

CHAPTER ONE: INTRODUCTION

1.1 Background

1.1.1 Information communication technology and human resource management

As organizations strive to be efficient, management of human resources has become a major concern to all especially management who must ensure that their human resources are made more productive than ever before (Graham and Bennet, 2000). According to O' Brien (2000) information systems help human resource managers to plan and monitor employees and, develop programs aimed at enhancing their efficiency. For purposes of better understanding of this research, it is vital to first define the concepts of human resource management and information communication technology.

Armstrong (1999) defines human resource management (HRM) as "...the strategic approach to acquiring, developing, managing, motivating and gaining the commitment of the organization's key resource- the people who work in it and for it." Miner (1999) asserts that efficient management of human resources is critical to the success of any organization in the era of a turbulent business environment.

Information communication technology (ICT) encompasses computer hardware and system, computer software and system, computer controlled systems and communication equipment system and services all these systems provide (O'Brien, 2001; Laudon, 2000; Wendy, 1997). ICT is one of the most potent forces that are shaping the 21st century because its revolutionary impact affects the way people live, learn and work and, the way business organizations interact with the environment. It has also enabled many people, enterprising individuals, firms and governments around the globe to address economic and social challenges with greater efficiency and effectiveness (Njogu, 2003).

Furthermore ICT is facilitating new ways of creating and delivering products through electronic commerce (e-business models) and better management of organizational resources through substantive minimization of manual related operations in modern business firms (O'Brien, 2001).

Dessler (2003) notes that ICT has to a great extent transformed human resource management operations and practices in organizations. There is also general consensus that the operative functions of human resource management have been impacted upon by ICT developments which is a major driving force to the changes that are being witnessed in today's business organizations (Storey and Sission, 1993; Sparrow and Marnchington, 1998).

According to Peters (2001) manufacturing organizations have gained due to appropriate adoption of ICT because of its sustainability in the production process. In their efforts to become more customer driven and service oriented they are expected to adopt appropriate ICT in order to increase efficiency, reduce defects, lower transaction costs and serve the customer better. Peters (2001) explained that some countries like Argentina, India and Singapore use of ICT in human resource management have improved efficiency on firms, reduced costs to organizations and improved competitiveness in the private sector.

In a report on ICT (SWG, 2001) in the years 2001- 2002, a total of Ksh. 1.27 billion was the allocation of ICT resource requirements to be utilized in the following areas; government connectivity, national information infrastructure, promotion of electronic activities (e- activities), human resource development and policy and, ICT strategy development rollout. The Government of Kenya (GOK, 2004) recognizes that young people who are potential workforce and leading innovators are the earliest adopters of

ICT. The policy paper further notes that the main objective of ICT adoption and use is to spur organizational growth through efficiency at workplace.

It is therefore in the interest of all organizations to appropriately adopt and apply ICT so as to achieve competitive advantage in all areas of the value chain, human resources being one of the key chain activities. ICT adoption is inherent with challenges (Oros, 2001; Richard, 2002) to include policy infrastructure, network access (Internet connectivity) infrastructure, human capacity development infrastructure and information security and telecommunication regulation infrastructures. Richard (2002) further gave additional challenges to include insufficient employee skills, ICT perception and top management support.

From the above, it is indicative to note that organizations have continued to invest in ICT for competitive advantage but the extent of adoption has relatively remained low (Njogu, 2003). While ICT forms the integral part of the economy and enables global trading, critical issues in its use include among others perception, infrastructure and commitment. The prioritisation on the use of ICT in human resource will greatly enhance its usage as a competitive weapon (Cheruto, 2003).

1.1.2 Manufacturing Firms in Kenya

Kenya's manufacturing firms are diverse in terms of the products they are engaged in and size as determined by the number of employees in such firms. These firms are small, medium or large. Kenya's informal sector popularly known as *jua kali* comprise mostly of small firms engaged in manufacturing although not as active as those in the formal sector. The focus of this study is large firms operating in the formal sector whose operations are largely mechanized where ICT is more relevant.

According to Morawetz (1991), most of the manufacturing firms in Kenya generally learn and upgrade their technologies through a combination of imports and domestic investments. Multinational companies, who dominate the manufacturing sector have greatly assisted in terms of technological transfer in most firms in Kenya.

Whereas these firms engage in the production of a wide range of products, food and beverage, metal engineering and textile firms account for 63% of manufacturing value added.

A study by Gechino (2002) shows that foreign firms operating in Kenya are better technologically equipped and have better skilled manpower because they are mostly engaged in export trade.

The Kenya Association of Manufacturers (KAM) annual report (2004) notes, improved power supply, increased supply of agricultural products for agro processing, favourable tax reforms and tax incentives, more vigorous export promotion and liberal trade incentives are factors to take advantage of the expanded market outlets through AGOA, COMESA and East African Community (EAC) arrangements which have all resulted in a modest expansion in the sector by 1.4 % in 2004 compared to 1.2% in 2003.

However, the rising levels of poverty coupled with the general slowdown of the economy has continued to inhibit growth in the demand for locally manufactured goods, as effective demand continues to shift more in favour of relatively cheaper imported manufactured items thus affecting the performance of a section of manufacturing firms in Kenya the report continues.

Even with the enormous challenges facing these firms, most of these firms especially the large ones are moving towards restructuring their operations in order to remain

competitive. Manufacturing firms particularly those of foreign origin have embraced the use of ICT as a measure of reducing the operational costs and achieve competitiveness in price.

In Kenya, the GoK has continuously encouraged manufacturing firms to improve the quality of their products and remain competitive through measures such as tax incentives and concessions as part of achieving Government's strategic plan of attaining the industrial status by the year 2020 (GOK,2004).

1.2 Statement of the problem

In the era of globalization and market economy, the use of information communication technology (ICT) has become almost synonymous to life to both business people and organizations alike. Hammer and Champy (1993) notes that organizations should cope with the pace of change in ICT which has impacted on all strands of organizational management including human resource practices in most organizations.

Worldwide, business organizations utilize ICT in major functional areas such as finance, marketing, production and human resource management (Bresnahan, 2002). In human resource management, ICT has been used in manpower planning, selection, recruitment, performance appraisal, compensation and employee development. Furthermore, it has been noticed that generally most organizations worldwide are increasingly investing in ICT with indications that technology has become the dominant component of almost every modern enterprise such as manufacturing firms (Njogu, 2003).

Locally in Kenya SWG (2001) reports that in the year 2001- 2002 a total of Ksh. 1.27 Billion was required to for ICT infrastructure which included human resource development support policy and ICT strategy rollout. According to Njogu (2003) ICT adoption and use among state corporations in Kenya was still too low. Other research studies on ICT have been done in Kenya in related areas of marketing, finance, human resources and production (Maillu, 2004; Kinyeng, 2003; Muyoyo, 2002). Chunguli (2003) documented that most commercial banks in Kenya are fast moving towards applying ICT in recruitment.

To the best knowledge of the researcher, there is scanty empirical evidence and or few studies done to show the extent of ICT adoption in human resource management in manufacturing firms in Kenya.

1.3 Objectives of the Study

- i. To establish the extent to which large manufacturing firms have adopted information communication technology in human resource management.
- ii. To determine the challenges faced by large manufacturing firms in adopting the use of information communication technology in human resource management.

1.4 Importance of the study

The results of this study shall benefit among others the following:

- i Human resource managers. It is hoped that information from this study shall be an important input to other human resource managers who are expected to respond to developments in ICT at the work place. This information will be essential in helping them come up with organizational tailored HRM policy that shall enable such organizations fully respond to technological related challenges.

- ii Human resource information systems consultants. Information from this study shall greatly assist human resource consultants especially those engaged in Human Resource Information Systems in their continued search to provide new ways of responding to the latest developments in ICT.
- iii Government agencies such as the Directorate of e- government shall find information out of this study quite useful.

CHAPTER TWO: LITERATURE REVIEW

2.1 Information Communication Technology

According to Kirkman (2000) ICT infrastructure includes networking and computer hardware, underlying application software technologies for employing more staff-business applications, and the applications representing automated business processes. Kirkman (2000) further notes that a deeper understanding of the level of adoption of ICT in business organizations is gained from electronic readiness (employing more staff-readiness). Oros (2000) refers e-Readiness as the process for assessing the extent to which organizations are ready to adopt ICT so as to increase efficiency and effectiveness.

Worldwide, business organizations utilize ICT in major functional areas such as finance, marketing, production and human resource management (Bresnahan, 2002). In human resource management, ICT has been used in manpower planning, selection, recruitment, performance appraisal, compensation and employee development. Furthermore, it has been noticed that generally most organizations worldwide are increasingly investing in ICT with indications that technology has become the dominant component of almost every modern enterprise such as manufacturing firms (Njogu, 2003). Various nations of the world have formulated policies and infrastructure aimed at utilizing modern information communication technology. These policies are expected to regulate all the players in order to share all the potential benefits of information communication technology (Oros, 2001).

The foundation of employing more e-readiness is based on modern technologies and the access to those technologies in the areas of communications and information systems.

Richards (2002) notes that e-readiness is a prerequisite to the participation of business firms in the networked electronic economy which depends upon the integration of information communication technology. This implies that focus should be put on deployment of infrastructure, systems and web development to facilitate universal access of information technology to all citizens. International data Corporation (1997) noted that 55 nations accounted for 99% of the world's ICT expenditure and estimated the global expenditure to be US\$ 680 million. Gartner (1999) estimated information communication technology expenditure to be US\$ 3.3 billion with business organizations taking information communication technology investments a priority.

Oros (2001) and Richards (2002) noted that human capacity development infrastructure, information security and communication regulation infrastructures as the most relevant for consideration in assessing the extent of adoption of information communication technology and its application in business organizations. McConnell (2001) asserts that only a few rated e-readiness countries are benefiting from strong e-leadership, demonstrating a limited awareness of the critical importance of helping their countries move forward into the new information economy.

According to Richards (2002) issues concerning Internet connectivity such as the availability of quality networks, services and equipment are vital for broad benefit of technological developments. He further notes that information communication technology will not be available without substantial investments in internet accessibility, computer hardware and system, and computer controlled systems and communication affordability. Dawn (2002) confirmed that by mid 2001 for the US and Canada, Internet

connectivity was at a high speed of 2.5 Gigabytes per second. In Kenya, Amimo (2002) noted that policies that foster ICT implementation were required to speed up the rate of adoption of ICT.

Oros (2002) noted that capacity building needs to enable workforce to handle information, adapt to changes in their responsibilities and develop new competencies in order to effectively use information communication technology. According to Baldwin (2001) most successful development and deployment of information technology requires a cadre of highly skilled information resources management practitioners at all organizational levels. The focus should be on developing “human infrastructure” through integrated education, training and skill-based programs to enable a critical mass to utilize computers and online resources. McConnell (2001) observed that beyond a cadre of skilled workers, information communication technology needs workforce who are able to use information communication technology applications and are interested in it to avoid resistance during the implementation process. In his findings, Oros (2002) contended that civil servants resistance in technological implementation is severe in developing countries where human resources may be less robust, economies are less stable and job opportunities less plentiful.

2.2 Adoption of Information Communication Technology in Modern Organizations

The importance of information communication technology in today’s organizations is enormous and cannot be overstated. Over the recent years, developments such as internet, World Wide Web, wireless technology and associated developments in telecommunications have changed the traditional structures associated with communications and operations. According to Porter and Miller (1985) information

communication technology has transformed the nature of products, processes, companies and industries (porter and Miller, 1985). They have transformed the nature of work, production, and work systems notes that information technology has impacted business strategy and it varies widely from firm to firm. Most organizations today use information technology to gather, analyze, store and disseminate information and thus promising substantial competitive advantage to administrators (Simon, 1973). With the advent of technology, many organizations are able to turn data and information power into a potent strategic weapon. Further, organizations have restructured their operations and processes in order to cope with the changes occasioned by technological developments. Highlighting some of the developments in technology, Dessler (2000) singled out internet and systems networking to have had the greatest impact on business operations.

The progress of Internet in terms of access, usage and business applications, United Nations (2003) explained that most enterprises are preparing for e- business with information communication technology budgets estimated to have risen as much as 11% in 2002. The report further notes that the impact of information communication technology in modern organizations can be realized through increased information flows, which result in knowledge transfer as well as improved organization. In part the report quotes, “ information communication technology have become important tools for improving productive capacity and increasing international competitiveness by reducing the transaction costs, increasing efficiency of management functions and enabling firms to exchange and access more information.”

According to Njogu (2003) use of information communication technology has led to better financial management, customer service, locking in customers, gaining market

intelligence, generating new businesses, product development, telemarketing, training among other organizational functions and operations. Richards (2002) notes that the adoption of information communication technology has enormous benefits including cost reduction, speed up decision making and service delivery, minimize corruption, increase the capacity of an organization, improve quality of decision making and service delivery and streamline business processes and re-engineering initiatives. He further argued that these benefits would in turn improve the lives of workforce and catalyze cultural changes that improve business operations.

Michael (1999) noted that information communication technology is a major tangible lever to change which enable organizations to achieve efficiency through a wide range of benefits. Armstrong (1999) argues that organizations incur enormous expenditures in trying to acquire, retain and develop human resources whose productivity should be raised through initiatives such as technological adoption. Peters (2002) suggested that developing countries, corporations and organizations like Kenya can either jump on adopting information communication technology and try to steer their operations or stand aside and watch other corporations in other nations ride off into the future without them.

According Peters (1998) “the proliferation of computers in the modern world has forced great changes in every facet of the way business functions are performed. From marketing to accounting, the dynamics of information communication technology by most organizations. For instance in India over 150 business organizations spent close to Ksh. 2 billion in 1997 in information communication technology investments the report notes. In the developed world and the newly industrialized countries, business

organizations utilize a wide range of information technologies to guarantee effective information management because like finance and marketing, efficient management of information has become critical towards the success of these enterprises (Business Week, 1998).

As business organizations stand to face the challenges of information communication technology, perceptions and attitudes about information communication technology will largely determine the success of adoption of information communication technology. According to O'Brien (2001) even good technologies have failed to make successful changes due to perception by workers and organizations' themselves. He cites fear of loss of jobs and insecurity as factors that are behind the slow adoption of information communication technology by organizations. Moreover, poor skills and low knowledge have made changing these attitudes and perceptions difficult. This explains why the developing world is yet to keep pace with their counterparts in developed countries (Kandula, 2005). On his part, Rangarajan (1994) noted that adoption of modern technologies require heavy investments in real finances and skills which most organizations are lacking. He also agreed that information communication technology affects all strands of organizational performance but its adoption is expensive. Assessing the preparedness of developing countries towards adoption of information communication technology, International Telecommunications Union (2000) noted that developing countries are unable to fully benefit from technological developments because of lacking appropriate policies and information communication technology infrastructure. This, the report noted is behind the high costs of maintaining and installing recent technologies. Currently, in most organizations, information communication technology

has led to enhanced communication; teamwork and training are needed to reap benefits from technological investments (Kandula, 2005).

Comparisons worldwide have found that the core skills needed by managers were largely non-technical skills such as communication, problem-solving, analytical capacity and the ability to learn quickly (Oros, 2000). In Denmark, firms that combined organizational changes with information communication technology evidenced far higher rates of innovation: 77% of firms reported new and improved products following information communication technology investments accompanied by changes to management structures and work organization (Oros, 2000). In South Asia, mobile technology and computer systems networks have been identified as the two leading technological developments been adopted by most organizations (Huff, 1998). This is so because this developments have made it possible for internet access, telephone services and data transmission.

Njogu (2003) notes that whereas technological investments and adoption is inevitable in the current business environment, most organizations in developing countries are yet to reap the benefits of this important development. He further notes that in Kenya, high costs of communication and installation investments coupled with competition in the market place have limits usage of technological products to a few large enterprises. In his findings, Chunguli (2003) noted that commercial banks in Kenya are moving towards adopting information communication technology in selection and recruitment hence improving their operations by way of minimizing costs associated with the traditional approach to recruitment.

2.3 The use of Information Communication Technology in Human Resource Management

According to Dessler (2000) information communication technology has affected virtually all strands of organizational operations. Whether marketing, finance or production developments of modern technology have been applied to better performance. Rangarajan (1994) notes that the extent to which organizations are able to attain their corporate objectives critically depends on their ability to understand the opportunities presented to it and the constraints imposed by its environment. According to Hammer and Champy (1993) organizations are increasingly required to cope with the scorching pace of change. In her findings Cheruto (2003) asserted that technology has impacted on human resource practices in the banking sector. Further, she notes that as organizations strive to embrace information communication technology, managers must focus on improving capacity in order to carry out their roles more effectively and efficiently than before.

According to Baldwin (1999) organizations use human resource management practices as a strategic tool to achieve business objectives as they strive to adapt to the changes that occur in the external environment. These practices produce a skilled and motivated work force that can adapt to and take advantage of new technologies and changing markets (Lynch and Black, 1995).

Freeman, *et al.* (2000) asserts that a number of individual human resource practices such as employee suggestion programs, flexible job design and job rotation, job enrichment/enlargement, and job redesign, information sharing with employees, quality circles and problem-solving teams, self-directed work groups, and joint labour management committees have taken centre stage in this era of information

communication technology. Most organizations are fast moving towards adapting human resource management practices focusing on “high skill” strategies that make better use of information communication technology and continuously renew human capital are widely used by most organizations especially those in developed countries.

According to Armstrong (2000) developments in information technology have led to changes in human resource practices. He further asserts that employee selection and recruitment, planning, appraisal and training can be done online using information communication technology. Graham and Bennet (2000) explained that information communication technology have led to emergence of work systems which are more flexible and employee friendly. As a result of these developments, organizations are now developing their own customized training strategies, which are increasingly on-line with some organisations being involved in setting up corporate universities using current technologies and offering some combinations of satellite-based learning, web-based training, virtual reality and virtual campuses, sometimes in conjunction with more traditional methods.

Information communication technology has also had a positive impact on organizational performance when combined with new organizational practices (Hitt, 2002).

Black and Lynch (2000) found a positive and significant relationship between the proportion of non-managers using computers and the productivity of their organizations. The findings also revealed that organizations that reengineer their workplace to incorporate technological inventions in their practices are more productive.

In a subsequent study, Black and Lynch (2001) examining how workplace practices, human capital investments, and information communication technology are related to

productivity found out that what matters most for productivity is how human resource management systems are implemented. Bresnahan, *et al* (2002) surveying about 300 large firms found out that skilled manpower is complementary with a cluster of three distinct changes at the organizational level: information communication technology, new work organization, and new products and services. Further, interactions between information communication technology, new workplace practices and human capital positively predict organisational productivity and success. The most interesting finding is that new work practices are associated with improved organisational performance only when the practices are implemented as a bundle and not separately and that successful organisations adopt technology as part of a system or cluster of mutually reinforcing organizational changes (Brynjolfsson 2000).

Recent developments in information communication technology and other changes in the external environment forces have led to more flexibility in human resource management than ever before (Mayne and Tregaskis, 1996). Growth in flexible working patterns is a reflection of changes in the labour market and an aspect of human resource management strategy involving a greater ability by management to dispense with certain workers when not strictly essential to the production process (Brewster et al 2000).

Whereas flexibility is gaining fast recognition in today's world of work, some human resource practitioners and scholars contend that it doesn't completely eliminate the challenges facing human resource managers in our organizations. Hendry (1995) argues that flexibility discriminates against particular groups of people, thus perpetuating a social disadvantage. Such a situation is exacerbated by government legislation aimed at reducing trade union protection in the interest of a more flexible labour market.

Currently, most organizations have invested in computer hardware and software and associated systems to execute various human resource functions such as salary and wage administration, training and development, employee performance appraisal, human resource planning and recruitment (Kandula, 2005). Better systems of work such as telecommuting have been made possible through information communication technology. According to Miner (1998) organizations have improved their practices by managing human resource activities through computer systems including the Internet. He also notes that organizations are able to outsource some activities to outside providers who use computer systems to build networks to serve their clients more efficiently.

2.5 Challenges facing organizations in adoption of Information Communication Technology in Human Resource Management

Developments in information communication technology and the use of computers worldwide have resulted in corresponding new ways of executing activities and functions of human resource department. Organizations have responded to these challenges by instituting changes in their structures as well as human resource practices.

Kandula (2005) asserts that the emerging trends such as outsourcing, telecommuting, development of human resource information systems and development initiatives aimed at equipping workers with technological skills are evident. Chhabra (2005) notes information communication technology developments such as groupware, Bluetooth technology, wireless networking have greatly transformed the function. The emergence of new work arrangements such as virtual teams, home working and telecommuting -

apart from their perceived benefits – pose a challenge to the human resource function (Muyoyo, 2003).

Even with the enormous benefits of information communication technology, Richards (2002) contests that if the target customer has no access to technology needed to obtain a service, then the intended objectives may not be achieved. He further notes that information communication technology investments are heavy and requires capacity to effectively implement. Oros (2002) notes that technology projects require long term plans and relevant training for all those implementing the projects and programmes. Kinyeny (2003) noted that Kenyan organizations are faced with lack trained workforce to effectively manage information communication technology departments in our organizations. Njogu (2003) asserts that employee resistance to adoption of technology because of their perception that it may lead to loss of jobs hamper the implementation of information communication technology projects in their organizations.

Organizations in their quest to use technology in human resource management are faced with problems such as lack of infrastructure, skilled manpower, low bandwidth and high operational costs. O'Brien (2000) noted that information communication technology has led to increased insecurity of records and information. Personnel confidential information are easily leaked to unauthorized people and this will bring about problems. The use of information communication technology in human resource practices such as appraisal and employee training pose the danger of not being successful especially if the employee is not well equipped in terms of skills. Employee perception to the use of information technology is has posed a great challenge (Hilt, 2000). Loss of jobs, fear of being victimized and attitude to the use of technology are some of the challenges facing

organizations in their quest to use information communication technology. According to Dessler (2000) human resource departments face the challenge of supervision of workers who work say from their homes or from virtual offices.

Countries such as the US and UK have experienced even more rapid changes in information communication technology thus influencing their work systems. Technology has changed not only the nature of work but also creates new jobs which require new skills and 'new' types of knowledge workers as well as new human resource management methods to manage them and a new focus of human capital (Dessler, 2000). This implies that organizations need new, world class human resource systems to select train and motivate employees and win their commitment new technologies and continuous improvements organizations today depend on. Karanja (2004) noted that shortage of manpower with skills is a major problem affecting information communication technology implementation among Kenyan organizations. He further maintained that the information communication technology industry and businesses reliant on systems should be more proactive by introducing better initiatives for educating students about opportunities available in the information communication industry. Implementing information communication technology in human resource management requires the right organizational culture (Dessler, 2000) and organizational cultures take time to change. It is therefore a challenge to organizations to first re-engineer their cultures to accommodate the adoption of technology.

Information communication technology requires a policy framework to guide its usage. Armstrong (1999) identifies lack of sufficient policy tend to limit the use of information

communication technology in human resource management. He further notes that issues related to online communication and administration of pay using computer systems requires privacy and ethical considerations which are lacking in most organizations. On his part, Graham and Bennet (2000) noted that most organizations are unable to sufficiently adopt information communication technology to better their human resource practices because of resistance from union officials and other employees who vie technology as a danger to their job security.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

This was a descriptive sample survey design. Sample survey designs are most appropriate in collecting information from broad spectrum of members of the population and in making comparisons. Sample survey designs have been found to be the most accurate in making comparisons and generalizing results (Mugenda, 1999).

3.2 Population

The population of study comprised all manufacturing firms in Kenya. Large manufacturing firms were those which employed more than 100 staff with an annual turnover or production level in excess of Ksh. 500 Million (International Finance Corporation, 2002). As at June 2006, there were 2085 manufacturing firms in Kenya (Government of Kenya, 2006). Out of this number 759 firms were classified as large. This study focused on these firms.

3.3 Sample

A sample size of 70 firms was selected. Similar studies (Njogu, 2003; Musau, 2003) used a sample size of 30 and 50 respectively. A sample size of 70 was considered adequate for this study. Disproportionate stratified random sampling method was used to select the sample units as described in the sampling procedure (see Table 3.1).

Table 3.1: Sampling procedure

Category	Total number in category	Proportion (%)	Sample size
Agro processing	226	29.8	20
Pulp and paper	114	15.0	10
Wood and wood products	74	9.7	6
Chemical processing	134	17.7	12
Capital goods and spare parts	28	3.7	3
Ceramics and glass making	62	8.2	5
Iron and steel making	43	5.6	5
Electrical and electronics	24	3.2	4
Construction and equipment	54	7.1	5
Total	759	100	70

3.4 Data Collection

Data was collected using a semi-structured questionnaire. The questionnaire comprised of three sections. Section one contained general information, section two contained questions on extent of adoption of information communication technology in human resource practices and section three contained questions on the factors hindering the adoption of information communication technology and the implication of information communication technology on performance of these organizations. The questionnaire was administered using drop and pick later method. The respondents were the heads of the human resource function in these organizations.

3.5 Data Analysis

A descriptive analysis of proportions, frequencies, means, averages and tables was used. Content analysis was used for open-ended questions. Data was first edited, arranged and coded. Quantitative data was analyzed using percentages and proportions while qualitative data was analyzed by content analysis through annotation and cut and paste.

CHAPTER FOUR: DATA ANALYSIS AND FINDINGS

This chapter presents data analysis. The findings of the study are presented in three parts. Part one presents respondents' classification variables. Section two presents the adoption of information communication technology on human resource practices. Section three presents the hindrances to adoption of information communication technology in human resource management.

4.1 Response Rate

A total of seventy (70) randomly distributed questionnaires were given to respondents and only thirty nine (39) returned. This represented 55.7% response rate.

4.2 Profile of large manufacturing firms

Data on this was obtained from thirty nine firms who were asked to provide information on their classification based on their core activity. The findings are presented using frequencies and percentages.

Table 4.1: Profile of large manufacturing firms

Firm classification	Frequency
Agro processing	3
Wood and Wood products	3
Chemical processing	7
Capital goods and spare parts	3
Ceramics and glass making	1
Iron and steel making	1
Electrical & electronics	1
Construction and equipment	1
Others	19
Total	39

The findings revealed that of the surveyed firms, 7.7 % were agro processing, 7.7% were engaged in wood and wood products, 17.9% were engaged in chemical processing, while 2.6% were engaged in capital goods and spare parts; ceramics and glass making; iron and

steel making; electrical and electronics and construction and equipment respectively while 48.7% were unclassified.

4.3 Extent of Adoption of information communication technology in human resource management

Respondent firms were asked to indicate the adoption of information communication technology on specific human resource management practices. The human resource practices considered were human resource planning, recruitment, performance appraisal, compensation, succession planning, human resource development, communication, work flexibility, employee health, employee relations and job evaluation. Data was analyzed using mean scores and standard deviation. Mean scores ranging from 3.5 to 5.0, 2.5 to 3.5 and 1.5 to 2.5 represented human resource practices where information communication technology was not adopted, fairly adopted and largely adopted respectively. The findings are presented in Table 4.2

Table 4.2: Extent of adoption of ICT in human resource management.

Human resource aspects	Mean	Standard deviation
HRIS for planning	3.58	1.33
Recruitment	3.76	1.19
Performance appraisal	4.13	1.13
Compensation	3.83	1.36
Succession planning	4.22	1.16
Human resource development	4.12	1.31
Work flexibility	3.64	1.51
Work safety	3.83	1.42
Communication	2.51	1.54
Work scheduling	4.03	1.16
Employee health	4.12	1.27
Industrial relations	3.72	1.39
Job evaluation	3.71	1.30

The findings revealed that most respondents had not adopted information communication technology in planning, performance appraisal, recruitment, compensation, succession planning, human resource development, work flexibility, work safety, work scheduling, employee health, industrial relations and job evaluation since all respective mean scores fall between 3.5 and 5.0 ($3.5 \leq NA \leq 5.0$)

The findings further revealed that these firms had reasonably adopted information communication technology in communication whose mean score was 2.51. Analysis also showed that responses varied significantly in regard to work flexibility and communications with respective standard deviations falling between 0.95 and 1.5 and were indifferent on all the other human resource practices.

Respondents were asked to comment on the effects of information communication technology on human resource practices. Responses were analyzed qualitatively through content analysis by cut and paste. The findings revealed that 28.5% of the respondents explained that information communication technology had enhanced better performance of human resource practices through reduced workload, efficiency in record keeping and data processing. Further, 12.8% of the respondents indicated that information communication technology brought about redundancies and strained their organizations in terms of resources and training while 7.6% of the respondents explained that information communication technology had not had an impact because they had not adopted it. In overall, respondents were of the view that information communication technology boosted production, improved employees' working morale, improved industrial relations and contributed greatly to work flexibility although others expressed fear that its implementation was costly, brought about redundancies and mistrust as it evades privacy.

4.4 Influences of developments in information communication technology in human resource management.

Respondents were asked to state the influences of information communication technology developments on human resource management. Specific technological developments were considered including Bluetooth technology, wireless networking, virtual teams, telecommunications, VSAT technology, personal digital assistants and electronic diaries. Data was analyzed using mean scores and standard deviation. The findings are presented in Table 4.3

Table 4.3: Influences of ICT developments in human resource management

ICT developments	Mean	Standard deviation
Bluetooth technology	4.24	1.13
Wireless networking	3.16	1.46
Virtual teams	3.91	1.29
Telecommunications	2.21	1.51
Video conferencing	4.25	1.14
VSAT technology	3.83	1.56
Personal digital assistants	4.17	1.25
Electronic diaries	4.19	1.33

The findings revealed that most respondents were to a large extent not affected by Bluetooth technology, wireless networking, virtual teams, video conferencing, VSAT technology, personal digital assistants and electronic diaries with mean scores ranging between 3.5 and 5.0. Further, the respondents were indifferent in regard to Bluetooth, wireless networking, virtual teams, video conferencing, personal digital assistants, and electronic diaries with standard deviations falling between 0.95 and 1.5.

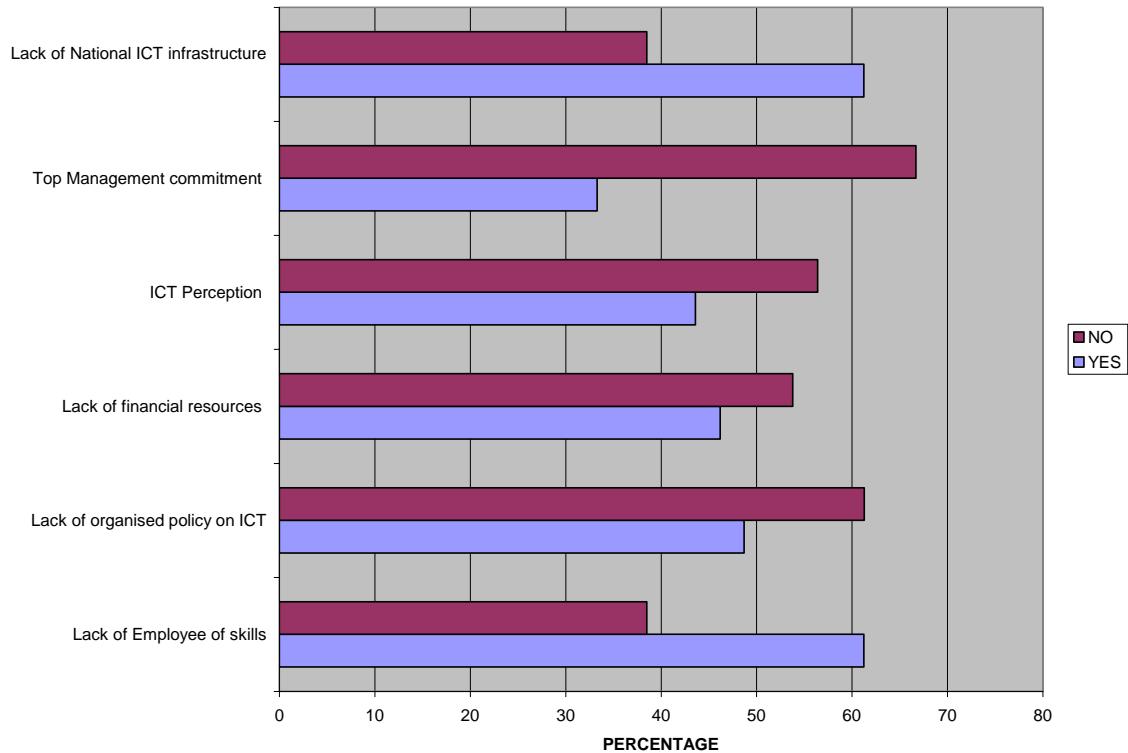
4.5 Hindrances to adoption of information communication technology

Respondents were asked to state the factors hindering the adoption of information communication technology. Lack of information communication technology infrastructure, top management commitment, information communication technology

perception, financial resources, organization policy on information communication technology and employee skills were considered. Data was analyzed using percentages.

The findings are presented in Chart 4.1

Chart 4.1: Hindrances to adoption of information communication technology



The findings revealed that respondents accepted lack of employee skills (61.2%) and lack of national information communication technology infrastructure (61.5%) as the major hindrances to the adoption of information communication technology in human resource management while top management commitment (66.7%) was cited as the least factor hindering the adoption of information communication technology. Respondents were indifferent on information communication technology perception, lack of financial resources and organizational policy as factors hindering the adoption of information communication technology in their respective organizations.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The objectives of the study were: to establish the extent to which large manufacturing firms have adopted information communication technology in human resource management and; to determine the challenges faced by these firms in adopting the use of information communication technology in human resource management.

In order to fulfill the objectives of the study, the research examined the profile of large manufacturing firms, the extent of adoption of information communication technology in human resource practices, influences of information communication technology developments on human resource management practices, factors hindering the adoption of information communication technology and the implications of information communication technology to overall organizational performance. Data was collected by use of semi-structured questionnaires which were administered to heads of human resource departments in these organizations. The findings revealed that large manufacturing firms have not adopted the information communication technology in human resource management.

While these organizations appreciate the importance of information communication technology in human resource management and overall organizational performance, its adoption has not been significantly embraced. Further, the results revealed that adoption of information communication technology by these firms is hindered by lack of employee skills, financial resources, perception to information communication technology and a deficient information communication technology policy. Moreover, the results revealed

that information communication technology has had a significant impact on organizations' productivity, flexibility in working, employee morale, efficiency and communications.

5.2 Conclusions

Large manufacturing organizations in Kenya have to a large extent not adopted modern information communication technology in human resource management. Although these organizations are making initiatives towards achieving this, the implementation process is costly and will take some time to realize gains. Adoption of information communication technology in human resource management is affected by insufficient employee skills, poor attitude and perception to information communication technology in terms of job loss and a weak information communication technology infrastructure. However, information communication technology has led to improvement in organizational productivity, work flexibility, easy coordination and employee morale.

5.3 Recommendations

The concern for organizations to adopt modern information communication technology in their operations and specifically in human resource management has become a key issue to most organizations because of its link to productivity. In Kenya, the Government of Kenya has put in place a policy framework on information communication technology. This framework would improve the adoption and implementation of information communication technology both in private and public sectors. Large manufacturing firms in Kenya need to utilize this framework by harnessing resources towards this adoption and implementation. Management of these organizations should develop the capacity of employees through training and development if the adoption of information communication technology will bring about meaningful gains. They should also prepare

their employees on these developments and change their perception on adoption of information communication technology.

5.4 Limitations of the study

The study encountered a number of limitations. First, due to scarcity of resources, the study narrowed down to only large manufacturing firms in Nairobi thus leaving out others in other parts of the country. The study depended only on questionnaires dropped to employees who needed a lot of pushing for them to fill them up.

Out of 70 firms listed for contact, only 39 responded thus limiting the general applicability of the findings of the study.

5.5 Suggestions for further research

This study focused on large manufacturing firms in Nairobi. It is therefore recommended that further research can be done to focus on small and medium firms. With the growth of the service sector in Kenya, information communication technology has become very relevant. This study recommends a further research on this sector. Furthermore information communication technology is comprised of many strands, which may be examined separately. Studies can be carried out to establish the response of business organizations to the impact of the use of Internet technology in human resource management, how the use of human resource information systems has revolutionised organizations in Kenya and the emerging challenges of wireless technology on human resource management practices in Kenyan organizations.

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APPENDIX 1
LETTER TO RESPONDENTS

Geoffrey Morara Nyakoe,
P.O. Box 167-00621 Tel. 4445361, 0721485566,
Nairobi

Dear Respondent,

RE: LETTER OF INTRODUCTION

I am a postgraduate student pursuing Master of Business Administration (MBA) degree at the University of Nairobi, School of Business. My full names are; **Mr. Geoffrey Morara Nyakoe Registration No. D61/ 7957/ 03**. I am currently conducting a survey on the adoption of information communication technology in Human Resource Management among Large manufacturing firms in Nairobi.

The name of your esteemed organization appeared in a list of manufacturing firms in the ministry of Trade and Industry. You have been selected to participate in this study. The information provided will be used together with similar firms to enable me document the challenges that your firm may be facing in an endeavor to meet the objectives. The information will be treated with utmost confidence and will only be used for the academic research purpose. Should you require the findings of this research I won't hesitate to provide the information. Your participation is highly appreciated.

Yours Faithfully,

Geoffrey Morara
MBA student

George Omondi,
Lecturer and Supervisor,
Department of Business Adm.
School of Business

APPENDIX 11
QUESTIONNAIRE

*Please answer the following questions in the spaces provided.
The information provided shall be used in the study and NOT any
other use. Your responses shall be treated confidential*

SECTION I: GENERAL

1. Name of organization

2. Please tick the classification of your organization.

- i. Agro processing
- ii. Pulp and paper production
- iii. Wood and wood products
- iv. Chemical processing
- v. Capital goods and spare parts
- vi. Ceramics and glass making
- vii. Iron and steel making
- viii. Electronics and electronics
- ix. Construction and equipment

Other (please specify)

3. When was your organization established?

SECTION TWO:

Indicate the extent to which your organization has adopted the following in human resource management. Where 1 =very great extent and 5 = not at all (Tick *where appropriate*)

4. HRIS for planning e.g. human resource database	(1)	(2)	(3)	(4)	(5)
5. Recruitment e.g. advertising jobs online, online interviews, online selection	(1)	(2)	(3)	(4)	(5)
6. performance Appraisal e.g. online appraisal reports, video conferencing interviewing	(1)	(2)	(3)	(4)	(5)
7. Compensation e.g. online payment, online salary processing	(1)	(2)	(3)	(4)	(5)
8. Succession planning e.g. models for forecasting (e-models)	(1)	(2)	(3)	(4)	(5)
9. Human resource development e.g. online seminars, online training, virtual learning	(1)	(2)	(3)	(4)	(5)
10. Work flexibility e.g. virtual offices, home working,	(1)	(2)	(3)	(4)	(5)
11. Work safety e.g. online safety manuals,	(1)	(2)	(3)	(4)	(5)
12. Communications e.g. e-mails, Internet, Virtual notice boards	(1)	(2)	(3)	(4)	(5)
13. Work scheduling e.g. online job rotation	(1)	(2)	(3)	(4)	(5)
14. Employee health programs e.g. online prescriptions, online enquiries	(1)	(2)	(3)	(4)	(5)
15 Industrial relations e.g. online membership registration, online industrial relations programs.	(1)	(2)	(3)	(4)	(5)
16. Job evaluation e.g. job description database, job specification database, online job evaluation procedure	(1)	(2)	(3)	(4)	(5)

On a scale of 1 to 5 where 1 = very great extent and 5 = Not at all, indicate the extent to which the following ICT developments have influenced the human resource function in your organization (Tick where appropriate).

- | | | | | | |
|---|-----|-----|-----|-----|-----|
| 17. Bluetooth technology e.g. HTML | (1) | (2) | (3) | (4) | (5) |
| 18. Wireless networking | (1) | (2) | (3) | (4) | (5) |
| 19. Virtual teams e.g. groupware | (1) | (2) | (3) | (4) | (5) |
| 20. Telecommunications e.g. internet
e-mail, mobile phones | (1) | (2) | (3) | (4) | (5) |
| 21. Video Conferencing | (1) | (2) | (3) | (4) | (5) |
| 22. VSAT technology e.g. cable, CCTV | (1) | (2) | (3) | (4) | (5) |
| 23. Personal digital assistants
e.g. electronic organizers | (1) | (2) | (3) | (4) | (5) |
| 24. Electronic Diaries | (1) | (2) | (3) | (4) | (5) |

Other (please specify)

.....

SECTION THREE:

Indicate by ticking which of the following factors are hindrances to adoption of Information communication technology in your organization.

- | | |
|--|--------------------------|
| 25. Insufficient employee skills | <input type="checkbox"/> |
| 26. Lack of organizational policy on ICT | <input type="checkbox"/> |
| 27. Lack of financial resources | <input type="checkbox"/> |
| 28. ICT perception | <input type="checkbox"/> |
| 29. Top management commitment | <input type="checkbox"/> |
| 30. Lack of national ICT infrastructure | <input type="checkbox"/> |

31. Briefly comment on the implications of information communication technology on Human resource management practices mentioned in questions 4 to 16

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32. In your opinion comment on the adoption of ICT and the performance of the organization

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.....
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.....
.....

THANK YOU VERY MUCH

APPENDIX 111:

MANUFACTURING ENTERPRISES IN NAIROBI

Jaydees Knitting Factory Ltd.

Tee Pee Industries Ltd.

Nairobi Flour Mills Ltd.

Kenya cooperative Creameries

Jambo Biscuits (K) Ltd

Brush Manufacturers Ltd.

TIM Joints Ltd

Nairobi Flour Mills Ltd.

Unilever Ltd.

Ambica Foods Ltd

Sava Industries Ltd.

National Unga Ind. (K) Ltd.

Rafiki Millers Ltd

Super bakery Ltd

Kabansora Flour Mills Ltd

Premier Food Industries Ltd

Nestle Foods Ltd

Proctor and Allan

Kenya Wine Agencies Ltd.

Kenya Millers Ltd.

Kenya Breweries Ltd

Brush manufacturers Ltd.

Carton Manufacturers Ltd.

Paper house of Kenya

Paper Converters Ltd.

Modern Lithographic Ltd.

Reata Printers Ltd.

Kenya Polybags

Kartasi Industries Ltd.

Printing Industries Ltd.

Dodhia Packaging Ltd
Twiga Stationers & Printers Ltd
Woodcraft Ind. Ltd
All Africa Timber Ind. Ltd
Furniture masters Ltd.
Furniture Enterprise Ltd.
Balozi Industries Ltd.
Hardwood & Engineering Works
K & J Furniture MFG Ltd.
Metro Plastics Kenya Ltd.
Nightrose cosmetics (1972) Ltd.
Kenpoly manufacturers Ltd.
Hamid Chemical Ind. Ltd
Polythene Industries Ltd.
Oasis Ltd.
Ariman International Ltd
Excel Chemicals Ltd.
Twiga Chemicals Ind. Ltd
Transnational Plastics (K) Ltd.
Crown rubber Products Ltd
Sterling Prod. International
Bayer E.A Ltd.
KAPA Oil refineries
Reckitt Benckiser Ltd
General Motors (K) Ltd
Metco Ltd.
Subaru Kenya
Arrow Motors
Choda Enterprises Ltd.
Sameer Africa
Impala Glass Industries Ltd.
PAN (A) Glass Ind. Ltd

Super manufacturers Ltd.
Fehmi Nail Works Ltd
Mabati rolling mills
RAJ Metals Ltd.
Ancillary products (K) Ltd
Kenya General Ind. Ltd
Kenya Lighting Ind. Ltd
E.A Cables
Philips Elecrical Lamps (E.A) Ltd
Power Technics
Bhimji and Sons (K) Ltd.
Kens metal Ind. Ltd
V.K Construction Ltd.
Welding Alloys Ltd
Hermes Enterprise Ltd
E.A Spectre Ltd.