; create new data based stock and administrations.IT additionally can encourage pull in and hold high ability; expand fulfillment, engagement and faithfulness; deliver a society of association, inspiration, trust and shared reason. Remotely, will encourage draw in and hold top quality clients, suppliers, accomplices and financial specialists; development outside speculators' pleasure, engagement and devotion (Sarkar S., 2012).

3. RESEARCH METHODS

3.1 Method of Data Collection

Data was collected from the employees of different organizations by using online questionnaire at both entry and exit.

3.2 Sampling Technique

Convenient sampling technique was adopted. The population of interest was professional and managerial staff of organizations.

3.3 Sample size

The sample size of study was for assessment of ICT knowledge and usage in different organizations so, 24 professional and managerial staff members of different organizations were interviewed through online questionnaire.

3.4 Instrument of Data Collection

The source of data collection was primary and used online questionnaire for data collection of professional employees and found their viewpoint on relevant issue.

3.4.1 Validity and reliability test

Data was entered through online questionnaire and double checked by study supervisor for validity and error checking to ensure that we produce a quality product and analyzed through SPSS software.

3.5 Statistical Technique

Data was subsequently exported to SPSS and clean data set was made available for analysis. Frequency distribution test was used to see the status of knowledge and benefits of ICT for professional/organizations for better results.

4. RESULTS

4.1 Findings and Interpretation of the results

Following factors were recorded against the assessment of ICT knowledge related to professionals and organizations. Overall the necessary aspects of ICT knowledge were captured by set of particular 20 questions.

- Knowledge about ICT among employees of organizations is high where 70.8% of the individuals were good knowledge about ICT.
- Online System using by organizations: It is high level factor where 62.5% individuals of organizations are using online system for making their transactions and records.
- Computer exposes organization works: it is high level aspect among the organizations where 58.3% of individuals were in favor of exposes of organization works.
- Latest Technology and internet facility using by professionals/organizations: ICT knowledge level is high where 75% of the individuals were using latest technology. On other hand internet usage is high as 62.5% and rest of the individuals were not in favor.
- Regarding allocation of budget for computer skills/trainings: it is high factor where 58.3% of organizations were allocated budget for ICT resources and rests of organizations were not allocated funds for improvement of their ICT resources.
- Knowledge about E-Commerce: it is high among the organizations where 87 % of individuals were good knowledge related to E-Commerce.
- Organization using computer for simple use (data entry/typing letters): Most of respondents were not in favor of using computer for simple work where 70.8% is quite high.
- Computer saves time: Most of respondents have agreed where 87.5% were responded in favor of this aspect.

- Computer improves efficiency and cost saving: it is important factor where 95.8% of employees of organizations were responded.
- Computer saves records and transactions: the responses are good where 83.3% among the organizations were responded in favor of this factor.
- Public details should be available on website: this factor is high where 87.5% were responded among the individuals.
- Organization can operate business through website: this factor is high where 79.2% were responded among the employees of organizations.
- Government education system is good in Pakistan: it is very important factor

where most of the respondents 62.5% were not satisfied among employees of organizations.

A total of 24 professionals were assessed for frequency of ICT Knowledge factors and frequency distribution test was used to see the status of knowledge and benefits of ICT for professionals and organizations for better results.

In the first stage descriptive analysis of the all the relevant data was done by using different aspects. Different factors were recorded against the ICT Knowledge levels.

Table.1: Frequency distribution of Knowledge about ICT among employees of organizations

Characteristics	Number	Percent (%)
Yes	17	70.8
No	7	29.2

Table.2: Frequency distribution of Online System among professionals/Orgs

Characteristics	Number	Percent (%)
Yes	15	62.5
No	9	37.5

Table.3 : Frequency distribution of Computer exposes organizations works among professionals of organizations

Characteristics	Number	Percent (%)
Yes	14	58.3
No	10	41.7

Table.4: Frequency distribution of Latest Technology using by organizations

Characteristics	Number	Percent (%)
Yes	18	75.0
No	6	25.0

Table.5 :Frequency distribution of Usage of Internet for specific purpose by organizations

Characteristics	Number	Percent(%)
Yes	15	62.5
No	9	37.5

Table.6 : Frequency distribution of allocation of budget for computer skills/Training

Characteristics	Number	Percent (%)
Yes	14	58.3
No	10	41.7

Table.7 :Frequency distribution of Knowledge about E-Commerce

Characteristics		Number	Percent (%)
	Yes	21	87.5
	No	3	12.5

Table.8 : Frequency distribution of Computer usage for simple purpose (data entry/typing letters)

