

Understanding the Information Systems Evolution in Organisations Leading to Systems Integration and Enterprise Resource Planning (ERP): The Perspective of a Manufacturing Process.

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Abstract

This study gives an insight into on how software integration enhances the way of achieving coordination and organization of operations inside and outside organizations. It examines how the integration design force can exert a powerful influence on the shape of information systems for the achievement of corporate goals. Today, organizations have moved from stand-alone business information systems applications to integrated enterprise-wide systems. Expected from an effective organization are supporting and continuity of transfer of information from one step to another and the switching from one function to another. Performance of activities must be well supported so that the task as a whole can be completed in a reasonable time. Transfer of information must be maintained in terms of its efficiency and reliability. The methodology adopted was the use of secondary research which is useful to better understand and explain the research question. Secondary data can be raw data or published summaries from books, journal articles, online data sources and reports. The result shows that integration of information systems can foster a climate of creativity, harmony and a sense of organizational solidarity. Therefore the study recommends that organizations particularly in developing economies like ours, should strive toward integrating organizations information systems which increases the efficiency and wellbeing of the enterprise. In furtherance of this, the full potentials of Enterprise Resource Planning (ERP) systems could be harnessed. The goal of an ERP system is to make the information flow dynamic and immediate (within the organization and with its partners), therefore, increasing its usefulness and value.

Key words: *Software, Integration, Information Systems, Communication, Technology, Efficiency, Enterprise Resource Planning.*

1.0 Introduction

Organizations are increasingly relying on teams to complete work. A team is a group of individuals who work interdependently to solve problems, perform work or work toward goals (Hackman, 1987). An example is the use of teams in implementing an enterprise resource planning system (ERP), which represents an information systems (IS) project. As noted by Faraj and Sambamurthy (2006: 238), “Teams are the fundamental organizational unit through which Information Systems projects are executed.”

An ERP is a business management software consisting of a suite of integrated applications organizations use to manage their information and run their businesses. ERPs are scalable, multi-functional, and complex systems and include one or more modules. The purpose of an ERP is to integrate information across core functional areas in the organization (e.g., finance, human resources, manufacturing, customer relationship, supply chain management, etc.), to facilitate the management and flow of information between the functions as well as between the organization and stakeholders. ERPs are now considered the primary technology organizations employ to manage their information (Al-Mashari, 2003).

Organisations that fail to invest a portion of their capital in information technology could possibly lose increasing the production scope and level of utilisation of their information workers. These information workers provide the widely accessible data bases to process information for increased productivity and improved quality of output. In recent times, computing has revolutionised the way information is processed and stored.

Telecommunication has massively increased the amount of information in circulation as well as the speed of communication. Additionally, the level of sophistication of consumers has increased as they demand greater value for money. These developments and the availability of finance have edged out in favour of information and knowledge, both of which are resident in people. Competition is therefore increasingly service based and knowledge intensive. Thus, human creativity and productivity are the key sources of competitive advantage. It is therefore important to strive toward integrated organisations and information systems in order to harness the benefits of climate of creativity, harmony, and a sense of organisational solidarity. This situation helps in the organisations’ pursuits of economic well-being and its ability to withstand competitive forces. Organisations that operate a profile of information on ad-hoc basis, and that which is random and transaction driven, creates the avenue for the optimum loss of information and worker’s time while waiting for something to happen as a result of poor scheduling, redundant work, and inefficiencies.

1.1 The Pivotal Role of Information

Whatever the industry, the organisations that produce the highest quality information will remain or become their industry’s strongest competitor. Alternatively, if an organisation can’t improve its information sources and judicious application of same, it will be left in the wake of those who can.

Enterprise resource planning systems, if implemented successfully, can bestow impressive strategic, operational and information-related benefits to adopting firms. A failed implementation can often spell financial doom. Currently, most of the information about the failures and successes are based on reports on implementations in large manufacturing and service organizations. But enterprise resource planning vendors are now steadily

turning their marketing sights on small and medium-sized manufacturers. The time is ripe for researchers to gather, analyse and disseminate information that will help these firms to implement their projects successfully. This research adopts a single case study approach to investigate the implementation process in small and midsize manufacturing firm in the Nigeria.

