PROBLEMS DURING IMPLEMENTATION OF BUSINESS INFORMATION SYSTEMS

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Abstract
In today’s computerized society every organization need a sophisticated “Information System” to compete in the business world. Some of the organizations outsource their Information Systems and some implements their own custom designed information Systems. Business information systems implementation has been historically bothered by failures for which users resistance has been identified as an important reason. Users’ satisfaction can be achieved by solving the psychological problems and technical issues which are creating psychological problems during the implementation of IS. Some important aspects during implementation of business information systems like, interdepartmental relationship, knowledge management, independence of tasks and user satisfaction importance is highlighted for organizations. To find the Psychological problems during implementation of business information system and how the resistance from the users can be tackled is the aim of the study. This study also presents suggestions to organizations for enhancing users’ satisfaction and making the Implementation process of “BIS” a success.

Keywords: Business Information Systems, Users Satisfaction, Psychological factors, Implementation, Technical factors, Knowledge Management.
Acknowledgements

Business information system is very important area in the field of informatics, especially after the revolution in computer science and internet over the last decade. This research work is a contribution to the important research performed in this area and it will also assist future researchers to find solutions to growing problems in the field of Business Information systems.

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# Table of contents

1. **Introduction** .................................................................................................................. 1
   1.1 Background .................................................................................................................. 1
   1.2 Problem Statement ...................................................................................................... 2
   1.3 Purpose Statement ...................................................................................................... 2
   1.4 Research Questions .................................................................................................... 4
      1.5 Target Groups ......................................................................................................... 4
      1.6 Delimitations ............................................................................................................ 4
      1.7 Expected Outcome ................................................................................................. 4
      1.8 Authors Experience ............................................................................................... 5
      1.9 Distribution of Work ............................................................................................. 6

2. **Research Design** ......................................................................................................... 7
   2.1 Research Perspective ................................................................................................. 7-8
   2.2 Research Strategy ..................................................................................................... 9-10
   2.3 Data Collection Procedure ...................................................................................... 11
   2.4 Data Analysis Procedure ......................................................................................... 13
   2.5 Strategy for Validating Findings .............................................................................. 13
   2.6 Result Presentation Method ..................................................................................... 14

3. **Theoretical Study** ....................................................................................................... 15
   3.1 Key Concepts ............................................................................................................. 15
   3.2 Subject Areas Relevant for the Research ................................................................. 16-18
   3.3 Previous Research .................................................................................................... 19-20
   3.4 Relevant Literature Sources ..................................................................................... 21
   3.5 Information Systems ............................................................................................... 22-24
   3.6 Business Information Systems ............................................................................... 25-26
   3.7 Implementation of BIS ............................................................................................. 27-30
   3.8 Psychological Theories ............................................................................................ 31-34
   3.9 Knowledge Management ......................................................................................... 35-36
   3.10 Users Satisfaction ................................................................................................. 37-39
   3.11 Information Technology .......................................................................................... 40
   3.12 Summary of Theoretical Findings .......................................................................... 40-43
   3.13 Arguments for An Empirical Study ........................................................................ 44

4. **Empirical Survey** ....................................................................................................... 45
# Table of Figures

<table>
<thead>
<tr>
<th>Figures</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1: Implementation Process of Information System</td>
<td>3</td>
</tr>
<tr>
<td>Figure 2: Hermeneutic Circle</td>
<td>8</td>
</tr>
<tr>
<td>Figure 3: Data Collection Procedure</td>
<td>12</td>
</tr>
<tr>
<td>Figure 4: Subject Areas and Research Questions</td>
<td>16</td>
</tr>
<tr>
<td>Figure 5: Phases of BIS</td>
<td>20</td>
</tr>
<tr>
<td>Figure 6: campus information system</td>
<td>24</td>
</tr>
<tr>
<td>Figure 7: Successful Large Scale Information Systems Implementation</td>
<td>30</td>
</tr>
<tr>
<td>Figure 8: Knowledge management &amp; Interaction</td>
<td>36</td>
</tr>
<tr>
<td>Figure 9: Framework of user satisfaction in IS</td>
<td>38</td>
</tr>
<tr>
<td>Figure 10: Psychological factors in Implementation of Business Information Systems</td>
<td>56</td>
</tr>
<tr>
<td>Figure 11: Barriers between users and System</td>
<td>58</td>
</tr>
<tr>
<td>Figure 12: Technical Issues Causing Psychological Problems</td>
<td>59</td>
</tr>
</tbody>
</table>
Introduction

1.1 Background

Today it is widely recognized that a “business information system” is essential for most organisations to survive and compete with other organizations. Information is life blood of every organization, the modern business organization needs integrated, accurate and up to date information. To fulfill the needs of information the management of information is critical for the prosperity of every business organization (Beynon-Davies 2009). Business information systems assist companies to extend their business, offer services, reshape jobs, redesign work flows and modify the ways of controlling business (Lucas, JR 1981). The implementation of business information system is an ongoing process which includes the deployment of the business information system through feasibility study, analysis, design programming, training, conversion and installation of the system. According to (Gioia, 2001) survey 51% of the business information systems implementation was unsuccessful.

“The present focus on technical design neglects the centrally important social, political and ethical considerations that make a business process acceptable in our society” and “the highest point at which technology can fail us is its lack of social, political and ethical values to us”. (Information systems Critical perspective, Stahl, Page X, 2008). Business Information system implementation is the procedures performed for completing the design in approved system design documents and to test, install and begin to use the new or revised information system (Dull, 2009). Business information system problems can be solved by thinking outside the square because this is the only way to come up with new approaches and new solutions and we know that business information systems implementation is critical process which comes with number of problems. The previous research work is more focused on technological factors of IS. Our focus of study will be on psychological problems and issues regarding to the implementation of BIS and we will also pay attention to the technical issues which causes psychological problems e.g. security and competence etc. For example; a new payroll system is implemented in a company then due to Data gathering and security (Bank account details, miss calculated salary) they are not willing to be part of this new system and will not feel comfortable with the new system. A new business information system often requires the system to build data linkages in
order to handle the transactions and different processes. If data standards are not available, then the system may need to develop new standards to support linkages with multiple business partners. These kind of technical factors influence psychological problems during business information systems implementation, so we will investigate these factors and will try to resolve it to minimise the problems during business information systems implementation.

1.2 Problem statement

We have noticed that the research work is very limited in area of Psychological effects during implementation of BIS; lack of this knowledge can lead BIS to failure. This research work is for understanding the psychological problems and related technical factors which may influence the BIS implementation process. Another reason is to address the issue of conflict between decision makers and users, because at the end of the day user will suffer from the consequences of BIS implementation process. We have also noticed that there is not enough research work on building consensus between user and decision maker during the implementation of BIS. The main challenge is to investigate the problems during implementation of Business information systems and make a framework to achieve the highest possible level for users’ satisfaction.

1.3 Purpose Statement

Many information systems have failed during the last decades. User acceptance has many times been very low (Carr 2003, Fortune & peters, 2005). The purpose of this research is therefore to create an understanding for some important factors that should be taken into consideration during the implementation of business information systems to increase user acceptance and control the rate of failed information systems, which can be achieved by providing more satisfaction to the users and making the implementation process efficient. The main purpose of this research is to investigate the problems during implementation of business information systems and sub purpose is to find the factors which influences users’ satisfaction. Business information systems are used very often after the technological development in the present century because without modern information systems it is almost impossible for the business organizations to compete in modern day business. In implementing business information system the user acceptance is
known to be the main issue because most of the time the decision is taken by the top level management without even thinking about the users. Our curiosity about this research is due to the rate of failed information systems in the last few decades. The purpose of this research can also be seen in the diagram below:

![Diagram](image)

**Fig: 1** Implementation Process of Information System

### 1.4 Research questions
1. Which factors should be taken in consideration during implementation of business information systems?

a. Which psychological factors are affecting users?

b. Which technical issues are causing psychological problems for users?

c. What actions can be taken to satisfy the user during implementation process?

d. How can user satisfaction level be defined?

1.5 Target groups

In academia we are targeting the previous researchers in the field of business information systems and also current students in the same field. Practically we are targeting business organisations both medium and large multinational companies, but our main focus is on the large companies because they have complex business information systems and they are also affected by those systems.

1.6 Delimitations

In this research we have identified the psychological factors affecting users’ satisfaction and technical issues creating psychological problems. Distinguishing the satisfaction level of users is still considered to be an obstacle for the research work; we have also considered this obstacle for further research work.

1.7 Expected outcome

As more and more Information system projects were failing over the last decades (Carr 2003, Fortune & peters, 2005), as students of informatics with core interest in this field to pursue our carrier in the field of informatics, we were feeling curious about this problem. The “business information system” development process is lengthy and complex process, which obviously requires more time and resources to conduct a research in this field that is why we selected to conduct a research only about the phase of implementation during the BIS development process.
The main objective of this research is to investigate the psychological factors and technical problems which are causing psychological factors, which will make the BIS Implementation process efficient and successful. Then we can define the level of users’ satisfaction which can be attained by dealing with those factors by taking different kind of actions. As mentioned above the first major outcome of this research will be presenting the major psychological factors which are influencing the users during implementation process of BIS, these factors will also include the factors which are caused due to technical problems in the BIS, then we will relate those factors to the users’ satisfaction. We also hope to come up with some procedures and principles which will reduce the conflict between users and decision makers during business information system development and implementation.

1.8 Authors Experience

There are three different authors involved in conducting the research and writing this report, but all of them are mostly from the same background studying computer science. We have done many projects in web development, management information system online.

Our previous experiences with business information systems are limited in a sense that we have only experienced some changes in the existing information systems but none of us have gone through implementation phase of business information systems completely, therefore our own experience cannot be trusted and we have to rely on theoretical material and empirical research to discuss and illuminate the problem area.

We have studied different subjects relevant to this research such as: system development philosophies, system analysis and design, Business process modelling and trends in informatics. One of the authors has been graduated in Business information systems and currently he is developing the skill and knowledge in the same field. All of the authors have gained a unique experience during the first semester of this program by studying and researching in the field of human information systems. Interest in the field of informatics and the motivation of the research work will lead us to achieve our goals in this research paper.
1.9 Distribution of work

This research work was a combine effort by all three of us; we have worked together on each and every stage of this research. Write from the beginning i.e., selection of topic and submission of research proposal, till submitting the final document we have worked together as a team.

We had only divided few tasks like during theoretical study we distributed some subject areas in order to study them deeply, but we have discussed those subject areas with each other. We had also designed and conducted the empirical research together. At every stage of the research work when we had received feedback from supervisor, we discussed the comments and solved it together as a team work. The continuous team effort and collaboration among us made it possible to submit this research paper on time.

2. Research Design

2.1 Research Perspective
There are different kinds of research perspectives such as; positivistic, post-positivism, interpretive and hermeneutic, while in this research we will use hermeneutic perspective because this perspective gives an insight of the very nature of information which is also required by the purpose of the research and also to investigate the research questions properly this perspective suits us the best. Another reason for selecting hermeneutic perspective is that, it is the most fundamental theory of meaning, understanding and interpretation (Lucas, 1993). The problems during implementation of business information system can be investigated by quantitative research or qualitative research method but we are applying qualitative research approach because hermeneutic perspective prefer qualitative data and our main objective is to achieve users’ satisfaction and psychological factors influencing it, which can be done accurately through the guidance provided by qualitative research such as users’ observation and in-depth interviewing. The motivation for doing qualitative research, as opposed to quantitative research, comes from the observation that, if there is one thing which distinguishes humans from the natural world, is consciousness. Kaplan and Maxwell (1994) argue that the goal of understanding a phenomenon from the point of view of the participants and its particular social and institutional context is largely lost when textual data are quantified. Qualitative research seeks to provide understanding of human experience, motivations, intentions and behaviours based on description, observation and utilizing a naturalistic interpretative approach to a subject and its contextual setting.

