

# INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION & MANAGEMENT

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**ROLE OF TRAINING FOR MAINTAINING AN ISO 9001 SYSTEM**

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**SANKALP BUSINESS SCHOOL**  
**PUNE**

**ABSTRACT**

Every organization needs to have trained and experienced employees to perform the tasks. Training is requiring for employees at different levels. Unskilled workers require training in handling machines and materials to reduce waste and prevention of defect generation. ISO 9001 is an international quality standard developed by the International Organization for Standardization (ISO). The standard of ISO 9001 covers all aspects of an organization's activities, including identifying its key processes. All employees need to have a general understanding of what ISO 9001 is, and what their responsibilities are for maintaining the system and complying with requirements. Organizations must train employees on ISO 9001 so that they should understand the requirements for their job, the importance of meeting customer requirements and how their job contributes to meeting the Quality Policy.

**KEYWORDS**

Training, ISO 9001, Quality Standard, Customer Requirements, Quality Policy.

**INTRODUCTION**

The important factor to lead any organization is its efficient and effective workforce. It is necessary to raise skill levels and increase the versatility and adaptability of employees. Inadequate job performance or a decline in productivity or changes resulting out of job redesigning or a technological breakthrough require some type of training efforts. As the job become more complex the importance of employees training also increases. In the world of competition, employees training are not only an activity that is desirable but also an activity that an organization must commit resources to if is to maintain a viable and knowledgeable work force.

Training is the process that attempts to provide an employee with information, skills and an understanding of the organization and its objectives. In addition training is a process which not only means to improve organization or organizational culture but it also enhances the individual capability. It gives an employee's an awareness of the rules and procedures to guide their behavior. It attempts to improve their performance on the current job or prepare them for an intended job. It covers not only those activities which improve job performance but also those which bring about growth of the personality; help individuals in the progress towards maturity and actualization of their potential capabilities so that they become not only good employees but better men and women. In organizational terms it is intended to equip persons to earn promotion and hold greater responsibility. Training a person for a bigger and higher job is development. And this may well include not only imparting specific skills and knowledge but also inculcating certain personality and mental attitudes. The change in environment factors is imposing various challenges before the organizations. Some of the well known and identified challenges are:

1. Workforce diversity
2. Complex organizational structure and system
3. Cross cultural values
4. Adaption of new culture
5. Job security
6. Frequent change in technology and demand
7. Innovation and quick decision demand

Apart from these various other challenges are there which comped organizations to provide training to their employees so that they can confront with these and other anticipation challenge and can cope with any changed scenario.

**IMPORTANCE OF TRAINING**

Training is the corner stone of sound management for it makes employees more effective and productive. It is actively and intimately connected with all the personnel or management activities. It is an integral part of the whole management programme, with all its many activities functionally inter-related. There is an ever present need for training men so that new and changed techniques may be taken advantage of and improvements affected in the old methods, which are woefully inefficient. Training is crucial for organizational development and success. It is fruitful to both employers and employees of an organization. An employee will become more efficient and productive if he is trained well.

Training is given on five basic grounds:

1. New candidates who join an organization are given training. This training familiarize them with the organizational mission, vision, rules and regulations and the working conditions.
2. The existing employees are trained to refresh and enhance their knowledge.
3. If any updations and amendments take place in technology, training is given to cope up with those changes. For instance, implantation of ISO 9001 system in an organization.
4. The employees are trained about use of new equipments and work methods.
5. When promotion and career growth becomes important. Training is given so that employees are prepared to share the responsibilities of the higher level job.

The basic purpose of training and development is to enable human resource in such a way that They can perceive their responsibility themselves. The benefits of training can be summarized as:

1. **Improves morale of employees-** Training helps the employee to get job security and job satisfaction. The more satisfied the employee is and the greater is his morale, the more he will contribute to organizational success and the lesser will be employee absenteeism and turnover.
2. **Less supervision-** A well trained employee will be well acquainted with the job and will need less of supervision. Thus, there will be less wastage of time and efforts.
3. **Fewer accidents-** Errors are likely to occur if the employees lack knowledge and skills required for doing a particular job. The more trained an employee is, the less are the chances of committing accidents in job and the more proficient the employee becomes.
4. **Chances of promotion-** Employees acquire skills and efficiency during training. They become more eligible for promotion. They become an asset for the organization.
5. **Increased productivity-** Training improves efficiency and productivity of employees. Well trained employees show both quantity and quality performance. There is less wastage of time, money and resources if employees are properly trained.

**ISO 9001**

ISO 9001 is an international quality standard developed by the International Organization for Standardization (ISO). ISO 9001 can be applied to any type and size of organization, from small family-run businesses to the world's largest corporations and government institutions. It provides a structured yet flexible framework for a customer focused business management system that will drive business performance improvement. ISO 9001 is based on the following eight Quality Management Principles, which are incorporated within the requirements of the standard, and can be applied to improve organizational performance:

- Customer focus
- Leadership
- Involvement of people
- Process approach
- System approach to management
- Continual improvement
- Factual approach to decision making
- Mutually beneficial supplier relationships

The standard covers all aspects of an organization's activities, including identifying its key processes, defining roles and responsibilities, policies and objectives, documentation requirements, the importance of understanding and meeting customer requirements, communication, resource requirements, training, product and process planning, design processes, purchasing, production and service, monitoring and measurement of products and processes, customer satisfaction, internal audit, management review, and improvement processes.

**THE BENEFITS OF IMPLEMENTING AN ISO 9001 QUALITY MANAGEMENT SYSTEM**

Many organizations initially implemented ISO 9001 because they had to either their customers demanded it, or their competitors had it, making it imperative that they do the same to stay competitive. As time went by, however, these companies soon realized that if properly implemented, ISO 9001 gave them many significant and noticeable benefits. For management, an important benefit has always been improved financial performance. In addition to benefiting the bottom line, companies also realize many other advantages, including improved employee and customer satisfaction, resulting from better defined and implemented business processes.

Some of the direct benefits achieved by ISO 9001 certified companies include:

- Improved financial performance
- Motivated staff, who understand their roles and how their work affects quality
- Improved product and service quality, leading to satisfied customers
- Improved management and operational processes, resulting in less waste ,increased productivity, efficiency and cost savings

The indirect benefits are no less important, and include:

- Enhanced reputation
- Repeat business
- Ability to compete more effectively globally, both on quality and price
- Access to new markets
- Improved customer and supplier relationships
- Improved employee morale
- Improved management control

**ISO 9001 TRAINING**

As with many parts of the revised ISO 9001:2008 quality standard, the training requirements were changed to help improve the organization's quality. All employees need to have a general understanding of what ISO 9001 is, and what their responsibilities are for maintaining the system and complying with requirements. Organization must train employees on ISO 9001 so they understand the requirements for their job, the importance of meeting customer requirements and how their job contributes to meeting the Quality Policy. It also requires verification that the training provided was effective.

Planning for HR process controls must include determining - competency criteria; skills evaluation; identification of training needs; types of training; provision of training; how training effectiveness is evaluated; methods to communicate awareness of the importance of quality requirements and meeting quality objectives, to all employees.

Criteria for competency must be developed based on appropriate education, skills, training and experience for activities, tasks, functions and processes. The level and detail of such qualifications, skills, training and experience will depend upon the complexity of product, process, technology and customer and regulatory requirements.

It is up to organization to determine the necessary criteria for the various functions and activities affecting product and QMS based on these factors.

Organizations undergo significant changes through growth or decline, acquisitions, new technology and new products and processes, Also, many organizations are now outsourcing their production labor to save on payroll costs and benefits. Labor related nonconformities can easily arise in such cases. Planning for your HR process must ensure that contract and agency personnel performing work affecting product quality have adequate competency and training. Appropriate records must be kept of such training. Quality awareness must be focused on meeting customer and regulatory requirements. The process to promote quality awareness may include the use of methods such as cross functional teams, involvement in quality planning, quality circles improvement suggestions, product workshops, zero defect programs, product review checklist; etc. QMS personnel must be motivated to achieve the organizations quality objectives. The process to motivate employees may include the use of methods such as employee recognition awards; ongoing training programs; performance reviews, employee surveys etc.

Organization must determine and keep appropriate records of education, training, skills and experience. These records must demonstrate the effective operation of HR process controls.

Summary of the training requirements from section 6.2.2 Competence, training and awareness as follows.

1. Define the knowledge and skill needed for each employee to conduct their job.
2. Deliver training or other learning activities to develop the required knowledge and skill.
3. Provide a way to whether the training or learning activities were effective .
4. Keep training records and records of employee education, skills and experience. Once an organization determines how to organize a training program to meet these requirements, they must find a way to keep track of the training schedules, evaluation activities and training records for every employee.

**RESULTS**

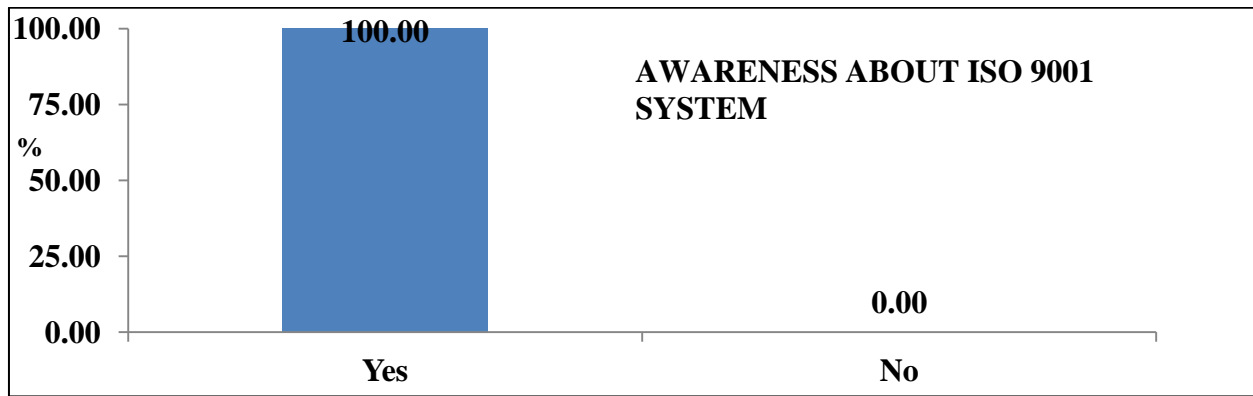
**ANALYSIS # 1 AWARENESS ABOUT ISO 9001 SYSTEM**

The data was obtained from employees about the awareness about ISO 9001. The data was analyzed and tabulated as follows:

Opinion	Total
Yes	100.00 %
No	0.00 %



The graphical presentation of data analysis is given below.



From the above analysis it was observed that:

1. 100.00 % respondents were said that training is needed about awareness of ISO 9001.
2. 0.00 % respondents were said that training is needed about awareness of ISO 9001.

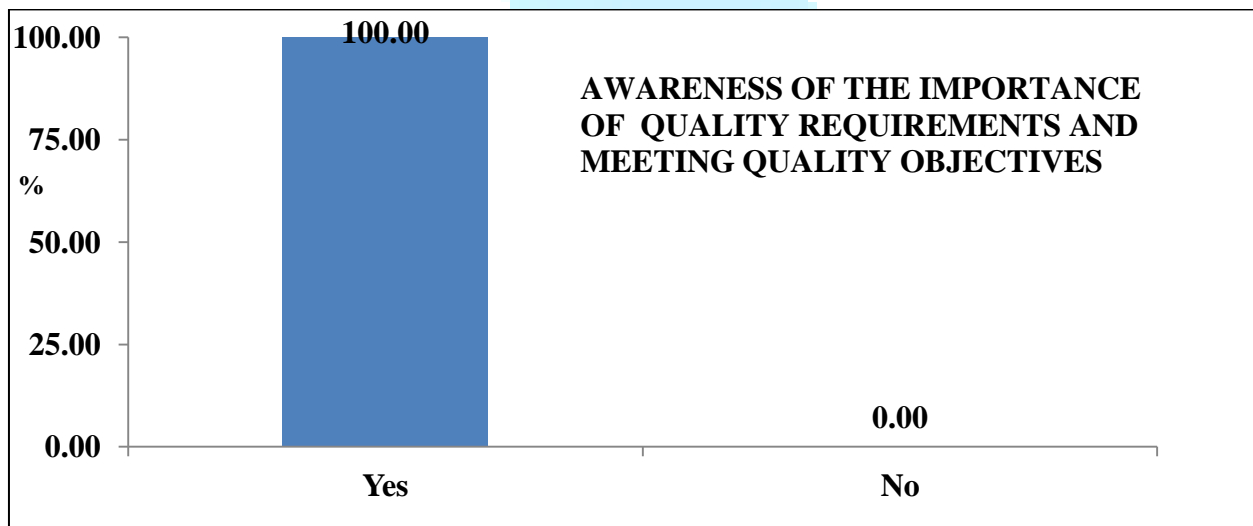
From the observations 1 to 2, it was interpreted that awareness through training is needed for awareness of ISO 9001.

**ANALYSIS # 2 AWARENESS OF THE IMPORTANCE OF QUALITY REQUIREMENTS AND MEETING QUALITY OBJECTIVES**

The data was obtained from employees about the awareness of the importance of quality requirements and meeting quality objectives. The data was analyzed and tabulated as follows.

Opinion	Total
Yes	100.00 %
No	0.00 %

The graphical presentation of data analysis is given below.



From the above analysis it was observed that:

1. 100.00 % respondents were said that training is needed about awareness of the importance of quality requirements and meeting quality objectives.
2. 0.00 % respondents were said that training is needed awareness of the importance of quality requirements and meeting quality objectives.

From the observations 1 to 2, it was interpreted that awareness through training is needed for awareness of the importance of quality requirements and meeting quality objectives.

**DISCUSSION**

The increased competition for jobs , combined with technological change makes it vital that employees are assisted to become even more productive , through the best training possible. Although training provides a measure for modifying employees behavior involving complex attitudes ,knowledge , understanding and improving organizational effectiveness. All employees need to have a general understanding of what ISO 9001 is, and what their responsibilities are for maintaining the system and complying with requirements. Organization must train employees on ISO 9001 so that they understand the requirements for their job, the importance of meeting customer requirements and how their job contributes to meeting the Quality Policy. It also requires verification that the training provided was effective.

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**AN ANALYSIS OF THE ROLE OF SMALL SCALES INDUSTRIES' SECTOR IN INDIA**

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**ABSTRACT**

*This paper explains the various tax policies and their impact on Small Scales Industries' Entrepreneurs in India. The effect of taxation on SSI's entrepreneurs is one of the central questions in both public finance and development. This effect matters not only for the evaluation and design of tax policy, but also for thinking about economic growth. In this paper, we present new intra-country evidence on the Taxation Policies for Small Scales Industries' Entrepreneurs in India are correlated with investment in manufacturing but not services, as well as with the size of the informal economy. The results are robust to the inclusion of many controls.*

**KEYWORDS**

Entrepreneurs, SSI, Fiscal Incentives, Excise, CENVAT.

**INTRODUCTION**

In this chapter, we will focus on entrepreneurship development within the Small Scale Industry in India. The Small Scale Industry has often been termed the 'engine of growth' for developing economies. We begin with an overview of this sector in India and look at some recent trends which highlight the development and significance of this sector vis-à-vis the Indian economy. Over the last few years, there have been major policy changes at the federal and state level aimed at consolidating and developing this sector. The Small scale industry Development Act of 2006 is perhaps the most crucial of these recent policy changes. In the fourth section of this paper, we will critically analyze this legislation and look at its main achievements as well as the remaining challenges. We also discuss a few policy recommendations which have been commonly suggested to settle some of the ongoing debates in this sector which the Small scale industry Development Act of 2006 has been unable to resolve. In the second part of this paper, we do an impact assessment of specific government policy interventions on the growth of entrepreneurship in the Small scale industry sector in India. The policies of interest are state outlays and subsidies targeted towards this sector. More specifically, we analyze the impact of total financial subsidies to the sector, total state investment in industrial parks and clusters aimed at this sector and the total state expenditure to support technology within the Small scale industry sector. We do a state level analysis based on data from 1991 until 2002 and study some key outcomes of interest such as total number of units, total output, total employment and total exports from the Small scale industry sector. Our main findings are that while specific policies that are aimed at the Small scale industry sector have basically no significant impact on the growth of this sector, more general development policies such as expenditure on infrastructure and access to finance have significantly positive impact on growth of the Small scale industry sector across states in India over the last 15 years.

Entrepreneurs shape economic destiny of nations by creating wealth and employment, offering products and services, and generating taxes for governments. That is why entrepreneurship has closely been linked to economic growth in the literature on the subject. Entrepreneurs convert ideas into economic opportunities through innovations which are considered to be major source of competitiveness in an increasingly globalizing world economy. Therefore, most governments in the world strive to augment supply of competent and globally competitive entrepreneurs in their respective countries. While developed nations have a reasonably good pace of entrepreneurial supply, most developing countries suffer from dearth of such entrepreneurs. This is one of the reasons for the poverty in developing countries, despite their rich resource endowments.

**OVERVIEW OF SSI' ENTREPRENEURS**

A Small Scale Industry (SSI) is an industrial undertaking in which the investment in fixed assets in plant & machinery, whether held on ownership term or on lease or hire purchase, does not exceed Rs. 1 Crore. However, this investment limit is varied by the Government from time to time. Entrepreneurs in small scale sector are normally not required to obtain a licence either from the Central Government or the State Government for setting up units in any part of the country. Registration of a small scale unit is also not compulsory. But, its registration with the State Directorate or Commissioner of Industries or DIC's makes the unit eligible for availing different types of Government assistance like financial assistance from the Department of Industries, medium and long term loans from State Financial Corporations and other commercial banks, machinery on hire-purchase basis from the National Small Industries Corporation, etc. Registration is also an essential requirement for getting benefits of special schemes for promotion of SSI viz. Credit guarantee Scheme, Capital subsidy, Reduced custom duty on selected items, ISO-9000 Certification reimbursement & several other benefits provided by the State Government.

**SUPPORTING BODIES FOR SSI**

The Ministry of Micro, Small and Medium Enterprises or SSI acts as the nodal agency for growth and development of SSIs in the country. The ministry formulates and implements policies and programmes in order to promote small scale industries and enhance their competitiveness. It is assisted by various public sector enterprises like:

1. Small Industry Development Organisation (SIDO) is the apex body for assisting the Government in formulating and overseeing the implementation of its policies and programmes/projects/schemes.
2. National Small Industries Corporation Ltd (NSIC) was established by the Government with a view to promoting, aiding and fostering the growth of SSI in the country, with focus on commercial aspects of their operation.
3. The Ministry has established three National Entrepreneurship Development Institutes which are engaged in development of training modules, undertaking research and training and providing consultancy services for entrepreneurship development in the SSI sector. These are:-
4. National Institute of Small Industry Extension Training (NISIET) at Hyderabad,
5. National Institute of Entrepreneurship and Small Business Development (NIESBUD) at NOIDA
6. Indian Institute of Entrepreneurship (IIE) at Guwahati

7. The National Commission for Enterprises in the Unorganised Sector (NCEUS) has been constituted with the mandate to examine the problems of enterprises in the unorganised sector and suggest measures to overcome them.

8. Small Industries Development Bank of India (SIDBI) acts as apex institution for financing SSIs through various credit schemes.

In a developing country like India, Small Scale Industries play a significant role in economic development of the country. They are a vital segment of Indian economy in terms of their contribution towards country's industrial production, exports, employment and creation of an entrepreneurial base. These industries by and large represent a stage in economic transition from traditional to modern technology. Small industry plays a very important role in widening the base of entrepreneurship. The development of small industries offers an easy and effective means of achieving broad based ownership of industry, the diffusion of enterprise and initiative in the industrial field.

Given their importance, the Government policy framework right from the First plan has highlighted the need for the development of SSI sector keeping in view its strategic importance in the overall economic development of India. Accordingly, the policy support from the Government towards Small Scale Industries has tended to be conducive and favourable to the development of small entrepreneurial class. Government accords the highest preference to development of SSI by framing and implementing suitable policies and promotional schemes.

The most important promotional policy of the Government for the SSI's is fiscal incentives in the form of tax concessions and exemptions of direct or indirect taxes leviable on production or profits.

### FISCAL INCENTIVES FOR SSIs

Fiscal incentives are provided through tax concessions granted in the form of exemptions of direct or indirect taxes leviable on production or profits, besides special tax concessions. These incentives have been provided to promote the SSIs. With effect from financial year 2005-06, SSIs can claim deductions in respect of profits and gains (under section 80IB of Income tax Act) at the following rates:-

1. If SSI unit is owned by a company, the deduction available is 30% for first 10 years.
2. If SSI unit is owned by a co-operative society, the deduction available is 25% for first 10 years.
3. If any other person owns SSI unit, the deduction to be claimed is 25% for first 10 years. SSI unit can avail this tax exemption after fulfilling following conditions:
  - (i) They should not be subsidiary of, or owned or controlled by other industrial undertakings. They should not be formed as a result of splitting up or reconstruction of any industrial undertaking/business. SSI units can manufacture any nature or type of goods, which they are permitted to do so. They should have commenced business between 1st April 1991 and 31st March 2002. They should employ atleast 10 workers in a manufacturing process carried out with aid of power or atleast 20 workers without aid of power.
  - (ii) This tax exemption from total income is allowed from the assessment year in which the unit begins to manufacture goods.
  - (iii) No small scale or ancillary undertaking shall be subsidiary of, or owned or controlled by other industrial undertaking.
  - (iv) SSI unit can manufacture any nature/type of goods/article to avail deduction.
  - (v) The SSI unit should commence business between 1st April 1991 and 31st March 2002.
  - (vi) They should employ at least 10 workers in a manufacturing process carried out without the aid of power.
  - (vii) This tax exemption from total income is allowed from the assessment year in which the unit begins to manufacture or produce goods or articles.

### EXCISE CONCESSIONS

Small Scale Industries are subjected to excise duties under the Central Excise Tariff Act, 1985 (5 of 1986). The eligibility for excise concessions for SSIs has been based on annual turnover rather than SSI registration. SSI units having turnover less than Rs. 4 crores are only eligible for concessions. Government of India has provided various concessions to SSIs by granting full exemption from payment of central excise duty on a specified output and thereafter slab-wise concessions. Thus concessions in this regard are:-

1. SSI units producing goods upto Rs. 100 lakhs are exempted from payment of excise duties.
2. SSI units having turnover less than Rs. 60 lakhs per annum need not have a separate storeroom for storing finished products.
3. They are not required to maintain any statutory records such as daily stock accounts, etc. Their own records are adequate.
4. SSI exemption is available for goods for home consumption as well as goods exported to Nepal and Bhutan.

Government of India has provided a major relief by granting full exemption from the payment of central excise duty on a specified output and thereafter slab-wise concessions. The following concessions are available to them in this regard:

- (I) SSIs are also not required to maintain any statutory records such as daily stock account of production and clearances, raw material account, personal ledger account etc. Their own records are adequate for excise purposes.
- (II) There is no distinction between registered and unregistered units for SSI concessions. Further, the eligibility for excise concessions for SSIs has been based on annual turnover rather than SSI registration. Duty liability is to be discharged by 15th of the following month.
- (III) Normally, excise officers are not expected to visit SSI units paying less than Rs. 11 lakhs duty annually.
- (IV) With effect from 1-4-1994, Gate-Pass System was replaced by manufacturer invoice to cover clearances of goods as the duty-paying document.

### VARIOUS CONCESSIONS/EXEMPTIONS REGARDING CENVAT

1. SSI Scheme (without CENVAT) :- Units can avail full exemption upto turnover or value of clearance of Rs. 100 lakhs and pay normal duty thereafter in the slab-rate of Rs. 100-300 lakhs. This option can be exercised automatically. Such SSI units can avail Cenvat credit on inputs only after reaching turnover of Rs. 100 lakhs. This scheme is applicable to all those units mentioned under SSI exemption notification no.8/2003-CE. This notification grants exemption in respect of basic excise duty and special excise duty. The manufacturer may opt for not availing exemption contained in this notification and instead pay normal rate of duty on the clearances. But once the option is exercised, it shall continue till the financial year ends.
2. SSI Scheme (with CENVAT) :- Units can avail Cenvat credit on inputs on all its turnover. Upto the value of clearance of Rs. 100 lakhs, units have to pay 60% of normal duty and thereafter for value of clearance of Rs. 100-300 lakhs, they have to pay normal rate of duty. 'Assessable value' is used to calculate limit of 100 and 300 lakhs which is equal to wholesale price at factory gate, exclusive of taxes. A manufacturer can opt this option any time determining his eligibility for concession and the concessional rate of duty. While exercising this option, the manufacturer should inform in writing to the Assistant Commissioner of Central Excise with a copy to its Superintendent giving following details: (a) name and address of manufacturer; (b) Location/locations of factory/factories; (c) description of inputs used in manufacture of specified goods and its description thereafter; (d) date from which option under SSI exemption notification has been exercised; (e) Aggregate values of clearances of specified goods (excluding the value of clearances not covered under SSI exemption notification) till the date of exercising the option.

### CONCLUSION

Small Scale Industry sector has emerged as India's engine of growth in the New Millennium. The SSI sector accounts for nearly 40 per cent of value added in the manufacturing sector and 34 per cent of total exports from the country. Through 95 per cent of industrial units in the country, the sector provides employment to about 20 million persons. The Government has recognized its importance for the economy and its intention towards promotion of SSIs is reflected in various Industrial Policy Resolutions right from the year 1948. The primary objective of the Small Scale Industrial Policy during the nineties was to impart more vitality and growth-impetus to the sector to enable it to contribute its mite fully to the economy, particularly in terms of growth of output, employment and exports.

The sector has been substantially delicensed. Further efforts would be made to deregulate and debureaucratise the sector with a view to remove all fetters on its growth potential, reposing greater faith in small and young entrepreneurs. All statutes, regulations and procedures were reviewed and modified, wherever necessary, to ensure that their operations did not militate against the interests of the small and village enterprises.

Government is aware of the challenges faced by SSIs and has been trying to improve their competitiveness through various measures. These consist of the following:

- a) Tax concessions have been provided to SSIs to promote investment in this sector and also to grant relief to small entrepreneurs.
- b) Technological facilities have been increased.
- c) In order to facilitate adequate flow of credit efforts have been done.
- d) Measures have also been taken to improve infrastructure facilities and promote marketing of products.

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**REDUCING PATH CONGESTION AND FAILURE IN AN INTERACTIVE NETWORK APPLICATIONS****S. SATHYAPRIYA****STUDENT****DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING****S. K. P. ENGINEERING COLLEGE****TIRUVANNAMALAI****A. KUMARESAN****PROFESSOR****DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING****S. K. P. ENGINEERING COLLEGE****TIRUVANNAMALAI****K. VIJAYAKUMAR****PROFESSOR****DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING****S. K. P. ENGINEERING COLLEGE****TIRUVANNAMALAI****ABSTRACT**

Real time interactive applications are utilized in huge network applications such as online trading, online gaming. At present the emerging application is computer gaming. Due to more request from the client side there occurs a traffic which leads to lag or latency. To achieve a equalized delay here an approach called Latency Equalisation Service (LEQ) With network support, the network delay measurement can be performed more accurately throughout the network either at the client or server side with network support. Few routers in the network were picked as hubs to transmit packets. Frequent accessibility can leads to the problem so carried an approach called Htrae where the routers is used for the transmission with a wireless protocol to transmit the information and to reduce the delay. In the Existing system greedy algorithm is used where hub selection remains NP-hard. If it remains as NP-hard, the condition is inapproximable. In proposed approach the delay difference is reduced up to a millisecond.

**KEYWORDS**

LatencyEqualization (LEQ) Algorithm, router as hubs, Htrae.

**INTRODUCTION**

In the multiple interactive network applications involve several users taking part during a interactive applications. Increasing popularity and accessibility of internet ends up in traffic during a new generation of frequent net users. The quickest growing segments of the computer market are that of on-line gaming. Contributory to the present growth is especially attributable to the widespread support of networking in PCs. for instance, on-line gaming and e-Commerce, on-line commercialism. The delay distinction minimizing among participants can lead additional period interactivity. In this paper on-line gaming is used as an example that is enforced either at the client or server side with network support. With network support, the network delay measurement can be performed correctly. While using the network there will be some latency occurring in interactive network application. The problem of accessing the internet is particularly latency or lag and the lag is due to packets tending to experience relatively large delays in traversing these networks. Generally latency is the time delay or a short period of delay experienced in the system

In [2]-[4], The author mentioned the delay and also the delay difference practiced by the frequent internet users considerably affects the game quality. to boost the interactive expertise, game servers had enforced by taking part players will vote to exclude players with higher lag times. additionally in [5] particularly in e-commerce, latency variations between pairs of looking agents and evaluation agents may result in unfair advantage to those pairs of agents have lower latency. antecedently they consider application-based solutions to realize equalised delay. Client side solutions are exhausting as a result they require that all clients swap latency information to all other clients. There happens divergence within the network applications need delimited delay difference across multiple clients to avoid traffic. A server-side technique places memory overhead on the applying servers. To scale back delay with network support they show the necessity to scale back delay since the prime supply of the latency distinction is from the network. within the paper [14] utilizing the idea of programmable router. A key element of flexibility is that the programmable router. Here the beginners of 2 totally different routing architectures: one meets the low latency wants of standard applications and also the different meets latency effort (LEQ) needs among a group of interacting users. Overhead of network measurements and also the implementation of latency compensation techniques consume central time on servers and important processing power. we have a tendency to carried an approach of planning and implementing network-based Latency effort. web Service suppliers provides additional careful information of current network traffic and clump among themselves. Therefore, internet Service suppliers will higher support latency effort routing for an oversized variety of players with varied delays. Without network support it is difficult for applications run proper in unusual conditions and failures. Latency Equalisation is done using adjacent nodes and routers. The routing is done by moving information from source to destination Latency compensation techniques are supported on hardware and software improvement in the quality is to speed up the processing. The techniques cannot equalize a group of servers for delay variations.

**ARCHITECTURE DESIGN OF LATENCY EQUALIZATION**

The basic LEQ architecture is to support access network delay. This section deals with A. Basic LEQ Hub Routing, B. LatencyEqualisation Routing design, C. Comparing alternative Network Based Solutions, D. In the Presence of Access Network Delay.

**A. Basic LEQ Hub Routing**

First, The LEQ routing is completed employing a hub routing: The hubs within the network are accustomed with the packets the delays is equal for interactive applications. The internet service supplier will enable the projected LEQ routing design to take a note on several applications on a similar network. the fundamental LEQ design focuses on equalizing traffic or congestion delays between the client and also the server edge routers while not considering access delay. currently supported the Latency service the applying traffic from every edge router is assigned to a collection of hubs. These edge routers with the applying packets equivalent to the LEQ service through the hubs to the servers. Redirecting packets through the hubs from totally different client edge routers with different delays to the servers can reach the servers at intervals a assumed delay difference. In different cases or additionally we are able to assume this



type of effort design it depends. for instance, in Figure.1 from the paper [15] the client congestion from a network application enters the supplier network through edge routers R1 and R2. The server is connected to the network through edge routers. R6 and R7 are chosen as hubs for R1. R7 and R8 are chosen as hubs for R2. Using R1, has 2 methods to the server edge router R10: R1-R6- R10 and R1-R7-R10 each of that have a delay of ten milliseconds. R2 additionally has 2 paths: R2-R7-R10 and R2-R8-R10, whose delay is additionally ten milliseconds. Latency service is achieved by optimized hub choice.

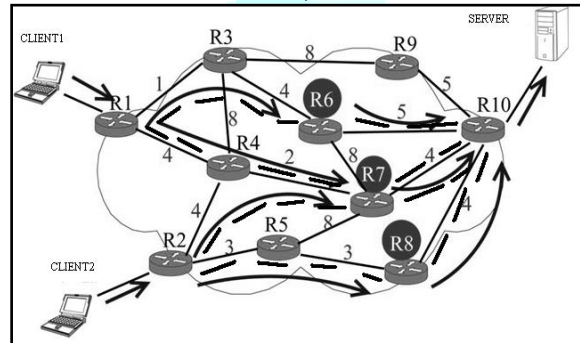
Every client edge router is assigned to over one hub, thus it will simply choose the hubs to avoid congestion. In Figure.1, LEQ architecture (R6, R7, R8 Routers used as Hubs) R1 and R2 are each used 2 hubs. Our LEQ design involves 3 key parts. The hub selection algorithm is chosen because an online hub selection algorithm would require significant monitoring overhead and fast online path calculation and network failures and network congestion.

**B. Latency Equalisation Routing design**

The algorithm assumes the presence of clients at all edge routers. The inputs are the edge router locations, network topology, and the approximated delay. A group of routers is selected to serve as hubs for each client edge router and sends this information of the assigned hubs to the client edge routers.

Packets are sent through the hubs while not changes to routing design. considering all edge routers as the chosen hub nodes which will be shared among several network applications. analyzing additionally shows that the LEQ design with some hubs scales well with increase within the number of servers. Implementing the higher than LEQ routing design, implementation on totally different delay and delay difference meet the necessities of various forms of interactive network applications. to boost the latency effort performance for the application the edge router initially identifies interactive application packets by their port number and known to the service provider in advance and then redirects the packets by its assigned hubs. once the traffic is found on a path, the sting router will sent packets to a different assigned hub to induce round the purpose of congestion.

**FIGURE 1: LEQ ROUTING DESIGN (R6, R7, R8 Routers used as Hubs)**



**C. Comparing Alternative Network-Based Solutions**

Comparison between Latency Equalisation design to different network-based solutions is done in paper [7]. To implement latency effort the LEQ design is scalable to several servers and applications with modifications to the edge routers. The approach of implementing the network is to equalize delays to buffer packets at the edge routers. this needs huge buffers for every interactive application, creating the router expensive and power inefficient. Edge routers want advanced packet-scheduling mechanisms that takes packet delay needs, with different edge routers to determine however long to buffer these packets. Our LEQ design will scale back the delay with and while not compromising delay. Also one could use source routing to address the problem of latency equalization. Source routing is chosen by the sender and the packets are sent the server. All clients are known about the network topology and coordinate with each other to ensure that the delay differences are minimized. Multi-protocol label switching is set up which is essential for service provider and large networks. However this approach is value effective than LEQ design in this it needs product of variety of clients and variety of server methods to be designed.

**D. In the Presence of Access Network Delay**

In paper [9] and [10] access network delay depends on the technology used, For different access network types, the average access network delay can be: 180 millisecond for dial-up, 20 ms for cable, 15 millisecond for asymmetric digital subscriber line (ADSL) Multiple nodes may connect to the same client edge router through different access networks. The proposed LEQ routing in the backbone network can also be used in conjunction with Quality of Service

**NOTATIONS FOR LATENCY EQUALISATION**

Initially the basic hub selection problem is formulated without considering access delay and prove that it is NP-hard [15]. The key component of our LEQ architecture is the hub selection algorithm, which focuses on the problem of hub selection and the assignment of hubs to the client edge routers. Hubs are selected with the goal of minimizing the delay difference and the delay across all client edge routers. This shows that delay variations can be significantly reduced using the selected hub nodes as compared to shortest-path routing. It focuses on the client side routers.

**NOTATIONS USED IN BASIC HUB SELECTION PROBLEM**

**FIGURE 2: HUB SELECTION NOTATION**

$d(u,v)$	Propagation delay between router u and v
$Sc_i$	Set of servers associated with client edge router $C_i$
$Hc_i$	Set of nodes assigned to client edge router $C_i$
$R$	Number of servers associated with client edge router
$N_s$	Number of servers in the network
$M$	Total number of hubs
$M$	Number of hubs selected for each edge router

Hub Selection with Access Delays: we can partition clients of an edge router into four groups with access delays. The edge router forwards the packets from the new client to the hubs associated with its client group. We can sporadically measure access delay changes and accordingly we can assign the client to different delay groups accordingly

**ALGORITHM 1 GREEDY ALGORITHM FOR BASIC HUB SELECTION**

Step1. All the delays are sorted from client edge router  $C_i$  Server  $S$  through hub  $h$  in increasing order, which is denote as array  $A$

Step2. For each  $A[i]$ , binary search to find the min delay difference:

For each delay  $A[i]$  left =0, right=dmax- $A[i]$

while(left not equal right)

$\partial_i = (left+right)/2$

$l_i = \text{greedycover}(A[i], \partial_i, m, \{d(u,v)\}, d(j,k))$

If  $(|l_i| > M)$  left =  $\partial_i$  else right =  $\partial_i$ ,

Step3. pick  $l_i$  with smallest  $\partial_i$ , if multiple solutions achieve the minimum  $\partial_i$ , pick the smallest  $A[i]$ . If  $\partial_i = dmax$  then Output no solutions found.



Optimal Algorithm for  $m=M$ : We prune a candidate hub if the delay from edge router to server edge router through it exceeds the bound. Denote the records sorted in increasing order respectively

Step1. Let  $A1$  and  $A2$  be the candidate hub records sorted by their min delay and max delay in increasing order

Step2. For each  $b_t \in A1$  in sorted order  $l_t = \{b_t, h_t\}, \partial_t = d_{max}$

For each  $b_i \in A2$  in sorted order If  $(b_i, \min d > b_t, \min d$  and  $|l_t| < M$ )  $l_t = l_t \cup \{b_i, h_i\}$   
 $\partial_t = b_i, \max d - b_t, \min d$

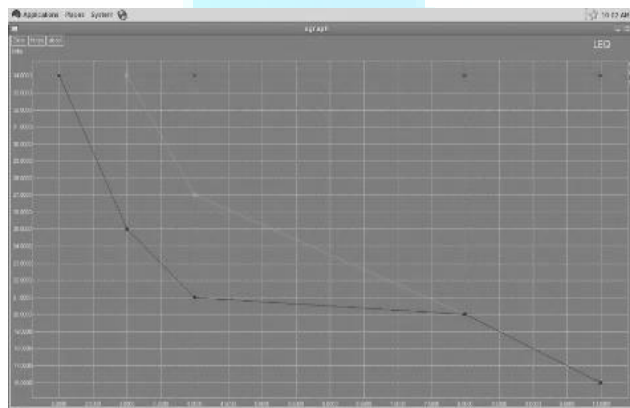
Step3. pick  $l_t$  such that  $\partial_t$  is the smallest

## EVALUATION

The Latency Equalisation routing architecture is evaluated with and without access delay. Our evaluation uses several parameters which defines the routing architecture the total number of hubs  $M$ , the number of hubs selected as edge routers and randomly choose edge nodes as the location of servers. Then run the Latency Equalisation routing and shortest-path routing algorithms to compute the paths between these clients and servers. The LEQ path computation is based on the computed delay in the network. The computed delay of these networks based on the geographical distances between any two nodes. The delay and delay differences obtained using Open Shortest Path First routing are compared to the Latency Equalisation routing. This latency equalization is achieved using OSPF. In [11] the author mentioned the consistent with the working where they show that end-to-end delay can be reduced by packet indirection. The end-to-end delays of individual clients are not compromised. In a service provider network, OSPF weights are arranged for traffic engineering [11], and thus OSPF paths may not always leads to lowest delay paths.

### A. Simulation

For the simulation we use two topologies AT&T and Telstra [12]. We run the LEQ routing and shortest path between client and servers Network topology is created for creation of nodes and transmission of packet in a simple network LEQ with and without compromising End-to-End Delay. The evaluation is between Open Shortest Path First and Latency Equalisation without compromising delay (AT & T network,  $N_s=1, m=3$ ) Figure.3 is implemented with delay difference and delay. The average delay difference is 60%, but LEQ reduces the delay by LEQ scheme with packet indirection. In the case of with compromising delay 85% of reduction for both AT&T and Telstra topologies. In this topologies while providing more than five does not yield better significance improvement.



## CONCLUSION

With multiple servers the Delay difference, Compared to LEQ, with Latency Equalisation routing the total number of servers does not have significant performance. This reduction improves the performance which is given below. The implementation in this paper is based on network support with htrae support. It can predict latencies between machines which is mainly designed for game matchmaking. While using this nearly 90% delay is minimized. The prediction system Htrae is implemented where the Round Trip Time is calculated which yields minimum delay than OSPF and LEQ. Round Trip Time is the measure of time it take for a packet to achieve a node and that latency will not change in the very near future.

## RELATED WORK

In [1] the approach called colyseus which support low latency gameplay also meet tight latency state. The method distributed hash table with additional interface method is used. The technique called box grouping technique and incorporating proximity routing where the architecture is used for multiplayer games. By using this approach nearly 60% is improve also leads to better scalability, load balance and to detect violations. In another paper [2] discrepancy occurs in online gming that used a paradoxical outcomes and impose stringent constraints on responsiveness. The method called First person shooter is used wher latency compensation method is used. The result called trading and training consistencies to manage fairness. centerserver approach to improve the performance.

In [3], an approach called Quake II, game traffic method is used to evaluate counter strike between client and server. As a result simulation on Qos metrics for adequate evaluation of simulation results. From LAN the measurement between client and sever. The quality of graphics will continue to increase. For additional voice communication be incorporated in the online games soon. In the paper [4] the effect of latency in football games carefully designed between players. The technique called latency compensation mechanism leads to low, internet latency over compensating games. The result is latency difference is 500ms. To determine more effective ways to evaluate latency on passing performance and to determine their succesibility of latency.

The author in paper [5] resolve the problem, an implementation called SAGLU (self-adjusting game lagging utility) technique can be used where an artificial delay is added. It automatically equalizes the participants delay. The delay equalization is done by knowing the participant such as IP address, port., also by adding this artificial delay the packet loss due to congestion is very less. SAGLU is like proxy between client and server. Delay adjustment algorithm is used to implement SAGLU. Delay based algorithm adapts to the transmission rate and improve TCP connections. Real time transport protocol is used. This congestion control algorithm is used along with TCP/RENO. It reduces the loss ratios and improve the bandwidth utilization while using algorithm the increase in transmission rate increases and reduce the congestion periods. Packet losses also adjusted by the transmission rate of various applications.

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**SEGMENTING THE SHOPPERS OF GREEN FASHION PRODUCTS ON THEIR SHOPPING BEHAVIOUR**

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**ABSTRACT**

A variety of customers come to fashion retail stores to purchase green fashion products. While some of them are regular consumers of these green fashion products by choice, others are experimenters with ecofriendly products, still others buy these products under the influence of some reference group and so on. There seems to be an apparent need to understand the segments of these green fashion products shoppers and to understand their profiles. This can go a long way in formulating better marketing strategies for these products. There have been numerous efforts to segment shoppers of different product categories on their demographic characteristics. In the case of green fashion products the one of the effective way of segmentation can be segmentation on the basis of their shopping behaviour as behavioral cues can reveal many psychographic patterns. Additionally, as buyers for these products belong to various demographic groups understanding them through their behaviors at stores can be more useful and obviously more factual for laying down marketing and retailing strategies for these products. The current research is broadly a descriptive research aimed at identifying the different segments on the basis of observational studies, questionnaires and interviews carried out in shops. The shoppers for green fashion products have been classified into 18 segments and segment profiles have been developed for them. The study has also included the preference and consumption of different segments in order to suggest product mix for these segments which can be perceived as value maximisers by respective segments. The research intends to provide an alternative framework to understand shopping behavior of green fashion products' shoppers.

**KEYWORDS**

Green fashion products, Retailing, shopping, behavioral segmentation, Dubai, psychographic patterns.

**INTRODUCTION**

Green fashion products refer to those fashion products which are environment friendly and contributes to the larger cause of sustainability. The process of segmentation is the key to marketing. In order to produce and distribute the right products to right group of people with right marketing strategy one unequivocally requires doing the right segmentation first. The process of segmentation is basic and carries the typical importance of foundation stone in the world of marketing. When something is basic, any mistake related to that can have far reaching consequences. And when something is important, it must be looked and re looked with various possible perspectives at different points of time to ensure the continuous improvement and adaptation.

In marketing various bases for segmentation have been identified and they have been grouped under heads like geographic, demographic, psychographic etc. The marketing of green fashion products is a phenomenon of comparatively new origin. The growing awareness about the environmental issues and the phenomenon of more and more people opting for environmentally fashion products is reason of celebration for entire humanity. Fashion is largely a psychological choice based on various factors related to sociocultural issues, recent happenings in surrounding, reference groups' behaviours and so on. Hence the choice of people of going for green fashion products impacts the behaviours of others and the process continues.

It is needless to say that retail is the point where marketer and consumers come in direct contact like never before. Hence there is a need and relevance of segmenting the shoppers so that marketing can be done in a better way. Shoppers indulge in search of products with various motives. The search processes give shoppers an opportunity to ensure that they take the right decision. In addition, they also derive emotional satisfaction (Tauber, 1972). Behaviour has been studied using one or a combination of three methods. The first method is based on the manipulation of the store variables such as display or promotions and measuring the change in sales pattern through inventory and purchase audit (Cox, 1964). Similarly, various other attempts have been made. The segmentation at retail level is of paramount importance due to various reasons. The segmentation of shoppers will help the retailers to provide the most suited products to different segments of consumers and the most effective sales promotion schemes, advertising; visual merchandising and other promotion and pricing strategies and tactics can be devised for different segments. Retailing is a location bound business and there is a defined catchments area consequentially defined customer group. Undoubtedly, the customer satisfaction can be put on risk. The dissatisfaction of customers in a way is the costliest for retailing as there is hardly any way to change the customers for a retail situated at a particular location. Retail is a service and encounters must be satisfactory to make customers visit the retail in future. Actually, there is a need to be first time right. It can be done by understanding customers' needs and wants thoroughly. And segmentation is required for this.

The process of segmentation requires the identification of bases for segmentation. In segmenting the shoppers the shopping behaviour can be utilized as a basis of segmentation more effectively than other bases as demographic or geographic. The demographic and geographic bases actually decide impact the fact which customers will visit retail store and who will not. But, for segmenting the shoppers, their behaviour and attitude can act as better basis for segmentation.

The shopping behaviours of consumers change with shops' visual merchandising and information displayed in different shops.

**OBJECTIVES**

Objectives of this research can be summed up as following:-

- 1) To examine shopping behaviour for green fashion products,
- 2) To segment the green fashion products' shoppers on the basis of shopping behaviour,
- 3) To know the factors impacting consumption of green fashion products; &
- 4) To know the psychography of green fashion products' shoppers.

**METHODOLOGY**

The current research is broadly a descriptive research aimed at identifying the different segments on the basis of observational studies, questionnaires and interviews carried out in shops.

In the research of studying behaviours of shoppers, the observational technique was actually the most appropriate method to get the primary and the basic information. The research design is by and large descriptive because the research intends to describe the behaviours and attitude of shoppers, not going into the depths of exploring why they behave in such manners.

But carrying out the observational study was a challenge, as the process of observation needs to remain hidden from the shoppers. The feeling of being observed changes the behaviours of human beings in almost all the circumstances. And it makes the researches in humanities more challenging than researches in natural science.

Researchers made it a point that their presence as observers was not disclosed to shoppers. They did not disturb the shoppers in the process of shopping. They followed the shoppers clandestinely and they acted as they were also shopping in the same store.

In a few of the shops, the arrangement was made with the grateful attitude of retailers to facilitate the presence of investigators in the disguise of retail staff. The contribution of retailers at the various shops of Dubai, deserves all the possible praise. It was done by making them understanding the purpose of the research and the usefulness of its outcomes to encourage the consumption of green fashion products and help into marketing of green fashion products.

In sampling, both the breadth and depth were taken into consideration. Here, breadth refers to the number of shoppers being observed, while the depth refers to the time spent to observe each observed shopper and the dimensions of observations. The dimensions include study of moods, behavioural patterns, studying their eyes' movement, the way they observed the information on the product, the time for which they observed different products, the time they took to zero down on particular product, their talking with fellow shoppers (people accompanying them), their timing of shopping and profile related information conjectured through observation and so on.

Observers were instructed to use the tiny pieces of paper and recording equipments. The usage of recording equipments both audio and visual was largely possible due to availability of cellular phones with multimedia facilities and the tendency of students to own these latest gizmos in fashion institutes.

Apart from observational studies (which actually formed the backbone of research methodology), questionnaires and interviews were used as tools to get the additional information from shoppers wherever and whenever it was feasible, and shoppers and retailers assisted in gathering information through these tools.

The research was carried out in the city of Dubai and in total 450 shoppers formed the sample for the research. The number of 450 shoppers was less than targeted, but it was the number which could be achieved in the period of two months by a research team. The findings are based on the data available from observations, questionnaires and interviews of these shoppers.

## FINDINGS AND ANALYSIS

The findings and analysis of this research is based on the observation of 450 shoppers with the additional use of questionnaires and interviews.

The stores selected belonged to fashion items those which also had a good collection of green fashion products like green textile products, green gift items and other consumables under fashion category. In order to ensure better or adequate representation stratification was done in terms of locations within the city, store formats, mall and stand alone stores and new and comparatively old stores. The rationale behind this stratification was to gauge the percolation of environment friendly products' consumption among shoppers. The lifestyle products are largely consumed by people with fair educational and economic background. Hence, the study is based on shopping behaviour of urban consumers. Undoubtedly, it also includes a few of the shoppers with non-urban background with the psychography of awareness about environmental concerns. The active role of media to propagate and inculcate environmental concerns definitely has a major role in making these green products popular. The news and discussions about Kyoto protocol, Copenhagen summit really contributed to consumption of these products. According to media reports, the media in the UAE is comparatively more active in environmental and sustainable issues. Hence, the selection of Dubai luckily was a good choice for this study. Although the selection of this city is due to the fact because it is the city where I work and it was easy to carry out research with the help of students and people known to me in fashion industry and academics.

The selection of stores was also based on the cooperation extended by retailers for this research. There was a conscious effort made to make the study equally representing the different strata but due to obvious reasons of retailers' cooperation and reachability it can't be termed as absolutely free of biases. Nonetheless, it provided a good scope of study facilitating and building platforms for further researches in related areas.

