ERP and CRM
(Assignment –I)

Submitted in partial fulfilment of the requirements for the degree of

Master of Technology in Information Technology

by

Vijayananda D Mohire

(Enrolment No.921DMTE0113)

Information Technology Department
Karnataka State Open University
Manasagangotri, Mysore – 570006
Karnataka, India
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ERP and CRM

CERTIFICATE

This is to certify that the Assignment-I entitled ERP and CRM, subject code: MT32C submitted by Vijayananda D Mohire having Roll Number 921DMTE0113 for the partial fulfilment of the requirements of Master of Technology in Information Technology degree of Karnataka State Open University, Mysore, embodies the bonafide work done by him under my supervision.

Place: _____ Signature of the Internal Supervisor

Date: _____ Name

Designation

Preface

This document has been prepared specially for the assignments of M.Tech – IT III Semester. This is mainly intended for evaluation of assignment of the academic M.Tech – IT, III semester. I have made a sincere attempt to gather and study the best answers to the assignment questions and have attempted the responses to the questions. I am confident that the evaluators will find this submission informative and evaluate based on the furnished details.

For clarity and ease of use there is a Table of contents and Evaluators section to make easier navigation and recording of the marks. Evaluators are welcome to provide the necessary comments against each response; suitable space has been provided at the end of each response.

I am grateful to the Infysys academy, Koramangala, Bangalore in making this a big success. Many thanks for the timely help and attention in making this possible within specified timeframe. Special thanks to Mr. Vivek and Mr. Prakash for their timely help and guidance.

Candidate's Name and Signature Date

Table of Contents

Table of Figures

ERP and CRM

RESPONSE TO ASSIGNMENT - I

Question 1 What are the related technologies of an ERP System?

Answer 1

There are many technologies that help to overcome the limitations of standalone ERP system. These technologies, when used in conjunction with the ERP package, will help in overcoming the limitations of a standalone ERP system and thus help the employees to make better decisions. Some of these technologies are BPR, Datawarehousing, Data Mining, On-line Analytical Processing (OLAP), Supply chain management etc.

Business process reengineering (BPR)

Another management philosophy to enhance corporate competitiveness in this customer economy is BPR. The BPR movement arose with the publication of two academic articles in 1990. In the first article, Thomas H. Davenport and James R. Short argued that the combined use of IT and business process redesign could transform organizations and improve business processes to the degree Taylor's scientific management once did.

They defined business process redesign as ".. the analysis and design of work flows and processes within and between organizations." They prescribe a five-step methodology for achieving process redesign. The methodology starts with setting business vision and process objectives. Instead of rationalizing tasks to eliminate bottlenecks, as done in previous process redesign works, they suggest that process redesign should be performed on entire processes to achieve desired business vision and process objectives. The second step is to identify the processes to be redesigned. This is similar to the Pareto analysis practiced in TQM. Instead of redesigning all processes, key processes that offer the most impact should be redesigned. The next step is to understand and measure the existing processes. This is to understand the problems in the existing processes and to set baseline performance measurements to judge future improvements. The fourth step in their five-step methodology is to identify how IT can be leveraged in the process redesign. Instead of simply supporting process redesign, Davenport and Short argue that IT can actually create process redesign options. The last step is to implement a prototype of the process. This prototype should extend beyond IT

applications and into business organization and serves as the base for iterative improvement before being phased into full implementation. The combination of IT and business process redesign creates what the authors term new industrial engineering. Just as scientific management created the original industrial engineering discipline, IT, and business process redesign would be essential tools in the new industrial engineering discipline.

About the same time that Davenport and Short published their ideas on business process redesign, Michael Hammer published his radical sounding concept of BPR. Hammer claims the process rationalization and automation efforts of the past have not improved productivity and performance significantly. He believes corporations were simply automating processes designed prior to the wide usage of computers. This type of automation does not address fundamental process limitations. He argues that corporations need to radically change business processes to take advantage of computers. The reengineering efforts need to be broad and encompassing. They should have cross-functional boundaries and utilize IT to enable the new processes that come out of the reengineering efforts. In Reengineering the Corporation: A Manifesto for Business Revolution, Hammer and co-author James Champy, further discuss the need for change. They debunk Adam Smith's labor specialization theory and the functional hierarchical organization that resulted from it. They state that the new post-industrial economy, started in the 1980s, is different from the mass production economy of the past. In this new economy, customers have the upper hand, competition has intensified, and constant changes are normal for the conduct of business. To compete in this new customer economy, companies need to reinvent how tasks are performed. Instead of incremental improvements to business processes, companies need to start from scratch and invent a better way of performing business processes. The goal of radical change is to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed. Hammer and Champy offer a set of prescriptions to reengineer business processes. The guiding principle is to organize around processes instead of tasks. Workers who share complementary tasks report to the same supervisor even though they do not share the same skills. In essence, the authors suggest that corporations should be grouped along process boundaries rather than functional boundaries. Every process should have a process owner. The role of the process owner is to attend to the performance of the process. They further state that workers should be trained to perform all the tasks in the process rather than only a single step. In other words, labor specialization, as