As our target group is the users of the system and their behaviour during and after implementation of business information system so to study the big picture of the organization and the implementation of business information system hermeneutic perspective is the best approach. Since we have selected hermeneutic perspective therefore it is obvious that we will use qualitative research methods which also fulfil the research needs. We will also use hermeneutic perspective throughout the research paper in literature review, analysis and evaluating findings, because changing the perspective or using different perspectives will make our research findings ambiguous. Another reason for selecting hermeneutic perspective is that, modern hermeneutic perspective not only issues involving the written text but everything in the interpretative process
such as presuppositions and pre-understandings. Hermeneutic is; understanding that comes by active (in the situation) interpretation thus based on lived experience (Erlebnis) not on removed contemplation (Lucas, 1993).

Fig: 2 Hermeneutic Circles (Lucas, 1993).

The hermeneutic circle is very important concept of hermeneutics, which proves the principle that “one must understand the parts from the whole and the whole from the parts” (Lucas, 1993). In the hermeneutic circle the project meaning in the text is based on the historical interpretation, and then it allows the text to redesign the historical methods according to practical scenario from which the system is understood. The text can be reshaped according to different scenarios and needs and can be understudied accordingly.

As we have mentioned earlier that we will follow qualitative research methodologies because it is required after selecting hermeneutic research perspective and this will also assist us to address the research questions. The essential components of qualitative research methods are literature review, theoretical framework, field work, purposive sampling, inductive analysis, emergent design, negotiated outcomes and forming a tentative working hypothesis (Research methods in information by Lincoln and Guba 1985). Trustworthiness in qualitative research can be achieved by credibility, transferability, dependability and confirm-ability.
2.2 Research Strategy

The purpose of the research work is to identify and tackle the psychological factors influencing the implementation process of BIS. Hermeneutic research strategy will be used for this research work. The hermeneutic approach is generally based on three evolutionary steps:

- Perspective consciousness
- Internal logic
- Ethical Values

Qualitative research methods are most suitable for performing this type of research work. Using the Qualitative method, we will have the following strategy for conducting this research. Our first priority is to carry out Case studies of the different information systems to find out the Psychological problems influencing the implementation process of BIS. In second step we will carry out interviewing process which will give us important information after direct interaction with the users, because the purpose of this research work is to satisfy the user with psychological effects and to make the implementation process a success. This interviewing process is helpful for finding out the concerns of users and the conflicts between users and decision makers. After interviewing, observation process is carried out for concluding the flow of BIS implementation process. The main part of the research work is based on the empirical knowledge and theoretical work. The theoretical study will guide us to understand the problems within the research work. The case study of different IS within a business organizations will help us to know the real psychological problems of users. The literature study from different books and journals about each subject area will help us to know the background of the problems and knowing them very well. Theoretical study of all the relevant subject areas will make an overview of the existing problems and we can further investigate more points related to the research problem in each and every subject area. The empirical findings in the research work are very important. Interviewing, Observations and questionnaire will give us the real values of the problems and will reveal the behaviour of the users. So we can easily conclude efficient results of the research work by
comparing the theoretical work and empirical findings, both the theoretical and empirical research are very important in this particular research work.

Qualitative research methods were developed in the social sciences in order to enable researchers to study social and cultural phenomena. Examples of qualitative methods are action research, case study research and ethnography. Qualitative data sources include observation and participant observation (fieldwork), interviews and questionnaires, documents and texts, researcher’s impressions and reactions (Myers 2009).

Types of qualitative research methods:

a. Action research: there are many definitions of action research but the most widely cited is by (Rapoport, 1970) “Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework”. This definition clearly emphasizes, that action research is concerned to enlarge the stock of knowledge in the social science community. In information systems action research was for a long time ignored but later there seems to be increasing interest in action research (Checkland, 1991).

b. Case study research: Case study research is the most common qualitative method used in information systems; it is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin 2002). Case study research can be positive, interpretive or critical depending upon the underlying philosophical assumptions of the researcher.

c. Ethnography research: Ethnographic research comes from the discipline of social and cultural anthropology where an ethnographer is required to spend a significant amount of time in the field. Ethnographers immerse themselves in the lives of the people they study (Lewis 1985, p. 380) and seek to place the phenomena studied in their social and cultural context. In the area of the design and evaluation of information systems, some very interesting work is taking place in a collaborative fashion between ethnographers on the one hand, and designers, IS
professionals, computer scientists and engineers on the other. This collaborative work is especially strong in the UK and Europe and is growing in the US.

2.3 Data collection procedures

The basis for theoretical data collection and criteria for data selection is text study. We carried out the text study from different books, articles (both in soft and hard form) and different websites. To validate the credibility of the literature we have checked the author’s trustworthiness and his previous publications, along with this to make sure that the literature is authentic; we have used top academic sources like Harvard, Boston and California institute of technology.

The empirical part of the study consists of two different parallel phases for data collection. i.e. Interviews and questionnaires. The preparation for empirical studies will be done on the basis on both theoretical findings and research questions. Both the knowledge of theoretical studies and the concerned issues raised by research questions will be tested in the empirical studies through interviews and questionnaires. Questions for both interviews and questionnaires are prepared carefully and were asked from concerned people for making sure that it delivers accurate knowledge for research.

We are collecting text in English language mostly because it is international language and most of the research papers are published in English, the papers published in other languages are also translated in English. After collection of different range of material we compared and checked the credibility of the material by authors and publication. The empirical data is collected through conducting interviews and questionnaire because this will provide solid information about the problem and is less time consuming. We are not using experiments because they will not contribute any answers to the research questions. To investigate the specific problems regarding system users we are using observations for collection of empirical data because by observations we will see and feel the problems in real time. We have used qualitative data collection methods during the research process which are interviews, users’ observation and case study analysis. Interviews were conducted with middle and upper level management because decisions
regarding business information system development and implementation were formulated and finalized for the most part at those two levels of management. We also included interviewing from the users of the system to see the other side of the picture. The type of approach we used for interviews were both “informal conversation interview” and “general interview” but we are relying more on general interview because through general interview we get proper feedback about the specific issues which we are concerned about.

The users’ observations occurred throughout the entire research period, but were most intensive during the implementation process. We gathered different case studies specifically about implementation of business information systems.

The diagram below shows the basis for collecting the data and how those different data sources will be utilized to achieve the results for the research questions.

Fig: 3 Data collection procedure.
2.4 Data analysis procedures

The research work is mostly analyzed by qualitative method of analysis. Data analysis procedure is designed in a way to gather the points of our interest and to identify the practices that contribute in creating the myth of business information system. The theoretical knowledge which shows problem area within IS will be compared with empirical findings to get rid of psychological problems faced by users. The research work is based on the comparative analysis where we will compare theoretical findings with the empirical results.

2.5 Strategies for validating findings

The researches findings will be validated by qualitative research strategies. To achieve better understanding for the problem area of the research and to identify important concepts we will perform text analysis. In this research we will use triangulation strategy to validate the research findings because in triangulation, multiple data sources are analysed to create final understanding of research results. We will analyse all the data sources; text, interview, questionnaire and observations, then we will create a final understanding of the results to our research questions.

Reliability and validity are mostly used for evaluating quantitative studies. The main criteria for validating the findings are; discourse criteria, heuristic value, empirical value and most importantly consistency because without consistency we cannot propose a solid method to tackle the problem area. As we have talked previously about the comparative studies for our research work so therefore it comes under qualitative method. The theoretical findings and empirical approaches for results are used in this research work. Triangulating the data sources in case studies is carried out for finding the functionalities of the BIS system implementation. Cross functional interviews are taken for finding the accurate data within the system which is very helpful in the research work. The action necessary for findings out the social artefact are taken by observing the system. The additional information like conflicts has been explained in the research work. Major part of the research work is based on the empirical surveys and findings in the field of BIS implementation.
2.6 Result presentation method

The thesis results will be presented in text while we will also add diagrams and models where necessary. The theoretical parts of the thesis like hypothesis and other relevant theories will be presented in text because they are explained better in text format. The logical representation of the system and the flow of implementing the business information systems will be presented through models and diagrams.
3 Theoretical study

3.1 Key concepts

Key concepts of our research work are taken from the research questions. The research questions are about the psychological factors and users’ satisfaction and to make implementation of BIS a success. Information system in a business organization is a key factor to Success because it turns the information in a shape which is meaningful to the users. The work flow and the knowledge of working organizational structure all have a basic need of good Information system. Key thing in Information system is that it has a particular configuration which bounds the users around in the form of teaming or individuals, depending on the tasks they have to do.

The Business information system is all about performance and team co-ordination. It plays a vital role for managerial control for monitoring performance of both the system and the users. The effective performance of every activity in an organization relies on effective information system (Davies 2009).

Implementation of Business information system is highly important because it will shift all the plans and preparations into a practical world. Therefore taking care of every single factor in this stage is the key concept behind implementation phase. One has to treat the investigated problems accordingly with consensus and taking the users concerns into confidence.

Psychological problems: Those factors are considered as key concepts in our research work which are creating psychological problems to users in the information systems of a business organization.

Knowledge management in an information system has an important stack. Teaming and group working need these phenomena to be handled efficiently for good results. The purpose of knowledge management is to know how one should utilize the experts’ knowledge to make a business information system successful.
Technical factors: In the information system of business organization the technology plays a vital role. The technicality of the system often creates bad feelings for users, which lead them to psychological problems. User satisfaction: it is another key concept of the research work. Highly satisfied users have great motivation which result in better work performance and the end product of the organization is achieved efficiently and effectively.

3.2 Subject areas relevant for the research

The subject areas for research work which have been considered are shown and described below:

![Subject Areas and Research Questions](image)

**Information systems (IS)**

The purpose of the research work is to gain user satisfaction during implementation of the information systems by finding out the psychological problems faced by user, which will automatically make the implementation process a success. Therefore an information system is chosen to be the relevant subject area for our research work. A *system consists of elements that have either been designed into particular configurations or evolved into configurations over time*
Information system is the basic subject area for our research work. Other parts of subject areas will come out from information system e.g. BIS, implementation and ICT etc.

**Business information systems (BIS)**

The research work is based on the implementation of Business information systems there for BIS is also taken as relevant subject area for research work. Business information systems are the information systems used for Business organizations. Business Information systems are also needed for recording transactions between an organization and its environment, also for managing relationships with external stakeholders (Davies 2009). In implementation of BIS our focus is to find out the psychological problems during the process, there for BIS is considered as an important subject area.

**Implementation of BIS**

Business Information system implementation is the procedures performed for completing the design in approved system design documents and to test, install and begin to use the new or revised information system (Dull, 2009). The factors which are affecting the users within a business organization can be found in implementation process. Therefore implementation of BIS is considered as the most important subject area for research work.

**Information Technology (Technical factors in Implementation)**

Some technical factors which has affect in implementation process need to be watched out to find out whether those factors are involved in creating the psychological problems for users or not, due to this reason we consider the technical factors in Implementation process as a subject area for research work.

**Psychological theories**

Knowledge structure provides a roadmap which subjectively interprets sense data in the environment. Information as process is actually the definition of providing a frame work for transformation of sense data into information occurs (Spink, Cole, 2007).
To investigate the psychological problems about users during implementation of BIS we need psychological theories about the users’ behaviour. This area of research work is directly related with the users. To know about users’ behaviour, the Psychological theories are placed into the relevant subject areas of the research work.

**Knowledge Management**

The management of knowledge is frequently identified as an important antecedent of innovation (Darroch & MaNaughton, 2002). After finding out the psychological problems, knowledge management plays a vital role for tackling these problems. Communication among users for sharing the experiences and knowledge about the information system is necessary to handle the existing problems and to be prepared for the coming obstacles. It has an important role in the IS systems there for it is also Considered as a subject area for this research work.

**Users Satisfaction**

The users Satisfaction is a summary with other consumption emotions (Oliver, 1992). This subject area is very important to study because this will help us to investigate the main objective of this research. Well this subject area will explain the sub-question of the research paper but all our questions are centred towards this problem if we can define the level of users’ satisfaction and the factors which influences it then most of the research objectives will be achieved.

These factors during implementation process are affecting the success of IS and BIS, therefore research question 1 in chapter 1.4 has relation with the above mentioned subject areas.

Sub question “a” in chapter 1.4 of research questions is, “Which psychological factors are affecting users?” It is about users problems in IS therefore it comes in the subject area of information systems. The problems which have been asked for are psychological. It has relation with subject area of Psychological theories because the problems which users are facing are Psychological.
Sub question “b” in chapter 1.4 is about technical factors causing psychological problems to users. It is therefore related to the subject areas of technical factors and psychological theories of research work.

Sub question “c” in chapter 1.4 is about the solution of problems for users. As we know that the main focus is on psychological problems in this research work. Knowledge management is an important part of subject areas of research work for solving the problems for users. Therefore this question is related with the subject areas of psychological theories, user stratification and knowledge management.

Sub question “d” in chapter 1.4 is about the satisfaction of users within BIS. The satisfaction must be psychological for users. Therefore this question comes under the subject areas of BIS, psychological theories and user satisfaction.

### 3.3 Previous research

After the revolution in the field of computer science, in 1970s mainframe computers were used and data was centralised, then the systems were connected to few business functions such as; payroll, inventory and billing, since then the research in the field of business information systems started and it continued up till now.

According to the research of (Ahmad and Ruighaver, 2002) the security environment has almost become impossible to offer absolute protection to information systems in organization; therefore security will always be a work in progress. Security strategies are especially important as organizational security currently is limited by available security resources, such as information security experts, funds and technology.

The Zachman’s study identifies factors that influence the selection and implementation of strategies for architecture of security strategies, and discusses the classification of these factors. They have also developed a framework from Zachman’s well-known organizational representation of enterprise architectures then classified these factors into six categories using
this framework. The contributions of this study are development of a theoretical framework to categorize influencing factors and their identification.

As this research has created a framework for technical factors like security so this gives us a lot of information and we can research furthermore about this factor and come up with new idea which will resolve the issue of security during implementation of information systems.

The report by (McGrath, Dampney and More, 2007) presents a power source distribution model as means of more effectively and efficiently managing the conduct of information development process and implementation. The aim is to empower those who manage such a technology change process to deal better with the critical human aspect of resistance to change.

By continuing the work done in this research we can introduce a new strategy which will decrease the tension between upper management and the users; through this we can also empower the system users, so they will get more involvement during the system development process. In the research by (Goncalves and Sapateiro, 2008) they have presented an overview of IS implementation and they have also shown motivation and challenges illustrated with a case study in a higher education institution. They also conducted a review of research works addressing the gap from fully structured formal activities to ad-hoc informal unstructured activities.

Fig 5: Phases of BIS (Bygstad, 2005)

The above figure describes the main phases of the adaptation process, in IS projects introducing a new organization chart without changing the work practices has often proved unsuccessful. Mutual adaptation implies that it is possible to change structural properties of both the organization and the information system, creating opportunities.
The main findings of this report by (Yeo, Handzic and Parkin, 2005) indicates that both perceived usefulness and perceived ease of use have a positive correlation with user satisfaction in the situation when users are given no other choice but to accept the new IS. This suggests that, in a mandatory environment, potential user assessments of the perceived usefulness and perceived ease of use of a new or proposed system may provide useful insights into later user environments.

### 3.4 Relevant literature sources

Relevant literature sources are used in the research work on the basis of credibility, reliability and compatibility with subject area. Trust worthy resources of published literature is selected by checking the credibility of both authors and publishers. IEEE journals and research papers are used for literature study which is considered the most credible authority of publication. The standard for books reading for the study is also observed in the same manner.

*Information system* is the first subject area where we have used literature from different sources. In this subject area we have used the book of “Loudon” with the title of “Management Information Systems” and it was published in 2002.

Business information systems by Paul Beynon-Davies was published in 2009 helps a lot in the literature studies regarding the information system and its implication in business.

Furthermore the article of Martin E. Smith “A training Information system” was published in 2007, in lighted more the literature for our research work.

The second subject area of research work is Business Information systems. Information Quality Management Theory and Application, the book of Latif AL- Hakim which was published in 2007 has been studied for this subject area.

Business Information systems technology, development and management by Paul Bocij, Andrew Greasley, and Simon Hickie, published in 2008, were also thoroughly studied for this specific subject area. Paul Beynon-Davies book “Business information systems”, 2009 also contributes literature in this subject area.

*Implementation of BIS* is another subject area for which we have studied both articles and books. Rodrigo Manuel Oliveira in his article “The organizational implementation of Information
systems: Towards a new theory, 1999” highlighted some important aspects about BIS implementation. Therefore it is selected for our literature studies. The book of DULL “accounting information systems, 2009” was also studied for this subject area.

“Aspects for Information Systems Implementation: challenges and impacts: A higher education institution experience” Is the article of Gonçalves and Sapateiro, 2008 was also analyzed for this subject to get some knowledge and ideas from it. The article of Vithanage and Wijayanayake, 2007 “Insight to the large scale information systems Implementation in Sri lanka” also contributed in our literature study.

*Psychological theories* is another subject area where we have studied the book of J R. Anderson “Cognitive psychology and its Implication, 2005” and the article of Sandra L. Schneider “Framing and Conflict: Aspiration level Contingency, the status Quo, and current theories of risky choice, 1992” were also studied for this subject area.

Knowledge management is the subject area where we have studied the article of Andrew H. Gold Arvind Malhotra Albert H. Segars “Knowledge Management: An Organizational Capabilities Perspective, 2001” for our literature study in this subject area. We have also studied the book of Eisenhart, Mary “Gathering Knowledge While its Ripe" Knowledge Management 2001” for literature study of this subject area.

For user satisfaction as a subject area we have studies the book of Jane M. Carey “Human factors in information systems: Emerging theoretical Basis, 1995”. We have also studied the articles of Oliver, 1997: Schumann and Burns, 1994: Peterson and Wilson, 1992).

### 3.5 Information systems

To describe this subject area in detail we have to understand the basic concept of system, *a system consists of elements that have either been designed into particular configurations or evolved into configurations over time* (Smith, 2007). A system for multiple users may have many computers and peripherals devices which allow users, to use the system in a coordinated manner to achieve the desired goals and objectives. *An information system is a melding of the concept of*
information with a system of technology to best facilitate organizational needs. An information system requires designers and users capable of systems thinking to keep the system dynamic within an environment of constantly changing variables over time (Smith, 2007).

Up till the beginning of 21st century there was a vast gap between technical and social orientation to information systems problems, this gap was affecting the problem solving ability and also the attempts to create a science of information systems. (Eckhard D, Kalle and Staurt, 2000). The information systems are still considered as social science, “machines and formalisms for handling information are human artefacts and they should be incorporated naturally into a social model of information systems” (Information systems Concepts by Eckhard D, Kalle and Staurt, 2000). Information systems are often mixed up with information technology and computer science but information system is a field which only emphasise on humans and organizations while it uses software’s and hardware’s but it has nothing else to-do with them in detail. Information systems plays vital role in transformation of organizations and community such as e-business. IS work as a bridge to join the intersection between technology and business, IS performs multiple tasks at the same time like enabling organizations to realize potential strategic benefits and at the same time also providing facilities to transform the traditional business into the modern e-business (Information systems: the state of the field, John & Kalle, 2006).

Information systems contain data that have been shaped into a form which is meaningful and useful to human beings. Data are streams of raw facts representing events occurring in organisations or the physical environment before they have been organized and arranged into a form that people can understand and use. For example a supermarket checkout counters ring up millions pieces of data, such as product identification number or the cost of each item sold. Such pieces of data can be totalled and analysed to provide meaningful information, such as total number of shampoos sold, which brand is selling more and how much amount is available in stock etc. An information system contains information about an organization and its surrounding environment. Three basic activities input, processing and output produce the information which organization needs. Feedback is output returned to appropriate people or activities in the organization to evaluate and refine the input. Environmental actors both external and internal
such as customers, suppliers, stockholders, competitors and regulatory agencies interact with the organization and its information systems (Management Information Systems, Laudon, 2002). Information systems are more than computers; using information systems effectively require an understanding of the organization, management and information technology. All information systems can be described as organizational and management solutions to challenges posed by the environment.

Usability of an information system is a typical concept of user acceptability that derives from using functions of the system and it also determines the success and failure of the information system. Usability of an information system also shows the effectiveness, efficiency and satisfaction of the system from users’ perspective. If a system is highly usable then it will reduce errors and will increase productivity of the organization and it will also increase the users’ satisfaction.

Fig: 6 campus information system source: (www2.ed.gov/about/offices/list/os/technology/plan)

To understand the Business information systems and Problems during implementation in BIS it is necessary to understand the basic concept of information systems. The subject area of information system is directly related with the main research question and the first sub question.
The main research question is that “Which factors should be taken in consideration during implementation of business information systems” information system provides information about external and internal environment of an organization and it also describes the basic functions of the system like input, processing and output which gives general idea about the factors during implementation of BIS. To deal with main research question and sub questions we can identify both psychological and technical factors through information system because IS development is a complex process and the implementation stage is the second last stage in the IS development life cycle.

This subject area also deals with sub question “What actions can be taken to satisfy the user during implementation process?” after understanding IS we can redesign the whole cycle and make some critical changes during the system development to eliminate the problems during IS implementation, like thinking and planning about implementation from the very beginning of IS development process.

3.6 Business Information Systems

The importance of information as a business resource is highlighted by John Talburt from the University of Arkansas at Little Rock, who says “As modern society becomes increasingly information driven, the capability and maturity of an organization to manage the quality of its information can mean the difference between success and failure” (Al Hakim, 2007). Business information systems typically rely on five basic resources which are as follows:

- People resources: this resource includes the users of an IS and those who develop, maintain, operate and implement the system.

- Hardware resources: the hardware resources not just include computers but also hardware like telephones, fax machines, switchboards, servers etc are all valid examples of hardware.

- Software resources: the software resources not only refer to computer programs and the media on which they are stored. Software resources also include the procedure used by the people to handle different business activities like instruction manuals and company policies.
• Communication resources: these resources are required to enable different systems and transfer data, in business process communication resources plays a vital role.

• Data resources: These include all the data that an organization has access to, regardless of its form. Computer databases, paper files and measurements taken by sensors on a production line are all examples of data resources. (Bocij, Greasley, Hickie, 2008).

Business information system is critical for staff that needs to coordinate their work with others, and it is also critical for the effective monitoring of performance and the exercise of managerial control, therefore BIS is essential for both internal and external activities of an organization. The effective performance of every activity in an organization relies on effective information system. Information systems are also needed for recording transactions between an organization and its environment and also for managing relationships with external stakeholders (Davies 2009).

Due to advancements in technology the business has to adopt new systems in order to keep up the pace with competitors the key ingredients for every BIS are vision, finance and patience during development and implementation of BIS. “Essentially, BIS center on a full understanding of information and knowledge that is derived from data” (Robert J, 2001). The huge amount of data available is waste, until it is utilized to generate some useful information and knowledge. “Data becomes business intelligence when it is in the hands of decision makers who know what to do with it” (Robert J, 2001). BIS comprises of different sub-systems and each of them performs different tasks such as analysis, comparison, presentation all these tasks together gives the company an edge over the competitors. Successful accomplishment of managing a growing enterprise requires very “creative” BIS in today’s global economy.