On the basis of this study 18 different segments could be identified on the basis of shopping behaviour. These segments can be described as following:-

1. **CONSCIENTIOUS**-These shoppers go for green products because of their conscience. They feel that consumption of products which impact the environment is sin. This category of shoppers has a tendency to look for these products making special efforts and asking a lot of questions to retail staff about the products and their origins. They believed in going to different stores in search of products of their choice, if they were not satisfied with the products available in stores they visited initially.
2. **ECOFASHIONABLE**-These are the shoppers who have green products as fashion statement. These shoppers buy these products due to the snob value of these products or the reason that the consumption of these products will make them being perceived as eco-conscious shoppers and consumers. These consumers were seen talking to retail staff about the other green products available in different locations of the country and abroad. The price consciousness among these shoppers is comparatively low and they believe in buying products well known for their environment friendly nature.
3. **SOCIALITE**-This is the group of customers those who are buy the products to be worn or used in social functions. These are actually socialites with environment friendly bent of mind. These customers are influenced by aspirational groups like celebrities or page-3 people.
4. **IMPULSIVE**-They buy the products without previous thoughts or much thinking. They make the buying decision at spur of the moment. The number of such customers is also significant. At many occasions, they made the purchase because some of these products caught their attention when their eyes were surfing the products on retail shelves or sometimes they were informed about the nature of these products by the salesmen/saleswomen at retail counters.
5. **CHANGE DRIVEN**-These customers have begun shopping these products due to their tendency of looking for change in their consumption habits. They bought these products just for change, not for any commitment towards green products or any intention to buying these products regularly in future. These shoppers were mostly found in malls and in high-end lifestyle retail stores.
6. **EXPERIMENTER**-Customers of this segment are experimenters. They purchase green fashion products as an experiment. Their future purchase of these products will be dependent on their level of satisfaction achieved on the consumption of these products. The unique aspect of these shoppers are that their purchasing is based on promises of retail sales staff or promises of manufacturers printed on product packaging or on point of purchase materials.
7. **ASSORTMENT HUNTER**-Assortment hunters are always looking for a variety of products under different category. For these types of customers the satisfaction comes from choosing from a large number of options. They frequent the shops with a large number of green products. The satisfaction in these customers comes from the power of discretion to choose among various alternatives.
8. **IMITATOR**-This is the segment of customers who bought these products because they saw other shoppers buying it. They did not have knowledge about these products, but their behaviour was shaped by typical phenomenon of service industry i.e. impact of fellow customers' behaviours. These customers mostly belong to middle class and they were found in both stores in malls and stand alone stores.
9. **DISILLUSIONED**-This is a group of customers those who had a some sort of disillusionment of products they bought in past. It was sometimes related to their uncomfortable experiences on skin with other products or sometimes they were did not feel about disposal of these products (as products were non biodegradable).
10. **VALUE SEEKER**-These shoppers buy the product where the perceived value is maximum. Hence, their buying criteria includes price, guarantee or warranty available, health benefits etc. with products
11. **GREEN LOVERS**-This is the class of shoppers who can be termed as green lovers. They love any product which can be termed as green. Their shopping behaviour was not confined to shopping. They believed in keeping the surrounding at their homes and work places green. One unique aspect of these customers are preference for buying from the stores with green ambience. Hence, the green visual merchandising acted as a very strong cue for their purchasing.
12. **MEDIA INSPIRED**-This segment of shoppers are highly influenced by media. And for the purchasing was a pull phenomenon at retail counter not the push by retailers (no hard selling retailing)
13. **CONSULTATIVE**-This is the segment of shoppers highly influenced by retail staff. Their behaviour in a way a just opposite to that of media inspired. They believed in consulting retail staff, and product or brand selection was based on what retail staff told or advised.
14. **GROUP PLAYER**-They come to shop in group, and the selection of product and brand is a group decision. In most of the cases, it was group of friends or housewives belonging same demography. These groups normally try many products before buying and a fair amount of discussion takes place.

15. **CONFUSED**-These shoppers were confused or indecisive regarding the selection of products. For them, alternative choices have different comparative costs and benefits in comparison to other alternatives.Hence, they try different products at different buying occasions and their brand or product selection was unpredictable.
16. **ACCIDENTAL**-Their purchase of green fashion products is accidental, they do not buy it regularly. They purchase it when they come across such products in the course of shopping, and they like it.
17. **BRAND LOYAL**-These are the customers who stick to a particular brand for a long time. They repeatedly purchase the products of same manufacturer.
18. **DIFFERENCE SEEKER**-These customers have typical attitude of buying something different. They go to various shops to find out different products. They believe in trying new items over old.

## CONCLUSION

It is evident that green fashion products are being purchased for different reasons by different groups of buyers. A few people purchase it due to its obvious contribution to environmental safety, while various others purchase it because it is itself a fashion for them. Many people buy it under the impact of retail staff while many other buy it just to experiment with it. A few people are brand loyal even in this category while others are value seekers.Hence, marketers and retailers need to develop different marketing strategies to market these products successfully. There is an apparent need to understand the needs, wants and behaviours of different segments. And the segmentation on the basis of shopping behaviour seems to be an effective proposition for marketing of these products.

## SCOPE FOR FURTHER RESEARCH

This research was to understand the shopping behaviours of people those who buy green shopping products. On the basis of observations made and data collected from them through questionnaires and interviews, they were segmented in 18 segments on the basis of their shopping behaviour.The habits of shoppers were studied and a few observational studies about the reasons of their shopping was also made.

But the research findings are based on the study of green fashion products in a particular city. There is an obvious scope to carry out such studies in different cities and in larger geographical areas to reach conclusive segmentation of shoppers of green fashion products.

Secondly, there are scopes to carry out researches in other product categories. Researches can also be carried out in single product categories for in-depth study.

The research can be carried out on the impact of in store promotion and overall promotion to so that further insights can be generated to increase the sales of green products.Similarly,researches can be carried out related to age group, income group and other variables and the correlated shopping behavior related to these products.

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## SEARCHING THE CAUSES OF ORGANIZATIONAL FAILURE IN CONTROLLING DRUG ADDICTION IN THE PERSPECTIVE OF SOME RELEVANT VARIABLES IN BANGLADESH WITH SPECIAL REFERENCE TO SYLHET

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### ABSTRACT

*This paper aims to find out the tactics of drug traders in making people addicted to drug, the causes of failure of authority in deactivating their efforts and searching some imperatives to be followed to save the people. After ascertaining the reasons of constant growth of illegal drug business from the secondary data, attempts have been made to suggest implementation of certain necessary measures. The causes of failure of the authority are identified and some imperatives are suggested to remove the loophole and make the institutions more effective. By educating people where necessary and making the vulnerable group of people aware of the detriments of drugs this goal can be achieved.*

### KEYWORDS

Drug, constant growth, loopholes, vulnerable.

### 1.1 INTRODUCTION

**D**rug means a medicine or other substance which has a physiological effect when ingested or otherwise introduced into the body (www.google.com). It can be useful or detrimental to health. Among detrimental drugs the most dangerous is the psychoactive drug. A psychoactive drug or psychotropic is a chemical substance that crosses the blood-brain barrier and acts primarily upon the central nervous system where it affects brain function, resulting in alterations in perception, mood, consciousness, cognition, and behavior. Thus, many psychoactive substances are abused, that is, used excessively, despite health risks or negative consequences. With sustained use of some substances, psychological and physical dependence ("addiction") may develop, making the cycle of abuse even more difficult to interrupt (wikipedia)

Because of this potential for abuse and dependency, the ethics of drug use are debated. Many governments worldwide place restrictions on drug production and sales in an attempt to decrease drug abuse. Ethical concerns have also been raised about over-use of these drugs clinically, and about their marketing by manufacturers.

During the 20th century, many governments across the world initially responded to the use of recreational drugs by banning them and making their use, supply, or trade a criminal offense. By fighting a war on drugs the government has increased the problems of society and made them far worse. A system of regulation rather than prohibition is a less harmful, more ethical and a more effective public policy. In some countries, there has been a move toward harm reduction by health services, where the use of illicit drugs is neither condoned nor promoted, but services and support are provided to ensure users have adequate factual information readily available, and that the negative effects of their use be minimized.

There exist three UN Conventions on drug abuse and trafficking, namely the Single Convention on Narcotic Drugs 1961, the Convention on Psychotropic Substances 1971 and the United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances 1988. Bangladesh is a signatory to all three UN Conventions (bdlaws).

To meet the requirements of these Conventions Bangladesh has enacted The Narcotics Control Act of 1990 (Act no XX of 1990) which covers the control of narcotic drugs and psychotropic substances, including provision for the treatment and rehabilitation of drug dependent people (bdlaws). Bangladesh has amended the Narcotics Act and allows the Director General of the Department of Narcotics Control to send drug addicts for treatment. Drug use is considered as a treatable condition rather than a criminal offence.

### 1.2 TYPES OF DRUG

#### CANNABIS

Cannabis makes users feel relaxed and heighten their sensory awareness. Thus, users may experience a more vivid sense of sight, smell, taste and hearing (unodc).

#### COCAINE

Cocaine makes users feel exhilarated and euphoric. Furthermore, users often experience a temporary increase in alertness and energy levels, and a postponement of hunger and fatigue (unodc).

#### ECSTASY

Ecstasy is usually distributed as a tablet or pill but can also be a powder or capsule. It can heighten users' empathy levels and induce a feeling of closeness to people around (unodc)

#### HALLUCINOGENS

Hallucinogens are drugs that alter users' state of consciousness and produce different kinds of hallucinations (unodc).

#### HEROIN

Heroin makes users feel an initial surge of euphoria, along with a feeling of warmth and relaxation. Users also often become detached from emotional or physical distress, pain or anxiety.

#### METHAMPHETAMINE

By taking Methamphetamine users experience a temporary rise in energy, often perceived to improve their performance at manual or intellectual tasks. Users also feel postponement of hunger and fatigue. Such as, Crack meth, Ice, Crystal meth, Tik, Shabu, Yaba



### 1.3 REASONS FOR DRUG ADDICTIONS

Most of the people take drugs as they think it will help them lead a better life than he is leading right now. Many of them believe taking drugs causes them to forget the sorrows and frustrations. Some think that drugs are solution to their problem but in reality it is not. The reasons behind the taking of drugs are not clear, but many social scientists blame the examples set by their elders. Firstly, parents who drink and smoke are, in effect, telling their children that it is a socially acceptable behaviour. Consequently children may have a similar view towards illegal drugs, even if their parents are against their use. In addition, drug use shown on television, films, magazines and public displays can only attract children, if not confuse them, about the serious health-hazards that are associated with drug abuse (thefinancialexpress).

From another perspective, the pressure on young people to perform well at schools and other competitive platforms is a possible cause of the problem. Many believe they cannot live up to their parents' expectations and feel a sense of hopelessness and frustration. Scientists have established a relation between drug use and stress, frustration, lack of expressing dissatisfaction with the pressures that they face in society. Also the widespread availability of drugs means teenagers are often encountered by the temptation to experiment. (thefinancialexpress).

### 1.4 DRUG ADDICTION & CRIME

Drugs are related to crime in multiple ways. Most directly, it is a crime to use, possess, manufacture, or distribute drugs classified as having a potential for abuse. Drugs are also related to crime through the effects they have on the user's behavior and by generating violence and other illegal activity in connection with drug trafficking. (bjs.gov)

### 1.5 YOUNG GENERATION & DRUG

Nowadays hundreds of thousands of youths across Bangladesh are taking drugs on a large scale which is turning to create a catastrophic event. Drug abuse among youth is a serious problem in Bangladesh. Not only the illegal drug use is on the rise, but children as young as 10 years old are also experimenting with alcohol, phensidyl, heroin, baba, ganja, and other forms of available drugs. Many young talents are wasted, and prolonged addiction to hard drugs can cost a user his or her life. Suggesting remedies for youth drug abuse requires a clear understanding of the underlying reasons. (thefinancialexpress)

### 1.6 DRUG TRAFFICKING ROUTE-MAP IN BANGLADESH

Bangladesh, with its longest borders with India on 3 sides and with Myanmar to the northeast has become very risky and vulnerable for drug trafficking and abuse. The most frequently used drug is heroin, thereafter, phensidyl (Codeine based cough syrup) illegally transit from India and the third highest is cannabis. Bangladesh has borders with India on its three sides except the south, which stands on the Bay of Bengal. The three border routes are as follows:

Routes	Areas
<b>The Western Routes</b>	Darshana, Zibannagar of Chuadanga, Hili and Birol of Dinajpur and Moghulhat, Aditmari, Durgapur, Fulbari, Nageshwari of Kurigram and Nawabgonj, Rajshahi, Meherpur & Debbat and Kaligonj of Khulna and Benapole, Chowgacha of Jessore.
<b>The Eastern Routes</b>	Akhaura, Zhautala, Sadullahpur, Nawagaon, Singer bil, Col. bazar, Gangasagar and Kasba of B.Barua, Bibirbazar, Chagalnaiya, Maharajganj and Gutuma of Feni, Barkal and Baghaichari of Rangamati, Chittagong, Teknaf of Cox's Bazar, Dighinala, Panchari, and Matiranga of Khagrachari.
<b>The Northern Routes</b>	Haluaghat(Telikhali/Karaitali/Surjyapur/Bandarkata/Munsirhat/Munshipara) of Mymensing and Durgapur (Bijoypur and Bhabani area) of Netrokona and Bangla Banda, Bhurungabari, Jhenaigati, Sunamgonj, Tamabil.

### 2.1. OBJECTIVES OF RESEARCH

The main objective of this research is to explore the business tactics of drug traders, the causes of failure of drug administration in controlling the drug business and finding out the effective methods to control the drug business.

### 2.2 RESEARCH METHODOLOGY

#### RESEARCH DESIGN

The research is to study the present's tactics of drug traders, the causes of drug addiction, the existing laws to control the drug trading, the causes of failure of drug and narcotics control department and the effective way outs to control the drug trading in Bangladesh. So it is the research of descriptive nature.

#### SAMPLING DESIGN

The research is designed to use the secondary statistics of narcotics department and others with some primary data collected from drug control official and executives of rehabilitation centers of Sylhet district to get insights of causes and remedies of controlling drug trade along with addicted persons. To take the opinion of experts and executives of drug administration the researchers have to depend on non-probabilistic type of sampling to ensure the availability along with the reliability of data.

#### DATA COLLECTION

The primary data was collected from the executives of narcotics control department, Sylhet and the rehabilitation centers, who were selected by the judgmental sampling to ensure the availability and reliability of data. The data were collected from them and from 200 addicted persons by well designed questionnaire and interview. The secondary data was collected from the books, brochures, websites, newspapers, magazine and journals etc.

#### INTERPRETATION OF DATA

The data was processed by SPSS 19 and Microsoft Excel 2007 to get the insights and interpreted by the output of SPSS and excel. Some recommendations are made through the logical viewpoints of the researchers from the outputs.

### 3.0 FINDINGS

#### 3.1 PRIMARY REASON OF DRUG ADDICTION

The drug addicted persons are the customers of drug traders. The promotional activities of them are oriented to the causes of drug addiction. The drug traders capitalize the causes and make the persons addicted to use drug regularly.

**TABLE 1: REASONS FOR DRUG ADDICTION**

Reasons for drug addiction	2011	
	Number	%
Interest	259	32.62
Peer pressure	439	55.29
Satisfaction	11	1.39
Mental Disorder	5	0.63
Adverse family Environment	33	4.16
Easy Availability	1	0.13
Unemployment	1	0.13
Frustration	36	4.53
Ignorance about addiction	3	0.38
Medical hazards	1	0.13
Others	5	0.63
Total	794	100.00

Source: Annual Drug Report, 2011 (dnc.com)

From the above table it is clear that the modal class is the peer pressure. The drug addicted persons enjoy taking the drug in a group, so they tried to keep pressure on their peers to use these drugs. Specially they take the advantage of weakest moments of the peer and also attract them to enjoy their life by taking drugs. The second largest cause is interest. Around 32% persons were addicted by their interest to know about the drug. Sometimes, it happened by the drug control campaign of the authority. The drug traders take the advantage of promotion of drugs by the controlling authority's campaign. The brokers of drug traders try to grow interest of the youths to drugs by various ways also. Adverse family environment and frustration are shown as the causes of drug addiction in 4% of the persons each. The other causes like easy availability, unemployment, ignorance about addiction, medical hazards & others are proved as insignificant causes of drug addiction.

From the survey in Sylhet it is found that out of 200 addicted persons, 50% of them are addicted because of peer pressure, 20% of them are from interest and the rest from other enlisted reasons of the above table. So it is clear that the marketing of drug traders in the form of peer pressure and interest created more addicted persons.

**3.2.1 AGE VARIATION OF DRUG ADDICTION**

Another important factor of finding the tactics of drug traders is to find the age limits of addicted persons to identify the maturity levels of the addicted persons and to find the drug traders influences on them. The following table explores the age variations of the addicted persons:

**TABLE 2: AGE VARIATION OF DRUG ADDICT**

Age	Number	%
Below 15	11	1.39
15-20	81	10.25
20-25	136	17.22
25-30	232	29.37
30-35	178	22.53
35-40	81	10.25
40-45	41	5.19
45-50	23	2.91
Above 50	7	0.89
Total	790	100.00

Source: Annual Drug Report, 2011(dnc)

The above table shows that the modal class of addicted persons is 25-30 aged (29.37%). The second largest class is 30-35 age groups (22.53%). Another significant class is 20-25 age groups (17.22%). It is apparent from the table that the drug addiction held more in the age of 125-30, here youths are somehow in anxiety about their future. The other significant influences of the two age groups also expressed the uncertainty in the future with immaturity may be the main cause of drug addiction, when men are becoming somehow independent in their life as the guardians control at that stages are becoming slacks. The peer pressure and interest can influence on the targeted persons of the drug traders and brokers.

From the survey in Sylhet it is found that out of 200 addicted persons, 45% of the addicts are of 25-30 years of age, 25% of them are of 30-35 years of age, and the rest from other enlisted age ranges of the above table. So it shows that at that age a person usually feels himself much more independent and capable of making decisions of his own and due to that attitude, they become the victims of drug marketers.

**3.2.2 MARITAL STATUS OF DRUG ADDICT**

it is also important to check whether the marital status have influence on the addiction to drug or not. The following table exposed the same:

**TABLE 3: MARITAL STATUS OF DRUG ADDICT**

Status	Number	%
Unmarried	295	37.25
Married	430	54.29
Separate	41	5.18
Widow	3	0.38
Divorced	22	2.78
Other	1	0.13
Total	792	100.00

Source: Annual Drug Report, 2011(dnc)

The table also expressed the impact of peer pressure and interest is the main cause of drug addiction on the persons. The effect of peer pressure can play effective role on the person at the stage of their going to be independent. So the newly marital stage is the most effective time to make them customers by the method of peer pressure. Of course it cannot affect on the matured stage, but addiction cannot be removed easily. For these reasons the married persons are most vulnerable class in drug addiction and the traders targeted that class more. The unmarried persons are the second largest group of being addicted. It also happened at the stage of their going to be independent age. The main promotion by peer pressure and growing interest can play effective role at that stage also. In Sylhet area among the 200 drug addicts 60% of them are married and 10% of them are divorced and rest belongs to the other classes. So it implies that sense of immaturity also plays a significant role in drug abuse.

**3.3 EDUCATIONAL QUALIFICATION**

Checking the education time of the addicted persons is also a significant factor. The tools of promotion have great influence on the shorter duration than longer duration because the education level can increase the reasonability and understanding of men. The following table shows the effect of drug promotional tools on the education time of men:

**TABLE 4: EDUCATION TIME OF MEN**

Education time	Number	%
Illiterate	208	26.26
1-5 years	149	18.81
6-9 years	198	25.00
10 Years	121	15.28
11-12 years	61	7.70
13-14 years	31	3.91
15-more	24	3.03
Total	792	100.00

Source: Annual Drug Report, 2011(dnc)

The above table successfully showed that the modal class in illiterate class of people who are most vulnerable as the drug traders are successful on them to make them addicted on drug. It is gradually reduced with the increase of education time as education build up the logical ground of men. But why the 6-9 years group is more affected than 1-5 & 10 years group cannot be explained by the researchers.

Survey in Sylhet Area shows that, 30% of drug addicts is illiterate and 20% is primary school dropout. This indicates that ignorance in education is an important factor which drives a person take drugs.

**3.4.1 FAMILY INCOME**

It should be examined that whether family income have significant influence on the addiction or not. Because there is some logic that, the lower family income creates frustration among members that leads to the addiction. The following table shows the addicted persons in number and in percentage distributed by the family income:

**TABLE 5: FAMILY INCOME OF DRUG ADDICT**

Income	Patient	%
0-2000	15	1.90
2001-3000	86	10.89
3001-5000	133	16.84
5001-10000	330	41.77
10001-20000	151	19.11
20001-Above	75	9.49
Total	790	100.00

Source: Annual Drug Report, 2011(dnc)

From the above table it is clear that the modal class is the family income group of 5001-10000. It constitutes around 42% of the addiction under survey. The second largest group is 10001-20000 (19%). Then another significant income group is 3001-5000 (16.84%). But it is proved that in the solvent family drug addiction is lesser and it is lowest in most vulnerable economic group of family income of 0-2000. The group of 5000-10000 shown highest addiction, because this group suffer most as they cannot make the both ends, meet in the daily requirements. The lower income group can manage somehow and have no money spare to involve in drug addiction. The higher income groups are beyond the frustration from economic reason and at the mean time they are well informed about the bad impact of addiction and the marketing techniques of drug traders and become cautious about the dreadful habit.

In our survey, it is found that, the middle income family members are mostly indulged in drug addiction. This is due to failure in meeting the necessities of families and ability to spare money for drugs. For the involvement in family affairs in most of the time they cannot develop themselves with the information of bad impact of drug addiction. The markets can avail that opportunity.

**3.4.2 PROFESSION OF THE DRUG ADDICTS**

it is also to check whether the profession have any influence on drug addiction or not. The survey on addicted persons on different professions of low income people is checked to explore the same. It is expressed in the following table:

**TABLE 6: PROFESSION OF DRUG ADDICT**

Profession	2011	%
Unemployed	365	46.09
Small Business	104	13.13
Job	64	8.08
Day Worker	84	10.61
Driver	56	7.07
Students	30	3.79
Farmer	11	
Other	78	
Total	792	

Source: Annual Drug Report, 2011(shaptahik 2000)

The highest addiction is held on the unemployed persons (46%), as they have the scope to be in touch of peer pressure. They are also targeted persons in reach of salesmen of drug traders. The small traders are second largest group because they are in reach of the traders. The salesmen have also access on them easily. The farmer is the class of least addiction as they are out of their reach and have no access to them easily because they are very busy with their work and no time to enjoy in leisure.

By the survey in Sylhet the similar result was found. The unemployed and small traders are the vulnerable class of drug victims. Around 70% of members are found from those classes.

**3.5 CRIMINALS' DRUG ADDICTION**

It is also shown that the criminals are the easy target of drug traders as the criminals can easily involved in drug trading. The person of high crime record becomes easy target of the drug traders, brokers and the salesmen of traders. The % of people involved in drug addiction with criminal record in the last five years is shown in the following table:

**TABLE 7: CRIMINAL RECORDS OF DRUG ADDICTS**

Year	% of addicted people's crime record
2007	33.22
2008	47.73
2009	73.68
2010	56.10
2011	46.88

Source: Annual Drug Report, 2011(dnc)

The above table shows that it is in increasing trend from 2007 to 2009, then it shown decreasing trend. It may be because of anti drug campaigning of the government and various groups in current years.

### 3.6 AMOUNT OF DRUG TRADES

It is not ascertained the annual units of drug consumed in the country as it is used as at route of drug trafficking and also a good market of drug as it is the most populated country of the world. From study, it is found that around 60 lakh people of Bangladesh spend Tk. 7 crore on various types of drug daily ( The daily Star, Aug. 14, 2013). The seizure list of drug control department and police can be used to predict the total drug consumed and transferred in the drug route. The list is summarized as below:

**TABLE 8: LIST OF SEIZURE OF DRUG IN THE LAST 5 YEARS**

Name of Drug	Seized drug in the last five years				
	2008	2009	2010	2011	2012
Popy Plant		1450210			
Affim (kg.)			11.69	8.07	
Heroin (Kg.)	146593	159783	188186	104183	78802
Elements produce Kodin (bottle)	904384	1117354	961260	925763	788580
Loose kodin (liter)	2620.438	32955.581	48749.357	52691	26695
Kanabis (Kg.)	24282.395	32955.581	48749.357	52691	26695
Kanabis Plant	2834	791	1760	742	243
Injecting Drug (Ample)	45921	89469	69158	117042	92423
ATS (Yaba Tablet)	36543	129644	812716	1360186	1073827

Source: Annual Drug Report, 2011(dnc)

The increasing trends of seizure of ATS (Yaba Tablet) clearly indicate that the use of Yaba is increasing in the country. The same trend is shown in injecting Drugs. Kanabis seizure was in increasing trends up to 2010 but a declining trend in expressed in 2011. It may be due to the failure of authority. Heroin seizure is also reduced in a little bit, but there is also a regular flow.

### 3.7 EXISTING MEASURES TO CONTROL DRUG IN BANGLADESH

#### 3.7.1. EXISTING LAWS IN BANGLADESH

In Bangladesh the Narcotics Control Act of 1990 (Act no XX of 1990) is the prime law to control narcotic drugs and psychotropic substances in. Some other laws like The Narcotics control Rules 1999, The National Narcotics Control Board Fund Rules 2001, Alcohol Control (License Fee) Rules 2002 and Acid Control Rules 2004. Under Narcotics Control Act of 1990 drug use is considered as a treatable condition rather than a criminal offence. Any kind of illegal operations regarding narcotic drugs, psychotropic substances as well as precursor chemicals is prohibited under Section 19 and 20 of the Act. Additionally, a rule is introduced for the licensing of the precursor chemicals. It is a special law having predominance over other laws in respect of its ambit and jurisdiction on drugs and drug related issues. Interception of illicit drug trafficking through law enforcement, control of narcotic drugs and psychotropic substances used in medical, industrial and scientific purposes coupled with treatment and rehabilitation of the drug addicts underlie the propriety of this law. But there has no adequate and enabling law to handle the grubby condition created by drug abuse and the related issues.

#### 3.7.2. AUTHORITIES TO CONTROL DRUG

a. NNCB: National Narcotics Control Board was formed in 1990 for achieving the objectives of narcotics Control Act 1990', headed by the Home Minister with the Director of Narcotics Control Department as the member-secretary. The responsibilities of the board was marked as making necessary policies to prevention of drug addiction, collecting data regarding various aspects of narcotics, to create public awareness and to take any measures necessary to control.

b. DNC: Department of Narcotics Control is formed with the responsibilities to implement the policies of NNCB. It is powered with 155 field offices across the country with headquarter in Dhaka. DNC has 4 zonal office, 4 zonal intelligence offices, 26 range office, 108 circle office, 1 chemical laboratory, 4 treatment centers, 4 Distillery, 13 ware Houses with 1277 sanctioned officers.

c. Police, RAB and BGB: Police, RAB, BGB are the supporting forces in controlling drug. They are to help the narcotics control department by catching the drug traffickers across the country.

d. Social Norms: Our social norms are strong force against drugs. But the social system is about to destroy due to changing norms and migration of people from one place to another weaken the social strongholds.

The sanctioned manpower of DNC is 1283 persons. Up to April 2013 21% of the actual requirements are vacant. Among the vacant positions, most of them are class three employees. Imports of different chemicals are found to be used in drug production in the country. So there are lacking in supervision for imported drug consumption in necessary field and in abuse. The laws and authority to implement is almost sufficiently equipped but the measures are not taken properly. It is alleged that the authority itself is involved in taking bribes monthly from drug traffickers. Even in the remote place like prison, drugs are widespread with the help of law enforcing agencies, as the marketers found it is a good market as the prisoners have nothing to do in the place but to worry about their future. In that situation, using drugs can give them relief from anxiety. So with the help of the law enforcing authority they targeted that place and successfully marketed the product and making huge number persons addicted.

The business of transferring to the profitable places in DNC is published in various media regularly. It proved that the authority is failing to control the drug. They are making money by helping the drug traders in their marketing and distributions in the name of controlling the drug.

The police are found taking extortions regularly from the drug traffickers. Even they are found taking Tk 1000-2000 from the rickshaw pullars and release them even when they found drugs in their vehicles (Shaptahik 2000, 2012).

### 4.0 RECOMMENDATIONS

4.1.1 Peer pressure has been found to be among the strongest reasons of drug use during adolescence. To reduce the influence of peer pressure various governmental and non-governmental initiatives need to be taken. Effective schooling is one of the reasons which cause drug abuse reduction. Educational institutions can play a great role in ensuring effective schooling among the youth. The government may introduce compulsory subject in Higher Secondary level on moral teachings. Laws can provide stricter punishments if anyone induce someone to take drugs. Existing laws need to be amended and should meet the growing need of time. In Bangladesh drug abuse is considered as a treatable situation, not an offence. Here at least reformatory punishments may be introduced.

4.1.2 Another important cause of drug abuse is "Interest" among the youths about drugs. In that case also measures need to be taken to make people aware about the demerits of taking drugs. The Electronic and Print Media can play a great role in creating awareness. They can run anti-drug campaign and may also show the demerits of taking drugs through various popular television programs. In Bangladesh until now four short films on drugs has been made but it failed to

grow interest among the viewers. Usually people don't enjoy watching awareness programs. That's why the authority should rethink about alluring the viewers. Various participatory competitive programs can be initiated and beside that anti-drug campaign can be run during the popular television programs.

4.2.1. It is found that going to be independent level of age is the most vulnerable in drug addiction. So it is suggested to build up proper awareness to combat the marketing of drug traders among the youngsters.

4.2.2. The newly married and unmarried persons are found as drug addicts because of their immaturity and newly independent attitude when the guardians are to ignore the supervision. So it is suggested to build up awareness by all means to protect them.

4.3 It is found that the rate of drug abuse among the illiterate people is alarming. That is because they are less caring about the affects of drug abuse. They take it as a usual habit and they do not care about the physical, economical, mental or social harm caused by the drugs. Awareness program among those people is mandatory at first place. Measures may be taken to educate them, to make them know the bad sides of taking drugs. People who have discontinued their study may also be given chance to continue their study at any stage of life.

4.4.1 The middle income families are targeted by drug marketers. So the authority can think to create a savings attitude among them by new schemes of better return and also the awareness programs of every available means.

4.4.2 The majority of drug addicts are small traders and unemployed persons. So the authority should give more emphasize to solve the unemployment problems and the law enforcing agencies must be cautious about the movement of drug traders and brokers along with drug addicts to the small traders. Besides, the awareness programs will play significant role in this respect.

4.5 To address the issue of drug addiction among the offenders who are in prison it is suggested to take measures to ensure proper accountability of the Jail Authorities. Culprits who are responsible for this should be brought before justice.

4.6 Authorities dealing with controlling of drug trades must be made competent to meet the demand of time. Special Training for the officials can be arranged which can bring some significant improvements.

4.7.1 Prosecution and sanction need to be carried out properly. There should be a special court to deal with drug and drug related offences for speedy disposal. To prevent the drug traders from marketing their harmful products law enforcement agencies should be reformed. Punishment for trading drug should be increased. Good governance should be ensured in all spheres.

4.7.2 Concerned law enforcement body should be rearranged. Miscreants, those who are hidden in the Police, RAB, BGB, Jail Authority and Narcotics Control Department, must be punished. At the same time, rewards may be declared for good performance. It is obvious that, drugs business would fall rapidly if border-crossing areas can be checked properly.

4. 8 Mentors of social institutions like schools, colleges, other educational institutions etc. should come forward to build resistance against drugs.

## 5.0 CONCLUSION

Drug abuse directly affects the economic and social growth of a country. In Bangladesh it is a raising concern and is spreading like a disease in the society. The symptom indicates that, it is going to bring a social change in Bangladesh. The adequate laws and logistics support of the authority is failed in meeting their objectives to reduce drug addiction. The causes of failure of the authority should be properly identified and preventive measures should be taken. The suggested measures can be taken to bring the effectively of the authority. A more intensive research, action program, and social movement are needed. It is also needed to strengthen family and social values and religious ethics in order to maintain a stable and drug-free society.

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## AN ASSESSMENT OF QUALITY OF SERVICE DELIVERY IN ETHIOPIAN PUBLIC HIGHER EDUCATION INSTITUTIONS

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### ABSTRACT

*The study assesses the status of quality of service delivery in public higher education institutions in Ethiopia. Quantitative research approach/design was used. Data were collected from academic staff and regular students at six public higher education institutions using the SERVQUAL scale and through focus group discussions. The research findings indicated that the quality of service delivery were to be very poor. The findings also indicate that reliability, tangibles and empathy present the service quality dimensions that require the most urgent attention. It is further recommended that for effective implementation of the BPR/BSC process, the importance of the provision of different training and guiding documents, continuous monitoring of activities and top management support should be kept in mind.*

### KEYWORDS

service quality, SERVQUAL, Importance Performance Analysis (IPA), assessment, Business process re-engineering (BPR).

### BACKGROUND

The "massification" of higher education in Ethiopia poses a number of challenges regarding the attempt to provide quality service. These challenges have contributed to the growing government interest in establishing policy mechanisms to satisfy customers'. Currently, quality and related issues (quality assessment, quality assurance, stakeholder satisfaction and service quality improvement) in Ethiopian higher education are high on the national agenda. Service quality has become a key strategic issue at HEI management level.

To bring quality in service delivery it is better to understand what service quality is. One way of understanding service quality is to understand the characteristics of service quality. The four well-documented characteristics of service provide a clear understanding of what service quality is (Parasuraman *et al.*, 1985). The first characteristic is intangibility, which refers to the fact that services are performed, which cannot be measured, counted or inventoried. Thus, it is difficult for institutions to know how stakeholders perceive and evaluate the service quality of their institutions. The second characteristic is heterogeneity, which indicates that there is variation in the perception of service quality from producer to producer, stakeholder-to-stakeholder or even over time. What the stakeholders perceive may be completely different from what the institutions may deliver. Hence, assuring uniformity in quality is difficult. The third characteristic is the inseparability of production and consumption. In some service organisations quality occurs at the time of service delivery, mostly in the form of the interaction between the stakeholders and the contact person from the service organisation. In some cases, the inputs of stakeholders become important for the quality of service delivery. Prakash and Mohanty (2012) and Hill (1995) add a fourth characteristic, namely perishability. They go on to state that perishability refers to the fact that goods/service can be consumed only as long as the activity or the process continues. That means that services cannot be stored for a long period like products and are stopped when the organisation discontinues the process.

Many stakeholders are involved in higher education. The primary stakeholders in the Ethiopian higher education sector are direct beneficiaries students, academic and administrative staff, the university management, research collaborators, other institutions, funding organizations and potential employers. Secondary stakeholders include former graduates, part-time instructors, professional associations, international organisations, visiting professors, employing organisations and adjunct staff (HU, 2009b). One of the driving forces of BPR (business process re-engineering) implementation in Ethiopian public higher education institutions as service quality improvement strategy is the failure to satisfy external (government and community) and internal (students and staff) stakeholders of the universities (HU, 2008).

### LITERATURE REVIEW

The degree of service quality delivery mostly depends on reliable assessment and measurement techniques (Nadiri, Kandampully & Hussain, 2009; Quinn *et al.*, 2009). The measurement of service quality is a prerequisite for improvement, because "... you cannot improve what you cannot measure" (Owlia, 2010). However, finding the appropriate instrument for measuring service quality is a controversial matter, according to Abdullah (2006). Accordingly, a few conceptual models for measuring customer satisfaction on service quality have been developed. Namely, the SERVQUAL model (Parasuraman, *et al.*, 1988) reveals the gap between customer perceptions and expectations of service quality, while the SERVPERF model (Cronin & Taylor, 1992) only gives an indication of the perceptions of service quality. The EP model (Teas, 1993a, b) also measures the gap between perceived service quality and the ideal quality of service, while the importance-performance analysis model (Martilla & James, 1977) describes the absolute performance measure of customer perceptions. On the other hand, the HEDPERF (Higher Education Performance) model is (Firdaus, 2006) employed to identify valid determinants of service quality in higher education institutions (Firdaus, 2006).

There is no universally agreed single model suitable to all circumstances to be employed in HEI service quality management and measurement (Becket & Brooks, 2008; Nadiri *et al.*, 2009; O'Neill & Palmer, 2004). Therefore, this research makes use of the two most popular models (SERVQUAL and IPA) to assess the service quality in Ethiopian higher education. According to Parasuraman *et al.* (1985; 1988), the SERVQUAL model is also referred to as the disconfirmation paradigm or the gap model. The model shows the gap between stakeholder perceptions and their expectations of service quality in order to assess service quality. The wider the gap between stakeholder expectations and perceptions, the larger the weakness in service quality (Parasuraman *et al.* 1985).

According to Parasuraman *et al.* (1985) regardless of the type of service, stakeholders basically used similar criteria in evaluating service quality. These criteria seem to fall into 5 dimensions of service quality, which are labelled by Parasuraman *et al.* as "service quality determinants". According to Parasuraman *et al.* (1985), judgements of service quality by stakeholders depend on how they perceive the actual service delivery, with respect to what they expected. The five service quality dimensions are: tangibles, reliability, responsiveness, assurance and empathy.

The Importance- Performance Analysis (IPA) also used to assess the service quality delivery. For a service sector practitioner it is important to be able to measure the extent of satisfaction and the importance of service attributes to users. Accordingly, satisfaction is a function to the fulfilment of the needs of stakeholders by all the service attributes (Schneider & White, 2004). Thus, it is of considerable importance for the management section firstly, to identify service attributes that are in need of improvement and then to improve these areas, thereby increasing stakeholder satisfaction. According to Joseph and Joseph (1997), the IPA paradigm is the most suitable model for measuring service quality satisfaction in educational institutions.

### BPR IMPLEMENTATION AS SERVICE QUALITY IMPROVEMENT

Business Process Reengineering (BPR) in 2003 as part of the civil service reform was launched in all public organisations and in 2008 in PHEIs in order to bring radical change to the quality of service delivery (Getachew & Common, 2006; Adebabay, 2011). Even though all the public universities in Ethiopia have officially



declared that they have implemented the BPR process in order to solve several problems related to service quality delivery that are identified by HEIs, Naod's (2011) findings indicate that only 40% of the BPR process was implemented by public universities.

Business Process Re-engineering (BPR) as a quality improvement initiative is commonly applied in the business sector for attaining efficiency, effectiveness and for making the activities customer-focused. It is a new phenomenon in the HE context (Walker & Black, 2000). For Vakola and Rezqui (2000), BPR provides an opportunity for monitoring and evaluating the progress of the re-engineering effort. Regarding the aims of BPR, Selladurai (2002) as well as Tissan and Heikkila (2001) deem it an improvement of business processes through the implementation of radical and rapid changes by removing the way of doing through replacement and formation of new processes.

Before the implementation of BPR, Hawassa University and Mekelle University's BPR teams found so many problems related to service quality. Some of the problems are: staff lacked professional training and that the institutions were understaffed and that the service rendered was not stakeholder-oriented. In addition, procurement procedures were lengthy, leading to delays in service provision. Other areas of concern were security on campus and the lack of fencing around campuses, hygiene at campus cafeterias, waste and sewerage removal and too few personnel. Further problems were the lack of staff punctuality and problems of ethics, the absence of vehicles for waste removal, the lack of timely maintenance of the pipelines and toilets, and the problem of sustained checking of despatching and receiving of goods, guests and vehicles (HU, 2009b; MU, 2008). All these problems render the current work situation of HEIs difficult and laborious in terms of providing satisfactory service quality to stakeholders.

Inevitably, these problems have forced the universities to restructure the activities of the institutions and to start implementing quality improvement initiatives themselves using BPR as a tool. In Ethiopian PHEIs, radical changes have taken place as a result of BPR processes in order to bring about improvement in the performance of the institutions. Based on the BPR redesigns in terms of the BPR principles, public HEIs are now claiming that they are progressing in terms of attaining increased stakeholder satisfaction and improved service quality. However, the following research questions were raised:

1. Have PHEIs attained the service quality delivery as the expectation of the stakeholders (academic staff and students)?
2. What is the perception of both academic staff and student towards the implementation of BPR as service quality improvement?
3. Are the HEIs trying to improve the quality of service delivery as the BPR team recommended?
4. Which areas of service quality require more attention and priority?

**METHODOLOGY**

Quantitative approach was used as the study design. From the 31 MoE owned universities (MoE 2012) six universities were selected using simple random sampling techniques: Hawassa, Mekelle, Addis Ababa, Wolaita Sodo, Dilla and Debre Brehan. A representative sample of 1200 students and 240 academic staff from all six public universities were selected for the survey study. The selection of academic staff and students for the survey study was also based on the principle of random sampling.

The modified, self-administered SERVQUAL survey questions (Parasuraman *et al.* 1991) were used to gather information related to the perceptions of, importance of service quality improvement and priority areas. The questionnaire had four parts: The first paragraph dealt with the demographic information of the respondents. The second part contained 22 items designed to measure stakeholder expectations (E) of service quality improvement. The third part presented questions that were designed to measure stakeholder perceptions (P) of service quality improvement and which comprised the 22 questions that mirrored those of part one. The final part required respondents to specify the importance of the various attributes based on the 22 items for expectation and perception.

The same SERVQUAL questionnaire was used to assess the IPA scale. The IPA questionnaire requested respondents to rate the importance of the service attributes from the vantage point of users of the service (higher education service quality improvement). Respondents were requested to rate the importance of each service attribute in improving the quality of service of the institution. Respondents rated the importance on a 5-point Likert rating scale where a rating of '1' indicated very low importance, up to a rating of '5' indicating a rating of utmost importance. Likewise respondents were requested to rate service attributes on perceived service performance on a 5-point satisfaction scale where a rating of '1' indicated total dissatisfaction with performance on attribute of service up to a rating of '5' indicating total satisfaction with a service delivery improvement attribute.

**DATA ANALYSIS AND INTERPRETATION**

The mean difference between perception and expectation was calculated for both the academic staff's and the students' data sets. In addition, the data were analysed, by using a factor analysis firstly. The purpose of factor analysis is to describe the covariance relationships of variables (Johnson & Wichern, 1998; Hair, Black, Babin & Anderson, 2010) and to examine the dimensionality of the service quality concept.

In addition to factor analysis, quantitative data of the present study was also analysed using the Importance Performance Analysis (IPA) technique. IPA analysis uses a grid system to visually display the importance-performance balance of service attributes as perceived by stakeholders/users of services. The grid is divided into four quadrants of varying perceived importance-performance balance.

**INTERPRETATION AND ANALYSIS OF DATA**

A total of 1440 questionnaires were distributed and 1427 questionnaires were returned. In total, 1423 questionnaires were found to be acceptable as reliable responses to generate data for the quantitative analyses. This accounted for the response rate of 98.8%. The study employed Principle Factor analysis and Maximum Likelihood, with an oblique rotation. The oblique transformation was selected because there was reason to believe that the factors that probably underlie the data were dependent.

**TABLE 1: SIGNIFICANCE TESTS**

Significance Tests Based on 1423 Observations			
Test	DF	Chi-Square	Pr >ChiSq
H0: No common factors	231	9487.1897	<.0001
HA: At least one common factor			

- Reliability criteria: Akaike Information criterion, Schwarz's Bayesian criterion and Tucker and Lewis's reliability coefficients.

Chi-Square without Bartlett's Correction	524.07686
Akaike's Information Criterion	223.06696
Schwarz's Bayesian Criterion	-512.31321
Tucker and Lewis's Reliability Coefficient	0.93423

**DECIDING ON FACTOR LABELS**

Factors are labeled according to the concept or aspect of quality service delivery which the variables that underlie the factor represent. The four labels of the factors in the current study were therefore assigned as follows:

**Factor 1:** the subset of variables, q5-q9, describe aspects of reliability loaded into factor 1.

**Factor 2:** Two subsets of variables, namely q10-q12 (not q13) and q1-q3 (not q4) load into factor 2 – this corresponds to the *responsiveness and tangibles* dimensions of the service quality delivery which seem to be related to effectiveness and efficiency of service delivery – and the materials used in service delivery. The factor was labeled *service delivery/process*.

**Factor 3:** the subset of variables, q14-q17 described the construct of *assurance* of a service and was labeled "*assurance*"

**Factor 4:** the subset of variables, q19-q21, (not q20) describe the concept of *empathy* and was therefore labeled "*empathy*".

Thus, an exploration of the underlying constructs of higher education institutions service quality delivery revealed four dimensions: *service reliability, delivery, assurance* and *empathy*. The table below shows the rotated factor loadings for the four-factor model of best fit.

TABLE 2: ROTATED FACTOR PATTERN FOR THE 4-FACTOR SERVQUAL PERCEPTION DATA FACTOR ANALYSIS

Perceptions Scale items	Factor loading			
	factors			
	1	2	3	4
q12		64		
q10		65		
q2		73		
Q3		43		
q1		64		
q11		59		
Q4	41			
q18		49		
q8	63			
q7	63			
q6	61			
q5	60			
q9	41			
q3				
q21				75
q22				63
q20				62
q19				41
q14			52	
q16			57	
q17			61	
q13			50	
q15			69	

Printed factor loadings are multiplied by 100 and rounded to the nearest integer.  
 Loadings less than 40 are suppressed to facilitate pattern recognition (Field, 2005).  
 Extraction Method: Common factor analysis: Maximum Likelihood (Principal Axis factoring used in preliminary phase).  
 Rotation Method: ProMax (Oblimin with Kaiser Normalization used in preliminary phase). 4 factors extracted  
 \*Items: P1 - P4 (Tangibles)  
 P14 - P17 (Assurance)  
 P5 - P9 (Reliability)  
 P18 - P22 (Empathy)  
 P10 - P13 (Responsiveness)

Calculation of perceived and experienced service delivery quality construct-scores to assess the gap between perceptions and expected service (the service quality gap)

The mean differences, referred to as the 'gap scores', are included in Table 3 for the entire sample. In table 4 the mean difference scores are presented in such a way as to compare academic staff and students on the different dimensions. Tables 5 thus reflect how respondents perceive service: if the gap score deviates considerably from zero, a discrepancy between the experienced and expected level of quality service delivery for a service quality dimension is indicated. In Table 3 t-test results testing the null hypothesis that the mean difference score for a service quality dimension does not deviate statistically significantly from zero (in other words that expectations and experience do not differ) are included in the last column of the table.

TABLE 3: SERVICE QUALITY GAP ANALYSIS FOR ALL RESPONDENTS: MEAN EXPECTED, EXPERIENCED AND GAP SERVICE QUALITY CONSTRUCT SCORES FOR THE FIVE SERVQUAL SERVICE DELIVERY DIMENSIONS

	Perceived experience		Expectation		Gap		H <sub>0</sub> : gap=0
	Mean	Std	Mean	Std	Mean	Std	
Entire dataset: (academic staff and students)							
Tangibles	3.58	1.68	6.48	.77	-2.90	.23	-59.68***
Reliability	3.21	1.75	6.56	.75	-3.34	.20	-67.93***
Responsiveness	3.41	1.66	6.57	.70	-3.16	.19	-68.74***
Assurance	3.34	1.78	6.55	.74	-3.21	.26	-61.67***
Empathy	3.65	1.69	6.54	.77	-2.88	.23	-58.57***
Significance level: *** : 0.1% ; ** : 1% ; * : 5% level of significance							

Table 3 indicates that on all the quality service dimensions, perceived experience fell statistically significantly short of expectations if all respondents are jointly considered. The statistical significance associated with the null hypothesis on all dimensions was statistically highly significant and the alternative hypothesis of a difference between expectations and perceived experience was accepted in each case.

TABLE 4: MEAN GAP SCORES FOR THE FIVE SERVQUAL SERVICE DELIVERY DIMENSIONS OF ACADEMIC STAFF COMPARED TO STUDENTS

	Gap score Academic staff		Gap score Students		Gap		t-statistic (Satterwaite)
	Mean	Std	Mean	Std	Mean	Std	
Entire dataset: (academic staff and students)							
Tangibles	-2.92	1.27	-2.90	1.50	-0.01	1.46	-0.07 (-0.07)
Reliability	-3.71	1.35	-3.28	1.50	-0.42	1.47	-3.24 (-3.46)***
Responsiveness	-1.94	1.18	-3.22	1.41	1.27	1.37	10.47 (11.75)***
Assurance	-3.00	1.43	-2.86	1.48	-0.15	1.47	-1.15 (-1.18)
Empathy	-3.07	1.39	-3.18	1.38	0.11	1.38	-0.95 (-0.94)
Significance level: *** : 0.1% ; ** : 1% ; * : 5% level of significance							

The t-test results comparing the mean dimension gap scores for staff and students in Table 4 indicate statistically significant (on the 0.1% level of significance) gap scores for staff and students on the reliability and responsiveness dimensions. On the responsiveness dimension, the gap between expectations and

perceived experience for students were statistically greater than that of staff – staff expectations appear more realistic. On the reliability dimension the mean gap score for staff was statistically significantly greater than that of students.

TABLE 5: MEAN PERCEIVED EXPERIENCED SERVICE QUALITY SCORES FOR THE FIVE SERVQUAL SERVICE DELIVERY DIMENSIONS OF ACADEMIC STAFF COMPARED TO STUDENTS

	Academic staff		Students		Gap		t-statistic (Sattertwaitte)
	Mean	Std	Mean	Std	Mean	Std	
Entire dataset: (academic staff and students)							
Tangibles	3.38	1.19	3.41	1.32	-0.03	1.30	-0.29 (-0.31)
Reliability	2.74	1.14	3.31	1.41	-0.57	1.37	-4.69 (-5.38)***
Responsiveness	3.46	1.17	3.69	1.37	-0.24	1.33	-1.99 (-2.21)*
Assurance	3.47	1.09	3.60	1.40	-0.13	1.36	-1.05 (-1.23)
Empathy	3.13	1.06	3.38	1.34	-0.25	1.29	-2.16 (-2.50)
Significance level: *** : 0.1% ; ** : 1% ; * : 5% level of significance							

Table 5 indicates that the mean perceived experience scores for staff on the reliability and the responsiveness dimensions were statistically significantly less in agreement than the students' perceived experience. In summary it can be concluded that, the gap response pattern of academic staff and students also differed statistically significantly from each other.

The major contributor to differences between stakeholder perceptions and expectations of service quality is the *reliability* construct. This is consistent with the findings of a study by Brysland and Curry (2001) on the ability of the public service provider to deliver dependable and accurate service as promised. *Reliability* of services is an essential component of quality service delivery and the considerable mean gap scores for the *reliability* construct clearly signals that stakeholders perceive that they did not receive the services stated in the BPR documents.

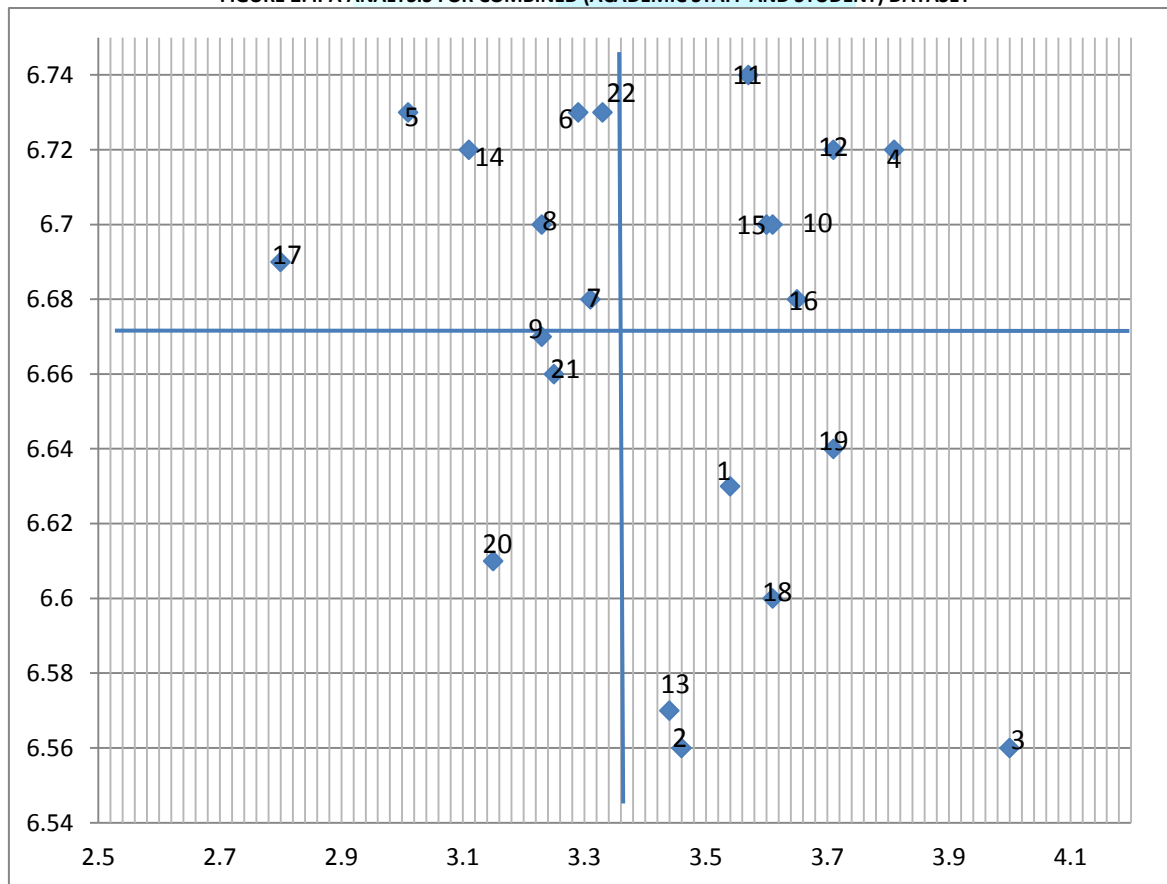
A considerable gap between perceived experience and expected service delivery was also reported for the *Assurance* construct of service quality delivery. This service construct refers to readiness for provision of individualised care and attention to stakeholders. It is interesting to note that the third largest gap score for the three groups was *responsiveness*. This illustrates the institution's willingness to assist its stakeholders by providing prompt service.

The negative values of the overall mean gap scores (as set out in Tables 3 - 5 above) for the constructs of *reliability*, *responsiveness*, *assurance*, *tangibles* and *empathy* all indicate that service delivery fall short of expectations. The negative gaps scores indicate that respondents' expectations are higher than what they perceive to experience.

The overall mean importance and mean performance rating values of the 22 importance-performance service attribute mean ratings were mapped to the IPA grid system Figures 1 depict the importance-performance balance of the 22 service attributes for the entire sample. The grid was interpreted to identify critical service improvement areas according to the quadrant in which certain service attributes fell. The quadrants are numbered from "A" to "D".

Quadrant A identifies service attributes perceived to be important, but underperforming and quadrant C identifies service attributes perceived not to be that important but underperforming as well. Quadrant B identifies service attributes that are perceived to be important and which performs well and quadrant D identifies service attributes that perform well but are less important.

FIGURE 2: IPA ANALYSIS FOR COMBINED (ACADEMIC STAFF AND STUDENT) DATASET



DEDUCTIONS DERIVED FROM FIGURE 1

As indicated in the previous paragraph, service attributes perceived by the academic staff and students to be critical in delivering quality service, group together in quadrant A, namely, *attributes perceived to be important but underperforming*. According to figure1 the attributes include question items no 5,6,7,8,9,14,17 and 22. These items prove that this quadrant contains a substantial number of items from the *reliability* dimension (q5, q6, q7, q8, q9) which is related to the

ability of the service provider to deliver dependable and accurate service as promised. A number of items in this quadrant also resort under *assurance* (q14, q17) and these critical items describe the service provider’s knowledge and ability to provide confidence to stakeholders. Furthermore attributes that group together in quadrant C, namely, *service attributes perceived as not very important but also underperforming* will impact on service quality although to a somewhat lesser extent and include service attributes of questionnaire items 20 and 21 which describe personal or individual attention received by stakeholders. These above listed attributes identified by all the respondents indicate the areas of improvement to quality service delivery.

**SUMMARY OF THE TWO ANALYSIS APPROACHES**

The following table, table 7, summarises the most critical findings derived from the mean gap score analyses and IPA results.

**TABLE 7: SUMMARY OF THE MOST CRITICAL FINDINGS DERIVED FROM THE TWO ANALYSIS APPROACHES FOLLOWED IN THE STUDY: MEAN GAP SCORE ANALYSES AND IPA RESULTS**

Type of analysis & risk criteria	Datasets		
	All respondents	Academic staff	Students
<b>Approach 1:</b> <b>Mean gap scores</b> Service quality dimensions with large mean gap scores indicating poor quality service delivery	Ha: Mean dim. gap scores stats sign > 0 Largest mean gap scores: Reliability Assurance Responsiveness	T tests: that identify statistically significant differences in mean dimension gap scores for students & staff Reliability Assurance Reliability Responsiveness	
<b>Approach 2:</b> <b>IPA analysis</b> SERVQUAL items which fall into either quadrant A or C (the two critical dimensions in that order)	<b>Quadrant A</b> SQ attributes in QA: 5, 6, 7, 8, 9, 14 & 17 • reliability (q5, q6, q7, q8, q9) • Assurance (q14, q17) <b>Quadrant C:</b> • empathy (q20, 21)		

The gap and IPA analyses findings for all respondents (second column of Table 7) correspond and indicate that *reliability*, *assurance* and *empathy* present the service quality dimensions that require the most urgent attention and that service improvement should focus on these areas since the mean dimension gaps for these dimensions were the largest and proved to be statistically significantly different from zero. The findings are echoed in columns 3 and 4 of Table 7 where staff/student differences were brought into consideration and areas of experience-expectation discrepancies for staff and students are displayed more prominently. The IPA analysis indicated that *reliability*, *assurance* and *responsiveness* -expectations were critical issues where academic staff was concerned.

**CONCLUSION**

In this study, the major contributors to the gap between stakeholders’ perception and expectations of service quality were the *reliability* and *assurance* dimensions followed by the *responsiveness* dimension. The *reliability* dimension of service quality is an essential component of quality service delivery and the considerable mean gap scores for the *reliability* construct clearly signal that stakeholders hold the perception that the services had not improved as stated in the BPR “TO BE” document. Stakeholders also expressed their dissatisfaction with the *assurance* service quality dimension. This finding implies that the *assurance* dimension of the institution does not comply with the improvement plan set by the “TO BE” design of the BPR documents of the universities (MU, 2008; HU, 2008).

Similar to the findings of the gap analyses, the overall IPA findings indicated that almost all elements of the *reliability* and *assurance* dimensions of service quality improvement grouped within the domain of high importance to service quality and low experience of quality service received” the domain of service dimensions that needs critical attention and improvement.

Therefore to maximise the satisfaction of stakeholders, the service delivery dimensions of *reliability*, *assurance* (and to a lesser extent *responsiveness*, *empathy*, and *tangibles* as indicated by staff and students) should be given top priority and immediate attention in improving service quality at Ethiopian PHEIs. These indicators suggest service delivery improvement areas to PHEI management.

In order to achieve greater success with their service quality delivery and to improve stakeholder satisfaction, it is suggested that the institutions have standardised assessment instruments to periodically assess the experience of service quality delivery. Since no such instrument currently exists for the Ethiopian higher education sector, the use of the SERVQUAL scale is recommended as an interim improvement-assessment tool. Secondly, the institutions have to re-identify and re-assess aspects of service attributes periodically in future, which stakeholders indicate as crucial towards customer service satisfaction. As in the current study, these attributes should be the criteria for improvement strategies for service quality improvement and meeting stakeholder expectations. This strategy assists HEI management to determine those areas that appear to have the biggest influence on stakeholder satisfaction. It can assist management on decisions regarding redeployment of resources (human, material and money) from the less important areas to critically important areas (that is, in IPA terminology, from quadrant D to quadrant A).

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## A STUDY OF THE EFFECTS OF INSUFFICIENT SLEEP, CHANGES IN THE SLEEPING AND FOOD HABITS OF NIGHT SHIFT WORKERS

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### ABSTRACT

*Insufficient sleep and circadian rhythm disruption are associated with negative health outcomes, including obesity, cardiovascular disease, and cognitive impairment, but the mechanisms involved remain largely unexplored. One of the ways we have of understanding why we need to sleep so much is to look at what happens if we don't get enough sleep. It affects our personalities and our sense of humor. We may become irritable and less tolerant. Parents of small children often tell that when they're tired they get irritated at the activities of children that might keep busy them if they were properly rested. Lack of sleep clearly affects our thinking, or cognitive, processes. A sleep-deprived brain is truly running on four rather than eight cylinders. If we're trying to be creative, the motor doesn't work as well. The amount of sleep a person needs will vary from individual to individual. But most people require around eight hours.*

### KEYWORDS

Night shift workers, insufficient sleep.

### INTRODUCTION

Now, the current world is like a modern village, because all technology is rapidly developing. Many services are running in 24\*7 hours and for that manpower is very important in every sector.

Many sector like Industrial sector, Communication sector, Medical sector nightshift workers are very much necessary to provide services. Now a day's money is more important for human being and for that they are ready to work for hours and hours for making more money.

Mostly in between 20-45 years of age person are preferred doing night shift work. Young generation is attracted towards night shift because of high pay rate offered by an organization. So that they can fulfil their requirements and they don't have to rely on others. They can also carry out the other routine activity during the day time.

Unfortunately, night shifts are a part and parcel of today's fast life in the working atmosphere - be it Call Centers, BPOs or even software companies, which need people working nights to provide technical expertise/troubleshooting for their clientele. On the brighter side, people working night shifts take home a heavier pay package.

Apart from that night shift jobs creates hormonal imbalance which create a lot of disease in human body. They have to face many problems such as insufficient sleep, back pain, heart attack, depression, hair loss, diabetes and many more.

Night shifts basically call for a complete changeover in the biological clock as people working in the nights have to sleep during the daytime and work at night a complete opposite in life styles. This necessitates a total change in thinking too, as one has to be alert at night. The job maybe very challenging and stimulating and the person would have to be in top form both physically and mentally to meet the day's (night's) challenge.

### REVIEW OF LITERATURE

In humans, it has been demonstrated that the metabolic activity of the brain decreases significantly after 24 hours of sustained wakefulness. Sleep deprivation results in a decrease in body temperature, a decrease in immune system function as measured by white blood cell count (the soldiers of the body), and a decrease in the release of growth hormone. Sleep deprivation can also cause increased heart rate variability.

For our nervous systems to work properly, sleep is needed. Sleep deprivation makes a person feel sleepy and unable to concentrate the next day. It also leads to impairment of memory and physical performance and reduced ability to carry out mathematical calculations. If sleep deprivation continues, imaginary thoughts and mood swings may develop.

Release of growth hormone in children and young adults takes place during deep sleep. Most cells of the body show increased production and reduced breakdown of proteins during deep sleep. Sleep helps humans maintain optimal emotional and social functioning while we are awake by giving rest during sleep to the parts of the brain that control emotions and social interactions.

### IMPORTANCE OF THE STUDY

Research is important both in scientific and non-scientific fields. In our life new problems, events, phenomena and processes occur every day. Practically implementable solutions and suggestions are required for tackling new problems that arise. Scientists have to undertake research on them and find their causes, solutions, explanations and applications. Precisely, research, assists us to understand nature and natural phenomena.

#### Some important points for research are:

- A research problem refers to a difficulty which a researcher or a scientific community, an industry or a government organization or a society experiences. It may be a theoretical or a practical situation. It calls for a systematic understanding and possible solution.
- Research on existing theories and concepts help us to identify the range and applications of them.
- It is the fountain of knowledge and provides guide lines for solving Problems.
- Research provides basis for many government policies. For example, research on the needs and desires of the people and on the availability of revenues to meet the needs helps a government to prepare a budget.
- It leads to the identification and characterization of new opportunities, new problems and solutions to it.
- Social research helps to find answers to social problems. They explain social phenomena and seek solution to such problems.

### STATEMENT OF THE PROBLEM

- It allows researcher to control the situation.
- It provides qualitatively informed evaluation.
- It is useful tool for comparison.
- It helps to people in business and industry that are responsible for taking business decisions.
- Research may mean the development of new styles and creative work.
- It provides a large amount of information from large numbers of people.
- It provides in-depth understanding.

**OBJECTIVES**

- To know how people work in night shift in different corporate companies.
- To know which problem is faced by the employee during the work in night shift.
- To know why employees choose working in night shift.
- To know night shift effect on employees health.
- To know how employees manage their work and personal life.

**RESEARCH METHODOLOGY**

Research instrument: - Questionnaire

**Types of Questions in Questionnaire:**

- Dichotomous: A question in which there are two possible answers.
- Multiple Choices: A question in which there are three or more answers.
- Rating scale: A scale that rates some attribute from “very less” to “more frequently”.
- Ranking scale: ranking scale taps preferences between two or more objects or person.

(b) Source of data

**1. PRIMARY DATA**

PRIMARY DATA is data that has not been previously published, i.e. the data is derived from a new or original research study and collected at the source, e.g., in marketing, it is information that is obtained directly from first-hand sources by means of surveys, observation or experimentation. Here are two sources of data. Primary data collection uses surveys, experiments, interviews or direct observations.

Key primary Data Collection Techniques

- Surveys
- Questionnaires
- Interviews
- Observation

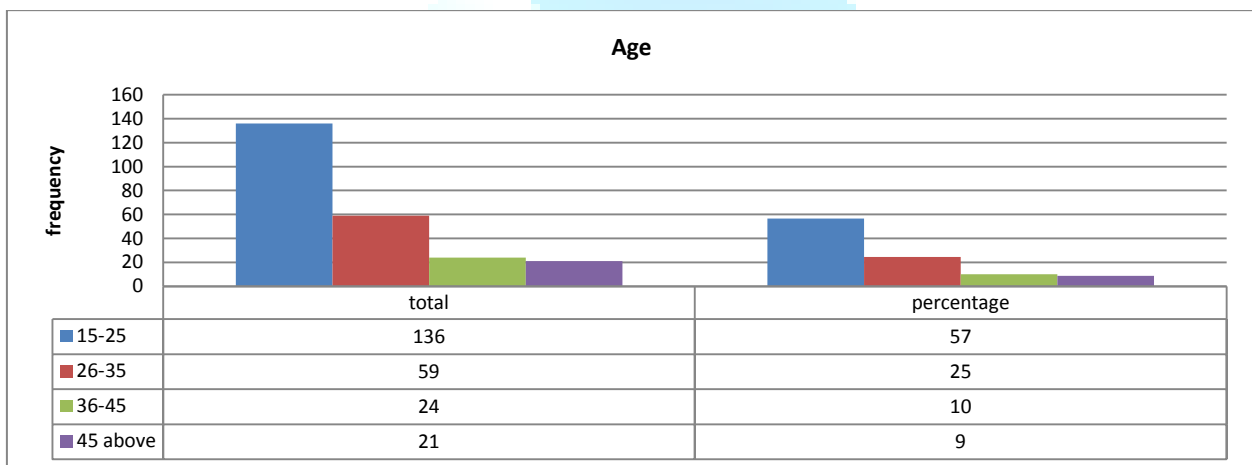
**2. SECONDARY DATA**

Secondary data is the data that is reused by somebody which is already there in existence. We got secondary data by,

- Books
- Internet

**HYPOTHESES AND RESULT DISCUSSION**

**SERVE OF AGE**

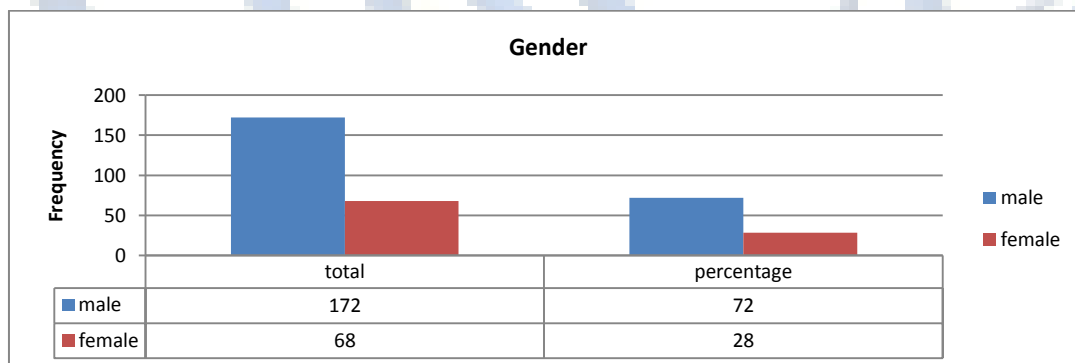


No. of respondents: - 240

**INTERPRETATION**

From this we could find that mostly youngsters are working in the night shifts. We can see that majority of people shown in the graph are youngsters which are ranging from 15-25 years and on the other side the age group of 45 years and above are minimum, it means that elderly aged people don't prefer to work in night shift.

**SERVE OF GENDER**

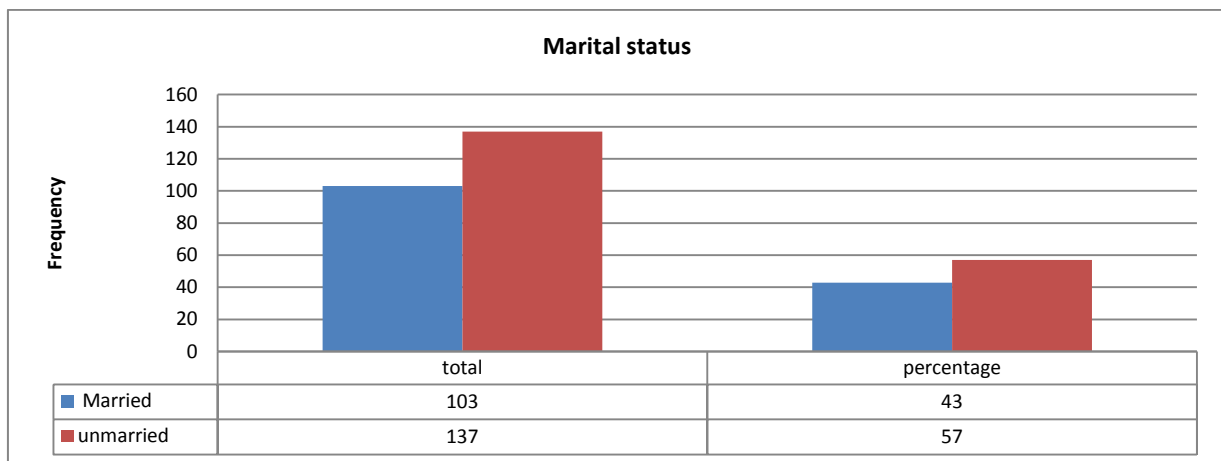


No. of respondents: - 240

**INTERPRETATION**

From the above graph we could find that the total number of male is more as compared to women. As women faces problems such as safety and insecurity, so they don't prefer to work at night (therefore their ratio is less as compared to male workers in night).

**SERVE OF MARITAL STATUS**

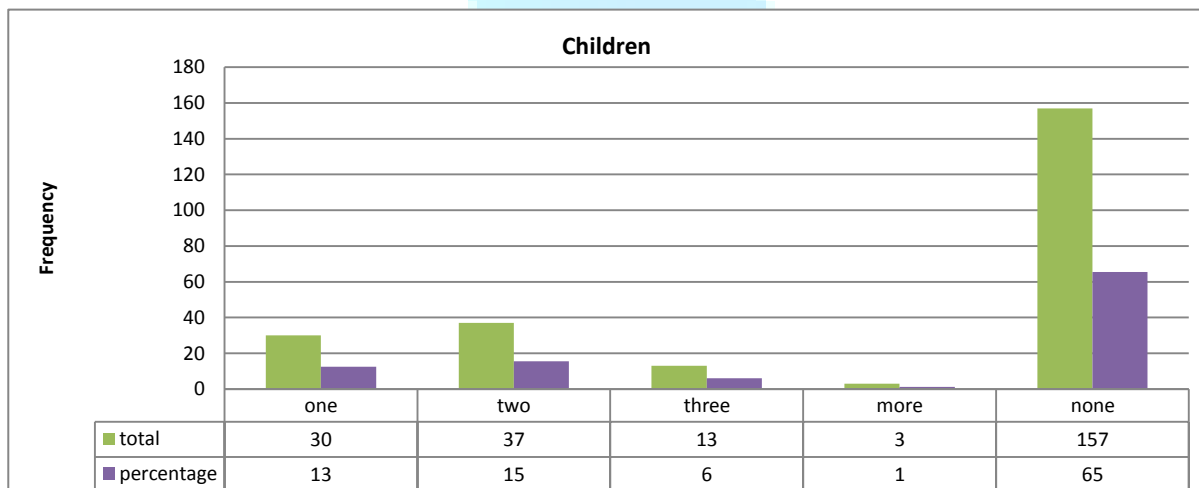


No. of respondents: - 240

**INTERPRETATION**

There is thin line of difference between married and unmarried persons working in night shift. As we can see that 57% of people are unmarried and 43% of people are married. It shows that majority of the people working in night shift are unmarried (i.e. unmarried prefer nightshifts then married people.) because the married people faces more problems than unmarried.

**SERVE OF NUMBER OF CHILDREN**

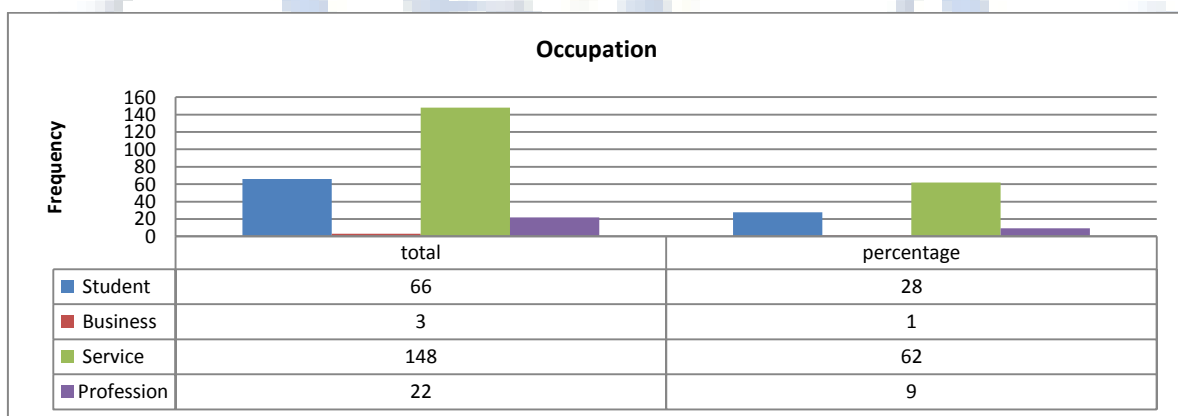


No. of respondents: - 240

**INTERPRETATION**

Children are important for everyone. But to some extent unmarried people working in nightshift are more as compared to married because married people have to look about their family, children and they are more concerned with social life. On other side unmarried people are independent and they take decisions of their own and work in night shifts.

**SERVE OF OCCUPATION**

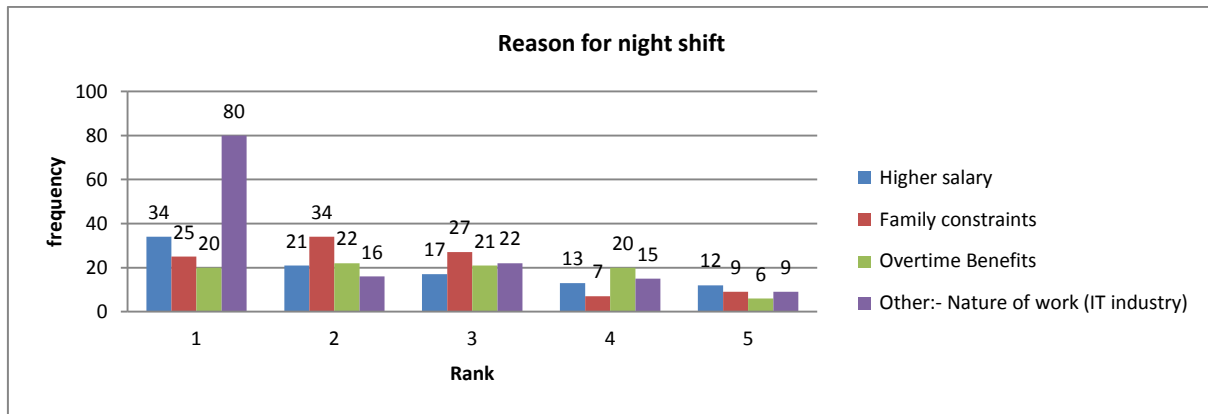


No. of respondents: - 239

**INTERPRETATION**

From the above graph we can see that 62% of people are doing service in different companies and only 1% of people are having their business and working in night shift that means those who have their own business they don't prefer to work at night. And now a day's students also prefer to work in night shift so that they can carry out their routine (i.e to attain school or college), along with that they can also earn and carry out their day to day expenses.

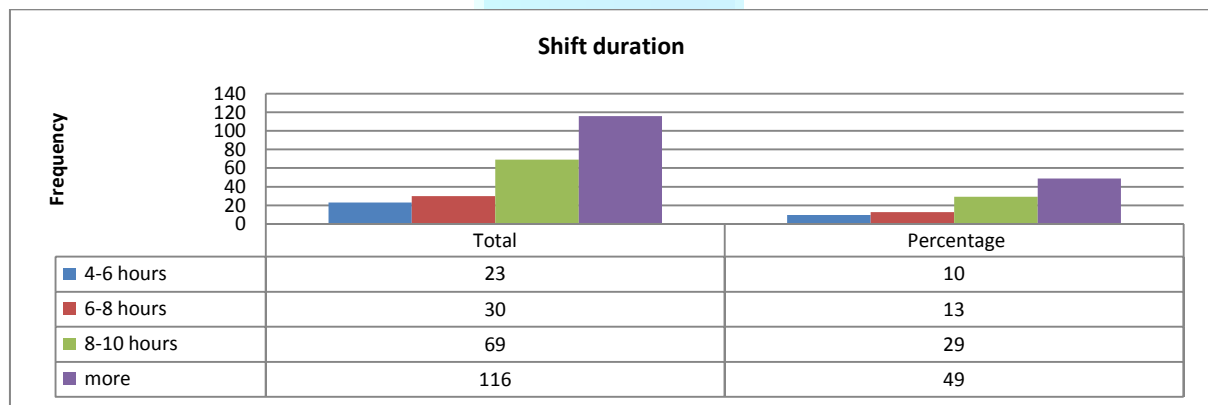
**SERVE OF SALARY**



**INTERPRETATION**

From the above graph it can be concluded that more workers (80) do night shift as a part of their duty (as it is nature of their work). We can find that some workers are working for higher salary and due to family constraints.

**SERVE OF TOTAL WORKING HOURS DURING NIGHT SHIFT**



No. of respondents:- 238

**INTERPRETATION**

From the above graph we can find that 49% of the people working in the night shift for more than 10 hours are conducting as their duty as they might get over time salary. And 10% are working as a part time.

**SERVE OF RELATIONSHIP BETWEEN WORKING HOURS & HEALTH PROBLEMS**

Problems	Working hours				Grand Total
	4 to 5	6 to7	8 to 10	more	
backache	6%	19%	28%	47%	100%
digestive	5%	13%	30%	53%	100%
weight gain	8%	18%	26%	48%	100%
anger & irritable	9%	18%	30%	43%	100%

**INTERPRETATION**

From the above graph we can see that those who are working for more hours face more problems.

**SERVE OF RELATIONSHIP BETWEEN PROBLEMS & ACCIDENT**

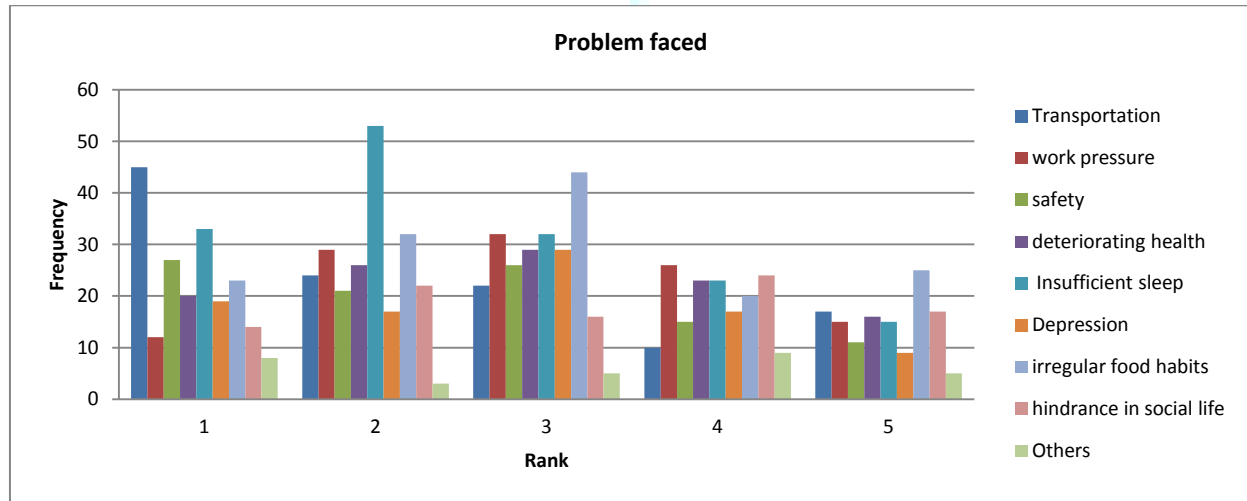
Problems	Accident place				Grand Total
	Near the house	Near the office	Middle of the distance from your house	At some other place	
Health problem					
anger & irritable	25%	10%	65%		100%
depression	7%	21%	71%		100%
Family problem					
less attention to family member	16%	5%	79%		100%
anger & misbehavior	31%	15%	46%	8%	100%
knowledge about children	8%	8%	85%		100%

**INTERPRETATION**

We have taken data of two types of problems and compared that with the accident and from that we can conclude that mostly accidents occurred at the middle of the place.

**SERVE OF WHICH PROBLEMS DO YOU FACE BECAUSE OF WORKING IN A NIGHT SHIFT?**

	1	2	3	4	5
Transportation	45	24	22	10	17
work pressure	12	29	32	26	15
safety	27	21	26	15	11
deteriorating health	20	26	29	23	16
Insufficient sleep	33	53	32	23	15
Depression	19	17	29	17	9
irregular food habits	23	32	44	20	25
hindrance in social life	14	22	16	24	17
Other	8	3	5	9	5

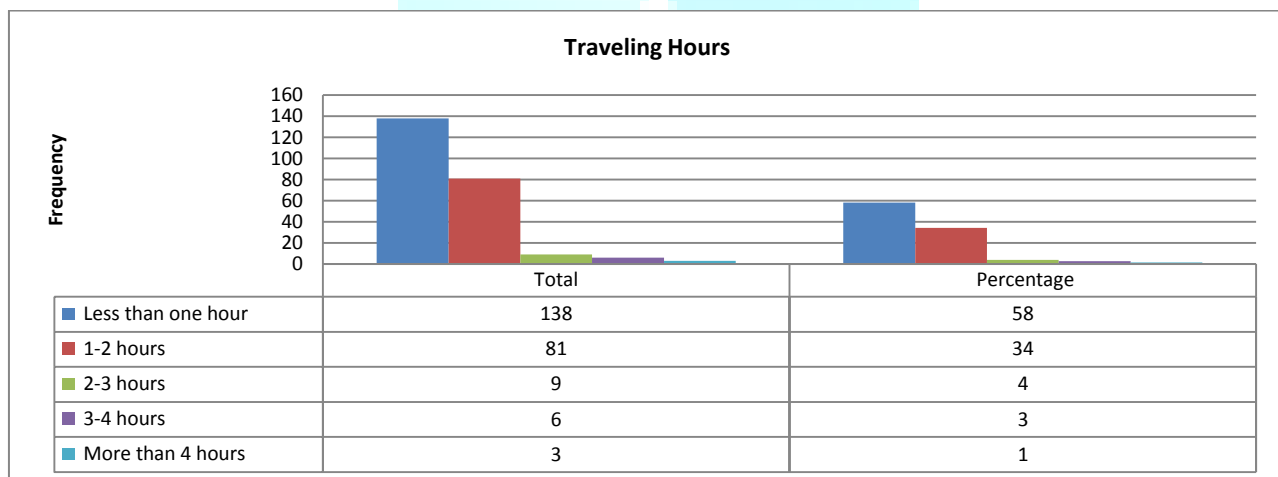


**INTERPRETATION**

From the above graph we can find that from the many problems the most affected problem is transportation (45) and insufficient sleep (53) The company does not provide transportation facilities to them. And due to complete changeover in the biological clock, people working in the nights have to sleep during the daytime that becomes the reason of insufficient sleep. And the food habits of the workers is also changed (it becomes irregular due to their timing).

No. of respondents: - 237

**Serve of How many total hours per day do you spend in travel for workplace?**



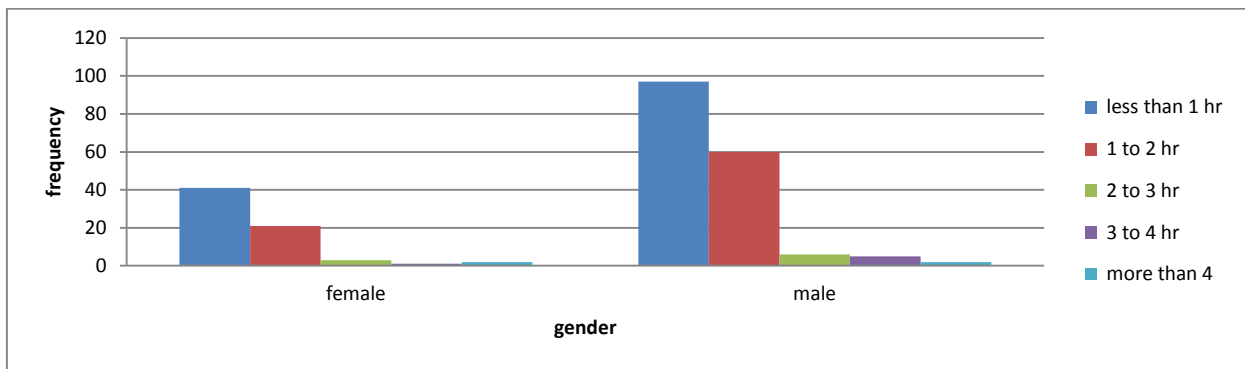
**INTERPRETATION**

From the above graph we can see that majority of the people spend less than an hour in travelling and from that we can say that those who are working in night shifts lives in nearby areas from the work place. And there are some people who takes more than an hour in travelling (i.e. they live at distance from the workplace and thus we can also say that they might be facing transportation problem.)

**SERVE OF RELATIONSHIP BETWEEN GENDER & TRAVELLING HOURS**

Gender	Travelling hours					Grand Total
	less than 1 hr	1 to 2 hr	2 to 3 hr	3 to 4 hr	more than 4	
female	41	21	3	1	2	68
male	97	60	6	5	2	170
<b>Grand Total</b>	<b>138</b>	<b>81</b>	<b>9</b>	<b>6</b>	<b>4</b>	<b>238</b>



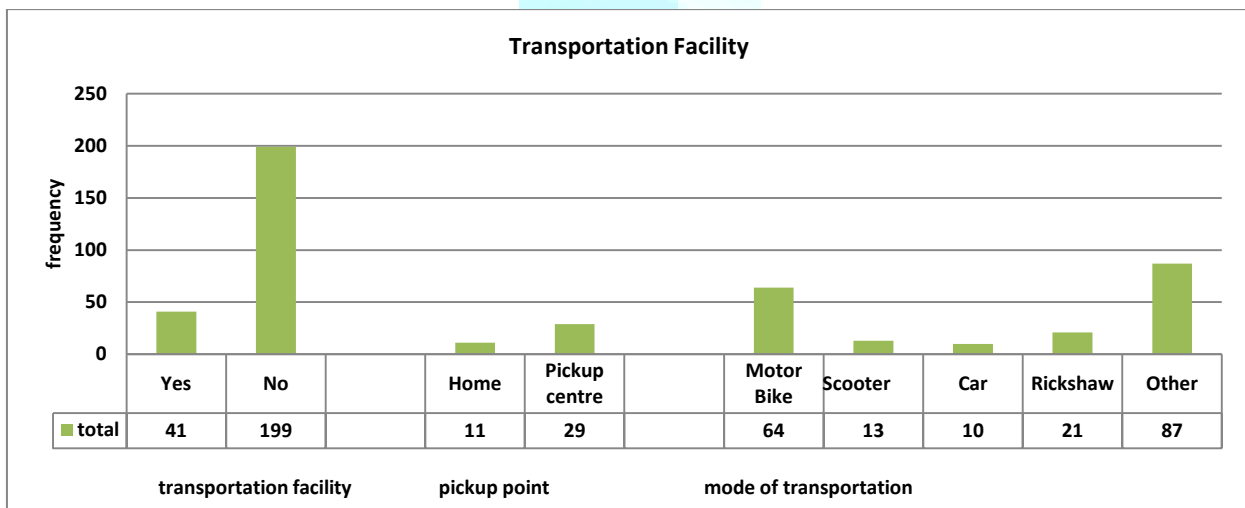


**INTERPRETATION**

From the above graph it can be stated that majority of workers working in night shifts are male. Here we can say that female workers are staying nearer from their work place as because of safety reasons.

**SERVE OF DOES YOUR COMPANY PROVIDE YOU WITH TRANSPORTATION FACILITY?**

- a) If yes then from where?
- b) If no then which mode of transportation do you use?



No. of respondents: - 240

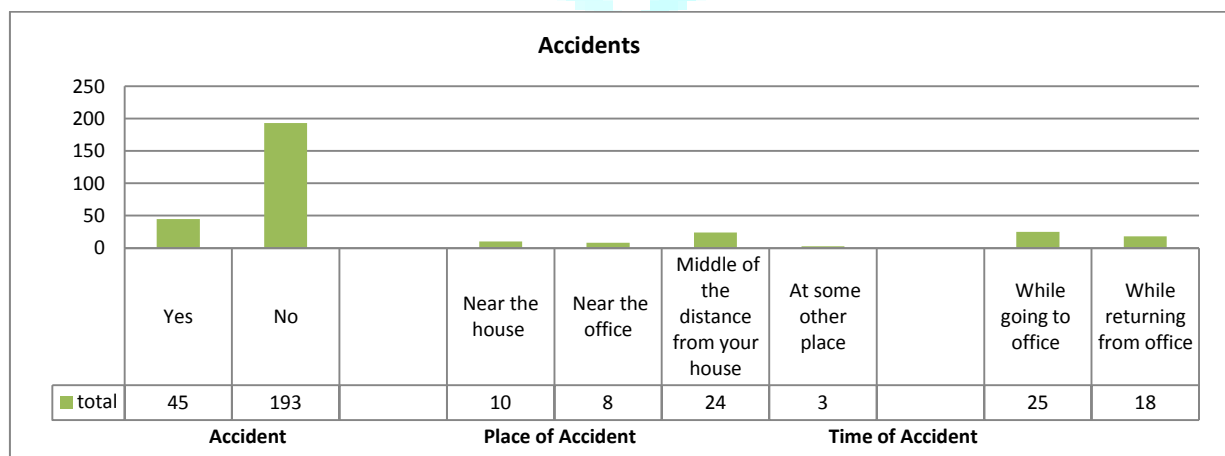
- a. no of respondents: - 40
- b. no of respondents:- 195

**INTERPRETATION**

From the survey made we can conclude that in the night shifts there are only some companies which provides them with the transportation facility. Majority are not provided with this facility. And those who are not provided with this facility, they prefer their own mode of transportation.

**SERVE OF HAVE YOU MET WITH AN ACCIDENT BEFORE/AFTER THE JOB?**

- (A) If yes than at which place?
- (B) At what time?



No. of respondents: - 238

- For (A) no of respondents:- 45
- For (B) no of respondents:- 43

**INTERPRETATION**

From the above graph we can say that those who are working in the night shift are meeting with accidents in middle of the distance while going to office, this show that they are in rush to reach office on time. Que. Relationship between transportation mode & accident place.

Mode of transportation	Accident place				Grand Total
	Near the house	Near the office	Middle of the distance from your house	At some other place	
Motor car	5	1	5	1	12
Scooter		2	4		6
Car		1	1		2
Rickshaw	2	1	2	1	6
Other	2	1	11	1	15
<b>Grand Total</b>	10	8	24	3	41

**INTERPRETATION**

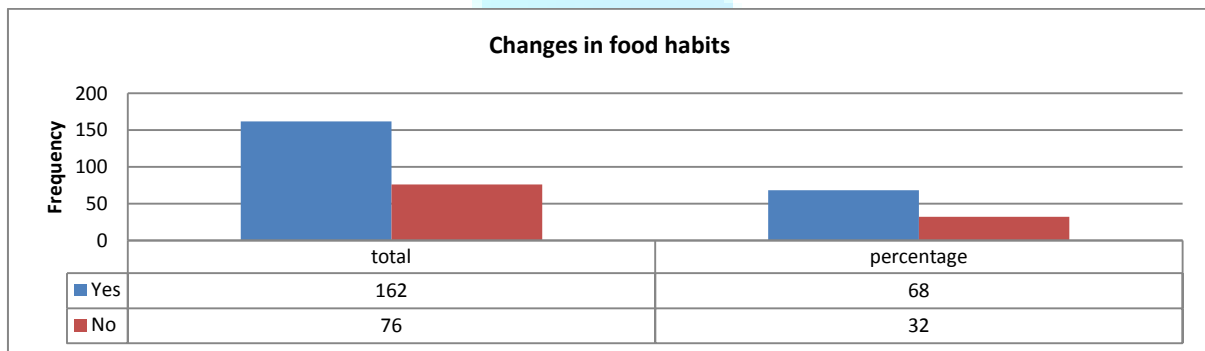
From this we come to know that those who meet with the accident and among them they meet with the accident in the middle of the distance from the office and their house.

Transportation mode	Accident time		Grand Total
	While going to office	While returning from office	
Motor car	9	4	13
Scooter	3	3	6
Car	1	1	2
Rickshaw	2	2	4
Other	8	6	15
<b>Grand Total</b>	23	16	40

**INTERPRETATION**

Most of the nightshift workers met with an accident while going to office, from that we can conclude that the reason behind that could be family problems, anger and rush to reach the office.

**SERVE OF DUE TO NIGHT SHIFT HAS YOUR FOOD HABIT CHANGED?**

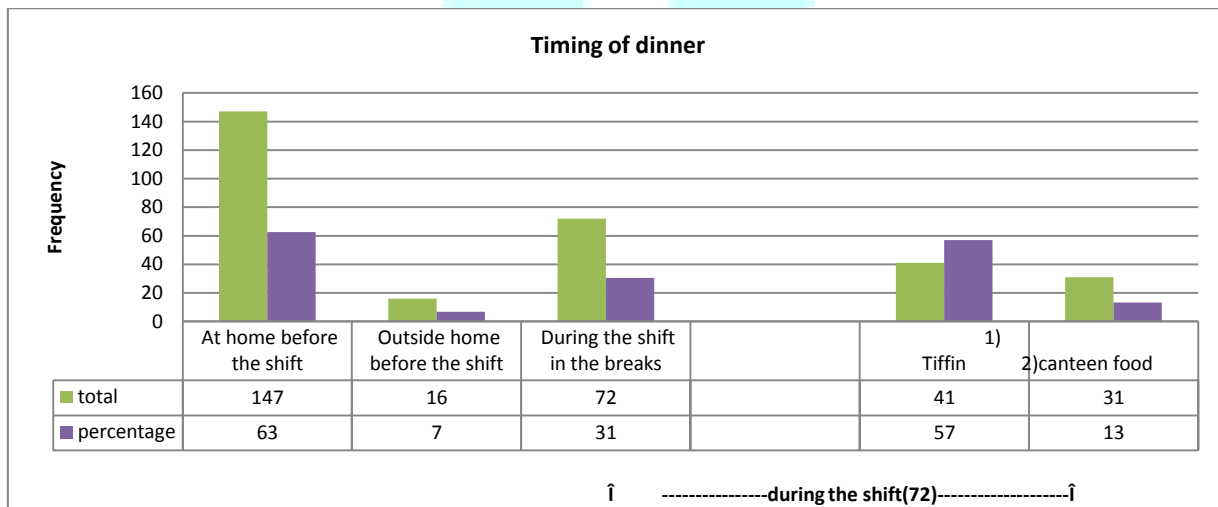


No. of respondents:- 238

**INTERPRETATION**

From the above graph we can find that due to night shifts the food habit of the people changes. And 68% of people agreed with this. As food habit is directly correlated with health. Therefore due to changes in their food habits because of night shifts affects their health directly.

**SERVE OF HOW & WHEN DO YOU TAKE YOUR DINNER?**

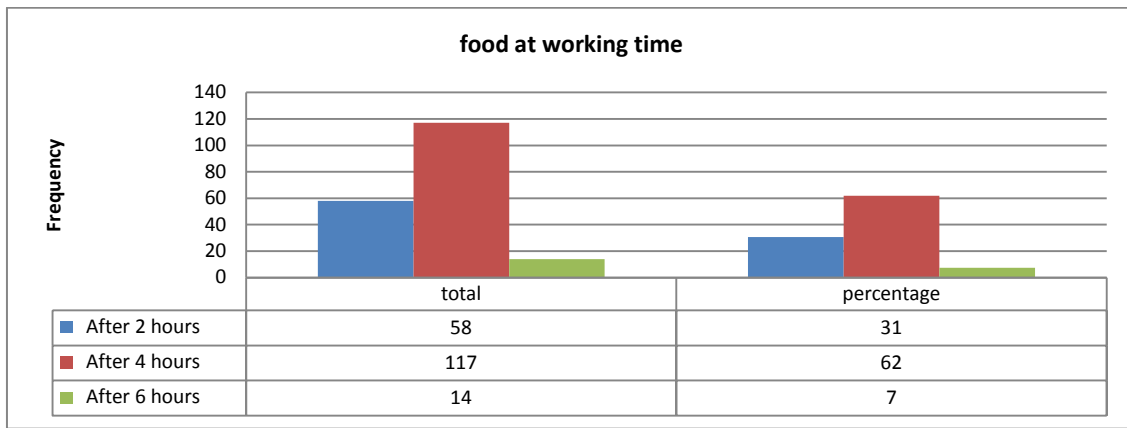


No. of respondents: 235

**INTERPRETATION**

From the survey made we can see that (147) worker/employees prefer dinner at home before night shifts and majority apart from those prefer Tiffin during night shift.

**SERVE OF DURING THE SHIFT AT WHAT TIME DO YOU TAKE YOUR DINNER?**

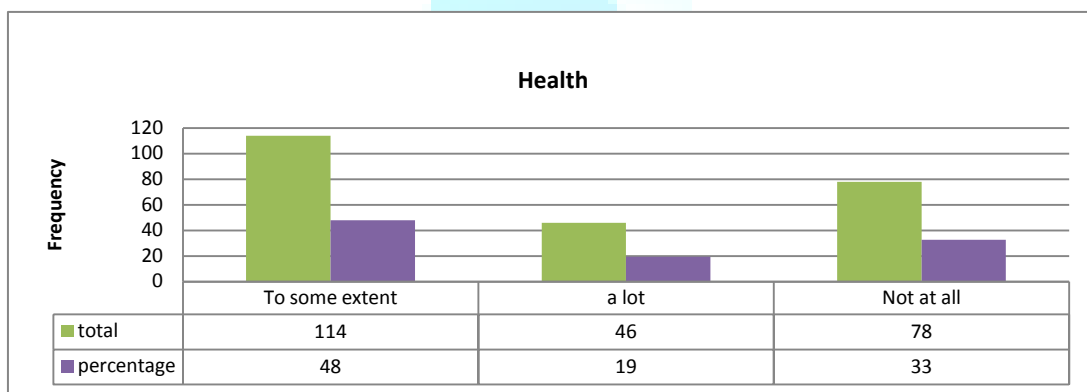


No. of respondents: 189

**INTERPRETATION**

From the above graph we can say that those people who prefer food during the shifts are having food after 4 hours so that they can continuously stretch their work at a time. Very less people are there who takes food after 6 hours.

**SERVE OF DO YOU THINK YOUR HEALTH IS ADVERSELY AFFECTED BY NIGHT SHIFTS?**

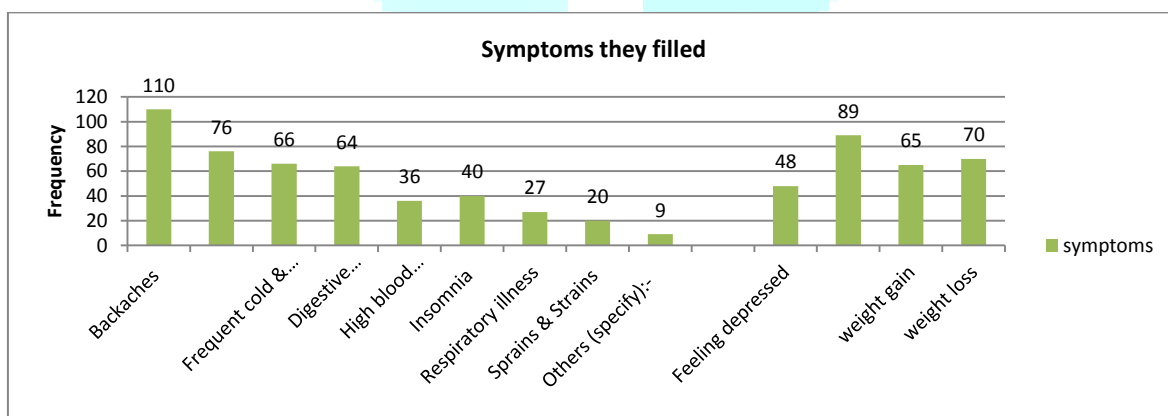


No. of respondents: - 238

**INTERPRETATION**

From the respondents of this question we can conclude that most of the worker's health is affected to some extent. Here 19% of workers health is affected a lot & 33% of workers health is not at all affected.

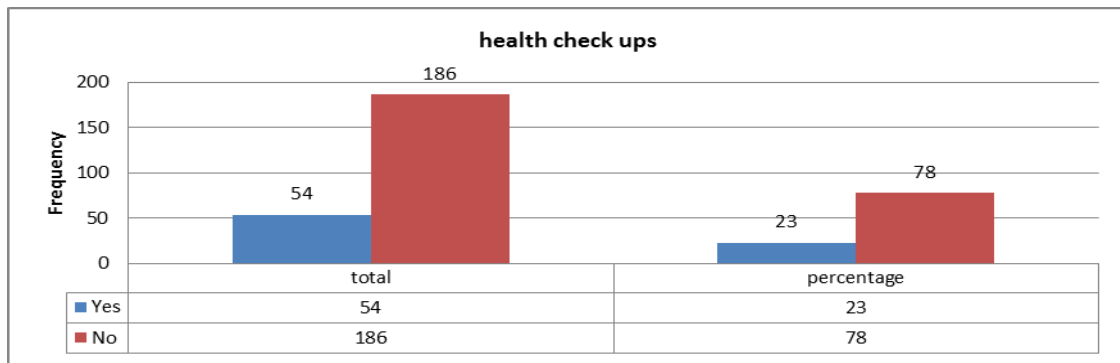
**SERVE OF HAVE YOU EXPERIENCED ANY SYMPTOMS FROM THE FOLLOWING AS A RESULT OF NIGHT SHIFT?**



**INTERPRETATION**

Here we can analyze that every night shift worker suffer from one or other diseases. But most commonly **physical problem** faced by the workers is **Backache** and **psychological problem** faced by them is **irritation** (i.e. they become angry and irritable by nature.)