espoused by Smith, Taylor, and Ford, should be dismantled. The key enabler for BPR is IT. IT serves as the disruptive technology that allows generalists to do the work traditionally performed by specialists, enables everyone to make decisions (as opposed to managers making all the decisions), and offers shared databases that allow direct access to the same information regardless of functions. In fact, shared databases are essential to BPR. Traditional IT infrastructures have often been designed to satisfy independent business. Various functions have their own information systems and databases. This created barriers to process performance because transactions had to be recreated in different applications and information replicated in different functional databases. Using a common database eliminates this barrier and presents an opportunity to reengineer the business processes without functional systemic limitations.

Dr Michael Hammer defines BPR as "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance such as cost, quality, services and speed". Business process reengineering (often referred to by the acronym BPR) is the main way in which organizations become more efficient and modernize. Business process reengineering transforms an organization in ways that directly affect performance. One of the main tools for making this change is the Information Technology (IT). Any BPR effort that fails to understand the importance of IT, and goes through the pre-BPR analysis and planning phases without considering the various IT options available, and the effect of the proposed IT Solutions on the employees and the organization, is bound to crash during takeoff.

We have seen that the ERP systems help in integrating the various business processes of the organization with the help of modern developments in IT. With a good ERP package, the organization will have the capability of achieving dramatic improvements in critical areas such as cost, quality, and speed. So many BPR initiatives end up in the ERP implementation.

When a BPR project is undertaken across the organization, it can require managing a massive amount of information about the processes, data and systems. If you don't have an excellent tool to support BPR, the management of this information can become an impossible task. The use of a good BPR/documentation tool is vital in any BPR project.

The types of attributes you should look for in BPR software are:

1. Graphical interface for fast documentation.
2. "Object oriented" technology, so that changes to data (e.g. Job titles) only need to be made in one place, and the change automatically appears throughout all the organization's procedure and documentation
3. Drag and Drop facility so you can easily relate organizational and data objects to each step in the process
4. Customizable meta data fields, so that you can include information relating to your industry, business sector or organization in your documentation
5. Analysis, such as swim-lanes to show visually how responsibilities in a process are transferred between different roles, or where data items or computer applications are used.
6. Support for Value-stream mapping
7. CRUD or RACI reports, to provide evidence for process improvement
8. The ability to assess the processes against agreed international standards
9. Simulation software to support "What-If" analysis during the design phase of the project to develop LEAN processes.
10. The production of word documents or website versions of the procedures at the touch of a single button, so that the information can be easily maintained and updated.

The software we use by choice is Protos, a very comprehensive Dutch system that has been translated into English. Protos meets all the above requirements and many more, and is better than any other contemporary system.

Datawarehousing

Datawarehousing is combining data from multiple and usually varied sources into one comprehensive and easily manipulated database. Common accessing systems of data warehousing include queries, analysis and reporting. Because datawarehousing creates one database in the end, the number of sources can be anything you want it to be, provided that the system can handle the volume, of course. The final result, however, is homogeneous data, which can be more easily manipulated.

Datawarehousing is commonly used by companies to analyze trends over time. In other words, companies may very well use datawarehousing to view day-to-day operations, but its primary function is facilitating strategy planning

resulting from long-term data overviews. From such overviews, business models, forecasts and other reports and projections can be made. Routinely, because the data stored in data warehouses is intended to provide more overview-like reporting, the data is read-only. If you want to update the data stored via data warehousing, you'll need to build a new query when you're done.

Definition of Datawarehouse:

The term Datawarehouse was coined by Bill Immon in 1990, which he defined in the following way:" A warehouse is a subject-oriented, integrated, time-variant and non-volatile collection of data in support of management's decision making process". He defined the terms in the sentence as follows"

Subject oriented: Data that gives information about a particular subject instead of about a company's ongoing operations.

Integrated: Data that is gathered into the data warehouse from a variety of sources and merged into a coherent whole.

Time-variant: All data in the datawarehouse is identified with a particular time period.

Non-volatile: Data is stable in a datawarehouse. More data is added but data is never removed. This enables management to gain a consistent picture of the business.