2.0 Empirical Framework

2.1 Information and Communications Technology

Usually called ICT, is often used as an extended synonym for information technology (IT) but is usually a more general term that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), intelligent building management systems and audio-visual systems in modern information technology. ICT consists of all technical means used to handle information and aid communication, including computer and network hardware, communication middleware as well as necessary software. In other words, ICT consists of IT as well as telephony, broadcast media, all types of audio and video processing and transmission and network based control and monitoring functions. The expression was first used in 1997 in a report by Dennis Stevenson to the UK government and promoted by the new National Curriculum documents for the UK in 2000. ICT is often used in the context of ICT roadmap; to indicate the path that an organization will take with their ICT needs. The term ICT is now also used to refer to the merging (convergence) of audio-visual and telephone networks with computer networks through a single cabling or link system. There are large economic incentives (huge cost savings due to elimination of the telephone network) to merge the audio-visual, building management and telephone network with the computer network system using a single unified system of cabling, signal distribution and management. This in turn has spurred the growth of organizations with the term ICT in their names to indicate their specialization in the process of merging the different network systems.

2.2 The Enterprise Resource Planning (ERP) Systems

According to Al-Mashari and Al-Mudimigh (2003) ERP is a useful tool that businesses are turning to, in order to build strong capabilities, improve performance, undertake better decision making, and achieve a competitive advantage. The ERP package aims to integrate all key business activities through improved relationships at all levels to achieve a competitive advantage.

Al-Mudimigh et al., (2001); Davenport, (2000) said IT-enabled re-engineering is an important approach used to achieve dramatic improvement in business processes. The development of ERP systems was a result of the increasing demand for re-engineering, combined with the advent of client/server technologies (Buck-Emden, 2000). There was also a desire to replace MRP systems which fell short of supporting multiple plants, multiple suppliers and multiple currencies, and did not include functions such as inventory control, plan management and order processing (Kalakota and Whinston, 1997). ERP systems can be considered as an IT infrastructure that is able to facilitate the flow of information between all business processes in an organization (Martin, 1998). In particular, SAP R/3 has emerged as the dominant leader in ERP systems, and is now one of the most used tools to optimize and re-engineer business processes (Cooke and Peterson, 1998; Keller and Teufel, 1998). Siemens and Lucent, for instance, have implemented SAP R/3 to improve the integrity of their supply-chain (Elliott, 1997).

The ERP system has been the subject of much academic discussion in recent times. The impact that a successful implementation can have on an organization cannot be overstated. The factors which are crucial to the successful implementation of an ERP system are commonly known as Critical Success Factors (hereinafter CSFs). Reviewing the findings of an earlier study that investigated the CSFs and the crucial role they played during the implementation process in Omani organization, it was identified that the CSFs are most important in ensuring a successful ERP system implementation. The survey was distributed to 35 enterprises using an ERP system. The managers of those enterprises identified 10 CSFs as the most important. Many successful cases of ERP system implementation have been reported, but equally, many companies have announced their ERP system as failed system. The failure of ERP system or the inappropriate usage of the system will definitely cause a huge loss for the organization and may even lead to bankruptcy (Davenport, 1998; Soh et al., 2000; Chen, 2001; Davenport et al., 2004).

There are many benefits associated with an ERP system. All can lead to increased efficiency and will give a company a more competitive advantage in the global economy. In order to achieve this, companies should consult experts during the implementation process in order to deliver the above-mentioned benefits, and avoid system failure (Ekman and Thilenius, (2011); Maditinos et al., (2012). McNurlin (2001) revealed that only 34 percent of the companies were satisfied with their ERP system. 28 percent of the implemented ERP systems were failures. Further, 90 percent of the implemented ERP systems were late and more expensive than the companies had expected (Loonam & McDonagh, 2005). Moreover, 25 percent of the money invested in ERP system was viewed as wasted and less than 75 percent of the ERP system's effectiveness was utilized (Ettlie, 1998). Many companies only used between 50 and 75% of the ERP system functionalities or modules. Betts (2001) indicated that 80 percent of the ERP system failed to achieve the business objectives that were expected from system. Notwithstanding this, many companies have implemented ERP system, but few are used effectively (Yu, 2005). According to Kremzar & Wallace (2001) the implementation of ERP system revolutionizes the way of a business operates. Therefore, the management and stakeholders need to appreciate the magnitude of the impact that the implementation will have on the organization. They must have a full understanding of the CSFs that will help them to ensure the successful of the ERP system implementation.