BIS have a strategic impact by reducing production costs and identifying the potential market segments and it also brings improvement in the services provided to the customers. According to (Kadiyala and Kleiner, 2005) there are new developments in the field of BIS some of those are;

• Geographical Information Systems (GIS)

• Inventory Management Systems (IMS)
• Warehouse Management Systems (WMS)

• Smart Chip Technology System (STS)

• Customer Relationships Management Systems (CRMS)

• Supply Chain Management System (SCMS)

• Transportation Management System (TMS)

• Electronic Commerce System (ECS)

• Electronic Data Interchange System (EDIS)

To address the issues of the main research question a deep study of the subject area business information systems (BIS) is very important. After understanding the core concept of this subject area we will be able to point out some actions for users’ satisfaction during implementation process of BIS, which will help us in finding some solutions for the sub-questions of this research. After studying BIS we got an idea about the technical and psychological problems during development and implementation of BIS, like in many organizations the selection of appropriate system and combination of some systems is very important to achieve the desired objectives.

3.7 Implementation of BIS

Rodrigo Manuel Oliveira (1999) says that the term implementation has different meaning depending on the context. In case of (BIS) the researchers and writers take special care while using the implementation term.

“The word implementation causes problems. To a programmer or software engineer, it means taking design specification and writing programmes. To an information system analyst it means taking the programmes and other components, and setting them to work in real world.” (Magalhaes, 1999)
Information system implementation is the procedures performed for completing the design in approved system design documents and to test, install and begin to use the new or revised information system. (Accounting Information systems 8e, Dull, 2009, Page: 628)

Implementation is a separate important Phase of Information system, which bring systems into working condition for organizations. BIS implementation is the process in which we have to take care for both programmes and the other components which have stack in IS for better results. It is a big issue to sort out these components. In today’s research work technical issues are counted but a very limited research work has been done for finding the psychological issues in IS implementation.

Some recurrent problems in IS project are capturing of requirements and system specification, unrealistic and unarticulated goals, dealing with project complexity, etc. These problems are often leading to systems with de-efficient support and usability for the required functionalities promoting users resistance in adopting them in fact some are abandoned without being used at all. (Gonçalves, Sapateiro, 2008).

The actions in system development are explained usually from the planning phase of project to the final delivery followed by the intermediate phases such as requirement analysis, design system, development, coding, implementation, testing and finally maintenance. Reliability is the important aspect we need to take concern in the system development process. The reason for Information system to come down in the minds of the public is due to the negative outcome from unreliable system. Thus, these kinds of negative effects for the professional in an organization will create unsecure environment and which will result in the failure of the system.

In the countries which joined EU recently the food safety standards are not good, to bring those standards high in Bulgaria they introduced a “food safety management system”, we will discuss some its factors during the implementation process. According to the initial research conducted by (Vladimirov 2011), “10.7% of the interviewed consumers shared that at least once in the last year they suffered from consuming unsalable food”, this situation is only founded in other new EU countries like Lithuania and Poland (Vesolovska, 2005). According to the research by
(Vladimirov 2011) the external factors concerning the implementation of food quality and safety management system are:

- Infrastructure and communication of the company
- Technology and traceability
- Information environment
- Competency
- Frequent inspections
- Official control

According to (Gonçalves, Sapateiro, 2008) the below factors should be taken in consideration for implementation process of information system.

1. The nature of work. (Quality, task specialization and temporal aspects);
2. The individuals (role identification, stress, perceived status, job satisfaction, and identity among others);
3. The organizational communications (communication efficiency, communication type between organizational levels, communication volume, job monitoring methods, and job perception);
4. The interpersonal relationships (social interaction quality and quantity, social reinforcement, number of sociometric relations and communication hierarchy);
5. The interdepartmental relationships (interdepartmental conflicts, cooperation, independence, and departmental limits);
6. The organizational structure and processes (physical limits and organizational adaptability).

(Gonçalves, Sapateiro, 2008)

The (Vithanage and Wijayanayake, 2007) describe the successful implementation in six aspects.
a. Individual characteristics of the system stakeholders.
b. Nature of the task they are performing.
C. Exposure to the technologies used in the system.
d. Internal organizational environment.
e. Implementation process specific factors.
f. External operational environmental characteristics.

In further studies they identifies through analysis the most prominent influential factors which guarantees the successful implementation of information systems are

- Attitude towards the information systems.
- Information intensity.
- IT maturity.

(Vithanage and Wijayanayake, 2007)

The diagram representation of the factors for implementation of information systems according to (Vithanage and Wijayanayake, 2007) is

![Diagram of Successful Large Scale Business Information Systems Implementation](image-url)

Fig: 7 Successful Large Scale Business Information Systems Implementation (Vithanage and Wijayanayake, 2007).

In BIS implementation defining these factors is much needed for better performance of an organization. Hurdles like departmental conflicts, stress acceptance by user and social
reinforcement can create problems. In perspective of Psychology, we will look into these issues and will find out the psychological problems which users can possibly face during implementation of BIS.

(Dull, 2009) took more simplistic and general approach to explain the phase of BIS Implementation. He considered the basics of designing, testing and installing during the BIS implementation process. While (Vithanage and Wijayanayake, 2007) describes the broad aspects of successful BIS Implementation process. In short (Dull) shows the boundary walls “Principles” of BIS Implementation and (Vithanage and Wijayanayake) added the key ingredients to make the BIS Implementation process a success.

3.8 Psychological theories

(Ned Kock, 2009) has argued that explanatory of evolutionary psychology is a fact which can underlay ideas related to the basic design of the brain, which can be a base for developing the fundamental explanations for behaviors. The statement of “Ned Kock” is referring towards explaining the problems in the information systems. If the nature of the problems is explained in its evolutionary methods, then users of information systems can make their mind to solve it in the independent environment.

“Evolutionary psychology also arguably holds the key to, many counterintuitive predictions of behavior towards technology, because many of the evolved instincts that influence our behavior are below the level of conscious awareness often those instincts lead to behavioral responses that are not self-evident to the individuals involved.” (Ned Kock, 2009) The above Psychological theory is referring clearly to the training within an information system. If good is the training better will be mind set of the users to the information system. Another important issue which is addressed by this theory is the psychological effects of technology which we have raised in our research questions. Technicality has their psychological effects within information systems.

Spink and Cole presented a theory of (Alexander, 1990b, p. 4) which like “Humans had in some unique fashion become so ecologically dominant that they in effect became their own principal
hostile force of nature, explicitly in regard to evolutionary changes in human psyche and social behavior” (Spink, Cole, 2007). Spink and Cole tell that there is qualitative difference in human brain as it is now and what it was in pre-human form. The evolution of human mind (human brain) is discussed in the above theories and it has tried to linked up with a system that how a human mind can evolve itself in an environment and tackle problems. Spink and Cole written the arguments of Alexander in his research work about the evolution and cognitive psychology of human brain like “Alexander (1990b) asks what sort of challenges could have caused the human divergence to accelerate in its later stages, He concludes that the divergence may have been due to the development of human socio-cognitive abilities. Alexander (1990b) defines socio-cognitive ability as an attribute or trait that is unique and unusual to humans. These socio-cognitive abilities, according to Alexander (1990b) led to human evolutionary physical adaptations such as menopause, concealment of ovulation and altriciality. These socio-cognitive abilities emerged and developed as humans evolved, allowing further selective human advantages due to these cognitive changes. Alexander (1990b) frames socio-cognitive abilities and human intelligence as a social tool and “the human brain has evolved in the context of social cooperation and competition. Physical changes to the hominid form were caused by the brain as a social tool to increase intra-group cooperation in competition with other groups. Hidden ovulation, hairlessness, and menopause--usually such radical adaptations occur elsewhere in animal world when animal entered new habitat (e.g., land to sea)” (Spink, Cole, 2007)  

Spink and Cole discussed relation between human cognitive psychology and information processing in the information systems. They argue that information processing is related to the work of humans’ cognitive architecture. They further explain the human mind and information by referring Buckland (1991), information has three type of impact on human mind: information as thing, information as knowledge and information as process. They told that Buckland (1991) believes that information as thing is a common conception of information and that information is additive and does not make any difference to thinking of the person receiving information. For information as process, they refer Brooks’ (1980), it is influential fundamental equation of information which modifies the knowledge structure who receiving the information. Knowledge structure provides a roadmap which subjectively interprets sense data in the environment.
Information as process is actually the definition of providing a frame work for transformation of sense data into information occurs. (Spink, Cole, 2007)

Human being is considered superior by his thought process from other creatures in the world. But the question is how to produce better thoughts? Cognitive psychology is defined as the science in which it is told that how the mind should be organized to produce better thoughts. The psychologists also agreed that there are serial bottlenecks in human information processing. These are the points at which continuing parallel processing of information is not possible. For example one cannot move his both right and left hand simultaneously to the right and to the left. The psychologist raised a question that, where that bottleneck lies in the information processing. The late selection and early selection theories were proposed depending on when the bottleneck takes place? (Cognitive psychology and its implication, J R. Anderson, 2006, P 73)

According to (J R. Anderson, 2006) the attention system’s selection of information for parallel processing is not possible. He centred his research work on the dichotic listening task. The researcher carried out an experiment where some people wear a set of head phone. They hear two different messages in each ear, and then they are asked to “shadow” one of the two messages. Most of them attend only one message and tuned out the other. Different psychologist have discover that very little information about unattended messages are processed in dichotic listening. The participant report that they were even unable to tell about the unattended messages whether it was a noise or human voice, male or female. Even they cannot tell about the language spoken in the messages, and they had got very limited information about the message. An analogy is often taking place between performing this task, for example in a cocktail party the guest pay attention to one message and tune out the other. The researcher support an early selection theory in this case where the information is selected before the message is undergone virtually in any processing. (Cognitive psychology and its implications, J R. Anderson, 2006, P74, 75) In main research question we have asked about the psychological factors which can affect the implementation of information system. The above mentioned studies highlighted some factors which can possibly affect the information system during implementation in business environment. We have talk about bottleneck, parallel processing of information and selection of
process during parallel process. These factors can cause issues to the users during processing of information in a business organization. The (J R. Anderson, 2006) discus issue of cognition when stimuli are attended to and encoded, the question which is raised is how to select the line of thought for pursuing? He explained the situation like when a person is driving and found a dog in the middle of road. So what he/she should do? Different taught comes to the mind in this case. For example whether to figure out why the dog is sitting on the middle of the road or we should help out the dog or certainly we should steer the car to avoid the accident? Can anybody do all these at once? If not, then how we select the important problem of deciding to steer car and save the rest for later? It concludes that people allocate central attention for competing line of taught is the same as people allocate perceptual attention for competing objects. It is further told in explanation that in many circumstances, people are able to pursue only one line of taught at a time. (Cognitive psychology and its implication, J R. Anderson, 2006, P 95)

Further study of (J R. Anderson, 2006) explains that the parallel stream of processes can occur. Within each and every stream one process can happen once at a time. This is called the potential problem in the case of central cognition stream because the author told that central cognition must be directed to all activities. In this case all the processes must be served. The author finds out a problem which is, taking longer time on the processing of the task. It is called a critical problem. In this case two things must be achieved for accomplishing the practice. First, participant should increase their tendency to pursue parallel streams. Second, the time required for achieving the central cognition should be decreased. This will eliminate the contention for the stream of process. The author has more focus on the bottleneck in central cognition. There can be bottle necks in any modalities. People cannot attend more than one location at a time. It is been concluded by author that “people can process multiple perceptual modalities at once or execute multiple actions at once, but they cannot think about two things at a once.” (Cognitive psychology and its implication, J R. Anderson, 2006, P 98, 99)

The impact of IS in business has increased. The alignment of business and Information Systems is believed to improve business performance. According to (Schneider, 1992) when making choices the people are sensitive to the way in which the options are presented. People’s
preferences among options were dependent on how those options were described. Different representations frequently elicited different preferences even though the objective outcomes remained the same from one representation to the next. (Schneider, 1992)

“According to prospect theory, risky decision making involves (a) an editing phase in which available options or prospects are coded to yield simplified mental representations and (b) an evaluation phase in which subjective outcome values and probability weights are psychophysically determined for each prospect and are integrated into a single prospect value”. (Schneider, 1992)

There are number of Psychological factors but we will consider the most important ones, which affects on implementation process. This subject area address the psychological effects and the user satisfaction level in implementing BIS which are the sub questions in the research works. Cognitive dissonance theory explains that, tension occurs when the consistency between a person’s attitude and behaviour is disrupted, motivating the individual to change the attitude or the behaviour to return to the state of consistency (Festinger, 1957). Therefore users, who were initially positive about the change and about working with the new information system, would become less favourably inclined in order to avoid potential disappointment. In accordance with cognitive dissonance theory, it is expected that both attitudes would become less positive if there is a delay in the implementation of the new business information system.

**3.9 Knowledge Management**

It is a process designed to capture and preserve the knowledge of an organisation both formally and informally. Organisation can create a program with assistance of IT department which can reduce the wastage of time for the knowledge by employees re-creating and re-learning the solutions to problems existed in past. Due to knowledge harvesting, the problems created by loss of experienced employee (IT Administrator) can be avoided. Gold, Malhortra, and Segars (2001) suggests that a knowledge infrastructure consisting of technology, structure, and culture along with knowledge process architecture of acquisition, conversion, application, and protection are essential organizational capabilities or “preconditions” for effective knowledge management. (Darroch & MaNaughton, 2002) The management of knowledge is frequently identified as an
important antecedent of innovation. Effective KM has been presented in the literature as one method for improving innovation and performance. While many studies have reported that KM as antecedents of innovation, none has explicitly examined the relationship between the two constructs. In some organisations employees can be afraid to contribute their share or even resist in some cases to share their knowledge, this can be tackled by offering rewards and also by showing the positive results for both organization and employees. For example a Xerox technician who received a standing ovation at a company conference because the technician has contributed many useful articles to Xerox’s Knowledge management system. Due to knowledge harvesting, Information system implemented will be understand and welcomed by most of employees, also before implementation the cost of training will be reduced. As we know that there are two major types of knowledge tacit and explicit according to this research paper by (Kyobe, 2010) they have created a model for knowledge transformation which consists of four stages which are: Socialization (tacit to tacit): In this stage the conversation of tacit to tacit knowledge is done through observation and practice, tacit knowledge is developed slowly through face to face interaction. Externalization (tacit to explicit): the experienced people articulate their tacit knowledge and transform it into explicit knowledge then share it with other inexperienced people. Combination (explicit to explicit): this is the process of combining existing explicit knowledge in order to generate a new explicit knowledge. Internalization (explicit to tacit): this is the process of understanding and organizing the explicit knowledge learnt by individuals and transferring it into tacit knowledge by creating their own models and ideas.
The knowledge harvesting is also affected by organisational culture, according to (Davenport and Prusak, 2002) there are four main aspects of organisational culture which increases information sharing. First is altruism, it is a general feeling of goodwill in which members of an organisation share their knowledge for goodness of the organisation, without expecting anything in return. Second aspect is Reciprocity; it is the belief that if one member of an organisation contributes useful knowledge then others will also contribute knowledge that helps that member. The third factor is repute; it is the belief by members of an organisation that contributing knowledge will improve their reputation within the organisation, which can lead to tangible benefits such as job security and bonuses. Trust is the final characteristic and it is considered the most important of the four, without trust all knowledge management efforts will fail. According to these four characteristics the knowledge harvesting can be well managed by introducing these in the organisational culture.
This subject area addresses the issues in the main research question and also describes some issues in the sub-questions of this research. The subject area knowledge management is itself an important factor during implementation of BIS and it is highlighting some other psychological and technical factors like job security, information security and technical training etc. This subject area tells about users’ satisfaction which is the main objective of the research. Due to knowledge management and sharing the Business Information system (BIS) implementation will be understood and welcomed by most of employees, because they will be educated from the very beginning of the system development process and also before implementation, the cost of training will be reduced. The knowledge management also plays a key role to make the mindset of the system users and make the innovation process smooth and steady.

3.10 Users Satisfaction

The users Satisfaction is a summary with other consumption emotions (Oliver, 1992). It is a judgment that a product or service feature, or the product service itself, provided a pleasurable level of consumption-related fulfilment, including levels of under or over fulfilment (Oliver, 1997). The literature review shows a wide variance in definitions of satisfaction. The lack of consensus made a limited contribution in users’ satisfaction research. Without a uniform definition of satisfaction, researchers are unable to select an appropriate definition for a given context; develop valid measures of satisfaction; users satisfaction researchers have agreed that these problems are pervasive and important (Schumann and Burns, 1994; Peterson and Wilson, 1992). We have concluded from our psychological part of study that user satisfaction plays a vital role in implementation of Successful BIS. “User satisfaction is a set of user beliefs about the relative value of an IS in terms of providing timely, accurate and easy to understand information to support his/her decision making” (Human factors in Information Systems by Carey, 1995 p228). We considered the consumer satisfaction research because it is somehow related in a sense like a new information system is also a product/service and the users are actually consumers of the new Information system. After doing the literature review of
consumers’ satisfaction, Users Satisfaction in different Information systems such as (HIS) Health Information System etc, we got an overview of the basic problem which will for sure help us in defining the level of users satisfaction and will also help us to identify the most important factors which influences the users satisfaction.

Fig 9: Framework of user satisfaction in IS (Human factors in Information Systems by Carey, 1995).

“The measurement of user satisfaction can be divided into two groups; the first group focuses on the measurement of overall user satisfaction, with little attention paid to its individual dimensions” (Human factors in Information Systems by Carey, 1995 p224). While the other group focus on a single dimension. User interface is very important aspect to be kept in mind while implementing business information system. Power distribution within an organization and individual characteristics of decision makers directly affects innovation and implementation process. According to CORPORATE EXECUTIVE BOARD (2003), research studies on the link between, the relationship of user (employee, customer) satisfaction, productivity and financial performance was began in 1980 when Benjamin Schneider conducted a survey of bank employees and customers. By studying previous researchers they have concluded that there is direct and quantifiable links between customer’s variables, employee variables (such as satisfaction, loyalty, enthusiasm, commitment, capability and internal quality of service) and
financial results. They argue that employee (user) is strongly related to their commitment and 
loyalty. And these two measures have proven relationships to productivity and retention. 
(CORPORATE EXECUTIVE B.O.A.R.D, 2003) The study shows the role of users’ satisfaction in 
both productivity and retention, and then the importance of user satisfaction in a Business 
organization is loud and clear. There for we put the user satisfaction subject in the 
implementation of BIS to improve the productivity and efficiency of users. “In “The Service 
Profit Chain” (1997), the authors proposed a model that workforce Capability, satisfaction, and 
loyalty would lead to customers’ perceptions of value. Value perception would lead to customer 
satisfaction and loyalty, which leads to Profit and growth. The study found that employee’ 
perceptions of their capabilities, Satisfaction and length-of-service were correlated with customer 
satisfaction”. (Corporate Executive Board, 2003)

They further taking the satisfaction of user by referring the model of Dr. Thomas Rollins of Hay 
Group. In this model they have talked that employee satisfaction result affect unit employee 
satisfaction which goes and affect the business unit financial results and which in turn affect 
company-wide financial metrics. The same model tells that company-wide financial may also 
affect the company-wide employee satisfaction. (Corporate Executive Board, 2003)

The study of users’ satisfaction in implementing BIS shows that a successful business 
organization should consider the users satisfaction while they are implementing their information 
system. This will help the organization in giving positive and efficient results.

3.11 Information Technology

In today’s life information technology is considered the most important thing for a successful 
business organization. It plays a vital role in efficiency and delivering tasks of the users. When 
technology comes to play a role in an organization, it is used by the users of organization directly 
for better performance. There for one should look after the needs of users while introducing the 
technology in implementing an information system within a business organization. One of the 
research question in our study is that “how are technical issues causing psychological problems 
for users?” There for the technical issues have considered in the implementation process of IS in 
a business organization. The (Chae, Yen and Sheu, 2005) have figured out the impact of IT on a
business organization when it is about to introduce or upgrade. According to them the IT effect is moderated through an existing inter organizational relationship is characterized in four dimensions. They mention trust, interdependence, commitment and information sharing.

Westbrook in his book write about the shifting of technology. As a final element, an organizational team can consider the major shift can be made by technology. He gives the example of libraries. If a change in the library system has taken place. But for the user fundamental changes in every nature of the library is yet to be made. In that case the team remembers that user has needs. For example, if the teachers want to access the library resources in their class rooms but they do not know about the technology which can make it possible. (Identifying and analyzing users needs, Westbrook, 2001, P 55)

3.12 Summary of theoretical findings

We have summarised the major findings after theoretical research, some aspects about implementation of business information systems that we have discovered during the literature study are shown below:

Sub question one:

*Which psychological factors are affecting users?*

The psychologists had told that there are serial bottlenecks in human information processing. These are the points at which continuing parallel processing of information is not possible. For example one cannot move his both right and left hand simultaneously to the right and to the left. The psychologist raised a question that where that bottleneck lies in the information processing. The attention system’s selection of information for parallel processing is not possible. He centred his research work on the dichotic listening task. The researcher carried out an experiment where some people wear a set of head phone. They hear two different messages in their each ear. Then they are asked to “shadow” one of these two messages. Most of them attend only one message and tuned out the other. (See chapter 3.10)

The parallel stream of processes can occur. Within each and every stream one process can happen once at a time. This is called the potential problem in the case of central cognition stream
because the author told that central cognition must be directed to all activities. In this case all the process must be served.

Knowledge management is a process designed to capture and preserve the knowledge of an organisation both formally and informally. Organisation can create a program with assistance of IT department which can reduce the wastage of time for the knowledge by employees re-creating and re-learning the solutions to problems existed in past. Due to knowledge harvesting the problems created by loss of experienced employee (IT Administrator) can be avoided. (See chapter 3.8)

The short listed factors which are creating psychological problems in BIS and which need to be resolve during implementation process are:

- Bottlenecks
- Weak interdepartmental relationship
- Weak knowledge sharing (Weak Knowledge management)
- Challenging the user independence
- Technical Factors of information system

Sub question two:

Which technical issues are causing psychological problems for users?

The impact of Technology on a business organization when it is about to introduce or upgrade the Business information system, the technology effect is moderated through an existing inter organizational relationship is characterized in four dimensions. They mention trust, interdependence, commitment and information sharing.

The shifting of technology as a final element, an organizational team can consider the major shift can be made by technology. He gives the example of libraries. If a change in the library system has taken place. But for the user fundamental changes in every nature of the library is yet to be
made. In that case the team remembers that user has needs. (See chapter 3.11) The technical factors which can cause psychological issues during implementation process are list as:

- Technology as a barrier in Direct communication for Users
- System Up gradation
- User Interface
- Data (System integration)
- System break Down
- Security (of system)
- System Latency
- System Failure

**Sub question three:**

*What actions can be taken to satisfy the user during implementation process?*

Some recurrent problems in Information system implementation are requirements capture and system specification, the users should be taken in confidence during implementation process by applying all their requirements and fulfilling their needs. We considered the consumer satisfaction research because it is somehow related in a sense like a new information system is also a product/service and the users are actually consumers of the new Information system. (See chapter 3.9 and 3.6) The nature work of user, the role, organizational communication, interdepartmental relationship, structure of organization and process are the key factors which should be taken in consideration in the BIS implementation process. The successful implementation in defining the Individual characteristics of the system stakeholders, Nature of the task they are performing, internal organizational environment and External operational environmental characteristics.
Sub question four:

*How can user satisfaction level be defined?*

The measurement of user satisfaction can be divided into two groups; the first group focuses on the measurement of overall user satisfaction, with little attention is paid to its individual dimensions”, while the focus of the other group is on single dimension. User interface is very important aspect to be kept in mind while implementing business information system. (See chapter 3.9).

User satisfaction is a set of user beliefs about the relative value of an IS in terms of providing timely, accurate and easy to understand information to support his/her decision making. After the literature review we also discovered a framework for user satisfaction in information system which is shown in (chapter 3.9). The users’ satisfaction level will be achieved if all the issues addressed in earlier chapters are dealt properly.

3.13 Arguments for an empirical study

The main reason for conducting empirical study is to verify the theoretical findings. The theoretical study has only answered some parts of the research questions; this is why empirical study is of great concern to address all the research questions adequately. As mentioned in (sub-question a) the psychological problems of users to solve this question we will perform observations of different systems. Empirical study is needed for finding the technical issues of the system which causes psychological problems for the users which addresses (sub-question c) and this will be find out through interviews. Users’ behaviour will be observed when they are facing psychological problems and on the basis of those observations, solutions to (sub-question c) will be suggested.
4. EMPIRICAL SURVEY

4.1 Purpose

The purpose of empirical survey is to find out the solutions for questions which are raised in theoretical part of research and to validate the results found during theoretical research. We are using qualitative research method, as we have noticed in our studies that in qualitative research the researcher mostly using empirical studies for testing their knowledge that they have gained form theoretical part of their study. We will use two parallel types of empirical studies for testing the knowledge, i.e. interviews and questionnaires. This will go parallel with each other. Harris & Brown (2010) told that structured questionnaires and semi structured interviews are used for getting confirmatory results, (Harris & Brown, 2010) there for we are conducting both of them in our empirical studies. (Adamson, Gooberman-Hill, Woolhead and Donovan, 2004) has argued and concluded in their research study at Royal Society of Medicine Press that by including standardized survey questions in the qualitative interviews can explore research issues and can also trigger the difficult and contested research topics. They have named the combination of these both as “Questerveiws”.

After conducting the empirical survey we will obtain the knowledge about the factors, both psychological and technical which is influencing implementation of business information systems users. We will also investigate some other problems during implementation of business information systems along with the psychological and technical factors. The important out come after conducting this empirical survey will be a practical framework for users’ satisfaction and which actions can be taken to increase the level of users’ satisfaction.

4.2 Sampling

As mentioned in chapter 2.3 we are doing sampling for empirical research especially for interviews to achieve high level of feedback which will assist us in solving the research questions. We are using qualitative data selection technique therefore for sampling we are using judgment sampling strategy which is also known as purposeful sampling. We will actively select
the most productive sample to answer the research questions; we will also develop a framework of the variables which might influences an individual’s contribution and this will be based on our practical knowledge of the research area. This is a more intellectual strategy than the simple demographic stratification of epidemiological studies, though age, gender and social class might be important variables, we considered the age and gender factors during the selection of samples for empirical survey. As our approach is qualitative so that’s why for questionnaire and interviews, we selected the university students who are new, so they will face more problems in using the information system, therefore they will provide us more detail answers about their problems and experience. We selected users in different business organizations who’s daily job duties are directly related with the information system and are also affected the most by the IS, so they can provide us information which they finds in daily routine.

The criteria for selecting business organizations is also based on qualitative strategy, we selected multinational organizations who are mostly interlinked via Information systems and the second criteria was the companies who have implemented or are going to implement new business information system recently, so we can observe the implementation process in great detail.

4.3 The Interviews

An interview is literally an inter-view, an inter change of views between two persons conversing about a theme of mutual interest (Kvale, 1996). The preparation of interview was based on the qualitative research interview strategy to obtain the real world results. We also kept in notice the central theme which is the research objective. The aim will be qualitative knowledge not quantification. First we studied some literature about qualitative interview conduction then we designed the questions for interview on the basis of research questions and selected the professionals in different multinational companies for conducting interview, and then we sent requests to the selected professionals for booking the appointments. As some of them were not available for conducting face to face interviews in the near future this is why we planned to conduct the interviews via phone or e-mail. We designed a thorough plan which will be followed to complete the interview process and achieve the desired objectives.
Most of the interviewees requested to keep their identities confidential on which we agreed, and then we requested them for recording the interview conversation via any digital recording device preferable mobile phone, luckily they accepted our request which will save our time and will also keep us away from a lot of hassle like taking notes and then writing them in fair form. In case of interviews via phone we took the notes and also recorded the conversation with their permission, while in case of interviews via e-mail the documentation was very easy because the interviewee sent us the answers in word file but through this medium we can judge the gestures and expressions of the person. Most of the material will be in text format but there is also some material in oral format which we are going to transfer in text format later, which will be easy during interpretation and analysis.

4.4 The first interview

The interviewee of interview is a user of business information system. The interviewee was representing the “Capgemini” Consulting, Technology and outsourcing multinational company as an assistant manager HR.

After introduction in e-mail, we asked the interviewee that “How is your organizational system for the flow of information?” The interviewee was looking somewhat satisfied from their organizational information system mentioning continuously the technology they were using. We asked further that “What are your feelings during work with other colleagues within the same system which you mentioned earlier?” he has highlighted some problems which were hitting feeling of the user in information system. According to the interviewee, inter organizational relationship between users for knowledge sharing was mentioned very weak. we further asked him that “If u has double state of work, for example when you have to handle two tasks at a time what do you do to finish work, and what problems does u face?” In reply the interviewee observes confusion state when he faced parallel stream of process during his work. He justified his concerns with different arguments. For example time for both process and the selection of one and ignoring the other one was his concerns. He actually wanted to set priority for the task to avoid the confusion state.
When we asked about training, he replied that he got training for his work in the organization but the most important thing was that he has only given the training for utilizing the technical resources. He was not taught about how to utilize the knowledge of other users, building interdepartmental relationships and mentioning the importance of different tasks. When we asked him that what is your concerns about the information system of your organization? The interviewee has clearly told that I do not know where decisions are made for changing the information system and who is responsible for making decision about the system.

The interviewee assumes that the decisions are made depending on budget, there for the stratification needs of user in an information system are usually ignored. And according to him it leads the motivation of users to low level.

4.5 The second Interview

The second interview we conducted was from a professional, working as “Accounts Analyst” at Phillip Morris International Service center Europe in Krakow Poland. As the appointment was booked in advance during the initial communication with the interviewee and the meeting was confirmed at 2 pm, on Thursday 9th December 2010 in his office. We arrived there 15 minutes earlier and informed him about the meeting through the receptionist in the meanwhile we checked recording device which we were going to use as recording device and we also checked the interview questions. After entering his office we introduced ourselves and asked if he is ready so we can start the interview as he agreed then we started by asking the first question, which was “What do you think about the implementation of new business information system in your company?” after thinking for a moment he started to answer “As after the testing phase we are using the beta version of the system so we can provide feedback before implementing the final version of the system. Generally the beta version seems to be very good, it has accounting and purchasing module for Finance departments and HR modules for HR department with option of sending internal mails. Overall the new Information System is very good as compared to the old Information system”. Then we asked the second question which was “Have you been trained to use the new business information system?” he responded very quickly to this question and said that “Yes there was three weeks training organized by Finance Applications Support Team
and IS Department Team. They taught all employees advanced functions concerning system; reporting, creating layouts and variants in public and private options.” Then we continued the interview and asked the next question which was “Have you been consulted for recommendations during implementation of information system in your organization?” he answered very calmly “Yes, each department was responsible for some analysis concerning the country for which it is responsible (my company is providing accounting services for companies in different countries). We were also consulting some changes and processes with IS department and Finance Application Support Team.” From his response we realized that interviewee is not expressing his feelings clearly, we noted this behavior on a paper then we asked the next question which was “Are you satisfied from your organization’s new information system and why?” Interviewee answered “At the beginning it was very hard but now I am very satisfied both from information system and from IS support concerning changes in the system. Information System in my company provides lots of useful modules which are very helpful in monthly reporting. Some transactions increase effectiveness of work providing “fast entry postings” or giving opportunity for posting large amount of bookings to the system in few minutes. It also helps with transferring the data to General Reporting System available in companies for which we provide services, thanks to which our customers always have finance statements available on time and can confirm/electronically sign it very quickly. It saves time, influences positively on the relation between company and customer it also increases work effectiveness and proves best accounting practices.” We were satisfied from this answer because interviewee expressed his feelings in detail, then we asked the next question which was “What kind of problems (bottlenecks) do you face when using the information system?” his answer was “After system upgrade one transaction didn’t work, But it was solved later after complaining to the IS department. Sometimes public layouts created by me can be easily changed by other users without asking for my permission, therefore when I want to use it next time I have to re-change it to the previous version.” we were running out of time so we continued asking the next question “Is there any technical factor which creates bad feelings during your work?” interviewee responded that “After changing the department because of security reasons old authorizations to some transactions are cancelled. They are not available even for viewing (without making
changes).” During this answer we noticed his gestures that how he feels due to this technical problem. Then we asked the final question of the interview “What changes will you recommend which makes you feel easy in organization’s information system?” the interviewee responded to this question after thinking for a while and said “More trainings concerning new transactions for all employees with explanation of whole process is important. If there are two or more options to retrieve the data from the system all options should be explained to employees not only the best one. Moreover, for bookings posted by MS Excel upload errors should be seen before posting not in the middle of creating batch. Test run is not showing all mistakes (e.g. Brand Family for some capex (investment projects) is not applicable for some accounts. System cannot find this mistake in test run, but it shows it after creating a batch to post).” After completing the interview we thanked the interviewee for his time and providing the useful information and then we left his office.

4.6 The questionnaire

Questionnaire is a part of qualitative research in the empirical studies. The preparation for Questionnaire is there for based on qualitative research. The objective of the questionnaire is to practice the assumption which we have made in the research questions in the real world. We studied the literature of qualitative research regarding questionnaire for extracting specific qualitative knowledge from working organizations about our research work. The questionnaire was based on the research questions and literature review. We have targeted different business organizations. The second thing was to target the employees who were the users of information systems in these organizations.

We have prepared a questionnaire according to our research questions. The main focus in questionnaire was to find out the factors/problems to the users which were creating psychological effects. We have put these questions in the questionnaire which were representing our research work. We have tested the questions of questionnaire on different people for evaluating the value and understanding about the aim. The questions for questionnaire were selected on the basis of our research questions. As we have mentioned before that our research work is all about the problems in an information system to the users. Problems of psychological effects on users in an information system are addressed in the questionnaire.
After all these preparation we visited to the target organization for completing the questionnaire. We introduce our selves to each respondent as students doing research work in our master thesis. We got positive response from most of the respondents. Most of them have their reservation on the privacy but we assure them for not disclosing their privacy. We present them out questionnaire in hard form and allowed them to think and take some time for completing the questionnaire with appropriate answers.

After completion of the questionnaire, we have putted all the hard form document of questionnaire in file for the record.

4.7 Empirical research results

As the empirical research was conducted by using different approaches like interviews and surveys were conducting through paper based questionnaires and also online survey but we mainly relied on the results from interview. The overall results of the empirical research are shown below:

Sub question one:

Which psychological factors are affecting users?

Business information system in an organization plays a vital role in the success and goals achievement, which is directly related to the users of the Business information system. Due to bottlenecks in the system the users are affected psychologically and that is why they lose their concentration and makes them less motivated which is an important psychological factor. When there is a parallel process going simultaneously then it confuses the users that which process should be handled first and which one should be ignored, if the user selects one process and handles it then he/she is still thinking about the other process and its impact on the work efficiency. This psychological problem drags the user motivation to low level which definitely affect the overall work efficiency of the user.

The other important issue we have discovered during the empirical research is that, when a task is bounded by time limit then it creates a lot of confusion for the users. The over results from
empirical studies for sub question is concluded in below mentioned problem for users during implementation of BIS.

- Bottlenecks
- Weak interdepartmental relationship
- Weak knowledge sharing (Weak Knowledge management)
- Challenging the user independence
- Technical Factors

The other important issue we founded during the empirical research is that, when a task is bounded by time limit then it creates a lot of confusion for the users.

Sub question two:
Which technical issues are causing psychological problems for users?

After the empirical research we discovered that security and privacy concerns cause more psychological problems. When a new function is added to the current system without concerning users then problems arises like, the users realises that someone else is changing the data or vomiting it from the system which was uploaded originally by them. These kind of technical issues creates psychological problems for the users and this is why they loss their motivation and trust on the information system. The technical factors which are creating psyche problems for users of information system are shown below. These factors should be handled at implementation phase in BIS.

- Technology as a barrier in Direct communication for Users
- System Up gradation
- User Interface
- Data (System integration)
- System break Down
- Security (of system)
- System Latency
- System Failure

Sub question three:

What actions can be taken to satisfy the user during implementation process?

Inter departmental relationship should be increased during implementation process of business information system which will result in knowledge sharing among the users from different departments. Tasks should be defined clearly and responsibilities for all the users should also be defined in great detail.

Sub question four:

How can user satisfaction level be defined?

After the empirical research we founded that it is hard to be defined the user satisfaction level, but if all the issues described in the above questions are addressed adequately then the user satisfaction level will increase automatically. The users satisfaction level can also be increased by providing more security and solving their privacy concerns.
5 Analysis and Result

5.1 Analysis

The results of the theoretical and empirical parts of the research are analyzed and compared with each other. The differences and similarities between empirical and theoretical research are identified and reviewed. As mentioned in chapter 2 we are using triangulation strategy to analyse all the data gathered from different sources such as text, interviews, surveys and observation. The final results are mostly presented through text but we have also used some models and diagrams to show the results where necessary, the detailed results are shown below:

Sub question one:

Which psychological factors are affecting users?

The bottlenecks like parallel processing, that parallel stream of processes can occur within each and every stream, only one process can happen at a time and also unclear tasks in business information system affects the users psychologically this is confirmed by the theoretical part of the study and also by the interviews. Users can process multiple perceptual modalities once at a time or execute multiple actions once at a time, but they cannot think about two things at same time, this was found during the literature study. These psychological factors affect the users’ motivation and their attachment with the system which can be reflected from their work progress.

The management of knowledge is frequently identified as an important antecedent of innovation. In many organisations employees are afraid to contribute their share or even resist in some cases to share their knowledge, this can be tackled by offering rewards and also by showing the positive results for both organization and employees, but in empirical part of the research we founded that the interviewees were satisfied from cooperation by other colleagues and also from the concern IT department. The literature study shows that knowledge management is the top psychological factor effecting users which is also proved by the survey, interview and observations but after deep analysis we found that knowledge management can be prioritised, but
still all of the psychological factors are needed to be dealt properly to make the implementation process smooth.

The theoretical part shows that users can be motivated through different techniques and theories but according to the survey users can be motivated in this specific scenario of implementing BIS by offering them a user friendly system, extra security measures and attract them with the help of system interface, this is also proved by interviews and observations. The survey also shows that there is always resistance to change and more than 85% of the users don’t welcome the new system. We assume that after dealing with all the mentioned factors the resistance by the users can be minimised up to a great extent.

Power distribution within an organization and individual characteristics of decision makers directly affects innovation and implementation process. The empirical research also proves that decision making and power distribution during information system development process plays vital role to satisfy the users and to motivate them for using the new information system. The theoretical research shows that inconsistency in users’ attitude and behaviour will need motivation to make their attitude positive, while users who were initially positive about the change and about working with the new information system, would become less favourably inclined in order to avoid potential disappointment. It is also expected that both attitudes would become less positive if there is a delay in the implementation of the new business information system. We have verified the psychological issues in implementation of BIS through empirical studies. And these issues were raised from research questions and theoretical studies.

- Bottlenecks
- Weak interdepartmental relationship
- Weak knowledge sharing (Weak Knowledge management)
- Challenging the user independence
- Technical Factors
The below diagram will show all the implementation problems for BIS in a comprehensive way.

![Diagram showing implementation processes of Business Information System](image)

Fig: 10 Psychological factors in Implementation Processes of Business Information System

The above model of the psychological problems is an inspiration of the study of the CAUSE & EFFECT DIAGRAM FOR THE LARGE SCALE INFORMATION SYSTEMS IMPLEMENTATION SUCCESS (Vithanage and Wijayanayake, 2007) model. The differences between both is, Vithanage and Wijayanayake shows a sequential flow of the over all system problems during the implementation phase while in our model we have shown the psychological effects creating factors. There is no sequence of the problems occurring in our model. It mean, these problems can affects psyche of the user any time at any stage of the information system, if they are not dealt properly during implementation phase of the business information system.

**Sub question two:**

*Which technical issues are causing psychological problems for users?*

The impact of Technology on a business organization when it is about to introduce or upgrade the Business information system, the technology effect is moderated through an existing inter organizational relationship is characterized in four dimensions. They mention trust, interdependence, commitment and information sharing. The theoretical findings of the research work tells technical problems can hit users psychology and which may leads users toward
dissatisfaction. The Factors are security issues of the technology which is been used by the users in a business organization. The feels that their work and monitoring is always exposed to the authorities which psychological keeps the users in pressure. This felt pressure affecting the user efficiency of doing tasks. They take extra care for everything, just because of these insecure technical factors in their eyes. It is also been learnt that when new changes comes into the system it feeling no good to the users.

In theoretical part of research we founded that there is impact of Technology on a business organization when it is about to introduce or upgrade the Business information system, the IT effect is moderated through an existing inter organizational relationship which is characterized in four dimensions which are trust, interdependence, commitment and information sharing. The theoretical review proves that, technical issues vary the trust level of users and it also affects the interdepartmental relationships and interdependence among all the users in the organization. The technical issues during implementation process of business information system also affect the commitment of users and information sharing. After the empirical part of the research we discovered that security and privacy concerns cause more psychological problems. When a new function is added to the current system without concerning users then problems arises like, the users realises that someone else is changing the data or vomiting it from the system which was uploaded originally by them. These kind of technical issues creates psychological problems for the users and this is why they loss their motivation and trust on the information system. In the survey we have put some question to find out the technical problems of users which were creating psychological problems to the users. As in the theoretical findings in surveys different users of information systems were have the concerns of security and up gradations of the information systems. This was a common issue which we have dug out from the both theoretical and empirical studies. The other thing was barrier of direct communication between users was a problem which was avoiding knowledge sharing and interdepartmental relationships. These were also because of the involvement of technology.

We have found and verified some technical issues regarding implementation of BIS which are causing psyche problems to users which are:
• Technology as a barrier in Direct communication for Users

• System Up gradation

• User Interface

• Data (System integration)

• System break Down

• Security (of system)

• System Latency

• System Failure

As in the below diagram we have made a sketch of the problem.

Fig: 11 Barriers between users and System.
The above model represents how technology is creating a barrier among the users and they cannot communicate directly among themselves. Due to this technological barrier the users cannot share knowledge with each other which creates lake of experience among the users and it also affects the interdepartmental relationship in the organization.

Fig: 12 Technical Issues Causing Psychological Problems during implementation of Business Information Systems

The above diagram shows some of the main technical issues which cause psychological problems for users in business information system. Each technical issue may cause one or more than one psychological problems.
Sub question 3

What actions can be taken to satisfy the user during implementation process?

The question raised in the above research is to satisfy user in the BIS implementation process for effective and efficient work. From both theoretical and empirical studies we have found that when there is a satisfied user, there will be effective results of information systems. The satisfaction of the users is directly related to their mind set toward the tasks they are performing. In theoretical findings we have learned that the tasks for the users should be defined in the beginning with their priorities and an interviewee in the empirical part of studies endorsed these assumptions made. The survey which we have conducted tells the whole story that we should define the process for each user to avoid the confused situation which will help the improving efficiency of users. If the tasks priority is left on hold then selection of tasks will create confusion in the mind of users which will results in bottlenecks. The first action which is needed to be taken is to avoid bottlenecks in the information system of a business organization for users’ satisfaction and better efficiency.

The theoretical part of the research tells us that inter departmental relationship plays a vital role in the satisfaction of users. The interviewee was 100% agreed with this phenomenon. We have studied and observed from theoretical and empirical studies that more the users of information systems interact with each other more knowledge they will gain about their system which leads them toward a satisfied tasks performing mind. In the literature we have found the barrier in knowledge sharing is observed, which is the technology used in the information systems. The interviewee was agreed. The personal experiences of experience users can not contribute with the other users. This issues needs to be resolved for gaining the satisfaction of users. The second action which should be taken for satisfaction of user is to deal with technology in a way which does not affect the interdepartmental relationships.

The surveys and interviews clearly told us that Independence in the task performing should be given to the users in an organization. This issue is related with psychological satisfaction of users. In this case the user utilizes his/her line of taught and self experience in the confusion state
where he/she faces the parallel streams of processes. The users should have the authority to deal the stream of processes with their own logic this will give them more satisfaction during performance.

**Sub question four:**

*How can user satisfaction level be defined?*

The theoretical part of the research shows that measurement of user satisfaction level can be divided into two groups; “the first group focuses on the measurement of overall user satisfaction, with little attention is paid to its individual dimensions”. The other group focuses on single dimensions individually.

User satisfaction is a set of user beliefs about the relative value of an IS in terms of providing timely, accurate and easy to understand information to support his/her decision making. After the literature review we also discovered a framework for user satisfaction in information system. The users’ satisfaction level will be achieved if all the issues affecting users are dealt properly.

According to survey 65% of users are less satisfied, 30% are very satisfied and 5% of users are dissatisfied from the information system, after comparing this with interviews, observations and theoretical data we noticed that satisfaction level varies in different companies but mostly the users are not happy after implementing a new BIS.

After deep study and analysis we discovered that satisfaction level is directly related with motivation and motivation can be achieved by providing more security, knowledge sharing, strong interdepartmental relationship and independence during task performance. This analysis is proved by theory, survey, interviews and observations.

**5.2 Summary of Results**

The implementation of business information system is a complex process in which different issues influence the whole process. We have carried out research work on the psychological issues influencing the user satisfaction in implementation process. The result which we got from
the theoretical studies and empirical findings highlighted the psychological factors and its created issues. We have found that parallel process in business information systems creating bottlenecks which lead the user to the unclear finishing of work. The research work shows that satisfaction of the user is directly affected by the interruption. The independence in task performing gives user more satisfaction which increases both motivation and attention of user toward better performance.

In our research work we have found some technical factors which needs addressed in the implementation of business information system to avoid the psychological effects on users. We have found in both theoretical and empirical studies that security feature of the technology is a major problem which is always in the mind of users. Users have also shows concern about the privacy in technical system. We learned in the research work that system upgrading, system failure and user interface also hits the minds of users.

The satisfaction of the users is directly related to their mind set toward the tasks they performing. The result of our research work show that during implementation the tasks of the users should define in the beginning with clear priorities for better performance and satisfaction of users. We have suggested that to get the above desired result and to satisfied user, bottlenecks should avoid in the beginning of implementation process. Interdepartmental relationship should consider in high priority for user satisfaction. This will help to share the experience of experienced users with other colleagues. Independence in the task performing should be given to the users. This action will increase the level of satisfaction of users.

Users satisfaction is a set of users believes and attitudes which comprises of different individual elements. Users’ satisfaction can either be measured as overall, with little attention to its individual dimensions, or it can also be measured on the basis of individual elements with focus on creating overall picture in the end.
6 Discussions

6.1 Conclusions

The research work has found and showed the psychological effects and its factors in the implementation process of the business information systems. We have learned the importance of the user satisfaction in the business information systems. Both directly effecting factors and the technological factors which were creating psychology problems to the users are find out. Suggestions for tackling these factors to avoid problems are suggested for solution.

In the complexity of BIS implementation user can face different psychological problems. One of them is unclear stream of parallel processes. If the processes are unclear it can lead the user to a confusion state which further causes bottlenecks. This is a psychological problem to the user which we have found in our research work through theoretical and empirical studies. Our suggestion for avoiding the issue of bottlenecks is by clearly defining the process and setting them with priority in the beginning of implementation process of BIS. Another psychological problem of users which we have notice trough our studies is interruption in the task performing to the user. Challenging the independence of users drags their satisfaction to a very low level. The user should let to use their own line of taught for handling the tasks.

In the research work it has been concluded through theoretical and empirical studies that there some technical factors which influence the user psychology in the business information systems. The security and privacy while dealing with technology in an information system create the psychological concerns in the mind of users. There for we have concluded that technology should be utilized in way which gives more satisfaction to users. There for in the beginning of implementation process of BIS this factor should be tackled very effectively to avoid dissatisfaction. We have noticed some other technical features of information systems that need to clear. For example Interface, system irregular behavior, latency and upgrading system can possibly cause psychological effects of users.
In the research work we have find that the satisfaction of user deal with tasks they are performing. More clear the tasks high the satisfaction level. We have concluded that in the beginning of implementation process of BIS the tasks for user should defined clearly with priority level. We have found that if the bottlenecks are avoid in the beginning of implementation process the psychological effects will decrease and the satisfaction of users will increase. The interdepartmental relationship also plays a vital role in increasing the satisfaction level of users. In the empirical part of our research work we have found that where ever the users of information systems have good interdepartmental relationships, they are at good satisfaction level. There for we have conclude from our studies that more effective the interdepartmental relationships helps in knowledge sharing within the users of information system.

Our research work defines and concluded the satisfaction level (measuring) of users as “satisfaction can either be measured as overall, with little attention to its individual dimensions, or it can also be measured on the basis of individual elements with focus of creating overall picture in the end.”

**6.2 Implications for Informatics**

Informatics can be regarded in a rationalistic relationship between the user and the developer practices. The implication of our result for the user practice is an influence on the business organization. The result shows that creation of both formal and informal relation should be encouraged between the users and developers. In the overall process of business information system development the users are ignored mainly, they are only considered at some phases like testing and implementation. One interviewee believed that considering their suggestions in the whole business information system development process will bring the developer and users’ closer and this will also helps in achieving the main objectives.

The implications of the results for developer practice are that interface should be kept in focus when designing the system and the technical issues should be avoided completely to gain the desired results. During designing the user interface should be tested on regular basis to remove
all the flaws and the users’ feedback should be considered seriously, which will provide the best outcome in the end.

Another implication for the developer practice is that, they may priorities some process by settings when there is option of selection during two parallel processes. This will eliminate the state of confusion among the users of business information system and will also clarify their tasks. Another important implication for the developer practice is that they may start planning for the implementation of business information system from the very beginning of the development process because there is opportunity for detailed and proper planning due to availability of extra time. After availing this opportunity the developer will be able to plan some extra ordinary tasks which were not possible before due to lake of timing. The implication for user practice is knowledge sharing with colleagues both intra-departmental and inter-departmental which will make them easy to understand the business information system and its complexities. This will also make the users mentally ready to accept the business information system.

6.3 Method evaluation

In theoretical part of the research main intention of text analysis was to find relevant possession in different subject areas and relate these in the context of business information system. The first important task was selection of relevant subject areas, after this step it was possible to relate it with relevant research questions and elaborate previous research and existing theories. The first major difficulty we faced was selection of most appropriate subject area. We also studied some literature in subject areas which were outside the boundary but it was difficult to combine some theories and results, which may also result in misconception sometimes that is why we avoided out of boundary subject areas up to some extent. We tried to study the most recent literature to find out up to date concepts, the literature studied was from different parts of the world with not any focus on specific countries or region and most of the literature was either written originally in English or was translated in English. The Previous research about our specific topic is not done in great detail and number but we also overviewed other relevant research areas such as; information system, human information system and management information systems.
The basic reason for the empirical research was to investigate the uncovered area about the research question during theoretical findings and to validate and compare the concepts identified during theoretical research. In the empirical research we mostly relied on interviews but we also conducted some surveys to gain general idea about the research questions. The interviews were conducted from professionals working in multinational companies and using information system on regular basis during their daily job routine. Another criteria for interview selection was companies who were about to implement or upgrade the current information system, luckily we found few companies who were fulfilling all of the above criteria’s.

We started the interviews with an open introductory question: “What do you think about the implementation of new business information system in your company?” this introductory question led to detailed description of the implementation process. To achieve the maximum answers about the research question I tried to ask closed and direct questions but sometimes the interviewee perception was different.

After asking the next question: “Is there any technical factor which creates bad feelings during your work?” During the answer I noticed his gestures that how interviewee felt due to this technical problem. I observed some non verbal communication during the face to face interviews which was not possible during the interviews conducted via phone or internet.

The difficult part in the research was searching for interviewees who were fulfilling the criteria and then making them to agree for being part of the research. Generally the interview conduction was very good for validating the theoretical findings and the information achieved during interviews was very helpful to answer the research questions.

We also conducted a survey from a sample to obtain some general view about some of the main points in the research questions; the survey was helpful up to some extent.

6.4 Result evaluation

In chapter 2 we have discussed the hermeneutics approach for our qualitative research studies. As we know that qualitative research work has major part of text analysis, there for we have chosen hermeneutics criteria for text analysis. The hermeneutics approach for qualitative method of research makes the target groups (research observers) to assume the truth to get the result of
the research work. We have found some assumptions in the theoretical studies and then prove it through surveys and interviews. This method as we have described in chapter 2.5 helps us to get to the target point of our research works. We have related our research work with other researcher knowledge. There are some similarities and some dissimilarity because of the wide range of knowledge area. As Anna Lind discuss the criteria that when and how to relate the arguments of research are kept on hold and to relate, the same criteria we have tried to follow in the hermeneutics approach for our research work.

As mentioned in chapter 2.4 we have also used triangulation method to achieve comprehensive results, for this we made the research questions as the basis. Then we noted each and every point which is explained in text (theoretical research) but in practice via interviews and observations (empirical) the point was not valid. We also compared the results of qualitative research (Survey) with quantitative research (Interviews) to validate the findings of theoretical research. For example the issue knowledge management from theoretical point of view is well handled but after empirical research we noticed that most of the employees do not share the secret knowledge with co-workers. Therefore by comparing each and every point on the basis of research question we have derived solid points to answer the main research question.

The importance of following ethics in the research work cannot be ignored and discipline is needed in the research studies. Fabricating the knowledge from empirical studies can definitely influence the results of the research work. This should be considered as unethical action in the research work. Researcher must avoid using different points to the same concept without any context to the research work. As far as our research work is concerned we have used the term “Psychological Factor” and “BIS Implementation “which creates new thinking in the information systems implementation process. We have carried out the empirical research work in the most common language (English) without any scientific flaws. Concluded research work in our studies is purely based on the theoretical studies and empirical findings. The conclusion explicitly shows the studies and our findings to the point of focus. We took good care of ethical values in the interviews. We have presented both theoretical and empirical work with honesty in the research work.
6.5 Generalizing Possibilities of research work
The research study is carried out using different literature of the researcher in the field of information systems, business information systems and cognitive psychology. We have used this literature as a base for our research work and guidance for the empirical studies. In the empirical studies we have collected data related to our research work from the real world (companies) using interviews survey and questionnaires. Through these sources of information (theoretical and empirical) we have found the factors which were influencing the user psychology in the business information systems and were causing problems for users. Our research work is from selected sources and we have visited limited number of companies for empirical study but our findings have implication in the whole field of business information systems. Because each and every Information System has the same factors which influence the users. The research work can be applied in health information system, management information system.

6.6 Ideas for continued research
The information system failure is an important problem for both private and public sector since the advancement of Information technology. The rate of failed business information system is much higher than the successful systems. In the theoretical part of the research we investigated many psychological factors affecting users of the system which can decrease the rate of failed business information system but further research is required to investigate the elimination process of those factors and make a comprehensive framework which will assure successful implementation of business information system.

Our empirical study found some important psychological and technical factors which are affecting users’ satisfaction and how those factors can change the level of users’ satisfaction but further more comprehensive empirical study may also investigate the specific factors with direct relation to satisfaction level and it can also distinguish the most important factors which may provide complete satisfaction to the users.
References:


5. Michael, D. Myers., 2004, Qualitative research in information science, pp.1-5.


15. Dirk, J. Van., 2004 Human resource management practices in selected Ethiopian private companies, pp.2-7


Appendix

Interview Structure

1. How long have you worked with this company?

2. Could you describe your organization and your job duties?

3. How is your organizational system for the flow of information?

4. What do you think about the implementation of new business information system in your company?

5. What are your feelings during work with other colleagues within the same system which you mentioned earlier?

6. If you have double state of work, for example when you have to handle two tasks at a time what do you do to finish work, and what problems do you face?

7. Have you been trained to use the new business information system?

8. Have you been consulted for recommendations during implementation of information system in your organization?

9. Are you satisfied from your organization’s new information system and why?

10. What kind of problems (bottlenecks) do you face when using the information system?

11. Is there any technical factor which creates bad feelings during your work?

12. What changes will you recommend which makes you feel easy in organization’s information system?”
The results of survey findings are shown below:

Survey about Implementation of Business Information System

<table>
<thead>
<tr>
<th>Task</th>
<th>count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Started</td>
<td>61</td>
</tr>
<tr>
<td>completed</td>
<td>18</td>
</tr>
<tr>
<td>Cancelled</td>
<td>43</td>
</tr>
<tr>
<td><strong>Completion %</strong></td>
<td><strong>29.5%</strong></td>
</tr>
</tbody>
</table>

1. What is your overall satisfaction rating of the current Information System?
   - Very Satisfied
   - Somewhat Satisfied
   - Neither Satisfied nor Dissatisfied
   - Somewhat Dissatisfied
   - Very Dissatisfied
2. How do you handle the problems using new Information System?
   - Easily handle the problem
   - The problem create other problems
   - Quit the system
   - Quit the system

3. How do you handle the technical problem using new Information System?
   - Try to solve it yourself
4. How can we motivate the user during implementation of business information system?

- The system should be User friendly
- By providing more security
- Easy to handle & understand
- Use attractive visuals
5. Which factor is more important to you during implementation of Information system?

- Training
- Security
- Knowledge
- Motivation
- All of the above
6. Do you suggest changes in the existing system to satisfy end users?
   - Yes
   - No

7. Which kind of problem are you facing in the information system?
   - Interface
- Technical problem
- Security
- Need to be more integrated system
- More logical
- All of the above

8. Were you consulted for recommendations during implementation of information system?
   - Yes
   - No
9. If yes then what were your recommendations about?

- Functionality
- Design
- Technicality
- Other
University of Borås is a modern university in the city center. We give courses in business administration and informatics, library and information science, fashion and textiles, behavioral sciences and teacher education, engineering and health sciences.

In the School of Business and Informatics (IDA), we have focused on the students' future needs. Therefore we have created programs in which employability is a key word. Subject integration and contextualization are other important concepts. The department has a closeness, both between students and teachers as well as between industry and education.

Our courses in business administration give students the opportunity to learn more about different businesses and governments and how governance and organization of these activities take place. They may also learn about society development and organizations' adaptation to the outside world. They have the opportunity to improve their ability to analyze, develop and control activities, whether they want to engage in auditing, management or marketing.

Among our IT courses, there's always something for those who want to design the future of IT-based communications, analyze the needs and demands on organizations' information to design their content structures, integrating IT and business development, developing their ability to analyze and design business processes or focus on programming and development of good use of IT in enterprises and organizations.

The research in the school is well recognized and oriented towards professionalism as well as design and development. The overall research profile is Business-IT-Services which combine knowledge and skills in informatics as well as in business administration. The research is profession-oriented, which is reflected in the research, in many cases conducted on action research-based grounds, with businesses and government organizations at local, national and international arenas. The research design and professional orientation is manifested also in InnovationLab, which is the department's and university's unit for research-supporting system development.