If operational data is kept in the databases of the ERP system, it can create a lot of problems. As time passes, the amount of data will increase and this will affect the performance of the ERP system. So it is better is over does not mean that the archived data is useless. On the contrary, it is one of the most valuable resources of the organization. However once the operational use of the data is over, it should be removed from the operational databases. For example, once the financial year is over, the daily transactional data can be archived.

It is clear that as the volume of the data in the database increases, the performance of the database and the related applications decreases. But this data is a very valuable resource and is toll precious to be kept in some archive. It is in this situation that a datawarehouse comes in handy.

The primary concept of datawarehousing is that the data stored for business analysis can be accessed most effectively by separating it from the data in

operational systems. The most important reason for separating data for business analysis, from the operational data, has always been the potential performance degradation on the operational system that can result from the analysis processes. High performance and quick response time is almost universally critical for operational systems. The reasons to separate the operational data from the analysis data have not significantly changed with the evolution of the data warehousing systems, except that now they are considered more formally during the datawarehouse building process. Advances in technology and changes in the nature of business have made many of the business analysis processes much more complex and sophisticated. In addition to producing standard reports, today's data warehousing systems support very sophisticated online analysis, including multi-dimensional analysis.

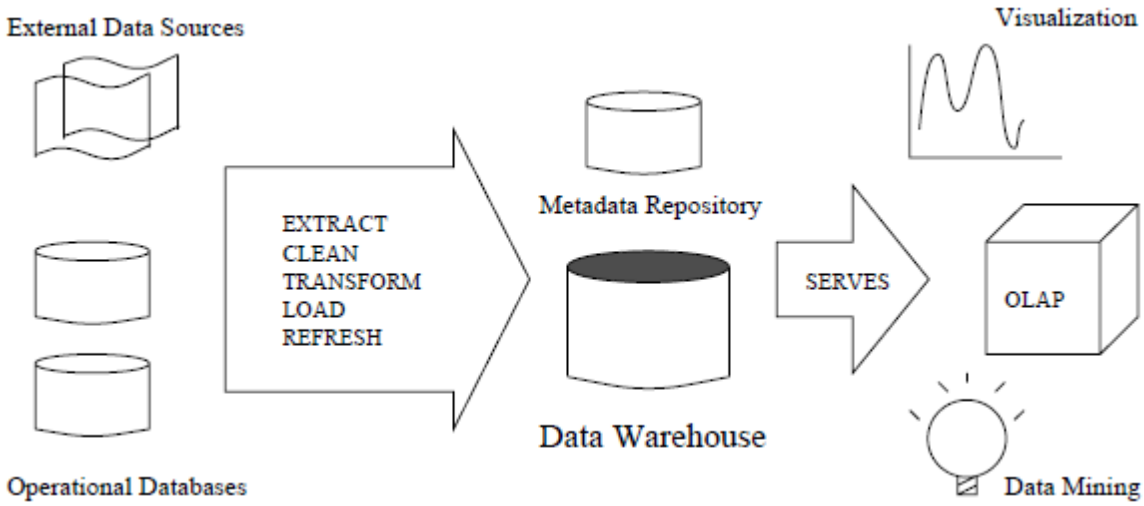

Figure 1 A Typical Data Warehousing Architecture

Data warehouses contain consolidated data from many sources, augmented with summary information and covering a long time period. Warehouses are much larger than other kinds of databases; sizes ranging from several gigabytes to terabytes are common. Typical workloads involve ad hoc, fairly complex queries and fast response times are important. These characteristics differentiate warehouse applications from OLTP applications, and different DBMS design and implementation techniques must be used to achieve satisfactory results. A distributed DBMS with good scalability and high availability (achieved by storing tables redundantly at more than one site) is required for very large warehouses. A typical data warehousing architecture is illustrated in Figure 1.

DATA MINING:

We are living in the information age. The importances of collecting data that reflects ones business, or of activities that achieve competitive advantage, are widely recognized now. Powerful systems for collecting data and managing it in large databases are available in most organizations. However, the major bottle neck of converting this data into effective information is the difficulty faced in extracting knowledge about the system from the collected data. Modeling the investigated system discovering relations that connect variables in a database are the subjects of data mining.

Data mining is the process of identifying valid, novel, potentially useful and ultimately comprehensible information from databases that is used to make crucial business decisions. Modern data mining systems self learn from the previous history of the investigated system, formulating and testing hypotheses about the rules, which the system obeys. When concise and valuable knowledge about the system of interest has been discovered, it can and should be incorporated into some decision support system, which helps the manager make wise and informed business decisions.