2.3 Information Defined

Edemenang (1997) stated that "Information is data that have been put into a meaningful and useful context and communicated to a recipient who uses it to make decisions. Information involves the communication and reception of intelligence or knowledge. It appraises, notifies surprises, stimulates, reduces uncertainty, reveals additional alternatives or helps eliminate irrelevant or poor ones, influences individuals, and stimulates them to action. Especially in business, information should give early warning signals and portend the future."

Information consists of data, images, text, documents, and voice, often inextricably intertwined, but always organized in a meaningful context. Data to be processed can be input, stored, or both. Data are processed through models to create information; the recipient receives the information and then makes a decision and takes action; and this creates other actions or events, which in turn create a number of scattered data that are captured and serve as input; and the cycle starts all over again.

2.4 The need for information today

According to Edemenang (1997) “The need to produce more information, available to a wider array of users, is increasing. Investors in a business need information about its financial status and its future prospects. Bankers and vendors need information to appraise the performance and financial soundness of business before making loans or granting credit. Government agencies need a number of reports that disclose financial and operating activities for purposes of taxation regulation. Unions are interested in the profitability the organizations in which their members work. The individual, however, most involved with and dependent on information are those charged with the responsibility of managing and operating organizations, that is management and employees; their needs range from maintenance of accounts receivable to strategic information for corporate takeover. One top manager once said, ‘when you try to keep track of as many things we do, timely and accurate information is the essential resource to maintain operations and be competitive’ There is no doubt, information as a resource is very vital ingredient in the operations of any enterprise.

Every organization must have some sort of information system. Very small organization can function satisfactorily with an informal information system that relies on the mind of the owner and bits of paper for information storage. As an organization grows, however, informal information becomes unacceptable. Lack of organized information and improper communication can lead to the total breakdown of an organization. This means that large organizations must have some kind of formal information system that provides a basis for making decisions related to planning, organizing, controlling and general operation. Such a formal information system constitutes the means of communicating among humans in an organization and linking them to the external environment.

Hitherto, management information has not been given high priority by many organizations. In most cases, the information system, at best constituted a loose amalgamation of data and report without any overall consistent pattern. Invariably, such system generates information to fulfill basic accounting and legal requirements with little support for management decision making. Furthermore, Edemenang (1997) stated that “The essential components of an organization can be thought of in terms of the workplace, the culture, the asset base, and the stakeholders. For an organization to operate smoothly, these components must be oriented toward the same goals and synchronized with one another. Information is the key ingredient that enables an organization to achieve and maintain a state of unity and harmony”.

The answers to the question “what has already happened that will make the future?” define the potential of opportunities for a given company or industry. To convert this potential into reality requires matching the opportunities with the company’s strengths and core competence. What is this Company good at? ‘What does it do well? ‘What gives it a competitive edge? Matching a company’s strengths to the changes that have already taken place, produces, in effect, a plan of action. It enables the business to turn the unexpected into advantage. Uncertainty ceases to be a threat and becomes an opportunity.

2.5 Software

These are series of instructions written in a particular language (low level language and/or high level language) that makes a system work in a particular manner. For a computer system there are two main software namely the system software and the application software. Software follows a sequence of instruction referred to as programs. However, software is not just the programs but also all associated documentation and configuration data which is needed to make these programs operate correctly. A software system usually consists of a number of separate

programs, configuration files which are used to set up these programs, system documentation which describes the structure of the system and user documentation which explains how to use the system, and for software products, web sites for users to download recent products information (Sommerville, 2001).

