

**AN ANALYSIS AND DESIGN OF ORGANIZATIONAL
MIS MODEL USING IT**

A Thesis

Submitted towards the Requirement for the Award of Degree of

DOCTOR OF PHILOSOPHY

IN

COMMERCE

Under the Faculty of Commerce

By

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Under the Supervision of

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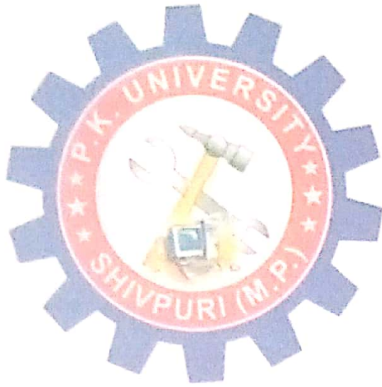
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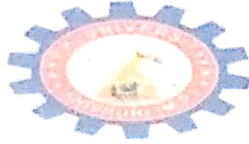


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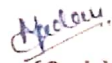
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ABSTRACT

In today's fast-paced and dynamic business environment, organizations rely heavily on effective Management Information Systems (MIS) to facilitate decision-making processes, enhance operational efficiency, and gain a competitive edge. This abstract presents an overview of the analysis and design process for developing a computer-based MIS model using Information Technology (IT) within an organizational context.

The analysis phase involves a comprehensive examination of the organization's structure, processes, and information needs. This phase aims to understand the current state of the organization's information flow, pinpoint areas of inefficiency or redundancy, and uncover opportunities for improvement.

Following the analysis, the design phase focuses on conceptualizing and structuring the MIS model based on the gathered requirements. Utilizing IT tools and methodologies, such as data modeling, system architecture design, and user interface prototyping, the MIS model is crafted to align with the organization's objectives and enhance decision-making capabilities.

Key considerations in the design process include selecting appropriate hardware and software components, establishing data security measures, defining system integration requirements, and outlining implementation and maintenance strategies.

The proposed computer-based MIS model aims to centralize organizational data, streamline information flow. By harnessing the power of IT, the MIS model offers the potential to transform raw data into actionable intelligence, enabling the organization to adapt quickly to changing market conditions and capitalize on emerging opportunities.

In conclusion, the analysis and design of a computer-based organizational MIS model using IT represent a strategic initiative to enhance organizational agility, productivity, and competitiveness in today's digital age. Through a systematic approach to understanding requirements and leveraging technology effectively, organizations can unlock the full potential of their information assets and drive sustainable growth and innovation.

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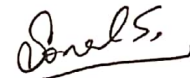
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CONTENTS

List of Publications	I-V (Own)
List of Figure	VI
List of Tables	VII
List of Abbreviations	VIII-IX
Notations Used	X
CHAPTER - 1 INTRODUCTION	1-25
1.1 Introduction	1
1.2 Information System concepts	4
1.3 Research Motivation & Objectives	12
1.4 Baidyanath Profiles	13
1.5 Organization of thesis	24
CHAPTER - 2 LITERATURE REVIEW	26 -50
2.1 Introduction	26
2.2 Survey of Literature	29
(a) IT Paradigm and IT Metaphor	34
(b) Metaphor of 1 st IT paradigm	40
(c) Metaphor of 2 nd IT paradigm	40
(d) Metaphor of 3 rd IT paradigm	41
(e) Metaphor of 4 th IT paradigm	42
2.3 Outcome of Study	42
CHAPTER - 3 CASE STUDY AND EVALUATION:	51-83
3.1 Data model	51
3.2 Methodology	57
3.3 Analysis	58
3.4 Architecture Model	79
3.5 Conclusion	82

CHAPTER - 4 FINANCIAL INVESTMENTS AND RECOVERY 84-91

4.1 Introduction	84
4.2 Direct Saving	85
4.3 Indirect Benefits	85
4.4 A Practical Approach: Cost Benefit Analysis	86
4.5 Graphical Representation	90
4.6 Conclusion	91

CHAPTER - 5 DATA BASE SECURITY ARCHITECTURE MODEL

	92-108
5.1 Database Security	93
5.2 Network Security	95
5.3 Operating System Security	97
5.4 General Security	98
5.5 Disaster Recovery Plan	104
5.6 Conclusion	108

CHAPTER - 6 CONCLUSION & FUTURE WORK 109-120

REFERENCES	112-117
ANNUAL REPORT & BOOKS	117
OTHER REFERENCES	117
APPENDIX	118-120

List of Publications (LOP)

List of Figures:

Title	Page No.
Relationship Model	56
Inventory DFD	60
DFD for Purchasing	61
DFD for Sales	62
DFD for Payroll processing system	66
DFD for OAS	68
DFD Product Manufacturing & Computer Role	70
Basic Architecture of Company Database	79
Homogeneous Distributed Data Processing System	81
Five Years Cost Benefit Graphical Representation	90
Data Security Layers	92
Encryption Process	96
Good Security Measures	101
Access Control Pictorial Representation	103

List of Tables:

Spender's Topology of Uncertainties	33
IT Paradigms and Metaphor	36
IT Paradigms	39
Uncertainty types and Organizational Response	44
Customer's Detail	52
Product Supply Chain Management & Therapeutics Uses	73
1 st Year Cost Benefit Analysis	88
2 nd Year Cost Benefit Analysis	88
3 rd Year Cost Benefit Analysis	89
4 th Year Cost Benefit Analysis	89
5 th Year Cost Benefit Analysis	90

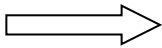
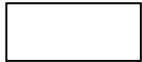
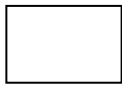
List of Abbreviations:

CBIS	Computer Based Information System
MIS	Management Information System
AIS	Accounting Information System
OAS	Office Automation System
DFD	Data Flow Diagram
EDI	Electronic Data interchange
EDP	Electronic Data Processing
TDA	Top Down Approach
LAN	Local Area Network
IT	Information Technology
IS	Information Systems
CBIIS	Computer Based Inventory Information System
IIS	Inventory Information System
PPS	Payroll Processing System
EIS	Executive Information System
H/W	Hardware
S/W	Software
N/W	Network
DSS	Decision Support System
WWW	World Wide Wave
TPS	Transaction Processing System
IOS	Inter Organizational System

GDSS	Group Decision Support System
R&D	Research and development
ESS	Executive Support System
ES	Expert System
EDS	Expert Database System
ANN	Artificial Neural Network
ISS	Information Support System
CS	Computer Science
SE	Software Engineering
PAS	People, Activities and System
CIO	Chief Information Officers
BPR	Business Processing Reengineering
ERP	Enterprise Resource Planning

NOTATIONS USED:

SYMBOLS



FUNCTIONS

Data Transformation

Temporary Data Storage

Permanent Data Storage

Data Flow

CHAPTER-1: INTRODUCTION

1.1 Introduction:

With reference to an International Journal of the Institute for Operations and the Management Sciences, it is been investigatated Bodily's [1986] conjecture that the spreadsheet medium could be used by the users to solve Management Science Problems and to improve decision-making. But, according to volume 26 of above mentioned Journal Londa Leon, Zbigniew Prazasnyski, Kala Chand Seal Department of Finance and computer Information Systems. College of Business Administration. Loyola Marymount University, 7101 W.80th Street Los Angeles, California 90045 Have found in their investigations that users are solving management Science problems using spreadsheet, especially who are already spreadsheet experts. Management Science Models developed in spreadsheet can be found across many functional areas of business, through in varying degrees. Some functional areas still prefer traditional methods for implementing management

sciences tools, while other areas, which are well known for using the spreadsheets environment, show more use of spreadsheets in accomplishing such tasks. Overall, there appears to be a growing acceptance of spreadsheet in management sciences modeling.

However, possible following limitations of a spreadsheet implementation addressed in the survey were the inadequacy of spreadsheet to handle large applications which becomes the basic reason of uncertainty occurrences

[LOP/International/01/02]

- a) The lack of computational speed.
- b) The limitation of spreadsheet in handling complex logic.
- c) The need for excessive macro writing.
- d) The need for the applications to be linked with other external modules.

The majority of users feel that the main limitation of spreadsheet in their present form are their inability to handle complex applications, their lack of computational speed, and

the need for excessive amount of programming or macro writing.

Finally research candidates asked the respondents in their survey to indicate if they felt that a spreadsheet implementation would have improved some aspects of their non spreadsheet applications. None of the users think that spreadsheet would have provided the better interactive environment or would have helped in getting better presentation quality of the solution.

This may be stem from the fact that computing environment in general, especially in PC-based applications, is getting more user friendly, the interfaces are becoming easier to learn and use , and almost all of the applications developed nowadays features pull-down menus, on line help facility and easily obtainable outputs.

Spreadsheet no longer retains exclusive rights to the interactive environment, to good presentation quality or to easy ways of obtaining outputs. Future research in this direction needs to be carried out.

Traditional Approach:

Different types of information are needed by people at different levels in an organization. MIS is a network of computer based data processing procedures developed in an organization and integrated as necessary to provide timely and effectively information to support decision making. An MIS can help improve managerial planning by giving managers (a) Faster signal of problems, (b) More time to devote to planning, and (c) The ability to evaluate more alternatives.

1.2 Information System: Concepts

Management has been defined in a variety of ways, but for our purposes it comprises the processes or activities that describe what managers do in the operation of their organization: Plan, organize, initiate, implement and control operations.

They plan by setting strategies and goals and selecting the best course of action to achieve the plan. They organize the tasks necessary for the operational plan, set these tasks up into homogeneous groups, and assign authority delegation. They

control the performance of the work by setting performance standards and avoiding deviations from standard.

Data must be distinguished from information and this distinction is clear and important for our purpose. Data are facts and figures that are not currently being used in a decision process usually take the form of historical records that are recorded and filed without immediate intent to retrieve for decision making.

A system can be described simply as a set of elements joined together for a common objective. A system is a part of larger system with which we are concerned. All systems are parts of larger system. For our purpose the organization is the system, and the parts (division. Departments, functions, units, etc.) are the subsystem .

The system concept of computer based MIS is to optimizing the output of the organization by connecting the operating subsystems through the medium of information exchange.

Importance of MIS :

- MIS supports decision making in both structured and unstructured problem environments.
- MIS supports decision making at all levels of the organization.
- MIS are intended to be woven into the fabric of the organization, not standing alone.
- MIS supports all aspects of the decision making process.
- MIS are made of people, computers, procedure, database interactive query facilities, and so on. They intended to be evolutionary/adaptive and easy for people to use.

Frame Work of M.I.S.:

1. Management information system may be defined as a formal method of making available to management the accurate and timely information necessary to facilitate the decision making process and enable the organization planning, control and operational functions to be carried out effectively.

2. Conceptually a management information system can exist without computers, but it is the power of computers which makes MIS feasible.
3. Organizations have always had some kind of management information system even if computerized MIS was not recognized as such. In the past, these systems were of a highly informal nature in their setup and utilization.
4. Not until the advent of computers, with their ability to process and condense large quantities of data, did the design of computerized MIS.
5. Now-a-days the question is not whether the computer should be used in Management information system, but the extent to which information use should be computerized.
6. The computerized system provides information on the past, present and projected future and on related events inside and outside the organization.
7. The purpose of MIS is to aid decision making and not to automate the decision making process itself. Secondly MIS

should focus only on those decisions whose benefit/cost ratio is attractive.

8. When computers were first introduced into organization they were used mainly to process data for a few organizational functions usually accounting and billing. As the speed and ease of processing data grew other data processing and information management tasks were computerized.
9. The growth of EDP departments spurred managers to plan their organization information systems more rationally. These efforts led to the emergence of the concept of computer based information systems (CBIS), which became better known as Computer based MIS or simply MIS.
10. Recent advances in computers have made it possible for EDP/MIS experts, and then for managers, to gain on-line or real-time access to data based in CBISs.
11. The near future will witness the widespread use of expert systems using artificial intelligence to diagnose problems, recommend strategies to revert or solve these problems. In

effect, the expert systems acts like a human expert in analyzing unstructured situations.

12. An MIS is a network of computer based data processing procedures developed in an organization and integrated as necessary to provide timely and effective information to support decision making.

Topology of Computers Based MIS:

1. To provide the desired information available in the right form at the right time.
2. To supply the desired information at a reasonable cost.
3. To keep the information up to date.
4. To store important and confidential information properly.
5. To increase the productivity and efficiency of the respective organizations.
6. To regularize and maintain disciplinary systems of work.
7. To explore and project changes of future developments.

These are the properties for economic reasons:

1. Accuracy: Accuracy is the ratio of correct information to the total amount of information produced over a period.

2. **Timeliness:** Timeliness is another important information characteristic. It's of little consolation to a manager to know that information that arrived too late to be of use was accurate.
3. **Completeness:** Most managers faced with a decision to make have been frustrated at some time by having supporting information that's accurate, timely – and incomplete.
4. **Conciseness:** Many traditional information systems have been designed on the assumption that lack of completeness is the most critical problem facing managers.