Characteristics		Number	Percent (%)
	Yes	7	29.2
	No	17	70.8

Table.9 : Frequency distribution of Familiar with Oracle and Statistical softwares among organization

Characteristics		Number	Percent (%)
	Yes	20	83.3
	No	4	16.7

Table.10 : Frequency distribution of Computer saves time among organizations

Characteristics		Number	Percent (%)
	Yes	21	87.5
	No	3	12.5

Table.11 : Frequency distribution of Computer Improves efficiency and cost saving among organization

Characteristics		Number	Percent (%)
	Yes	23	95.8
	No	1	4.2

Table.12: Frequency distribution of saves records and transactions among organizations

Characteristics		Number	Percent (%)
	Yes	20	83.3
	No	4	16.7

Table.13: Frequency distribution of Public details should be available on website

Characteristics		Number	Percent (%)
	Yes	21	87.5
	No	3	12.5

Table.14: Frequency distribution of Org can operate business through website among organizations

Characteristics		Number	Percent (%)
	Yes	19	79.2
	No	5	20.8

Table.15: Frequency distribution of Govt. education system is good in Pakistan

Characteristics		Number	Percent (%)
	Yes	9	37.5
	No	15	62.5

4.2 Hypothesis Assessment Summary

This study reconfirms the association of factors including online system, computer exposes organization works, usage of latest information technology, internet, E-commerce, computer records/transactions reliability, computer saves time/cost, different statistical software's, education system related to ICT knowledge which affects the IT professionals and organizations. A high level frequency distribution of ICT knowledge was observed among professionals and organizations. The overall need for achievement is prominent at all levels.

A total of 24 employees were assessed for frequency distribution of ICT Knowledge factors and descriptive analysis test was used to see the association of online system, computer exposes organization works, usage of latest technology, internet, E-commerce and different statistical software's related to ICT knowledge.

Different factors were recorded against the improvement of ICT knowledge and resources. Overall the necessary aspects related to ICT knowledge were captured by set of particular 20 questions for productive results.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

All the discussion and overall critical analysis of Information Technology reveals that Information Technology in Pakistan is getting progress but speed is slow. The study reconfirms the association of factors including online system, computer exposes organization works, usage of latest information technology, internet, E-commerce, computer records/transactions reliability, computer saves time/cost, different statistical softwares, education system related to ICT knowledge which affects the IT field, professionals and organizations. A high level frequency distribution of ICT knowledge was observed among professionals and organizations. The overall need for achievement is prominent at all levels.

The Higher Authorities of Government of Pakistan should realize the issues of importance, shortcomings, deficiencies and requirements of the Information Technology and accordingly all possible help may be extended to IT related field.

5.2 Recommendations

The study has following few recommendations on the basis of data analysis and findings to meet the challenges of 21st Century without any problems. Although the knowledge of ICT is better but some professionals and organizations are not utilizing the ICT resources completely to achieve the useful results. They should improve and enhance their staff skills and knowledge through different trainings and upgrade their systems for fulfillment their requirements and productive outputs.

- Standard and quality of IT education may be enhanced by obtaining the services of highly qualified persons.
- All those government and private organizations which purchase computers in bulk may be directed to create posts of IT experts consisted on Hardware and Software Engineers/Data Administrator and computer engineers, so that IT may be utilized in true sense.
- IT should also be introduced in Government Schools too so that young generation could go ahead with the rest world in 21st century.

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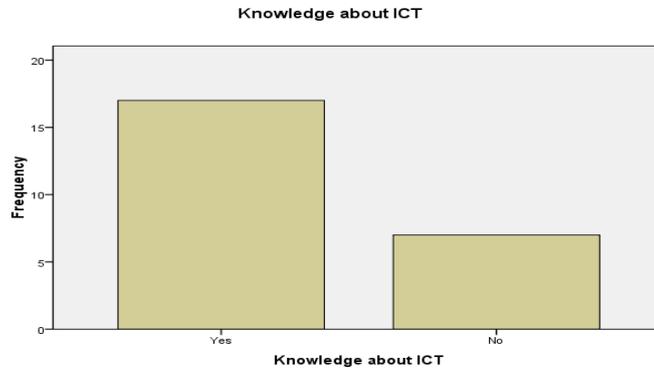
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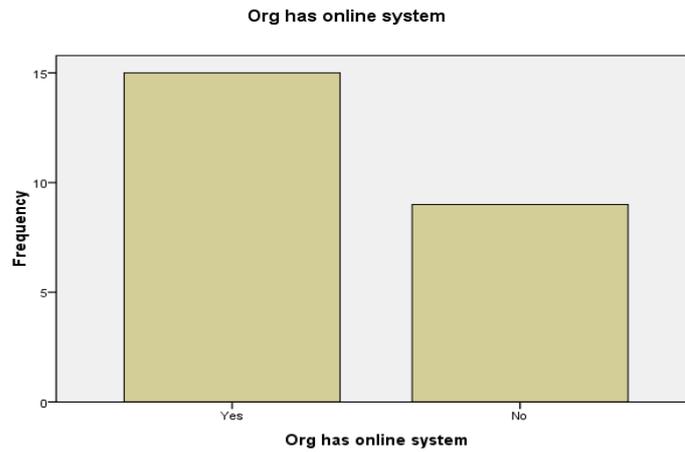
Appendixes