2.6 Integration

Newman (1986) is of the opinion that “Integration may be approached from either of these two angles: as a collection of interactive techniques for linking systems together or in terms of its contribution to procedural activities”. For better understanding, it entails bringing and joining modules together to form a complete system which allows retrieval of information with ease or in other sense to accomplish a process which would have been in pieces (modules) as a whole in a limited time. For example, different modules are brought together to form an information system.

The purpose of Integration is thus to bind together the facilities of interactive systems so as to support sequences of procedural activities. Integration can be seen also in three main forms which are integration of representations of information, integration of storage access, integration of tools and functions for operating on information.

2.7 Software Integration

Software integration is all about bringing/linking a lot of software together to work just as one body. This implies that the operating (system) software should be able to support multi-user and multi-tasking environment and also the application software should be able to support graphics, word processing, networking, records processing and data base.

Software Integration also links various facilities and information stores so that complete sequences of activities can be carried out. It provides the key to interactive support of complex tasks.

Software integration creates a continuum of functionality where previously there were isolated concentrations; it also ensures that information is continuously accessible. The user can then perform one step after another without encountering blocks to progress or other sources of lost time (Newman, 1986).

2.8 Integrating Software Applications

This is a way of finding software solutions for business. Businesses have been traditionally organized along the functional line of marketing, manufacturing and accounting. Information systems are built to support transaction processing and decision-making specific to each of these functions. Although accomplishing their major purpose of supporting these business functions, the information systems tended to be highly compartmentalized, that is are unable to work in consult or share information with each other.

However with resolve of most management to begin to tap the benefits of integration, the old functions specific information systems are now being replaced by on-link together into a Fully Integrated Information Systems. This trend to integration of organizations information systems is further accelerated by the introduction of a number of new manufacturing concepts and techniques and development in networking technology. Because function is an action or process for which a person or activity is specially fitted or used, marketing is therefore a classic example of necessary function in any business.

With commonality through functions specific information systems, each system also has to be modified and designed to match the industry in which the business operates e.g. an information system that supports the accounting function of an oil well service company differs in many

respect from an information system that support the accounting system of a hospital. Also the amount and variety of transaction dictates the degree of simplicity or complexity of the information system needed.

Under this review, attempts would be made to introduce the information system that supports the Accounting, Manufacturing and Marketing functions; to show how information systems are comprised of a number of sub-systems or modules that support the vital sub-functions of Accounting, Manufacturing Marketing; and to describe the informational outputs of these modules.

2.9 Integration System that supports manufacturing function

A well-designed information system provides a real-time link between the many applications and automated operations. It ties together all components into a single, streamlined process that extends the product and information flow from concept design to the product completion. Figure 3 shows a schematic of an Information system that supports Manufacturing Function.

2.10 The criticism of ERP

ERP has been one of the most important and influential trends in information technology in the past years. This, however, does not imply that everyone or organizations automatically subscribes to the advantages of ERP. The main characteristics of ERP, and their impact on organizations has been criticized. The criticism of ERP of various authors such as Van der Reep and Van del Heuvel (2005) are very clear in their judgments of ERP: the disadvantages of ERP systems is that they create exanimate organizations in which people operate in silos. Van der Reep (2007) has not found out a single example of a successful implementation of the ERP concept. ERP only gives a sense of control, and creates dependency on the IT department for the whole organization. According to Van der Reep (2007), there is no role seen of ERP, but states that the ERP concept is only suitable for goods flow and routine large-volume processes, and not for information technology that is people-centric.

However, despite the criticism muted above, according to Sneller (2015), ERP systems are computer applications with two important characteristics: data integration and support for best practice process. ERP is a mature concept as per Sneller (2014) because it has been implemented by many organizations, initially by large multinational companies, later also by governmental organizations, and today in small and medium-sized businesses as well.

Moreover, organizations that implement ERP expect that the data integration characteristics will improve the quality of their decision making as well as increase their efficiency. By using the best practice processes that are supported by ERP, an organization want to speed up their processes, and improve the quality of those processes. In this way, they expect that ERP will improve customer satisfaction and at the same time reduce working capital requirements.

According to Sneller (2014), in practice, ERP requires large initial investments, and ERP implementation take considerable time. Accordingly, in half of the implementation projects the budget is exceeded, and there are some well-known examples where a problematic ERP implementation even endangered the continuity of the organization. However, in most cases companies are positive about ERP and consider their implementation successful. According to Sneller (2014), academic research shows that ERP adds financial value as well, productivity in the organization will increase, as well as the return on investment compared to similar organizations that have not implemented ERP.

3.0 Research Methodology

According to Kumar (1996), research is a structured inquiry that utilises acceptable scientific methodology to solve problems and create new knowledge that is generally acceptable (Grinnell 1993). A research can be quantitative or qualitative, according to Cresswell (2013). Furthermore, a study is said to be qualitative if it describes a phenomenon, event problem; information gathering is done through the use of qualitative measurement scales and if analysis is done without quantifying variables in event, phenomenon and problem (Kumar 1996). Likewise, a quantitative research quantifies the degree of variations in a situation, phenomenon, issue or problems and adopts the use of predominant quantitative variables in data assembly (Kumar 1996).

3.1 Research design

A research design assists to provide a specific direction for a study (Yin 2009). In a qualitative study, there are various designs such as narrative, phenomenological research, grounded theory, ethnography and case studies (Cresswell 2013). This study is based on a case study design using secondary sources of data.

3.2 Secondary data

According to Saunders, Levis and Thornhill (2007), secondary data includes raw data and unpublished summaries which have been collected for other purposes. This implies that the required information is available and only needs to be extracted by the researcher (Kumar 1996). Secondary research provides bases for supporting and explaining questions (Ghauri and Gronhaug 2005). Secondary data could include organisational data, books, and journal, audio and video recorded materials to obtain historical and other forms of information (McGivern 2006; Kumar 1996).

3.3 Desk Research

This is the research technique which is mainly acquired by sitting at a desk. Desk research is basically involved in collecting data from existing resources hence it is often considered a low cost technique as compared to field research, as the main cost is involved in executive's time, telephone charges and directories. However, it could also be a complete waste of time and money if the researcher does not have the proper knowledge of how the research is performed. According to managementstudyguide.com (on-line), desk research is very effective and can be conducted in starting phase of market research as it is quite quick and cheap and most of the basic information could be easily fetched which can be used as benchmark in the research process. There are basically two types of desk research techniques; the Internal Desk Research - Internal desk research can be treated as the most reasonable starting point of research for any organization. Much information could be generated internally within the organization as a course of normal process. Account related information which indicates what type of products are sold, in how much quantity and at what cost, sold to which type of customers including their geographical location and so on. The main advantage here in performing internal desk research is that it involves internal and existing organizational resources to organize the collected data in such a way that it is not only efficient but also usable. Internal desk research is comparatively very cheap and effective as internal resources are deployed and the expenditure in getting data from outside is less.

Secondly, is the External Desk Research which involves research done outside the organizational boundaries and collecting relevant information. These outside resources are the Online Desk Research which has an incredible amount of data available online on internet. It's

important for organization to be information specific while fetching out this information as there are billions of pages available on internet. There could be two approaches for digging out the relevant information from internet, one is directly browsing the specific information from industrial, marketing or business sites and extracting the information out of these sites.

Thirdly, using the various search engines like www.google.com, www.yahoo.com, www.infoseek.go.com, www.altavista.com, for modulated searching. The important aspect here is to refine the searching techniques in such a way that results are promising and relevant. For this, it is necessary that the researcher should know the importance of the research and follow the guideline intellectually to reduce the efforts made and time consumed in searching.

3.4 Case study method

A case study is defined as a “design of inquiry by which a researcher develops an in-depth analysis of a case, often a program, event, activity, process or one or more individuals” (Cresswell 2013, p. 14). A case study approach to asking research questions can be in the form of ‘why and how’ in contemporary set of events, the researcher therefore has little or no control over this (Yin 2009). Case study are constrained by activity and time (Yin 2009) but are an in-depth survey which comprises of oral, archival, and secondary source-based record of a precedent or present event (Zivkovic 2012).