Generally, data mining (sometimes called data or knowledge discovery) is the process of analyzing data from different perspectives and summarizing it into useful information - information that can be used to increase revenue, cut costs, or both. Data mining software is one of a number of analytical tools for analyzing data. It allows users to analyze data from different dimensions or angles, categorize it, and summarize the relationships identified. Technically, data mining is the process of finding correlations or patterns among dozens of fields in large relational databases.

Data mining is a class of database applications that look for hidden patterns in a group of data that can be used to predict future behavior. For example, data mining software can help retail companies find customers with common interests. The term is commonly misused to describe software that presents data in new ways. True data mining software doesn't just change the presentation, but actually discovers previously unknown relationships among the data.

The main reason for needing automated computer systems for intelligent data analysis is the enormous volume of existing and newly appearing data that require processing. The amount of data accumulated each day by various businesses, scientific and governmental organizations around the world is

daunting. Research organizations, academic institutions and commercial organizations create and store huge amounts of data each day. It becomes impossible for human analysts to cope with such overwhelming amounts of data.

Two other problems that surface when human analysts process data are:

- The inadequacy of the human brain when searching for complex multifactorial dependencies in the data.
- The lack of objectiveness in analyzing the data

On-Line Analytical processing (OLAP)

OLAP can be defined in five words – Fast Analysis of Shared Multidimensional Information. FAST means that the system is targeted to deliver most responses to users within about five seconds, with the simplest analysis taking no more than one second and very few taking more than 20 seconds. ANALYSIS means that the system can cope with any business logic and statistical analysis that is relevant for the application and the user, and keep it easy enough for the target user. SHARED means that the system implements all the security requirements for confidentiality (possibly down to cell level) and, if multiple write access is needed, concurrent update locking at an appropriate level. MULTIDIMESIONAL means that the system must provide a multidimensional conceptual view of the data, including full support for hierarchies and multi hierarchies. INFORMATION is refined data that is accurate, timely and relevant to the user.

OLAP describes a class of technologies that are designed for live ad-hoc data access and analysis.

While transaction processing (OLTP) generally relies solely on relational databases, OLAP has become synonymous with multidimensional views of business data. These multidimensional views are supported by multidimensional database technology and provide the technical basis for calculations and analysis required by Business Intelligence applications.

OLAP technology is being used in an increasingly wide range of applications. The most common are sales and marketing analysis; financial reporting and consolidation; and budgeting and planning. Increasing however, OLAP is being used for applications such as product profitability and pricing analysis; activity based costing; manpower planning; and quality analysis, or for that matter any

management system that requires a flexible, top down view of an organization.

Supply Chain Management

Supply Chain Management (SCM) is the combination of art and science that goes into improving the way your company finds the raw components it needs to make a product or service and deliver it to customers. The following are five basic components of SCM

1. Plan- This is the strategic portion of SCM. You need a strategy for managing all the resources that go toward meeting customer demand for your product or service. A big piece of planning is developing a set of metrics to monitor the supply chain so that it is efficient, costs less and delivers high quality and value to customers.
2. Source - Choose the suppliers that will deliver the goods and services you need to create your product. Develop a set of pricing, delivery and payment processes with suppliers and create metrics for monitoring and improving the relationships. And put together processes for managing the inventory of goods and services you receive from suppliers, including receiving shipments, verifying them, transferring them to your manufacturing facilities and authorizing supplier payments.
3. Make - This is the manufacturing step. Schedule the activities necessary for production, testing, packaging and preparation for delivery. As the most metric-intensive portion of the supply chain, measure quality levels, production output and worker productivity.
4. Deliver - This is the part that many insiders refer to as Logistics. Coordinate the receipt of orders from customers, develop a network of warehouses, pick carriers to get products to customers and setup an invoicing system to receive payments.
5. Return- The problem part of the supply chain. Create a network for receiving defective and excess products back from customers and supporting customers who have problems with delivered products.

A supply chain is a network of facilities and distribution options that performs the function of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers. Supply chains exist in both service and manufacturing organizations, although the complexity of the chain may vary greatly from industry to industry and firm to firm.

Traditionally, marketing, distribution, planning, manufacturing, and the purchasing organizations along the supply chain operated independently. These organizations have their own objectives which are often conflicting. Marketing objective of high customer service and maximum sales revenue

conflict with manufacturing and distribution goals. Many manufacturing operations are designed to maximize throughput and lower costs with little consideration for the impact on inventory levels and distribution capabilities. Purchasing contracts are often negotiated with very little information beyond historical buying patterns. The result of these factors is that there is not a single, integrated plan for the organization- there are as many plans as businesses. Clearly, there is a need for a mechanism through which these different functions can be integrated together. Supply chain management is a strategy through which such integration can be achieved.

