2.1 INTRODUCTION

As new technologies emerge into society day by day, the lifestyles and livelihoods of the people get directly affected. The influence this phenomenon causes in the lives of individuals’ generates a need for understanding and adjustment to the technology. From the distant past, technological progress has been found to keep on giving rise to social changes. As the needs of a society change, people are required to keep abreast of new innovations in both their personal and professional lives. Ultimately, the adoption of new technology is required as many of the emergent technologies become an integral part of the society. Therefore, it is important to understand and examine factors that influence a person’s adoption of new technology, as well as both the positive and negative effects that technology can have on the user.

Within the last few decades, information communication technologies which is a field converging mobile computing with telecommunications in a wireless environment has become more robust in its own right. This discipline encompassing computers, telecommunication systems and the internet have brought profound and revolutionary changes to businesses, consumers, education, health, entertainment and many other aspects of life. And ICT has been hailed as one of the most important technological developments in recent history (Franz, Robey, & Koeblitz, 1986). It influences the whole social fabric by remolding the individual and inter-individual relations in the civil space and in the family. It influences both work and leisure.

With the evolution of faster, more robust information communication technologies, organizations and the workforce are breaking out of the traditional work environment and moving towards a situation which provides the workforce innumerable opportunities for a diverse and enhanced work setting. To be more precise this convergence of mobile communications enables an organization and its individual workforce to become more flexible in communication as well as work structure.
2.2 WHAT IS ICT

Information and communications technology (ICT) is the term used to denote a wide range of services, applications and technologies, using various types of equipment and software, often running over telecommunication networks. ICT includes well known telecommunication services such as fixed line telephony, mobile telephony and faxes running over a variety of networks including copper or fiber-optic cable, wireless or cellular mobile links, and satellite links. These services and networks, when used together with relevant hardware such as desktop, portable personal computers, cellular phones along with servers and software, form the basis for a range of other services, including email, the transfer of video, audio and other data files from one computer to another within firms or between firms or between individuals utilizing the Internet.

ICT applications are wide-ranging – they include video conferencing, teleworking, distance learning, management information systems and stock control. The importance of ICT is not the technology as such, but rather its role as an enabler for accessing knowledge, information and communications, which are increasingly important elements in today’s economic and social interactions between people, firms and nations. ICT is a means for making the world a smaller and better informed place by expanding businesses’ and individuals’ networks and access to information.

ICT covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form. For example personal computer, laptop computers, blackberry, Smartphones having internet connectivity and even mobile phones concerned with storage, retrieval manipulation and transmission or receipt of digital data. It is also concerned with the way these different uses can work with each other.

In business ICT is often categorized into two broad types of products. The traditional computer-based technologies which include things we can typically do on a personal computer or using computers at home or at work and the most recent fast-
growing range of digital communication technologies which allow people and organizations to communicate and share information digitally

2.3 FEATURES OF ICT

A striking feature of information and communication technology is that the costs of storing, accessing and exchanging information have greatly diminished over time while computing power has continued to increase at an exponential rate. This has enabled ICT to reduce the costs of coordination, communications and information processing. Increasingly, ICT has also facilitated changes in what businesses do and how they do it. Business is approaching the point at which Information and Communication Technology plays a vital role in nearly all phases of its administration process. The significant features of ICT are listed below:

**Pervasive and cross-cutting:** ICT can be applied to an assortment of human activity ranging from personal use to business and government. Furthermore ICT is multifunctional and flexible, allowing for tailored solutions; based on personalization and localization; to meet diverse needs.

**Enables creation of networks:** ICT enables creation of networks and networks allow those who make use of information technology gain access to exponentially increasing returns as network multiplies the usage of information manifold.

**Dissemination of information and knowledge:** Information technology disseminates information and thereby generates knowledge. This flow of information is largely impervious to geographic boundaries; allowing remote communities to become integrated into global networks and making information, knowledge and culture accessible to everyone.

**Reduced transaction costs:** The digital and virtual nature of many ICT products and services allows replication of content virtually free regardless of its volume, and marginal costs for distribution and communication are near zero. As a result, ICT can radically reduce transaction costs.
**Efficiency gains:** ICT's power to store, retrieve, sort, filter, distribute and share information seamlessly can lead to substantial efficiency gains in production, distribution and markets. ICT streamlines supply and production chains and makes many business processes and transactions leaner and more effective.

**Reducing need for intermediaries:** ICT makes it possible for users to acquire products and services directly from the original provider, reducing the need for intermediaries. This cannot only be a considerable source of efficiency, but has in fact been one of the factors leading to the creation of so-called "markets of one," leveraging ICT's potential to cater to the needs or preferences of users and consumers on an individual basis.

**Fosters globalization:** Through the creation and expansion of networks, ICT can transcend cultural and linguistic barriers by providing individuals and groups the ability to live and work anywhere, allowing local communities to become part of the global network economy without regard to nationality.

**Impact on workplace:** With the upsurge of cellular phones, laptops and other modern communication devices among the workforce the need for people to be sitting behind a desk has reduced. ICT is not only making workplace more efficient but making the need for a workplace obsolete.

At this juncture it is imperative to touch upon the utility of ITC devices as a medium of work extension more commonly called as off-site work.

### 2.4 ICT ENABLED WORK EXTENSION

Of late organizations have progressively evolved physically distributed workforce, project-based structures, and less enduring team arrangements. These conditions of work call for knowledge workers to spend a large share of their time away from the desk, travelling, and attending meetings in a range of locations. Knowledge workers especially mobile workers and roaming professionals cannot effectively use their time unless they are equipped with the information and
communication technology resources that allow them to access corporate systems and applications, and to communicate with peers and other stakeholders while on the move. Consequently, information communication technology and employees performing work away from traditional workplace have become synonymous with each other and constitute a crucial ingredient of present business environment.

2.5 TELEWORK

Companies have used a variety of work arrangements to allow their employees to perform work away from the traditional workplace. One type of work arrangement involves telecommuting, an arrangement in which an employee works from home most of the time and uses telecommunications and computers to work during normal business hours (Duxbury et al., 1992). Telecommuting typically involves an explicit understanding between the company and the employee regarding what work will be done. But this arrangement is yet to become prevalent at least in the financial services industry.

Unlike telecommuting where employees spend a considerable part of their work time away from office telework involves employees not giving up their office space, instead they are extending their work environments to include spaces beyond the office such as home, restaurants, customers’ office, etc. Telework is also used to refer the situations in which employees do supplemental work away from the office outside of regular working hours. The ability to be productive outside traditional office hours means that work can be extended in the dimension of time, and the fact that it is possible to work outside the office means that work can also be extended in the dimension of space. Aforementioned work extensions are not possible these days without the use of information and communication technologies.

Therefore telework can be defined as ‘working offsite whilst linked all day or for some period whilst offsite to a firm’s computer systems’. This is a broad definition of telework making an effort to encapsulate the practice in its many forms and labels
including remote access, remote work, mobile work, e-work, telecommuting, working from home and more. This definition of telework encompasses all employees that work remotely for however short a period and at whatever location offsite, as long as they have a link to their firm’s computer systems.

2.5.1 Telework – Types or Forms

As information and communication technology advances and matures, the ability of employees to work anywhere has increased dramatically. ICT devices such as palmtops and laptops enable employees to be connected to work via email and cellular phones keep them in constant touch with their base from anywhere. Consequently telework allows organizations to move away from traditional brick and mortar workspace toward a roaming office environment that brings a great many advantages to the organization and society.

Though it is still common to envision a corporate office building or factory as the place where we go and work, every day a large proportion of the labor force works off-site in another kind of environment—perhaps a room in their home, an airport lounge, or a customer’s office. These off-site workers are a major and apparently growing component of the workforce.

There are five types of off-site work. “Regular tele-workers” work from home on a regular basis, an average of two days a week; “ad hoc tele-workers” perform their work from home about two days a month; and “remote workers” function full-time from a home location. “Mobile workers,” as the name suggests, work from multiple locations including their car, their home, hotels, customer offices and company offices. “Customer site workers” are located in a customer office from which they do all or most of their work. Mobile workers and customer site workers are the largest groups, together comprising about a quarter of the workforce. Tele-workers and remote workers together constitute another quarter.
2.5.2 Perceived Benefits of Teleworking

As the possibilities of off-site work gets better with advancements in communication tools, both the organizations and employees are realizing the benefits that come with it.

Employees’ productivity Enhanced: From the workers perspective, telework provide them the opportunity to be more productive and take advantage of the idle time encountered while they are on the move. By using ICT devices and telework, they would be able to complete tasks such as checking and responding to mails and/or receiving and returning important phone calls while waiting for any means of transportation or while waiting for a customer. At their place of stay, either house or at their hotel, a laptop allows them to work for instance on documents or presentations and establish a dial-up connection to access emails. Telework allows the employee to be productive anywhere such as a café, internet kiosk, library, vacation spots and anywhere else as long as the employee is equipped with a proper ICT device such as a laptop or a Smartphone.

Reduced exhaustion because of exertion: In spite of working longer hours than employees in most other arrangements, it is perceived that tele-workers are least likely to feel physically or emotionally drained at the end of the day. This favorable situation benefits both the organization and the individual, as employees who are less stressed not only have a sense of greater well-being but are more likely to be physically and mentally capable of contributing more over time.

Reduced work interruptions: Frequent interactions lead to possibilities of work interruptions. Irrespective of the source, interruptions by colleagues related to work and non-work related interruptions both affect productivity. Even though the vast majorities of interactions are work-related and are essential for accomplishing work the frequency of interactions is considerably more for on-site workers compared to various off-site worker groups. Since teleworkers may have somewhat less communication with other
employees, on balance, they are also interrupted less frequently. As a result teleworkers experience fewer work interruptions from co-workers than those workers who work on-site.

24×7 workers Response: In this era of information technology incessant communication, such as having access to the company emails anywhere and everywhere is what drives most of the organizations. One of the positive aspects of teleworkers is that they are having constant access to the communication channels of the firm through ICT devices such as laptops and smartphones with net connectivity. This gives the teleworkers the needed edge to remain responsive 24 hours a day and seven days a week. Such 24×7 response from a worker is nothing short of a boon to the organization.

Flexibility and Control: No amount of supervision would be enough as far as telework is concerned and so the workers are given the flexibility to carry out their tasks according to their convenience. The assumed flexibility provides the workers greater control over their tasks as to when and how it has to be done.

Autonomy and Job Satisfaction: The concept of telework turns out to be meaningless unless and until the workers involved in telework are given the autonomy to prepare their work schedules. This autonomy provides the worker the freedom to schedule their tasks according to their convenience and the accomplishment of those tasks in turn provides them greater job satisfaction.

Benefits to the Organization: As organizations are nothing but a composition of employees, the benefits earned by employees via teleworking in turn makes a bearing on the organization. The autonomy, flexibility, control and the ultimate job satisfaction earned by employees through telework will demonstrate their impact on the organization by improving the employee retention ratio, level of employee commitment and productivity of the organization.
2.5.3 Detrimental Impact of Teleworking

Engrossed with the numerous advantages offered by teleworking more and more companies these days resort to teleworking and offer their employees the opportunity to work from beyond the boundaries of workplace. But it is better to make it a point that even though the disadvantages of telework are greatly overshadowed by the numerous advantages that telework represent it is not that the telework option is without any disadvantages.

The anytime anywhere obsession: The major obstacle facing telework is the employees’ obsession with work irrespective of working time and place. Cascio and Shurygailo (2003) refer to this as the “new paradigm of work— anytime, anywhere, in real space or in cyberspace”. This obsession with work anytime and anywhere is called as the state of being ‘always on’ which influence communication and relationships with work. Workers feel that they are engrossed in work always and find it hard to get away from work. Having access to constant communication of course also points to another shortcoming of teleworking which is increasing the amount of time a mobile employee will work. Eventually teleworkers end up working longer hours than they would in an office.

Social consideration is at stake: A major factor which has its impact on the firms implementing telework is the social aspect. An important component of being in the workplace to carry out the work is the social interactions and the team spirit that goes with it. . Sussan (2006) mentions that “teamwork is a crucial element of workplace functioning.” He also mentions that studies have shown lower satisfaction levels for users of virtual meeting tools in contrast with face-to-face meetings. Even though people keep in touch with each other electronically, it is not quite the same as interacting in person.
Team Work and Cohesiveness tends to suffer: Teams do not exist just for the sake of social interactions, but team work and cohesiveness has become a primary concern for most of the organizations. And most often the achievement of the organizational goal rests on the cohesiveness between the team members. If that is the case, lack of interaction between peers could even hinder the achievement of organizational goal. Employees also share the belief that working off-site diminishes a sense of connection with the company.

Difficulties in Supervision, Evaluation and Control: Many organizations and managers are uneasy about teleworking programmes that remove associates form a physical workplace most of the time, because the managers find the supervision and coordination of employees working off-site as problematic. Evaluating performance, distributing the workload and motivating employees is more difficult when they are not physically present, because managers often do not recognize the contributions made by teleworkers. Another biggest obstacle for managers with teleworking employees is the issue of control, because monitoring performance is more difficult for those working off-site.

Distractions associated with off-site locations: Interruptions from family members, friends and others are commonly a problem for off-site workers. Family members and friends might not consider people working at home and could be a source of constant disturbance. Restaurants, travel or other location where the off-site workers carry out their tasks may not present a conventional atmosphere as that of an office and they could find it hard to concentrate. People who telework could come across too many distractions and might be tempted to do other things rather than work. And so most of the time they find it very hard to motivate themselves.

Failure to convey nonverbal cues: Human beings relate to each other in a number of ways, some of which are nonverbal. Most teleworkers interact with employees or clients by telephone or email, so body language and other visual indicators are not
accessible. For the same reason telecommuters may feel emotionally disconnected from their in-office peers too. Even if the teleworker interacts with other employees or clients via webcam, people tend to control their words and actions in the environment and may not act as naturally as they would in person.

**Lack of Structure:** Employees who telework do not work within a structured organizational framework instead have the flexibility as to how they manage their tasks. Since they don’t have a supervisor or the co-workers around the teleworkers need a certain amount of self discipline in order to keep them on track. Effective time-management skills are the key for a teleworker to ensure that work is completed on time.

### 2.5.4 Telework Drivers

As information and communication technology advances and matures, the ability of employees to work anywhere has increased dramatically. Apart from the role of ICT many other factors affect the quantity and amount of telework practices adopted by any organization. But these factors which can technically be called as telework drivers may not remain stable all the time but can change with events such as a changes in legislation, market situations, environmental issues and the such. But few drivers of telework which remain relatively stable over time can be brought under the following heads

**Organizational factors:** The most foretelling factors that determine the inclination of an individual's attitude to work remotely are the organizational factors. The organizational related factors of primary importance are work-related factors such as manager’s willingness, workplace interaction, and organization readiness. The organizational factors further include the availability of skilled staff, strategic direction, corporate social responsibility objectives, organizational restructuring, and culture. These factors along with organizational norms determine the likely level of formal support for telework within an organization.
**Industry work practices:** The traditional industry work practices along with competitive industry forces, regulatory intervention, etc are the next important group of driving forces which determines the telework inclination in an organization. But over an extended period of time even these practices might change due to new technologies, competitive forces or regulatory intervention.

**Employee preferences:** A number of personnel attributes are found to influence teleworking inclination by individuals such as preference to work with a team, family orientation, attitude of family members and household distraction. Some other factors related to employees are their life-stage, an ability or desire to work remotely, personal sense of social responsibility, or need for visibility. Over and above the factors given above the generation to which the worker belongs could be the major factor which influences the workers preference for workplace flexibility.

**2.6 PERCEIVED BENEFITS TOWARDS BUSINESS VIA ICT DEVICES**

Several studies have examined the performance of those sectors of the economy that are intensive users of ICT such as the services sector including finance, business services and distribution. Information and communications technology (ICT) has turned into the key technology of the past few decades for these industries. The rapid diffusion of the Internet, of mobile telephony and of broadband networks all demonstrate how pervasive this technology has become. But how do ICT affect economic growth and the efficiency of firms is not a matter of accurate precision but more of a perception, which depends on innumerable factors.

Not only the service sector workers but human resources in organizations belonging to almost all kinds of industries are in constant need for information. They spend incredible amount of time in communicating with other people, both inside and outside the organization relying on information technology and communication devices. The workplace is now more efficient and productive as a result of increased technology. The computer and ICT have affected almost every business in the world,
but worth mentioning to say that none more prevalent than the financial services industry.

2.6.1 Enhanced Productivity

ICT is likely to boost the productivity levels of most workers. Electronic communication methods such as email and mobile phones have enabled individual workers to connect quickly to deal with and respond to others. Communicating with people both inside and outside the company has become timelier and thus more productive. Possibility of such real-time access to information systems is not only helping to boost productivity levels but it enhances collaboration and increases flexibility to both the firm and the individual. For the firm, this flexibility in turn again leads to productivity gains, improve information transparency, and make it easier to meet and exceed the needs of customers.

Information Technology enables even the individual workers to be more flexibly in terms of both time and place too. For instance they have possibilities to work in the evenings and weekends, while at home, saving commuting time and allowing the combination of work and leisure and, indeed, to work while on the move which makes them further productive.

Productivity gains were also obtained through another related concept the multicommunicating, a process Reinsch, Turner and Tinsley (2008) define as “engaging in two or more overlapping, synchronous conversations” (p. 3). Multicommunicating is defined as “engaging in two or more overlapping, synchronous conversations.” This process is made possible through the use of various communication technologies such as instant messaging, text messaging, videoconferencing, or email. Multicommunicating can be a beneficial process, because when used effectively it can increase efficiency and productivity.

ICT also makes productivity possible by allowing people to work from home in a quiet space or intensely over a period of time beyond normal office hours to
accomplish something for a deadline. Finally ICT is supposed to enhance workgroup productivity via web collaboration tools such as social networking sites and Google Docs that allow collective editing and modifying of on-line content and by facilitating teleworking.

2.6.2 Improved Job Performance

The electronic notes taking and storing functionality of some of the communication devices allows a more effective recording and sharing of personal notes regardless of location. It also saves consultants time searching for information. Wireless accessibility of the personal email system has been reported to speed up communication processes quite significantly. With all relevant resources at hand, the consultants felt better equipped and, therefore, more self-confident when visiting clients, working with others in meetings and sharing information over the personal communication devices with coworkers.

On the whole, more effective management of personal information, speedier communication processes, improved decision making, and greater effectiveness when working in meetings and sharing information are the ways by which the information and communication technology devices enhance the job performance of workers.

Information technologies have been claimed to help remove the monotony attached to certain jobs and make them more enriched and satisfying to the employees thereby enhancing their performance.

2.6.3 Better Consulting Process.

The ‘always-on’ connectivity through communication devices like the mobile phone and related devices have made the consultants much more responsive to communications and queries, and thus expedite the consulting process. For instance a consultant or marketing executive at a customer site expecting something very important to come in that they need to act on immediately such as closing a deal or clarifying a bid find a ICT device handy to act upon it immediately.
Another form of enhancement is the time gains availed from using the ICT devices results in an opportunity for workers to dedicate more time to value-adding work. The time the communication devices frees up enables relevant workers to allocate more time to working on consulting, as opposed to the background and admin work that needs to be done. It frees up more time to be face-to-face with the customer and less follow-up time.

Enhanced interactivity is an added advantage in using information and communication devices like the notepads and tablet PC’s. The interactive working option offered by such ICT devices aid the consulting process by involving all participants in the process, increasing the reflection of their views in the solution and, thus, enhancing ownership of the results.

Ultimately it can be inferred that ICT devices improve the consulting assignments by increased success in completion, increased face-to-face customer contact and enhanced interactivity.

**2.6.4. Enhanced Job Effectiveness**

Information and communication devices have enhanced workers’ effectiveness on the job, service providers in particular, by improving the quality of collaboration not only at a distance but also face-to-face. Information and data can be brought in front of the customers either within the office or in customer locations using visual aids and they can be worked upon by the service providers and the customer as a team. This is especially beneficial in financial services industry such as in insurance, auditing and the like. Ict enhances the quality of presentation too which is an imperative task as in case of roaming professionals and marketing staff. Tablet PCs, laptops and even palmtops assist in better presentation. All these together enhance the job effectiveness.

**2.6.5 Faster Task Accomplishment.**

Using the information and communication devices enable the professionals especially those who are on the move accomplish their tasks more quickly. The greater
independence of physical location that the wireless connectivity of the communication devices provided allowed users to complete tasks on demand, as and when they emerged. Rather than having to return to their desk they can perform tasks there and then, and they don’t have to interrupt the flow of a meeting in order to do access information or consultation with coworkers.

To put it in short execution of tasks as and when they emerge with the help of ICT devices makes it possible the accomplishment of tasks more quickly

2.6.6 Greater Control over Work.

Communication devices provide the consultants with greater control over their work. Permanent connectivity via internet or the convenience of mobile connectivity facilitate personal time management and the professional workers’ ability to schedule and re-organize work. Advanced communication devices like the PDAs or smartphones with net connectivity makes the professionals aware of their meetings and further to reschedule their programmes or meetings effectively from where they are rather than returning to their desk.

Ultimately the ICT devices bring greater control over the workers by bringing awareness of changes in daily work schedule and by improving the personal time management

2.6.7 Makes Job Easier

Using the information and communication devices have made it easier for workers especially roaming and mobile professionals to do their job. The benefits were associated with the mobility of personal and corporate information resources, which greatly enhanced opportunities for performing work out of a large range of locations. It is also found that using ICT devices have reduced duplication of work. All of these benefits are associated with the mobile functionality of the computers and mobile communication devices. To put it in simple terms ICT devices makes job easier by enhancing the ability to work away from their desk.
2.6.8. Improved Collaboration and Access to Team Resources

We find that team work and interdependent tasks form the major component in good number of organizations. ICT devices finds its use in improving the collaboration on the consulting team and results in faster completion of interdependent tasks even if the team members are geographically distributes. Collaboration is also improved through the ease of turning personal electronic notes into publicly available team resources. Another way of putting this is ICT devices makes personal knowledge quickly available as team knowledge which helps in completion of interdependent tasks and team work.

ICT enhances the ease of building and accessing team resources, due to the ease with which structured and unstructured information could be captured in digital form and made available through the wireless connectivity to all those who are in need of the information by sharing it online.

2.6.9 Increased Information Accessibility

An enormously distinct benefit most directly associated with access to ICT devices is the increase in supply of information by reducing the cost of producing and transmitting information. By increasing the availability and accessibility of information, ICT devices in turn reduce uncertainty. Reduced uncertainty will generally lead to better decision making and allow for new forms of organizational innovation, thus reducing transaction costs and inefficiencies. When the speed of communication continues to increase, the expectation of immediate or near immediate response continuous to increase with it.

2.6.10 Closer encounter with customers

No matter what type of organization, close interaction with the customer is what drives organizations to have a deployed workforce. Of course, a deployed workforce has a requirement to be tied into the organizational infrastructure to connect to critical resources. Increased diffusion of mobile networks and technologies enables
geographically separated entities and nomadic workers to utilize mobile communications to be closer to their customer base while remaining constantly connected to the critical resources needed to support the customer. This pushes organizations to rely on information and communication technology to drive their strategic direction and goals in today’s mobile environment.

2.7 ICT DEVICES AS A SOURCE OF ANXIETY

Long back when computers were introduced in the workplace it was said to generate a negative impact on the workforce. Some people argued that the computerized workplace is inhumane and workers' jobs are robbed of enriching elements (Attewell & Rule, 1984). And the deskilled jobs were said to produce dissatisfaction, alienation, and reduced motivation to perform.

Same as that of the computer revolution at this moment in time ICT revolution, in spite of its benefits to the modern workplace such as an array of new options and improved efficiency, is said to become a source of increasing psychological stress. As pressures to increase working hours and work intensity continue to rise supported by technology that speeds up all that we do and technology enabling us to be continually accessible make no means for a break from work and time to relax leading to overwork and stress.

As workers constantly try to cope with the everyday stress at work they are often confronted with additional stress from the effects of technology and technology related responsibilities on their job.

- People experience difficulty learning and adapting to the new technology. Some people adapt to the new technologies quickly, while others experience a greater sense of difficulty in learning, developing knowledge and skills, and ultimately adopting their use within their daily lives.
- Employees are expected to keep up with changes in systems, programs and methods without being trained or even shown how the new technologies work.
As technology in the workplace keeps evolving, workers feel as if they are constantly trying to adapt to the new methods and skills. When workers are trained in the new technologies, they often feel more frustration and stress at having to take the time from their work responsibilities for retraining.

Workers spend less time interacting with other workers throughout the day. In reality, there is significantly less human interaction on all levels. Emails, voice mails, text messaging and video conferencing make many workers feel stressed, alone and isolated.

With introduction of ICT in organizations many workers are continually expected to perform more work in less time as the world seems to spin faster each day making the days look shorter.

Many workers worry that technological advances will eliminate their job positions.

Workers worry about computer crashers causing them to lose work documents and research.

The issues discussed above are the darker side of information and communication technology as seen by the technophobic Technophobia is the fear or dislike of advanced technology or complex devices, especially computers. The term is generally used in the sense of a fear, either rational or justifiable. As technologies become increasingly complex and difficult to understand, people are more likely to harbor anxieties relating to their use of modern technologies. When a worker is faced with constant stress or anxiety, it affects him or her on all levels, mentally, physically and emotionally.

2.8 ICT DEVICES AT WORK

Even though the ICT devices lack universally accepted definition the term refers to any product that allows the transfer or manipulation of digital information. ICT is an umbrella term that includes a wide variety of devices and technologies most
of them beyond the scope of this study. Those ICT devices that facilitate the employees to extend their work beyond the physical and time boundaries of workplace are distinctively referred to as work extending technologies in the technical parlance.

2.8.1 Personal Digital Assistant (PDA)

PDA, the abbreviation of personal digital assistant, were originally introduced for the purpose of keeping address, phone, calendar, and task lists. But PDA’s have evolved over the years and today a typical PDA can function as a cellular phone, fax, provide Internet connectivity, personal organizer and can do much more. The PDAs available in the market these days can be defined as a handheld device that combines computing, telephone/fax, Internet and networking features.

While some PDAs work only with a stylus, others incorporate a miniature keyboard. A PDA might include handwriting recognition software, voice recognition, and a digital voice recorder. Some models come with a suite of software programs preinstalled, while others offer optional programs if desired.

A PDA can function like a mini-computer and can be used to carry information or alter information while en-route to the office or to a client. PDA’s that work with software, predominantly Windows Mobile can be used to run a variety of mobile applications, including Excel and Microsoft Word. A PDA can be an extremely useful tool, replacing the cell phone while adding the functionality of an organizer, planner, and mini-computer node.

Functions of PDA

Even though a PDA is a handheld device designed to facilitate organizational ability from a mobile platform, separate versions of PDAs can carry out a diverse range of activities though with the help of optional accessories. But invariably all PDAs can synchronize with a laptop or desktop which is the most popular feature of this device. A few significant among the numerous functions of PDAs are listed below.
**Synchronize with Personal Computers:** As individuals need to work with the same information in different places and as personal computers in the office or residence may not be portable PDAs are designed to complement the data on the personal computer. There is a need for information interchange from PDAs to Personal computer and vice versa. This is made possible by synchronization software on the PDA that works with companion software that is installed on the personal computer. The added advantage of synchronization is that the users will always have a backup copy of their data, which can be a lifesaver if the PDA is broken, stolen, or completely out of power.

**Handle Personal Information Management Functions:** All PDAs come with some kind of personal information management (PIM) software that typically handles tasks such as storing contact information, make to-do lists, track and remind appointments, perform calculations and take notes to keep the user organized.

**Run Application Software:** Making the PDAs compatible or synchronize with personal computers is not possible if the PDAs cannot run specialized software applications. Windows mobile devices come with Pocket versions of Word, Excel, PowerPoint, Internet Explorer and Outlook along with other windows accessories. Other PDA devices are also loaded with compatible software that support Microsoft Office package. Application software multiply the utility of these pocket held devices.

**Wireless connectivity with other devices:** In addition to doubling up as a mobile phone PDA are enabled to make short-range wireless connectivity using Infrared (IR) or Bluetooth technology, IR is found on most PDAs and requires a clear line of sight. It's commonly used to sync with a notebook computer that has an IR port. Bluetooth wirelessly connects (it's a radio frequency technology that doesn't require a clear line of sight) to other Bluetooth-enabled devices, such as a headset or a printer. Internet and corporate network connectivity through Wi-Fi and wireless access points

**Miscellaneous applications of PDA:** PDAs, not only can manage the user’s personal information, such as contacts, appointments, and to-do lists, today's devices can also
connect to the Internet, act as global positioning system (GPS) devices, and run multimedia software. Manufacturers have combined PDAs with cell phones, multimedia players and other electronic gadgetry. A PDA can connect to the Internet to check email, send and receive messages and incorporated with wireless local area network (LAN) capability. A PDA can store, access, and transfer virtually any kind of data, including maps, spreadsheets, presentations, and dockets.

**The downside of PDAs**

With all the conveniences of a PDA mentioned earlier comes a downside. In order to have the full range of features of a PDA the user needs to sign up for some kind of internet plan which costs more that the PDAs itself over its lifetime. Distractions from important work and addiction to PDAs caused by the internet connectivity can cripple a person’s personal and social life. Another potential drawback is the lack of privacy one can have when they have a PDA. In addition to people calling the users at all hours of the day they are expected to receive and reply the constant emails and ultimately leading to increased availability and responsiveness.