Figures/Graphs

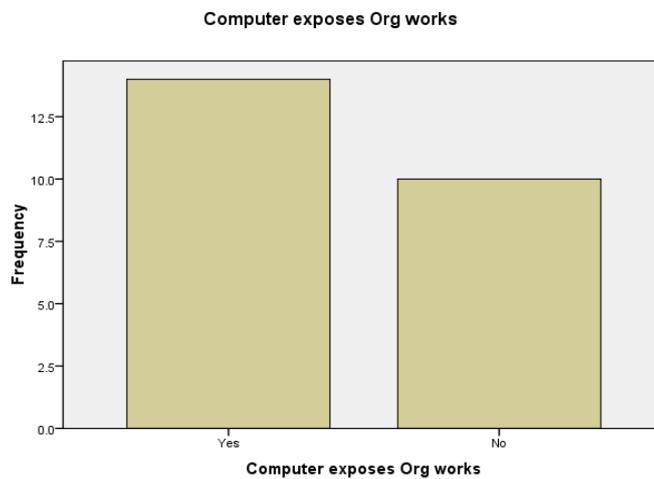
Graph 1: Frequency distribution of Knowledge about ICT among employees of organizations



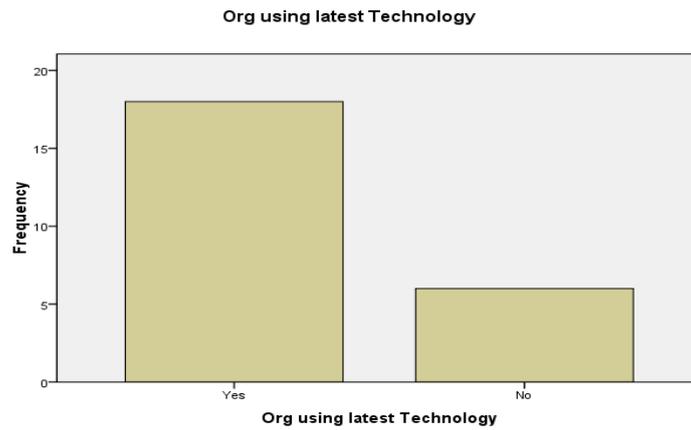
Graph 2: Frequency distribution of Online System among professionals/Orgs



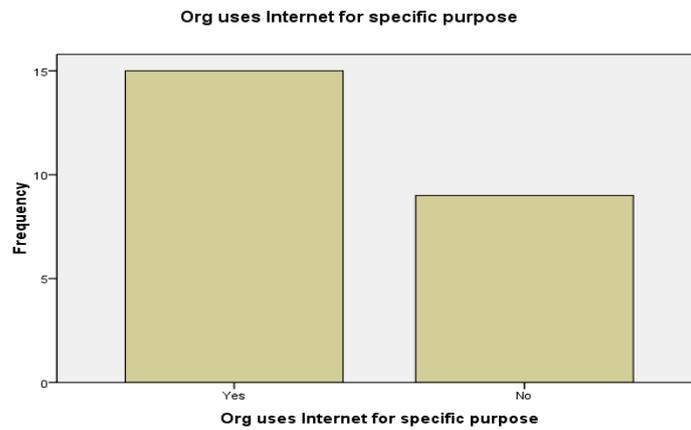
Graph 3: Frequency distribution of Computer exposes organizations works among professionals of organizations



