Chapter 1
Introduction

1.1 Introduction

Industrial revolution took place from 18\textsuperscript{th} to 19\textsuperscript{th} centuries. It was a period, when, mostly rural societies in Europe and America became industrial and urban. Prior to the industrial revolution in the late 1700s, manufacturing was done in people’s homes, using hand tools or basic machines. Industrialization began to shift towards the special purpose machinery, factories and towards the mass production. The iron and textile industries, along with development of steam engine, played the important roles in the Industrial Revolution, also improved systems of transportation, communication and banking. While industrialization increased volume and variety of manufactured products and also improved standard of living. It resulted into changing living conditions for the poor and working classes. Britain was the birthplace of industrial revolution where many factors contributed. They became world’s leading country for providing raw material as well as market place for manufactured goods. As demand for the British increased business people needed more cost effective methods of production, which led to the rise of business and the factory system. In Britain during 1775-1850, it gave birth to modern industry – a new system of production based on machines and factories \cite{1}.

Prior to Independence, Indians had dominated with world textile trade. After independence in 1947, cotton exports were down, instead of supplying raw material India became producer of cloths in their own factories. Though India’s automobile industry did not grow till independence, the foundations of domestic carmakers such as Tata Motors and Hindustan Motors were set up prior to 1947 \cite{1}.

During the second half of the nineteenth century railways reached out to Calcutta, Bombay and Madras. Coal mines began to be seriously worked in Bengal and Bihar, the first cotton mill in Bombay and first jute mill in Bengal were started, serious attempts were made to manufacture paper through machines. With this led the foundation of industrialization of India \cite{1}.
In 1980s, globalization involves the removal of trade and barriers and restrictions, and encourages liberalization, privatization and free market economies. The removal of trade barriers leads to free flow of raw materials and goods across borders. It encourages healthy competition for mutual benefit and promotes trade \[1\].

Globalization has led to the formation of economic organization like the European Union (EU) and the Association of South-East Asian Nations (ASEAN). The 21\textsuperscript{st} century is an age of interdependence and mutual benefit. The success of any economy will depend on the sharing of goods and services and healthy competitive trade with other countries. In 2010, Asian enterprises recorded the strongest growth on information systems hardware, software and telecommunications equipment. The days of isolation are over. The path to progress and prosperity now lies in globalization. Globalization leads to greater disparity between the developed and developing countries (Jayanti Sengupta).

Due to the effect of Liberalization, Privatization and Globalization, many multinational companies established their base in India. Competition between foreign industries and Indian industries were on rise. The effect of imbalanced competition between Indian and Foreign industries was such that many Indian industries were forced to close down (due to inability to cope up with the foreign companies basically due to lack of technology). Globalization brought the world closer and closer increasing more understanding, cooperation and healthy competition. Hence to sustain Indian industries in the world, adoption of new methods and technology were essential. Thus the need of Information and Communication Technology (ICT) emerged with globalization. \[2\]

1.1.1 Information and Communication Technology (ICT)

Information and Communication Technology (ICT) is a general term which means any technology that helps to produce, manipulate process, store, communicate, and/or disseminate information \[3\]. According to Shelly et al (2004), Information and Communication Technology (ICT) includes hardware, software, databases, networks and other related components which are used to build information systems \[4\]. Gholami (2006) defines Information and Communication Technology (ICT) in her PhD thesis as an acronym as a concept which is a combination of two

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previously unrelated concepts, (1) information technology and (2) communication technology. Information technology (IT) is the term used to describe the equipment and software elements that allow us to access, retrieve, store, organize, manipulate and present information by electronic means. Communication technology (CT) is the term used to describe equipment, infrastructure, and software through which information can be received and accessed, for example phones, modems, digital networks, and Digital Subscriber Lines (DSL)\(^5\).

The Information and Communication Technology (ICT) has revolutionized the world to a greater extent. The innovation of computer and Internet facilities and the phenomenal growth of the information technology sector have made global business easy, quick, savvy, competitive and profitable.

This study explored using Information and Communication Technology enhancing manufacturing and industrial performance. However there are many challenges to implement information and communication technology in the rural areas including cost of infrastructure, electricity, skilled employees etc. To this end government introduces some policy as ICT plays an important role to develop industrial sector. The policy highlighted that the government will encourage the implementation and use of ICT in manufacturing industries in the rural areas.

1.1.2 Organizational Performance
According to Richard et al. (2009) organizational performance encompasses three specific areas of firm outcomes: (a) financial performance (profits, return on assets, return on investment, etc.); (b) product market performance (sales, market share, etc.); and (c) shareholder return (total shareholder return, economic value added, etc.).

Performance indicates how the organization accomplished their goals and objectives whichever set previously. Organization performance measure by performance measurement system is a complex system as there is an interface of individual, organizational and environmental factor. Therefore, there seems to be a need to examine the relationship between behavior and organizational outcomes that need to be changed, so as to help improve organizational performance. Information and Communication Technology helps to improve the organizational performance.
Stephen Robins defines "field of study that investigates the impact that individuals, groups, and structure have an organization for the purpose of applying such knowledge improving an organization's effectiveness".

1.1.3 Technology and Business Organization

Today in the information age, where destiny springs from innovative ideas with clever use of information, the business environment in the information age places many pressures on companies. Companies may respond reactively to a pressure already in existence, or proactively to an anticipated pressure. Company responses are typically facilitated by Information Communication Technology (ICT), which in broad sense is collection of the individual technology, components that are typically organized in to computer based information systems. The ultimate goal of any business is to survive, sustain and grow. Information and Communication systems are a foundation for conducting business today. In many industries, survival and the ability to achieve strategic business goals are difficult without extensive use of ICT. In the technology field instead of wired technology advanced technology that is wireless technology were opened in 2011. Cell phones, Black Berrys, iPhones, email and online conferencing over the Internet have all become essential tools of business.

All over the world, most successful companies simply could not exist without ICT. It has been found that thousands of entrepreneur from developed countries launched businesses including manufacturing units in urban as well as rural areas. In fact, ICT is very important for every functional area of an organization and information systems which are integral to every functional area. These successful companies rely on inexpensive computers, networks including Internet, hardware, software and applications not only to perform the business functions efficiently but also to manage and grow the companies.

The ICT applications enable entrepreneurs to handle varied tasks intelligently such as marketing & sales, manufacturing, accounting, inventory, quality control and many others. The most modern businesses all over the world have been using ICT and business information systems effectively. As a result of effective implementation of ICT, the manufacturing units become more self-sufficient and reduce their operating cost. However, in long term, in order to obtain
meaningful value from information systems, organizations must support their technology investments with appropriate complementary investments in organization and management. New ICT investments are unlikely to produce high returns unless businesses make appropriate managerial and organizational changes to support the technology.

Today’s world is digital world. In computer age each area or organization requires work finished within fraction of seconds. In the current era technology updates and earlier technology becomes obsolete. Information Communication Technology plays crucial role in the modernization / upgradation by contributing especially in manufacturing industries. Manufacturing industries need technology to perform various functions in the different department. To perform task everyone should get familiar with operation of these devices though organization implement properly. Information and Communication Technology is used to simplify and speed up the work. The various automated devices and software’s are introduced in the manufacturing industries. In manufacturing industry information communication technology uses by the different department for performing various operations. Organizations adopt the new technology and try to enhance their performance. Through this topic tried to find out the various difficulties to implement the ICT. Adoption of new technologies helps to enhance the organizational performance.

Recently many innovations in technology have generated significant interest among academics and practitioners. In recent decades, Information and Communication Technologies (ICT) such as a diverse set of technological tools and resources used to create, store, disseminate, manage and communicate valid and up-to-date information. Information and Communication Technologies (ICTs) encompasses a range of rapidly evolving technologies and they include digital technologies such as computers, information networks (Internet, World Wide Web, intranets and extranets) and software applications as well as telecommunication technologies (telephony, cable, satellite, TV and radio, computer-mediated conferencing, video conferencing). Internet and their applications improve growth and social change. However, although interest in this subject has grown substantially, research on the importance of the combination of organizational change together with technological innovation has been less common. Some studies suggest that technological innovation is not an isolated source of improvement, but part of a system or cluster of mutually-reinforcing organizational approaches.
Indeed, it is very difficult for any business to survive, sustain and grow. Modern Businesses must compete in a challenging marketplace – one that is rapidly changing, complex, and global, hypercompetitive, and customer focus. Therefore, businesses must react rapidly to problems and opportunity arises from this modern business environment such as manufacturing industries works on accuracy, speed and consistency. In fact, ICT play a significant and powerful role in the modern global business environment. In todays competitive age, the organization or person who gets the required information quickly and uses it, wins. In modern business, information is a very important resource just like other physical resources such as material, machinery, men and money. The right information providing to the right department / person at the right time can increase productivity, efficiency, sales, reduce cost, produce new products in time, secured new financing, obtain government approval or resolve employee conflicts. In fact, several modern businesses in urban areas have implemented ICT infrastructure successfully and started using business information systems for various functional areas (such as marketing and sales, Production and manufacturing, Accounts and Finance, Human Resource Development, Research and Development etc) including Transaction Processing Systems, Management Information System, Decision Support Systems, Executive Information System, Enterprise Resource Planning and Knowledge Management Systems. ICT in modern business organizations are woven into complex systems that are interrelated with other systems, permeating every business process and enabling tremendous gains in knowledge, productivity, competency and profitability.

1.1.4 The business environment and industries in the rural area
Rural areas are the areas situated outside the municipal corporation area. The government announces various schemes but organizations from this area could not get benefits of those schemes. The business environment refers to combination of physical, economic, social, legal, political and technological factors that affect business activities. The pace and magnitude of change affecting small scale industries in the rural areas continue to accelerate, causing increased uncertainty in company operations and strategies. Therefore the small scale companies must operate to produce more with fewer resources efficiently and for this company responses are
typically facilitated by ICT, which are the individual components that are typically organized into computer based information systems.

It has been observed that the businesses and industries in the rural area have been facing many problems regarding the implementation of ICT and business information systems for enhancing organizational performance.

1.2 Need for Research - Why this Subject?

In Nashik district there are around thousand manufacturing units situated at different rural areas such as Satpur, Ambad, Dindori, Musalgaon, Gonde-Padali, Sinnar MIDC area. It has been observed that very few manufacturing units situated in rural area have been performing well. Further, most manufacturing units from rural areas have not been using ICT effectively because of several reasons such as supply of electricity, Network communication problem, Poor Internet connection, poor awareness of technology etc.

At present, most industries in rural area in Nashik district do not have adequate ICT infrastructure and facilities. Therefore the manufacturing industries from rural area find it very difficult to perform effectively and efficiently. However the situation is gradually changing and few companies have started using ICT, resources and infrastructure in order to expedite business processes and overall efficiency.

Through this study, an attempt will be made to analyze the performance when Information and Communication Technology (ICT) plays very important role in day to day activity for enhancing productivity of manufacturing industries in the rural area of Nashik District.

Ideally, the gap between the manufacturing units from urban and rural areas with reference to productivity, sales, and efficiency of business processes should be less.

At present most manufacturing industries are in danger and suffering from n number of drawbacks, sick industries.
The entrepreneur from rural area has been facing many challenges and find very difficult in order to encourage industry people.

There is dire need to study the role of Information and Communication Technology (ICT) on organizational performance and also enhance the productivity of manufacturing industries in the rural area of Nashik District and suggest / provide a suitable cost effective solution. Through this study the outcome will certainly helpful and beneficial to the existence as well as potential industrialist from rural area.

1.3 Problem area of the Study
Statement of the Problem:
“Study the role of Information and Communication Technology (ICT) on organizational performance in the manufacturing industry in the rural area of Nashik District.”

In the manufacturing industry there is dire need to develop their business and improve their performance. Information Communication Technology upgraded so fast as everyone likes to upgrade them. The various hardware and software are used in the manufacturing industries not only for accounting or communicating people but also for production, quality and in various departments. Due to technology on one click will get required information by maintaining accuracy and speed.

In this study the role played by Information and communication technology in the manufacturing industries is studied. The various departments in the manufacturing industries used ICT for different purposes such as accounts department used financial software’s, production department used CAD softwares, sales and marketing department used e-commerce softwares, HR department used payroll etc. The departments from organization may link with by using Enterprise Resource Planning softwares or SAP. To maintain accuracy and to avoid human error automated machines are preferred to be used by the industries. It effects their performance, so naturally organizations enhance their performance by using ICT.

Study identifies the organizational performance of manufacturing industries so data is collected from the various industries from the Nashik district and analyze to find organizational
performance. Also identify and study the various problems faced by the industrial organization while implementing ICT.

1.4 Objectives of the Study

1) To identify how ICT plays an important role on organizational performance.
2) To study whether technological innovation and organizational changes are complementary, and whether they are associated with better performance.
3) This study examines the contribution of Information and Communication Technology (ICT) to a growth in manufacturing industry.
4) To identify the problems in rural areas, while implementing Information and Communication Technology and give them some guidelines for effective implementation.

1.5 Hypotheses

Following are the hypotheses for research study
1. Effective utilization of Information and Communication Technology enhances the productivity of manufacturing industry.
2. Lack of resources specially technology and human resources causes difficulties for using I.C.T. in rural areas.
3. There is a significant variation in the organizational performance before and after the use of ICT in manufacturing industry.

1.6 Scope of the Research

The present study is based on selected rural area from Nashik District.

There are 1281 manufacturing industries located in the rural area of Nashik District.

There exist various types of manufacturing units in this rural area. This study is restricted to certain manufacturing units. Further the study does not include the intangible difficulties which rarely occurred and faced by manufacturing units in the rural area.
Nasik district is fast growing industrial sector. It is having its own vast history about industries. MIDC (Maharashtra Industrial Development Co-operation) have developed industrial zone in different area like Ambad, Satpur, Gonde, Igatpuri, Sinnar. Further, there are many industrial units established at Musalgaon, taluka Sinnar, district Nashik. It was set up and run by cooperative industrial estate. About 3550 manufacturing industries are working in Nashik district including Micro, Small and Medium Scale (ref. DIC, Nashik Report from 2007 to 2013). There are 1281 manufacturing industries located in the rural area of Nashik District (Ref. DIC, Nashik).

One hundred and ten manufacturing industries from the different rural areas of Nashik district have selected for the study. In fact, there exist various types of manufacturing units in this rural area. This study is restricted to certain manufacturing units. Further the study does not include the intangible difficulties which rarely occurred and faced by manufacturing units in the rural area.

1.6 Chapterisation and Layout of the Thesis:
The thesis has been divided into seven chapters. The preliminary part, appendices and bibliography are also given in the appropriate place.

Chapter 1 is Introduction, deals with introduction of the topic, objective of the study, scope and need.

The second chapter entitled ‘Theoretical Background’ gives overall views of the various concepts related to the topic. Chapter explains Information and Communication Technology, Efficiency, productivity, organizational performance and its various dimensions.

The literatures, which are relevant to the study, are reviewed under the ‘Literature Review’ chapter and are included according to the flow of the topics.
Chapter four is ‘Research Design and Methodology’, which describes the demographic details and description of manufacturing industries in Nashik district. Tools used for data collection, sample design, sample size and statistical technique used to prove the hypotheses.

Data Analysis and Hypothesis Testing is the fifth chapter. In this chapter Presentation of the collected data, processing of the data and describe the tools used for data analysis. This chapter also shows the result or outcome from the data analysis. It concludes with the hypothesis testing and conclusions.

Sixth Chapter ‘Findings and Recommendations’ includes the major findings from the study, utility of the study and the recommendations for implementation of ICT in the rural area and some suggestions.

Chapter seven deals with ‘Conclusion’ consist of the problems faced during the research, limitation of the study, conclusion and scope for further research.