Definition: A Management Information System is

- An Integral user machine system.
- For providing information.
- To support the operations, management analysis and
- In an organization.

The System Utilizes

- Computer hardware and software.
- Manual procedures.

- Models for analysis, planning control and decision.
- A database.

1.3 Research Motivation and Objectives:

Many managers began to realize that they were not able to cope with rapidly changing conditions merely by using the routine reports that their traditional systems were producing. Their information did not possess the properties mentioned above, and it was no longer adequate to meet their needs.

Responding to these management needs, A New computers-oriented management information systems is required which must be more responsive and more comprehensive than the EDP that had existed just a few years earlier. There is initially talk of designing a completed integrated “total system” built around a single online data base that would instantly give managers all the information they needed to make their decisions.

The objective of this thesis is to find out how computers support the organizational MIS by reducing the uncertainties occurring in organizations especially in Shree Baidynath

Ayurved Bhawan Ltd., Jhansi. Uncertainties which are found are

1. Incompleteness
2. Irrelevance and
3. Indeterminacy

is to be removed by computers to support the managers for taking the effective decisions.

1.4 BAIDYANATH PROFILES

Ayurveda the science of life is the traditional system of medicine in India since centuries. With the advent of modern allopathic medicines Ayurveda receded into the background so much that the traditional users started losing confidence in this system & began adopting modern medicines. One basic reason for Ayurveda suffering a setback due to the onslaught of modern medicine was that Ayurved had remained confined only to few learned Vaidyas who did not pass on the wealth of knowledge to their successors, on account of which the number of practitioners of the system started dwindling rapidly. Under these circumstances Pandit Ramnarayan Sharma, a learned

Ayurvedic scholar himself could visualize the main causes of the falling popularity of Ayurved & decided to take it upon himself the uphill task of rebuilding the popularity of Ayurved brick by brick to re-establish Ayurved as a major system of medicine in India competent to take care of the Indian masses effectively economically and without the side effects common to the system of modern medicine.

Pandit Ramnarayan Sharma made a small beginning by starting the manufacture of Ayurvedic medicines at Baidyanath Dham in Bihar in the year 1918. What began as a tiny sapling has grown into a big & reputed Institution called SHREE BAIDYANATH AYURVED BHAWAN (P) LTD. With six manufacturing units located at 1.] Calcutta 2.] Patna 3] Jhansi 4] Nagpur 5] Allahabad 6] Bhaddi (Himachal).

SHREE BAIDYANATH AYURVED BHAWAN is a name synonymous with superior quality, authentic Ayurved medicine over the length & breadth of India. This institution of Ayurved has been a forerunner in propagating Ayurved through funding of education & research. SHREE

BAIDYANATH AYURVED BHAWAN has more than 75 publications to its credit by virtue of which it has been able to take the knowledge of the learned scholars of this field to the coming generations of Ayurvedacharyas. BAIDYANATH also publishes a monthly journal called “SACHITRA AYURVEDA” which has created a niche for itself as a reputed journal dedicated to the cause of Ayurved ,the journal is now in the 51st year of publication.

SHREE BAIDYANATH AYURVED BHAWAN has been bestowing in an annual award of Rs. 1lac to learned Ayurved scholars in reorganization of their services to Ayurved in particular & to the society at large. At SHREE BAIDYANATH AYURVED BHAWAN manufacturing Ayurvedic medicines is an Art and a Science. BAIDYANATH has preserved the traditional art of manufacturing medicines & synthesized the modern manufacturing techniques in the manufacturing process to produce authentic Ayurved formulations of superior quality. BAIDYANATH manufactures over 700 Ayurvedic

preparations comprising of about 50 well studied & researched patent medicines.

In Ayurveda the raw materials are of plant, animal & mineral origin, fully natural, nurtured by mother-earth for the living humanity. Though all modern instrumental & chemical procedures are used to analysis the natural raw materials, they are personally checked & studied by Ayurvedacharyas with more than 40 years of experience behind them. Considering all this there is little wonder that BAIDYANATH has emerged as the largest Ayurvedic medicines manufacturing company with a turn over of more than 100 million catering to needs of society within India. Lot of sales centers and over 75,000 agencies distribute the medicines to every nook and corner of India.

Every day more & more news is pouring in about the achievement of Ayurveda in tracking some of the most dreaded diseases which cannot be cured or controlled by modern medicines. BAIDYANATH believes that the answer lies in Ayurveda & it shall forever strive to discover remedies to

mitigate pain & suffering of the people and usher in good health & resistance to disease.

ABOUT AYURVEDA

The quest for good has been incessantly an urge of human being for ages and in order to satisfy himself man has endeavored to explore all possible avenues in search of health so far as the ayurvedic science is concerned IT has been serving mankind ever since its inception dating back to the vedic period The specialty of this science is that it only with the cure of disease but also with the maintenance of physical mental and social health of an individual and the society as a whole.

During its prime it flourished and spread across oceans .Scholars from abroad used to flock at the universities of taxila & nalanda. Great teachers Physicians and thinkers like Charak and Sushrut prospered that Aurveda had reached the summit of its glory.

The foundation of the science of ayurveda rests on the inherent spirituality of man. Charak, an expounder of the ayurvedic

system, has stated that a study of human constitution and an understanding of the etiology of physical and mental disease is not possible through a purely empirical endeavor, completely divorced from its meta empirical moorings.

Ayurveda has laid a great emphasis for taking man's psychosomatic constitutions as a whole in solving various problem of health and disease. An ancient author of ayurveda has given a great importance to personal hygienic methods & other related measures to keep themselves in sound health throughout life. They have described three types of psychosomatic constitutions as vatic, paittik & kaphaja & three types of psychic personalities as sattvik, rajasik & tamasik.

By assessing these somatic and psychic constitutions in each person, one prescribes the way of life including diet, exercise , sleep etc. during illness also the management is individualized depending upon ones physical & psychic constitution such an individual approach to treatment is completely lacking in modern medicine.

Here one should also remember that it is not necessary to individualize the treatment in acute infectious diseases since in such situation the clinical manifestations & management mostly remain the same in all the cases. On the other hand as mentioned in the Ayurvedic texts in most of the psychosomatic disorders there are always varied manifestations and hence the treatment will have to be individualized to get prompt recovery. Ayurveda has many unique methods of treatment with Herbal remedies, Mineral preparations, Panchkarma (i.e. Purificatory therapy), Rasayan, Rejuvenative therapy, Yogic practices etc. We urge all the modern medical scientists to make an earnest study of the ancient Indian medical literature by which they will be able to make a full scientific inquiry into the nature of ever increasing psychosomatic disorders & their effective management as described in Ayurved about 2500 years ago.

NAME OF PRODUCTS:

1. Baidyanath Bhasmas And Pisti
2. Baidyanath Kupipakwa Rasayans
3. Baidyanath Ras Rasayanas 4. Baidyanath Lauh and Mandoor

5. Baidyanath Bati, Golian (Pills) 6. Baidyanath Parpati
7. Baidyanath Guggulu 8. Baidyanath Churans (Powders)
9. Baidyanath Avleh, Modak & Pak
10. Baidyanath Perfumed Hair oil
11. Baidyanath Ghritas 12. Baidyanath Asava and Arishtas
13. Baidyanath Prawahi Quath (Kadha)
14. Baidyanath Kshar & Lavan
15. Anya Upayogi Dravya Samuh
16. Anupan (Vehicle) (Adjuvant)
17. Baidyanath Patent & Proprietary Allopathic Medicines
18. Baidyanath Patent & Proprietary Ayurvedic Medicines
19. Gold 20. Compounds of some herbal Drugs

Name of Depots

1. HYDERABAD

20-1-11/1 Galbhaveedhi Bahroopia Gali

Purana Pul, Hyderabad (A.P.) Ph: 040-24522068 Fax

:24411109

2. BANGALORE

City Office : 2 BVK Lyeger Road, Bangalore - 560053,

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3. MUMBAI

Kulkami Wadi, J.M. Road, Hill No. 5, Aslafa Village,

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4. AHMEDDABAD

34/51 Adarsh Co-operative Industrial Estate

Rakhial, Near Chakudia Mahadeo,

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22761872

5. JAIPUR

C-112 Tilak Nagar, Shivaji Marg, Jaipur (Raj). Ph : 0141-

2624518

6. NEW DELHI

M/s Salil Enterprises (C&F Agent)

"Rishyamook", 85-A Panchquian Road,

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23742452

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Fax-0171-2521887

8. ZEERAKPUR

M/s Shree Baidhyanath Ayurved Bhawan Pvt. Ltd.
Village -Pabhat, Near Choice Restaurant
Zeerakpur(Roopnagar)
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9. AGRA

A-26 Jatni ka Bagh, Jeevani Mandi, Belan ganj, Agra(U.P.)
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10. HALDWANI

Behind Old I.T.I. Shripuram,Bareilly Road,
Haldwani(Nainital)
Ph: 05946-245131, 250514

11. GHAZIABAD

M/s Mahalaxmi Enterprises (C& F Agent)
Patel Marg, Ghaziabad Ph : 201001

Ph: 2730213 telefax -0120-2730434

1.5 Organization of Thesis:

Basically this research work contains 6 chapters to accomplish the research question raised by this thesis. The first chapter contains the basic concepts of Computer Based Management Information System and the research motivation along with object of the thesis. Then after a surveyed Company -A Baidynath Ayurved Company -An introduction and profiles is made.

The Chapter-2 contains the content analysis of the IT literature regarding concrete applications of Computers in organizations to support the managers by reducing the uncertainties occurred in organizations through IT/Computers evaluation in organizations (paradigms) and its applications (metaphors) is discussed here.

Chapter-3 contains the Case Study of Baidynath Auryedic Company-Analyzing the role of computers and how it really reduces the uncertainties occurred in Baidynath. Here

Baidynath data model, methodology used, working style, Architecture, and analysis techniques along with the conclusion at last is made.

Chapter-4 is the Financial Investment and its Recovery: Cost invested in installing the computers in Baidynath then in what time this invested money is recovered and what are the other benefits computers project of the Baidynath Company provides to managers is discussed here.

Chapter-5 This chapter basically measures the security architecture used in Baidynath Company. Chapter also discusses how the database security, Network security, operating system security and general security is maintained by the company to support the Baidynath CBMIS.

Chapter-6 this chapter discusses the how the final results of IT-literature survey with respect to research question matches practically with the Baidynath Company whose a case study is made. Here how the computers can more support the Baidynath if little changes be made is also discussed.

CHAPTER - 2: LITERATURE SURVEY

2.1 Introduction

This research work uses these entire three paradigms, metaphors and narrations at the same time to analysis the social construction of computer based management information system in organizations. Although some of the researchers construct and design the computer based MIS through paradigm [e.g.33, 37,47], through metaphors [e.g. 33,31], through narrations separately. However the concept of paradigm is made popular by [33]. Technological paradigm describes the evaluation of IT in organizations then the specific metaphors are used to describe how these paradigms are used in organizations. Significance of each metaphor is further evaluated based on the organizations ability to reduce a particular type of uncertainty.

Two research propositions can be used to evaluate the research questions raised by this study. One possible way to test IT-appropriations and the reduction of uncertainty in organizations would be to perform a content analysis of the existing IT literature. The examination of the relevant articles published in

the top Information Systems journals in the last decades would help to evaluate if the description of the technology and its uses confirms the claims of Table 4. Other authors have successfully employed this research method to examine different aspects of the Information Systems field [e.g. 1, 14, 20, 23, 51] Therefore, ***Proposition 1: A content analysis of the IT literature regarding concrete applications of IT in organizations will provide evidence of the existence of the IT-paradigms and their appropriation.***

To address the second research question, it is necessary to study stories (narratives) of successful and unsuccessful IT appropriations. In fact, some authors [e.g. 13, 23] argue that the most commonly employed empirical strategy in Information Systems is the case study method of research, to learn the state of the art and generate theories from practice [15]. Thus, a compilation of narratives of IT appropriations in organizations over the past decades would help to identify the key elements that determine the success of IT in some organizations.

Narratives derived from case study research would highlight the specific processes by which particular organizations adopt and adapt IT. Hopefully, a collection of narratives will help to identify the crucial factors that contribute to the different social constructions of IT in organizations, and will shed some light to the key elements that help some firms to choose the *right* technologies and radically alter the "industry recipe".

Proposition 2: The compilation and analysis of actual narratives of IT in organizations will help to identify the key elements that make IT successful in some organizations.