**SERVE OF DOES YOUR COMPANY PROVIDE YOU ANY ANNUAL HEALTH CHECKUPS?**

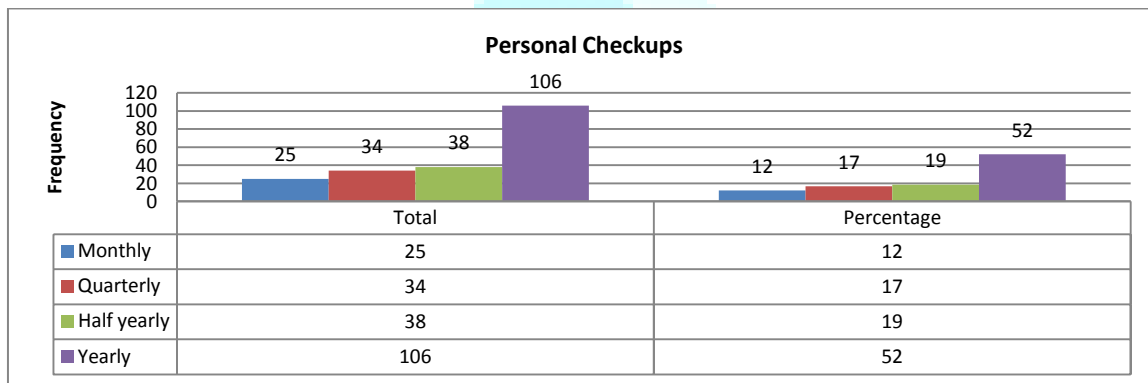


No. of respondents:- 240

**INTERPRETATION**

Out of the survey made, here it is clearly visible that most of the nightshift companies do not provide any annual health checkups. From the survey made 23% workers said that their company provide them with annual health checkup, which is good for them and also for the company's reputation as well.

**SERVE OF HOW OFTEN DO YOU VISIT ANY DOCTOR FOR YOUR PERSONAL CHECKUPS?**



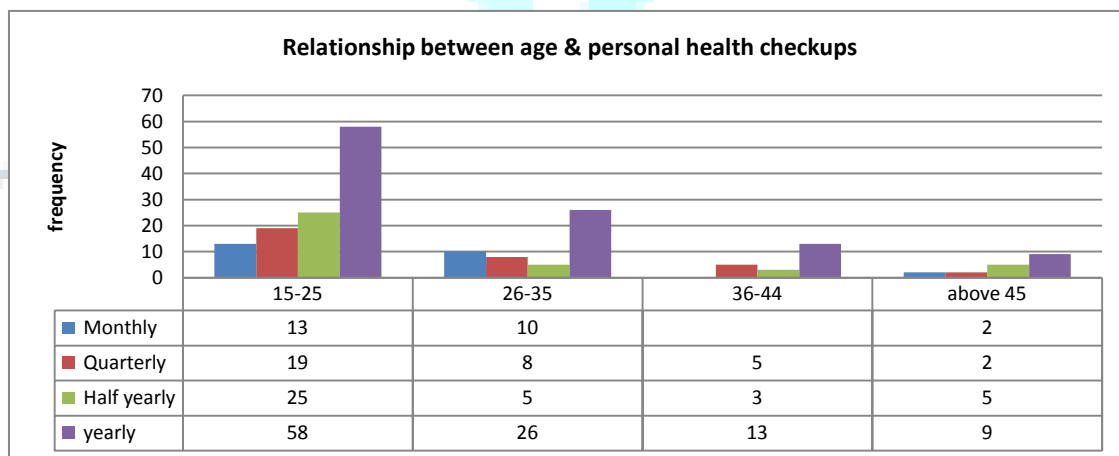
No. of respondents: - 203

**INTERPRETATION**

From the above graph we can find that 52% of the people visit their doctor yearly for their personal checkup and only 12% of people visits for monthly checkup which shows that they are really concerned about their health.

**SERVE OF RELATIONSHIP BETWEEN AGE & PERSONAL CHECKUPS**

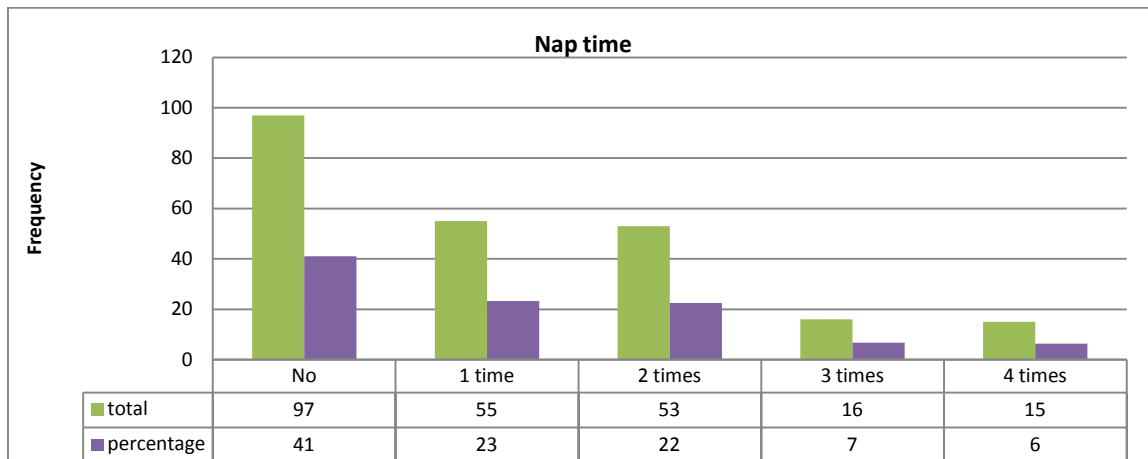
age	duration				Grand Total
	Monthly	Quarterly	Half yearly	yearly	
15-25	13	19	25	58	115
26-35	10	8	5	26	49
36-44		5	3	13	21
above 45	2	2	5	9	18
<b>Grand Total</b>	<b>25</b>	<b>34</b>	<b>38</b>	<b>106</b>	<b>203</b>



**INTERPRETATION**

Maintaining health is essential for all. And for the nightshift workers it is necessary to maintain their health. Here we can see that mostly workers opt for yearly personal health checkup.

**SERVE OF HOW FREQUENTLY DO YOU TAKE A NAP DURING THE JOB?**

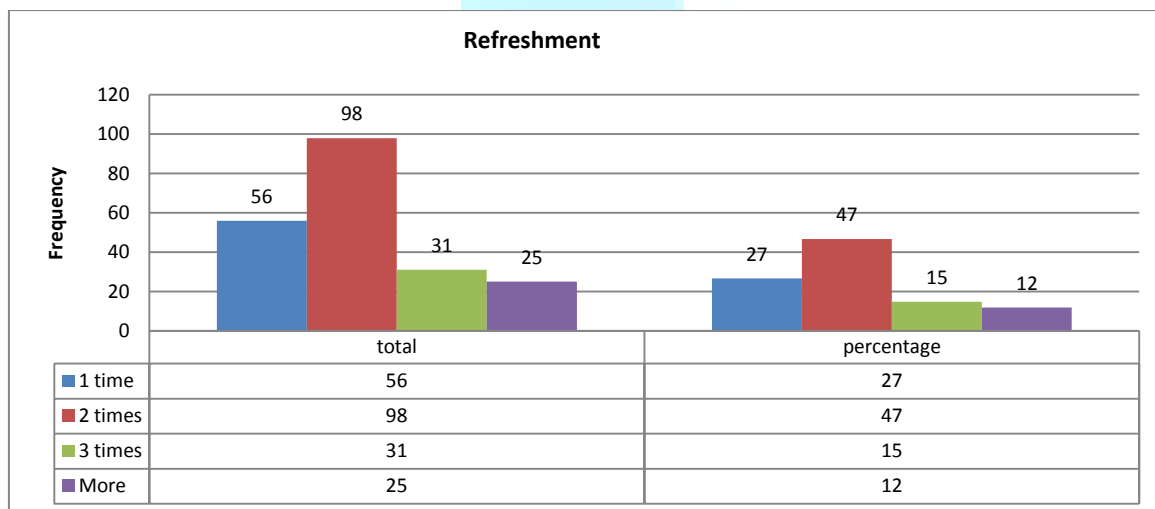


No. of respondents: - 236

**INTERPRETATION**

Majority of the workers say that they don't take nap during the working hours. Whereas approximate 23% of workers take 1-2 times nap during the working hours.

**SERVE OF HOW MANY TIMES YOU TAKE REFRESHMENT (HOT/COLD) DURING THE WORKING HOURS?**

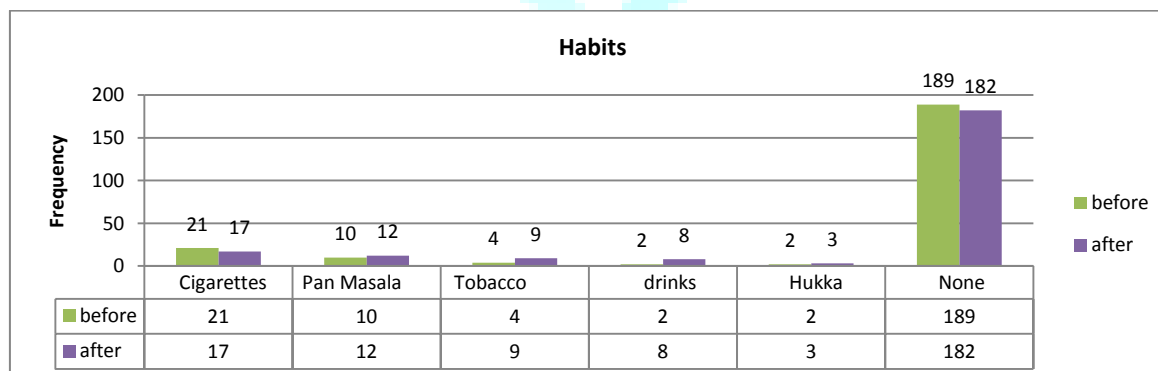


No. of respondents: 210

**INTERPRETATION**

People in night shift are mentally stressed due to constant working, so to get relaxation from stress they needs refreshments to carry out their work effectively. Therefore from the survey made, 47% of workers take refreshment 2 times during their shifts.

**SERVE OF WHICH OF THE FOLLOWING HABITS DO YOU HAVE?**



No. of respondents:-

Before: - 228

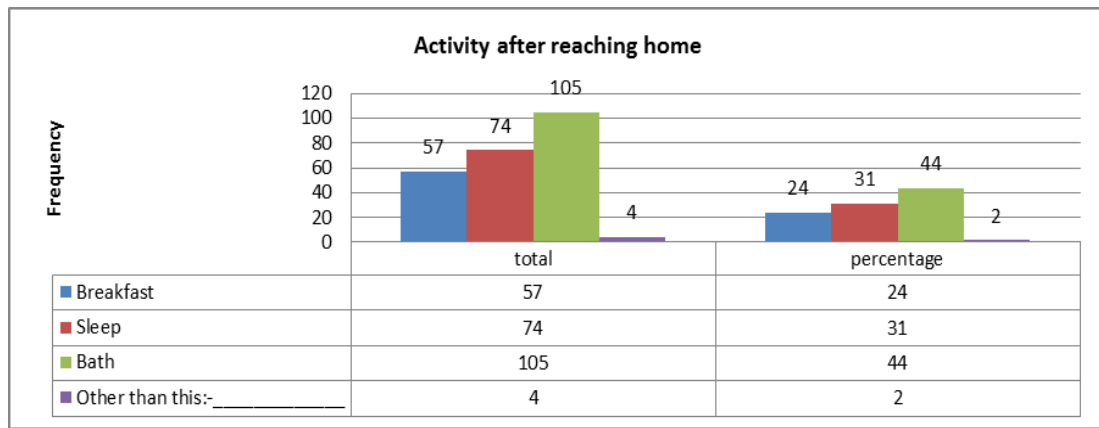
After: - 231

**INTERPRETATION**

Mostly people say that they don't have any habits to keep themselves awake. Apart from them there are also some people who have habits of cigarettes and pan masala. And from the graph we can also see changes in their habits after joining night shift.



**SERVE OF WHAT DO YOU DO IMMEDIATELY AFTER REACHING HOME FROM THE JOB?**

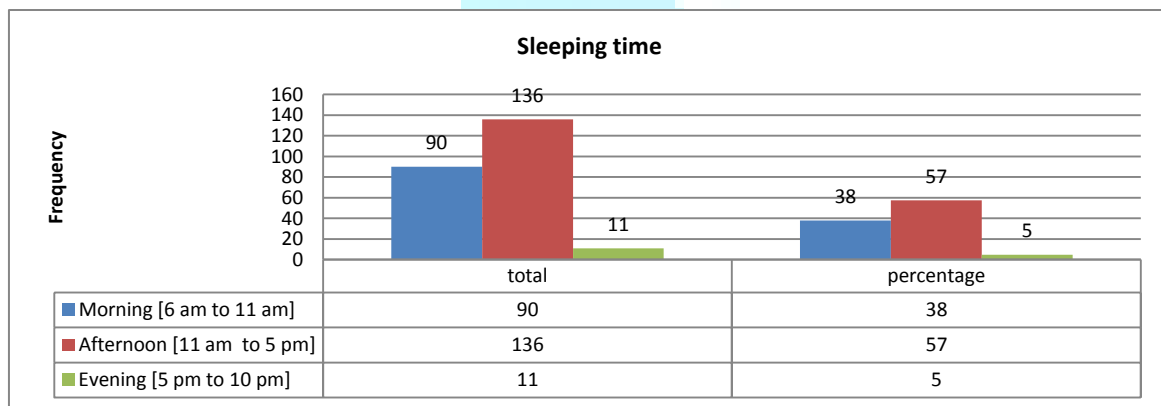


**INTERPRETATION**

Employees prefer to take bath after reaching their home from night shifts so that they can refresh themselves from the stress. And 30% of the employees prefer sleep and some prefer breakfast also. Different people have different choices to carry out their routine after night shift.

No of respondents: 237

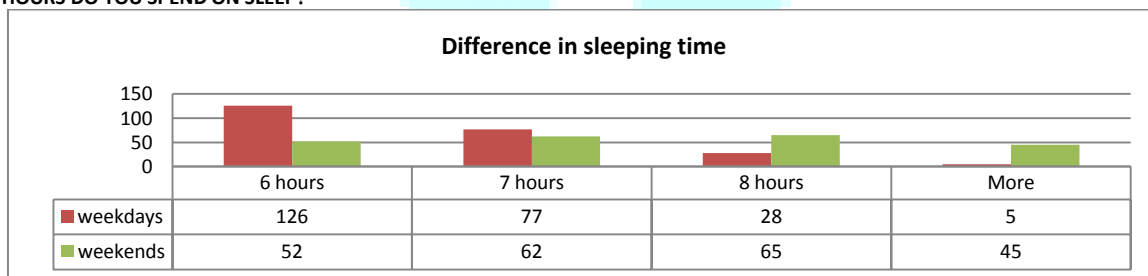
**SERVE OF WHEN DO YOU GO TO SLEEP?**



**INTERPRETATION**

Most of the night shift workers prefer to sleep in afternoon because after they come back to their home they need to carry some routine activities so they don't get proper time to sleep. From the above graph 57% of the workers sleep in afternoon and there are also some workers whose sleeping time is in the morning. And from the survey made we can see that nightshift workers rarely sleep at evening.

**HOW MANY HOURS DO YOU SPEND ON SLEEP?**



No of respondents for weekdays: -236

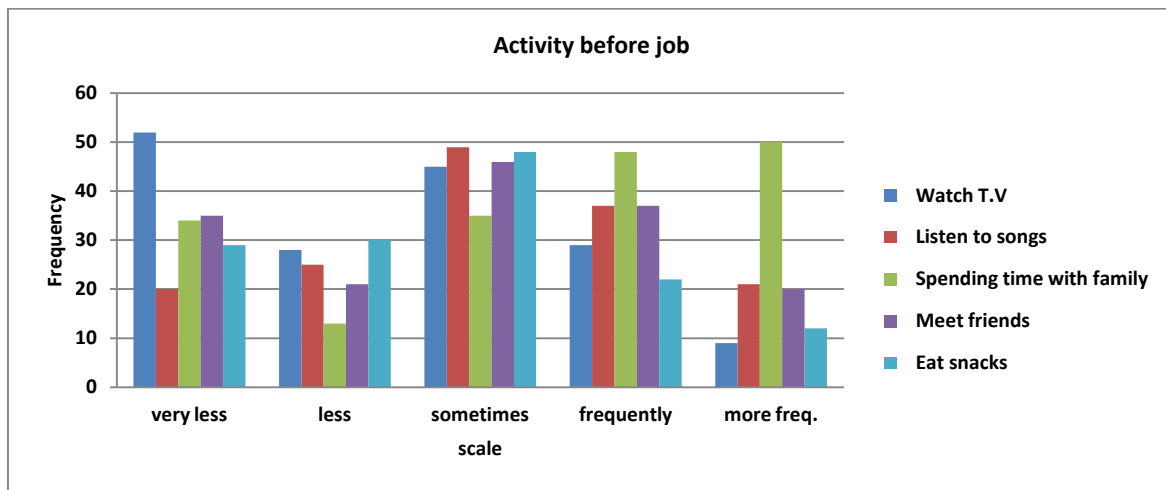
No of respondents for weekends: -224

**INTERPRETATION**

Generally it is necessary for everyone to sleep for minimum 7-8 hours but here we can see that night shift workers don't get enough time to sleep. Majority of nightshift workers sleep for only 6 hours because as their sleeping time is during day time, therefore they can't sleep properly as they need to maintain social relations. From the above graph we can conclude that during weekends their sleeping hours increases.

**SERVE OF WHAT DO YOU PREFER TO DO BEFORE GOING FOR THE JOB?**

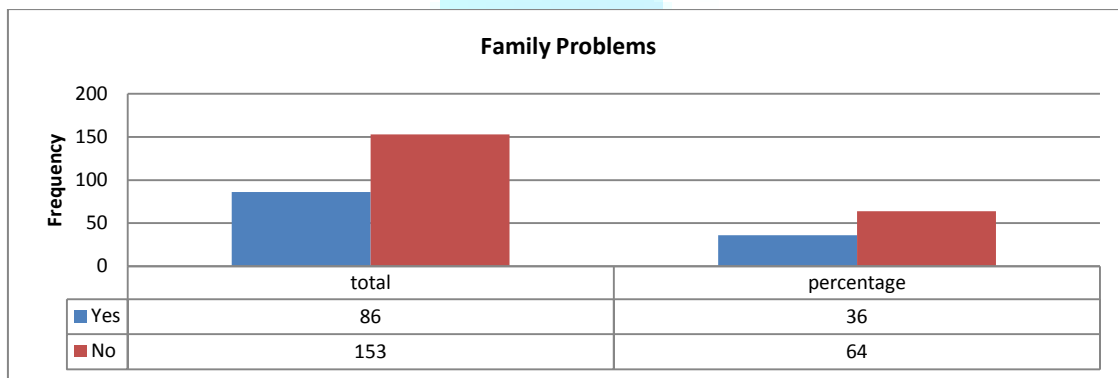
	very less	less	sometimes	frequently	more frequently
Watch T.V	52	28	45	29	9
Listen to songs	20	25	49	37	21
Spending time with family	34	13	35	48	50
Meet friends	35	21	46	37	20
Eat snacks	29	30	48	22	12



**INTERPRETATION**

Everyone needs to spend some quality time with their family. But nightshift workers don't get enough time to stay with their family. So before their shifts workers mostly opt for spending the quality time with their family. But sometimes workers also need some changes so they spend time by listening some good music or meet friends.

**DO YOU FACE FAMILY PROBLEMS BECAUSE OF NIGHT SHIFT?**

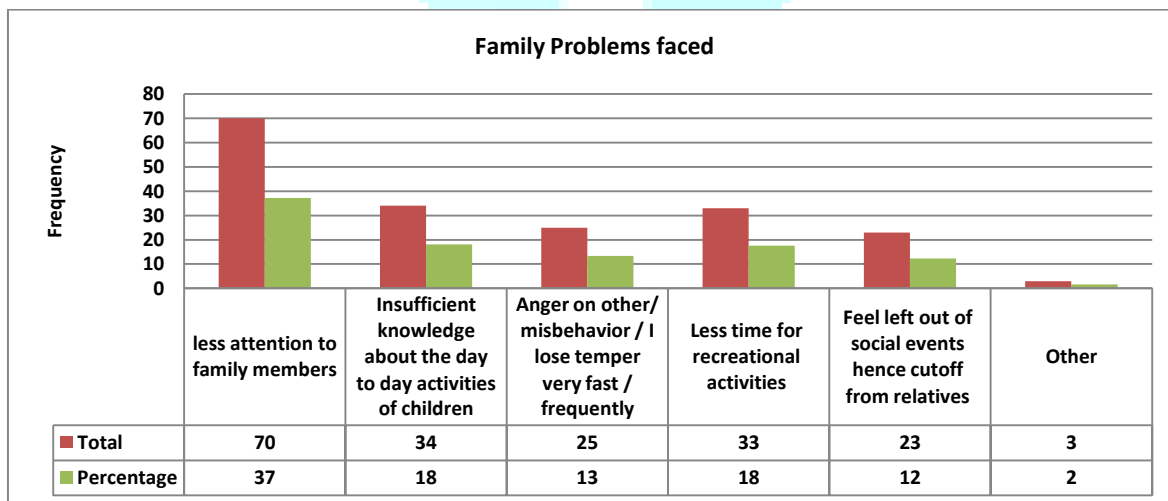


No of respondents: - 239

**INTERPRETATION**

As from the above questions we interpreted that night shift workers don't get enough time to spend with their family. And as there are mostly youngsters in the night shifts, they don't face family problems because they rarely indulge in the social activities.

**SERVE OF IF YES THEN WHICH TYPE OF PROBLEM?**

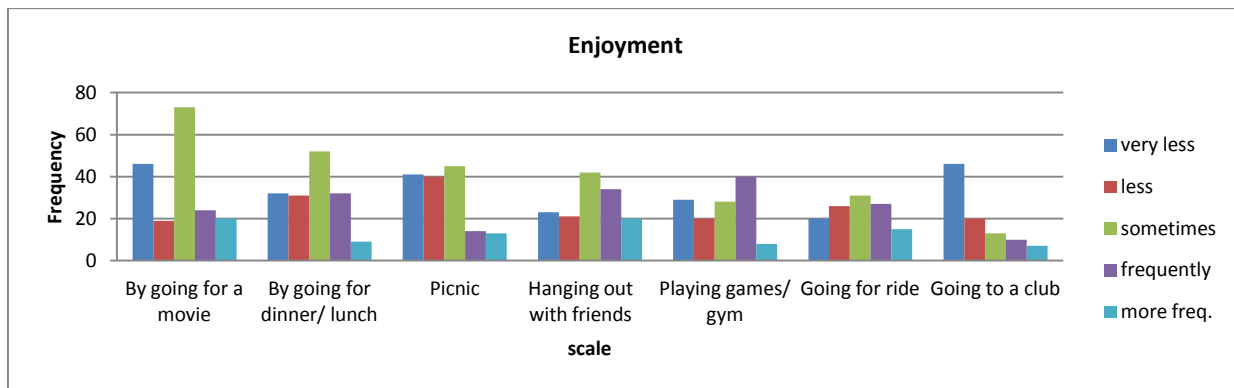


**INTERPRETATION**

Those who faces family problems, they faces it because the can't pay proper attention to their family (37%) and they are unaware about their children's activities (18%).

**SERVE OF HOW DO YOU ENTERTAIN YOURSELF/ RELAX?**

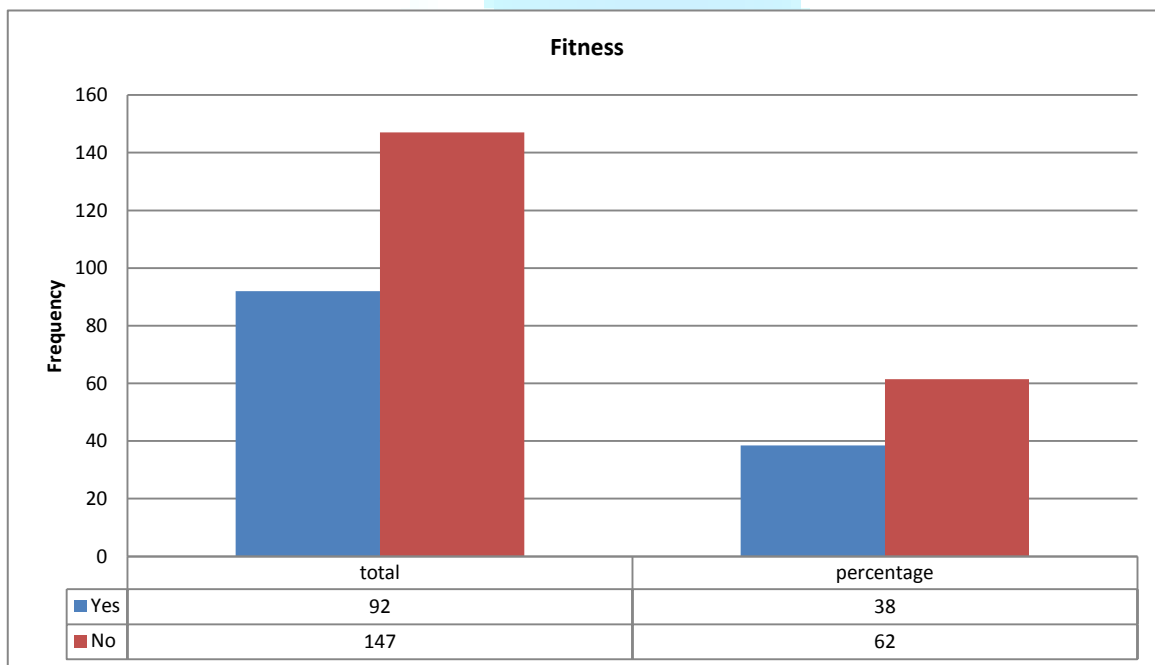
	very less	less	sometimes	frequently	more freq.
By going for a movie	46	19	73	24	20
By going for dinner/ lunch	32	31	52	32	9
Picnic	41	40	45	14	13
Hanging out with friends	23	21	42	34	20
Playing games/ gym	29	20	28	40	8
Going for ride	20	26	31	27	15
Going to a club	46	20	13	10	7



**INTERPRETATION**

Everyone should spend some time for their enjoyment but here we can see that nightshifts workers don't have much time. But whenever they get some time they either spend time for movie/dinner or picnic.

**SERVE OF DO YOU SPEND TIME FOR PERSONAL FITNESS (GYM/ YOGA/ EXERCISE OR WALKING)?**

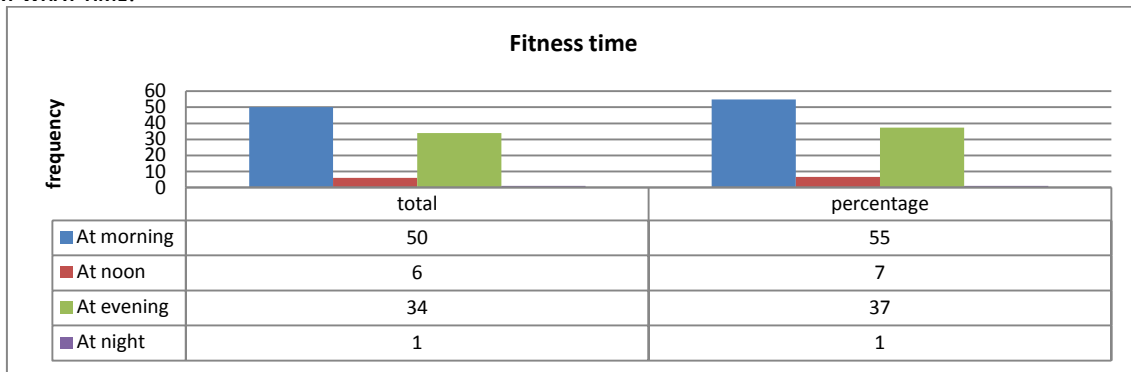


No of respondents: - 239

**INTERPRETATION**

From the above graph we can find that out of 239 only 92 people spent their time for their personal fitness. So we can say that nightshift workers don't pay enough attention for their fitness.

IF YES, THEN AT WHAT TIME?



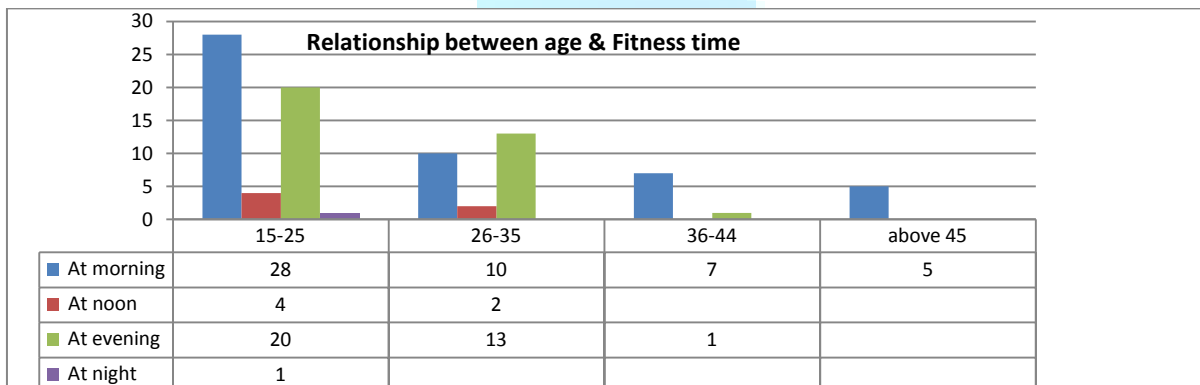
No of respondents: 91

**INTERPRETATION**

From the above we can say that those people who spend their time for fitness, they prefer morning time as normally people do. But there are also some people (38%) who carries out their fitness activity at evening.

**SERVE OF RELATIONSHIP BETWEEN AGE & FITNESS**

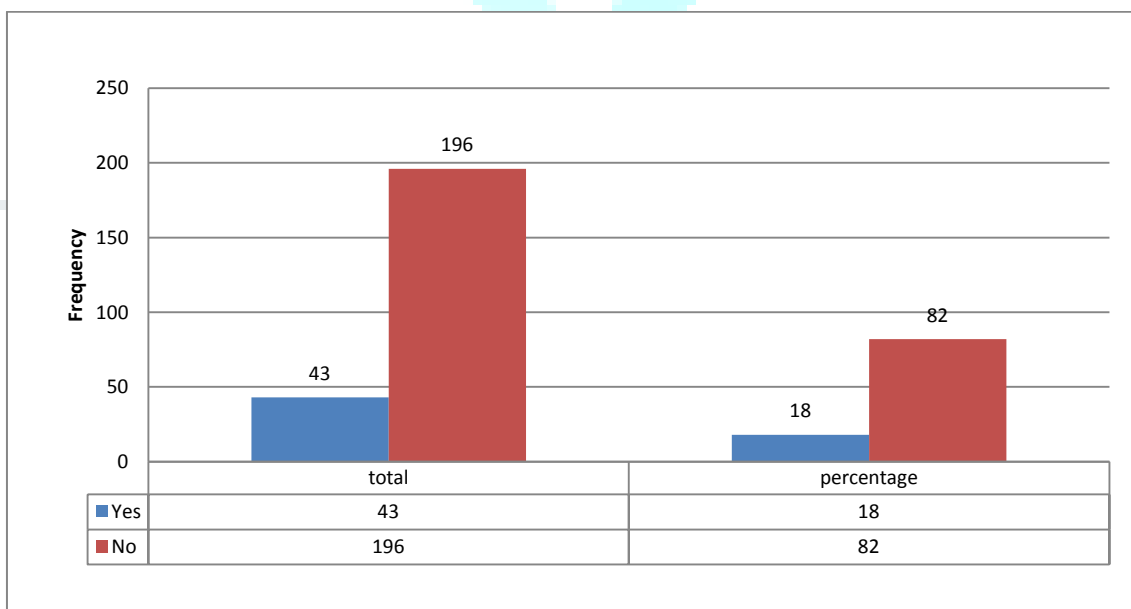
Age	fitness timing				Grand Total
	At evening	At morning	At night	At noon	
15-25	20	28	1	4	53
26-35	13	10		2	25
36-44	1	7			8
above 45		5			5
<b>Grand Total</b>	<b>34</b>	<b>50</b>	<b>1</b>	<b>6</b>	<b>91</b>



**INTERPRETATION**

Usually people do their fitness exercise in the morning but it is difficult for nightshift workers, they are doing exercise as per the convenience (morning or evening). From the above graph we can conclude that youngsters are maintaining their body fitness but on the other side we show that youngsters health is affected the most.

**SERVE OF HAVE YOU EVER THOUGHT LEAVING JOB DUE TO DIFFICULTIES FACED DURING NIGHT SHIFTS?**

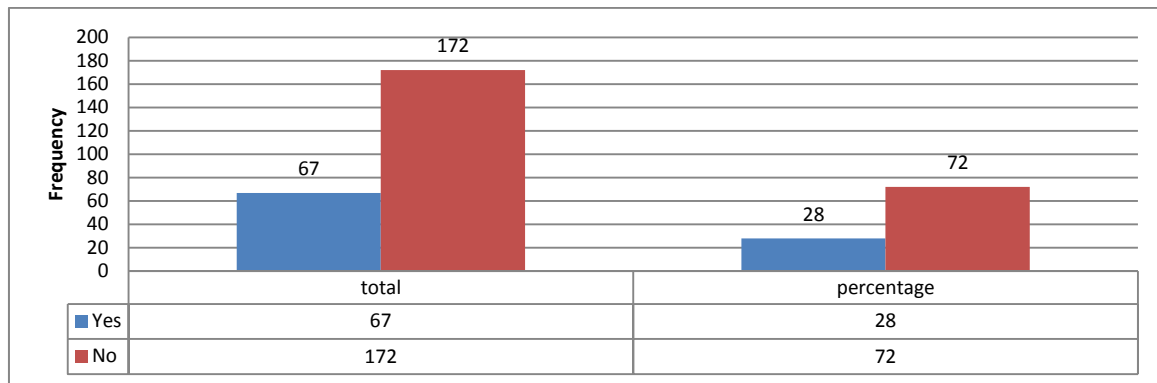


No. of respondents: - 239

**INTERPRETATION**

From the above, it shows that mostly nightshift worker are satisfied with their job, so that they never think of living their job. But on other side 18% workers to ready to change their timing.

**SERVE OF HAVE ANYONE LEFT THEIR JOB DUE TO DIFFICULTIES FACED DURING NIGHT SHIFTS?**

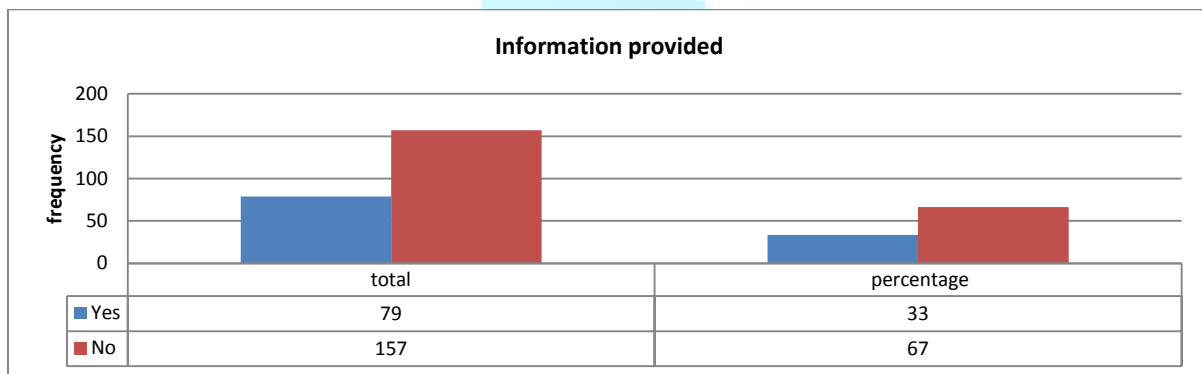


No. of respondents: 239

**INTERPRETATION**

As mostly nightshift workers don't think quickly to leave the job so they have not seen others leaving the job for the reason of night shifts. But those who have left it, it is because of their personal reason.

**SERVE OF DOES YOUR WORKPLACE PROVIDE TRAINING OR ANY INFORMATION REGARDING THE HEALTH AND SAFETY EFFECTS OF NIGHT SHIFT?**

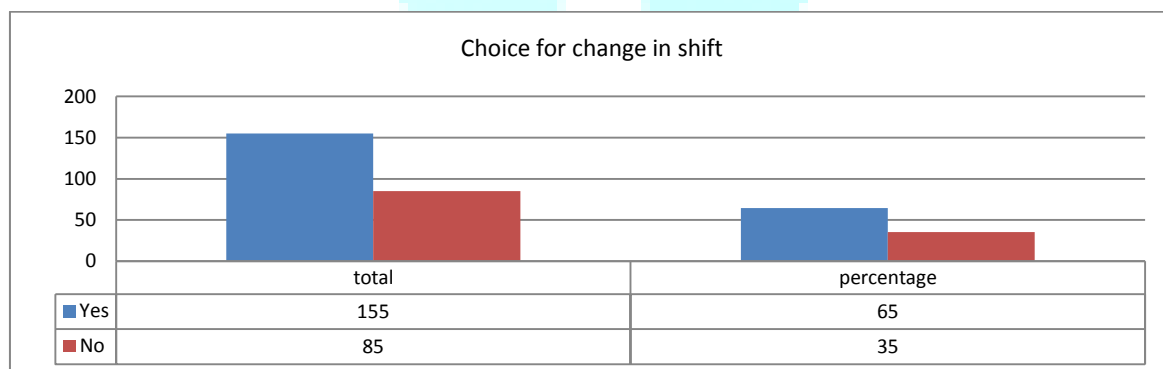


No. of respondents: - 236

**INTERPRETATION**

From the above graph we can found that 67% of people say that they are not provided the information regarding their health and safety effects in nightshift. Only 33% of the people replied positively which shows there are some companies who take care of their employees.

**SERVE OF IF YOU HAD A CHOICE, WOULD YOU LIKE TO WORK IN 'NORMAL HOURS' RATHER THAN IN 'NIGHT SHIFT'?**



No. of respondents: - 240

**INTERPRETATION**

From the above graph we can see that 65% of people are ready to work in normal hours rather than nightshift if they get the choice.

**SERVE OF RELATIONSHIP BETWEEN AGE & HEALTH**

H<sub>0</sub>:-There is no relationship between age & health

H<sub>1</sub>:-There is relationship between age & health

**TABLE: OBSERVED FREQUENCY**

Age	Effects of health			Grand Total
	a lot	not at all	to some extent	
15-25	24	51	59	134
26-35	12	17	30	59
36-45	4	7	13	24
above 45	6	3	12	21
<b>Grand Total</b>	<b>46</b>	<b>78</b>	<b>114</b>	<b>238</b>

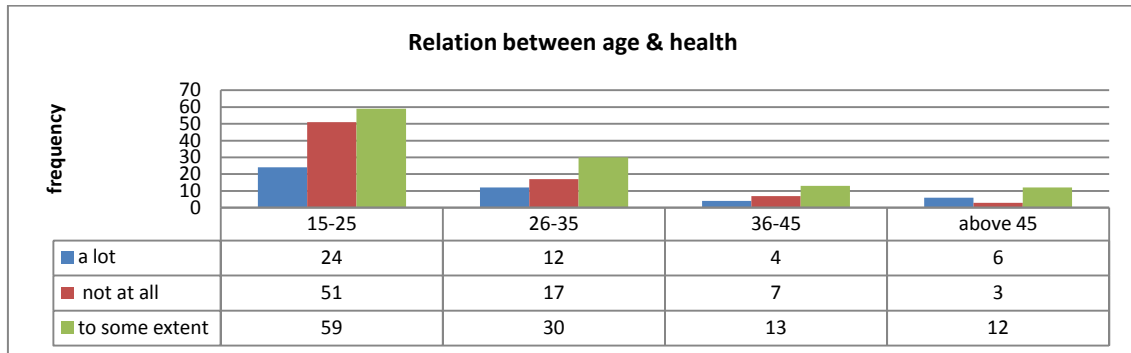


TABLE: - EXPECTED FREQUENCY

Age	Effects of health			Grand Total
	a lot	not at all	to some extent	
15-25	26	44	64	134
26-35	11	19	28	59
36-45	5	8	11	24
above 45	4	7	10	21
<b>Grand Total</b>	<b>46</b>	<b>78</b>	<b>114</b>	<b>238</b>

$\chi^2_{tab}(12.59) > \chi^2_{cal}(6.48)$

Here the value of  $\chi^2_{tab}$  is more than  $\chi^2_{cal}$  which means, that there is relationship between age and health.



From the above graph we can say that age group of 15-25 years health is more affected as compared to other age group of night shift worker. Therefore it can be stated that the youngsters health is more affected then elders.

**SERVE OF RELATIONSHIP BETWEEN TRANSPORTATION FACILITIES & ACCIDENTS**

H<sub>0</sub>:-There is no relationship between transportation facilities & accidents

H<sub>1</sub>:-There is relationship between facilities & accidents

TABLE: OBSERVED FREQUENCY

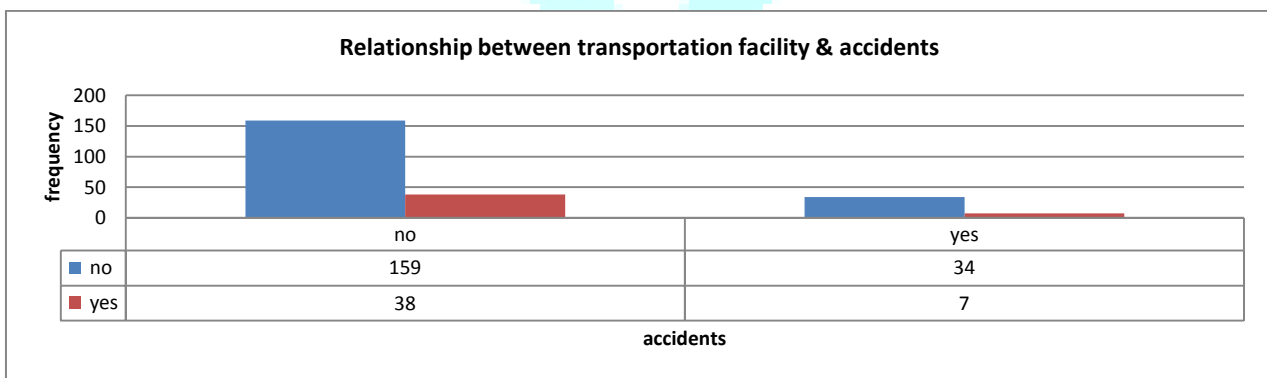
Transportation	Accident		Grand Total
	no	yes	
No	159	38	197
Yes	34	7	41
<b>Grand Total</b>	<b>193</b>	<b>45</b>	<b>238</b>

TABLE: - EXPECTED FREQUENCY

Transportation	Accident		Grand Total
	no	yes	
No	160	37	197
Yes	33	8	41
<b>Grand Total</b>	<b>193</b>	<b>45</b>	<b>238</b>

$\chi^2_{tab}(3.84) > \chi^2_{cal}(0.19)$

Here the value of  $\chi^2_{tab}$  is more than  $\chi^2_{cal}$  which means, that there is relationship between transportation facility & accidents.



From sample survey made can see that 34 people have transportation facility and still 7 people meet with an accident. And on other side 159 people are not provided with this facility from there company and 38 meet with an accident.

**SERVE OF RELATIONSHIP BETWEEN DINNER & HEALTH.**

H<sub>0</sub>:-There is no relationship between dinner & health

H<sub>1</sub>:-There is relationship between dinner & health

TABLE: OBSERVED FREQUENCY

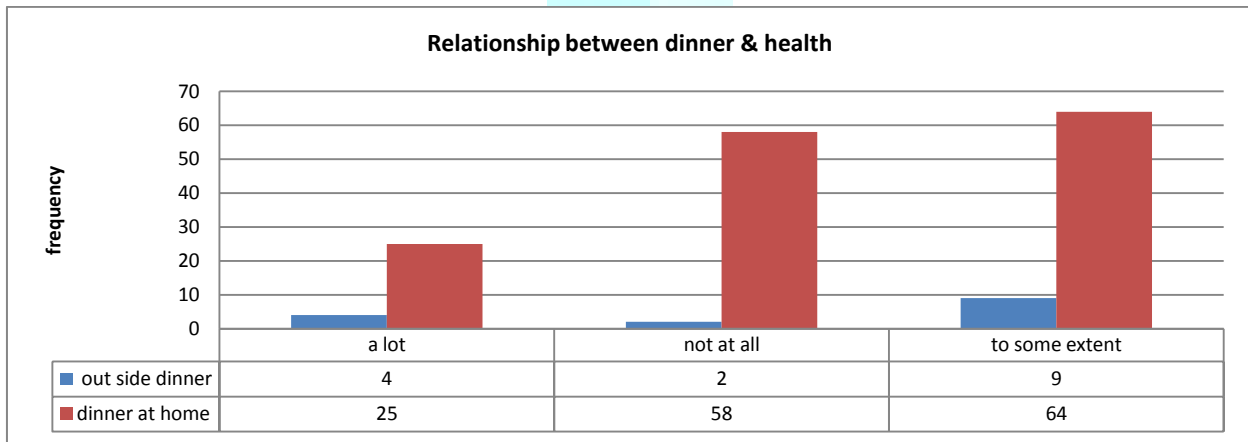
Health effects	Dinner		Grand Total
	at home	out side	
a lot	25	4	29
not at all	58	2	60
to some extent	64	9	73
<b>Grand Total</b>	<b>147</b>	<b>15</b>	<b>162</b>

TABLE: EXPECTED FREQUENCY

Health effects	Dinner		Grand Total
	at home	out side	
a lot	26	3	29
not at all	54	6	60
to some extent	66	7	73
<b>Grand Total</b>	<b>147</b>	<b>15</b>	<b>162</b>

$\chi^2_{tab}(5.99) > \chi^2_{cal}(3.97)$

Here the value of  $\chi^2_{tab}$  is more than  $\chi^2_{cal}$  which means, that there is relationship between dinner and health.



Some workers are having dinner at home and from that some are also having during the shifts, therefore majority of those kind of workers health is affected who have dinner at home and also during the shifts.

**SERVE OF RELATIONSHIP BETWEEN GENDER AND FAMILY PROBLEM FACED BY THEM.**

H<sub>0</sub>:-There is no relationship between gender & family problem

H<sub>1</sub>:-There is relationship between gender & family problem

TABLE: OBSERVED FREQUENCY

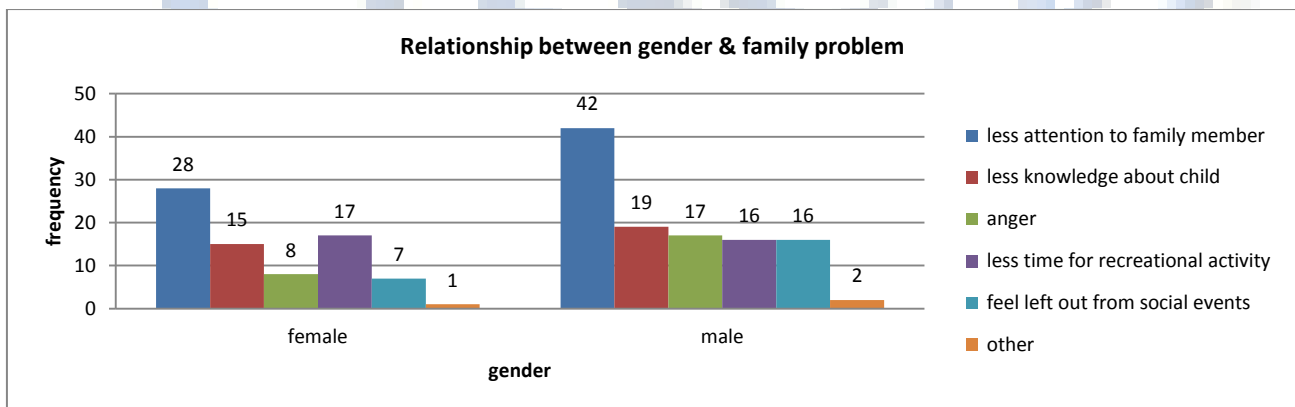
Gender	Family problem						Total
	less attention to family member	less knowledge about child	anger	less time for recreational activity	feel left out from social events	other	
Female	28	15	8	17	7	1	76
Male	42	19	17	16	16	2	112
<b>Grand Total</b>	<b>70</b>	<b>34</b>	<b>25</b>	<b>33</b>	<b>23</b>	<b>3</b>	<b>188</b>

TABLE: EXPECTED FREQUENCY

Gender	family problem						Total
	less attention to family member	less knowledge about child	anger	less time for recreational activity	feel left out from social events	other	
Female	28	14	10	13	9	1	76
Male	42	20	15	20	14	2	112
<b>Grand Total</b>	<b>70</b>	<b>34</b>	<b>25</b>	<b>33</b>	<b>23</b>	<b>3</b>	<b>188</b>

$\chi^2_{tab}(11.07) > \chi^2_{cal}(3.55)$

Here the value of  $\chi^2_{tab}$  is more than  $\chi^2_{cal}$  which means, that there is relationship between gender & family problem.



From the above graph we can conclude that male has more problems rather than female. Female faces problem such as less attention to family member and recreational activity but male has to face all the problems due to nightshift.

**SERVE OF RELATIONSHIP BETWEEN WORKING HOURS AND CHANGES IN FOOD HABITS.**

H<sub>0</sub>:-There is no relationship between working hours & food habits

H<sub>1</sub>:-There is relationship between working hours & food habits

**TABLE: OBSERVED FREQUENCY**

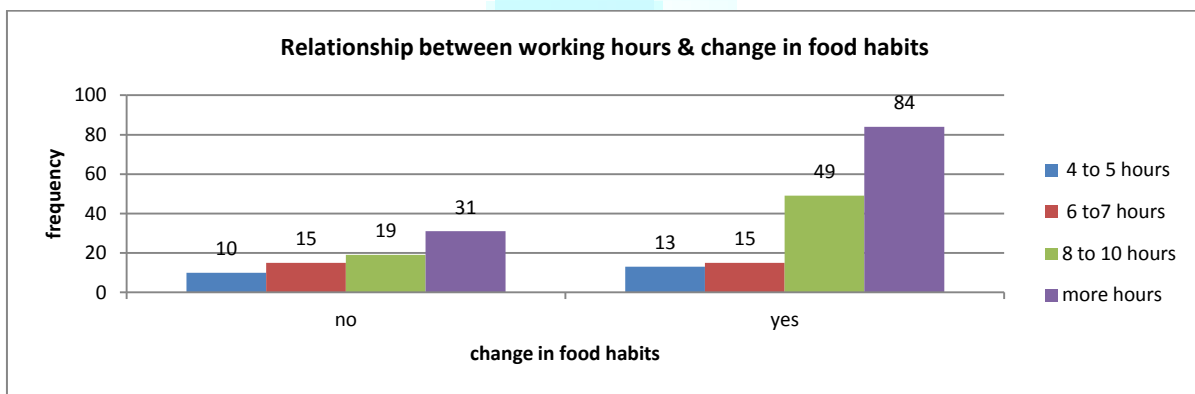
Changes in Food habit	Working hours				Grand Total
	4 to 5	6 to7	8 to 10	more	
No	10	15	19	31	75
Yes	13	15	49	84	161
<b>Grand Total</b>	<b>23</b>	<b>30</b>	<b>68</b>	<b>115</b>	<b>236</b>

**TABLE: EXPECTED FREQUENCY**

Changes in Food habit	Working hours				Grand Total
	4 to 5	6 to7	8 to 10	more	
No	7	10	22	37	75
Yes	16	20	46	78	161
<b>Grand Total</b>	<b>23</b>	<b>30</b>	<b>68</b>	<b>115</b>	<b>236</b>

$\chi^2_{tab}(7.81) > \chi^2_{cal}(7.64)$

Here the value of  $\chi^2_{tab}$  is more than  $\chi^2_{cal}$  which means, that there is relationship between working hours & food habits.



From the above graph we can conclude that food habit changes due to working hours. Nightshift workers biographical cycle is different rather than normal hour workers and it affects directly or indirectly their health.

**FINDINGS**

- We could find that mostly youngsters are working in night shift.
- It is found that most affected problem is transportation and insufficient sleep and also change in food habit.
- It can conclude that most of the worker's health is affected due to nightshift. Most commonly physical problem faced by the workers is Backache and psychological problem faced by them is irritation and anger.
- As workers can't spend sufficient time they faces family problems and also they can't give proper attention towards their fitness.
- Mostly nightshift worker are satisfied with their job, so they don't think of leaving the job but if they get chance they would like to work in normal hours.

**RECOMMENDATIONS/SUGGESTIONS**

These suggestions are partially based on the findings of our study but mostly they are on the basis of what our respondents shared with us.

- Firstly company should provide proper transportation facilities to their workers.
- Health is affected due to nightshift so the company should provide annual health checkups which will be beneficial to both workers as well as company.
- Due to insufficient sleep workers can't give proper attention to the work, therefore company should provide refreshment facilities like tea, coffee and also snacks so that they can work effectively.
- Workers also want the improvement in management and clean environment at work place.

**CONCLUSIONS**

- From the comparative study between age and health we were able to find that in night shifts there are maximum numbers of youngsters working and from overall comparison we came to the point that from the total respondents, youngster's health is affected to some extent as it takes time to settle themselves in different kind of routine and even some are not able to settle but they have to work as it becomes the nature of their work.
- Majority of companies don't provide their employees with transportation facility. But very few companies provide transportation facility to their employees and even after that they meet with an accident.
- We found that those who are having dinner at home, their health is affected to some extent because they even have some food during the shifts and this creates disturbance due to change in their timings and digestive system which affects them.
- Those who are working in the nightshifts are facing more family problems. But if we compare gender wise then females faces more problems than males. But both of them face family problems as they are not able to give proper attention to their family. As they can't give attention to their family they become unaware about their family and social activities.
- Those who are working for less number of hours their food habits is not affected to great extent but those who are working for 8-10 hours or more, their food habits have changed a lot due to changes in their regular life cycle.

**LIMITATIONS**

- Problems with Digestive system

- Risk of Heart Diseases
- High risk of Cancer
- Health Concerns
- Diverted Life
- Security

**SCOPE FOR FURTHER RESEARCH**

- From the comparative study between age and health we were able to find that in night shifts there are maximum numbers of youngsters working and from overall comparison we came to the point that from the total respondents, youngster’s health is affected to some extent as it takes time to settle themselves in different kind of routine and even some are not able to settle but they have to work as it becomes the nature of their work.
- Majority of companies don’t provide their employees with transportation facility. But very few companies provide transportation facility to their employees and even after that they meet with an accident.
- We found that those who are having dinner at home, their health is affected to some extent because they even have some food during the shifts and this creates disturbance due to change in their timings and digestive system which affects them.
- Those who are working in the nightshifts are facing more family problems. But if we compare gender wise then females faces more problems than males. But both of them face family problems as they are not able to give proper attention to their family. As they can’t give attention to their family they become unaware about their family and social activities.
- Those who are working for less number of hours their food habits is not affected to great extent but those who are working for 8-10 hours or more, their food habits have changed a lot due to changes in their regular life cycle.

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**ANNEXURE**

**QUESTIONNAIRE**

Q1.) Personal information:-

1. Name :-
2. Age :-  
15-25      26-35      36-45      45 above
3. Sex :-  
Male      Female
4. Marital status :-  
Married      Unmarried
5. Number of persons in the family :- \_\_\_\_\_
6. Number of children :-  
One      Two      Three      More      None
7. Occupation:-  
Student  
Business  
Service  
Profession

Q2.) Company details:-

- a) Name of the company \_\_\_\_\_.
- b) Nature of the company \_\_\_\_\_.
- c) Timing of night shift \_\_\_\_\_.
- d) Designation \_\_\_\_\_.
- e) Since how many months/years have you been working with this company? :- \_\_\_\_\_
- f) Salary(annual):-  
Below 80000      80000-150000  
150000-300000      300000-800000  
800000 & more

Q3.) Reason for working in night shift:-

	<b>(Circle the preferable rank)</b>				
Higher salary	1	2	3	4	5
Family constraints	1	2	3	4	5
Overtime Benefits	1	2	3	4	5
Other: - Nature of work (IT industry)	1	2	3	4	5

Q4.) Total working hours during night shift:-

- 4-6 hours      6-8 hours      8-10 hours      more

Q5.) Which problems do you face because of working in a night shift?

	(Circle the preferable rank)				
Transportation	1	2	3	4	5
Work pressure	1	2	3	4	5
Safety	1	2	3	4	5
Deteriorating health	1	2	3	4	5
Insufficient sleep	1	2	3	4	5
Depression	1	2	3	4	5
Irregular food habits	1	2	3	4	5
Hindrance in social life	1	2	3	4	5
Other: - _____	1	2	3	4	5

Q6.) How many total hours per day do you spend in travel for workplace?

- Less than one hour                      1-2 hours
- 2-3 hours                                      3-4 hours
- More than 4 hours

Q7.) Does your company provide you with transportation facility?

- Yes                                              No

7.1) If yes then from where?

- Home
- Pickup centre

7.2) If no then which mode of transportation do you use?

- Motorbike                      Scooter                      Car                      Rickshaw                      Other: \_\_\_\_\_

Q 8.) Have you met with an accident before/after the job?

- Yes                                              No

(A) If yes than at which place?

- Near the house
- Near the office
- Middle of the distance
- At some other place:- \_\_\_\_\_

(B) At what time? :-

- While going to office
- While returning from office

Q9.) Due to night shift has your food habit changed?

- Yes                                              No

Q10.) How & when do you take your dinner?

- At home before the shift
- Outside home before the shift
- During the shift in the breaks
- 1) Tiffin                                      2) Canteen food

Q11.) During the shift at what time do you take your dinner?

- After 2 hours                      After 4 hours                      After 6 hours

Q12.) Do you think your health is adversely affected by night shifts?

- To some extent                      A lot                      Not at all

Q13) Have you experienced any symptoms from the following as a result of night shift?

- A)                                              B)
- Backaches                                      Feeling depressed
- Continuous tiredness                      Feeling angry & irritable
- Frequent cold & headache                      weight gain
- Digestive disorder / acidity / gastric                      weight loss
- High blood pressure / low BP
- Insomnia
- Respiratory illness
- Sprains & Strains
- Others (specify):- \_\_\_\_\_

Q14.) Does your company provide you any annual health checkups?

- Yes                                              No

Q.15) How often do you visit any doctor for your personal checkups?

- Monthly                      Quarterly                      Half yearly                      Yearly

Q16.) How frequently do you take a nap during the job?

- No                      1 time                      2 times                      3 times                      4 times

Q17.) How many times you take refreshment (Hot/Cold) during the working hours?

- 1time                      2 times                      3 times                      more

Q18.) Which of the following habits do you have?

- Before                                              After
- Cigarettes
- Pan Masala
- Tobacco
- Drinks
- Hukka
- None

Q19.) What do you do immediately after reaching home from the job?

- Breakfast                      Sleep                      Bath                      Other than these:- \_\_\_\_\_

Q20.) When do you go to sleep?

- Morning [6 am to 11 am]                      Afternoon [11 am to 5 pm]                      Evening [5 pm to 10 pm]

Q21.) How many hours do you spend on sleep?

Weekdays	6 hours	7 hours	8 hours	more
Weekends	6 hours	7 hours	8 hours	more

Q22.) What do you prefer to do before going for the job?

Very less    Less    Sometimes    Frequently    More frequently

- Watch T.V
- Listen to songs
- Spending time with family
- Meet friends
- Eat snacks

Q23.) Do you face family problems because of night shift?

Yes    No

Q24.) If yes then which type of problem?

- Less attention to family members
- Insufficient knowledge about the day to day activities of children
- Anger on other/ misbehavior / I lose temper very fast / frequently
- Less time for recreational activities
- Feel left out of social events hence cutoff from relatives
- Other:- \_\_\_\_\_

Q25.) How do you entertain yourself/ relax?

Very less    Less    Sometimes    Frequently    More frequently

- By going for a movie
- By going for dinner/ lunch
- Picnic
- Hanging out with friends
- Playing games/ gym
- Going for ride
- Going to a club

Q26.) Do you spend time for personal fitness (gym/ yoga/ exercise or walking)?

Yes    No

Q27.) If yes then at what time?

- At morning
- At noon
- At evening
- At night

Q28.) Have you ever thought leaving job due to **difficulties faced** during night shifts?

Yes    No

If yes which was the main problem:- \_\_\_\_\_

Q29.) Have **anyone** left their job due to **difficulties faced** during night shifts?

Yes    No

If yes which was the main problem:- \_\_\_\_\_





**ELECTRONIC COMMERCE ADOPTION BY MICRO, SMALL AND MEDIUM SIZED ENTERPRISES**

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**ABSTRACT**

*Micro, small and medium sized enterprises (MSMEs) play a pivotal role in nation building. They are considered to play a vital role in guarantying the national economic and social development. MSME give a strong foundation to maintain steady and fast development of national economy. Electronic commerce is becoming the new battlefield of competition among enterprises. The number of transactions and the volume of business generated through electronic commerce is increasing steadily. However, the penetration of electronic commerce in MSMEs' of our country is still at a nascent stage. This in turn is slowing their growth story to a large extent. Their development and expansion is getting restricted owing to the lack of adoption of electronic commerce as a viable business model. Micro, small and medium sized enterprises are generally not in a position to compete with the larger well established business organizations due to the visibility acquired by the latter. By adopting electronic commerce MSMEs' can get visibility in the global market place. This will be of immense help to them. This paper analyzes the problems existing in the electronic commerce set up of micro, small and medium enterprises of our country. A solution is proposed keeping in mind the existing cyber laws and other regulations, which hopefully will be conducive to micro, small and medium sized enterprises launching electronic commerce.*

**KEYWORDS**

Electronic commerce; micro, small and medium sized entrprises; problems; strategies.

**1. INTRODUCTION**

E-commerce in simple terms is the capability of doing business with the help of internet, in which the sellers and buyers conduct various business activities without meeting each other. E-commerce combines the resources of information systems with the reach of network connectivity to directly link the key business constituents - Customers and Businesses [1]. The history of e-commerce dates back to the early 1990's but only in the last few years it has made a strong foothold in the Indian sub-continent. A micro-enterprise is one where the investment in plant and machinery (their original cost excluding land, building and items specified by the Ministry of Small Scale Industries in its notification No. S.O. 1722(E) dated October 5, 2006) does not exceed Rs.25 lakh. A small enterprise is one where the investment in plant and machinery is more than Rs.25 lakh but does not exceed Rs.5 crore. A medium enterprise is one where the investment in plant and machinery is more than Rs.5 crore but does not exceed Rs.10 crore. This applies for the manufacturing sector [2].

The definition of MSMEs in the service sector is:

- Micro-enterprise: Investment in equipment does not exceed Rs.10 lakh.
- Small enterprise: Investment in equipment is more than Rs.10 lakh but does not exceed Rs.2 crore.
- Medium enterprise: Investment in equipment is more than Rs.2 crore but does not exceed Rs.5 crore [2].

The Indian micro, small and medium sized enterprises (MSMEs) sector plays a pivotal role in the country's industrial economy. It is estimated that in value, the sector accounts for about 45 percent of manufacturing output and about 40 percent of total export. In recent years, the MSME sector has consistently registered a higher growth rate than the overall industrial sector. The major advantage of the MSME sector is its employment potential at a low capital cost. According to available statistics (4th Census of MSME Sector), the sector employs an estimated 59.7 million people in 26.1 million enterprises; labor intensity in the MSME sector is estimated to be nearly four times that of large enterprises.

**2. CLASSIFICATION**

Electronic commerce can be broadly classified into the following categories:

**BUSINESS TO BUSINESS**

This category of e-commerce helps inter-organizational interaction and transaction. It requires two or more business entities interacting with each other directly or through an intermediary [1]. Business applications of this type can be used to facilitate almost all types of interactions among organizations such as inventory management, channel management, order fulfillment and delivery. This category is further sub divided into supplier-centric, buyer-centric and intermediary-centric.

**BUSINESS TO CONSUMER**

This category of E-commerce helps consumers the capability to browse, select and buy merchandise online from a very wide variety of sellers at better prices [1]. This model has been utilized mainly by on-line internet based stores and small businesses trying to surpass entry barriers. Existing business organizations may use this model by making a web presence and expanding the market space and revenues by utilizing the internet as a new channel to do business with customers.

**CONSUMER TO BUSINESS**

In this model the consumers get a choice of wide variety of products and services. They also specify the range of prices they are willing to pay for a particular product or service. As a result there is a reduction in bargaining time, increase of flexibility and ease of operation at the point of sale for both the merchant and the consumer.

**CONSUMER TO CONSUMER**

In this model consumers get opportunity of trading products or services among themselves through internet. Products that are sold through this model are mainly small gift items, craft merchandise etc. This model is a platform for consumers to transact goods or services with other consumers present on the internet.

**BUSINESS TO GOVERNEMENT**

In this model transaction takes place between business organizations and government. The transactions are guided by much stricter rules and regulations as it should be when dealing with the government.

**3. BENEFITS OF ELECTRONIC COMMERCE**

Indian companies intending to join the e-commerce business must consider the short term and long term benefits that the companies will get. The main benefits of e-commerce are considered to be the following:

**WEB PRESENCE**

Web presence or having an own website makes a company visible across geographical boundaries. This for a company is an entry to the virtual marketplace. This offers tremendous advantages to companies of any size and sector. Web sites can help a company by providing timely and relevant information to customers

about the products and services that are offered. One of the important benefits that a company gets out of a web presence is image enhancement, larger influence of the brand and expansion of overseas market as well as national market.

#### **SUPPLY CHAIN**

E-commerce helps companies in refining their supply chain to a large extent. A proper supply chain can help in reducing costs while ensuring the customers get right quality of product at the right place and at the right time and at the least cost. Channel partners work together in an environment of trust and results are seen through reduction in costs, proper maintenance of stocks in the inventory and cycle time reduction. Refinement of supply chain can also be possible over traditional route but e-commerce provides far too many benefits over the traditional route.

#### **ENHANCED CUSTOMER SERVICE**

E-commerce also provides lot of opportunities to enhance customer service. As for example a bank customer who has an online access to his account is spared the burden of visiting the bank branch and carrying out transactions in the traditional way. This saves a lot of time and results in improved customer service and satisfaction.

#### **COMPETITIVE PRICING**

Buyers and sellers come together in electronic market place and it is a win-win situation for both. E-commerce offers the benefit of online ordering of goods and online payment options. Buyers get competitive pricing and sellers do not have to build brick and mortar stores. This results in direct reduction of costs of the products and the companies pass on to this benefit to their customers. MSME segment players can make their bids online. When it comes to bidding or quoting prices of products online in an electronic marketplace constraint of bidding in the traditional way are overcome. This may result in increase in business for many organizations.

#### **INTERNAL BUSINESS PROCESSES**

E-commerce initiative can be linked with the internal business processes of an enterprise as well. Companies can link the e-commerce initiative with their enterprise resource planning, supply chain management and customer relationship management initiatives through a seamless integration of business processes and providing great value to the end customers. This initiative if taken properly will also help companies to stay ahead of the competition.

### **4. ROLE OF ELECTRONIC COMMERCE**

E-commerce allows companies to be available 24 hours a day throughout the year to their prospective and existing customers. So it can be said that e-commerce breaks away from the limitation of time and space when it comes to reaching the customers or for customers looking for prospective suppliers of goods and services. In short which means transactions can be conducted at any time and at any place. This improves the companies operating efficiency and global competitiveness. Additionally the advantages of being paperless to a large extent and low operating costs make up for the deficiencies of MSMEs in capital, technology, scale and image. This in turn creates more chances for them to develop. One of the major benefits of an e-commerce initiative which is in perfect synchronization with E.R.P, S.C.M and C.R.M initiatives of a company is maintenance of proper inventory levels so that the customer can get the quality product at the least cost. E-commerce has a distinct role in reducing cost of MSMEs. The following are some of the various categories of expenditure of MSMEs that can get reduced:

- i. Raw materials procurement cost.
- ii. Inventory cost.
- iii. Production cost.
- iv. Promotion as well as export marketing cost.
- v. Cost related to retaining present customers.
- vi. Cost related to identifying prospective customers.
- vii. Product information dissemination cost.
- viii. Communication costs within the enterprise.
- ix. Communication costs with external entities.

### **5. PROBLEMS OF ADOPTING E-COMMERCE BY MSME**

Though there exist lots of benefits of e-commerce there are some areas of concern in the adoption of e-commerce by MSMEs that needs to be addressed. Those areas are mainly:

#### **SECURITY**

The security problems still remain the main factor that affects the development of e-commerce. To do transactions in the open internet safe transmission of data is the most important factor and this factor plays a major role in popularizing electronic commerce. Surveys about the application prospect of e-commerce clearly point out that the majority of people express their fear of personal information being lost or infringed because of the invasion of hackers. Therefore, security or the lack of it is an area of concern that has become the biggest obstacle to the development of e-commerce. The operation of e-commerce involves many types of security problems such as capital security, information security, commodity security and business secrets. In order to popularize e-commerce it is very important that the security issues are addressed properly.

#### **LACKING STRATEGIC PLAN**

The management in many micro, small and medium-sized enterprises does not understand the power of internet as a means to boost business. The management leaders have a weak sense of using information, not fully recognizing the importance of information in the era of knowledge economy, or only partially understanding how to conduct e-commerce such as considering e-commerce as surfing the internet or simply establishing a website, without having the related management foundation. Thus e-commerce only stays on the surface of website construction. The e-commerce conducted by many micro, small and medium-sized enterprises tends to lack long term planning. E-commerce involves business transformation and different enterprises have different ways to develop e-commerce. In order to reap the benefits of internet the implementation of e-commerce in many micro, small and medium-sized enterprises needs to be gradually realized, planned for a long time and implemented step by step. This can be done by making use of the internet to browse, collect and issue information, to establishing enterprise's own website and information platform, conducting online purchase, and to setting up joint purchase platform of the trade and perfecting the management system of supply chain [6].

#### **LACK OF TALENT**

The managers of many micro, small and medium sized enterprises haven't fully realized the revolutionary changes e-commerce has brought to business development and marketing methods and hence importance hasn't been attached to the cultivation of talents. As a result of which there is a lack of talents in e-commerce. To conduct e-commerce, the small and medium-sized enterprises need both technology and talents, and because of the lack of professional personnel and of innovation in the pattern of e-commerce, the micro, small and medium-sized enterprises are short of network-running experience, and superiority of e-commerce could not be given full play. Consequently many such enterprises engaged in e-commerce are not competent enough [6]. The lack of professional personnel is the most important factor hindering the application of e-commerce in micro, small and medium-sized enterprises.

### **6. STRATEGIES TO ADOPT E-COMMERCE BY MSME**

E-commerce is a herculean and complicated systematic project, which can hardly be done at one shot. To be successful in the e-commerce business in the long run, it is extremely necessary for organizations to make proper plans and policies. Reference [7] states that before entering e-commerce managers must be able to answer some very important questions related to e-commerce implementation strategy. The government also has an important role to play. The government should bring advanced technology and platform of developed countries to strengthen the construction of technology infrastructure. The government should help in all possible ways to cultivate the developing environment of e-commerce.

**SECURITY**

The security problem of e-commerce needs to be addressed effectively. Securing e-commerce must occur on four fronts:

- i. Securing the web clients.
- ii. Securing the data transaction.
- iii. Securing the web server.
- iv. Securing the network server operating system.

Organizations need to be proactive in protecting their resources linked to the network. It is reasonable to tolerate a flaw that will hardly occur. It is also reasonable to assume that logically independent failures will be statistically independent and not happen in concert. In contrast, security vulnerability, once discovered, will be rapidly disseminated among the growing community of hackers and will be exploited on a regular basis until it is fixed [1].

**PROMOTE ONLINE CONCEPT BY TOP MANAGEMENT**

The top management of micro, small and medium-sized enterprises should promote e-commerce, applying modern technology to the management of the enterprises, and making them succeed in the competition. At present, in case of many micro, small and medium-sized enterprises, e-commerce is only limited to maintaining a web site which gives information about the enterprises and their products. But the various other advantageous avenues of e-commerce have been overlooked. The top management of MSMEs should come forward whole heartedly to reap the full benefits of e-commerce. Since conducting business over internet also requires a change in mentality the top management should also train employees so that there is no resistance from the employees to carry business over the internet. In order to have a successful e-commerce development it is necessary to have board level commitment and support from all stake holders. Projects have been known to fail without such commitment [7].

**INFRASTRUCTURE IMPROVEMENT**

Our country has already achieved initial achievement in the construction of information infrastructure but compared with the information highway of developed countries, we are still in the initial stage. India has got a low personal computer penetration and consequently internet usage is also low as compared to the developed nations. But it can be expected that more and more people will get connected with the internet in the near future. E-commerce infrastructure should be highly usable and reliable, and at the same time, it should be safe. The e-commerce site should be easily accessible 24/7. Any time a visitor tries to reach the site, it must be available instantly. Non availability of the site will cause serious negative impact on the buyers. Speed of internet is another crucial factor. Given the Indian scenario where the online buyer is paying for the internet connection as well as for the telephone, the speed of content downloading is of great importance [4].

**TALENT HUNT**

Lack of employable engineers is an area of serious concern. According to NASSCOM only a small percentage of fresh engineering graduates are employable [3]. Top companies attract talent owing to a number of factors. The most important being the salary package that they offer. Apart from this the learning environment and the growth potential that an employee gets while working in a big company are the other advantages that lure young and experienced engineers alike to join top companies. However, MSMEs should recruit new talents and devise ways to retain old talents. Developing e-commerce setup is a pioneering and creative task, which requires high quality pioneering personnel engaged in the profession. The people selected for the job should be prospective in vision, open in mind, passionate and bold in starting business.

**GOOD CLIENT BASE**

In business good relation with clients is always beneficial for any enterprise irrespective of the size and sector to which the enterprise might belong to. MSMEs do not have a huge client base as compared to the large multinational companies. After adopting e-commerce the MSMEs can get feedback in real time from their clients for their existing products and thus can have a very clear idea about the likes and dislikes of their customers. These enterprises can also go onto customize products according to the requirements and demands of their customers. They can also provide their customers with enhanced after-sales service. But they have to fulfill their customer demands promptly. Speed of execution of customer orders is very important. Otherwise those customers may switch loyalty and move to other business competitors. Customer response and queries have to be dealt with extreme care. These will definitely prove to be of great help in expanding the client base.

**CONTINUOUS EVALUATION**

E-commerce implementation involves various stages. Each and every stage of e-commerce implementation should be carried out after planning meticulously. Problems if any should be removed. Business processes involved in the proper functioning of e-commerce have to be closely monitored and modified as per the customer requirements. A long lasting supervision and management mechanism should be present to promote the constant improvement of e-commerce. Thus a continuous evaluation of the e-commerce initiative by the top management is necessary.

**COMMUNITY BUILDING**

A strong community building exercise is also required for an e-commerce enterprise to be a success. Frequent online visits by individuals or by persons representing business organizations having a sense of belonging or feeling a part of community that the e-commerce venture represents is very helpful. This community building exercise goes a long way in making the e-commerce venture a success [4].

**7. CONCLUSION**

E-commerce makes use of the internet and mobile communications network to conduct various business activities. E-commerce as a concept basically involves the applications of high end technologies and as stated earlier it has got lot of benefits. So it will continue helping the human society in ways too many. The micro, small and medium sized enterprises must fully recognize the trend and explore different ways to carry out e-commerce activities to remain competitive in the information age of today as well as in the years to come. Though it must not be overlooked that setting up an e-commerce venture or shifting from doing business in the traditional way to an e-commerce organization has got lot of challenges but e-commerce is poised to become an important driving force for the development of enterprises as long as there is a highly professional and proper management and commitment, clear goal and deep knowledge of all stake holders.

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## THE WORKING CAPITAL ANALYSIS OF DISTRICT CENTRAL COOPERATIVE BANKS IN TIRUNELVELI REGION, TAMILNADU

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### ABSTRACT

*Finance and Financial management plays an important role in all types of organization. Sound financial planning and management is the most vital requirement for successful management. Financial management also plays an important role in cooperative enterprise. A study of business failures in cooperatives would reveal that majority of such failures resulted from the lack of proper financial management. DCCBs occupy a place of significance in the cooperative credit delivery system. They act as a spokesperson of the cooperative movement at district level. Inefficient functioning of cooperatives is due to bad debts, excessive overdue or otherwise investment. Therefore, the financial management occupies an importance place as the functions of these institutions. Hence, the analytical study on the Working Capital Analysis of District Central Cooperative Banks in Tirunelveli Region has been undertaken. The results of the study will help in identifying the lacuna if any in the financial performance of the DCCBs and to frame financial policies and programme to the benefit of the banks and the community.*

### KEYWORDS

Co-operative banks, working capital analysis.

### 1.1 INTRODUCTION

Financial management plays an important role in cooperative enterprise. Sound financial planning and management is the most vital requirement for successful management. A study of business failures in cooperatives would reveal that majority of such failures resulted from the lack of proper financial management. Inefficient functioning of cooperatives is due to bad debts, excessive overdue or otherwise investment. The financial management, similar to the private or public sector corporations has their own distinctive features. The principles, practice, legal basis, performance criteria and financial base of cooperatives are not the same as prevails in companies or public enterprises.

Financial management refers to two vital activities like procurement and utilization of financial resources. The finance function in a Central Cooperative Bank is highly regulated in that the sources, forms and cost of borrowings by the bank are regulated and it is not altogether free in organizing its investment portfolio. While it borrows only from the State Cooperative Bank (SCB), it lends to societies as per the directives by RBI. The share capital and deposits are the other resources of bank, but these are also not free from regulation. While share capital contribution from the societies is linked to their borrowings from the bank, the types of deposit accounts and the interest rates on deposits are specified. Its investment in channels other than loans and cash credits to societies are limited and specified. These include government promissory notes, shares in SCB and other approved Cooperatives and Public institutions, term deposits and current accounts with SCB and other approved banks, debentures, bonds, etc. Of these, share capital and deposits with the SCB form the biggest chunk. The Registrar frames the policy for investment of funds of cooperative societies, including the Central Cooperative Banks based on the guidelines issued by the RBI from time to time. Thus, the Central Cooperative Banks function within a straight jacket in matters relating to finance. Not much discretion is left to the management of the bank in managing funds. In addition to the restrictions on its borrowings, landings and investment of funds, Central Cooperative Bank is also subjected to rigorous discipline in respect of a few important financial operations and its failure to observe the financial discipline will entail serious consequences of inadequate and interrupted credit flow.

The District Central Cooperative Banks occupy a position of cardinal importance in three-tier credit system. They came into existence due to the failure of Primary Agriculture Cooperative Societies to collect the required resources of village community on one hand and to inspire the habit of thrift and savings among the members to provide strong capital base. Hence, the DCCBs were started to tap the required finance from the members, higher financing institutions, in order to fulfill the credit needs of the affiliated societies.

The success of primary agricultural credit societies at village level and state cooperative banks at apex level depend much on the strength and the efficient operations of the District Central Cooperative Banks. A sound and strong District Central Cooperative Bank is capable of providing the required financial assistance to primary agricultural credit societies and also support the apex banks in ensuring greater flow of credit from the NABARD. As a federation of Primary Agricultural Credit Societies, District Central Cooperative Banks have an important role to play in guiding, supervising and directing financial operations of primary agricultural cooperative banks. Attempts are being constantly made to keep these institutions purely as federal institutions representing all types of societies working in a district. Under the multi-agency system of financing the DCCBs have to face keen competition from commercial banks and Regional Rural Banks. Hence the success of the cooperative credit in a district depends on the success of the DCCBs. The flow of the NABARD funds also depends primarily on the fulfillment of financial discipline by the DCCBs and their capacity to absorb at least a certain amount of over dues from its own resources.

Working capital of cooperative credit institutions differs from that of corporate sector. It consists of owned funds and borrowed funds.

**a) Owned funds:** It consists of the paid up share capital plus various reserves created by the bank/societies.

- **Paid-up Share Capital:** It is the important component in the owned fund of cooperative bank. Primary cooperative societies/banks collect share capital from individual members. Government also contributes to the share capital in all cooperatives.
- **Reserve Funds:** All cooperative institutions, according to the Act and bye laws, must distribute their profits every year and must set a portion of their profits to Reserve fund and other reserves like credit stabilization funds, bad debt reserves, etc. Reserve funds are indivisible and cannot be use by an institution as a source of the "Loan able fund". It is invested with their immediate apex institution. Reserve fund is used to calculate the maximum borrowing power of the institution though it is invested outside the institution.

**b) Borrowed Funds**

- **Deposits:** Like commercial banks, cooperative banks also mobilize resources by way of deposits and attracting them from the public. Cooperative banks are allowed to attract deposits from member and non-members and in banks like Urban Cooperative Banks and Central Cooperative Banks non-member's deposits from the major part of their total deposits.



- **Borrowings:** Borrowings are borrowings from apex institution, Government, RBI, etc. Though other borrowings form part of the borrowed funds they occupy an important place on the working capital of cooperative banks. Too much dependence on this fund is not a good sign for self-reliance in resources.

## 1.2 REVIEW OF LITERATURE

Several individual researchers had studied a few facets of fund flow analysis of selected DCCBs in selected areas. To know how far the ground is already prepared and to identify the gaps therein and to spell out the issues which need further intensive and comprehensive analysis, an attempt is made to review the related literature.

**Sundhararaman R. and Malaikolunthu S,** (2010) studied on "A study on the working of Thiruchirapalli District Central Cooperative Bank". The important findings of study were share capital, deposits, working capital increased and borrowings of the bank decreased. The profitability of the bank a fluctuating trend was observed during the period. The study has analyzed the performance evaluation with regard to deposit mobilization, issue of loans and advances, recovery of loans, financial aspects and views of employees of the bank. The study has revealed that the financial viability and profitability of the bank is moderate.

**Devaraj. T.S,** (1999) studied "Working of District Central Cooperative Bank, Hassen, Karnataka - An Analysis". The objective of the study were to study the progress made in the share capital, to examine the size and composition of working funds, to analyze the overall profitability of the bank. The findings of the study were that the total share capital of the bank had increased during the study period. The working fund of the banks has substantial increased growth rate of 186 percent in composition.

**Sankhyan C.L and PankajLalit Sharma,** (1996) studied on, "Performance of a Central Cooperative Bank in Himachal Pradesh – An appraisal". The study analyzed the factors of the bank like share capital, reserve fund, deposits, borrowing, working capital and resources mobilized in the form of share capital, deposits and borrowings. The study found that the profitability of the bank was suffering with losses during seven years out of a total fifteen years under study. The main reason of losses to the bank was its poor recovery. The study concluded that Joggindra Central Cooperative Bank Ltd., (JCCB) has not performed well. It can be treated as a weak bank in some fields and hence, requires special attention of the management and government for its proper growth and improving its performance. For improving its position the bank should open new branches in unbanked areas, manage its cash and liquid assets properly, expand its credit facilities by finding avenues for investment and improve its recovery.

**Muthupadian. K,** (1995) studied on "A Case Study on Tirunelveli District Central Cooperative Bank". He analyzed the share capital, deposits, reserve fund, borrowings, working capital, loans, government grant, classification of credit like, ST, MT, LT credit, lending procedures, recovery of loans, funds analysis etc., The finding of the study is that organizational structure promotes stability and creates lot of creditability among the farmers. It also helps free flow of funds at all level without any problem. It functions more or less a corporate body. The study suggested that the ST and LT credit structure the organizational competence are found to be ineffective because of lack of communication, it conducts periodic audit but in most of the primary banks it does not conduct audit and supervision. The working of PACB can be considerably improved by supervision and inspection. The audit should be undertaken regularly and it should take immediate action of the objection raised in the audit report. The cooperative banks need efficient management for better coordination with the organization.

## 1.3 STATEMENT OF THE PROBLEM

DCCBs occupy a place of significance in the cooperative credit delivery system. They act as a spokesperson of the cooperative movement at district level. The success or otherwise of the cooperatives in a district level largely depends upon the efficiency of the functioning of DCCBs. The founders of the movement envisioned the role of DCCBs beyond the boundaries of mere financing bank. DCCBs are expected to serve as a financing bank for the primaries in a district, guide them in their day to day operations, supply of necessary manpower and technology wherever it is required, voicing on behalf of primaries at policy level etc., Because of this integrated role, DCCBs are strategically located and integrated with the cooperative system.

Hence, they are not only acting as financing banks but also act as development banks for the cooperatives at district level. To do these multifarious functions DCCBs should have a well-defined management system. In the total management of the DCCBs, financial management occupies a place of importance as the functions of these institutions are also governed by the Banking Regulation Act. Even a minor deviation from banking norms would attract penal actions from the law enforcing authorities. On the one side, DCCBs are expected to act as a financing bank for the primaries, which are in majority of the cases managed by untrained work force. On the other side, DCCBs are expected to follow the banking norms as well as implement the State Governments schemes and programmes for the development of the state. Most DCCBs that fail seem to do so because of problems in their loan portfolio. Non-performing loans grow to such extent that revenues fall off and loan expenses as well as operating costs absorb all the earnings that remain. The bad loan situations usually arise from combination of factors. In this regard, it is pertinent to study how these banks mobilize the resources and deploy them. Hence funds management of the DCCBs is an important issue and their financial performance is to be studied with their impact on working capital in DCCBs. In this context, the questions apt to arise are:

- What are the strategies followed in general and working capital aspects?
- What is the business result?
- Whether the financial performances of the banks are in satisfactory manner in terms of working capital?

To find out the answer to these questions, an analytical study had to be undertaken. The results of such studies will help to find out the problem, difficulties, impacts etc., and to frame financial policies by the DCCBs for the benefits of the farmers, the community and other stakeholders.

## 1.4 OBJECTIVES OF THE STUDY

The specific objectives of the present study are:

1. To analyze the working capital in the DCCBs, and
2. To offer suitable suggestions for the development of the DCCBs

## 1.5 METHODOLOGY

Mainly-analytical method has been followed for studying the working capital analysis of Tirunelveli (TIDCCB), Virudhunagar (VIDCCB), Thuthukudi (TUDCCB) and Kanyakumari (KADCCB) District Central Cooperative Banks in Tirunelveli Region, Tamil Nadu. The secondary data were collected from the profit and loss account and balance sheet for the selected DCCBs. The macro level data were collected from the office of the Joint Registrar of Cooperative Audit in Tirunelveli region, Tamilnadu State Apex Cooperative Bank, Tamilnadu State Cooperative Unions, National Federation of State Cooperative Banks, NABARD and RBI.

## 1.6 SAMPLING

The present study has adopted the purposive sampling method for the selection of sample banks. Among the five cooperative regions (Chennai, Coimbatore, Trichy, Madurai and Tirunelveli) categorized by the Registrar of Cooperative Societies, Tirunelveli region was purposively selected. The considerations kept in mind were that the Tirunelveli region of Tamilnadu is popular for Agriculture, Fisheries, Dairy and Industrial growth. This region also covers plain and coastal areas with different cropping patterns. Four districts of this region were served by the four District Central Cooperative Banks namely Tirunelveli, Virudhunagar, Thoothukudi and Kanyakumari DCCBs. These four banks were selected for the present study.

## 1.7 SCOPE OF THE STUDY

A strong network of the District Central Cooperative Banks is a prerequisite for the sound performance of the three tier cooperative credit structure. DCCBs not only provided much needed financial assistance to PACBs but also ensured the smooth flow of credit to various sectors in the district. The success of these banks depends on efficient management of funds. The study has mainly focused attention to study the working capital of the four DCCBs in Tirunelveli Region. The

results of this study will help in identifying the lacuna if any in the working capital of the DCCBs and to frame financial policies and programme to the benefit of the banks and the community.

**1.8 PERIOD COVERED BY THE STUDY**

The period of the study has been taken-up from the financial year 1998-99 to 2008-09 (11 years) as complete and comprehensive secondary data both for macro and micro level were available only for these years. The period of eleven years was considered for analysis.

**1.9 TOOLS USED FOR DATA COLLECTION**

For collecting the required secondary data from the selected DCCBs, a comprehensive schedule was prepared and used. The schedule was pre-tested and finalized.

**1.10 FRAME WORK OF ANALYSIS**

The data collected were subduced into a digestible account by appropriate coding, computing and tabulations. The basic tools of statistical analysis like average, growth index, growth rage, standard deviation, trend and working capital were employed.

**1.11 RESULTS AND DISCUSSION**

**1.11.1 MEMBERSHIP**

The membership of the district central cooperative banks consisted of Primary Agricultural Cooperative Banks (PACBs) and other primary and secondary level cooperatives like Consumer's Cooperatives, Marketing Societies, Weavers Societies, Milk Societies, Processing Societies etc., working within the area of operations of the banks. A peculiar feature of the membership of DCCBs is that individuals were admitted as 'A' class members in the initial period. Now such admissions are stopped. However, the existing members continue to be the associate members of the bank, 'B' class/Associate members were admitted for the purpose of getting jewel loan, micro credit, etc. All cooperative societies within the area of operations of the District Central Cooperative Banks and the state government were admitted as 'A' class members. The following table shows the various types of societies which are known as institutional members.

**INSTITUTIONAL MEMBERS OF THE BANKS**

Sl. No.	Societies/Banks
1.	Primary Agriculture Cooperative Banks
2.	Handloom Weavers Cooperative Societies
3.	Urban Cooperative Banks
4.	Milk Producers Cooperative Societies
5.	Employees Cooperative Thrift and Credit Societies
6.	Primary cooperative Agricultural and rural development banks
7.	Vegetables Growers Cooperatives Societies
8.	Housing Cooperatives Societies
9.	Sericulture Cooperative Societies
10.	Joint Forming Societies
11.	Health Cooperative Societies
12.	Fisheries and Other Growers Cooperatives Societies
13.	Poultry Production Cooperative Societies
14.	Cooperative Sugar Mills
15.	Cooperative Spinning Mills
16.	Cooperative Printing Press
17.	District Consumer Cooperative Wholesale Stores
18.	Cooperative Training Institute
19.	District Cooperative Milk Producers Union
20.	Agriculture Producers Cooperative Marketing Societies
22.	District Printing Press Service Industrial Cooperative Societies
24.	Ladies Cottage Cooperative Societies
25.	Sheep Breeding Cooperative Societies
26.	Farmers Service Cooperative Societies
27.	Agro Service Cooperative Centre
28.	Hill Tribe Cooperative Societies
29.	others

The trend in 'A' class membership position in the selected DCCBs during the period is furnished in the following table.

**TABLE – 1.1: MEMBERSHIP POSITION (No. of Members)**

Banks Years	TIDCCB			VIDCCB			TUDCCB			KADCCB			TOTAL			Trend
	Nos.	GI	GR	Nos.	GI	GR	Nos.	GI	GR	Nos.	GI	GR	Nos.	GI	GR	
1998-99	836	100	-	535	100	-	579	100	-	522	100	-	2472	100	-	2477
1999-00	842	100.7	0.7	527	98.5	-1.5	580	100.0	0.2	522	100	0.0	2471	100.0	-0.0	2471
2000-01	849	101.6	0.8	515	96.3	-2.3	580	100.0	0.0	523	100	0.2	2467	99.8	-0.2	2465
2001-02	853	101.9	0.5	511	95.5	-0.8	580	100.0	0.0	516	98.9	-1.3	2460	99.5	-0.3	2459
2002-03	854	102.2	0.1	499	93.3	-2.3	580	100.0	0.0	516	98.9	0.0	2449	99.1	-0.4	2453
2003-04	857	102.5	0.4	496	92.7	-0.6	580	100.0	0.0	516	98.9	0.0	2449	99.1	0.0	2448
2004-05	857	102.5	0.0	496	92.7	0.0	578	99.8	-0.3	515	98.7	-0.2	2446	98.9	-0.1	2442
2005-06	857	102.5	0.0	496	92.7	0.0	578	99.8	0.0	514	98.5	-0.2	2445	98.9	-0.0	2436
2006-07	857	102.5	0.0	493	92.1	-0.6	578	99.8	0.0	514	98.5	0.0	2442	98.8	-0.1	2430
2007-08	857	102.5	0.0	493	92.1	0.0	578	99.8	0.0	484	92.7	-5.8	2412	97.6	-1.2	2424
2008-09	857	102.5	0.0	491	91.8	-0.4	578	99.8	0.0	484	92.7	0.0	2410	97.5	-0.1	2418
<b>Avg.</b>	<b>852</b>	<b>102</b>	<b>0.2</b>	<b>505</b>	<b>94.3</b>	<b>-0.8</b>	<b>579</b>	<b>100.0</b>	<b>-0.1</b>	<b>511</b>	<b>98</b>	<b>-0.7</b>	<b>2448</b>	<b>99</b>	<b>-0.2</b>	
<b>SD</b>	<b>7.2</b>	<b>0.9</b>	<b>0.3</b>	<b>15.1</b>	<b>2.8</b>	<b>0.9</b>	<b>1</b>	<b>0.17</b>	<b>0.1</b>	<b>14</b>	<b>2.7</b>	<b>1.8</b>	<b>20.9</b>	<b>0.8</b>	<b>0.4</b>	

No. of Members=Nos., GI = Growth Index, GR= Growth Rate



Progress in the membership position of the selected banks could be noted from the above table for all the banks, it has decreased from 2472 in 1998-99 to 2410 in 2008-09. An average growth rate of -0.2 percent was found per annum. In Tirunelveli District Central Cooperative Bank had recorded higher growth rate than the other three banks. The average annual membership of the Tirunelveli, Virudhunagar, and Thuthukudi District Central Cooperative Bank was calculated as 852, 505, 579, and 511 respectively during the study period. The trend analysis results shows a liner trend of  $y=2447+(-)6x$  evidencing a gradual decrease in membership. The actual membership almost matches with the trend value upto the 1999-00. After which the negative trend in membership was higher than trend value upto the year 2008-09. The total membership of the banks which presently stand at 2418 may decrease to 2358 in 2020. Linear trend revealed that the growth rate in membership was comparatively higher in respect of TIDCCB.

**1.11.2 SHARE CAPITAL**

The share capital is the basic fund of any cooperative society. It is obligatory that every 'A' class member should hold atleast one share to be the member of a cooperative. Share capital partakes much position among owned funds. The value of 'A' class share capital of selected District Central Cooperative banks was Rs.100/- and 'B' class / associate share was Rs.10/-. The authorised share capital of Trinelveli, Thuttokudi, Kanniyakumari and Virudhunagar District Central Cooperative bank were Rs.30 crores, Rs.20 crores, Rs.15 Crores and Rs.10 Crores respectively. The paid up share capital of the selected bank during the study period are given in the following table. The total share capital is summation of amounts contributed by Institutional members, Individual, Government and Associate members.

**TABLE – 1.2: SHARE CAPITAL POSITION (Rs. in lakhs)**

Banks Years	TIDCCB			VIDCCB			TUDCCB			KADCCB			TOTAL			Trend
	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	
1998-99	633	100	-	709	100	-	613	100	-	700	100	-	2655	100	-	1836
1999-00	669	105.7	5.7	739	104.2	4.2	648	105.6	5.7	857	122.4	22.0	2913	109.7	9.7	2369
2000-01	739	116.7	10.0	756	106.6	2.3	642	104.7	-0.9	858	122.6	0.1	2995	112.8	2.8	2903
2001-02	777	122.7	5.1	787	110.9	4.1	673	109.7	4.8	931	133.0	8.5	3168	119.3	5.8	3436
2002-03	906	143.1	17.0	830	117.0	5.5	700	114.1	4.0	993	141.9	6.7	3429	129.1	8.2	3969
2003-04	918	145.0	1.3	918	129.4	11.0	689	112.3	-1.6	1088	155.4	9.6	3613	136.1	5.4	4503
2004-05	922	145.7	0.4	922	130.0	0.4	690	112.5	0.2	1129	161.3	3.8	3663	137.9	1.4	5036
2005-06	1927	304.4	109.0	939	132.4	1.8	1206	196.6	74.8	1194	170.6	5.8	5266	198.3	43.8	5570
2006-07	1931	305.1	0.2	1483	209.1	58.0	1683	274.4	39.6	1556	222.3	30.0	6653	250.5	26.3	6103
2007-08	1945	307.3	0.7	986	139.0	-34.0	2140	348.9	27.2	1913	273.3	23.0	6984	263.0	4.9	6637
2008-09	1984	313.4	2.0	1030	145.2	4.5	2577	420.1	20.4	2502	357.5	31.0	8093	304.8	15.9	7170
<b>Avg.</b>	<b>1214</b>	<b>191.7</b>	<b>14</b>	<b>918</b>	<b>129.5</b>	<b>5.3</b>	<b>1115</b>	<b>181.7</b>	<b>15.8</b>	<b>1247</b>	<b>178.2</b>	<b>13.0</b>	<b>4494</b>	<b>169.2</b>	<b>11.3</b>	
<b>SD</b>	<b>589</b>	<b>93.04</b>	<b>33</b>	<b>215</b>	<b>30.36</b>	<b>22</b>	<b>703</b>	<b>114.6</b>	<b>24.4</b>	<b>541</b>	<b>77.25</b>	<b>11</b>	<b>1921</b>	<b>72.33</b>	<b>13.2</b>	

Amt. = Amount, GI = Growth Index, GR= Growth Rate

The above table shows the total share capital position of the selected DCCBs. The total share capital of the banks had increased from Rs. 2655 lakhs in 1998-99 to Rs.8093 lakhs in 2008-09; on an average the share capital of the banks had increased by 204 percent during the study period. Comparatively, the average yearly share capital of KADCCB was high at Rs.1247 lakhs but TUDCCB had recorded higher growth rate than the other banks and that was due to a sudden increase in the year 2005-06. The trend analysis results shows a liner trend of  $Y=4502+533x$  evidencing a steady growth in share capital. A comparison of actual figures with trend value reveals a fluctuating trend during the study period. The expected share capital for the year 2020 was worked out at Rs.12504 lakhs.

**1.11.2 RESERVE FUND**

Reserves include statutory and other reserves. The statutory reserve fund is created out of net profit to meet in unforeseen losses and for building internal resources. It is one of the constituents of owned funds and a component of the working capital. A long life institution should have more resources by virtue of its earnings and profits every year. Every cooperative society and bank should set aside 25 percent of its net profit to statutory reserve fund. It belongs to the societies and banks and it is intended to meet the unforeseen losses. This can be invested in the government savings bonds or in the form of shares, securities etc., Further, if the funds exceed 25 percent of the working capital, the excess may be used in the business of the society or bank with the approval of the Registrar. Any dividend that has not been claimed within a period of three years (normally) from the date of declaration is added to the reserve fund. And also to the amount of "due by" which is not claimed within the period of limitation allowed by the Indian Limitation Act is added to the reserve fund. Important among non-statutory reserves are bad and doubtful debt reserves and Agricultural Credit Stabilization Fund. As per the recommendations of the All India Rural Credit Survey Committee (1954), National Agricultural Credit Stabilization Fund was created in the RBI and at all levels of cooperative credit institutions. The main purpose of creating this fund was to convert the short-term loans into medium-term loans whenever repayment of loans becomes difficult on account of natural calamities (Govt. of India. 1972). The Standing Advisory Committee on Agricultural Credit at its fifth meeting finalized a detailed scheme for the establishment of agricultural credit stabilization funds in the state and central banks. The main objective of keeping the bad and doubtful reserves is to write off bad and doubtful debts. The following table will present the reserve fund position of the selected banks.

**TABLE – 1.3: RESERVE FUND POSITION (Rs. in lakhs)**

Banks Years	TIDCCB			VIDCCB			TUDCCB			KADCCB			TOTAL			Trend
	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	
1998-99	629	100	-	773	100	-	1101	100	-	848	100	-	3351	100	-	3228
1999-00	844	134.2	34.0	1177	152.2	52.0	1866	169.5	69.5	897	105.8	5.8	4784	142.8	42.8	4965
2000-01	867	137.8	2.7	1138	147.2	-3.3	2348	213.3	25.8	1229	145.0	37.0	5582	166.6	16.7	6702
2001-02	1264	200.9	46.0	2037	263.5	79.0	3319	301.5	41.4	1300	153.4	5.8	7920	236.4	41.9	8440
2002-03	2340	372.0	85.0	2290	296.2	12.0	5183	470.8	56.2	1354	159.7	4.2	11167	333.3	41.0	10177
2003-04	2749	437.0	17.0	3475	449.5	52.0	6080	552.3	17.3	1856	219.0	37.0	14160	422.6	26.8	11914
2004-05	2203	350.2	-20.0	2417	312.6	-30.0	5194	471.8	-15.0	1831	216.0	-1.3	11645	347.5	-18.0	13651
2005-06	3431	545.4	56.0	3452	446.5	43.0	6531	593.2	25.7	2879	339.6	57.0	16293	486.3	39.9	15389
2006-07	3744	595.2	9.1	4163	538.5	21.0	6605	600.0	1.1	3143	370.8	9.2	17655	526.9	8.4	17126
2007-08	4522	718.8	21.0	4468	577.9	7.3	7114	646.2	7.7	2861	337.5	-9.0	18965	566.1	7.4	18863
2008-09	4762	757.0	5.3	4750	614.4	6.3	7376	670.0	3.7	2650	312.6	-7.4	19538	583.1	3.0	20600
<b>Avg.</b>	<b>2487</b>	<b>395.3</b>	<b>23.0</b>	<b>2740</b>	<b>354.4</b>	<b>22.0</b>	<b>4792</b>	<b>435.3</b>	<b>21.3</b>	<b>1895</b>	<b>223.6</b>	<b>13.0</b>	<b>11915</b>	<b>355.6</b>	<b>19.1</b>	
<b>SD</b>	<b>1491</b>	<b>237</b>	<b>30</b>	<b>1406</b>	<b>181.9</b>	<b>32</b>	<b>2251</b>	<b>204.5</b>	<b>26.1</b>	<b>850</b>	<b>100.2</b>	<b>22</b>	<b>5881</b>	<b>175.5</b>	<b>20.8</b>	

Amt. = Amount, GI = Growth Index, GR= Growth Rate

cent and growth rate was higher during 2001-02 i.e., 41.9 per cent. Comparatively, TUDCCB had highest growth index (435.3) followed by TIDCCB (395.3), KADCCB had the lowest index in the growth of reserve funds. The actual reserve funds of the selected banks were higher than the trend value up to the year 2007-08. The projection for the year 2020 works out at Rs. 37973. The liner trend was  $Y=11915+1777x$ .

1.11.3 DEPOSITS

Mobilization of deposit is one of the main functions of banking business and so an important source of working fund for the bank. The district central cooperative banks have to increase their financial resources by way of deposit mobilization. Deposit mobilization is an indispensable factor to increase the source of the district central cooperative banks to serve effectively. The importance of deposits of the cooperative banking structure to provide satisfactory service to any programme of agricultural production and industrial manufacturing hardly needs to be over emphasized. Several committees and commissions have stressed that the district central cooperative banks must tap deposits from urban and rural areas so that they may be able to provide funds in large amounts to primary societies for farm and non-farm development. The success of the banking greatly lies on the deposit mobilization performance of the bank as the deposits are normally considered as a cost effective source of working fund.

One of the important objectives of the district central cooperative banks is the mobilization of rural savings. It helps to expand loaning operations. The philosophy of cooperation emphasizes that cooperative institutions should function only with the funds pooled from members and not to rely largely on external financial accommodation. The All India Rural Credit Survey Committee (1954), Mehta Committee (1960) and Banking Commission (1972) have recommended that the district central cooperative banks could engage in the mobilization of deposits for improving the internal resources. Contrary to this principle, the concessional finance available to the district central cooperative banks from the RBI made them indifferent to the function of mobilization of deposits. To mobilize deposits, the district central cooperative banks are given some encouragement by the RBI and apex institutions such as subsidy for branch expansion, states' participation in share capital, permitting the district central cooperative banks to offer 1/2 per cent interest higher than the commercial banks and application of deposit insurance scheme.

The Central Cooperative Banks offer the following deposit schemes to members and non-members and to the staff of the banks. The types of deposits collected by the banks were fixed deposits, saving deposits, thrift deposits, recurring deposits, cash certificate, reinvestments plan deposits, staff provident deposits and staff security deposits. The following table will present the total deposits position of the banks during the study period.

TABLE – 1.4: DEPOSITS POSITION (Rs. in lakhs)

Banks Years	TIDCCB			VIDCCB			TUDCCB			KADCCB			TOTAL			Trend
	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	
1998-99	15576	100	-	17141	100	-	11081	100	-	8179	100	-	51977	100	-	58240
1999-00	20983	135	34.7	19922	116	16.0	13639	123	23.1	12656	155	55.0	67200	129	29.3	60625
2000-01	19581	126	-6.7	20976	122	5.3	13154	119	-3.6	11200	137	-12.0	64911	125	-3.4	63011
2001-02	19886	128	1.6	22008	128	4.9	13832	125	5.2	13323	163	19.0	69049	133	6.4	65397
2002-03	20512	132	3.2	24062	140	9.3	15209	137	9.9	16036	196	20.0	75819	146	9.8	67782
2003-04	17841	115	-13.0	23336	136	-3.0	12161	110	-20.0	15849	194	-1.2	69187	133	-8.7	70168
2004-05	16479	106	-7.6	20976	122	-10.0	12358	112	1.6	16683	204	5.3	66496	128	-3.9	72554
2005-06	14986	96	-9.1	20074	117	-4.3	11504	104	-6.9	16512	202	-1.0	63076	121	-5.1	74939
2006-07	16231	104	8.3	21889	128	9.0	11764	106	2.3	16886	206	2.3	66770	128	5.8	77325
2007-08	20102	129	23.8	26235	153	20.	14638	132	24.4	19067	233	13.0	80042	154	19.9	79711
2008-09	25479	164	26.7	30467	178	16.0	17355	157	18.6	24025	294	26.0	97326	187	21.6	82096
<b>Avg.</b>	<b>18878</b>	<b>121</b>	<b>5.6</b>	<b>22462</b>	<b>131</b>	<b>5.8</b>	<b>13336</b>	<b>120</b>	<b>4.9</b>	<b>15492</b>	<b>189</b>	<b>12.0</b>	<b>70168</b>	<b>135</b>	<b>6.51</b>	
<b>SD</b>	<b>3059</b>	<b>19.6</b>	<b>16.8</b>	<b>3565</b>	<b>20.8</b>	<b>9.8</b>	<b>1870.2</b>	<b>17</b>	<b>14</b>	<b>4184</b>	<b>51.2</b>	<b>19.0</b>	<b>11454</b>	<b>22</b>	<b>12.9</b>	

Amt. = Amount, GI = Growth Index, GR= Growth Rate

The above table reveals the total deposits of the selected banks. During the study period it had recorded an increasing trend. It had increased from Rs.51977 lakhs during 1998-99 to Rs.97326 lakhs during 2008-09, an increase by 87 per cent. Almost the same trend was noticed with the selected four banks individually. On an average each bank had Rs.70168 lakhs as deposits during the study period.

Comparatively, the TUDCCB had lower deposits i.e. an average of Rs. 13336 lakhs. The average per year growth rate was 135 per cent and growth rate was higher during the study period. The average growth rate was higher in the KADCCB, i.e.12.0 percent. The liner trend in the deposits of the banks under study was  $Y=70168+2385x$ . Hence steady progress is apparent. The total deposit of the banks was Rs.97326 lakhs against the trend value of Rs.82096 lakhs in 2008-09. It is expected that the total deposits of the banks will be around Rs. 105953 lakhs during 2020.

1.11.4 BORROWINGS

Borrowings are one of the major sources of working capital. DCCBs are eligible to borrow funds from the NABARD through State Cooperative Bank for meeting the funds required for lending. The maximum borrowing power of the DCCBs should not exceed 15 times of paid up share capital plus reserve funds. The DCCBs borrow money for ST, MT& LT loans, cash credit and overdraft from the State Cooperative Banks (Marriappan: 2007). The following table presents the borrowing positions of the selected banks.

TABLE – 1.5: BORROWINGS POSITION (Rs. in lakhs)

Banks Years	TIDCCB			VIDCCB			TUDCCB			KADCCB			TOTAL			Trend
	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	
1998-99	1369	100	-	1952	100	-	926	100	-	5946	100	-	10193	100	-	8901
1999-00	738	53.9	-46.0	2249	115.2	15.0	346	37.4	-63.0	3779	63.6	-36.0	7112	69.8	-30.0	10265
2000-01	1399	102.2	90.0	2626	134.5	17.0	538	58.1	55.5	5237	88.1	39.0	9800	96.1	37.8	11630
2001-02	2436	177.9	74.1	2584	132.3	-1.6	1163	125.6	116.0	4717	79.3	-9.9	10900	106.9	11.2	12995
2002-03	3010	219.8	24.2	2430	124.5	-6.2	1230	132.8	5.8	4214	70.9	-11.0	10884	106.8	-0.1	14359
2003-04	5895	430.5	96.0	3188	163.3	31.2	2476	267.4	101.0	8867	149.1	110.0	20426	200.4	87.7	15724
2004-05	7207	526.4	22.0	4438	227.3	39.0	1473	159.1	-41.0	8691	146.2	-2.0	21809	213.9	6.8	17089
2005-06	8231	601.2	14.2	5970	305.8	35.0	2283	246.6	55.0	10985	184.7	26.0	27469	269.5	26.0	18453
2006-07	6770	494.5	-18.1	3499	179.2	-41.0	2245	242.4	-1.7	7393	124.3	-33.0	19907	195.3	-28.0	19818
2007-08	5908	431.5	-13.5	1825	93.5	-48.0	1022	110.4	-54.0	8438	141.9	14.0	17193	168.7	-14.0	21183
2008-09	5168	377.5	-13.6	2580	132.1	41.0	2504	270.4	145.0	7022	118.1	-17.0	17274	169.5	0.5	22547
<b>Avg.</b>	<b>4376</b>	<b>319.6</b>	<b>21</b>	<b>3031</b>	<b>155.2</b>	<b>7.4</b>	<b>1473.3</b>	<b>159.1</b>	<b>29.0</b>	<b>6844</b>	<b>115.1</b>	<b>7.4</b>	<b>15724</b>	<b>154.3</b>	<b>8.9</b>	
<b>SD</b>	<b>2658</b>	<b>194.1</b>	<b>49</b>	<b>1226</b>	<b>62.77</b>	<b>32</b>	<b>782.51</b>	<b>84.51</b>	<b>74</b>	<b>2275</b>	<b>38.26</b>	<b>43</b>	<b>6369</b>	<b>62.48</b>	<b>34.7</b>	

Amt. = Amount, GI = Growth Index, GR= Growth Rate

The total borrowings of the bank stood at Rs.10193 in 1998-99 which had increased to Rs.27469 lakhs during 2005-06 (increased by 169 per cent), and it has decreased to Rs.17274 lakhs in 2008-09. Though the total borrowings of the banks fluctuated; the average increase per year was about 8.9 per cent. Comparatively, the TIDCCB and TUDCCB have high level of borrowings and VIDCCB and KADCCB had low level borrowings. A liner trend of  $Y=15724+1364x$  was found. Hence the liner rate of growth in the total borrowings is found to be high. The borrowings of the banks show an increasing trend during 1998-99 to 2002-

03 and 2007-08 to 2008-09. The projection of total borrowings by the banks for the year 2020 is calculated at Rs.36194 lakhs. Increasing trend was noticed for the total borrowing during the study period.

**1.11.5 WORKING CAPITAL**

The working capital of the selected DCCBs comprise of the owned funds (share capital and reserves), and borrowed funds (deposits and borrowings). The total working capital of the banks for the period under study is presented in the following table.

**TABLE- 1.6: WORKING CAPITAL POSITION (Rs. in lakhs)**

Banks Years	TIDCCB			VIDCCB			TUDCCB			KADCCB			TOTAL			Trend
	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	
1998-99	18207	100.0	-	20575	100.0	-	13721	100.0	-	15673	100.0	-	68176	100.0	-	72187
1999-00	23234	132.1	27.6	24087	116.1	17.0	16499	120.2	20.2	18189	116.3	16.0	82009	121.1	20.3	78210
2000-01	22586	129.5	-2.8	25496	123.2	5.8	16682	122.4	1.1	18524	118.1	1.8	83288	123.1	1.6	84232
2001-02	24363	139.2	7.9	27416	132.1	7.5	18987	138.1	13.8	20271	129.2	9.4	91037	135.2	9.3	90255
2002-03	26768	152.3	9.9	29612	143.3	8.0	22322	163.2	17.6	22597	144.5	11.0	101299	150.1	11.3	96278
2003-04	27403	156.1	2.4	30917	149.1	4.4	21406	156.6	-4.1	27660	176.4	22.0	107386	159.3	6.0	102301
2004-05	26811	153.0	-2.2	28753	139.2	-7.0	19715	144.2	-7.9	28334	181.1	2.4	103613	153.4	-3.5	108324
2005-06	28575	163.2	6.6	30435	147.3	5.8	21524	157.4	9.2	31570	201.2	11.0	112104	166.2	8.2	114347
2006-07	28676	163.1	0.4	31034	150.5	2.0	22297	163.2	3.6	28978	185.3	-8.2	110985	164.1	-1.0	120370
2007-08	32477	185.5	13.3	33514	162.2	8.0	24914	182.1	11.7	32279	206.2	11.0	123184	182.3	11.0	126392
2008-09	37393	213.2	15.1	38827	187.1	16.0	29812	217.2	19.7	36199	231.3	12.0	142231	210.1	15.5	132415
<b>Avg.</b>	<b>26954</b>	<b>153</b>	<b>7.1</b>	<b>29151</b>	<b>141</b>	<b>6.1</b>	<b>20716</b>	<b>151</b>	<b>7.7</b>	<b>25479</b>	<b>163</b>	<b>8.2</b>	<b>102301</b>	<b>151</b>	<b>7.1</b>	
<b>SD</b>	<b>5113</b>	<b>29.7</b>	<b>9.3</b>	<b>4867</b>	<b>23.4</b>	<b>6.8</b>	<b>4399.4</b>	<b>32</b>	<b>9.9</b>	<b>6757</b>	<b>43.1</b>	<b>8.5</b>	<b>20725</b>	<b>30.7</b>	<b>7.4</b>	

Amt. = Amount, GI = Growth Index, GR= Growth Rate

It is evident that the total working capital of the selected banks had considerably increased during the study period. It had increased from Rs.68176 lakhs in 1998-99 to Rs. 142231 lakhs in 2008-09; i.e., an increase by 110 percent. The average growth rate was 7.1 percent. Comparatively, the TUDCCB had very less amount of working capital which is due to low membership position. The TIDCCB stood first i.e. Rs. 37393 lakhs of working capital in 2008-09. The liner trend of Y=99255+5563x was worked out. The total working capital of the region was higher than the trend value during the period 2001-02 to 2003-04. The projection for the year 2020 is calculated as Rs.192644 lakhs. On an average 5.7 percent, 13.7 percent, 68.4 percent and 12.2 percent of the working capital was thro' share capital, reserve fund, deposits and borrowings.

**1.11.6 BUSINESS RESULTS**

Though profit making is not a primary objective of the bank, profits can't be ignored, because an institution suffering losses cannot serve for a long period. Depositors and lending institutions hesitate to invest in such a banking institution. Profit is the simplest and most convenient yardstick for the appraisal of the performance and efficiency of the bank. Therefore, the attainment of economic stability through profitability becomes the essential feature of any bank management. Profitability, in a nutshell, reflects the overall efficiency of district central cooperative banks

**TABLE – 1.7: BUSINESS RESULTS (Rs. in lakhs)**

Banks Years	TIDCCB			VIDCCB			TUDCCB			KADCCB			TOTAL		
	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR	Amt.	GI	GR
1998-99	-44	100	-	47	100	-	8	100	-	30	100	-	41	100	-
1999-00	-328	745.5	645.5	-902	-1919.0	-2019.0	-41	-512.5	-613	70	233.3	133.3	-1201	-2929.3	-3029.0
2000-01	-1143	2597.7	248.5	-444	-944.7	-50.8.0	-949	-11863.0	2215.0	-153	-510.0	-319.0	-2689	-6558.5	123.9
2001-02	-298	677.3	-73.9	-320	-680.9	-27.9	-791	-9887.5	-16.6	55	183.3	-136.0	-1354	-3302.4	-49.6
2002-03	-1544	3509.1	418.1	-111	-236.2	-65.3	-987	-12338.0	24.8	93	310.0	69.1	-2549	-6217.1	88.3
2003-04	-348	790.9	-77.5	-348	-740.4	213.5	-331	-4137.5	-66.5	111	370.0	19.4	-916	-2234.1	-64.1
2004-05	953	-2166.0	-374.0	1909	4062.0	-648.6	1506	18825.0	-555.0	508	1693.3	357.7	4876	11893.0	-632.3
2005-06	-1979	4497.7	-308.0	-911	-1938.0	-147.7	-710	-8875.0	-147.0	-4321	-14403.0	-951.0	-7921	-19320.0	-262.4
2006-07	-566	1286.4	-71.4	6	12.8	-100.7	778	9725.0	-210.0	10	33.3	-100.0	228	556.1	-102.9
2007-08	-2065	4693.2	264.8	-585	-1245.0	-9850.0	-783	-9787.5	-201.0	53	176.7	430.0	-3380	-8243.9	-1582..0
2008-09	102	-231.8	-105.0	722	1536.0	-223.4	4	50.0	-101.0	5	16.7	-90.6	833	2031.7	-124.6
<b>Avg.</b>	<b>-660</b>	<b>1500</b>	<b>51.6</b>	<b>-85.18</b>	<b>-181.2</b>	<b>-1175</b>	<b>-208.7</b>	<b>-2609.1</b>	<b>30.1</b>	<b>-322</b>	<b>-1072</b>	<b>-53.3</b>	<b>-1276</b>	<b>-3111.3</b>	<b>-512.3</b>
<b>SD</b>	<b>929.4</b>	<b>2112.3</b>	<b>325.4</b>	<b>806.6</b>	<b>1716</b>	<b>3073</b>	<b>782.5</b>	<b>9781.24</b>	<b>795.7</b>	<b>1336</b>	<b>4453</b>	<b>386.3</b>	<b>3140.6</b>	<b>7660</b>	<b>1002</b>

Amt. = Amount, GI = Growth Index, GR= Growth Rate

It is disheartening to note that the banks were running on loss during most of the years and was on increasing trend. However, the figures of the individual banks were not matching. Comparatively, the VIDCCB, TUDCCB, KADCCB had good performance than the TIDCCB. VIDCCB and TIDCCB could earn profit during 2004-05 and 2008-09. The projected business result for the year 2024 is Rs. -1506.7 lakhs.

**1.11.7 AUDIT CLASSIFICATION**

Based on various norms by the Registrar of Cooperative Societies the DCCBs are classified as A, B, C and D. The audit classification of the DCCBs in Coimbatore Region over the years is presented below.

**TABLE – 1.8: AUDIT CLASSIFICATION**

Years	TIDCCB	VIDCCB	TUDCCB	KADCCB
1998-99	A	A	A	A
1999-00	B	A	B	A
2000-01	D	A	B	A
2001-02	D	D	D	A
2002-03	D	D	D	A
2003-04	D	D	D	A
2004-05	D	D	D	B
2005-06	D	D	D	A
2006-07	D	D	D	A
2007-08	D	D	D	A
2008-09	D	D	D	A

The audit classification is made on the basis of different norms. It is clear from the above table that the performance of KADCCB was very high as it was classified under 'A' category. The TIDCCB, VIDCCB and TUDCCB were mostly classified under 'D' category.

**1.12 FINDINGS**

The present study, "The working capital analysis of the DCCBs in Tirunelveli Region, Tamilnadu State" is an analytical one. The study was conducted in Tirunelveli Region, Tamilnadu state. Among the five Cooperative Regions in Tamilnadu, Tirunelveli Region (South Region) covering four DCCBs was selected and secondary data were used for the analysis. A decadal period was covered by this (1998-99 to 2008-09). Statistical tools of statistical like Percentage, Mean, Standard Deviation, Growth index, Growth rate, Trends were used for analysis. The major findings and conclusion are presented in the following paragraphs.

**1.12.1 MEMBERSHIP**

Membership position of the selected banks had decreased from 2472 in 1998-99 to 2410 in 2008-09. An average growth rate was found -0.2 percent per annum. Only in Tirunelveli District central cooperative bank the membership had increased over the study period. However the increase was marginal (i.e. 2 percent). The average annual membership of the Tirunelveli, Virudhunagar, Thuthukudi and Kanyakumari District Central Cooperative Bank was calculated as 852, 505, 579, and 511 respectively during the study period. Trend analysis showed the decreasing nature and the actual membership almost matches with the trend values.

**1.12.2. SHARE CAPITAL**

The total share capital of the banks had increased from Rs. 2655 lakhs in 1998-99 to Rs.8093 lakhs in 2008-09; on an average the share capital of the banks had increased by 204 percent during the study period. Comparatively, average yearly share capital of KADCCB was high at Rs.1247 lakhs. But TUDCCB had recorded higher growth rate than the other banks. A comparison of actual figures with trend values reveals a fluctuating trend during the study period.

**1.12.3 RESERVE FUND**

The total reserves of all the banks stood at Rs.3351 lakhs in 1998-99 which had increased to Rs.11915 lakhs in 2008-09 i.e., 3.5 times increase was found. The average per year growth rate was about 19.1 per cent and growth rate was higher during 2001-02 i.e., 41.9 per cent. Comparatively, TUDCCB had highest growth index (435.3) followed by TIDCCB (395.3), KADCCB had the lowest index in the growth of reserve funds. The trend value does not tally with actual in most of the cooperative years.

**1.12.4 DEPOSIT**

The total deposits of the selected banks during the study period had recorded on increasing trend. It had increased from Rs.51977 lakhs during 1998-99 to Rs.97326 lakhs during 2008-09, an increase by 87 per cent. Almost the same trend was noticed with the selected four banks individually. On an average the banks had Rs.70168 lakhs as deposits during the study period. Comparatively, the TUDCCB had lower deposits i.e. an average of Rs. 13336 lakhs. The average per year growth rate was 135 per cent and growth rate was on increasing trend during the study period.

**1.12.5 BORROWINGS**

The total borrowings of the bank stood at Rs.10193 in 1998-99 which had increased to Rs.27469 lakhs during 2005-06 (increased by 169 per cent), and it has decreased to Rs.17274 lakhs in 2008-09. Though the total borrowings of the banks fluctuated; the average increase per year was about 8.9 percent. Comparatively, the TIDCCB and TUDCCB had high level of borrowings and VIDCCB and KADCCB had low level borrowings.

**1.12.6 WORKING CAPITAL**

The total working capital of the selected banks had considerably increased during the study period. It had increased from Rs.68176 lakhs in 1998-99 to Rs.142231 lakhs in 2008-09; i.e., an increase by 110 percent. The average growth rate was 7.1 percent. Comparatively, the TUDCCB had very less amount of working capital which is due to low membership position. The TIDCCB stood first with Rs. 37393 lakhs of working capital in 2008-09. The working capital growth was not linear.

**1.12.7 BUSINESS RESULTS**

It is disheartening to note that the banks were running on loss during most of the years and was on increasing trend. However, the figures of the individual banks were not matching. Comparatively, the VIDCCB, TUDCCB, KADCCB had good performance than the TIDCCB. VIDCCB and TIDCCB could earn profit during 2004-05 and 2008-09. The projected business result for the year 2024-25 is Rs. -1506.7 lakhs.

**1.12.8 AUDIT CLASSIFICATION**

The audit classification is made on the basis of different norms. It is clear from the above table that the performances of KADCCB were very high as it was classified under 'A' category. The performance of TIDCCB, VIDCCB and TUDCCB were classified under 'D' category.

**1.13 CONCLUSION**

Invariably in all the selected DCCBs of this study conducted in the Tirunelveli region of the Tamilnadu State zig-zag trends were found especially with reference to position in a) membership b) share capital c) deposits d) borrowings and e) working capital during the study period. Deposits were noted to be the single largest component of working capital (i.e., 87 percent). There were ups and downs in their total investments. The major chunk of investment was loaded in the governmental (state and central) securities. The trend analysis of various working aspects did not reflect a desirable working capital of the selected units of this study. The 'KRA's (Key Result Areas) with reference to working capital is not upto the mark. This indicates a sorry state of financial affairs. Hence the main conclusion is that the working capital of the selected DCCBs was not upto the mark during the study period.

**1.14 SUGGESTIONS**

Based on the findings and conclusion, the following suggestions are offered for the better working capital analysis of the DCCBs under study.

**1.14.1 FUNDS AUGMENTATION**

Reserve funds created in DCCBs are accumulated out of profits generated by the banks. Though share capital have cost in the form of dividend distribution, reserve funds do not entail any cost. Therefore the banks should attempt to generate more profit and transfer substantial portion of the profit to the reserve funds.

The importance of deposits of the cooperative banking structure to provide satisfactory service to any program of agricultural production and industrial manufacturing hardly needs to be emphasized. DCCBs must tap deposits from urban and rural areas so that they may be able to provide funds in large amount to farm and non-farm sector developments. To generate more deposits the banks have to deliver a host of attractive schemes

The best method of reducing cost of funds by DCCBs is to increase the current deposit and saving deposits (CASA deposits). These two deposits carry nil or less interests. These funds when deployed as loans the spread will be more and more profitability to the bank. Therefore every bank should try to maximize CASA deposits to the tune of atleast 35 percent of the total deposits.

**1.14.2 NON-INTEREST INCOME**

The banks should meet their total establishment expenditure out of non-interest income. For this purpose the banks have to introduce many fee based products like bank guarantees letter of credit etc...

**1.14.3 ADVANCED FACILITIES**

The DCCBs may go for CBS implementation which will strengthen the bank with technology based products like ATM, Debit card, internet banking, mobile banking etc.

**1.14.4 REDUCTION IN COST OF MANAGEMENT**

The major income expenditure portfolios in banking are "interest collected" and "interest paid". On the expenditure side, establishment expenses contribute a major portion. The introduction of modern technologies and efficient HR management will reduce the manpower requirements and thereby the salary bill of the banks.



**1.14.5 SUPERVISION OVER UTILIZATION**

Proper supervision over the end use of loan is required to check credit delinquencies. The working of PACBs can be considerably improved by proper supervision and inspection by the DCCBs. Supervisor should ensure that the loans are used only for the purpose for which they have been obtained.

**1.15 LIMITATIONS**

Taking into consideration the objectives of the study and its coverage both time span and the number of banks, the study is prone to some limitations. Such unavoidable limitations of the present work are:

The study was conducted in the Tirunelveli (southern) region of Tamilnadu State. The environment particularly demographic, geographic, economic and the contributing factors for the fund flow analysis of DCCBs, differs from region to region and state to state. Hence, the findings and conclusions arrived out of the study may or may not be applicable to the banks in other regions and state.

The data used in this study are mostly derived from balance sheets of the selected banks. Window-dressing in any financial aspects is not easily traceable.

Thus, the findings of the present study should be used judiciously and carefully taking into account the various limitations

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**QUANTIFICATION OF QUALITY AS PER USER PERSPECTIVE IN SOFTWARE DEVELOPMENT****SHABINA GHAFIR****ASST. PROFESSOR****FMIT****JAMIA HAMDARD (HAMDARD UNIVERSITY)****NEW DELHI****MAMTA SHARMA****STUDENT****JAMIA HAMDARD (HAMDARD UNIVERSITY)****NEW DELHI****ABSTRACT**

Software quality is well understood by a software developer through his prolonged exposure to the SDLC (Software Development life Cycles). The quality till now is taken up to be a non-quantifiable entity. The quality itself is defined as "satisfaction of customer in many perspectives as per his requirements generated at the beginning of the development cycle". The definition clearly states it to be purely dependent upon the end-users discretion. The quality has been a factor which hasn't been quantified yet and varies upon the requisite of the customer evaluating it. The customer may have set a HIGH, MEDIUM or LOW standard as per developer's perspective; but, it may turn out to be sufficient as per his personal requirements. Due to standards followed by the developer as per his knowledge or techniques, the product developed may come out to be different as per user's requirements. This may cost him in terms of TIME, MONEY, WORK, TRAINING and even MAINTENANCE. This paper discusses how to overcome this problem of varying standards; we can set the requirements by QUANTIFYING QUALITY AS PER THE END USER of the software. However, as discussed earlier the Quality is an aspect which is non-quantifiable. However, the soft computing holds a technique in form of FUZZY LOGICS which allows one to quantify the quality.

**KEYWORDS**

SDLC, ISO

**PROBLEM**

The different perspectives of users lay down basis of my problem statement. The software under quality check has to go through rigorous testing to meet the standards set as per the ISO or SEI. Also, it should be noted that with growing quality standard of the software the cost of testing increases and so does the need of risk estimation; which in itself is one time consuming as well as cost incurring process. The risk estimation is brought into consideration for security against failures at any given step of software use cycle. This should also be noted that, risk estimation and testing incur maximum time. These two processes if minimized could be minimized in terms of duration and cost.

However, the basic question lies with the fact: when to stop testing?

If testing is closed in haywire junction of SDLC, it may lead to project failure itself. Thus there has to be few heuristics for determination of what AMOUNT OF QUALITY is to be achieved from software. These heuristics should be directly dependent upon the satisfaction of end-user. And for any end-user Quality is function of desired performance of the software as per his requirements.

**BACKGROUND****ISO 9126 QUALITY MODEL**

ISO 9126 quality model is an extension of the work done by McCall (1977), Boehm (1978), FURPS and others in defining a set of software quality characteristics. ISO 9126 represents the latest (and ongoing) research into characterizing software for the purposes of software quality control, software quality assurance and software process improvement (SPI).

The ISO 9126 software quality model identifies 6 main quality characteristics, namely:

- Functionality
- Reliability
- Usability
- Efficiency
- Maintainability
- Portability

Each characteristic can further be divided into various sub-characteristics, defined as follows:

**Functionality** - A set of attributes that bear on the existence of a set of functions and their specified properties. The functions are those that satisfy stated or implied needs.

- ✓ Suitability
- ✓ Accuracy
- ✓ Interoperability
- ✓ Security
- ✓ Functionality Compliance

**Reliability** - A set of attributes that bear on the capability of software to maintain its level of performance under stated conditions for a stated period of time.

- ✓ Maturity
- ✓ Fault Tolerance
- ✓ Recoverability
- ✓ Reliability Compliance

**Usability** - A set of attributes that bear on the effort needed for use, and on the individual assessment of such use, by a stated or implied set of users.

- ✓ Understandability
- ✓ Learnability
- ✓ Operability
- ✓ Attractiveness
- ✓ Usability Compliance



**Efficiency** - A set of attributes that bear on the relationship between the level of performance of the software and the amount of resources used, under stated conditions.

- ✓ Time Behaviour
- ✓ Resource Utilization
- ✓ Efficiency Compliance

**Maintainability** - A set of attributes that bear on the effort needed to make specified modifications.

- ✓ Analyzability
- ✓ Changeability
- ✓ Stability
- ✓ Testability
- ✓ Maintainability Compliance

**Portability** - A set of attributes that bear on the ability of software to be transferred from one environment to another.

- ✓ Adaptability
- ✓ Installability
- ✓ Co-Existence
- ✓ Replaceability
- ✓ Portability Compliance

**FUZZY LOGIC**

Fuzzy logic can be defined as a form of knowledge representation suitable for notions that cannot be defined precisely, but which depend upon their contexts. Fuzzy logic provides an alternative way to represent linguistic and subjective attributes of the real world in computing. It's a three step process which is well understood in following steps:

- 1) Fuzzification (Using membership functions to graphically describe a situation)
- 2) Rule evaluation (Application of fuzzy rules)
- 3) Defuzzification (Obtaining the crisp or actual results)

Fuzzy logic is a superset of conventional (Boolean) logic that has been extended to handle the concept of partial truth- truth values between "completely true" and "completely false". As its name suggests, it is the logic underlying modes of reasoning which are approximate rather than exact. The importance of fuzzy logic derives from the fact that most modes of human reasoning and especially common sense reasoning are approximate in nature. The essential characteristics of fuzzy logic as founded by Zadeh Lotfi are as follows.

In fuzzy logic, exact reasoning is viewed as a limiting case of approximate reasoning.

In fuzzy logic everything is a matter of degree.

Any logical system can be fuzzified

In fuzzy logic, knowledge is interpreted as a collection of elastic or, equivalently, fuzzy constraint on a collection of variables

Inference is viewed as a process of propagation of elastic constraints.

The third statement hence, defines Boolean logic as a subset of Fuzzy logic.

The whole idea of fuzzification/Defuzzification is based upon membership function. A membership function provides a measure of the degree of similarity of an element to a fuzzy set. The membership function of a fuzzy set is a generalization of the indicator function in classical sets. In fuzzy logic, it represents the degree of truth as an extension of valuation. Degrees of truth are often confused with probabilities, although they are conceptually distinct, because fuzzy truth represents membership in vaguely defined sets, not likelihood of some event or condition.

**ISO 9126 QUALITY MODEL AND FUZZY**

Both the terms comes from two different computing environments but if combined together can achieve better results. ISO 9126 has defined 6 quality characteristics, namely functionality, usability, maintainability, portability, reliability and efficiency. As we are concerned with end-user, so, we will consider only three quality characteristics that are more important for a user than others and will estimate quality based upon those three factors. These three factors are: Functionality, Usability and maintainability respectively. We will use fuzzy logic to estimate quality based upon these three factors.

**IMPLICATION**

Fuzzy logic system goes through three main steps or procedures which are as follows:

- Fuzzification
- Fuzzy Inference
- De-Fuzzification

The inputs for the fuzzification process will be Functionality, Maintainability and usability.

**FUZZIFICATION**

Three input variable to be fuzzified as mentioned are Functionality, Usability and maintainability. The terms LOW, MED, HIGH are used to depict INPUT and terms VLOW, LOW, MED, HIGH, VHIGH are used to depict OUTPUT in form of triangular membership functions.

The following figures i.e Figure 13, Figure 14, Figure 15 presents the input membership functions for the linguistic variables Functionality, Usability and maintainability respectively. The membership functions are divided into linguistic terms of LOW, MED, HIGH with the ranges as follows for the each:

LOW {0, 0, 0.5}

Med {0, 0.5, 1}

High {0.5, 1, 1}

It should be noted that when we talk of Functionality, Usability and maintainability, the above mentioned variables have standard meaning of the terms used as linguistic.

**FIGURE 1: INPUT FOR "FUNCTIONALITY"**

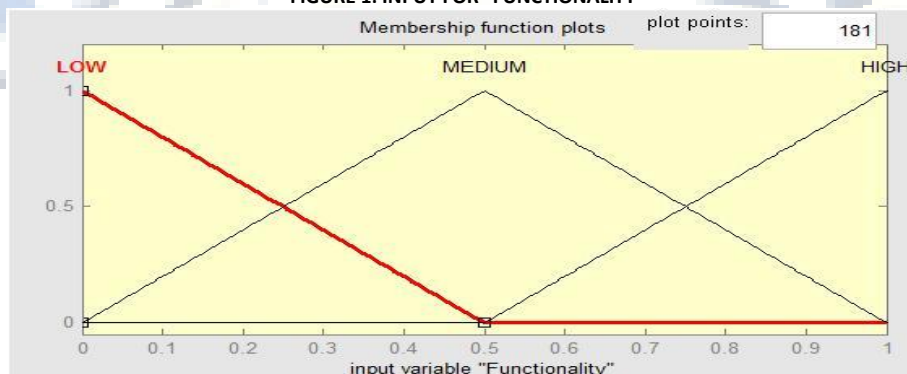


FIGURE 2: INPUT FOR "USABILITY"

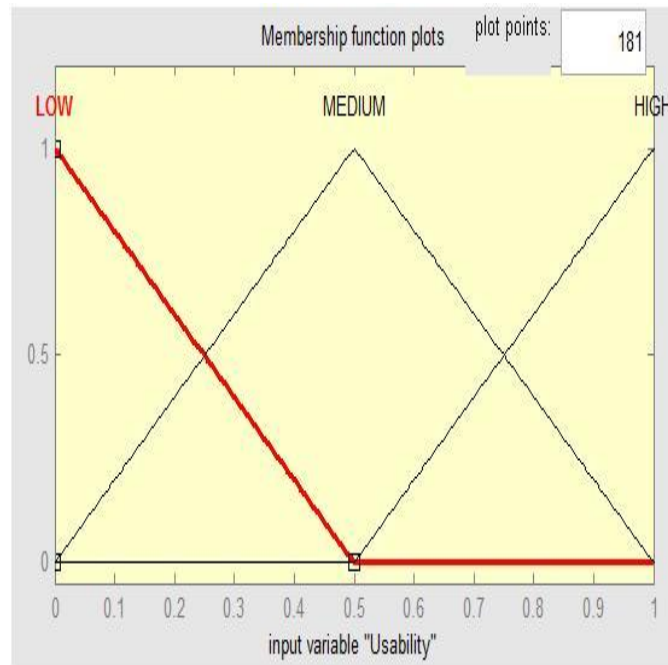
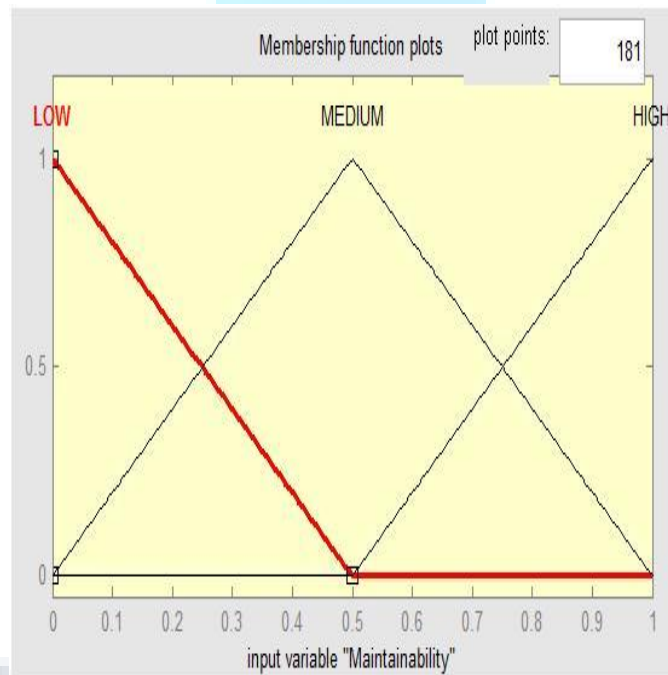


FIGURE 3: INPUT FOR "MAINTAINABILITY"



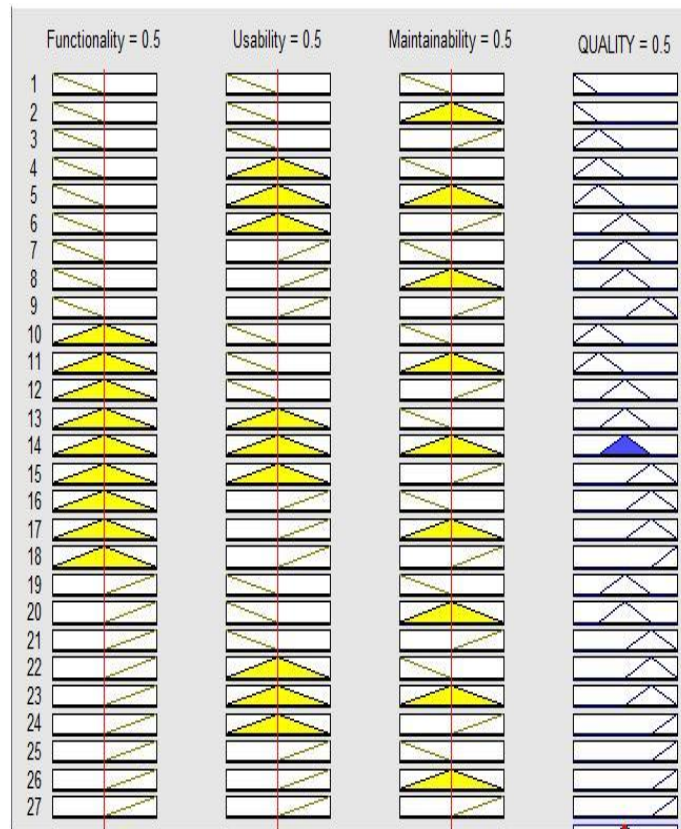
**FUZZY INFERENCE**

The input to the fuzzy systems are worked upon using Mamdani's mom method wherein "AND" operator is set to minimum such that each input variable contribute to the output created by the inference mechanism. The following rule base presents the base of simulation for the proposed fuzzy based method of quality estimation.

The following table presents the complete rule base designed for the fuzzy inference mechanism.

INPUTS			OUTPUT
FNTC.	USB.	MNTN.	QUALITY
LOW	LOW	LOW	VLOW
LOW	LOW	MEDIUM	VLOW
LOW	LOW	HIGH	LOW
LOW	MEDIUM	LOW	LOW
LOW	MEDIUM	MEDIUM	LOW
LOW	MEDIUM	HIGH	MEDIUM
LOW	HIGH	LOW	MEDIUM
LOW	HIGH	MEDIUM	MEDIUM
LOW	HIGH	HIGH	HIGH
MEDIUM	LOW	LOW	LOW
MEDIUM	LOW	MEDIUM	LOW
MEDIUM	LOW	HIGH	MEDIUM
MEDIUM	MEDIUM	LOW	MEDIUM
MEDIUM	MEDIUM	MEDIUM	MEDIUM
MEDIUM	MEDIUM	HIGH	HIGH
MEDIUM	HIGH	LOW	HIGH
MEDIUM	HIGH	MEDIUM	HIGH
MEDIUM	HIGH	HIGH	VHIGH
HIGH	LOW	LOW	MEDIUM
HIGH	LOW	MEDIUM	MEDIUM
HIGH	LOW	HIGH	HIGH
HIGH	MEDIUM	LOW	HIGH
HIGH	MEDIUM	MEDIUM	HIGH
HIGH	MEDIUM	HIGH	VHIGH
HIGH	HIGH	LOW	VHIGH
HIGH	HIGH	MEDIUM	VHIGH
HIGH	HIGH	HIGH	VHIGH
HIGH	MED	LOW	VHIGH
HIGH	HIGH	HIGH	HIGH
HIGH	HIGH	MED	VHIGH
HIGH	HIGH	LOW	VHIGH

1. If (Functionality is LOW) and (Usability is LOW) and (Maintainability is LOW) then (QUALITY is VLOW) (1)
2. If (Functionality is LOW) and (Usability is LOW) and (Maintainability is MEDIUM) then (QUALITY is VLOW) (1)
3. If (Functionality is LOW) and (Usability is LOW) and (Maintainability is HIGH) then (QUALITY is LOW) (1)
4. If (Functionality is LOW) and (Usability is MEDIUM) and (Maintainability is LOW) then (QUALITY is LOW) (1)
5. If (Functionality is LOW) and (Usability is MEDIUM) and (Maintainability is MEDIUM) then (QUALITY is LOW) (1)
6. If (Functionality is LOW) and (Usability is MEDIUM) and (Maintainability is HIGH) then (QUALITY is MEDIUM) (1)
7. If (Functionality is LOW) and (Usability is HIGH) and (Maintainability is LOW) then (QUALITY is MEDIUM) (1)
8. If (Functionality is LOW) and (Usability is HIGH) and (Maintainability is MEDIUM) then (QUALITY is MEDIUM) (1)
9. If (Functionality is LOW) and (Usability is HIGH) and (Maintainability is HIGH) then (QUALITY is HIGH) (1)
10. If (Functionality is MEDIUM) and (Usability is LOW) and (Maintainability is LOW) then (QUALITY is LOW) (1)
11. If (Functionality is MEDIUM) and (Usability is LOW) and (Maintainability is MEDIUM) then (QUALITY is LOW) (1)
12. If (Functionality is MEDIUM) and (Usability is LOW) and (Maintainability is HIGH) then (QUALITY is MEDIUM) (1)
13. If (Functionality is MEDIUM) and (Usability is MEDIUM) and (Maintainability is LOW) then (QUALITY is MEDIUM) (1)
14. If (Functionality is MEDIUM) and (Usability is MEDIUM) and (Maintainability is MEDIUM) then (QUALITY is MEDIUM) (1)
15. If (Functionality is MEDIUM) and (Usability is MEDIUM) and (Maintainability is HIGH) then (QUALITY is HIGH) (1)
16. If (Functionality is MEDIUM) and (Usability is HIGH) and (Maintainability is LOW) then (QUALITY is HIGH) (1)
17. If (Functionality is MEDIUM) and (Usability is HIGH) and (Maintainability is MEDIUM) then (QUALITY is HIGH) (1)
18. If (Functionality is MEDIUM) and (Usability is HIGH) and (Maintainability is HIGH) then (QUALITY is VHIGH) (1)
19. If (Functionality is HIGH) and (Usability is LOW) and (Maintainability is LOW) then (QUALITY is MEDIUM) (1)
20. If (Functionality is HIGH) and (Usability is LOW) and (Maintainability is MEDIUM) then (QUALITY is MEDIUM) (1)
21. If (Functionality is HIGH) and (Usability is LOW) and (Maintainability is HIGH) then (QUALITY is HIGH) (1)
22. If (Functionality is HIGH) and (Usability is MEDIUM) and (Maintainability is LOW) then (QUALITY is HIGH) (1)
23. If (Functionality is HIGH) and (Usability is MEDIUM) and (Maintainability is MEDIUM) then (QUALITY is HIGH) (1)
24. If (Functionality is HIGH) and (Usability is MEDIUM) and (Maintainability is HIGH) then (QUALITY is VHIGH) (1)
25. If (Functionality is HIGH) and (Usability is HIGH) and (Maintainability is LOW) then (QUALITY is VHIGH) (1)
26. If (Functionality is HIGH) and (Usability is HIGH) and (Maintainability is MEDIUM) then (QUALITY is VHIGH) (1)
27. If (Functionality is HIGH) and (Usability is HIGH) and (Maintainability is HIGH) then (QUALITY is VHIGH) (1)



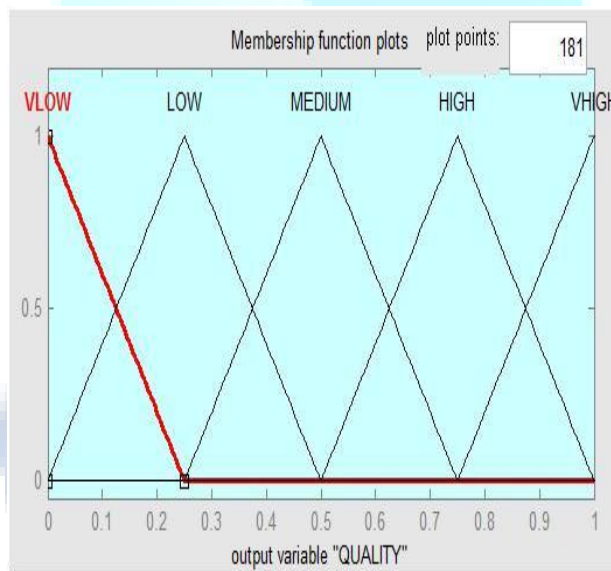
**FUZZY RULE BASE DESIGN AS PER TRIANGULAR MEMBERSHIP FUNCTION PLOT**

If Functionality is LOW, Usability is LOW and Maintainability is HIGH then quality LOW.

As we are having three INPUT states to every fuzzy input, therefore the total no of possible inference rule could be 27 (3\*3\*3).

**DEFUZZIFICATION**

It's a process where we extract crisp values from the output parameter in the knowledge base.



**OUTPUT AS "QUALITY"**

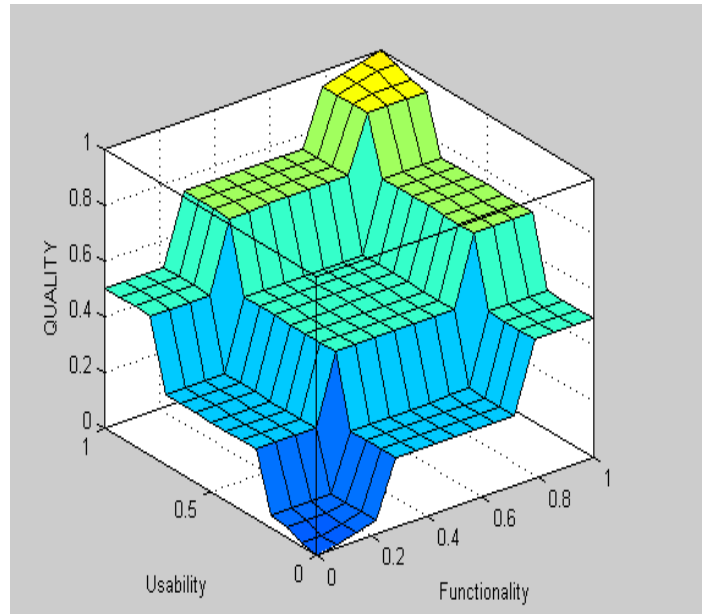
The output membership function is generated while the fuzzification process however, is depicted and referenced in this section as Figure 18 for a clear understanding of the output result evaluation. The Linguistic Variable Quality is generated with Linguistic Terms VERY LOW, LOW, MED, HIGH, VERY HIGH with the following fuzzy sets:

- VERY LOW {0, 0, 0.25}
- LOW {0, 0.25, 0.5}
- MED {0.25, 0.5, 0.75}
- HIGH {0.5, 0.75, 1}
- VERY HIGH {0.75, 1, 1}

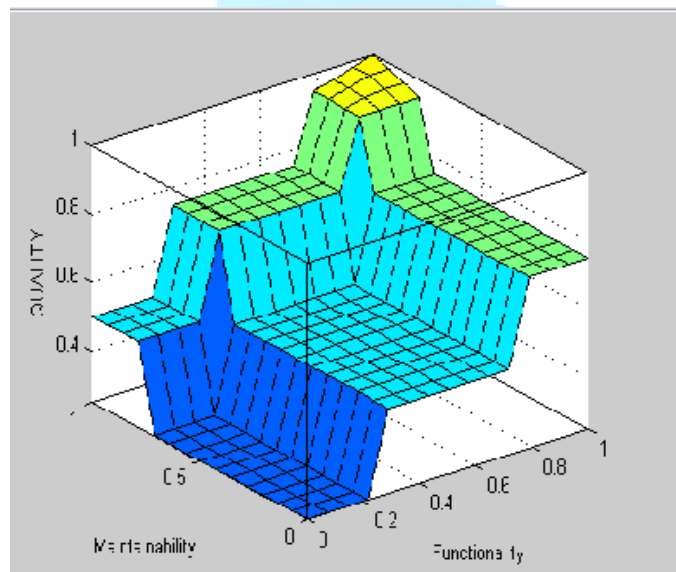


RESULT

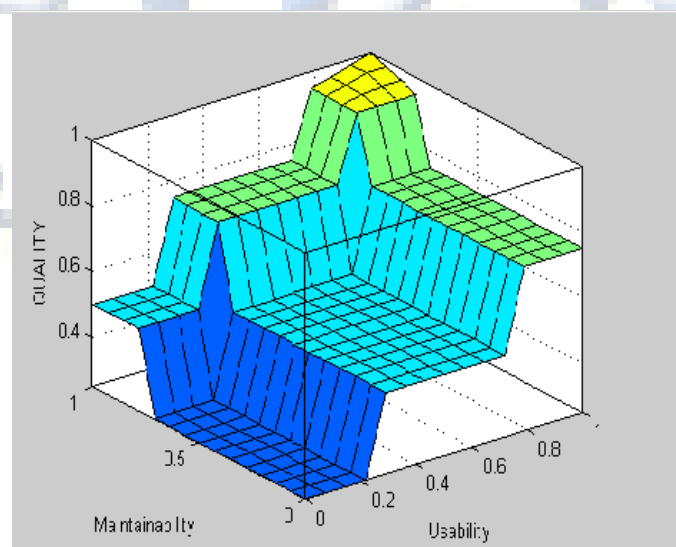
The following output shows the effect of usability and functionality on quality when maintainability is kept constant.



The following output shows the effect of maintainability and functionality on quality when usability is kept constant.



The following output shows the effect of maintainability and usability on quality when functionality is kept constant.



**FUTURE SCOPE**

In future all the 6 factors of ISO 9126 and their subparts can also be considered to determine the quality of software being delivered.

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**A STUDY ON CORPORATE SOCIAL RESPONSIBILITY**

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**ABSTRACT**

*This paper considers the motivations for and nature of business contributions to sustainable development through the medium of corporate social responsibility (CSR). It compares CSR with sustainable development, given that they are both 'essentially contested concepts'; it introduces CSR's changing meaning and it explains why there has been a recent increase in CSR with reference to the increasing socialization of markets as a result of narrow market drivers, along with other social, governmental and globalization drivers. It uses Hart's 'A natural-resource-based view of the firm' to explain the way in which these drivers give rise to sustainable development agendas in companies and provides illustration of these.*

**KEYWORDS**

CSR, Sustainable development, New companies Act, 2013.

**INTRODUCTION**

Businesses can no longer limit themselves to using resources to engage in activities that increase their profits. They have to be socially responsible corporate citizens and also contribute to the social good. Corporate Social Responsibility (CSR) is about integrating economic, environmental and social objectives with a company's operations and growth. Many consider CSR philanthropy, but that is a limited definition. An organization can accomplish sustainable development if CSR becomes an integral part of its business process. CSR impacts almost every area of operations: governance and ethics; employee hiring, providing opportunity; stakeholders benefit sharing and energy usage and environment protection.

**DEFINITION**

"Social responsibility (is the) responsibility of an organization for the impacts of its decisions and activities on society and the environment through transparent and ethical behavior that is consistent with sustainable development and the welfare of society; takes into account the expectations of stakeholders; is in compliance with applicable law and consistent with international norms of behavior; and is integrated throughout the organization."

As Wood puts it, "the basic idea of corporate social responsibility is that business and society are interwoven rather than distinct entities; therefore, society has certain expectations for appropriate business behavior and outcomes" (Wood, 1991).

Working definition, ISO 26000 Working Group on Social Responsibility, Sydney, February 2007

The World Business Council for Sustainable Development has described CSR as the business contribution to sustainable economic development. Building on a base of compliance with legislation and regulations, CSR typically includes "beyond law" commitments and activities pertaining to:

- corporate governance and ethics;
- health and safety;
- environmental stewardship;
- human rights (including core labor rights);
- sustainable development;
- conditions of work (including safety and health, hours of work, wages);
- industrial relations;
- community involvement, development and investment;
- involvement of and respect for diverse cultures and disadvantaged peoples;
- corporate philanthropy and employee volunteering;
- customer satisfaction and adherence to principles of fair competition;
- anti-bribery and anti-corruption measures;
- accountability, transparency and performance reporting; and
- Supplier relations, for both domestic and international supply chains.

*A growing body of evidence asserts that corporations can do well by doing good. Well-known companies have already proven that they can differentiate their brands and reputations as well as their products and services if they take responsibility for the well-being of the societies and environments in which they operate. These companies are practicing Corporate Social Responsibility (CSR) in a manner that generates significant returns to their business.*

**CSR- NEW COMPANIES ACT 2013**

"CSR Spending Likely to be Rs.27,000 Cr in a Year"

According to the Indian Institute of Corporate Affairs, of the 1.3 million companies in our country, about 6,000-7,000 companies are covered under the new CSR rule as it is applicable only to companies that have a minimum net worth of Rs. 500 Cr, turnover of Rs.1,000 Cr or net profit of Rs 5 Cr.

The new Companies Act, 2013, clause 135, which proposes that 2% of profits earned by a certain class of companies must be spent on corporate social responsibility (CSR) activities, would mean an estimated Rs.27,000 Cr will flow into grassroots development and social enterprise sectors every year. It is currently estimated that the average CSR spend currently is 1-1.25% of profits, while the Companies Act, 2013, prescribes 2%. While the new Act does not make this kind of a CSR spending compulsory, it mandates reporting any failure in meeting this target, creating social pressure on companies.

### CSR- SUSTAINABLE DEVELOPMENT

*"Sustainability is about living and working in ways that meet and integrate existing environmental, economical and social needs without compromising the well-being of future generations. The transition to sustainable development benefits today's society and builds a more secure future for our children."*

The origin of the term SD lies in the 18th century and was actually used in forestry. In those times, it was only allowed to cut down a certain number of trees so that a long-lasting protection of the tree population was guaranteed.

Whereas the term SD has mainly started to be used in the 1980's, the framework of CSR has already been established in the 1950's and 60's. Bowen defined CSR in 1953 - as one of the first - as "... an obligation to pursue policies to make decisions and to follow lines of action which are compatible with the objectives and values of society" (Douglas et al., 2004).

Sustainable development: United Nations' (UN) studies and many others have underlined the fact that humankind is using natural resources at a faster rate than they are being replaced. If this continues, future generations will not have the resources they need for their development. In this sense, much of current development is unsustainable—it can't be continued for both practical and moral reasons. Related issues include the need for greater attention to poverty alleviation and respect for human rights. *CSR is an entry point for understanding sustainable development issues and responding to them in a firm's business strategy.*

Businesses are recognizing that adopting an effective approach to CSR can reduce the risk of business disruptions, open up new opportunities, drive innovation, enhance brand and company reputation and even improve efficiency.

In the world's largest CEO study on sustainability to date, more than 1,000 top executives from 27 industries across 103 countries assess the past, present and future of sustainable business.

### CSR SURVEY

According to the 10th PricewaterhouseCoopers Annual Global CEO Survey, 81 per cent of CEOs surveyed (between September and December 2006) agreed or agreed strongly with the statement: *"My company's development programme focuses increasingly on equipping leaders to take a role in creating a sustainable business environment."* A similar percentage of respondents in a U.S. Chamber of Commerce survey conducted in late 2005 agreed that companies need to make corporate citizenship a priority.<sup>10</sup>

The IBM's global survey conducted on more than 250 business executives worldwide to gauge just how deeply the CSR issue has penetrated the core of the corporation – its strategies and operations. The report has led three dynamics that companies should understand and act upon in dealing with CSR. These dynamics are:

- Impact for business – From cost to growth
- Information – From visibility to transparency
- Relationships – From containment to engagement.

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## COMPUTERIZED ACCOUNTING INFORMATION SYSTEMS AND SYSTEM RISK MANAGEMENT IN NIGERIAN BANKS

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### ABSTRACT

*The advent and adopted of Information Technology (IT) have improved performance in business and accounting processes in the organizations. However, the attendant risks associated with this cannot be denied. The main objective of this paper was to evaluate Computerized Accounting Information System (CAIS) and system risk management in the Nigerian banking sector. It was an empirical survey of commercial banks in four states; namely Akwa Ibom, Cross River, Delta and Rivers; in the south-south region of Nigeria using a questionnaire designed on a bipolar scale of five. It was revealed that the greatest risks associated with CAIS of banks in Nigeria are salami fraud, acts of nature, logic bombs and data diddling; and that the mostly adopted techniques and tools for management of CAIS risks are penetration testing, use of mitigation and recovery means, and malware scanners. It was also discovered that the greatest challenges faced by Nigerian banks in this respect are difficulty in obtaining physical evidence and witness cooperation, and difficulty in understanding the offender's method. The Chi-square statistical tool was used to test the hypothesis which revealed that there was significant relationship between techniques and tools adopted for system risk management and the challenges associated with CAIS. The strength of relationship between the variables was 89.6% as determined using Spearman's rank correlation coefficient. The paper therefore recommended that banks in Nigeria should install infrastructures such as Address Verification System (AVS), Interactive Voice Response (IVR), Internet Protocol (IP) address tracking systems and Intrusion Detection Systems (IDS). These will go a long way to managing the vulnerability associated with CAIS which will invariably enhance effectiveness and guarantee greater results.*

### KEYWORDS

Computerized accounting information system(CAIS), information technology, Nigerian banks, risks, system risks management.

### INTRODUCTION

Information Technology (IT) has undoubtedly played a remarkable role in the business sector in recent times. The rapid change in IT; the wide spread of user-friendly systems and the great desire of organizations to acquire and implement up to date computerized systems and software have made computers much easier to be used and have enabled accounting tasks to be accomplished much faster and more accurate than hitherto. According to Wang, Ballou, Pazer and Tayi (1998), more and more organizations believe that quality information is critical to their success.

With rapid development of IT; Computerized Accounting Information Systems (CAIS) play an increasingly crucial role in the organizations regardless of their size. The world is moving rapidly to the point where it is possible to assert that everything depends on computer software (Edwards & Anderson, 1995). The exponential growth of technology; the increase in its capacity and accessibility and decrease in its cost; have brought about evolutionary changes in commerce, communication, entertainment and education. With this greater capacity, however, comes greater vulnerability. Information technology has begun to provide criminal opportunities of which olden day's criminal never dreamt. This advanced technology has also created significant risks related to ensuring the security and integrity of CAIS (Abu-Musa, 2005).

Apart from the advantages of the CAIS, several deadly deficiencies and threats in terms of the security and reliability of the accounting information system may emerge; which may be detrimental to the interest of the organization and even worse; may lead to the collapse of a company. The fundamental precept of information security is to support the organization against these threats and uncertainties posed by CAIS; hence, IT professionals must be able to help their organizations understand and manage these uncertainties.

System risk management plays a vital role in the mitigating these risks; as it helps in the understanding and responding to factors that may lead to failure in the confidentiality, integrity or reliability of CAIS. It is worthy of note that technology in many cases, has developed faster than the advancement in control practices and has not been combined with similar development in employees knowledge, skill, awareness and compliance.

Often time reports can be found in accounting and financial publications about computer related data errors, incorrect financial information, violation of internal control, theft, burglaries, spam, hacking, impersonation, sabotage and so on. Organizations should be aware of the potential security risks that might challenge their CAIS. The risks associated with CAIS are numerous owing to its vulnerability; not only in integral part of organization such as asset theft, artificial revenue information, expense manipulation, change of the CAIS illegally and so on; but also the external; such as hacking, spam, phishing and identity fraud.

Although considerable efforts have been made by practicing accountants and IT professionals to reduce the vulnerability of CAIS; it is argued that an increasing effort is still required (Abu-Musa, 2005). Today, not only computer whiz kids hack into computers, IT professionals have joined the league (Olasanmi, 2010). A new breed of white collar criminals has emerged and is infiltrating systems one way or the other. The introduction of the internet has heightened the threats of these crimes.

In 2005, the then Economic and Financial Crimes Commission (EFCC) Chairman in Nigeria; Malam Nuhu Ribadu stated that the Commission had confiscated at least 100 million United States Dollar (USD) from scammers and other defendants and by the time he was temporarily removed from office in 2008, the Commission had retrieved a total of 600 million USD in dubiously acquired funds. An anonymous survey by the EFCC recorded instances of electronic theft of up to 500 million USD (Tedeschi, 2003). According to Brey (2001), the internet has been used to gain illegal access to systems. Regrettably, 80% of these e-crimes remain practically undiscovered (Balogun & Obe, 2010).

According to Olasanmi (2010), estimating the incidence, prevalence, costs or some other measures of crimes related to computerized systems have posed some challenges as such crimes are not easily detected and even when detected, reports to the appropriate authorities are not always made due to the need of some organizations to protect some private information. It is in the face of these challenges that this paper seeks to:

- (i) determine the different risks associated with CAIS in Nigerian banks;
- (ii) appraise how these risks are managed by these banks; and

(iii) assess the challenges faced in the management of these risks.

The basic assumption for this paper is that there is no significant relationship between the techniques and tools adopted by Nigerian banks for system risk management and the challenges associated with CAIS.

## LITERATURE REVIEW

In order to understand CAIS, it is pertinent to first review what an Accounting Information System (AIS) is. This will provide a proper perspective for appreciating what CAIS is all about.

## THE ACCOUNTING INFORMATION SYSTEM

Accounting is a service function that seeks to provide the users with qualitative information; while AIS is an information system that is designed to make the accomplishment of the accounting function possible. Accounting Information System is a system of collection, storage and processing of financial and accounting data that is used by decision makers. According to Romney, Steinbart and Cushing (1997), AIS processes data and transactions to provide users with the information they need to plan, control and operate their businesses. The resultant reports can be used internally by management and externally by other interested parties such as investors, creditors and tax authorities. An AIS can be manual system or a computerized system; using computers. The components of AIS include; people, procedures and instructions, data, software applications, information technology infrastructure, and internal control and security measures.

## THE COMPUTERIZED ACCOUNTING INFORMATION SYSTEMS

Along with the improvement in the technology, information systems have been computerized. The result is that manual booking keeping systems have been replaced by computerized ones. According to Nash (1989), the revolution in the information system which started in the early 1950s when the first business computer became available is still in progress.

Companies now capture, process, store and transmit data with the help of the computers. Where data collection and processing were performed manually hitherto; on-line collection and processing of data are performed now by computer systems (Grabski & Marsh, 1994). This improvement in technology has enabled companies to collect, process and retrieve data quickly.

The CAIS though very useful and almost indispensable have some challenges. These include among others:

- computer systems are always at risk of being hacked, faced with power failure and virus attack with may result in lose of information;
- systems can be costly and they require constant updating and staff need to be trained to efficiently use the system;
- security issues are posed with a risk of computer fraud;
- human error is often not quickly identified, and records input need to be validated for accuracy;
- computerized accounting systems can be difficult to understand and if the systems are not specifically adapted to the business; it can cause havoc to the accounts;
- computerized accounting systems are dependent on machine and other software to work properly. If something goes wrong with the computer, access to the software is restricted and work cannot be done. Time and expenses are involved in solving the problem so as to get operations going.

There are many computer frauds and computer crimes exercised through CAIS owing to its vulnerability not only in the internal part of the organization such as asset theft, artificial revenue information, expense manipulation, change of the CAIS illegally and so on; but also the external such as hacking, spam, phishing, identity theft and so on.

The risks involved in CAIS include sabotage (physical damage to computer system), impersonation, phone phreaking, data diddling, hacking, salami fraud, logic bombs, extortion, spam amongst others.

## SYSTEM RISK MANAGEMENT

Risk is the potential harm that may arise from some current process or from future event. Risk is present in every aspect of our life and different disciplines focus on risk as it applies to them. From the IT perspective, risk management is the process of understanding and responding to factors that may lead to a failure in confidentiality, integrity or availability of an information system.

Information Technology security risk is the harm to a process or the related information resulting from some purposely or accidental event that negatively impacts the process with the attendant adverse effect on the organization. Some of these threats to information systems include accidental disclosure, alteration of software and intentional alteration of data. Others are system configuration error, telecommunication malfunctioning/ interruption and vulnerabilities (weakness in system security procedures, design, implementation and control).

An understanding of risk and the application of risk assessment methodology is essential to efficiently and effectively creating secured computing environment. All organizations operating a CAIS are exposed to uncertainties; some of which impact negatively on the organization. Therefore, the fundamental objective of information security is to support the mission of the organization.

Managing risks and uncertainties is not an easy task; for there is an ever-changing landscape of threats and vulnerabilities. Hence, IT security professionals must be able to help management of their organizations understand and manage these risks. Loch, Houston and Warkentin (1992) found that natural disaster, employee accidental actions (inadequate control over media) and unauthorized access to CAIS by hackers ranked among the top security threats. This goes to say that the greater risks are from inside the organization. Davis (1996); Ryan and Bordoloi (1997) corroborate this claim.

On the nature of the accounting systems and security in use Henry (1997) states that 80.3% of companies secured their accounting systems using passwords but only 42.7% utilized protection from viruses. He further stated that less than 40% have measures for physical security and authorization for changes to the system and sadly less than that figure use encryption for their accounting data. This calls for concern considering the number of companies utilizing some form of hardware and software or the other.

Hood and Yang (1998) in their comparative study of the impact of banking information system in China and UK found that management was aware of security risk but they have not taken enough action to reduce the risks and losses owing largely to lack of financial and human resources. On understanding how organizations are addressing their IT risks; Hermanson, Hall and Irancevich (2000) study revealed that internal auditors focus primarily on traditional IT risks and controls; such as asset safeguarding, application processing and data integrity, privacy and security.

Abu-Musa (2005) investigated the security risks associated with CAIS in the Egyptian banking sector. The study revealed that accidental entry of bad data by employees, introduction of computer viruses to the system, employees sharing of passwords; and misdirecting information to people not entitled to receive them were the most perceived significant security threats to CAIS in the Egyptian banking sector.

## WHY IS IT IMPORTANT TO MANAGE RISK?

The principal reason for managing risk in an organization is to protect the mission and assets of the organization. The first step in risk management is an understanding of the risk. An understanding of the specific risk to a system allows the system owner to protect the information system. Different risk management schemes offer different methodologies for identifying vulnerabilities and assessing risk. Assessing risk is the process of determining the likelihood of the threat being exercised against the vulnerability and the resulting impact from a successful compromise.

There is great need to make detailed preparations to withstand and recover from a wide range of unwanted cyber events; both accidental and deliberate. There are significant and growing risks of localized misery and loss as a result of compromise of computer and telecommunication services. Risks management approaches are most useful when there is a reasonable level of available reliable data about the risk being considered where there are probabilities and clearly definable potential financial losses.

According to Cashell (2004), the response usually is to adopt a three matrix of high, medium and low levels of probability, and another three level matrix of impact; which allows for some of the disciplines of risk management to be adopted without the need for precise financial calculation. Some remedies to system risk are system design which integrates security features into the initial requirement engineering, detective and preventive measures which provide opportunity to stop breach of basic routine security; this is the first essential step in the more complex series of actions necessary to achieve an event of significant information security technologies.

When preventive and detective methods fail, the emphasis switches to mitigation and recovery factors; as a function of the structure of the organization that is affected and to determine if there is a well tested contingency plan. Thompson (1989) identified a number of challenges of curbing risks associated with CAIS. He listed some factors to include:

- a large proportion of computer related crimes are 'insider jobs';
- e-crimes are generally of low visibility and therefore difficult to detect;
- once the crime has been detected; discovery and understanding the method used by the offenders in a technologically complex crime can be difficult;
- the ability to obtain physical evidence is generally more difficult than in other commercial crimes;
- computerized information; which is of evidentiary value can easily be altered or destroyed; often leaving no trace of tempering; and
- issues involving the admissibility of evidence in court is further complicated in the computerized environment.

## METHODOLOGY

The area of study was four states of the south-south region of Nigeria; namely Akwa Ibom, Cross River, Delta and Rivers; and the main focus was on the risks associated with CAIS faced by banks in Nigeria. The universe of the study was all commercial banks in Nigeria and period of study was 2012. In the survey, a total of 200 copies of questionnaire were administered to IT representatives in various commercial banks across the four states. The questions were on bipolar scale of five. Responses were ranked and analyzed. The chi-square ( $\chi^2$ ) statistical tool is used to test the hypothesis at 5% level of significance while the strength of association is evaluated using the Spearman's rank correlation coefficient. The purpose is to establish the pattern of association between CAIS and risk and evaluate efforts in managing the risks.

## DATA PRESENTATION AND RESULTS OF ANALYSIS

TABLE 1: FREQUENCY OF RISKS ASSOCIATED WITH CAIS OF BANKS

S/N	RISK	FREQUENCY	PERCENTAGE	RANKING
1	sabotage	114	57	19
2	impersonation	107	54	22
3	credit card fraud	151	75	5
4	phone phreaking	136	68	14
5	data diddling	158	79	3
6	salami fraud	172	86	1
7	logic bombs	157	79	4
8	extortion	107	54	22
9	Spam	150	75	6
10	denial of service	142	71	12
11	hacking	150	75	6
12	notorious worms & viruses	129	65	15
13	trojan horse	107	54	22
14	Accidental disclosure	143	72	10
15	Bandwidth interference	114	57	19
16	Alteration of software	142	71	12
17	Electrical interference	143	72	10
18	System configuration error	150	75	6
19	Telecommunication malfunction	121	61	18
20	Acts of nature:thunder, earthquake	165	83	2
21	Phishing	122	61	16
22	Keylogger	150	75	6
23	Root-kit	114	57	19
24	System overload	122	61	16

Source: Field survey 2012

Table 1 shows that the greatest risks associated with CAIS of banks in Nigeria are salami fraud (86%), acts of nature; such as thunder (83%), logic bombs (79%) and data diddling (79%). These risks cause more problems to Nigerian banks as their level of occurrence is very high. The lowest risks are impersonation, extortion and Trojan horse (all at 54%).

TABLE 2: DEGREE OF ADOPTION OF TECHNIQUES AND TOOLS FOR MANAGEMENT OF RISKS ASSOCIATED WITH CAIS

TECHNIQUES FOR MGMT OF RISK	FREQUENCY	PERCENTAGE	RANKING
1. Access control facilities(password & codes)	170	85	7
2. Virus scanners	171	86	5
3. Malware scanners	192	96	3
4. Penetration testing	193	97	1
5. Electronic data processing (EDP) audit	150	75	11
6. Use of failsafe systems	136	68	12
7. Use of cryptography	157	79	9
8. Load balancing	186	93	4
9. Use of input validation routines e.g validity checks, sign checks etc	170	85	7
10. Use of tripwires, honey pot lures & anomaly detection system	157	79	9
11. Use of infrastructure such as address verification system (AVS), interactive voice response (IVR) etc	65	33	13
12. Use of video surveillance systems	171	86	5
13. Use of mitigation and recovery means	193	97	1

Source: Field survey 2012



Table 2 shows the level of adoption of various techniques and tools for management of risks associated with CAIS. The mostly employed techniques are Penetration testing (97%), Use of mitigation and recovery means (97%) and Malware scanners (96%). On the other hand the least employed is the use of infrastructure such as Address Verification System (AVS) and Interactive Voice Response (IVR) (33% respectively).

**TABLE 3: CHALLENGES FACED IN THE MANAGEMENT OF RISKS ASSOCIATED WITH CAIS**

CHALLENGES FACED IN MGMT OF RISKS IN CAIS	FREQUENCY	PERCENTAGE	RANKING
1. Low visibility & difficulty in crime detection	134	67	11
2. International jurisdictional boundaries	130	65	12
3. Insider job	142	71	9
4. Difficulty in discovery & understanding the offenders method in technologically complex computer	171	86	3
5. Difficulty in obtaining physical evidence	172	86	1
6. Complications in admissibility of evidence in court especially in the computerized environment	128	64	13
7. Difficulty in carrying out investigations	157	79	4
8. Apathy of some countries to E-crime	157	79	4
9. Obtaining witness cooperation	172	86	1
10. Identifying suspects	157	79	4
11. Problem of encryption	141	72	9
12. Locating and securing relevant materials	143	72	8
13. Difficulty in bringing the offenders to trial	157	79	4

Source: Field survey 2012

Table 3 shows the extent of challenges faced by Nigerian banks in the management of risks associated with CAIS. The greatest challenges are Difficulty in obtaining physical evidence, obtaining witness cooperation and difficulty in discovery and understanding the offender’s method which were 86% respectively; while complications in admissibility of evidence in court is the least of all the identified challenges (64%).

**TESTING OF HYPOTHESIS**

The following hypothesis was tested:

H<sub>0</sub>: There is no significant relationship between the techniques and tools adopted by Nigerian banks for system risk management and the challenges associated with CAIS.

**TABLE 4: DEGREE OF ADOPTION OF TECHNIQUES AND TOOLS AND THE FREQUENCY OF CHALLENGES FACED BY MANAGEMENT**

	TECHNIQUES & TOOLS	CHALLENGES	TOTAL
1.	170	134	304
2.	171	130	301
3.	192	142	334
4.	193	171	364
5.	150	172	322
6.	136	128	264
7.	157	157	314
8.	186	157	343
9.	170	172	342
10.	157	157	314
11.	65	141	206
12.	171	143	314
13.	193	157	350
TOTAL	2111	1961	4072

Source: Field survey 2012

$$\chi^2 = \frac{(o-e)^2}{e}$$

where  
 $\chi^2$  = chi-square  
 o = observed frequency  
 e = expected frequency

The chi-square was computed to test the hypothesis at 5% level of significance. The calculated  $\chi^2_{cal} = 20.950$  which is greater than the tabulated  $\chi^2_{tab 0.95(12)} = 5.22603$ . Hence, the null hypothesis is rejected. Therefore there is significant relationship between the techniques and tools adopted by Nigerian banks for system risk management and the challenges associated with CAIS.

**TABLE 5: EVALUATION OF THE DEGREE OF RELATIONSHIP BETWEEN TECHNIQUES AND TOOLS FOR SYSTEM RISK MANAGEMENT AND THE CHALLENGES FACED BY MANAGEMENT**

ITEMS	RANK OF TECHIQUES & TOOLS	RANK OF CHALLENGES	D	D <sup>2</sup>
1.	7	11	-4	16
2.	5	12	-7	49
3.	3	9	-6	36
4.	1	3	-2	4
5.	11	1	10	100
6.	12	13	-1	1
7.	9	4	5	25
8.	4	4	0	0
9.	7	1	6	36
10.	9	4	5	25
11.	13	9	4	16
12.	5	8	-3	9
13.	1	4	-3	9



$$r = 1 - 6 \frac{\sum D^2}{N^3 - N}$$

Where

$r$  = coefficient of rank correlation

$N$  = number of observations

$\sum D^2$  = summation of square of deviation

$$r = 1 - 6 \frac{133}{(326)^2}$$

$$r = 0.896$$

The result showed that there is a significantly high positive correlation of 89.6% between the techniques and tools adopted by Nigerian banks and the challenges associated with CAIS.

## DISCUSSION OF FINDINGS

The paper revealed so many risks summing up to 24 that are associated with CAIS but the ones affecting the banks at a very high rate and serving as a menace to the CAIS as a whole include acts of nature, data diddling, salami fraud and logic bombs. Other risks are spam, hacking, notorious worms/viruses, accidental disclosure, alteration of software, electrical interference, system configuration error, telecommunication malfunction, phishing and system overload.

The paper also revealed the mostly adopted techniques and tools intensively employed by Nigerian banks in managing these risks as penetration testing; such as validity checks, sign checks and completion checks, use of mitigation and recovery means and malware scanners. Other methods include the use of access control facilities such as passwords and biometrics and the use of video surveillance system.

It was revealed that there were other methods that have been either totally neglected or slightly implemented by banks in Nigeria and this leaves CAIS at a very vulnerable state. These methods include Electronic Data Processing (EDP) auditing, use of failsafe systems and use of cryptography. Others are use of tripwires, honey pot lures and anomaly detection system such as Address Verification System (AVS) and Interactive Voice Response (IVR).

The paper revealed that there is significantly high positive correlation of 89.6% between the techniques and tools adopted by Nigerian banks for system risk management and the challenges associated with CAIS. These tools and methods adopted by banks in Nigeria are not without challenges and limitations. The greatest of these are identified as insider job, difficulty in discovery and understanding the offender's method in a technologically complex computer environment, difficulty in obtaining physical evidence while complications in admissibility of evidence in court is identified as the least challenging. Other challenges are difficulty in carrying out investigations and obtaining witness cooperation, problem of encryption, locating and securing relevant materials and difficulty in bringing the offender to trial. Hence, there is the need for more innovations by banks in Nigeria in tackling the challenges of CAIS.

## CONCLUSION AND RECOMMENDATIONS

The paper concludes that the role of information technology in accounting is indispensable despite its vulnerabilities. It is observed that if the risks associated with CAIS are not properly managed it will adversely affect the main function of accounting. In spite of efforts made to curb these risks, there are challenges faced and banks in Nigeria are not adequately protected from these risks. Therefore, the paper proffers the following recommendations:

1. Banks should employ professional ICT persons to protect their CAIS from hackers and malicious programmers and to track down offenders.
2. Banks in Nigeria that do not have infrastructures such as Address Verification System (AVS) and Interactive Voice Response (IVR) terminals should install and use them. They should also employ Internet Protocol (IP) address tracking systems and Intrusion Detection Systems (IDS).
3. There should be scheduled programs and IT forum organized for staff of the banks and E-crime safety rules should be applied.
4. Relevant ICT security agencies should be constituted and empowered by government. The use of biometrics, firewalls and other access control facilities should be enhanced.
5. Security classification of data should be established and different access restrictions for each classification should be implemented in all the banks.
6. Security controls check lists should be used by banks to help internal auditors in identifying and correcting their CAIS security exposures through evaluating the security controls. Auditors should expand their knowledge of new business-oriented information systems; as such knowledge would facilitate the development of more effective audit approaches.
7. Finally, banks should adopt a balanced approach to security controls which places equal emphasis on technical, formal and informal interventions against their computerized systems in order to minimize losses through computer fraud. Mandatory vacations of employees should be considered and personnel policies including the rotation of duties should be enhanced.

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APPENDIX

TABLE A

S/N	RISK	ALWAYS	OCCASIONALLY	NO IDEA	RARELY	NOT AT ALL	TOTAL
1	sabotage	57	57	43	14	29	200
2	impersonation	71	36	29	43	21	200
3	credit card fraud	86	65	14	14	21	200
4	phone phreaking	57	79	21	36	7	200
5	data diddling	101	57	14	21	7	200
6	salami fraud	79	93	14	14	0	200
7	logic bombs	100	57	14	29	0	200
8	extortion	57	50	36	14	43	200
9	spam	79	71	36	14	0	200
10	denial of service	57	85	29	29	0	200
11	hacking	93	57	22	14	14	200
12	notorious worms & viruses	100	29	29	29	13	200
13	trojan horse	29	78	36	14	43	200
14	Accidental disclosure	79	64	36	7	14	200
15	Bandwidth interference	43	71	36	36	14	200
16	Alteration of software	85	57	29	29	0	200
17	Electrical interference	93	50	21	36	0	200
18	System configuration error	79	71	14	29	7	200
19	Telecommunication malfunction	71	50	43	29	7	200
20	Acts of nature:thunder, earthquake	65	100	21	7	7	200
21	Phishing	93	29	36	21	21	200
22	Keylogger	36	114	14	22	14	200
23	Root-kit	29	85	50	7	29	200
24	System overload	79	43	36	14	28	200

TABLE B

TECHNIQUES FOR MGMT OF RISK	STRICTLY EMPLOYED	SLIGHTLY EMPLOYED	NO IDEA	RARELY EMPLOYED	NEVER EMPLOYED	TOTAL
1. Access control facilities(password & codes)	121	57	0	22	0	200
2. Virus scanners	128	43	0	29	0	200
3. Malware scanners	121	71	0	8	0	200
4. Penetration testing	114	79	0	7	0	200
5. Electronic data processing (EDP) audit	65	85	0	43	7	200
6.Use of failsafe systems	65	71	0	57	7	200
7. Use of cryptography	79	78	0	36	7	200
8. Load balancing	122	64	0	7	7	200
9.Use of input validation routines e.g validity checks, sign checks etc	85	85	0	30	0	200
10. Use of tripwires, honey pot lures & anomaly detection system	43	114	0	29	14	200
11. Use of infrastructure such as address verification system (AVS), interactive voice response (IVR) etc	29	36	0	85	50	200
12. Use of video surveillance systems	142	29	0	29	0	200
13. Use of mitigation and recovery means	93	100	0	7	0	200

TABLE C

CHALLENGES FACED IN MGMT OF RISKS IN CAIS	HIGH EXTENT	MEDIUM EXTENT	NO IDEA	LOW EXTENT	NOT AT ALL	TOTAL
1. Low visibility & difficulty in crime detection	67	67	14	43	9	200
2. International jurisdictional boundaries	65	65	21	43	8	200
3. Insider job	121	21	15	29	14	200
4. Difficulty in discovery & understanding the offenders method in technologically complex computer	100	71	7	15	7	200
5. Difficulty in obtaining physical evidence	121	51	7	14	7	200
6. Complications in admissibility of evidence in court especially in the computerized environment	71	57	15	43	14	200
7. Difficulty in carrying out investigations	114	43	14	21	8	200
8. Apathy of some countries to E-crime	100	57	14	15	14	200
9. Obtaining witness cooperation	107	65	7	14	7	200
10. Identifying suspects	136	21	14	29	0	200
11. Problem of encryption	114	29	14	36	7	200
12. Locating and securing relevant materials	129	14	7	43	7	200
13. Difficulty in bringing the offenders to trial	114	43	7	36	0	200

## EVALUATION OF CUSTOMER SATISFACTION ON BROADBAND INTERNET SERVICE USERS OF ETHIO TELECOM

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### ABSTRACT

*Customer satisfaction is an increasing challenge for telecommunication companies and it is a critical issue for the success of any business system. This study is aimed at investigating the overall customer satisfaction of the broadband internet users of Ethio Telecom(ET), Mekelle Branch. A self-administered questionnaire was used to collect the primary data. In addition, interviews were also conducted with managers of Ethio Telecom to gather supporting data. The total number of broadband user organizations of ET is 105 and census method was used. Moreover, the total number of respondents was 210 and finally 201 questionnaires were received back having a response rate of 96%. The data gathered were analysed with the help of Statistical Package for Social Science (SPSS version 16). The results obtained in this research shown, on one hand; with regard to the overall service quality majorities of the respondents are dissatisfied with broadband service and with regard to the service quality dimensions. On the other hand, customers are relatively satisfied on tangibility and assurance and highly dissatisfied on technical quality. Hence, ET should emphasize on attributes of technical quality, reliability, responsiveness, empathy, tangibility and assurance in their descending order.*

### KEYWORDS

Service quality, Customer satisfaction, Broad Band Services, and Ethio Teleco.

## 1. INTRODUCTION

### 1.1 BACKGROUND OF THE STUDY

In this competitive environment telecommunication technology enables businesses and industry to grow at a faster speed in order to contribute to the economic development of a nation, and telecommunication infrastructure can be reliable indicator of economic development. It works as a factor that multiply economic growth by providing employment, improving business efficiency and contributing towards international investments. Growing customer's needs for cheap, accessible and efficient communication modes leads to phenomenal growth of cellular phone industry (Muhammad and Ernest, 2009).

The telecommunication industry is becoming one of the most important industries in the world and delivers voice communications, data, graphics, and video at ever increasing speeds. Telecommunication influences the world economy and the telecommunication industry's revenue. In order to obtain sustainable competitive advantage, telecom firms are forced to make innovation and do the best for customer satisfaction (Grönroos, 2004).

The telecommunication sector aids decision making, organizing, influencing, activating, instructing, providing feedback, promoting interpersonal and business relationships as well as exchange of information. All social, economic, political, cultural, trade and commercial activities are undertaken using telecommunication. The nature of a country's telecommunication industry affects its pace of commercial and domestic activities. Due to the poor performance of many of these telecommunication firms, particularly in the developing countries, governments have had to intervene through divestiture and privatization programmes (Frempong and Henten, 2004).

A study made by Helms and Mayo (2008) stated that, complaining customers are expressing their dissatisfaction which they may hope results in action being taken to put this right. This action can be in the form of compensation, a verbal apology, a written apology, an explanation etc. Alternatively, they may just be raising awareness of the problem without having any negative feelings towards the organization and service provider. Organizations cannot avoid customer complaint permanently but it is possible to minimize it.

The introduction of telecommunication services in Ethiopia dates back to 1884, seventeen years after the invention of telephone technology in the world. Ethiopian Telecommunications Corporation (ETC) is the oldest public telecommunications operator (PTO) in Africa. It is a state owned enterprise and the sole telecom service provider in the country. The telecommunication services in Ethiopia have made rapid step both in quality and quantity. However, the users at large are found dissatisfied with quality and quantity of the services made available to them. The process of technological sophistication has gained the momentum but the users are yet to get the quality and quantity of service (Tele Negarit, 2007). These days, Internet has a great role for socio-economic and political developments of nations.

The International Telecommunication Union (ITU) 2011, describes that trends in telecommunication markets around the world are becoming more competitive in just about every aspect and confirms that broadband access is no longer a luxury, but a necessity that will be crucial to every country's economic, social and political growth. With broad band a powerful potential accelerator towards the Millennium Development Goals (MDGs), the report particularly, highlights the need for proactive national broadband planning by every government (ITU, 2011).

An effective national Broadband policy will examine the options for stimulating the deployment of broadband and for maximizing the positive economic impact of the technology. It will include strategic spectrum management that encompasses managing the transition from analogue to digital radio and television broadcasting, and the laying of a solid foundation for the rollout of Next Generation Networks (ITU) 2011.

Growth in Africa's Internet and Broadband sector has accelerated in recent years due to improvements in infrastructure, the arrival of wireless access technologies and lower tariffs. Broadband is rapidly replacing dial-up as the preferred access method. The number of internet users is increasing from time to time. In Africa within ten years, the number of internet users in 2000 was 4,514,400 and increased in 2011 to 118,609,620 with a growth rate of 2,527.4 % (ITU 2011). Ethiopia, one of the African countries, is ranked the least with 0.5 % Internet penetration rate among all African countries. But its rate of internet penetration increased from 10,000 numbers of users in 2000 to 445,400 in 2010 at a rate of 4.354 % (ITU, 2011).

## 1.2 STATEMENT OF THE PROBLEM

Customer satisfaction is now becoming a corporate level strategy for organizations as stated by Rust and Zahorik (1993). Drucker (1973) explained that, customer satisfaction is the base for a business success. Study made by Henkel *et al.* (2006) confirms that, satisfied customers of telecom sector have high extent of usage and intentions to repurchase in future like in other sectors.

The finding of Iqbal *et al.* (2008) also showed that, the greater the level of satisfaction of customers the greater will be repurchase chances of customers. Besides, Kim *et al.* (2004) found that call quality, value added services and customer support play a significant role in building customer satisfaction for telecom service subscribers and they tend to keep using current service as the level of the customer satisfaction is high that leads to customer loyalty.

Ahmed *et al.*, (2010) suggests that, there is a positive relationship between service quality retention and future intention of customers to stay as customer. All the firms that want to create and maintain competitive advantage against rivals should offer superior services to their customers. The findings of Ishfaq, *et al.*, (2010) indicate that overall service quality has a significant relationship with the customer satisfaction and this particular finding confirms that the service quality has a positive and significant relationship with the customer satisfaction.

The research study of Muzammil, (2010) confirms that customer services play a very important role in making customers satisfied and customer satisfaction is very important as satisfied customers would add value to the brand and spread a positive word of mouth and help in making good reputation of brand. Satisfied customers would be able to make long term profitable relationship with the brand and concluded that, for a firm to be successful then it has to make its customers satisfied through charging fair prices and memorable customer services so that they can gain competitive advantages over the market. Customer satisfaction is very important in today's business world.

According to Deng *et al.*, (2009) the ability of a service provider to create high degree of satisfaction is crucial for product differentiation and developing strong relationship with customers. Increasing competition and sophistication of customer requirements leads organizations to strive to be the market leader. Organizations now strive to retain their customers rather than to create new ones, because retaining customers is less costly and at the same time present customers can create more customers with their word of mouth marketing.

According to Serenko and Turel (2006), customer satisfaction measurement addresses both users and public interests and such studies can assist in economic and social development. Therefore, there is a need to gain more understanding in the area of customer satisfaction. This information then assists managers in identifying cost effective ways of closing the service quality gaps to focus on a critical decision. Nowadays as the result of higher competition and sophistication of customer requirements result managers to demonstrate that, their services are customer focused and continuous improvement is being brought. It is essential for service organizations that, expectations are properly understood and measured from the customer's perspective in order to identify any gaps in service quality. In these days of globalization and borderless market, customer satisfaction is essential for the survival and growth of any organization. Customer satisfaction significantly affects company performance and survival. Thus customer orientation is the main focus for any business organization to be successful in the market place. In a competitive market environment, customers are the ultimate beneficiaries of the competition.

As the previous studies confirmed, internet has a great role for socio-economic and political developments of nations and broadband access is no longer a luxury, but a necessity that will be crucial to every country's economic, social and political growth. Therefore, assessing the customer satisfaction level specifically in broadband can be used to bring about improvements in the internet service delivery. According to the preliminary study made by the researcher regarding broadband internet satisfaction with selected users, it was found that, customers are not happy with the broadband internet service and studies regarding broadband customer satisfaction, specifically in Tigray and particularly in Mekelle wasn't conducted as far as the researcher's knowledge is concerned. Based on the above felt reasons, the researcher has tried to assess customer satisfaction of broadband users in the branch.

## 1.3 RESEARCH OBJECTIVE

### GENERAL OBJECTIVE

The general objective of this study is to assess customer satisfaction level of broadband internet users of Ethio Telecom, Mekelle branch.

### SPECIFIC OBJECTIVES

The specific objectives of the research are:

1. To assess the perception of customers on the overall quality of broadband internet.
2. To examine on which dimensions of service quality customers are satisfied or dissatisfied.

## 2. RESEARCH METHODOLOGY

In general, this chapter outlines the methodology of the study; the main topics of this chapter include data type and source, sampling design, data collection procedures, and data analysis techniques.

### 2.1 DATA TYPE AND DATA SOURCE

The study employed both qualitative and quantitative approaches, the quantitative approach focused on obtaining numerical findings of the closed ended questions. The open ended questions and interviews on the other hand, were designed to deal with the qualitative aspects of the study. The qualitative data was obtained by interviewing both marketing and technical managers of ET to get supporting data and to contrast to the result obtained from customers. Quantitative data was obtained from survey, which includes closed ended questions. Regarding the sources of the data, the data were collected- from primary and secondary sources. Primary data was obtained from both survey using questionnaires and interview. The secondary data was obtained from ET report and previous related studies. As the research is intended to assess the integration of service quality, price, and customer satisfaction from the customers' and ET managers perspective, the data were collected from primary sources via questionnaires and interviews. The primary data was collected using questionnaire from the customers' perspective and by interviewing heads of marketing and operation and maintenance department. The completion of the questionnaires was entirely on a voluntary basis. Cover letter was attached with the questionnaire explaining the objectives of the research in and that it is believed to encourage participant respondents to contribute towards the successful completion of the research paper.

### 2.2. SAMPLING DESIGN AND SAMPLE SIZE

The study focused on broadband internet users of Mekelle branch; the number of broadband internet users as of June 2011 is 105. ET classified the users of broadband internet into three categories: These are Governmental organizations, Business Centres and Non Governmental Organizations (NGOS). The number of subscribers from each type of organization is 50, 15 and 40 respectively.

Based on the preliminary study conducted by the researcher, the organizations have their own ICT centres or respective personnel who are responsible for managing the broadband internet service for each organization. Since the number of broadband user organizations are manageable and to be representative census method was applied and the necessary data was collected from each of the 105 organizations ICT centres or respective personnel. The questionnaires were distributed to all the 105 companies' ICT centres or respective personnel of each organization. The reason why the ICT personnel was selected is that, information regarding internet connection, disconnection, any internet interruption, complains related to internet is reported to ICT personnel. In addition to this, the ICT person him/herself is a user of broadband internet. To avoid under representation and over representation each organization was given equal quota i.e. two respondents were selected from each user organization based on the researcher's judgment. Accordingly, the total number of respondents was 210.

### 2.3 DATA COLLECTION PROCEDURES

The study was conducted to measure the customer satisfaction regarding broadband service in ET Mekelle branch from the perspective of the user organizations. The questionnaire was divided into three sections. The first section was to solicit data on demographic characteristics of the respondents; the second section was designed to address data regarding perception of customers' on the broadband service quality. The extent to which customers are satisfied with the services they receive from ET using modified SERVQUAL model. The third section was included to collect data so as to assess their overall satisfaction level, and their perceptions of the price of the service provided. All participants were asked to fill out a survey containing measures of the six attributes of service quality, and satisfaction with the price. The questionnaire used to collect primary data was containing six quality dimensions tangibles, reliability,



responsiveness, empathy, assurance, and technical quality Parasuraman et al. (1985) and evaluated the items/ variables on a 5 point likert scale ranged from 1= strongly disagree, 2 = disagree, 3 = moderate, 4 = Agree and 5 = strongly agree.

The questionnaire consisted of 32 items split between 3 instruments that each measures service quality, overall customer satisfaction, overall price fairness and 4 demographic characteristics questions. Open-ended questions were also included in the questionnaire. In order to keep confidentiality of the data to be given by respondents, the respondents were not required to write their name and this assured that their responses will be kept confidential. In addition to this, the researcher tried to avoid misleading or deceptive statements to be incorporated in the study.

**2.4 DATA ANALYSIS**

The data collected were analyzed using Statistical Packages for Social Sciences (SPSS), Version 16 and data collected from interview were analyzed with the data obtained from survey. To analyze the pattern of respondent’s background, descriptive analysis was applied. Frequencies and tables were used to show the results of the analysis tables, figures and percentages generated through the SPSS. The interview and open ended questions were analyzed using qualitative method of data analysis. Finally, after the necessary analysis and interpretations, conclusions are drawn, and recommendations forwarded.

**3. RESULTS AND DISCUSSIONS**

The research was conducted to measure the customer’s satisfaction regarding broadband internet service in Mekelle branch. A total of 210 questionnaires were distributed and 201 questionnaires were received back having a response rate of 96%. The data collected was analyzed with the Statistical Package for Social Science (SPSS 16.0). Descriptive statistics was used to summarize, demographic profile, mean values of each service quality, overall service quality and overall customer satisfaction. In addition to the closed questions an open ended question was included and interviews were also conducted with the department heads of marketing and operation and maintenance to provide supporting data.

**3.1 PROFILE OF THE RESPONDENTS**

Data collected from the respondents was obtained in the areas of gender, age, type of employment, and number of years in using broadband internet. The purpose of this profile was to obtain a visualization of the ET customers responding to the questionnaire.

**TABLE 3.1: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS**

Demographic characteristic	Description	Frequency	Percent
Gender	Male	152	75.6
	Female	49	24.4
	<b>Total</b>	<b>201</b>	<b>100</b>
Age	18 to 31	139	69.1
	32 to 45	60	29.9
	Above 45	2	1
	<b>Total</b>	<b>201</b>	<b>100</b>
Type of employment	Public	96	47.8
	NGOs	80	39.8
	Business Centres	25	12.4
	<b>Total</b>	<b>201</b>	<b>100</b>
Years in broadband usage	Less than one year	46	22.9
	1 to 5 years	123	61.2
	Above 5 years	32	15.9
	<b>Total</b>	<b>100</b>	<b>100</b>

As it is revealed in Table 4.1, the data provides profile of respondents by count and percent. The results reveal that out of the 201 respondents, 152 were males and 49 were females. This represents 75.6% males and 24.4% females respectively. This shows significant majority of the respondents are male users. With regard to age distribution, respondents in the 18 to 31 years represented 69% of all replies, followed by the 32 to 45 age grouping of respondents at 30%, the remaining 45 and above age category represented the smallest number of respondents which is 1% of all the respondents.

Therefore, as can be observed from the above data most of the respondents were in the age of 18-31 years. With regard to the occupation of the respondents, about half or 96(47.8%) of the respondents were from public organizations, respondents from nongovernmental organizations accounts 80(39.8%) and the remaining 25(12.4%) were employed in private businesses (business centres) and it shows most broadband internet users are governmental organizations. Finally, based on the number of years in using broadband internet service, respondents using broadband for less than one year accounts 46(22.9%), a great majority of the respondents 123(61.2%) have been using broadband from 1 to 5 years and the remaining 32(15.9%) for above five years.

**Psychometric Properties and Dimensions of the service quality dimensions and Customer Satisfaction**

In order to ensure the appropriateness of the testing instruments for factor analysis Kaiser-Meyer-Olkin and Bartlett’s Test of Sphericity was employed. The values of The KMO values found in the following table indicated that the rules of factor analysis weren’t violated. All factors in each unifactorial test are more than 70% of the variance of the respective variable sets. This suggests that only a small amount of the total variance for each group of variables is associated with causes other than the factor itself, and the Bartlett tests of sphericity was significant at p <0:05, thus, indicating that the sample was appropriate for factor analysis (see table 3.2 ).

**TABLE 3.2: KAISER-MEYER-OLKIN AND THE BARTLETT’S TEST OF SPHERICITY**

Variables	Kaiser-Meyer-Olkin Values	Bartlett’s Test of Sphericity		
		Approx.Chi-Square	df	Sig
Tangible	79	1,140.21	9	0.02
Empathy	94	642.145	9	0.04
Assurance	78	933.251	6	0.012
Responsiveness	74	1430.05	5	0.04
Customer satisfaction	92	821/019	5	0.02

**Reliability test and factor analysis results of customers perceptions of service quality**

Factor analysis was applied to 32 statements used in order to determine the data reliability of customer services, with responses on a 5-point Likert scale. Factor analysis and reliability analysis were used in order to determine the data reliability for the service quality, and customer satisfaction measures. The suitability of factor analysis was determined by correlation and alpha reliability. The criteria for the number of extracted factors were based on the characteristic value, variance percentage, factor importance and factor structure. Significant factors were considered to be those with characteristic value equalling or exceeding one. All factors with a value less than 1 will be considered insignificant and should be disregarded. The result amounting to at least 45 per cent of the total cumulative variance was considered a satisfactory solution. It is considered that a variable has practical importance and that it can be included in a factor when its correlation degree equals or exceeds 0.50 (Nunnally, 1967). However, 4 statements are deleted from the expectations scale because their factor loadings are less than 0.50. Most of the deleted statements are new statements included in SERVQUAL scale. The results of factor analysis and reliability analysis are presented in Table 3.3. The reliability values were all above 0.5. Thus it can be concluded that the measures used in this study are valid and reliable. The results of the factor analysis and reliability tests are presented in Tables (3.3).

TABLE 3.3

Factors and statements	Factor loading	Factor mean	Eigenvalue	Cronbache's Alpha	Cumulative variance explained
<b>Tangibility</b>		2.90	2.14	0.873	26.154
Ethio Telecom has up-to date equipments	0.59				
The physical facilities are visually appealing.	0.782				
Employees are well dressed and appear neat.	0.579				
The appearance of the physical facilities in line with the type of service provided.	0.718				
Ethio Telecom has up-to date equipments	0.521				
The physical facilities are visually appealing.	0.784				
Employees are well dressed and appear neat.	0.541				
<b>II. Reliability</b>		2.68	1.9	0.6857	19.710
When Ethio Telecom promises to do something by a certain time, it will do so.	0.653				
Ethio Telecom keeps its records accurately.	0.579				
Ethio Telecom performs services right the first time reported	0.891				
It is easy to get Internet connection right first trial	0.630				
<b>III. Responsiveness</b>		2.86			
Ethio Telecom tells customers exactly when services will be performed.	0.582				
Employees give prompt service to customers.	0.746				
Employees are always willing to help customers.	0.759				
The response to consumers' complaints are always taken quickly	0.665				
<b>IV. Assurance</b>		2.91			
Employees providing services are polite.	.652				
Customers feel assured that service requests are duly followed up.	0.598				
Employees have the knowledge to answer customers' questions.	0.563				
Ethio Telecom gives individual attention to customers.	0.597				
<b>V. Empathy</b>		2.86			
Ethio Telecom has operating hours convenient to all its customers	0.745				
Ethio Telecom has its customers' best interest at heart	0.682				
Ethio Telecom has sufficient offices in different geographic areas	0.751				
Ethio Telecom has toll-free numbers, websites for customers for clarification of problems and to report complaints.	0.561				
It is easy to get Broad Band internet from Ethio Telecom.	0.783				
<b>VI. Technical Quality</b>		2.61			
The Broad Band has excellent quality in successfully completion of connection in uploading & downloading.	0.854				
The Broad Band internet service Has excellent speed.	0.562				
Ethio Telecom provides adequate network coverage.	0.764				
Employees have Technical knowledge & skill in solving customer problems.	0.685				
<b>Customer satisfaction</b>		2.41			
I have full satisfaction with the way service is provided.	0.567				
I have full satisfaction with the responsiveness speed to the complaints submitted.	0.653				
I have full satisfaction with the workers' skill in providing services	0.678				
I am fully satisfied with the way the workers treat me	0.577				
I am fully satisfied with the means of communication with the Ethio- Telecom	0.659				
I am fully satisfied with the speed of providing services	0.748				
			2.125	0.567	24.183

**Mean and SD scores of each dimension of the quality of Broadband internet service**

It is apparent that broadband internet users (Table 3.4) view that perceived customer satisfaction is the lowest with mean of 2.41 followed by perceived technical quality and reliability as relatively low ( $M = 2.61$  and  $2.68$  respectively) than other areas. So from this table we can infer that users view that perceived assurance and tangibility, were highest with mean ( $M$ ) of 2.91, 2.90 and 2.86 respectively, followed by a perceived empathy and responsibility with mean ( $M$ ) of 2.86. The detail analysis is presented next to the following table 3.4

TABLE 3.4: MEAN AND STANDARD DEVIATION OF THE SERVICE QUALITY DIMENSIONS

Factors	Mean	S.D
Tangibility	2.91	0.23
Responsibility	2.86	0.56
Reliability	2.68	0.24
Assurance	2.91	0.48
Empathy	2.86	0.023
Technical quality	2.61	0.40
Customer satisfaction	2.41	0.20

**TANGIBILITY**

TABLE 3.5: AVAILABILITY OF UP-TO-DATE EQUIPMENTS

Response	Frequency	Percent
Strongly disagree	10	5.0
Disagree	41	20.4
Moderate	103	51.2
Agree	46	22.9
Strongly agree	1	0.5
Total	201	100.0



Table 3.5 shows that, 51(25.4%) of the respondents are disappointed with the availability of up-to-date equipments, above half of the respondents 103(51.2%) evaluated as being moderate and the remaining 47(23.4 %) of respondents agreed with the availability of up to date equipments. Even though majority of the respondents evaluated as being moderate, ET is expected to satisfy its customers by providing above moderate service. This implies, respondents are unhappy on the availability of latest technology equipments.

**RELIABILITY**

**TABLE 3.6 PROVIDES SERVICES AT THE PROMISED TIME**

Response	Frequency	Percent
Strongly disagree	38	18.9
Disagree	58	28.9
Moderate	61	30.3
Agree	39	19.4
Strongly agree	5	2.5
Total	201	100.0

Table 3.6 demonstrates, almost half 98(47.8 %) of the respondents perceived that services are not done as promised, while one third of the respondents 61 (30.3%) evaluate as being moderate and the remaining respondents, 44(21.9 %) agreed services are done as promised. Accordingly, majority of the respondents conveyed their disappointment on performing services as promised.