Evaluator's Comments if any:

Question 2 Why choose Web Based or Hosted CRM?

Answer 2

In the last few years, the market for hosted CRM has soared particularly among small and mid-sized companies, largely because of fears about the expense and complexity of large-scale on-premise CRM implementations. And indeed, hosted CRM is often a good choice for companies that want to implement standard CRM processes, are able to use out-of-the-box data structures, with little or no internal IT support, and don't require complex or real-time integration with back office systems.

However, hosted CRM software is not always as simple as the vendors would have you believe. For instance, customization can be problematic and hosted CRM vendors' API tools cannot provide the degree of integration that is possible with on-site applications. Getting a hosted CRM system working shouldn't take as long as a traditional software package, but larger and more complex rollouts can still take a year or more. And while the hosted option reduces the need for in-house technical support, upgrades can still sometimes be technically tricky. In addition, some companies with particularly sensitive customer data, such as those in financial services and health care, may not want to relinquish control of their data to a hosted third party for security reasons. As a result, AMR Research predicts that even by 2009, hosted CRM applications will account for only 12 percent of the total U.S. CRM market.

The simple truth is that the web based delivery mechanism is not for everyone and does not fit every scenario. Organizations need to choose for themselves which is the better option. The CRM function is quiet unique in that it lends itself extremely well to a hosted platform – much better than, say, a finance or ERP application. This is because many of the systems needed for CRM actually do better as a stand-alone application. CRM systems track cold-calls and prospectus and marketing profiles and campaigns – having to enter all of these details into a finance system would only clog up the works and generally slow matters down. Integrated CRM/ERP solutions work well when the business is largely involved in "farming" a large, well-defined customer base. When the organization is "hunting" new clients however there can be too much unstructured data in the mix to warrant any meaningful integration.

So what are the main criteria and benefits of adopting the hosted model?

- Lower risk – Implementing any technology is often a high-risk action and not taken lightly. CRM is arguably even higher risk in that when it is implemented the success or failure is very public and the

consequences of getting it wrong range from inadequate management information right through to business failure. So the selection and rollout of what is often a very high-cost software product has certain challenges that are not to be made light of.

- Rapid ROI - Bundling software, hardware, systems configuration and integration into one offering that can be configured to a company's needs reduces implementation time drastically. This translates into faster-time-to-customer and a more rapid ROI. Of course, you still need to establish what the criteria are for that ROI - web based CRM solutions are only another form of technology, it still needs people to operate it and processes to follow before it can deliver the benefits. Those who have bad systems or bad people and believe that VRM will solve either or both can't be helped by web based or On-premise CRM solutions.

- Lower Costs - With a hosted solution, an organization can take advantage of sophisticated software running at a centralized, remote location, often on hardware that they could not afford to implement themselves. Hosted solutions can reduce software implementation and customize costs dramatically because of this shared functionality and infrastructure. Initial start up fees is minimal and the monthly subscription fee is based on the number of users who have access, providing complete transparency of costs and billing. There is some research at present that suggests that over a four year period the on premise model works out cheaper but in the studies I have seen there was no provision for upgrading hardware and/or software during that period- something that is almost certain to be required.

  Hosted applications eliminate the need for the installation of software at the client side, thus saving in initial installation and ongoing maintenance. The service provider guarantees performance, reliability and support through service-level agreements with client. Software maintenance, support and updates as well as infrastructure systems and network monitoring are centrally administered with web based CRM solutions. This frees up technical resources for other projects.

- Higher added value- The hosted CRM solution is designed to maximize the value of the application whilst minimizing the risks associated with implementing a traditional, on-premise solution. The figure below depicts how the general risks of using a traditional, licensed offering directly correspond with the general benefits of choosing an on-demand solution.

Table 1 Comparison of On-Premise and Hosted CRM

On-Premise	Web based or Hosted
Lengthy implementations (six + months) and slow speed-to-market	Short implementations (10-25 days) and quick speed-to-market
Price ranges in the thousands	Price ranges in the hundreds
Service costs up to 5 times license costs	Service costs no greater than license costs
Relatively high capital investment	Low capital investment
Hardware, support and services not typically included in license cost	Subscription includes all resources (hardware, software and people)
Upgrades and maintenance are separate investments from the license	Upgrades and maintenance are included in the subscription

Web based CRM solutions can be an option for any organization – regardless of size – but need to be treated like any other investment in technology. Most companies can afford a few hundred dollars for a pilot if it saves them thousands on a badly thought through implementation later.

Evaluator's Comments if any: