THE CONVERGENCE OF TELECOMMUNICATIONS, MEDIA AND
INFORMATION TECHNOLOGY SECTORS AND THE CHALLENGES
FACING THIS IN KENYA.

BY
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Declaration

This project is my original work and has not been presented in any other university or for any other award

Signature Gesembe Ursulah Bwari Date 1st August 2003

SUPERVISOR APPROVAL

This work has been submitted for examination with my approval as university supervisor

Signature Mr. Almadi Obere Date 4-8-2003

Lecturer Economics Department
DEDICATION

To my beloved husband Alfred Mboi Mageria and lovely daughter Pauline Buyaki for the support and encouragement you gave me in the course of the study.
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<td>Asynchronous Transmission Mode</td>
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<tr>
<td>CCK</td>
<td>Communication Commission of Kenya</td>
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<td>IDSN</td>
<td>Integrated Digital Service Network</td>
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<td>KBC</td>
<td>Kenya Broadcasting Corporation</td>
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<td>KPTC</td>
<td>Kenya Posts and Telecommunication Corporation</td>
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<td>IT</td>
<td>Information Technology</td>
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<td>LAN</td>
<td>Local Area Network</td>
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<td>NMG</td>
<td>Nation Media Group</td>
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<td>PBX</td>
<td>Private Branch Exchange</td>
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ABSTRACT

The key objective of the study was to find out the convergence in three sectors; telecommunications, media and information technology. The study sought to find out the extent and speed, challenges and the regulatory policies embracing convergence. Twelve institutions drawn from three sectors mentioned above. The respondents offered information on the extent of computer usage, level of networking of available of the available computers, ownership of production and transmission such private and public property.

The findings showed that most of these institutions had in more ways than one, facilitated an environment conducive for convergence,

- The challenge to regulatory structures. The existing regulations are not flexible to allow new technologies into the market.
- The challenge of globalization. With globalization is difficult to have one regulatory structure worldwide.
- The challenge to distinction between public and private activities.
- The challenge to the consistency of regulation. Regulating especially similar services differently particularly on the basis of technology could present discriminatory treatment which might hold back competition.
- The challenge of abundance of regulation based on scarcity. Regulatory approaches were based on the perceived scarcity on both frequency and content.

The following recommendations were made;

- Building on current structures. This option envisages a vertical regulatory model.
This means that different rules apply to the different sectors.

- Separation regulatory model for new activities. This option envisages a separate regulatory model for new activities to co-exist within the different sectors e.g. telecommunications and broadcasting.

- Progressively introducing a new regulatory model. This would progressively introduce a new regulatory model to cover the whole range of existing and new services.
CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Convergence is commonly expressed as the ability of different network platforms to carry essentially similar kinds of services or the coming together of consumer devices such as the telephone, television and personal computer.

Many organizations have realized that the information industry is highly volatile and dynamic. To try and “stay ahead of the curve”, it’s therefore becoming imperative for organizations to provide employees with the latest multi media tools. This can be achieved by bringing all types of telecommunication services under one information system (IS), umbrella – convergence (Zagaeki, 1997).

Until recently, data, voice and video each existed in their own separate, well defined spheres, but with organizations increasingly feeling the need to share costs by eliminating technological redundancies, there has been a systematic and stable movement towards consolidating all these technologies and bundling them under one information system umbrella (Zagaeki, 1997).

The increasing decentralized organization structures can easily be supported by convergence. It provides remote users, teleworkers, small offices and retail outlets, with complete access to all of the communication services enjoyed by their colleagues at the headquarters location. Convergence has further enabled remote workers to work
efficiently and effectively using extended Intranets to connect to the corporate Private Branch Exchange (PBX) telephone system and data networks.

The arrival of virtual organizations on the landscape has also encouraged convergence (Laudon & Laudon, 1999). These are companies not tied in any way to an organization able to deliver goods and services outside the traditional organizational framework. One company can take advantage of the capabilities of another company without actually being tied to it. It seems that there is a widespread tendency of convergence occurring at the technological level. The fact that digital technology now allows both traditional and new communications services whether voice, data, sound or pictures to be provided over different networks have evidenced this. Current activities in the market suggests that operators from sectors affected by convergence are acting on the opportunities provided by technological advances to enhance their traditional services and branch into new activities.

Telecommunications, media and information technology are cross-platform and cross product development as well as cross-sector share holding. Examples of new products and services being delivered include:

- Web casting of news, sports, concerts and other audio-visual services.
- Online services combined with television systems such as Web TV, digital satellites and cable modems.
- Data services over digital broadcasting platform.
- Voice over Internet Protocol (VoIP).
• Home banking and home shopping over the Internet.

Until early 1990's, separate networks had supported voice data and video imaging. This kink of separate networks displayed obvious inefficiencies in the use of network resources and personnel and the inefficiencies meant duplicate support systems, unnecessary user complexity and general lack of interoperability is clear (Ryan 2000). This is particularly true in enterprise applications in which Private Branch Exchange (PBX) and voice systems sit side by side with complex Local Area Networks (LANs) designed to support information technology (IT) applications. In response to those circumstances technologies have merged to combine systems in a way that eliminates duplicity while improving services and providing real value to the end user community.

Over the years, the topology of computer networks has changed considerably, paralleling changes in networking equipment and making better use of increasingly powerful platforms, both in centralized information technology and the desktop. Gradually as computer networks have evolved, they have come to resemble telecommunications networks. For example the traditional distribution plan for PBX system, which includes point to point station connections which are now replicated in switched Local Area Networks (LAN) arrangements. There has a long desire for convergence between computing and voice and telecommunications, in order to achieve technical and operational efficiency. This desire has been evidenced by the fast evolution of convergence over the years.
1.2 EVIDENCE OF CONVERGENCE

Convergence is evident with organizations which have invested massive resources on both hardware and software paraphanerias of information technology. These organizations range from print media to electronic (cellular mobile phone) providers and fixed phone line providers. In 1970’s and early 1980’s there was a clear-cut distinction between print mediaship and electronic media. However, since the 1990’s, there has been a systematic synthesis of the two to a point where the distinction is virtually wiped out (Laudon and Laudon). Print media houses are now doubling into electronic journalism through television production, frequency modulation in radio productions and both of which at the same time can be accessed on the information superhighway in form of web pages, as real time and on-line readership.

The telecommunication industry is perhaps one of the greatest exhibitors of convergence technologies. For may years in Kenya Telecommunications was a monopoly by Kenya Posts and Telecommunication Corporation (KPTC), but with the dire need of efficient and sufficient services, Kenya has made positive strides towards liberalization. This aimed at strategic positioning of the Kenyan economy for a competitive advantage through cost reduction in telecommunication services. This advantage was only to be achieved through employing the latest technologies in the market hence need for convergence. Safaricom, and Telkom (Kenya), then came into existence. Safaricom was the first cellular mobile provider. It was followed up the line by Kencell mobile providers.
These providers have within a short time of existence been able to offer their ever increasing and fascinated market with value added services such as conferencing (connecting up to 5 people at once at a call), info line (giving instant access for constantly updated news), info surf (connecting to the internet and allowing one to send faxes and send and receive e-mails) and directory features (these allow one to have a directory feature at ones palm top).

1.3 STATEMENT OF THE PROBLEM

The information society is becoming a reality and Kenya remains no exception. Its development is fuelled by the rapid technological change, which is transforming information industries at super high speed. The nature and speed of this transformation may pose new challenges to policy makers and the organizations that use it.

One of the most significant developments is the increasing use of different sectors, notably the telecommunications, media and information technology (IT) sectors, of the same technologies. Evidence of such convergence has been mounting in recent years with the emergence of the Internet and with increasing capability of existing networks to carry both telecommunications and broadcasting services. However the speed, extent, challenges and impact of convergence to the society is not yet clear.

The phenomenon of convergence is relatively new and a range of different views exists on what its implications are to the society and for economic activity. Is not clear whether the development in digital electronic and software are creating the technological potential
for a new approach to the delivery and consumption of information services. It is also
not clear on how much these developments will change existing practices and over what
time scales. It is equally not clear whether convergence will lead to a complete and rapid
transformation of existing telecommunications, media and information technology
services in such a way that, these currently separate groups of services will merge into
one another substantially blurring the previous clear distinctions between them. Also of
question is whether the specificity of the existing separate sectors will limit the scope for
service convergence. This would probably mean that the regulation of economic
conditions and that of the content of information services (if any) to be separated or
restructured to ensure efficiency and quality.

Anene M (2002), believes that if convergence does occur, it will evolve over an
extended period of time. With such a clear picture of suddenly coming together of
market, previously disparate, and a bundling together of goods and services from players
in the past, a part, the fundamental question then arises:
“What are the subsequent challenges in Kenya as a result of this bundling together or
convergence of telecommunications, media, and information technology sectors?”

1.4 OBJECTIVES OF THE STUDY

• Find out the existing regulations and their effectiveness in embracing the issue of
  convergence.

• To find out the challenges facing firms wanting to embrace convergence in
  Kenya
• To find out the extent and speed of convergence in Kenya.

1.5 RESEARCH QUESTIONS

• What is the extent and speed of convergence in Kenya.

• What are the challenges facing firms wanting to embrace convergence in Kenya.

• What are the existing regulations in Kenya in embracing the issue of convergence.

1.6 SIGNIFICANCE OF THE STUDY

New markets are likely to develop, which will be essentially global in nature. If the applicable regulatory framework is not appropriate to the development of these, then Kenya may find itself at a competitive disadvantage vis-à-vis its more flexible competitors. Thus, this study aims at giving and indication to the way forward on such existing framework. Nevertheless, the output of this study could prove as invaluable contributor to the development of the policy paper to guide the convergence phenomena and to help the policy makers to streamline regulations. The will also study will help market players/institution to make more informed decisions when embracing the issues of convergence so that they can gain a competitive advantage out of it. Finally, this study could prove valuable to academia serving not only as good backgrounds for further research, but also as a valuable contributor to knowledge.
CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

This chapter reviews literature on convergence of telecommunications, media and information technology. It seeks to address issues of challenges, extent, impact, speed and regulatory approaches to convergence. The literature review will be covered in five subsections. The first section deals with the extent of convergence over the years. Subsection two focuses on the speed of convergence. Subsection three deals with a review on the impact of convergence and the fourth subsection deals with the challenges of convergence. The last section deals with the regulatory approaches towards convergence.

2.2 EXTENT OF CONVERGENCE

There has been an evolution of new world markets for telecommunications at the close of the last century. These developments marked the closing of a policy circle in which the market has moved full circle from initially competitive circumstances (Muller, 1983). It is only in 1984 that the USA forced the divestiture of AT&T and thereby created competition in the market for long distance services. The divestiture also liberalized the market for competition in telecommunication equipment.

The evidence for convergence has been provided by the emergence of new multimedia services and the increasing capability of modern networks to carry both telecommunications and broadcasting services. Both have been made possible by the common application of digital technologies. The new multimedia services combine text, images, and sound to creative effect by making extensive use of digital technology and
software from the computing world. They also involve an element of interactivity with individual users, and thus exhibit some of the characteristics of existing audiovisual and telecommunications services. But they are expected to grow faster than these traditional services, and partially to replace them. This overlap between new and existing services, together with the common ability of transport networks to carry them, is the essence of convergence.

2.3 THE SPEED FOR CONVERGENCE

As alternative telecommunications infrastructure becomes more widespread, high speed networks based on optical fibers will soon be capable, in combination with modern server technology, of operating cost effectively in a virtual broadcast mode. The high data rates and spectral efficiency achievable though digital transmission open up the possibility of delivering high quality audio and video signals over a variety of different networks/infrastructures. Transmission technologies such as narrow band integrated digital service network (ISDN), XDSL and asynchronous transmission mode (ATM) will ensure that both existing and new infrastructure can play a role in carrying the new services. The capabilities of existing networks are also enhanced by the compression technique implicit in the MPEG standards, allowing networks of limited transmission capacity to carry services previously considered possible only on sophisticated and pricier wide band infrastructures.

ATM is considerable interest as a multi media transport technology. It is a high speed cell relay technology, capable of transporting telecommunications traffic of different
characteristics, voice, data, video, over the same network, and has been designated by the
ITU as the basis for broadband ISDN, the successor generation of its narrow band
counterpart.

2.4. IMPACT OF CONVERGENCE

2.4.1. IT/Tele/Electronics A strategy for growth

The IT/Tele/Electronics industry provides products and services within electronics, IT,
software, telecommunications, electronic media, multimedia and other areas, which are
primarily based on information technology. The IT/Tele/Electronics industry is not only
of economic significance, but through its selection of IT-based products and services it
also promotes the use of information technology throughout Kenyan industry and the
rest of society. Within industry, IT means greater efficiency and quality, greater
organisational flexibility and more effective learning processes for enterprises. In
consumer terms, IT means a selection of a large number of more intelligent products and
it also makes the public sector more open, flexible and efficient.

In Denmark the IT/Tele/Electronics industry has experienced significant growth: the
industry's turnover grew from DKK 115 billion in 1992 to DKK 156 billion in 1996,
which is an increase from 8.6 per cent to 10 per cent of the combined turnover of Danish
industry. The industry is growing faster than average compared with the rest of Danish
industry. Export also grew from approximately DKK 24 billion in 1992 to DKK 32
billion in 1996. Excluding telecommunications, the industry's overall value increased
from DKK 39 billion to DKK 42 billion in the same period. Employment in the same
period remained predominantly unchanged. In 1996, the industry had 91,712 full-time employees, which corresponds to 8.8 per cent of total employment in Danish industry.

In general, there is a shortage of internationally comparable statistics on the industry since the issue of convergence is fairly new one. However, joint Nordic statistics have recently been established. Measured in terms of turnover, in 1996 the IT/Tele/Electronics industry comprised a larger part of industry as a whole in Sweden and Finland, which is 12.7 percent and 11.2 per cent versus 10 per cent in Denmark. Sweden and Finland's generally stronger specialization is owed to the fact that manufacturing sectors in the industry in both countries comprise 4 per cent of the combined turnover of industry versus only 1.2 per cent in Denmark. Denmark has, on the other hand, specialised more effectively within software, service and trade. Measured in terms of employment, it is currently Sweden and Denmark who have specialised most effectively, which is demonstrated by the fact that 10.5 per cent and 8.8 per cent respectively of industry is to be found in IT/Tele/Electronics.

Denmark has established itself internationally in specialist markets, such as administrative software, multimedia production, electronic payments, measuring instruments, power electronics, navigation and teletransmission equipment, telephone terminals, hearing devices, AV equipment, consumer electronics, network systems, antenna and satellite receiver equipment. Significant changes are now being realized through the application of new technologies to the individual sectors. Such changes in themselves are no evidence of convergence,
but as can be suggested, the commonality of technology applied could provide a basis for the convergence group.

In the early 1990s, it was discovered that digital technology could be effectively used for delivering television and audio signals of particular interest was the possibility of delivering many more channels over the same existing infrastructure (cable TV, satellite, transponders, and terrestrial spectrum) by using digital compression rather than the existing analogue transmission.

Globalization of the world's industrial economies greatly enhance the value of the information to the firm and offers new opportunities to businesses. Today information systems provide the communication and analytical power that firms need for conducting trade and managing businesses on a global scale controlling the far flung global corporation. Communicating with distributors and suppliers, operating 24 hours a day in different national environments. Servicing local and international reporting needs – is a major business impact of information system responses. This has caused changes in contemporary business environment through

- Globalization – management and control in a global market place, competition in world markets, global work groups, global delivery systems.
- Transformation of industrial economies – knowledge and information based economies, productivity, time based competition.
- Transformation of the enterprise – flattening, decentralization, flexibility, low transaction and coordination costs, empowerment.
New options for organizational design: The networked enterprise. The explosive growth in computing power and networks, including internet, is turning organizations into networked enterprises allowing information to be instantly distributed within and beyond the organization. This had led to separation of work from location, reorganizing of workflows, changing of management process.

2.5 CHALLENGES OF CONVERGENCE

The IT/Tele/Electronics industry is developing new products at a rapid rate and at even greater value for money. Computer and telenet capacity has doubled over a number of years, as increasing capacity can be integrated into electronic components and products within increasingly smaller space and also because more effective transmission and data processing is being developed all the time. All signs indicate that this development will continue to characterize the IT/Tele/Electronics market. The industry's enterprises must keep up with this development in order to remain in the market, and it will be a central parameter of competition to be able to provide better products at lower prices.

The industry must anticipate growing competition as a result of global liberalisation, increased trade in IT services over the Internet, and because the boundaries between various sectors are becoming blurred, for example between computer, telecommunications and media products. Increased competition is an advantage for Kenyan consumers and provides the industry with new opportunities, which Kenyan enterprises are already attempting to exploit. However, the development is also a substantial challenge.
To be able to counter such challenges, other countries have developed strategies, e.g., the combined strategy for growth in Denmark. The aim of a strategy for growth is that Denmark should respond to these developments better and more quickly than its foreign competitors. The aim of the strategy is that Danish and international framework conditions for the Danish IT/Tele/Electronics industry be perceived on the whole as being amongst the best in the world. In the strategy work, therefore, all of the framework conditions have received “service supervision” with a view to meeting both the industry’s challenges as well as competition from other countries’ industrial policy.

The Ministry of Business and Industry (Denmark) has compiled information on competing countries’ strategies for the industry via, for example, the Ministry of Foreign Affairs’ representations and through searching the Net. The investigation showed that countries such as Malaysia, Ireland, and Singapore carry out marketing which includes comprehensive plans and far-reaching ambitions for the development of an effective IT/Tele/Electronics industry. Countries such as Sweden, Germany, and Finland have plans of action which are strongly industry-oriented. The USA, however, is without doubt the most important foreign competitor as it has many powerful growth regions.

Through this strategy, the ministries have committed themselves to a long-term and joint effort to maintain and improve the most important framework conditions at both Danish and international levels. The following five chapters amplify the strategy in each of the
five “key policy areas” for the industry: public regulation, access to knowledge, access to capital, public/private interaction and the conditions for international competition.

The most important challenges for Kenya in the coming years are to exploit the growth of the Net, to recruit qualified labour and generally to be able to manage increased competition on the framework conditions. It is in these areas that it is particularly necessary to strengthen conditions for the Kenyan industry.

2.6 REGULATORY POLICIES TOWARDS CONVERGENCE

In what may become a landmark document the European Commission has adopted a Green Paper on the convergence of the telecommunications, media and IT sectors. Given its backing by four Commissioners, it was not surprising that the Green Paper was adopted by the Commission unanimously, at its weekly meeting of 3 December 1997. Its purpose is to launch a debate on the regulatory implications of the convergence of the telecommunications, media and IT sectors, and to discuss options for future regulatory policy.

2.6.1 Reasons Why convergence is a problem for regulators

It is expected that convergence will enable new services and provide new ways of delivering those which already exist. One consequence will be to enable today's market players to extend their current activities to new areas, but convergence will also encourage the arrival of new players exploiting niche markets. The process is blurring the frontiers between traditional sectors such as telecommunications, media, broadcasting,
audiovisual and computing – sectors which are currently regulated separately and differently, or in the case of IT, not at all. The dilemma posed by convergence is therefore what regulatory regime, if any, will be appropriate to the new environment. This is not an easy question to answer. An instinctive response might be to create a new category of "multimedia" services for which a suitable regulatory framework could be devised. Such a dedicated approach may not be feasible; the increasing overlap between new and existing services could make for discriminatory treatment of similar services, thereby distorting the market. It could also be unresponsive to the rapid developments so characteristic of these sectors.

On the other hand, if a regulatory approach cannot be developed in isolation of current frameworks, there is a danger that existing regulation might be extended inappropriately to the new environment. One solution might be to take a completely fresh approach, with provisions for migrating from today's regulatory frameworks to a future unified regime.

The converging services are expected to expand the overall information market, and in doing so, to provide opportunities for the creation of economic wealth and employment. Facilitating convergence will be of crucial importance to the development of Europe's media and communications sector, and of the Information Society as a whole.

For the opportunities provided by convergence to be fully realized, they should not be hampered or constrained by inappropriate regulation. Any regulatory regime should be such as to provide market conditions which attract investment in new services, and at the same time provide sufficient protection for the consumer.
Failure to address the regulatory implications of convergence at an early stage could therefore maintain the current regulatory barriers, introduce market distortions and inhibit growth of the new market.

2.6.2 What the Green Paper covers

In an interrogative style that tries to avoid being conclusive about future trends, the Paper opens with a description of current technological and market developments. It suggests that convergence is clearly evident today only in terms of technology, and to some extent in the activities of companies pursuing mergers and alliances in order to address the new markets. But like the alliances themselves, the new markets appear to be far from certain.

The second chapter also sketches the political background of the Information Society by looking at macro-economic and business impact, employment effects and the relevance of Community R&D programmes.

In assessing the regulatory consequences, the Green Paper takes the approach of identifying actual and potential barriers to convergence (Chapter III), and of suggesting ways in which these may be overcome (Chapters IV and V).

Existing barriers identified include access restrictions (to users, to networks and to content), currently high prices for telecommunications services and EU market fragmentation. Among the potential barriers are market entry and licensing restrictions, frequency spectrum allocation, the existence of multiple regulatory bodies, and varying approaches in Member States to the achievement of public interest objectives.

In examining the impact of barriers identified in the preceding chapter, Chapter IV considers first whether certain features of convergence create new challenges for regulation. It suggests that there could be problems of inconsistent regulation of
essentially similar services based on the underlying infrastructure used to deliver them.

Globalisation is also seen to be a major problem, with the attendant risks of side-lining national regulation and arbitrage of domestic markets.

The challenges posed by convergence to scarcity-based regulation in the face of increasing abundance, to regulation based on distinctions between public and private communications, and to the current complex institutional structures for regulation are also discussed. The chapter then goes on to examine approaches towards key issues in the economic and public interest regulation in the context of the barriers previously identified, and concludes with a discussion of relevant international issues.

The Green Paper stops short of making concrete regulatory proposals, limiting itself instead to stating the general principles that could underpin a future regulatory framework. It aims to seek a broad range of views, so that a balanced position can be developed in any eventual policy proposals.

The debate on this topic is likely to be lengthy and occasionally challenging. Regulation of the audiovisual sector is an area where questions of national culture and language merit particular attention, and where deeply held views exist and are often passionately expressed.
CHAPTER THREE

3.0 RESEARCH METHODOLOGY / DESIGN

3.1 INTRODUCTION

In this part the type of study is discussed, population of study defined, sample size and selection method, a description of the data collection instrument and data analysis will be made.

3.2 TYPE OF STUDY

The objectives of the study will be achieved through conducting survey on all Stakeholders. A survey research according to Tull and Album (1973) has been defined as a systematic gathering of information from respondents for the purpose of understanding and/or predicting some aspects of behavior of the population of interest. Both qualitative and quantitative data are to be obtained to facilitate comparison. To get this data questionnaires, observation and interviews, as well as secondary data will be utilized.

3.3 POPULATION

The population of interest consists of all the stakeholders in the telecommunication, media and information technology sectors. As such the population will encompass all Internet service providers, all media houses, all telecommunication providers and all cell phone mobile providers in Kenya. The population of study will be limited to Nairobi mainly due to the fact that, all stake holders in the convergence phenomena have the headquarters in Nairobi and as such responses were considered as representative.
3.4 SAMPLING DESIGN

The sampling frame will be extracted from the list of all stakeholders (population). From this a working sample will be made. To achieve this, the population will be segregated into several mutually exclusive sub-population or strata based on the nature of the industry. The strata based on industry, will be grouped into three, namely- telecommunication industry, media industry and information technology.

This will then be followed by purposive sampling, which involves information from specific targets. (I.e. specific industries, which conformed to the research criterion, set by the researchers) (Sekarn 1992). In this purposive sampling the specific target groups will be specific media houses, Internet service providers, telecommunication and mobile phone service providers.

In total, twelve companies based on the above three strata will be studied.

With this stratification, it will be possible to obtain a fairly representative sample.

This twelve companies will be chosen by writing down all names of all stakeholders and placing them in three different container based on the nature of industry. This will be mixed well and the required number picked randomly from each strata. This sampling will be done with replacement to ensure that all the companies in question have equal opportunity of being picked.

3.5 DATA DESCRIPTION AND COLLECTION.

The study will use both secondary and primary data. Primary data that will be collected using questionnaire administered personally by the researchers to the chief information
offices (CIO’s) and Information Technology managers and / or business development managers of the pre-selected sample. The questionnaire will contain both structured and unstructured questions. Such kind of questions will elucidate as much information as possible from the respondents. Interviews will also be conducted. The interviews will ensure that as much possible information is collected which will not have otherwise been collected using the questionnaires. Because of the differences in the nature of the Institutions, the interview guides will also be structured differently to try and suit the particular institutions. The interview shall seek more information and aid in clarifying issues on convergence-its extent, challenges and regulatory policies in Kenya (if any.)

Secondary data will also be used for the purpose of this study. Secondary data is one that has already been collected and documented. For the purpose of secondary data, the following sources of data will be used.

- Published reports from journals, magazines, daily Newspapers
- Books
- Research thesis (projects)

3.6 DATA ANALYSIS

Data analysis will be done using both qualitative and quantitative methods. Cross tabulations will also be used. The first objective on existing regulations and its effectiveness in embracing the issue the issue of convergence will be achieved through qualitative analysis. This will involve the summarizing and analysis of the data so collected so as to arrive at a conclusion as to whether existence or non existence of regulations. The second objective on challenges facing firms wanting to embrace convergence in Kenya will be achieved through computation of averages. From these
averages, the major challenges will then be enumerated. Finally, the third objective on extent and speed of convergence in Kenya will be determined by the use of percentages / frequency of variables. Measures of associations such as correlation, will also be used to assist in determining the relationship between the variables under study.
CHAPTER FOUR

4.0 DATA ANALYSIS AND INTERPRETATION

4.1 INTRODUCTION

This chapter gives a systematic and comprehensive analysis of data collected during the study. The study's major concern was to examine the effects of nature, speed, and the challenge of information transformation on convergence and their implications to policy makers and the organization that uses it. An attempt is, therefore, made to tie the interpretations to the research questions that guided this study as specified in section 1.2

4.2 THE SAMPLE CHARACTERISTICS

The sample was drawn from all the Internet providers, media houses, telecommunication providers and cell phone providers in Kenya. As indicated from the table 4.1 below, the percentage representation of the different stakeholders was as follows; data in the study is summarized and presented in percentages.

4.3 SURVEY OF FIRMS SELECTED

The sample of the study was drawn three sectors that have embraced the issue of convergence; media, telecommunication and Internet service providers. Table 4.1 below illustrates the selected companies in each sector
Table 4.1 sub samples drawn from firms embracing convergence

<table>
<thead>
<tr>
<th>SECTOR</th>
<th>MEDIA</th>
<th>TELECOMMUNICATION</th>
<th>INTERNET SERVICE PROVIDERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPANY</td>
<td>KBC</td>
<td>TELECOM</td>
<td>AFRICAONLINE</td>
</tr>
<tr>
<td></td>
<td>SG</td>
<td>SAFARICOM</td>
<td>NAIROBI NET</td>
</tr>
<tr>
<td></td>
<td>NMG</td>
<td>KENCCELL</td>
<td>SWIFT GLOBAL</td>
</tr>
</tbody>
</table>

Source: field data

The original sample size comprised of all media, telecommunication and Internet service providers in Kenya. However, interviews were carried out on only nine out of twelve representing 75% return rate.

There were equal representations in all the three sectors. The media sectors comprised of Nation Media Group (NMG), Standard Group (SG) and KBC. The telecommunication sector comprised of Safaricon, Kencell and Telecom. The Internet service providers comprised of Nairobi net, Africaonline and Swift Global. This represented a fair and unbiased report.

Period of the firms' existence

From the study, all firms that were studied regardless of the period of their existence used the phenomenon of convergence. Table 4.2 below illustrates the findings.
From the table 4.2 above it was deduced that 5 out of 9 (55.6%) organizations were less than 10 years old. Another 4 out of 9 (44.4%) were more than 20 years old of existence.

**Print and electronic media**

Table 4.3 average use of computerized production and processing

<table>
<thead>
<tr>
<th>Organization</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nation Media Group (NMG)</td>
<td>100</td>
</tr>
<tr>
<td>Standard Group (SG)</td>
<td>80</td>
</tr>
<tr>
<td>Kenya Broadcasting cooperation (KBC)</td>
<td>50</td>
</tr>
</tbody>
</table>

Source: field data
With a whole computerized production and processing capacity Nation Media Group is the most highly computerized with 100% computerization, while KBC, represent the least with 50%. It can therefore be deduced that these organizations are applying digital technologies over a range of disciplined ranging from content creation to production and transmission activities.

4.4 Level and kind of networking technology employed

The following data revealed that there were various kinds of network technologies employed by the organization and are as presented in table 4.4 below

<table>
<thead>
<tr>
<th>organization</th>
<th>Levels (%)</th>
<th>Technology used</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMG</td>
<td>100</td>
<td>Broadcast and terrestrial wired and wireless</td>
</tr>
<tr>
<td>SG</td>
<td>100</td>
<td>Broadcast and terrestrial wired and wireless</td>
</tr>
<tr>
<td>KBC</td>
<td>50-100</td>
<td>Broadcast</td>
</tr>
</tbody>
</table>

Source: field data

Networking is wholly employed by all organizations sampled at processing and communications/training levels. The Nation Group is ranked at the top sharing with the standard group, both with 100% level of networking and terrestrial wired and wireless network technologies. KBC on the other hand has networked upto 50% and has yet to embrace the terrestrial wired and wireless network technologies.
Level of Internet connections and applications

Table 4.5 Level of Internet connections and applications

<table>
<thead>
<tr>
<th>organization</th>
<th>Percentage of connecting</th>
<th>Main application</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMG</td>
<td>100</td>
<td>Content delivery</td>
</tr>
<tr>
<td>SG</td>
<td>90</td>
<td>Content delivery</td>
</tr>
<tr>
<td>KBC</td>
<td>50-60</td>
<td>Program strengthening</td>
</tr>
</tbody>
</table>

Source: field data

There is generally a high level of Internet connecting. The nation media group has 100% whereas KBC has the least with between 50-60%. The implication of this high-level connectivity usage is that; these organizations have recognized and are exploiting the open non-proprietary approach of the Internet in improving production and transmission of service delivery.

A very high connectivity denotes growth and usage of internet facilities on part of clients of these organizations especially in the last four years. Africa online has the highest connectivity and usage on product of their clients

Table 4.6 classification of connectivity into public and private

<table>
<thead>
<tr>
<th>Organization</th>
<th>Frequency %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa online</td>
<td>30</td>
</tr>
<tr>
<td>Nairobi Net</td>
<td>20</td>
</tr>
<tr>
<td>Shift Global</td>
<td>20</td>
</tr>
</tbody>
</table>

Source: field data

This conclusion of classifying networks or services as either private or public is on the decrease. The separating line has become barely recognizable. Transmission is becoming accessible to all people and contact delivery increasingly becomes interactive. This would
explain why internet services providers are in the forefront disposing this notion of public Vs private.

Table 4.7 production constituted by this media

<table>
<thead>
<tr>
<th>Organization</th>
<th>Percentage of media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nation Media Group</td>
<td>50-60</td>
</tr>
<tr>
<td>Standard Group</td>
<td>50-60</td>
</tr>
<tr>
<td>Kenya Broadcasting corporation</td>
<td>30-50</td>
</tr>
</tbody>
</table>

Source: field data

All organizations are slowly converging their production to be wholly multimedia. The NMG shares with Standard Group at 50-60 multi media production, KBC is still struggling with upto 40% production constituting multimedia.

Table 4.8 use of digital technology in delivery of services

<table>
<thead>
<tr>
<th>Organization</th>
<th>Percentage of digital delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nation Media Group</td>
<td>100</td>
</tr>
<tr>
<td>Standard Group</td>
<td>60</td>
</tr>
<tr>
<td>Kenya Broadcasting corporation</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: Field data

The Nation Media Group with 100% digital delivery represents an organization that is using digital technologies in both processing and transmission with a computer networked environment and is highly multimedia in its content. KBC with 10% may seem way down but, it represents a big hip from a near whole manual productivity to upto 40% multimedia within a 50% networked environment in less than five years.
Table 4.9 range of employment of digital reworking in processing and delivery

<table>
<thead>
<tr>
<th>Organization</th>
<th>Percentage of processing</th>
<th>Percentage of delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kencell</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Safari com</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>TELCOM</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Field data

There is heavy reliance of digital networking for both processing and delivery of services. Kencell and Safaricom at 100% processing and delivery represent the highest level of technological advancement whereas TELCOM processes at only 50% and delivery using network 100% of the time.

Table 4.10 level of internet connectivity

<table>
<thead>
<tr>
<th>Organization</th>
<th>Frequency percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kencell</td>
<td>100</td>
</tr>
<tr>
<td>Safaricom</td>
<td>100</td>
</tr>
<tr>
<td>TELCOM</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Field data

Internet connectivity is a symbol of global network. Hence, with full levels of Internet connectivity all these organizations are at the centre of global interconnectivity. Presented at 100% internetworking for both, Kencell and Safaricom, TELCOM also connects to the net with 100% frequency.
Table 4.11 use of Internet for content creation and transmission

<table>
<thead>
<tr>
<th>Organization</th>
<th>Frequency in percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kencell</td>
<td>100%</td>
</tr>
<tr>
<td>Safaricom</td>
<td>100%</td>
</tr>
<tr>
<td>TELCOM</td>
<td>40-50%</td>
</tr>
</tbody>
</table>

Source: Field data

These organizations all enjoy the use of non proprietary approach to standards embraced by the internet, combined with the rapid development capacities of the world wide web (www). These organizations can therefore create and transmit content to any part of the world and/or with any other partner.

Table 4.12 provision of multimedia broadcasting to clients

<table>
<thead>
<tr>
<th>Organization</th>
<th>Percentage frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kencell</td>
<td>100</td>
</tr>
<tr>
<td>Safaricom</td>
<td>100</td>
</tr>
<tr>
<td>TELCOM</td>
<td>40-50</td>
</tr>
</tbody>
</table>

Source: Field data

Multimedia broadcasting allows organization employing it, to transmit digitally leading to expansion of capacity and hence effectively removing the perceived scarcity, which has dogged the sectors since their inceptions. Kencell and Safaricom are the leaders with the organization employing multimedia broadcasting.
Table 4. 13 Age of the business and involvement in cross sector investment

<table>
<thead>
<tr>
<th>Organization</th>
<th>Percentage of connectivity and usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>African online</td>
<td>Less than 10</td>
</tr>
<tr>
<td>Nairobi</td>
<td>Less than 10</td>
</tr>
<tr>
<td>Swift Global</td>
<td>Less than 10</td>
</tr>
</tbody>
</table>

Source: Field data

All the businesses understudy in the IT sector have less than ten years of existence. It can be summarized that convergence does not necessarily embrace long standing organizations. It indeed seems as if younger organizations have taken the risk for convergence much more frequent than their older counterparts.

Table 4. 14 Employment of digital network for delivery of content

<table>
<thead>
<tr>
<th>Organization</th>
<th>Frequency in percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>African online</td>
<td>100</td>
</tr>
<tr>
<td>Nairobi</td>
<td>60-80</td>
</tr>
<tr>
<td>Swift Global</td>
<td>80</td>
</tr>
</tbody>
</table>

Source: Field data

There is an increasing installation and usage of digital networks. The implication of these is that the organizations involved are able to transmit faster and more reliable bigger contents than was previously. Clients are able to acquire information and other services much faster than the same bandwidth as previously hence cheapening the cost. African online is ahead of other organizations with huge investment in digital network. Nairobi Net and Swift Global are making big strides towards the same.
Table 4. 15 client Internet connecting and usage

<table>
<thead>
<tr>
<th>Organization</th>
<th>Percentage of connectivity and usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>African online</td>
<td>100</td>
</tr>
<tr>
<td>Nairobi</td>
<td>90-100</td>
</tr>
<tr>
<td>Swift Global</td>
<td>90-100</td>
</tr>
</tbody>
</table>

Source: Field data

A very high connectivity denotes growth and usage of Internet on the part of clients of these organizations especially in the last 4 years. Africa Online has the highest connectivity and usage on part of their clients.

4.4 REASONS FOR CONVERGENCE

Interviews with the officers in the organizations revealed that convergence enable sharing of cost by eliminating technological redundancies by systematic and stable movements towards consolidating all these technologies. This argument was consistent with Zagaeki (1997). An official with the Nation Media Group asserted that with convergence, remote workers can work effectively and efficiently using extended intranets to connect the corporate private branch exchange (PBX) telephone systems and data networks. Ryan (2000) agreed with this statement too. In general, convergence was agreed to be a abroad strategy for organizational growth.
4.5 IMPRTANCE OF CONVERGENCE

The study found out that with convergence costs could be reduced through cost sharing and coordination. In addition, convergence facilities transformation of enterprises through flattening, decentralization, flexibility and empowerment.