Each proposition suggests a specific course of action to address the research questions raised by this study. The first proposition is based on the review of published experimental research in the field. The second proposition is grounded on the case study method of research and consists of compiling and analyzing narratives of IT appropriations in particular organizations.

2.2 Survey of Literature:

IT in organization is due to one of the main propositions of organizational theory is that firms process information in order

to reduce uncertainty. Traditionally, uncertainty is associated with the lack of information, the difference between the amount of information required and the amount of information already possessed by the organization [18 & LOP/International/1] To deal with uncertainty, organization must collect, gather and process information [15,49].

[48] uses the term incompleteness, or ignorance of what can be known , to label the most common interpretation of uncertainty (i.e. absence of information). This type of uncertainty assumes that the information exists somewhere but there is a gap between the information needed and the information already available. This gap can be reduced if more efforts are devoted to collecting and gathering missing data [15, 48].

Another type of uncertainty arises when the information is available but its meaning cannot be grasped precisely. [48] used the term irrelevance, to refer to situations in which the analyst is unable to comprehend the meaning of the data at hand.

To counteract this type of uncertainty, better acquisition methods and more powerful analytic tools must be developed.

These two notations of uncertainty

1- Incompleteness and

2- Irrelevance.

Presume that the necessary information exists and can be obtained, but there is some kind of gap that prevents its complete mastery, a possession gap in the first case, or an understanding gap in the second case. Both concepts presume a knowable reality that can be grasped.

However, sometimes the problem is more complex than just acquiring or interpreting existing information.

In some cases, the information is simply not available at any cost. [48] Distinguishes two other types of situations in which uncertainty arise because the world is not completely

knowable. The first case is indeterminacy, or the presence of unpredictable persons whose actions cannot be anticipated.

The second case is incommensurability, which refers to the limited and fragmented nature of the information.

Indeterminacy arises because of interactive relationships or interdependencies of the organization with other actors in the

environment, such as customers, suppliers or competitors. The degree of dependence among them sometimes calls for game theory allocations to figure out the possible outcomes of the interaction and to proceed later with a rational optimization. When the game becomes more complex, the best alternative is to "negotiate these interactions under conditions of incomplete knowledge "[48,57].

Incommensurability arises with the difficulty of -

1. Comparing different objects "apples and oranges",
2. Assembling fragmented data extracted from multiple sources.
3. Fitting together different types of information.

To deal with this type of uncertainty, leaders and managers are forced to make sense of the reality using their judgment and intuition, and enact their environments [52]. This type of uncertainty, more than any other, creates a place for managerial judgment and strategies choice in the analysis [12].

Table 1. Summarizes the typology of uncertainty developed by [48].

Table 1: Spender's Typology of Uncertainty

S.No.	Type of Uncertainty	Definition
1.	Incompleteness	Absence of knowledge or [18] . Difference between information at hand and information needed.
2.	Irrelevance	Information is available but its meaning cannot be understood.
3.	Indeterminacy	The presence of unpredictable whose action cannot be anticipated.
4.	Incommensurability	Limited and Fragmented nature of the information.

The organizational literature recognizes the value of IT because of its potential to reduce or counteract uncertainty.

2.2 (a) IT Paradigms and IT Metaphor:

Information technology (IT) and its applications in organization have changed dramatically in the last decades. IT has evaluated from strictly supporting role is the back office to a competitive weapon in the market place [28,39,40] and a new channel for conducting business [16,30]. The combination of increasing capabilities to process information and the decreasing of this technology has resulted in a broader range of computer application in organizations.

In 1960's, mainframe computer were introduced in large organizations to take over many operational routine tasks. Their role was to automate the paperwork, especially in accounting and recording functions. There task were previously performed entirely by clerical personnel. In this period, the computer was like a heavy duty calculator entirely operated by computer professionals.

As the cost and size of computer decreased and their power and capacity increased, many companies and departments installed mini and micro computers to automate their daily works. Computer progressively assumed some middle management functions, such as decision making, coordination and control. Most of the information users in organizations had computers on their desks and access data needed to carry out their jobs at the time when required not at the end of month. There personnel computers offered independence from the mainframe but constrained the user with limited memory and processing speed.

Further developments in network allowed firms to link their own computers with computer outside the organizational boundaries, establishing links to other companies in the environments such as buyers and suppliers.

S.No.	Period	IT Paradigms	IT Metaphors
1.	1960s	Mainframes	Automation of routine & repetitive tasks (accounting & record keeping future)
2.	1970s-80s	Mini & Micro	Middle management functions. (Decision Making, Co ordinations & Control)
3.	1980s-90s	Network	Inter firm linkages.
4.	1990s-2015	Internet & www	Direct connections with the consumers.

--	--	--	--

TABLE 2:

In the mainframe era, IT was incorporated into organizations to automate clerical and repetitive tasks, to perform the accounting and record keeping function more efficiently and effectively than traditional manual methods [2]. Transactions processing systems (TPS) and management information systems (MIS) were raised at "number crunching" and providing large quantities of accurate and updated data to managers.

The next generation of applications was focused on decision support systems [32, 56] and group decision support system [29]. These systems provided decision makers with powerful models for analysing information and improving decision quality.[17,57].

The development of networks made possible the advent of a new type of system - Inter Organizational System (IOS) - aimed at tackling this problem. IOS's are computer based information systems shared by two or more companies that automate the flow of information among them. [28,46]. They

enable the organization to communicate more easily and less expensively across time or geographic location, to communicate faster and with more precision to targeted groups, and to keep track of the content and nature of the communication [24,26].

Recently, the explosive growth of the Internet has allowed many organizations to effectively influence the environments, altering their product or service mix, changing the relationship with outside partners and customers [16] and modifying the rules of competition in their industry. Through their web sites, organizations can directly access their final customers, by passing traditional intermediaries or distribution channels and collecting a wealth of information about actual and prospective customers [30, 56]. Many organizations are dramatically redefining their traditional environments by using their web sites on the Internet [LOP/International/01/02].

[47, 55] Argument of different eras dominated by different technologies or "technological paradigms " can be adapted to the realm of IT in organizations.

Four different IT-paradigms (hardware & software) can be identified from the above historical analysis.

Table 3 summarizes these paradigms [LOP/International/04].

TABLE 3: IT PARADIGMS:

S.No.	Period	Artifacts (H/w)	Application (S/w)
1.	1960s	Mainframes	Automation of transactions (TPS) and aggregation of Information (MIS).
2.	1970s	Minis & Micros	Models of support decision making (DSS & GDSS).
3.	1980s	Networks	Links between organizations (IOS).
4.	1990s	Internet	Organizational web sites.

IT Metaphors:

Typical uses or "appropriation" of these IT paradigms can be described through metaphors. [31] Define metaphors as “cognitive lenses” to understand reality and structure thoughts.

[36]Suggests that metaphor --> should be used as descriptive devices first and then the significance of the interpretation produced be evaluated.

Consistent with [36] two step approach, this work uses different metaphors to highlight IT appropriation, and then the importance of each metaphor is evaluated in terms of its contribution to the reduction of uncertainty in organizations.

2.2 (b) Metaphor of First IT-Paradigm : In the first IT-paradigm, computing was viewed as a tool or an appliance, as a piece of equipment like a hammer to , drill or a saw, which extended and enhanced the capabilities of a person in a particular task" [50]. Tools can be used to get the jobs done, and someone (users or IT staff) determines what purpose need to be accomplished with what tools.

Computer ---> tool or appliances

2.2 (c) Metaphor of Second IT Paradigm:

As the technology developed, the computer demonstrated its ability to stand alone to informate , automate [52] and "supervise" production processes.

In this second paradigm, IT was more like a machine because computer were working by themselves, emancipated human operators, and even replacing many human workers [7].

The distinction between tools and machine is based on [38, 56] argument that the tool is as extension of the user, while the machine display more autonomy of operation

2.2 (d) Metaphor of Third IT Paradigm:

In the third paradigm, IT was used as a strategic weapon to gain competitive advantages over actual and potential competitors [28]. It was used to raise entry barriers, or to lock in customers and suppliers or to change the very nature of the business by introducing new or related products [39,40].

The weapon metaphor emphasizes that the IT focus was on gaining competitive strength, not on improving the internal operations of the organizations [7]

2.2 (e) Metaphor of Fourth IT Paradigm:

The internet and the increasing degree of its connectivity at all levels of society are amplifying the role of IT from a mere weapon to a brand new channel to exchange information and to conduct business.

The internet provides the infrastructure for an electronic market place in which buyers and sellers meet and carry out their transactions [30]. The web can be seen as a distribution channel, a medium for marketing communications and a market in and of itself [25 & 55].

2.3 Outcome of Study:

Linking the typology of uncertainty to the previous analysis of IT paradigms and metaphors, some analogies can be drawn.

IT - As a tool is used to reduce the informational gap produced by incompleteness-type uncertainty.

IT -As a machine, is used to provide sophisticated analytic tools and technique to enhance the managerial ability to analyze data, in order to reduce irrelevance-type uncertainty.

IT - As a weapon tries to reduce the indeterminacy level of uncertainty.

IT - As a channel, reduces the incommensurability aspect by enacting the environment.

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Table 4: Paradigms the typology of uncertainty and the metaphor.[LOP/International/01/02]

S.No.	IT paradigms	Metaphor	Type of uncertainty Reduced	Organizational Response
1.	Mainframe (1960's)	TPS,MIS	Incompleteness	Gather more Information tools.

2.	Minis & Micros (1970-80)	DSS, GDSS	Irrelevance	Development of sophisticated models
3.	Networks (1980-90)	IOS	Indeterminacy	Bridging strategies weapon.
4.	Internet (1990-till now)	Web based	Incommensurability	"Enactment" Of the Systems environment channel

Although the paradigm and metaphor may be similar across organizations, the specific practices and implementations of IT are different in each firm, according to the strategy, structure and culture [8].

When the same computers are found in different companies, their use and meanings may be different from one company to the next. Computer systems can be crucial for the flow of

production in one company, a status symbol in another or the hobby of an engineer in a third [43]. Each firm will appropriate IT in its own and unique way.

IT as any other technology, is embedded in organization's cultural systems, which determines how technological artifacts are constructed and interpreted [9, 27]. Since IT is constructed at the organizational and individual level, it may mean different things to different people and to different organizations. Even in firms belonging to the same industry, the same IT paradigms may render very different results. Due to differences in their cultural systems, what appears to be a successful IT application in one firm may be a failing technology in another [10].

The question is what makes an organization successful in its use of IT ? Truly successful IT appropriations are those that radically alter the competitive rules in some industrial sectors. For example, when the ATMs were first introduced in the banking industry, the innovator “constructed” a new reality and changed the competitive environment. Likewise, the

developers of the first automated reservation systems in the airline industry changed their environment.

Similar cases are now happening in cyberspace. Several entrepreneurial companies have found a tremendous success for being the first ones to use their Web sites as a vehicle to conduct business. Pioneer companies such as Amazon.com, or greetstreet.com, the electronic greeting card firm, have changed the competitive landscape in their respective industries [7,30].

The power of successful IT appropriations resides in their ability to modify the industry pattern of managerial beliefs ("industry recipe" in [21], which is developed according to the competition and the characteristics of the industry hence new IT applications change the rules of the game, the commonly held "industry recipe" is no longer valid.

Evidences through Metaphor Significances:

These IT -metaphors can be interpreted effects to reduce different types of uncertainty defined by [48].

In the first IT-paradigm the computer was used as a repository of information hoping to alleviate the information gap produced by incompleteness -type uncertainty.

The assumption behind TPS and MIS was that the greater the quality of data and accuracy of information the better the ability of the managers to make decisions [17].

In other words, if the information were available, managers would be able to analyze it. Indeed, these better informed managers began to experience information overload and to discover their own cognitive limites to process information.

Then the managerial problem was no longer data availability but data modeling. To overcome this deficiency, DSS were developed to enhance the managerial abilities to counteract the irrelevance-type uncertainty.

TPS, MIS and DSS shared the positivistic assumption that the reality is knowable, and the need was for more and better tools for grasping it. However, most of the problems faced by organizations are not always due to the lack of data or models

but to the impossibility of anticipate the actions and consequences of multiple actors in the same competitive space. The use of inter-Organizational Systems (IOS) addresses this problem [6, 57]. IOSs span or shift the organizational boundaries to include elements of other organizations, creating "bridges" between an organization and other organizations in its environment (Scott_ [46]. "The typical solution to problems of interdependence and uncertainty involves increasing coordination, which means increasing the mutual control over each other's activities" [41].

In fact, by reducing the freedom of maneuver of organizational actors, these systems lead organizations to work together, to cooperate, for their mutual benefits.

Bridging strategies through IOS may be viewed as a response to increasing organizational interdependence, and consequently as an attempt to reduce the uncertainty produced by many actors interacting in the same space-indeterminacy- [48].

After resolving the indeterminacy level of uncertainty, managers are faced with the challenge of "enacting" their environment. Enactment requires that organizational members not only selectively perceive but also directly influence the state of their environments through their own actions [52, 56].

One of the ways in which organizations can enact their environment is appropriately selecting their domains. An organization's domain consists of the claims it makes with respect to products or services provided and populations served. These claims relate the organization to a number of other organizations (suppliers, customers, competitors) that affect its behavior and outcomes [45, 55]. Information systems are key to select organizational domains [45] and to define or re-define environments [35,57].

Seeking innovative applications of IT through the use of Web sites and the internet helps organizations to enact their environments. By doing so, organizations are counteracting the incommensurability dimension of uncertainty.

CHAPTER – 3: CASE STUDY AND EVALUATION:

3.1 Data Model:

Basically Baidynath database is the collection of records stored in tables. It has a set of rules and tools to manage these records.

Normally there are different types of databases, each with its own format [LOP/International/7]. The most common known databases types are

- Relational Model
- Network Model
- Hierarchical Model

So far as the Baidynath company is concern it is using the Relational database model. In a Baidynath relational database model the data is stored in multiple tables with some 'relationship' between the tables in order to reduce data redundancy.

The Baidynath relational model of a database has stored data in tables in a 'row-column' arrangement. Each table has a relationship with one or more tables. This relational model helps to reduce redundancy of data, and helps to maintain data integrity. Each data is identified by its Row-Column position. Some of the definitions with respect to databases.

Tables

A table is a basic repository in which data is stored, and a specific structure for storing data. It is made up of one or more than one column. Data is stored in the form of rows and columns.

In Baidynath a table contains the related data of one topic like customer detail table,item_detail table,invoice_detail table, etc. A **customer detail table** as follows-

Sl.no.	Customer Name	Depo_code	Amount Due
001	Shalini Ayur Medico	J021	1,25,000.00
002	Lucknow Ayurvedic	L021	9190.00
003	Agra Ayurvedic Medico	A021	1,40,553.00

This table has three records (rows) and four fields (columns).

Rows

A Baidynath record is one row in a table. The row will span across all the columns of the table, and each row has one full set of information about one 'subject'. In the above table there are three rows, and each row gives the customer name, area code and amount due. Each time a record is added a row is added.

Columns

In the above table each row has four columns or attributes, and if Baidynath managers need to add any attribute to the records, they have to add columns.

Why Relational databases:

To answer this question, consider the following situation.

User has to maintain the following details of our suppliers.

Name
Address1 (H.No. & street)
Address2 (Road, Area)
Address3 (City, State, and Pin)
Items supplied
Invoice details
Amount due.

If user put these details in a flat file or an excel file, it will look like this.

R.R.Ayur, 12 II CROSS St.Adyar,Chenni Tamil Nadu-600020,jadibuti
M.R.Ayur, 13 II CROSS St.Adyar,Chenni Tamil Nadu-600020,jadibuti
S.K.Ayur, 14 II CROSS St.Adyar,Chenni Tamil Nadu-600020,jadibuti
P.R.Ayur, 15 II CROSS St.Adyar,Chenni Tamil Nadu-600020,jadibuti
R.K.Ayur, 16 II CROSS St.Adyar,Chenni Tamil Nadu-600020,jadibuti
R.S.Ayur, 17 II CROSS St.Adyar,Chenni Tamil Nadu-600020,jadibuti

Observe that for each time item supplied by the supplier user has to repeat all the details of the supplier like name, address, etc. If a supplier supplies 50 times then user has to repeat his details 50 times. On the other hand, if user have a file for the item details, user has to repeat the item details only like price, code, description etc.,for every supplier supplying that item. Either way the user repeats a lot of data.

To reduce this redundancy Baidynath has created the tables in the following forms:

Supplier table

Supplier code
Supplier name
Address1
Address2
Address3

Item table

Item code
Item name
Description
Price

Supplier_Item table

Supplier code
Item code

The supplier table has a relationship with supplier_item table through the supplier code. Likewise, the item table has a relationship with the supplier_item table through the item code. The relationship figure as follows

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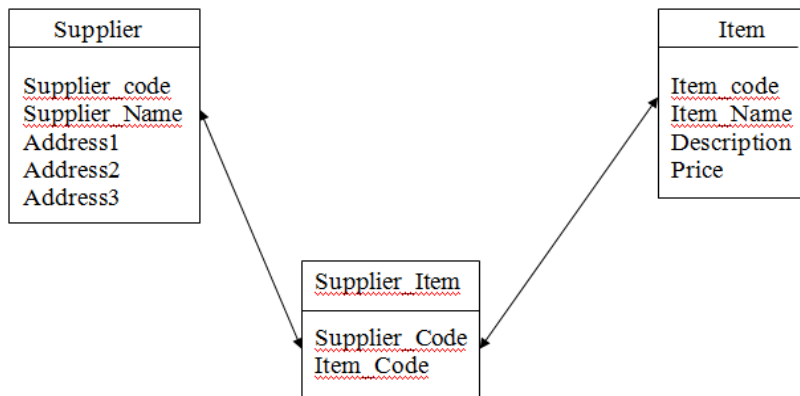


Fig. showing Relationship

Hence by spreading the data across related tables, user can reduce the data redundancy. Besides any changes that user want to make to the supplier's address for example can be made in one place and the same change will be reflected wherever the supplier's address is used.

The primary Key:

A primary key is a unique field or a combination of more than one field that identifies a record.

In the above table the supplier code is the primary key since no record has the serial number. The supplier code is the unique field that identifies the supplier in the supplier table.

A relationship between tables is built using this primary key.

3.2 METHODOLOGY: To identify the role of computers in organizations at Jhansi region to reduce the uncertainties - A Baidyanath Company survey is made. During survey the information is collected from distinct sources of the company to test the research question is as follows:

- 1) Computer Users
- 2) Forms and documents used in the organization
- 3) Procedure manuals and rule books which specify how various activities are carried out in the organization.
- 4) Various reports used in organization.
- 5) Computer programs of existing systems.

There are two other aspects in this understanding.

1. Understanding the flow of documents in the company.
2. Understanding the rules used to process data.

The important tools which is used to assist this task is data flow diagram which specify the origin of data and how this data flows throughout the company reducing uncertainties by using computer .

3.3 Analysis

Computer Based Inventory Information System:

The first information system found in company is inventory information system. Company contains the computer based inventory control system, which uses several files called as master files which the Keeps the track of the quantity of each product presently in stock. In addition it also contains the cost of items, the recorder point, max-point, product code, product name.

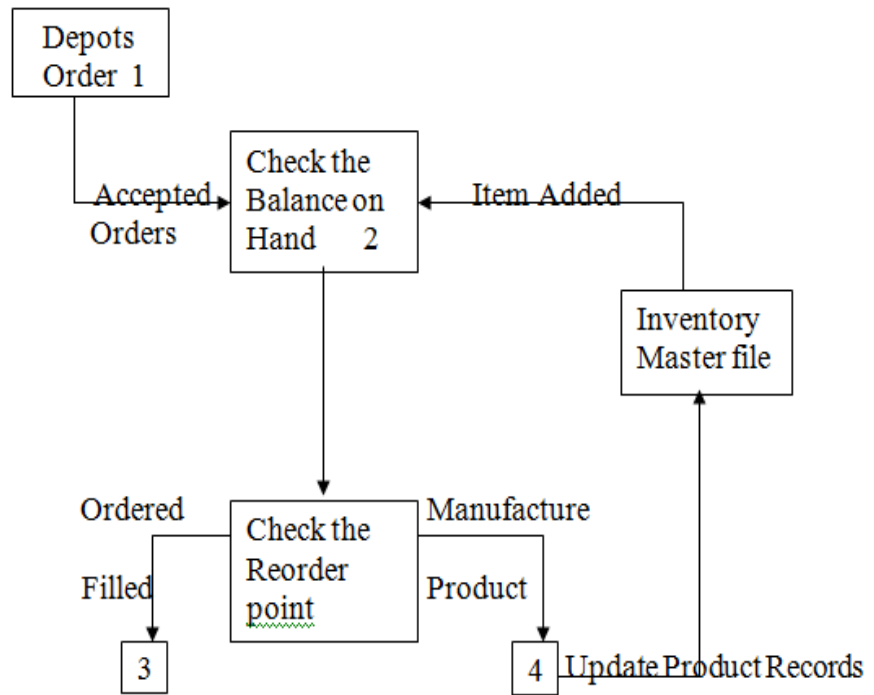
This allows the user of the system to locate an item quickly, get a listing of goods that need to be ordered, automatically create and print new orders and perform other similar stock control tasks. Apart from these files, company also keep track of each individual transaction that occurs within business, information on these individual transactions is usually maintained in

separate data files called **transaction files**. One such file keeping track of each individual sales transaction is sales file which depicts to whom products were sold, when for how much, and the invoices or receipt number. A second transaction maintains an incoming record of all new stock received.

Once a decision has been made to accept the orders, company passes through the 3 processes and the computer supports these processes.

1. **Check the Balance on Hand:** Computer maintains all the record of products stored in store room. The manager stores checks the balance available for each ordered product, if adequate stocks available the fill the order immediately else company prepares the new products.

2. **Check the Reorder point:** While filling the order, a reorder point of each sold a product is seen by the computer. A any product goes down or equals the reorder point value then that particular product is manufactured.



(Fig. 1. Inventory Data Flow Diagram)

P.T.O.

Update Product Records: When the stock equals the recorder point value new product is ordered to manufacturer then these developed product is increased automatically to inventory as entered by the computer.

Purchasing:

The purchasing department issues purchase orders to suppliers for the needed materials; the stock keeper keeps the stock and sends the invoice to account section for payments.

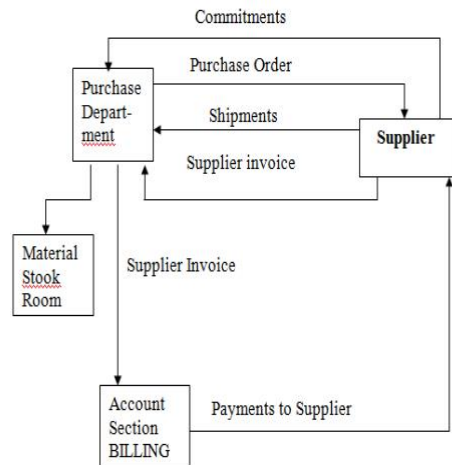


Fig. 2 .Data Flow Diagram for Purchasing

Sales and Marketing:

The main systems that are involved in filling customer orders- order entry, inventory, and billing and accounts receivable are drawn by DFD representation.

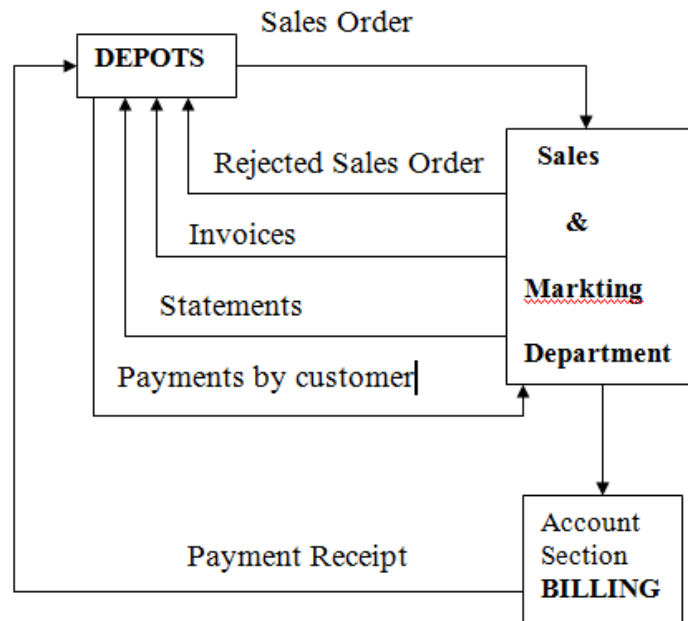


Fig. 3. Data Flow Diagram For Sales

ACCOUNTING SYSTEM:

The second type of information system found in company is accounting information system. The primary goal of Computer based accounting information system is to maintain a database of customer and records of monthly receipts and payments for each account. Each month system prepares invoices that

display the starting balance for the month, a list of individual transactions (both receipts and payments) , and the current balance due.

Accounting information system also displays the summary report of monthly activity for each customer and an aging report showing the current 30,60,90 day balances and the duplicate customer invoice when the user receiving inquiries about an account.

The most important output of the accounting information system is the basic monthly statement or invoice. This includes the customer's name and address, credit terms, starting balance, changes, payments and current balance other outputs are an aging report to display aged balances and a monthly summary report to provide a synopsis of the current month's activity, including balance charges and payments for each customer. In addition, the system provides some historical reports to permit the user to check data from previous months.

According to Mr. Matadin Sharma, manager, Accounts, company's data processing jobs are performed by the

accounting information system (AIS) that gather data describing the company's activities transforms the data into information and makes the information available to uses both inside and outside the company. Basically the accounting system of the company is based on the sales and purchases of products and Raw Materials .The Company has its lot of Depots (Warehouses) in different cities of the all states of the country. Each depot covers all the districts nearer to these depots. These depots have its own sales representative to sell the product. Company gets the order from these depots through sales order through email services. Raw material is purchased mainly from different states like Assam, Chhattisgarh, and Madhya Pradesh etc. by sellers. Company has its own farm houses to grow the raw materials

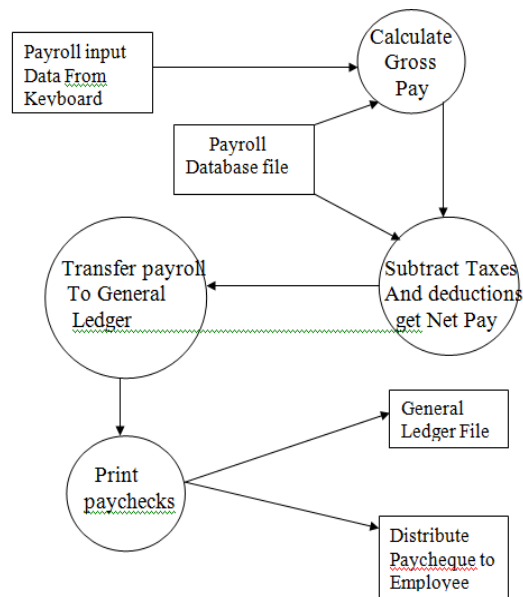
The company's customers are the depots. Depots make the purchase order to company. If the credit rating of depot is bad, company may reject their purchase order. In some cases the company obtains verbal commitment from its supplier before the purchase orders are prepared. Suppliers also send invoices

to advise the company how much have to pay and statements to collect unpaid bills.

Both the company and its supplier use invoices to advice customers how much money they owe (in debit) and statements to unpaid bill if occurred. The data flows from the distribution system to the management consist of standard accounting report.

Payroll Processing System:

The third type of information system found in company is the payroll information system. Company payroll process is shown by the data flow diagram. First payroll input of data from keyboard. Next gross payroll is calculated using the hourly rate amount retrieved from payroll data file. Net pay is calculated by subtracting taxes as determined from the data in the tax file deduction contained in the payroll data file. The payroll data are transferred to the general ledger file and the paychecks are printed finally distributed to the employees.



Office Automation System: The Fourth type of information system found in the company is office automation system (OAS). These are systems that support the automation of various managerial and clerical activities. The primary goals of this office automation are to enhance communications in the workplace and increase the efficiency and productivity of managers and clerical workers. Office automation system includes

- **Word Processing:** Creating written documents, such as letters, memos, and term papers on the computer.
- **Desktop Publishing:** Using software with sophisticated publishing capabilities to create documents.

- E-mail: sending mail electronically from one computer to others.
- Voice mail: Storing, accessing, retrieving, and distributing messages using the telephone.
- Image retrieval and storage: Conversions of papers documents into electronic files and images for easy retrieval and processing.
- Facsimile transmission or Fax: The transfer of written or pictorial information over phone lines to users anywhere in the world. Figure given below shows how managers and clerical staff use OAS to increase productivity.

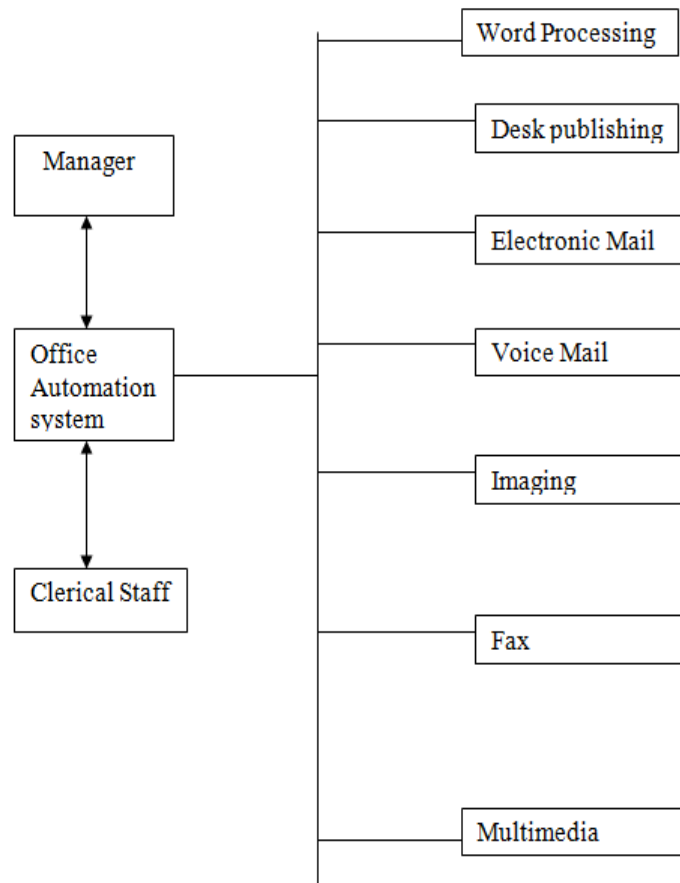


Fig. Baidynath company OAS

Product Manufacturing: Baidynath is manufacturing its ayurvedic medicines through man-power, mechanical devices, Chemists and above all the production Manager. The computer in the company supports the basically manufacturing functions of purchasing, receiving, inventory management, material planning, capacity planning, production scheduling and plant design. Though the company manufactures 1) Asav Chamanpras 2) Tablets 3)Batis 4) Churans 5) Syrup.

Basic phenomena of making products is different but the role computer in manufacturing is almost same hence we draw DFD of Syrups manufacturing here to display the role of computers.

The syrup is made in batches of 300 or 500 or 250 liters.

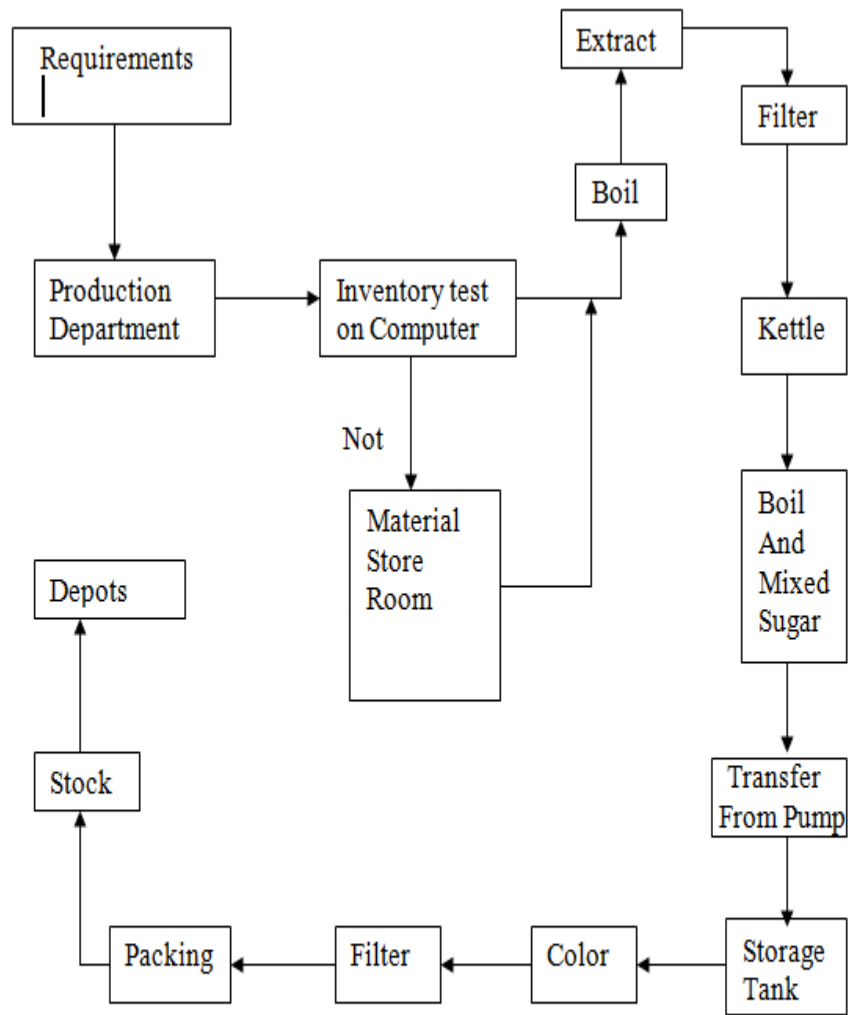


Fig. Product Manufacturing and Computer's Role

Report Formats used by MIS Department in Baidynath:

Following are the four report formats associated with MIS

Deptt. Of Company

1. Regularly scheduling listing
2. Exception listing
3. On demand reports
4. Forecasting reports

1. Regularly scheduling listing: This listing appears at a regular basis. These reports are mostly used at the lower level. They provide information regarding every activity that occurs within the organization. Weekly payroll listing, quarterly bank interest due and the annual summary of taxes are the examples of Regularly Scheduling Listing.

2. Exception listing: This listing provides information about activities that are exceptional and not normal. For example, instead of making a list of all those employees who have paid taxes, these

reports display a list of those employees who have not paid taxes. This focuses the attention of the management on the erring employees. All levels of management use it.

3. On demand reports: These reports are prepared when requested for. Usually these reports are in the form of a soft

copy format (display mode) because these can be readily seen on a CRT. Both top and middle management need these reports, because it is these two levels which have to examine the rapid change in business.

4. Forecasting Reports: These reports help the top management to develop future planning of the organization in terms of time, money and labour power. These reports, based on the previous data, forecast the future requirements of the organization, so that the top management is geared up in time to face the challenges in future.

Supply Chain Management in Baidynath: Basically Baidynath manufactures all the following products at its different organizations situated at the Jhansi, Allahabad, Nagpur, Calcutta, Patna, Bhaddi

Product

Therapeutic Uses

Baidyanath Bhasmas and Pisti

Cough,Diabetes,strengthen

muscles,Brainand Heart,Liver

Baidyanath Kupipakwa Rasayans	Asthama,Paralasis, strengthen muscles,Brain and Heart,Liver, Kidney,Lungs
BaidyanathRasRasayanas	Diarrhoea , dysentery, indigestion colics, all types of fever
Baidyanath Lauh and Mandoor	Vomiting, colice and painful micturation
Baidyanath Bati,Golian (Pills)	Improves memory and mental weakness,used in diaeases of mouth,throat,tongue & stomach
Baidyanath Partpati	Excellent uterine tonic, liver disorders,menorrhagia,haemate mesis,dysentry,cough,anaemia
Baidyanath Guggulu	Effective in nervous diseases, gout,rheumatism,leprosy,piles,c olitis, spermaturia , asthama ,

	seminal disorders , lumbag & arthritis
Baidyanath Churan (Powers)	Acts as a purgative,carminative & stomachic, hyperacidity, indigestion,constipation,vomitng ,dropsy.
Baidyanath Avleh,Modak and Pak	Tonic & alternative,metal & physical weakness,seminal disorder
Baidyanath Perfumed hair Oil	Maintain the hair soft & black, Promote thr growth of hair.
Baidyanath Medicinal Oils	Effective in headache,improves memory, relieves stress & strain and is refreshing to brain
Baidyanath Ghritas	Cardiac tonic and astringent.Used in breathlessness and coggestive cardiac failure.

Baidyanath Asava and arishtas Well known for blood circulation, heart disease and respiratory disorders.

Baidyanath Prawahi Quath (Kadha) Bitter tonic, diuretic and diaphoretic, useful in fever, cough, cold neuralgia, giddiness & vataj diseases.

Baidyanath kshar and Lavan indicated in constipation and liver troubles.

Anya Upayogi dravya Samuh Indicated in skin diseases, itching, oozing, eczema

Baidyanath Patent & Proprietary -

Allopathic medicines Effective remedy for gas, griping and indigestion

etc. and it has 600 depots at the different district of the country, some of them is as follows .

It is the power of information technology that makes the supply chain management feasible because after 15 days stock of each and every product is known by the Manager-Sales through internet or even if any customer needs any ayurvedic medicine, he or she may directly contact the company through e-mail then the company will refer to its nearest depot and will fulfill his or her requirements or else manage the item from company to the address of the customers.

As Baidynath's suppliers, they can easily share information with Baidynath's website called "Supplying to Baidynath" was built for present and potential supplier to be able to communicate with Baidynath online. In other words , the supplier will find information relative to both what Baidynath expects from them and what the supplier can expect from Baidynath.

Nowadays, Baidynath is developing and deploying e-Business solution to improve their overall efficiency and responsiveness throughout the supply chain . As they stated "Contineous

development and improvement of e-Business solution is the key for Baidynath in order to shape new, more efficient business models and support common supply chain management processes throughout our global enterprise”(www.Baidynathayurva.com) eBusiness solutions and common processes enable Baidynath to be more responsive to customers and competitive in the market place. Baidynath is focusing on e-business solutions to enable real time communications and workflow both internally and externally for a faster, more efficient linkage between suppliers and the customers.

P.T.O.

3.4 ARCHITECTURE

Since the Baidynath company has different departments, each department has to share the data from other departments to reduce the uncertainties hence the Baidynath architected the distributed data processing systems. Each department has its own server and data processing capabilities .Now these server are connected with each other through router to share the data between departments.

The Basic Architecture of Baidhyanath Database :

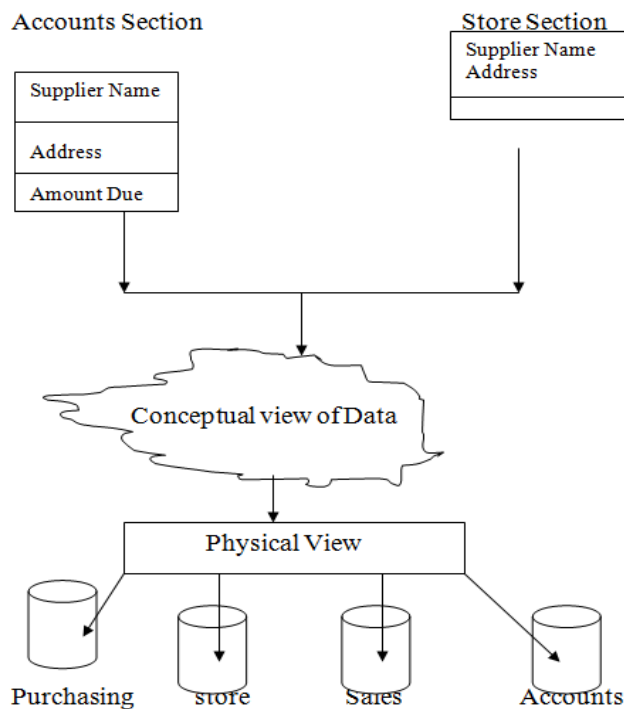


Fig. No.8

This three-tiered approach used by the Baidynath Company is more efficient and more secure because of **protected access** since the server side application is responsible to the actual database access, procedures can be implemented to prevent unauthorized access to data. **Efficiency** since client side procedures can prevent undisciplined access, which would limit performance and clog the network with excess traffic. Only the needed data rows are typically returned over the network. **Database structural independence** because the client side application does not need to be privy to the

details of the database structure, modifications to the database can be accomplished without rewriting the client applications. **Stored Procedures:** Using stored procedures to perform common tasks is more efficient and faster than using hard-coded queries. By removing dependence on updateable data cursors, database access is also enhanced and the server workload reduced. For example the client-side application can call stored procedures such as Check Inventory, Place-Order, or Update Account to perform specific tasks without knowing anything about how the data is organized.

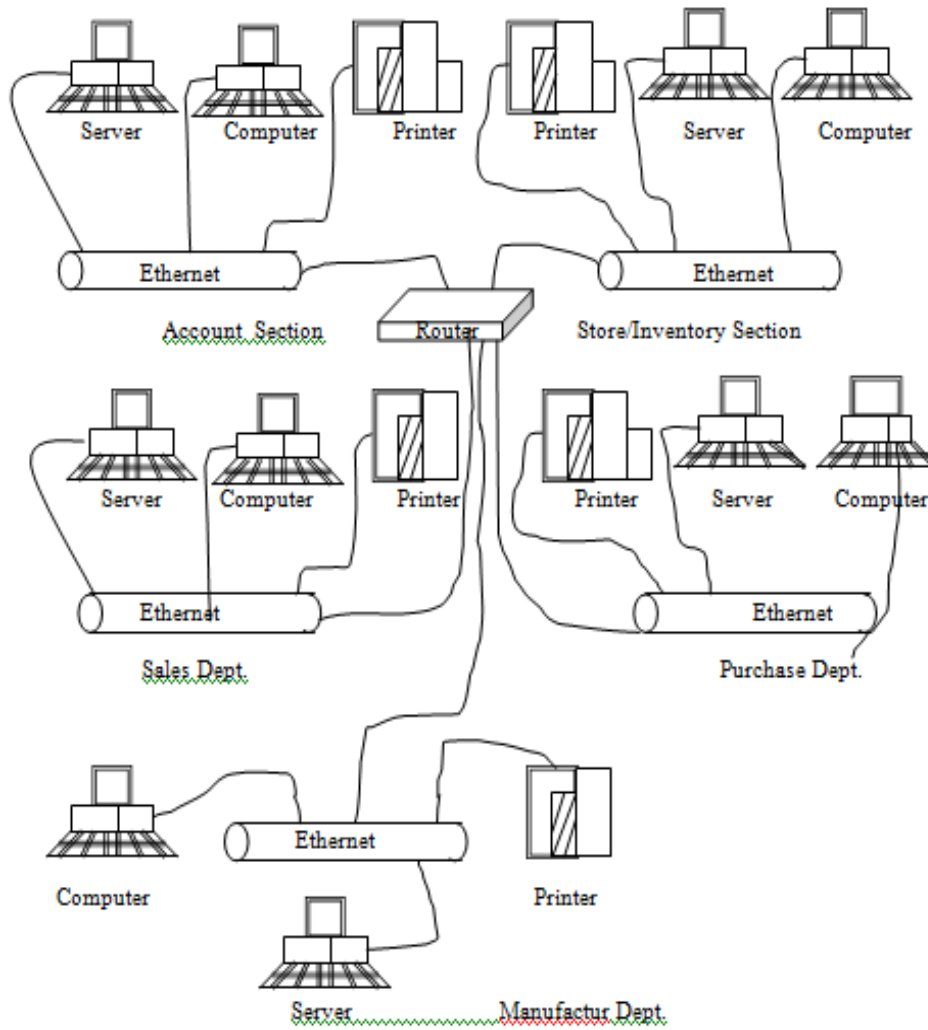


Fig. Baidyanath Homogeneous Distributed Data Processing System
Client /Server Architecture (Two-tier Architecture)

Fig. 9

3.5 CONCLUSION:

The case study describes how the computer is been used in Baidyanath Ayurved Bhawan Ltd., at Jhansi. The Baidynath Company is using the relational model of database in which data is stored in tables. Each table has a relationship with one

or more tables. This relational model helps to reduce the redundancies of data, and helps to maintain data integrity. Each data is identified by its row and columns position.

Baidynath Company is basically using the homogeneous distributed data processing system and it's all departments are connected with each other through router to share data between departments. Three- tiered approach is used by the company which is more efficient and more secure due to its efficiency, data structural independence, stored procedures and protected data access techniques.

In this thesis the cost invested for the installation of computers in company and its benefits to Baidynath is also evaluated .The cumulative benefit of Baidynath is also displayed with the 2% interest rate, per month, the cumulative benefit at the end of 6 months exceeds the invested cost. To know the total benefit within 5 years is estimated from the day of installation of computers.

The Baidynath company also protects the data through four data security levels Database security, Network Security, O/S

security and general security. Baidynath data security levels guard against accidental or malicious tempering with data, integrity ensure that any properly authorized access, alteration, deletion or insertion of the data in the database does not change the consistency and validity of data. Baidynath data security system also covers all aspects of database security provided by the Oracle.

CHAPTER - 4: FINANCIAL INVESTMENT AND RECOVERY

4.1 Introduction

A cost -benefit analysis is made to determine economic feasibility. The primary objective of cost-benefit analysis is to find out whether it is economically worthwhile in the Company. If the returns on the investment are good; then the

project is considered economically worthwhile [LOP/National/6].

To perform the cost-benefit analysis the cost of computers and its peripherals is checked out [LOP/National/1]. Costs consist of both direct costs and indirect costs. Direct costs are those incurred in buying equipment, employing people cost of consumer able items, rent for accommodation etc. Indirect costs include those involving time spent by user in discussing problems with system analysts, gathering data about problems, etc. Details of direct costs are:

Benefits can be broadly classified as tangible and intangible benefits. Tangible benefits are directly measurable. These are:

4.2 Direct Savings

1. Direct saving made due to reducing (a) inventories (b) delays in collecting outstanding payments (c) wastage (d) cost of production, and increasing production, as also its speed.
2. Saving due to reduction in human resources or increasing volume of work with the same human resources.

4.3 Indirect Benefits:

Indirect benefits are:

1. Better services to customers
2. Superior quality of products.
3. Accurate, reliable and up to date strategic, tactical and operational information which ensures better management and thereby more profits.

The sum of all costs (direct and indirect) is compared with the sum of all savings (tangible and intangible). It is not always easy to assign money value to intangible benefits.

Present value method is used for the analysis. This method is best because it's calculating benefits at any given month. Even Payback method with interest is not entirely correct as benefits would themselves earn interest. Hence Present value method is used. Present value of earning is achieved by the formula

Present Value = Net Benefit / $(1 + \text{interest rate}/100)^{\text{month}}$

4.4 A Practical Approach: Cost Benefit Analysis

1. Cost of computers, printers and uninterrupted power supply=Rs.1,75,000/-
2. Cost of space=Nil
3. Cost of Manager EDP/Consultant for 3 months=Rs.30,000/-
4. Recurring Costs: Stationery cost, floppy cost, maintenance / Electricity=Rs.10,000/-
5. One Time cost=Rs.2,05,000/-

Direct Benefits: Savings per month due to inventory reduction and wastage

(Since 5% variations of bills due to not better accuracy, outstanding bills etc)

= 5% bill of 100 depot within 1 month (One bill approx. of Rs.25000/-)

= $(5/100) * 25000 * 1 * 100$ (One Month Calculation)(North Zone Depos)

=Rs.12, 500/-

2. Saving in Transport cost =Rs.10, 000/- P.M.

3. Saving in Salary =25,000/- P.M.

Intangible Benefits:

1. Customer's satisfaction due to product wise bills and less variation.

2. Better menu planning

Total benefits = Rs.47, 500/- P.M.

Recurring cost=Rs.10, 000/- P.M.

Net benefit per month = Rs. 37,500/-

Total capital cost=Rs.2, 05, 000

1 st Year			
MONTHS	COST(Rs)	Present Benefit	Cummulative Benefit
0	2,05,000	-	-
1		36764.71	36764.71
2		36043.83	72808.54
3		35337.09	108145.6
4		34644.2	142789.8
5		33964.91	176754.7
6		33298.93	210053.7
7		32646.01	242699.7
8		32005.89	274705.6
9		31378.32	306083.9
10		30763.06	336846.9
11		30159.86	367006.8
12		29568.49	396575.3

2 nd Year			
Months	Cost	Present Benefit	Cummulative Benefit
	2,05,000		
1		28988.72	425564
2		28420.31	453984.3
3		27863.05	481847.4
4		27316.72	509164.1
5		26781.1	535945.2
6		26255.98	562201.2
7		25741.15	587942.3
8		25236.42	613178.8
9		24741.59	637920.3
10		24256.46	662176.8
11		23780.85	685957.7
12		23314.56	709272.2

3rd	Year	Benefit	Analysis
Months	Cost	Present Benefit	Cummulative Benefit
	2,05,000		
1		22857.41	732129.6
2		22409.22	754538.8
3		21969.83	776508.7
4		21539.05	798047.7
5		21116.71	819164.4
6		20702.66	839867.1
7		20296.72	860163.8
8		19898.75	880062.6
9		19508.58	899571.1
10		19126.06	918697.2
11		18751.04	937448.2
12		18383.37	955831.6

4th	Year	Benefit	Analysis
Months	Cost	Present Benefit	Cummulative Benefit
	2,05,000		
1		18022.91	973854.5
2		17669.52	991524
3		17323.06	1008847
4		16983.39	1025830
5		16650.38	1042481
6		16323.9	1058805
7		16003.83	1074809
8		15690.03	1090499
9		15382.38	1105881
10		15080.76	1120962
11		14785.06	1135747
12		14495.16	1150242

5th Year Benefit Analysis

Months	Cost	Present Benefit	Cummulative Benefit
	2,05,000		
1		14210.94	1164453
2		13932.3	1178385
3		13659.11	1192044
4		13391.29	1205436
5		13128.71	1218564
6		12871.29	1231436
7		12618.91	1244055
8		12371.48	1256426
9		12128.9	1268555
10		11891.08	1280446
11		11657.92	1292104
12		11429.33	1303533

4.5 Five Years Cost Benefit Graphical Representation:

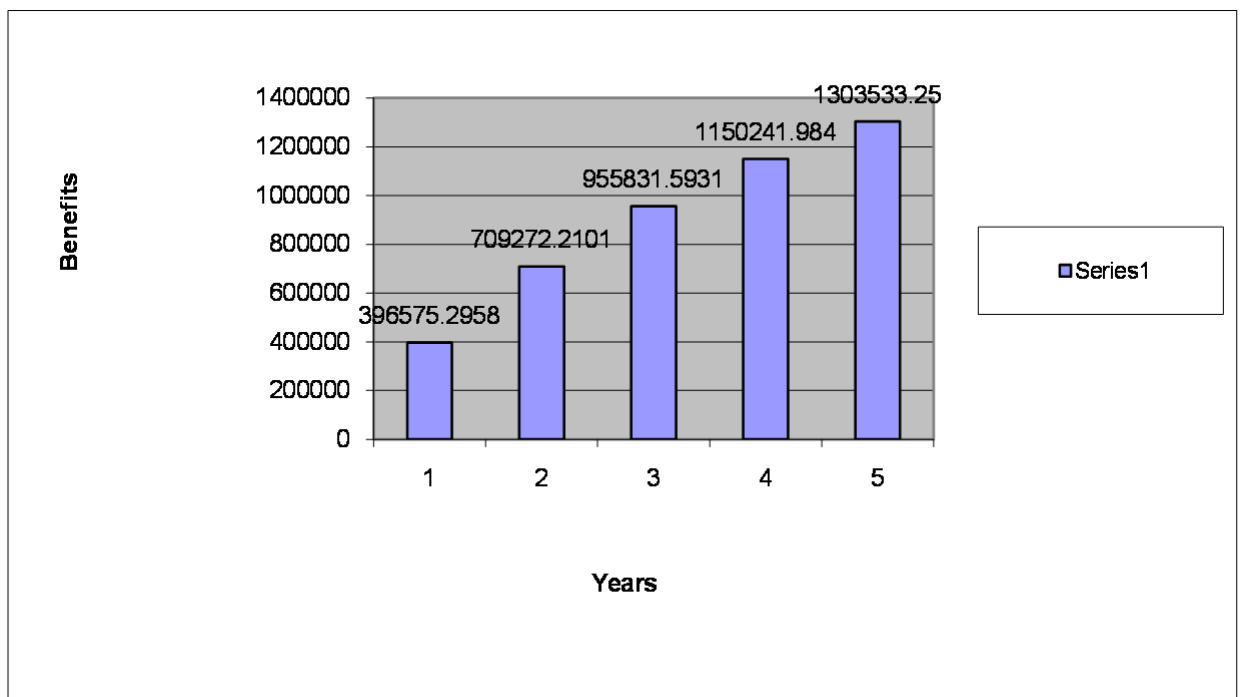


Fig.10

4.6 Conclusions:

This Fig. no. 10 shows the present value of benefit status of Baidynath Company. The cumulative benefits are shown above with the 2 % interest rate, per month, the cumulative benefit at the end of 12 months exceeds the cost. Hence today the company is in benefit as new systems were installed approximately one and half years ago.

To know the total benefit within the 5 years is estimated from the day of installation of computers.

CHAPTER – 5: DATA BASE SECURITY ARCHITECTURE

MODEL

Baidynath Company secures the database involving both policies and mechanisms to protect the data and ensure that it is not accessed, altered or deleted without proper authorization [LOP/International/4]

Security measures[LOP/Article/5] taken by the company is as follows:

- 1) Database Security
- 2) Network Security
- 3) Operating System Security
- 4) General Security.

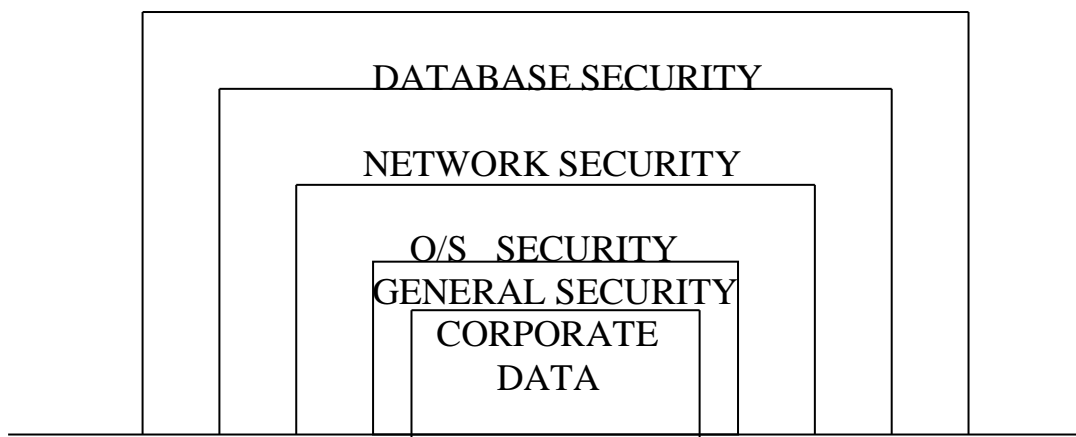


Fig. BAIDYNATH COMPANY DATA SECURITY LAYERS

5.1) Database Security: So far as the Baidyanath company database security is concern it is based on the soft wares used by the company.

Baidynath Uses

Front End: Oracle

Back End: Developer-2000

Platform: Windows-NT

The Oracle includes two independent mechanisms for database security namely authentication, authorization. The authentication subsystem requires to supply a username and password. The authorization subsystem assigns system and object-level rights and specifies the activities that various users may engage in. Oracle's powerful view mechanism is the part of its authorization subsystem. The authentication mechanisms permit to log on to the Oracle system, while the authorization mechanisms permit to share database objects (tables, views, and so on) and allow the DBA to assign system-wide privileges.

The authorization subsystem allows DBA users to grant and revoke privileges to other users with SQL statements GRANT and REVOKE. The decisions about which users are granted what privileges are company policy decision that is merely enforced by Oracle. Oracle ensures that accesses to the RDBMS are always checked against all the authorization constraints it stores and maintains. Oracle maintains two levels of groups of privileges: system privileges and object privileges. System privileges refer to the CONNECT, RESOURCE, and DBA privileges granted to users by the DBA. The privileges classes determine

whether user can log on to Oracle, whether or not user can create objects and whether or not user can authorize others to log on to Oracle.

Object privileges provide detailed control over database objects (tables, views, and so forth) once user logged on to the Oracle systems.

Enforced with object privileges, views allow user to control table access down to the level of selected columns of selected rows of a particular table. Object privileges determine what user may do at that level --whether user may merely "see" a value, alter a value, or create a new value and insert it into a table.

Users can also be granted different object privileges from the seven possible: ALL, SELECT, INSERT, UPDATE, DELETE, ALTER and INDEX. Further Baidynath data security system also covers how to use views in tandem with granted privileges to secure a database by restricting access to specified columns or rows of particular tables.

Changing the Super user Password:

```
SQLPLUS  SYSTEM/MANAGER
```

```
SQLPLUS  GRANT CONNECTS TO SYSTEM IDENTIFIED BY  
SHERLOCK;
```

This changes the system's password to SHERLOCK.

- 5.2) Network Security:** Since the company is working on the homogeneous distributed database system and each department has its own computers connected through LAN is connected with each other by the LAN hence

to protect the data in LAN environment is very important because data in a network is held in a common storage , and anyone is authorized to use the central storage.

The best solution to this potential problem taken by the company by storing the data in an encrypted form then any unauthorized person accessing the file would not be able to read its contents.

An **encryption key** is used for coding and decoding a message to protect the data from unauthorized users. Keys are basically distributed to authorized users.

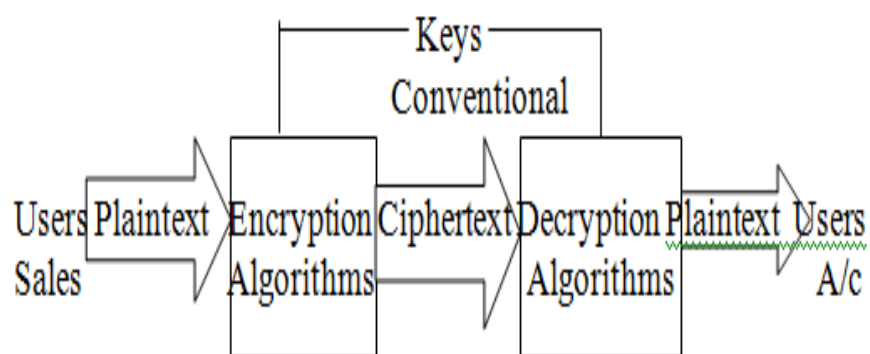


Fig. No. 12

Picture depicts the company encryption process when the data is running onto the N/W it is automatically changed to meaningless information called as Ciphertext. Upon reception the ciphertext is transformed back to the original plaintext by using a decryption algorithms and the same key that was used for encryption.

Network Security Techniques used in Company.

1. LAN Security cannot exist without a management policy.
2. LAN users are positively identifiable before they can access to network resources.
Prevention: passwords, passkeys authorization measures.
3. Data, hardware and software is protected from unauthorized and/or accidental modification ,destruction, theft or disclosure.
Prevention: locks
4. Data is reconstructed able.
Prevention: Frequent, regular backups of files.
5. Equipment is protected from fire, dirt and natural disasters.
Prevention: smoke detectors, sprinklers, air-conditioning .

5.3) Operating System Security : The DBA of company has also applied the O/s security techniques to the system is as follows:

Personnel Identification : Since the systems are running on the LAN environments which presents some additional security problems because of its dispersed nature and because many people have access to the network. This is the operating system which identifies the user's identification : personal, such as ID badge; key word such as log-in name and password; or key number.

- **Passwords** : After logging onto to the network ,the user of company has to type a password;Theoretically if users give a password,unauthorised access is prevented.
- **Security in Log-in** : Password is not displayed back to the screen during log-in process.The no of times a password can be attempted of the company network systems upto three times only then after the log-in name is invalidated temporarily and the network supervisor notifies of a failed log-in.

5.4) General Security :

Human Factors: At the outermost level are the human factors, which encompass the ethical, legal, and societal environments. The company depends on these to provide a certain degree of protection. Thus, it is unethical for a person to obtain something by stealth, and it is illegal to forcibly enter the premises of an organization and hence the computing facility containing the database.

The Baidynath Company performs some type of clearance procedure for personnel who are going to be deal with sensitive information, including that contained in a database. This clearance procedure is a very informal one, in the form of the reliability and trust that an employee has earned in the eyes of management or DBA.

The DBA is responsible for granting proper database access authorization to the user community. Inadvertent assignment of authorization to a wrong class of users can result in possible security violations.

Physical Security: Physical security mechanisms include appropriate locks and keys and entry logs to computing facility and terminals.

Security of the physical storage devices within the company and when data is transmitted from one location to another is maintained. Access to the computing facility is guarded, since an unauthorized person can make copies of files bypassing the normal security mechanisms built onto the DBMS and the operating system.

Authorized systems from which database access is allowed is physically secure, otherwise unauthorized person may be able to clean information from the database using these systems.

User identification and passwords is kept confidential, otherwise unauthorized users can "borrow" the identification and password of a more privileged user and compromise the database.

Administrative Controls: Administrative controls are the security and access control policies that determines what information is accessible to what class of users and type of access is allowed to this class.

The administrative control procedures are the implementation of security policies to provide protection, external to the database, operating systems, and computer hardware. The company administrator has chosen the security features provided by the DBMS to adequately implement the security perspectives.

Since the homogeneous distributed database system is used by the company and then hence chosen the administrative or DBA as security administrator and the access control policy is chosen by the DBA as closed system hence a user is not allowed to access any thing unless access is explicitly granted.

The Floppy diskless PC: To secure the data from external virus or program used by the unauthorized or authorized user accidentally or knowingly the company has removed all the floppy drives from all the systems except one and CD drive is also attached to one of the system to restore the data if required any time.

Protection Against Cable radiation: Since the information is moving through cable, it should not be intercepted by the unauthorized user hence DBA has protected it by putting out of sight through underground fittings.

This is the power of the security systems used in the company makes the company in more beneficial position. A research paper akt-[5.3.2] associated with security is attached at pg. no 108.