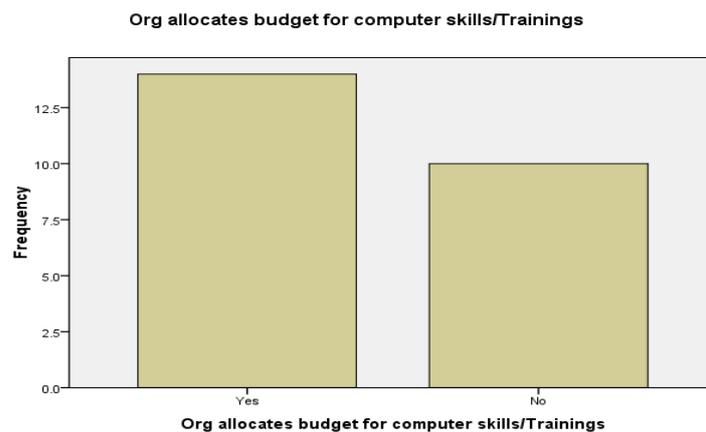
Graph 4: Frequency distribution of Latest Technology using by organizations



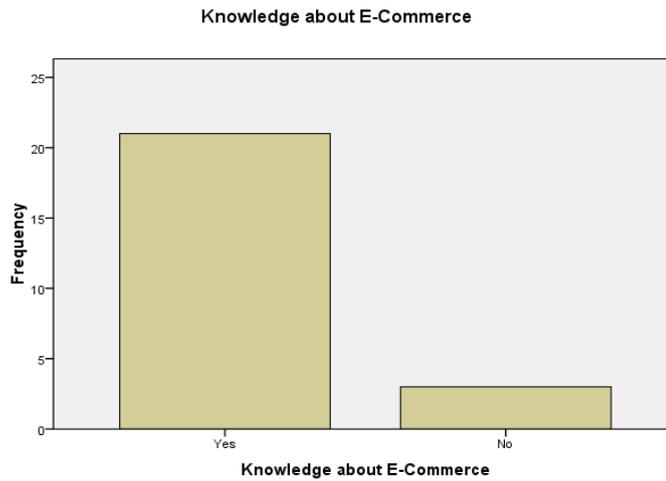
Graph 5: Frequency distribution of Usage of Internet for specific purpose by organizations



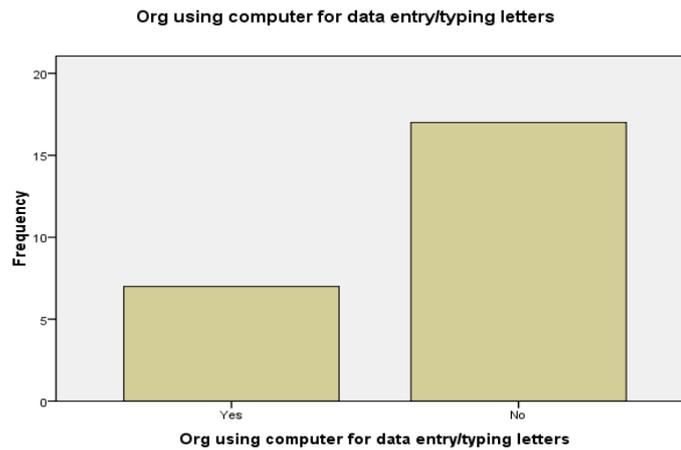
Graph 6: Frequency distribution of allocation of budget for computer skills/Training



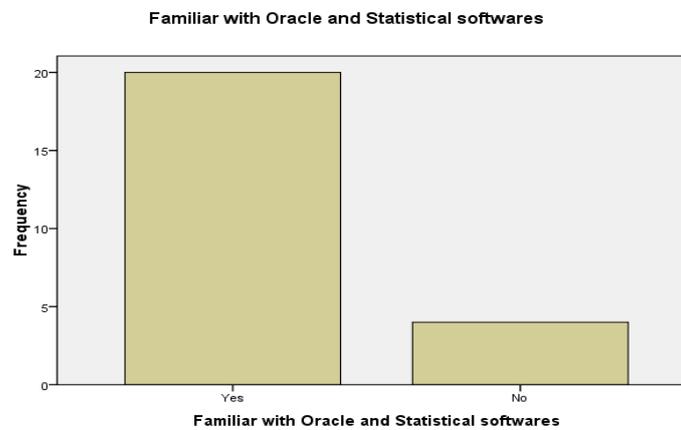
Graph 7: Frequency distribution of Knowledge about E-Commerce



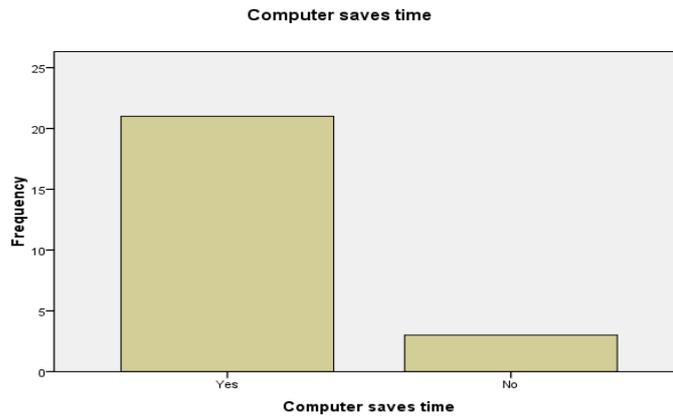
Graph 8: Frequency distribution of Computer usage for simple purpose (data entry/typing letters)



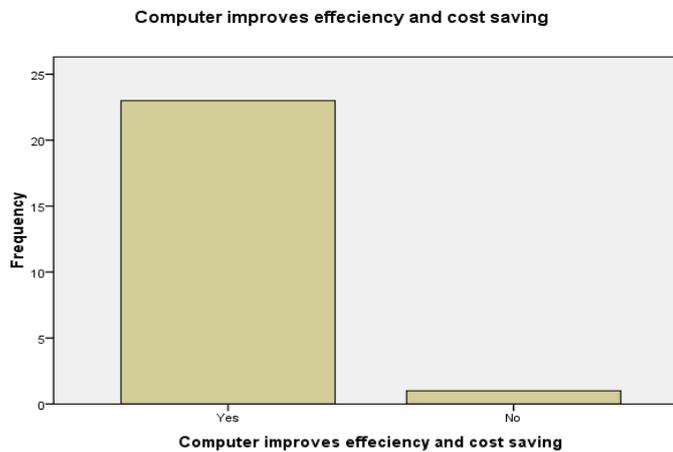
Graph 9: Frequency distribution of Familiar with Oracle and Statistical softwares among organization



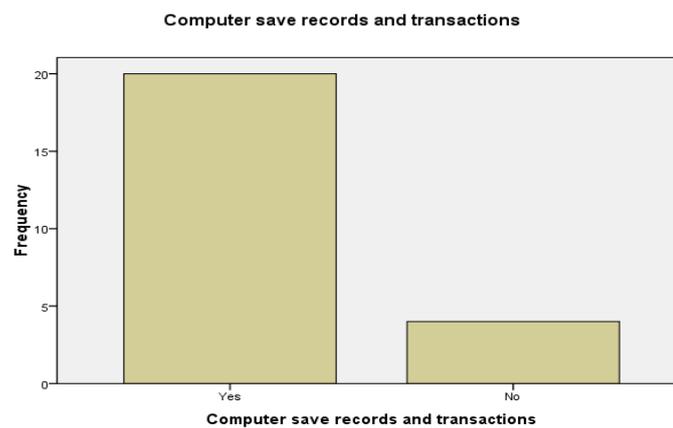
Graph 10: Frequency distribution of Computer saves time among organizations



Graph 11: Frequency distribution of Computer Improves efficiency and cost saving among organization



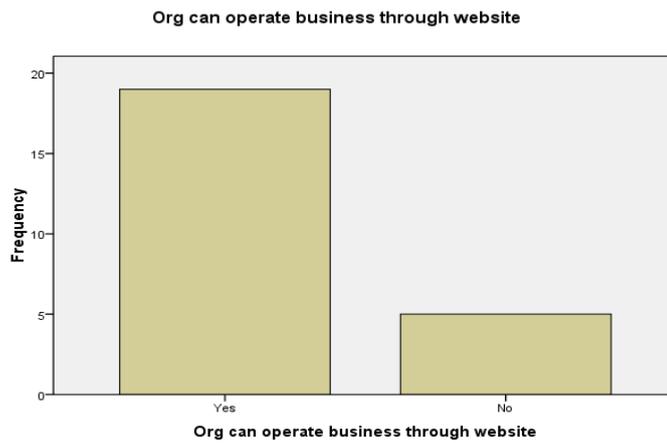
Graph 12: Frequency distribution of saves records and transactions among organizations



Graph 13: Frequency distribution of Public details should be available on website



Graph 14: Frequency distribution of Org can operate business through website among organizations



Graph 15: Frequency distribution of Govt. education system is good in Pakistan