The main purpose of a personal digital assistant (PDA) is to act as an electronic organizer or day planner that is portable, easy to use and capable of sharing information with the user’s PC. The PDA’s limited functionality has reduced its utility for those who need to do a wide variety of work outside the office; they are mainly used as a diary and address book. Today, almost all PDAs are smartphones. Over 150 million smartphones are sold each year, while "stand-alone" PDAs without phone functionality sell only about 3 million units per year. (http://digital-lifestyles.info/2006/02/06/pda-sales-plummet-again)

**2.8.2 Palmtops**

Palmtop is the generic name for a personal computer that fits in the palm of a user’s hand. It is a lightweight, small, battery-powered and general-purpose programmable computer. The definition says that a Palmtop otherwise called as
a handheld PC, or H/PC for short, is a term for a computer built around a form factor which is smaller than any standard laptop computer. Compared to full-size computers, palmtops are severely limited, but they are practical for certain functions such as giving fast information like addresses, dates, meetings, memos etc. and function as phone books and calendars.

Palmtops that use a pen rather than a keyboard for input are often called hand-held computers. Because of their small size, most palmtop computers do not include disk drives. However, many contain PCMCIA (Personal Computer Memory Card International Association) slots in which the users can insert disk drives, modems, memory, and other devices

Pros and cons of palmtops

Palmtop equipment provides three critical advantages unique to hand-held devices. Their complete portability helps ensure that individuals will have the equipment available when they need it. Unlike a laptop/notepad a palmtop device fitting in pocket, purse or briefcase is seldom left in the office. The palmtop can contain the names, emergency contact phone numbers, and other information about key corporate personnel. It can contain regularly updated customer contact and order information. It can even contain maps and diagrams, detailed instructions about where to go and what to do. Further its wired and wireless communications capabilities increase the probability that information and messages can flow as needed. And most of all the palmtop equipments aid the workers with the required flexibility that they need to maintain a balance between their work and the family. The combination of the above factors motivates the employees to keep the palmtops handy and thereby providing the organizations the required communication abilities.

In spite of the above benefits palmtops are less preferred because of their small screen, small memory, limited features and less functionality than the otherwise portable notepads.
2.8.3 Smartphones

The term Smartphone is usually used to describe phones with more advanced computing ability and connectivity than a contemporary feature phone, although the distinction can be vague and there is no official definition for what constitutes the difference between them. A smartphone is often seen as more of a portable computer with a cell phone than a phone with computer-like functionality offering features such as email, video conferencing, text messaging, e-book reading and GPS. Easy access to the Internet, coupled with the ability to send, receive and read documents, make this a valuable tool for communication with employees in the field.

Smartphone is a high-end mobile phone that combines the functions of a personal digital assistant (PDA) and a mobile phone. Today's models typically also serve as portable media players and camera phones with high-resolution touchscreens, web browsers that can access, and properly display, standard web pages rather than just mobile-optimized sites, GPS navigation, Wi-Fi and mobile broadband access.

Features of Smartphone

A Smartphone is either a cell phone with PDA capabilities or a traditional PDA with added cell phone capabilities, depending on the form factor and manufacturer. Characteristics of these devices include:

- A cellular service provider to handle phone service as with cell phones
- Internet access through cellular data networks
- Various combinations of cell phone and PDA features, depending on the device
- A number of different operating systems, including Windows Mobile Pocket PC Phone Edition, the Palm OS, RIM's Blackberry OS for Blackberry smart phones, iOS for iPhone and the Symbian OS for smart phones from Panasonic, Google’s Android OS, and many more.
As email use grows, the ability to respond to email while away from the office enabled by mobile devices such as Smartphone and PDAs makes employees more time efficient and better at utilizing gaps in their daily work schedules. This ICT device is also found to increase the efficiency of the teams they work with.

### 2.8.4 Personal Computers

In its more general usage, a personal computer (PC) is a microcomputer designed for use by one person at a time. Today, when someone says PC, chances are they mean a machine running on the Microsoft Windows operating system with an x86-compatible microprocessor. A personal computer (PC) is any general-purpose computer whose size, capabilities, and original sales price make it useful for individuals, and which is intended to be operated directly by an end-user with no intervening computer operator.

Software applications for personal computers include, but are not limited to, word processing, spreadsheets, databases, Web browsers and e-mail clients, digital media playback, games, and myriad personal productivity and special-purpose software applications. Modern personal computers can readily be connected to the Internet, allowing access to the World Wide Web and a wide range of other resources. Personal computers may be connected to a local area network (LAN) too, either by a cable or a wireless connection. A personal computer may be a desktop computer or a laptop, tablet PC, or a handheld PC.

Personal computers find its application in every aspect of a business. Internally, personal computers allow businesses to keep permanent records of communication, encrypt messages and transmit media of all types. PCs also increasingly play a significant part of external business communications. With eTForecasts¹ predicting that worldwide PC sales will increase from 301 million units in 2010 to 400 million

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¹ [www.eTforecasts.com](http://www.eTforecasts.com), on April 12, 2011
units in 2015 no one can ignore it’s consequences on the business and the constituent human resources.

2.8.5 Laptops

Portable computers, originally monochrome CRT-based and developed into the modern laptops, and were originally considered to be a small niche market, mostly for specialized field applications such as the military, accountants and sales representatives. As portable computers became smaller, lighter, cheaper, more powerful and as screens became larger and of better quality, laptops became very widely used for all sorts of purposes.

A laptop integrates most of the typical components of a desktop computer, including a display, a keyboard, a pointing device (a touchpad, also known as a trackpad, and/or a pointing stick) and speakers into a single unit. A laptop is powered by mains electricity via an AC adapter, and can be used away from an outlet using a rechargeable battery”.

Positive and Negative Aspects of a Laptop

A laptop computer is portable and has accessible ports, and has abilities of processing all operations, done by a common desktop computer, which makes it perfect for roaming professionals and mobile workers who need to use a computer while on the move. They have lower power and space requirements than desktops, thus conserving electricity and space while accomplishing the same work.

The basic source of energy for a laptop computer is the battery source, and an external AC adapter, which is applied for charging the battery when it's discharged. This gives the consumer an opportunity to operate his or her notebook for long hours especially on the move, with no necessity to connect with cords, till the battery drains

The fact that the laptops possess many similarities to a common computer really makes a great benefit to the workers using them. The dropping costs, decreasing sizes
and enhancing properties are really making laptops gain more and more popularity among computer users across the world.

2.8.6 Desktop Personal Computer

A desktop computer is a personal computer (PC) in a form intended for regular use at a single location, as opposed to a mobile laptop or portable computer. Early desktop computers are designed to lay flat on the desk but in modern usage the word "desktop" usually refers to tower cases that are in fact more often located on the floor under the desk than on a desk. Most modern desktop computers have separate monitors, keyboards and other input and output devices.

Desktops are known for its durability compared to laptops and unlike laptops they have additional slots for add-on cards to install the required additional features and slots for upgrading the RAM, Hard drive or any other component. The comparatively larger size of the desktop allows required number of drives to be fitted such as CD-ROM, DVD-ROM or Flash Memory. Moreover the desktop computers are relatively inexpensive compared to their portable counterparts.

However the fixed nature of the desktop limits its functionality as the workers need to make use of external storage devices such as CDs, DVDs and flash drives to transfer the data from one place to another. Additionally the very obvious space requirement and power dependency may perhaps be the reason why desktops are less preferred by the computer users.

The home desktop PCs are utilized for the same purpose as laptops by the users. As for as the knowledge workers are concerned access to e-mail is crucial and majority of workers who possess desktop PC at home get access to the office e-mail in their home desktops which make it imperative for the people who seek work extending technologies.
2.8.7 Mobile Phones

Mobile phone adoption in developing countries has grown dramatically in the past several years and experts estimate that by 2013, every adult in the world will own a mobile phone. Such is the popularity of this ICT device all over the world. India is no exception and is standing next to China in having the largest mobile phone subscriber base in the world.

A mobile phone also known as a cellular phone, cell phone and a hand phone is a device which can make and receive telephone calls over a radio link whilst moving around a wide geographic area. It does so by connecting to a cellular network provided by a mobile network operator. The calls are to and from the public telephone network which includes other mobiles and fixed-line phones across the world.

Features of mobile phones

Mobile phones are designed to work on cellular networks and contain a standard set of services that allow phones of different types and in different countries to communicate with each other. In addition to telephony, modern mobile phones also support a wide variety of other services such as

- Text messaging, MMS, email, Internet access, short-range wireless communications (infrared, Bluetooth), and business applications.
- Roaming which permits the same phone to be used in multiple countries, providing that the operators of both countries have a roaming agreement.
- Send and receive data and faxes provides a computer is attached, access WAP services, and provide full Internet access using technologies such as GPRS.

Mobile phones - Boon or bane

Mobile phone has gained popularity among the people in different strata of society owing to the convenience it provides to the users. The most significant advantage of having a mobile phone is that a person can communicate to his or her family and friends no matter where they happen to be. From the business point of view, it is obvious that mobile phones assist business communication a lot. Mobile phones have
enabled individual workers to connect quickly to deal with and respond to others. Communicating with people both inside and outside the company has become timelier and thus more productive. Mobile phones allow people to make better use of the time they spend travelling and waiting, keeping in touch with colleagues, friends and family, or performing a range of work-related tasks. In addition to being a communications tool, a mobile phone can increase worker flexibility, efficiency and productivity. Mobile telephony enhances business productivity by enabling employees to remain up-to-date with project news and developments while they are away from the office.

On the other hand, there are also disadvantages. There are perceptions that using a mobile phone could harm the brain. Too much of mobile phone usage has been related to consequences like dizziness, blood-brain barrier and ear problems. Moreover, as a result of so many features packed into a tiny device, mobile phones have recently gained reputations for their poor ergonomics. Their small size, plethora of features and modes, and attempts at stylish design have made them difficult and confusing to use.

Despite the conclusion whether it is a boon or bane mobile technologies are one of the fastest growing and most widely adopted technologies in history. It is worthwhile to note that a mobile phone services in India finds the majority its application primarily in making voice calls and short messaging service rather than email and other supplementary features it offers.

2.9 CONCLUSION

We live in the information era and witness a consistent enhancements and innovations in the communication devices. It is not just the social life but the professional life of each and every individual bears the brunt of information and communication technology enormously today and the days are not far when these devices could play a pivotal role in business and society. Like any other innovation information and technology devices may carry with them a cost along with their benefits. It is worthwhile to find what those costs are and whether they are worth the price.