Management Level Concern:

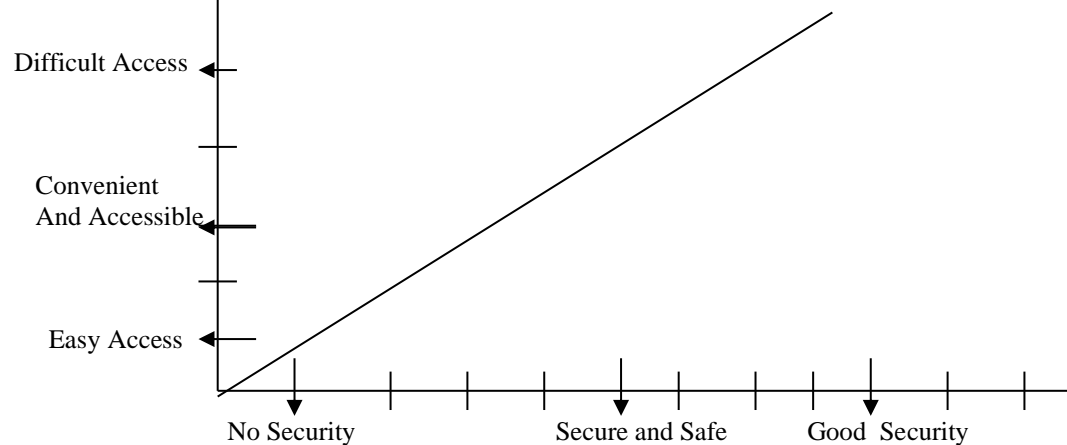


fig.13

Fig. No. 13 depicts Good security usually reduces case of access to the computer. Managers must weigh the trade offs between convenience and security when implementing a specific systems.

Since company is using the Oracle as front end and developer-2000 as back end. Data is secure Three levels of defense are made for Database security: human factors, physical security, administrative security and the security and integrity mechanisms built into the operating system and the DBMS.

DBMS and OS Security Mechanisms: The database of the company also depends on some of the features of the OS for security perspective.

- The proper mechanisms for the identification and verification of users. Each user is assigned an account no and a password. The O/S

ensures that access to the system is denied unless the number and the password are valid. In addition, the DBMS also requires a number and password before allowing the user to perform any database operations.

- The protection of data and programs is done by the OS both in primary and secondary memories. This is usually done by the O/S to avoid direct access to the data in primary memory or to online files.

The DBMS has the following features for providing security and integrity: mechanisms to support concurrency; transaction management; audit and recovery data logging. In addition, the DBMS provides mechanisms for defining the authorizations for the user community and specifying semantic integrity constraints and checking.

5.5 Access Control by Pictorial Representation:

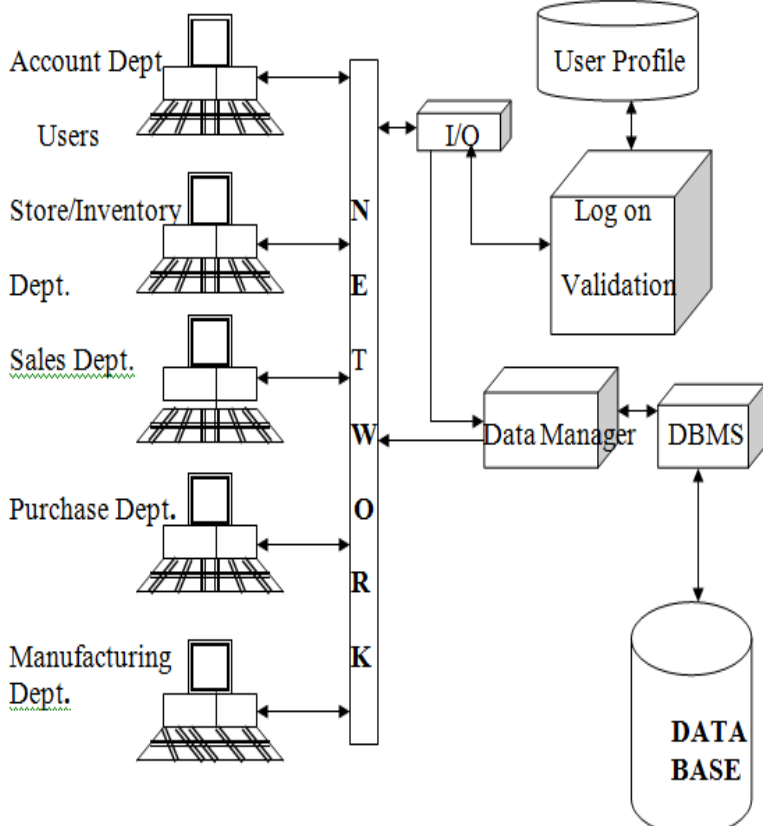


Fig. No. 14 Client/Server Architecture (Three-tier Architecture)
 Baidyanath Data processing system security

5.5 Contingency and Disaster Recovery Plan:

Eventually the most common question asked is just where do you draw the line for uncertain and disaster recovery [LOP/National/2]. The answer of course is the worst possible disaster is imagined with respect to company and recovery plan is prepared for it. In this manner we would have done our best. With ref. [LOP/Article/1] possible disaster is as imagined and work out

Imagination for IT Disaster Happening in Company: Disaster can be classified into different types:

Minor: System breaks down < 48 hours!> 72 hours

(Related with minor data or equipment failure)

When the system breakdown is less than for 48 hours but not greater than 72 hours, it is related to minor data or equipment failure.

Major: System breaks down > 72 hours < One week

(**Related** to severe damage to data, computer systems, Electrical systems or physical structures).

When the disruption in services is more than 48 hours but less than a week and is related to severe damage to data, computer systems, electrical systems or physical structures

Disaster: System breaks down > One week up to months

This could be defined as a severe damage to data systems or equipment and installation structures in part or total due to say a fire, explosion,

natural calamity, and sabotage or hardware/software failure, bring about an interruption in the business services for more than a week and up to several months.

Chances of Major losses by IT Disaster Happening: Widespread disturbance in company business services will arise. If one were to compute the business opportunities lost and the loss in terms of cost, the figures would be mind boggling, may be as follows ...

- 1) Financial loss to the company resulting out of the damage.
- 2) Loss of fresh business opportunities, a situation which will be frowned upon by the management . Total chaos and confusion.
- 3) Loss of important customers that have been nurtured over the years. In just few days. These key clients could be lost.
- 4) Re-entering the lost data will prove to be time consuming, frustrating and costly.

Guidelines for Drawing up a contingency and Disaster Recovery

Plan: Having categorized the nature of disasters and having comprehended the implications of the same, it becomes easy to derive the following simple guidelines for formulating the contingency and disaster plan.

- **Say goodbye to the bureaucratic approach:** This is of no use at such

a disastrous time. Efforts should be focused on reducing delays time involved in restoration process.

- Physical security measures (like the use of fire extinguishers, fire proof cabinets, proper electrical wiring) need to be taken to reduce susceptibility of damage to systems and the installed infrastructure.

- **Insurance of equipment** and systems is must.
- **Identification of an alternate site**, a temporary facility or a dual center concept should be explored.
- It is important **to identify vendors** who have provisions for emergency replacement or repair when required.
- It is important to identify **competent persons in our team** who will be responsible for the recovery process.

Role of Disaster recovery “Team”:-

- Communicating with the concerned users, organizing vendors and vendor transport, organizing the recovery process, claiming insurance and so on.[LOP/Article/6]
- Organizing hardware recovery, software or application recovery.
- Restoration of communications infrastructure.
- Organizing regular backups, ensuring virus protection, training staff on

security procedures.

- Identifying the order of priority of critical applications to be recovered.
If necessary, concerned user groups should be identified before hand by the team.
- The team should look into issues such as in- built redundancy, fault tolerance and recoverability features, when purchasing systems.
- The team should make the users aware of the disaster recovery strategy and just what is expected of them in the event of a disasterous situation developing.
- The team should undertake regular reviews of its plan.

A test run should be run once in a while to check out whether the plan really works and whether it is definitely recommended.

5.6 Conclusion : Baidynath data security levels guard against accidental or malicious tempering with data ; integrity ensure that any properly authorized access, alteration, deletion or insertion of the data in the database does not change the consistency and validity of the data. Baidynath data security system also covers all aspects of database security provided by the Oracle. More importantly, it covers the authorization subsystems which allow the user to grant and revoke both system-and object-level privileges within Oracle. Various users can be granted varying levels of the system privilege-from the limited CONNECT privilege to the more flexible RESOURCE privilege to the

most powerful DBA privilege. Users can also be granted different object privileges from the seven possible: ALL, SELECT, INSERT, UPDATE, DELETE, ALTER and INDEX. Further Baidynath data security system also covers how to use views in tandem with granted privileges to secure a database by restricting access to specified columns or rows of particular tables.

CHAPTER 6: CONCLUSION & FUTURE WORK

To summarize, the role of computers for reducing the uncertainties occurring in organizations, this thesis comprises theoreticals as well as practical approach. According to literature survey this research work shows how computers are used as tools, as machines, as weapons and as channel to reduce the uncertainties like incompleteness, irrelevance, indeterminacy and incommensurability to support the MIS.

To find the practical evidence of the existence of the paradigms and metaphors used in literature surveys -A Baidynath Case Study is made. A benefit found in computer based MIS is time saving, data sharing, and data security is maintained and cost benefit analysis is made to support the MIS to take the effective

decision. Baidynath computer based MIS provides the desired information available in the right form at the right time, supply the desired information at a reasonable cost, keep the information update, store important and confidential information properly, increases the productivity and efficiency, regularize and maintain disciplinary systems of work.

Hence it can be concluded that computer has power to reduce the uncertainties that organizations faces. Based on the topology of uncertainties developed, this thesis proposed that computer can reduce specific type of uncertainty occurring in organizations.

Since the Baidynath company is presently working under the homogeneous distributed system to support the company MIS to take the better and timely decisions. Each department has its own group of computers having the same o/s and the RDBMS packages to execute and share the data. The system is running into the distributed data processing environment. Company's database is the relational database.

In future the Baidynath can use the heterogeneous distributed system. Each department of the company can use different type of O/S and RDBMS packages to execute the queries required to support the Baidynath MIS for taking effective decisions and then company can use the online analytical processing (OLAP)- through which company can generate summary tables with multiple combinations of dimensions. Basically an OLAP server is connected to the databases or data warehouses server at one end, and to the user's computer at the other. Multi dimensions database can also be used in future.

In future the Baidynath Company can influence the environments, altering their product or service mix, changing the relationship with outside partners and customers and even can change the rules of competition in their company by using the **internet services**. Baidynath Company can directly access their final customers, bypassing traditional intermediaries or depots centre, and collecting a wealth of information about actual and prospective customers. Baidynath can redefine their

traditional environments by using their web sites on the internet.

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D) Information Technology Today by S. Jaiswal

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Website: www.baidynathayurva.com

Other References:

CD, Industrial IT – The total solutions suite for Baidynath enterprise.

Appendix...

1. Please state your rating on a scale of 1 to 5 that corresponds to your perceptions of the importance of each of the following skills for software professional at entry level job.

Where

5=Critical

4= Very important

3=Moderately important

2=Slightly important

1=Least important

	Developmental Skills	Rating
1.	Ability to listen others	
2.	Ability to works with others	
3.	Ability to work alone	
4.	Ability to persuade others	
5.	Ability to give effective presentations	
6.	Ability to appropriately respond to another's emotions	
7.	Ability to do a cost benefit analysis	
8.	Ability to do foresee problems and anticipate results	
9.	Ability to do project planning feasibility study	
10.	Ability to train and supervise others	
11.	Ability to use MIS planning methods	
12.	Ability to design and use algorithms	
13.	Ability to build applications in multiple environments/platforms	
14.	Ability to use Computer aided Software Engineering (CASE)	
15.	Ability to design collaborative work applications	
16.	Ability to design distributed applications	
17.	Ability to build application using SQL or similar database language	
18.	Ability to write clearly and effectively	
19.	Ability to assess the usefulness of new technologies	
20.	Ability to integrate local and global information flows and strategies	
21.	Ability to prototype applications	
22.	Ability to build applications in using 4th generation languages	
23.	Knowledge of specific systems development methodology	
24.	Ability to build systems in a PC environment	
25.	Ability to design relational database	

26.	Ability to use techniques for identifying applications that will provide competitive advantage	
27.	Knowledge of total quality management procedures	
28.	Ability to have an understanding of industry structure and behavior	
29.	Ability to have an understanding of a specific business function	
30.	Ability to have familiarity with an object oriented language	

2. Please indicate the approximate number of EDP personnel required for a big company according to your perceptions:

MIS Positions	No.
1.System Analyst	
2.Application Programmer	
3.Operators	
4.System Programmer	
5.Database Specialist	
6.MIS Planner	
7.AI specialists	
8.Web Designer	
9.e-commerce & e-business executives	
10.Others-Please specify	
A.	
B.	
C.	

D.	
E.	