**RESPONSIVENESS**

**TABLE 3.7: KEEPS CUSTOMER INFORMED WHEN SERVICES ARE PERFORMED**

Response	Frequency	Percent
Strongly disagree	33	16.4
Disagree	51	25.4
Moderate	57	28.4
Agree	52	25.9
Strongly agree	8	4.0
Total	201	100.0

As table 3.7 shows, majority of the respondents 84(41.8 %) perceived ET failed to give information when services will be performed, while 57(28.4%) of the respondents perceived as being moderate, the remaining of the respondents 60(29.9 %) agreed with getting information when services performed. Accordingly, respondents are dissatisfied in getting information when services will be performed and this is a wakeup call for ET, to consider providing information when services will be performed.

**TABLE 3.8: PROMPTNESS OF SERVICE PROVIDED TO CUSTOMERS**

Response	Frequency	Percent
Strongly disagree	14	7.0
Disagree	38	18.9
Moderate	91	45.3
Agree	46	22.9
Strongly agree	12	6.0
Total	201	100.0

Table 3.8 indicates, one fourth of the respondents 52(25.9%) expressed their displeasure on getting prompt service, majority of the respondents 91(45.3%) evaluated as moderate and the remaining 58(28.9%) of the respondents are happy in getting prompt service. This implies ET has a weakness on providing prompt service to its customers.

**ASSURANCE**

**TABLE 3.9: ASSURANCE LEVEL OF SERVICE PROVIDER**

Response	Frequency	Percent
Strongly disagree	12	6.0
Disagree	22	10.9
Moderate	96	47.8
Agree	62	30.8
Strongly agree	9	4.5
Total	201	100.0

Table 3.9 indicates, nearly 34(17%) of the respondents evaluated the knowledge of employees to answer customers questions as inadequate, almost half of the respondents 96(47.8 %) evaluated it as moderate and the remaining respondents 71(35.3%) were happy with the employees knowledge to answer customer questions. Overall, this result shows majority of the respondents evaluated the knowledge of employees as inadequate.

**EMPATHY**

**TABLE 3.10 CONVENIENT OPERATING HOURS TO CUSTOMERS**

Response	Frequency	Percent
Strongly disagree	10	5.0
Disagree	44	21.9
Moderate	94	46.8
Agree	48	23.9
Strongly agree	5	2.5
Total	201	100.0

As can be seen from table 4.11, one fourth of the respondents 54 (26.9%) evaluated the operating hours are inconvenient, nearly half of the respondents 94(46.8%) perceived it as moderate and the remaining one fourth of the respondents 53 (26.4%) perceived ET has convenient operating hours. Overall, majority of the respondents do have moderate feedback with the convenience of operating hours.

**TECHNICAL QUALITY**

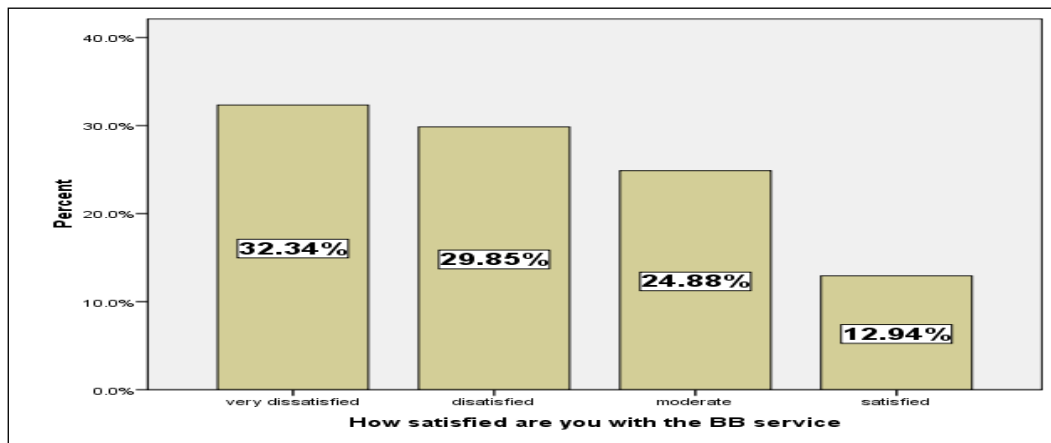
**TABLE 3.11: BB HAS EXCELLENT QUALITY IN UPLOADING AND DOWNLOADING**

Response	Frequency	Percent
Strongly disagree	40	19.9
Disagree	69	34.3
Moderate	56	27.9
Agree	36	17.9
Total	201	100.0

Source: own survey, 2011

Table 3.11 indicates, majority of the respondents 109(54.2%) evaluated the broadband has a poor quality in uploading and downloading, 56 (27.9 %) of the respondents perceived as moderate and the remaining of the respondents 36(18%) agreed with broadband excellent quality in uploading and downloading. Overall, majority of respondents revealed their unhappiness on the quality of broadband in uploading and downloading.

FIGURE 3.1: OVERALL SATISFACTION LEVELS



Source: own survey, 2011

Figure 3.1 shows, majority of the respondents 125(62.2%) are dissatisfied with the broadband internet service, 65(32.3%) rated as very dissatisfied and 60(29.9%) dissatisfied, about one fourth of the respondents 50(24.9%) evaluated their level of satisfaction with the broadband internet as being moderate and the remaining respondents 26(12.9%) are satisfied with the broadband internet provided. Overall, majority of the respondents are dissatisfied with the service provided. According to the interview conducted with ET managers, they confirmed that customers are not satisfied and recommended that; customer demand should be addressed, improve network infrastructure quality, implement adequate after sales service, decrease network break down, organizational culture has to be changed, employees should be motivated and trained, ET should create conducive working environment, training should be given regularly, and the required resources should be made available.

#### 4. CONCLUSIONS

On the basis of the analysis conducted in chapter four, the following conclusions have been drawn. The major concern of the study was to empirically assess satisfaction level of broadband internet users in Ethio Telecom Mekelle Branch. To achieve the stipulated objectives, the study used data collected through self administered questionnaire from 201 respondents and interview with marketing and operation and maintenance managers.

- According to the result obtained from the analysis, majority of the respondents which accounts 63 per cent are dissatisfied with the overall quality of the broadband internet. Overall it can be concluded that, respondents do have a negative view towards the overall service quality broadband internet ET is providing and this is a wakeup call for ET.
- Respondent's satisfaction level differs from one service quality dimension to another. Thus, the mean scores indicate that, respondents were relatively satisfied with the quality dimensions tangibility and assurance and score more than other dimensions and the technical quality scored the lowest.
- With regard to customer satisfaction level, the results demonstrated that customers were dissatisfied with the performance of the ET. Thus, about 63 percent of the respondents were dissatisfied with the service delivery of ET which is statistically significant and conveyed their disappointment on the overall performance of ET. This means ET should focus on areas which led to dissatisfaction and introduce complete overhaul to correct the situation. The study identified some areas of dissatisfaction particularly: service quality which includes low speed, uploading and downloading problems, low technical skill of employees, recurring network break downs, high price, slow service delivery process, poor complaint handling procedure, inconvenience of operating hours and insufficient offices at different geographical places.
- The result also demonstrated that customer satisfaction level differs among the specific demographic groups. Thus, respondents from public organizations which account 57.2 percent were dissatisfied, respondents from Non Governmental Organizations (NGOs) 71.3 percent were dissatisfied and respondents from Business centres 52.0 percent were dissatisfied. Thus, the high dissatisfaction among NGOs could be due to their international exposure and they expect high quality service. Finally with regard to the number of years usage in broadband internet and overall customer satisfaction the result demonstrates that, among respondents using broadband internet for less than one year about 61 percent were dissatisfied, respondents using broadband internet for 1 to 5 years 63 percent were dissatisfied and respondents using broadband internet above 5 years 60 percent were dissatisfied. Accordingly, the result demonstrates majority of respondents using broadband internet for many years and less than one year were dissatisfied so it can be concluded that there is no improvement in service quality form year to year.
- As the result demonstrated regarding the fairness of the price broadband internet service, majority of the respondents which accounts 57.2 percent evaluated the price of broadband internet as unfair in comparison to the service obtained and only 20.4 percent of the respondents evaluated the price as being fair. Accordingly, majority of respondents were disappointed with the price of broadband internet service.
- With regard to the link between service quality and customer satisfaction, the findings imply more than half of the respondents i.e., 63 percent rated the broadband internet quality below average. Similarly for the overall satisfaction measurement with a similar scale, result shows more than half or 62 percent of the respondents were dissatisfied. Hence, service quality and customer satisfaction are related and overall service quality has a significant relationship with the customer satisfaction.

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**EXPERIMENTATION IN OSPF MULTIPATH ENVIRONMENT WITH OPTIMAL INTERFACE TIMERS****KULDEEP DESHMUKH****IT TRAINER****DEPARTMENT OF COMPUTER SCIENCE (SOFTWARE ENGINEERING)****RKDF COLLEGE****BHOPAL****ABSTRACT**

Routing protocols are key elements of modern communication networks. Currently deployed dynamic routing protocols that are used to propagate network topology information to the neighboring routers are Routing Information Protocol (RIP), Enhanced Interior Gateway Routing Protocol (EIGRP), and the Open Shortest Path First (OSPF) protocol. The choice of the right routing protocol depends on a number of parameters. In this research, we used OSPF simulation via OPNET Modeler to design a model, which will experiment with reducing interface hello / dead intervals to see the impact on quality of VoIP calls going via loadbalanced, multi-path OSPF environment. In the end of the research it is found that there are considerable effects of reducing OSPF hello timers for achieving faster convergence in case of link failure.

**KEYWORDS**

VoIP, OSPF, Timer tuning, hello-interval, dead-interval.

**INTRODUCTION**

There are many different IGP protocols to choose from but OSPF is chosen due to its scalability and robustness. VoIP is sensitive to delays and variations in the delay, thus the packetdrops directly impact the voice calls.[1] During link failure the layer 2 recovery mechanisms may take longer or are stuck sometimes and thus can't be relied on solely. Thus the layer 3 protocol link failure recovery must also be used for the fast reconvergence and change of routing table in network domains. The data available on the OSPF and VoIP is already enough and a lot of research has been done on these topics.

In this research furthering the work by tuning OSPF timers to reduce the link failure recovery time so that the impact on VoIP sensitive traffic could be reduced. Also it is aimed to use OSPF as the protocol of choice as it is open source, robust and scalable, in previous researches scholars have already done much work in the nature of the IGP protocols and their effect on the VoIP. [4] But, so far there has been no research on correcting or recovering the link failure with help of varying the protocol timers. With protocol timers reduced to less and less values there is tradeoff of hardware and bandwidth resources but the tradeoff could be maintained for the benefit of the recovering from link failure on the neighbor router and this re-routing all the packets from the functional link.

We are investigating the different scenarios based on the different dead-interval and hello timer values, by default OSPF have 10 seconds hello interval and 40 seconds as dead interval. However, for the Voice traffic which is sensitive to delays and packet drops the multipath/load balanced environment is still not sufficient enough if a router comes to know about the neighbor link down in 40 seconds, our model tries to find the optimal value for which the dead interval could be reduced to the level where the BW & CPU utilization along with the link failure detection could be balanced.

**RESEARCH MOTIVATION**

The motivation to reduce the impact on VoIP is coming from the fact that OSPF in itself is quite flexible protocol and has many features which can be configured to optimize the performance of the protocol depending on the network conditions. [2] VoIP is already known to be prone to the variations and packet drops and BW availability issues, we are here researching into reducing the dead interval between two routers on the same subnet so that the rerouting of traffic on the other available links could be done within 5 seconds or less. In real world scenario it is possible to reduce the hello interval to milliseconds and thus also reducing the dead interval indirectly.[5] Here, we are working with OPNET to reduce the hello interval so that the dead interval stays at least 3 times of the hello interval. OPNET has one limitation, it cannot simulate the hello / dead intervals in sub-seconds thus we can only go as low as 1 second. The main aim is to cut the packet loss to as much low possible value.[6]

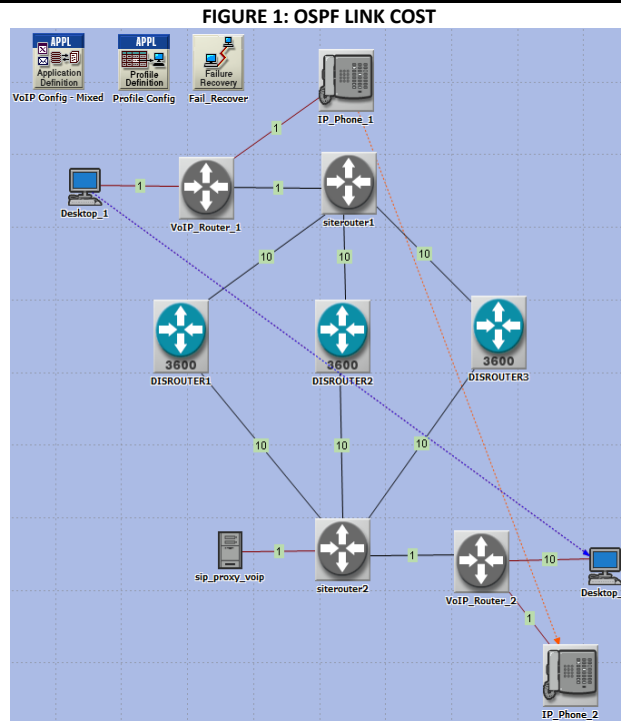
**THE SETUP**

The test network in the project is made with generating a demand link for VoIP traffic through OSPF multipath network. There are two desktops with Voice over IP and File transfer applications configured, also network consists of two IP telephones to have consistent stream of VoIP traffic across the network.

Desktop 1 and 2 also generate application traffic (ftp, http) to allow for congestion and contention in network so that the link utilization could be regular throughout the simulation. Siterouter 1 and 2 are sitting at the edge of two far sites and are handling data / voice routing for the two customer sites. Siterouters connect to VoIP routers which are connected to provide call processing and Quality of Service features to the VoIP traffic, in our case we are using simple proxy server for managing Session Initiation Protocol calls across the network. Sip\_proxy\_server is connected to siterouter 2 and is managing the calls generating from desktop and IP telephones as well.

The green numbers on the link in diagram below represents the assigned cost metric to the link and the core of the network consists of the equal cost paths so the the traffic could be load balanced at the middle of the core. Other elements in the network will be explained in detail in next section, Application Configuration, Profile Configuration and link failure / recovery are 3 elements which define, apply and run the traffic in network and manage when the link outage would occur during the simulation.

The SIP Proxy Server accepts registration requests from SIP endpoints such as IP telephones, residential voice gateways, and PC applications, creating a dynamic record of the endpoint's current contact address. Static registrations can also be configured directly on the Cisco SIP Proxy Server. When the Cisco SIP Proxy Server receives a SIP "Invite" (call setup) request, it searches its registry to locate the desired endpoint. If no match is found in its registry, the Cisco SIP Proxy Server can use external Telephone Number Mapping (ENUM) or location request (LRQ) queries, or locally configured static routes to determine where to forward the request[3].

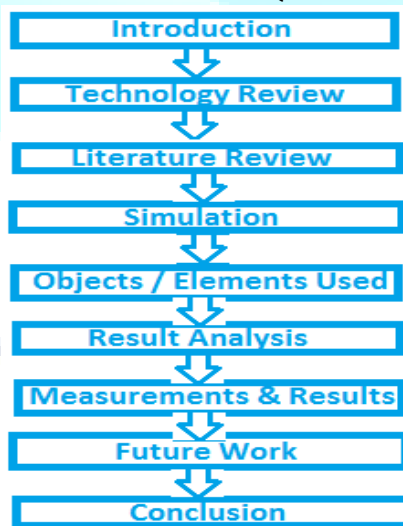


**METHODOLOGY OF RESEARCH**

In this research the method adapted is of reviewing the underlying technologies, thoroughly investing the details of VoIP, Routing Protocols, OSPF parameters, Link Failure and Recovery methods, multi-path and load-balanced networks followed by the literature review in form of previous work done in the similar field. At least 8 different previous works have been studied to find out what has been done so far and what more could be added to the existing knowledge of VoIP services over OSPF multi-path network.

Literature review is then followed by the simulation section in which test network has been simulated by changing multiple variables in four different cases, each case is unique in the terms of OSPF hello and dead intervals. VoIP parameters such as Packet Delay variation, Jitter and MOS values have been measured in each section.[8] VoIP demand paths have been assigned at the end devices to simulate voice traffic whereas the background traffic in form of (ftp, http applications) is simulated to have comparative bandwidth as in real-time scenarios. Although VoIP could utilize security measures which could affect the quality of VoIP but this research is excluding security measures to focus on routing optimization alone.[7]

**FIGURE 2: METHOD AND SEQUENCE USED**

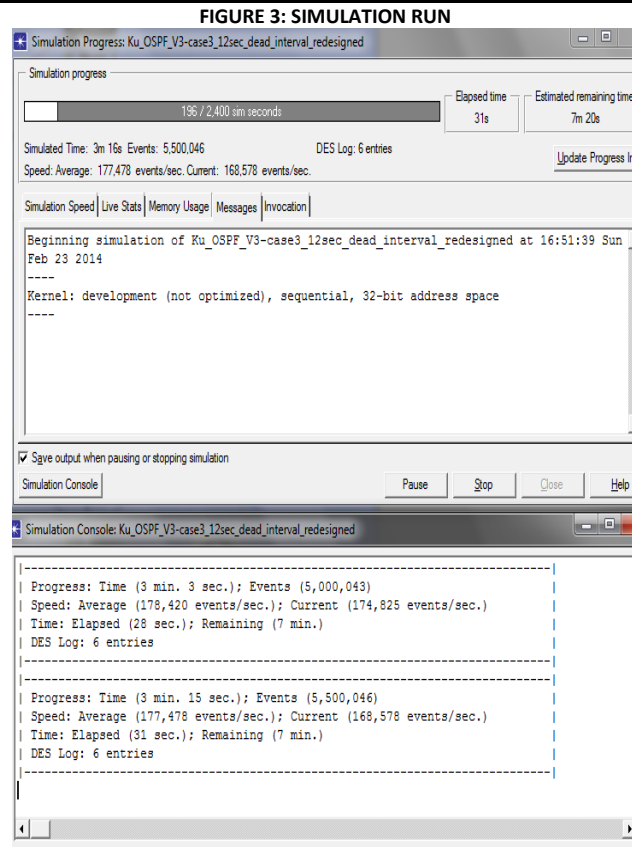


In simple break down analysis of the network topology designed for testing the VoIP connection was done in the research process and inclusion of results section in thesis work, and then moving further, a brief introduction of Elements/Objects used from OPNET palette will be given with configuration details. Also the demand paths and load-balance design will be described along with the OSPF timer settings.

**SIMULATION DETAILS**

From figure 1, Siterouter1 & 2 connect to Distribution Routers which are managed by Internet Service Provider and is connected in load-balanced fashion, all the links going from sitrouter 1 & 2 towards 3 distribution routers are of equal OSPF metric 10 and the routers are configured for loadbalancing the incoming traffic. Distribution router 1,2 and 3 are of higher capacity (Cisco 3600) than site routers.

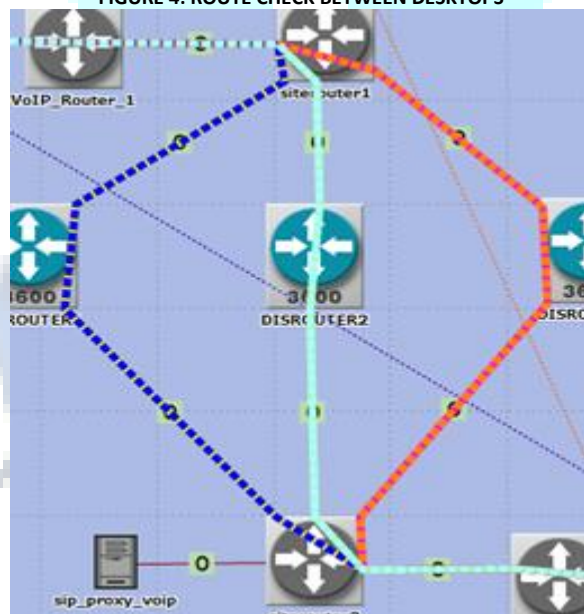
Scenario configuration is followed by simulation of the whole scenario with all the traffic steams, application and profile settings, link failures and loadbalancing. Diagram below shows how the simulation run time looks like and is providing with information about name of the scenario plus detail of each task been processed, this run time information is important some times to troubleshoot the simulation.



Each simulation takes about half time of the real time, time elapsed during simulation is called simulation time in OPNET. So each simulation time = ½ real time in this case, this time varies depending on the complexity of scenario configuration and network elements used. Other features of OPNET such as Flow Analysis allows us to check the routes from one node to another and helps to verify if the loadbalancing and interface metrics have been configured properly, diagram below shows us how it looks when the equal weight load-balancing is configured properly.

In the next diagram to follow, figure 4, blue, green and red lines shows the various paths OSPF routing is providing to traffic coming from end devices at site 1 to end devices at site 2. During the simulation links between siterouter1 and distributions routers 1,2 and 3 will fail within some intervals and we could see the effect of the link failure in the graphs, links between routers will fail in sequence from site router1 → distribution router 1, site router1 → distribution router 2 and site router 1 → distribution router 3. Link between site router 1 and distribution router 1 will come back up before the link between siterouter 1 and distribution router 3 will go down thus providing the consistent links between end devices. Simulation run for different scenarios will be same except the difference in OSPF timers.

**FIGURE 4: ROUTE CHECK BETWEEN DESKTOPS**



**MEASUREMENTS & RESULTS**

As discussed earlier in thesis now we are going to discuss the four different scenarios, with the same topology and elements and same IP routing protocol running (OPSF) along with load-balancing only difference each case have is OSPF interface timer. Following table shows the differenece of timers in different scenarios along with other parameters:



TABLE 1: SCENARIO COMPARISON

Scenario	Dead Interval	Hello Interval	Link Utilization	CPU
Case 1	40	10	Minimum	Normal
Case 2	20	5	Medium	Medium
Case 3	12	3	Medium	Medium
Case 4	8	2	Maximum	High

**ASSUMPTIONS**

- Decreasing dead interval should help
- Multipath is good but when fail occurs what is response
- Fine tuning of ospf for faster recovery
- Methods available for fast recoveries

**EXPECTED OUTCOMES**

- Trying to find optimal value for hello / dead interval
- Support VoIP in multipath OSPF environment (about VoIP little intro again)
- Rapid link failure recovery
- Least delay / jitter / delay variation in VoIP call [8]
- Faster switching over of the traffic from multiple links to the single working link
- Effect of increased hellos and dead-interval increase

*Scenario 1: case1\_40sec\_dead\_interval\_redesigned*

Scenario 1 has 4 end devices (2 desktop PCs, 2 IP Phone), with voice demand paths created between them. There are 2 voice routers, 2 siterouters and 3 distribution routers in middle layer, all the traffic will be load-balanced on all three distribution routers. The OPSF link cost is configured as 10 and all the links between siterouters and distribution routers are kept same. Links will fail one after other at fixed intervals and before failure of the last link between siterouter1 and distribution router 3, the link between siterouter 1 and distribution router 1 will come up.

This configuration will stay same for all the 4 scenarios and only hello and dead time intervals will be modified as given in table 1 above. For VoIP application profile is configured and codec G.711 is used for sending/receiving voice. Links will fail at 200, 500, 600 seconds respectively between site router 1 & distribution routers 1,2,3. Profile configuration assigns the voice traffic to IP phones and voice traffic and file transfer + http traffic to desktop PCs.

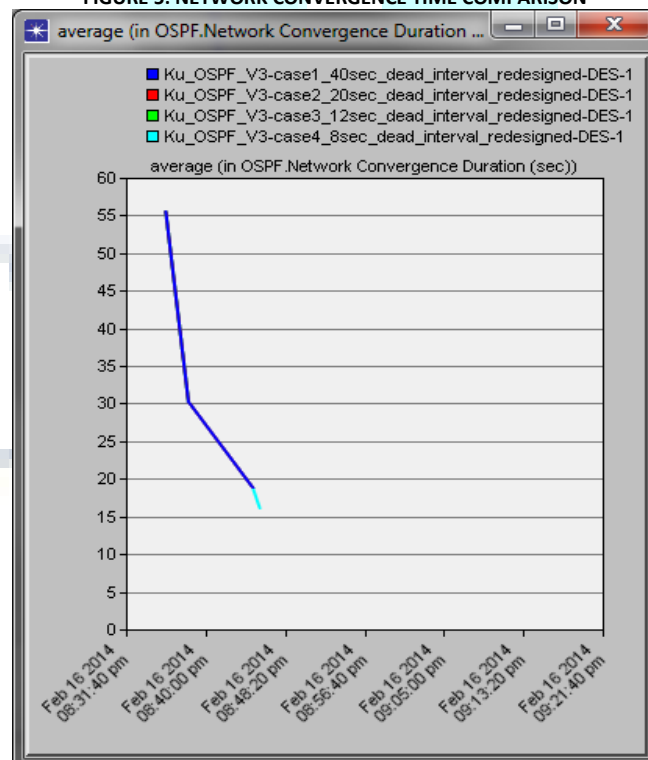
Also as 600th second link between siterouter 1 and distribution router 1 will come up, so that there can be consistent link between 2 sites. Thus most of the changes in the following graphs are expected to be within first 600 seconds and near to the link failure and recovery points. We will see one by one in each case how the link failure and recovery has influenced parameters related to OSPF and VoIP duign link fails and recoveries. Instead of delving into all the graphs for each scenario, only the comparative analysis of 4 scenarios/cases will be shown in this paper.

**CASE 1 – 4 COMPARATIVE ANALYSIS**

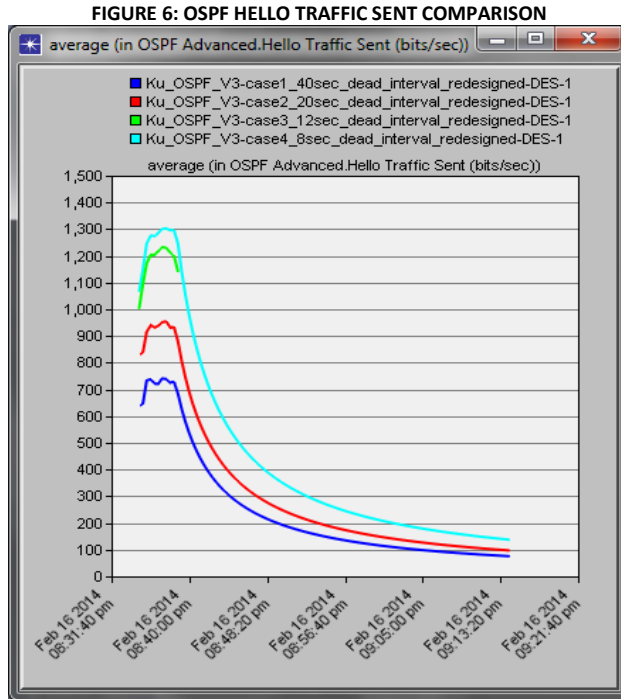
From the simulation results in thesis it seems that results are deviating and favoring scenario 2 more, scenario with smallest hello interval (scenario 4) was expected to show better performances on the basis of aster convergence speeds in case of link failures but it seems like the links under high utilization could not support fast hello traffic, in case of ethernet or high capacity links the reduced hello interval could perform much better than on low capacity or congested links. Following graph shows comparative analysis of scenarios 1, 2, 3, 4 for OSPF Network Convergence time, OSPF hello traffic, Jitter, and Packet delay variations. This comparison will show visually how the different scenarios differ in performances. Scenario names are:

- 1) *case1\_40sec\_dead\_interval\_redesigned*
- 2) *case2\_20sec\_dead\_interval\_redesigned*
- 3) *case3\_12sec\_dead\_interval\_redesigned*
- 4) *case4\_8sec\_dead\_interval\_redesigned*

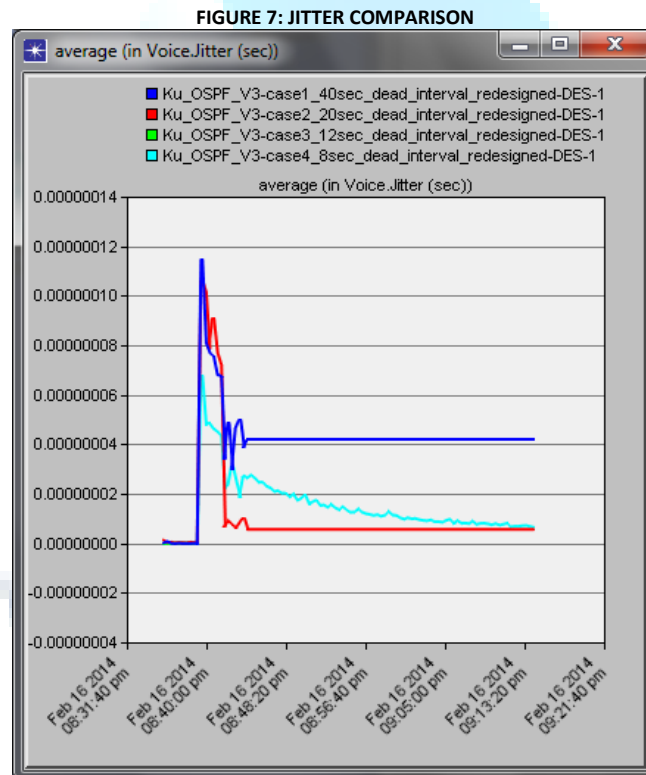
FIGURE 5: NETWORK CONVERGENCE TIME COMPARISON



From the above graph in figure 5, it seems that all the scenarios have almost similar fall of convergence times, in fact the best convergence time for first 3 scenarios are reaching 20 secs, only for scenario 4 with reduced hello interval graph is approaching faster convergence time of 15 secs.



As it can be seen from Figure 6, OSPF hello traffic sent increased in initial phases of network simulation, increase in hello packets is directly related to the increased frequency or decreased hello / dead interval.

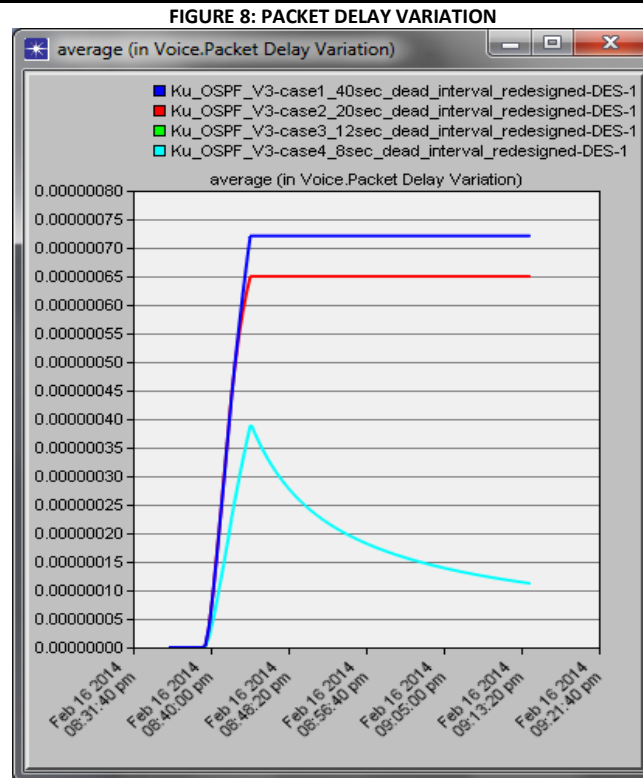


From the Jitter comparison in figure 7, it is clear that the best performance could be seen in case 2 represented by red line in above figure. Jitter stayed least for the case 2.

As name suggests packet delay variation is simply measure of deviations from the baseline or some preset / baseline delay on link, when delay increases or decreases from this base delay then delay variation occurs in VoIP calls. From figure 8 it as be seen that the delay variation stayed least in scenario 4.

TABLE 2: SCENARIO COMPARISON

Scenario	Hello / Dead (secs)	Convergence	Hello Traffic (bps)	Jitter	Variation
Case 1	10/40	20 secs (min)	700	Maximum	70+ (max)
Case 2	05/20	20 secs (min)	900	Medium	65 (max)
Case 3	03/12	20 secs (min)	1200	Least	60 (max)
Case 4	02/08	15 secs (min)	1300	Medium	40 (max)



From the results comparison in table 2 we see that case 4 has the best score, case is second best. Thus it can be proved that when done under controlled and bandwidth calculated environment OSPF with reduced hello / dead interval can perform well for VoIP calls.

## CONCLUSION

During preparation, reading literature and planning the research it was always a question if the experiment results would be proving any of the assumptions made, but in the end the comparative study made it clear that there are some considerable improvements in the VoIP parameters.

OPNET is bit tricky in the beginning and hard to master and use to its full potential, there are so many options which needs comprehensive study of the tool itself. The results obtained in the analysis clearly shows that reduction of interface timers and forcing the topology to converge faster has implications of increased link utilization and faster and sharper convergence as well.

There has been considerable improvement in delay variation and also in Jitter (case 3), if the parameters of VoIP could be affected in this way then it is for sure that further modification in this direction could bring better VoIP experience to end users in future.

## FUTURE WORK

We have seen that using PPP DS3 links in OSPF multipath environment we get significant performance improvement for Voice over IP calls, but still it is observed that the link capacity was not enough with DS3 links, as there were high number of packet drops in case 4. The same work could be done in higher link capacity environment such that ethernet and then results could be compared with the results measured in this research.

Also applying congestion control mechanisms along with the reduction of interface timers could show very improved results, this also could be made basis of the next research paper. There are queuing mechanisms and also DiffServ and RSVP methods which could be applied for congestion controls or prioritizing the specific traffic such as routing protocol control traffic.

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## FINANCIAL INDICATORS FOR BUY BACK OF SHARES

**PRERNA SEHGAL**  
**GUEST LECTURER**  
**SIKKIM MANIPAL UNIVERSITY**  
**NEW DELHI**

**DIMPY HANDA**  
**ALUMNI**  
**DEPARTMENT OF COMMERCE**  
**DELHI SCHOOL OF ECONOMICS**  
**DELHI UNIVERSITY**  
**DELHI**

### ABSTRACT

*As per financial management the ultimate aim of business is to maximize wealth of shareholders. Though dividends and stock price appreciation are the two most common ways in which companies can return wealth to its investors, there is one more useful, and often unnoticed, method for companies to provide return to investors i.e BUY BACK OF SHARES. This article emphasize on Buy Back of Shares and goes through the working of a share buyback and its effect on investors wealth. Share buy back can have positive and negative effect. If a stock is undervalued and a buyback truly represents the best possible investment for a company, the buyback and its effects can be viewed as a positive sign for shareholders. As it often happens in cases of finance, the question may not have a definitive answer. If a stock is undervalued and a buyback truly represents the best possible investment for a company, the buyback and its effects can be viewed as a positive sign for shareholders. However, if a company is merely using buybacks to prop-up ratios, provide short-term relief to an ailing stock price or to get out from under excessive dilution, then it may not be successful and the whole process of buyback may go for a loss. Finally, the decision for buyback of shares would depend on the analysis of the various facets to which the company is exposed.*

### KEYWORDS

Financial Indicator, Buy Back, Shares, Return on Investment, Shareholders.

### MEANING OF BUY BACK

A stock buyback refers to a company's buying back its own shares from the market or shareholders. It is also known as a "share repurchase". Buyback is a process that is opposite to the issue of shares by a company in which it offers to repurchase its shares owned by the investors at a stipulated price; this offer can be binding or optional to the investors. As company can't be its own shareholder, repurchased shares are cancelled by the company, and the number of outstanding shares in the market is reduced. As a result of which, the relative ownership stake of each investor increases because there are fewer shares, or claims, on the earnings of the company. In other words, stock buyback is the purchase of a long position by a company to offset a short position.

### CHARACTERISTICS OF COMPANY GOING BACK

- a) Companies with some of the following characteristics may opt for a share buy-back scheme.
- b) Companies having the intrinsic value of the shares of the company substantially greater than the market price of the shares of the company.
- c) Companies which do not have investment opportunity in hand in near future.
- d) A high net surplus cash position of company.
- e) Companies with low debt/equity ratio may go for a share buyback so that the debt/equity ratio may be increased.
- f) Companies with a high dividend yield ratio.

### WHY SHOULD COMPANY GO FOR BUY BACK OF SHARES?

A company can go for buyback for many reasons but the most significant and viable reasons are as follows:

- a) **Transferring excess Cash to Shareholders:** Buying back of stock provides option for a company to pass on extra cash available to shareholders without declaring dividend. If the cash is temporary in nature, it is more favorable to pass on surplus cash to shareholders through buybacks rather than raising the dividend.
- b) **Enhance Investors' Confidence in Management:** It might boost the investors' confidence on the board of directors of the company, as these investors know that the management is willing to return surplus cash if it's not able to earn above the company's cost of capital.
- c) **Increasing Shareholders' Wealth:** According to the law of demand and supply, if there is fewer number of shares in the market and the demand of the shares is rising, then the price of the shares will rise. This will result in increasing the wealth of the existing shareholders.
- d) **Higher Earning per Share:** Buying back of stock means that the company earnings are now split among smaller number of shares, which means higher earnings per share (EPS) for remaining shareholders. Higher earnings per share generally command a higher stock price.
- e) **Instrument for Financial Re-engineering:** In the case of profit making, companies whose share prices are declining, buybacks can actually boost their market prices since dividends attract taxes. A buyback and the subsequent neutralization of shares can reduce dividend outflows, and if the opportunity cost of funds used is lesser than the dividend savings, then the due motive of buy back is served.
- f) **Hedge against Takeovers:** Buying back stock consumes excess cash. The returns on excess cash in money market accounts can pull down overall performance of company. Cash rich companies are also very attractive takeover targets. Buying back stock provide opportunity to the company to earn a better return on excess cash and keep it safe from becoming a takeover target.
- g) **Psychological Effect:** When a company announces a buyback, it is usually perceived by the market as a positive thing, which often causes the share price to shoot up. Whenever a company is buying its own stock, it is basically telling the market that they think that the company's stock is undervalued. This can have a positive signal on prospective investors.
- h) **Tax Benefits:** Exemption is available only if the shares are sold on a recognized stock exchange and securities transaction tax (STT) on the sale of shares has been paid. In a buyback scheme, neither does the sale take place on a recognized exchange nor is the STT paid. So, the shareholder will have to pay income tax on long-term capital gain on the buyback, after deducting the acquisition cost of the shares plus the benefit of indexation from the year of purchase to the year of buyback. On the resultant gain, the tax would be 20% plus the applicable surcharge, if any, plus 3 % education cess or we may also work out the tax at 10% of the gain without considering indexation. The tax liability will be limited to the lower of the above two calculations.
- i) **Shoot up demand:** As in buyback process the company is also competing against other investors to purchase its own shares, this raise the stock demand in open market, which causes prices to rise.

**METHODS OF BUY BACK**

Buyback of shares can be done by the following companies:

- a) Public Limited Companies or Listed Companies
- b) Private Limited Companies or Unlisted Companies

(a) Public Limited Companies or Listed Companies can go for buyback through tender offer or from open market through stock exchange.

**1. TENDER OFFER**

Shareholders may be approached with a tender offer by the company to submit a portion or all of their shares within a certain time frame. The tender offer will specify both the number of shares the company is looking to repurchase and the price range within which they are willing to repurchase. Companies almost always pay price that is premium to the market price. When investors agree to take the offer, they will state the price they are ready to accept and the number of shares they want to tender. Once the company has received all of the offers, it will find the right mix to buy the shares at the lowest cost.

**2. OPEN MARKET**

The second alternative a company has is to buy shares on the open market, like an individual investor would, at the market price. It is important to note, however, that when a company announces a buyback, it is essentially telling the market that they think that the company's stock is undervalued. This often causes prices to rise.

(b) Unlisted Company may buy-back its shares by either of the following methods:

1. From the existing security holders on a proportionate basis through private offers;
- or
2. By purchasing the securities issued to employees of the company pursuant to a scheme of a Stock Option or Sweat Equity.

**EFFECTS OF SHARE BUY BACK**

When a company goes in for buyback of shares, there may be positive effects or negative effects on the shareholders and/or the company.

- a) EFFECTS ON THE SHAREHOLDER OF THE COMPANY
- b) EFFECTS ON THE COMPANY

**A) EFFECTS ON THE SHAREHOLDER OF THE COMPANY**

**A.1 Tax Advantages** - When a company is having surplus cash, it can either pay it off as dividend or go for buyback of shares. When a company pays dividend they are entitled to pay dividend distribution tax. This cost has to be indirectly borne by the shareholders, who receive fewer dividends as a consequence of tax payments. Therefore by Buying back shares, a company gives surplus cash to the shareholder and saves tax for the shareholders.

**Example:** A company has surplus cash of Rs.100 crore and if they declare

Rs. 100 crore as dividend then the company has to pay dividend distribution tax of Rs.15.00 crore. So, the net amount which would be received by the shareholders would be Rs.85.00 crore.

If a company decides to go for buyback of shares, then the entire amount of Rs.100 crore is received by the shareholders. Thus, shareholders save tax of Rs.15.00 crore, which they would have incurred, if the company would have given them surplus cash by way of dividend.

**A.2 Higher Proportion of Shares** - When a company goes for buyback, the number of outstanding shares reduces. That means the proportion of investment of an individual investor increases in the company.

**A.3 Higher Price of Shares** - One of the reasons why a company goes for a buyback is that they think that their shares are undervalued. That is why they buyback shares at a premium or at a price that they think it should command in the market.

**Example:** The Market price of a share of ABC Ltd. is Rs150 and the company believes that the price of their share should be at Rs 250 based of their fundamental and technical analysis. Therefore, the company buys back shares at Rs. 250 from the market, thus increasing the market value of the share from Rs 150 to Rs.250.

**B) EFFECTS ON THE COMPANY**

**B.1 Change in the Shareholding Pattern**

PARTICULARS OF ABC LTD.	
Total number of Shares	1,000
Face Values of Shares	Rs.10.00
Equity Capital	Rs. 10,000.00
Buyback of Equity Shares (numbers)	200
Maximum Offer Price	25.00

SHAREHOLDING PATTERN OF ABC LTD.				
Particulars	Before buyback	After buyback		
		Case1	Case2	Case3
Promoters(No.of shares)	400	400	320	200
Non-Promoters(No. of shares)	600	400	480	600
Promoters (percentage)	40%	50%	40%	25%
Promoters(percentage)	60%	50%	60%	75%

**ASSUMPTIONS**

**Case 1:** The original proportion of promoters and non-promoters share in the total equity capital was 40.00% and 60.00% respectively. It is assumed that there is a 100% buyback of 200 shares which the company has proposed to make. Therefore, all the shares that are proposed to be bought are bought from the non-promoters group and nothing has been offered by promoters. Thus, the proportion of promoters share in the total equity capital increases from. 40.00% to 50.00% and that of non-promoters decreases from 60.00% to 50.00%.

**Case 2:** The company decides to keep the shareholding same as before i.e. promoters 40.00% and non-promoters 60.00%.

**Case 3:** The Company decides to bring down the promoters shares in the company's equity share capital to 25%,

It can be seen from the above example that depending on the policy of the company, the shareholding pattern of the company changes. Promoters and non-promoters shareholding can increase, decrease or remain unchanged.

**B.2 FINANCIAL RATIOS OF THE COMPANY IS STRENGTHENED**

Another reason a company might pursue a buyback is solely to improve its financial ratios - metrics upon which the market seems to be heavily focused. If reducing the number of shares is not done in an attempt to create more value for shareholders but rather make financial ratios look better, there is likely to be a problem with the management. However, if a company's motive for initiating a buyback program is sound, the improvement of its financial ratios in the process may just be a bye-product of a good corporate decision. When a company decides to go for buyback, the financial ratios of the company are impacted to a greater extent. The ratios that are generally impacted are Return on Assets (ROA), Return on Equity (ROE), Earnings per Share (EPS) and Price Earnings Ratio (P/E). The same has been explained with an example:



COMPANY – XYZ LTD.		
Particulars	Before buyback	After buyback
Number of shares	150	125
Cash Balance	Rs.1000.00	Rs.625.00
Total Assets	Rs.10000.00	Rs.9625.00
Earnings	Rs.1500.00	Rs.1500.00
Equity Share Capital	Rs.1500.00	Rs.1250.00
Reserves	Rs.200.00	Rs.75.00
Total Shareholders' Funds	Rs.1700.00	Rs.1325.00
Market Share Price	Rs.10.00	Rs.15.00
Financial Ratios		
Return on Assets (ROA)	0.15	0.16
Return on Equity(ROE)	0.88	1.13
Earning per share(EPS)	10	12
Price-EarningRatio (P/E)	1	1.25

**EXPLANATION**

**Return on Assets:** We can see that ROA has increased after buyback. The reason behind this increase is that there is a reduction in the total assets. The total assets have gone down from Rs.10,000.00 to Rs.9,625.00 whereas the income has remained the same.

**Return on Equity:** It has also increased from 0.88% to 1.13%. This is due to the decrease in the shareholder's equity, which has gone down from Rs. 1,500.00 to Rs. 1,250.00

**Earnings per Share:** It has increased from Rs.10 to Rs. 12. The reason behind the increase of EPS is that, although the earnings of the company is unchanged, the numbers of shares have come down from 150 to 125, causing the EPS to increase.

**Price to Earnings Ratio:** Here, the market value of the share has increased from Rs.10 to Rs.15, which is a 50% hike in the price. On the other hand, the EPS has also increased from 10 to 12, which is a 20% hike. Since the overall increase in the market value of the share is much more than the increase of EPS, we can, therefore, see an increase in the price-earnings ratio.

**B.3 SEND NEGATIVE SIGNALS**

An announcement for buyback can send negative signals to the investors against the companies. A typical example is the Hewlett Packard (HP) case: The Company spent \$ 8.2 billion to buy back 128 million of its shares from the market during the period November 1998 to October 2000. The aim of the company was to make opportunistic purchases of HP stock at attractive prices—in other words, at prices they felt that undervalued the company. Instead of signaling a good operating prospect to the market, the buyback signal drowned out more powerful contradictory signals about the company's future which are an aborted acquisition, a protracted business restructuring, slipping financial results, and a decay in the general profitability of key markets.

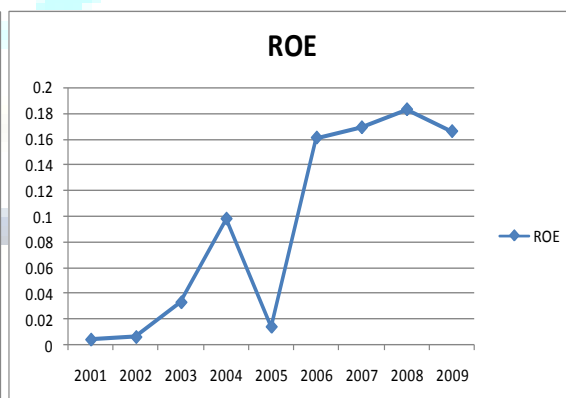
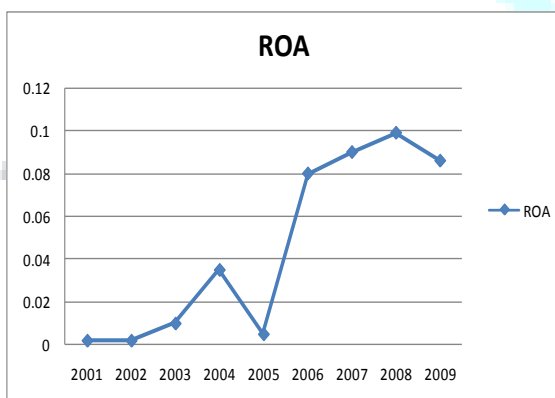
The share buyback scheme might become a big disadvantage to the company when it pays too much for its own shares. Indeed, it is not advisable to buy in an overpriced market. Instead, the company should put the money into assets that can be easily be converted back into cash. This way, when the market swings the other way and is trading below its true value, shares of the company can be bought back at a discount; ensuring current shareholders receive maximum benefit. Strictly, a company should repurchase its shares only when its stock is trading below its expected value and when no better investment opportunities are available.

Now let us look at an example of buyback of shares which happened in the year 2007. Natco Pharma decided to go for buyback of its shares in the year 2007. The company went for buyback on 12<sup>th</sup> February 2007 and completed the buyback on 30<sup>th</sup> July 2007. The price that was offered by the company for the buyback of shares was Rs 150.00 per share and the total outflow of cash was Rs.7.00 crore

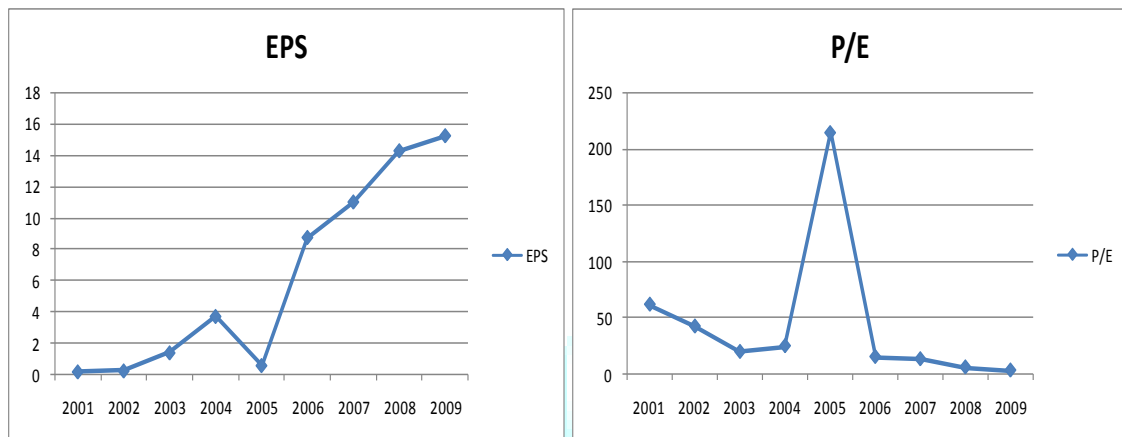
It can be seen from the graphs below, that after the buyback of shares by the company, the earnings per share, return on assets and return on equity have increased remarkably. This proves that the decision to go for buyback was a very valid and successful decision by the management.

**(3) EFFECT OF FINANCIAL RATIOS**

	2001	2002	2003	2004	2005	2006	2007	2008	2009
ROA	0.002	0.002	0.010	0.035	0.005	0.080	0.090	0.099	0.0860
ROE	0.004	0.006	0.033	0.098	0.014	0.161	0.169	0.183	0.166
EPS	0.200	0.260	1.410	3.730	0.600	8.760	11.020	14.280	15.240
P/E	61.750	42.308	19.716	24.853	214.417	15.234	13.203	5.935	3.166







### CONCLUSION

Are share buybacks good or bad? As it often happens in cases of finance, the question may not have a definitive answer. If a stock is undervalued and a buyback truly represents the best possible investment for a company, the buyback and its effects can be viewed as a positive sign for shareholders. However, if a company is merely using buybacks to prop-up ratios, provide short-term relief to an ailing stock price or to get out from under excessive dilution, then it may not be successful and the whole process of buyback may go for a loss. Finally, the decision for buyback of shares would depend on the analysis of the various facets to which the company is exposed.

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