4.6 SUGGESTED WAYS TO IMPROVE CONVERGENCE

There are various ways in which convergence could be improved. Policies makers should come up with consistent regulations, ease entry barriers to the market while protecting property rights through copyrights and licensing.

4.7 FUTURE REGULATORY PRACTICES

All the players within the converging sectors were asked on desirable regulatory practice; there were varied responses but some statements had a strong recurring theme and these were statements that were either verbally quoted from the respondents or were put across to them and were wholly agreed upon. Selections of these were;

1. Concerning the role of regulation, affirmation of the continuing need to meet a range of public interests objectives whilst reorganizing the need to promote investment in particular in new services.

2. Separation of transport and content regulation, with recognition of the links between them for possible competition problems (a more horizontal approach to regulation) with;

a. Homogenous treatment of all transport network infrastructure and associated services irrespective of the services carried.
b. A need to ensure that content regulation is in accordance with the public policy objectives associated with those services.

c. A need to ensure that content regulation addresses the specificity of the audio-visual sector in particular through vertical approach, where necessary building on the current structures.

d. Application of an appropriate regulatory regime to new service recognizing uncertainties of the market place and the need for large initial investment involved in their launch while at the same time maintaining adequate customer safeguard.

3. A balance solution as to how public broadcasting can be integrated into the new environment which should;

a. Encourage those organizations vested with public broadcasting obligations to exploit new technologies and new ways of reaching their audiences.

b. Require such broadcasting to distinguish clearly between public broadcasting activities and activities lying in the competitive domain.

c. Effective application of the competition rule and increased reliance on those rules, accompanied by gradual phasing out of sector-specific regulation, as the market becomes more competitive.

4.7.1 COMPARISON OF STRUCTURES

Three main options for the organization of the statutory duties to regulate the electronic communication industries were considered;

- Separate regulators for the infrastructure and services
- Separate regulators for economic/social issues (involving both infrastructure services) and content issues.
• Separate regulators for economic/social issues (involving both infrastructure services) and content issues.

• Single regulators, covering infrastructure and services economic / social and cultural content issue.

The perceived pros and cons of these three were also investigated;
<table>
<thead>
<tr>
<th>Option</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1</td>
<td>Different issues tend to arise in relation to the infrastructure and services</td>
<td>Does not solve problem of regulatory overlap so risk of double jeopardy</td>
</tr>
<tr>
<td>Separate infrastructure and services regulator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 2</td>
<td>Can address leveraging of market power from separate infrastructure and vice versa. Different skills and approaches required for effective economic and content regulation. Allows separate voice for each of the different approaches. This might ensure more transport debate about trade-off.</td>
<td>Content regulator might not take full account of decisions on economic issues. The boundary may not always be clear and who draws the boundary.</td>
</tr>
<tr>
<td>Separate economical social regulator (covering both infrastructure access and services)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 3</td>
<td>Can address leveraging of market power from service to infrastructure and vice versa. Full implication between and content issue can be taken into account and appropriate trade off.</td>
<td>Economic issues too different from content issues danger that one aspect might tend to dominate. Does not give separate voices to economic and content aspects.</td>
</tr>
<tr>
<td>Single regulator (covering infrastructure access and services and economic and social and cultural content)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS.

5.1 INTRODUCTION

This chapter covers the summary, conclusion, recommendations and limitations of the study as well as areas for further research.

The study had set out to establish the extent, speed, challenges and the regulatory policies of convergence in the telecommunications, media and information technology sectors. The study was to identify the challenges and explore possible options for the future regulatory approaches.

The literature covered in this study borrowed from the developed states especially from the European countries of which the United Kingdom was at the forefront. Included too, the United States of America, which has a highly dynamic and versatile regulatory structure.

5.2 CONCLUSIONS

These conclusions are based on findings tabulated in section four of this paper. These findings are discussed in the light of the objectives mentioned in the introduction above.

Several specific challenges to regulation can be deduced from the tabulated results;

1. *Consistency of regulation* Increasing computerized production and processing create the challenge to the consistency of regulation. Regulating especially similar services differently particularly on the basis of the technology used to deliver the service, could present discriminatory treatment which might hold back competition, investment and the
provision of the services. Another challenge to the regulation can be reduced from the prevalence of services is a feature of the new landscape.

2. The challenge of abundance to regulation based on scarcity; regulatory approaches were based on the perceived scarcity on both frequency and content. The findings of this study confirmed this perception. Current market technology trends such as the ones tabulated include; increases in network capacity; the possibility of content and services to be delivered over a number of platforms, the increase in competing routes to customers and improvements in digital compression suggests in a full digital environment. Scarcity may over time become less significant, calling for the current regulatory approaches to be assessed.

Table 5.1 summary of the challenges

- The challenge of consistency of regulation
- The challenge to distinguish between public and private activities.
- The challenge of globalization.
- The challenge to regulatory structures.
- The challenge of regulation based on scarcity
Such practices should be based on certain underlying principles. Independent and effective regulators will be central to a converging environment. The general trend might be towards lighter regulation, yet increased competition brought about by convergence. This underlies the need for effective and independent regulators.

A key priority to any regulatory framework should be to seek to meet the needs of users in terms of more choice, improving levels of service and lower prices whilst fully guaranteeing customer rights and the general public's interest. This calls for future regulatory approaches that respond to the needs of the users.

Regulators should be guided by principles that ensure full participation in a converged environment. This can be done by building on existing concepts of universal services in telecommunications and public the public service commission in broadcasting, by ensuring that everyone is able to participate in the information society.

Based on the above principles, three options for future regulatory practice can be delivered.

**Build on current structures.** This option envisages leaving the vertical regulatory model in place. This means that different rules apply in telecommunications and audiovisual/broadcasting sectors and to a lesser extent in publishing and information technology.

The second option envisages a separate regulatory model for new activities to coexist with telecommunications and broadcasting regulation. This would allow the government to 'curve out' new services and activities, with cross-traditional boundaries placing them under a distinct set of rules. This would allow a coordinated approach to develop in
relation to money of the high value activities, which characterize the converging market place.

The last option would be to progressively introduce a new regulatory model to cover the whole range of existing and new services. This would be the most far reaching since it would call for fundamental reassessment and reform of today's existing regulatory environment. This may not necessarily mean a new set of rules but rather looking to see how existing frameworks can be adopted to remove inconsistencies, avoid discrimination within and across sectors and continue to ensure the achievement of the public interest objectives, instead of applying to just some services as would in option 2 above.

Table 5.2 summary of options

| Building on current structures.                                                                 |
| Coordinated approach to the developed in relation to many the high value activities.              |
| Progressive introduction of new regulatory model to cover the whole range of existing and new services. |

5.4 LIMITATION OF THE STUDY

There were several limitations to the study, which posed a challenge to the findings of the study. The first limitation was the inability to convince all proposed interviewees to participate in the research. Resources were also limited making study subject to certain
constraints: time and money. Lastly, the topic (area of study) was not understood to the interviewees at the first glance. This called for long period of interaction with them.

5.5 SUGGESTIONS FOR FURTHER RESEARCH

A study could be done on the specific sectors rather than the three that were jointly dealt with in this study. This would probably help to find the finer objectives that might have been overlooked in this study.

A study could also be done within the East African region. This would enable regional comparison eg with the European circles, which are on the forefront in embracing the issue of convergence.
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APPENDIX 1

SPECIMEN LETTER TO RESPONDENTS

I am a master’s student in the School of Humanities and social science, Institute of Business, Department of Accounting Kenyatta University.

I am carrying out research on “Convergence of Telecommunications, Media and Information Technology sectors and the challenges facing such convergence. I aim get information on the impact, extent, developments, challenges of convergence and regulatory policies in the Telecommunications, Media and IT sectors.

This questionnaire is aimed at eliciting information, which will be useful in the above-mentioned research as part of the masters of Business Administration Requirements.

You have been selected as one of the respondents in this study. The information supplied will be used strictly for academic purposes only and will be treated with utmost confidentiality.

Your co-operation will highly be appreciated.

Thank you.

Gesembe Ursulah Bwari
APPENDIX 2

QUESTIONNAIRE

1. Name of institution

2. How long has the institution been in existence [tick one]
   (a) Less than 10 years [ ]
   (b) 10 to 20 years [ ]
   (c) Over 20 years [ ]

3. Where does your company fall in the following categories (tick one)
   (a) Telecommunication [ ]
   (b) Media [ ]
   (c) Information technology [ ]
   (d) Others (specify) ________________________________

4. Do you use the computers in the production and transmission of your activities?
   YES/NO

   i. If yes, at what level
      - Production [ ]
      - Transmission [ ]
      - Content creation [ ]
      - Others (specify) ________________________________

   ii. If yes, are the computers on a network?
iii. What kind of network technology is employed by your organization?

(a) Broadcast [ ]
(b) Terrestrial wired [ ]
(c) Terrestrial wireless [ ]
(d) Digital [ ]
(d) others (specify) ___________________________

iv. What ranges of services are carried over these network(s)?

5. Does your organization employ use of Internet? Yes / No .

Comment on the Internet connection in your organization.

-----------------------------------------------------------------------------------
-----------------------------------------------------------------------------------
-----------------------------------------------------------------------------------

6. "Convergence is expressed as the ability of different network platform to carry essentially similar kind of services or coming together of consumer services"

To what extent has it been realized in your organization? (TICK ONE)

(A) Very adequate [ ]
(B) Adequate [ ]
(C) Inadequate [ ]
(D) Very inadequate [ ]
2 [a] Is your organization connectivity classified into public or private?
   [b] What is your opinion about such owning?
   [c] In your opinion how has such owning affected regulatory policies in Kenya?

3 [a] What are some of the challenges that have been facing Information Technology, Media, and Telecommunication sectors at your organization?
   [b] What are some of the remedies to such challenges?

4 What are some of the regulatory practices you have set in place to cope with such challenges?

14. what do you think is the future of convergence? (Any success or failure)
   Elaborate
APPENDIX 3

PLAN OF ACTIVITIES

<table>
<thead>
<tr>
<th>Activity</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. PILOT STUDY</td>
<td>1 WEEK</td>
</tr>
<tr>
<td>2. DATA COLLECTION</td>
<td>5 WEEKS</td>
</tr>
<tr>
<td>3. DATA ANALYSIS</td>
<td>4 WEEKS</td>
</tr>
<tr>
<td>4. COMPLICATION</td>
<td>3 WEEKS</td>
</tr>
<tr>
<td>5. SUBMISSION OF THE REPORT</td>
<td>DATE DUE</td>
</tr>
</tbody>
</table>

SCHEDULE OF ACTIVITIES

<table>
<thead>
<tr>
<th>ACTIVITIES</th>
<th>MONTH 1</th>
<th>MONTH 2</th>
<th>MONTH 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WEEKS</td>
<td>WEEKS</td>
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<td></td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>1. PILOT STUDY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. DATA COLLECTION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. DATA ANALYSIS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. REPORT COMPILATION</td>
<td></td>
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<tr>
<td>5. REPORT SUBMISSION</td>
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</tbody>
</table>
### APPENDIX 4

### BUDGET

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Kshs.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Proposal Development</strong></td>
<td></td>
</tr>
<tr>
<td>i. Travelling and accommodation</td>
<td>7,000.00/=</td>
</tr>
<tr>
<td>ii. Typing and printing 50 pages @ 30</td>
<td>1,500.00/=</td>
</tr>
<tr>
<td>iii. Binding 4 copies @ 150</td>
<td>600.00/=</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>9,100.00/=</td>
</tr>
<tr>
<td><strong>B. Data collection analysis</strong></td>
<td></td>
</tr>
<tr>
<td>i. Traveling and accommodation</td>
<td>15,000.00/=</td>
</tr>
<tr>
<td>ii. Data processing</td>
<td>4,00.00/=</td>
</tr>
<tr>
<td>iii. Stationery</td>
<td>1,500.00/=</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td>20,500.00/=</td>
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<tr>
<td><strong>C. Production and final document</strong></td>
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<tr>
<td>i. Printing and typing 100 @ 30</td>
<td>3,000.00/=</td>
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<tr>
<td>ii. Binding of 8 copies @ 1000</td>
<td>8,000.00/=</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td>11,000.00/=</td>
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<tr>
<td><strong>TOTALS</strong></td>
<td><strong>40,600.00/=</strong></td>
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