For the purpose of this study, the functional specific information systems as interface points for a fully integrated information system in Steyr Nigeria limited, was investigated. The case study organisation is an automotive company engaged in the assembly of tractors, production of buses, and motorcycles. The initial concept of the information system is function specific based which serves as interface points for a fully integrated information system. The fully integrated information system employs a comprehensive approach in the management of data that connects logical business functions and provides needed information at the point of use. For instance, the variety of modules in accounting, manufacturing, and marketing functions are serving as interface points.

4.0 Analysis of Data and Discussion

This gives the description of the application of software integration in an organization. It describes how units in in the case study organization are functionally tied together to achieve the goals of the organization. It describes how software integration that supports information flow enhances the effectiveness of an organization through the good and efficient management of information.

4.1 Function Specific Information Systems as Interface Points for a Fully Integrated Information System in Steyr Nigeria Limited

For the purpose of analysis, the case study organization, a manufacturing Company (Steyr Nigeria Limited, Bauchi) was used for the analysis. The organization has a Fully Integrated Information Systems (FITS) that tie together function-specific information systems. The organization has a distinct accounting, marketing and production functions are viewed in terms of the modules within it that could serve as interface points for a Fully Integrated Information System.

Steyr Nigeria Limited is an automobile company engages in the assembly of tractors, production of buses and motorcycles. Though the Company is producing below its installed capacity, the initial concept of the information system is function-specific based which now service as interface points for a Fully Integrated Information System.

The Fully Integrated Information System employs a comprehensive approach in the management of data that connects logical business functions and provides needed information at the point of use. For instance, the variety of modules in Accounting, Manufacturing and Marketing Function could serve as interface points are shown below:

Accounting & Marketing

- General Ledger
- Marketing intelligence
- Stock Control Invoicing
- Cash Book
- Sales Order Processing
- Sales Ledgers Budget data
- Fixed assets and depreciation Prospect data
- Job Costing
- Purchases Order
- Payroll
- Inventory Management.

Manufacturing (Production)

- Bills of materials
- Material requirement planning
- Labour Performance
- Capacity requirement planning
- Shop Floor Control
- Standard Costing
- Production Scheduling

With the interface of such modules, efficiency would be enhanced and manual scheduling of resources, human interaction to ensure availability of materials, physical travelling of paper for approvals and routing would all be avoided. This is good for the efficiency of the system and the sum result of that efficiency is having an effective organization.

A simple narration/example of how the component parts of an organization are working together on the basis of software integration is explained. Assume a salesperson takes an order from a credit customer for an air compressor. First, this transaction's input is put through an edit and validation screen. For example, the order is checked for validity, reasonableness, and accuracy. A credit check is made, and assuming that credit is granted, the compressor requested is either found in stock or is placed on special order. If the compressor is in stock and the order passes validation, the order-entry system updates the appropriate files and a variety of technical documents are automatically prepared, such as an invoice, order acknowledgement, and shipping papers. If the compressor is to be manufactured, the order-entry system produces a transaction that causes manufacturing systems to generate a job order and bill of material.

This order transaction is then used, along with other external data, such as competitive, demographic, industrial trends and ratios, to update a sales forecast. This forecast is used to reformulate budgets, cash flow projections, and production schedules to provide relevant and timely information to users at all levels and across functions.

This study discussed software integration as a tool for achieving an effective organisation with a general overview of the application of software integration to enhance the effectiveness of

organisations. The result of the study are summarised and discussed indicating how the objective of the study have been achieved.

4.2 The Importance of Information for Decision Making

Managers perform the function of planning, organizing, controlling and actuating with a view to using the organization's resources in the best way possible. The success of any organization is determined by how well its leaders perform those activities. And how well those functions are carried out is dependent, in part, on how well the managers' information needs are being met. Each function involves decision making and decision making must be supported by information that is accurate, timely, complete, concise, and relevant. If a managers' information does not possess these characteristics, the quality of his decisions will probably suffer, and the organization will not attain the success it might otherwise have had. Quality information, in the hands of these who can effectively use it, will support good decisions; that good decisions will lead to effective performance of function; and that effective managerial performance will lead to successful attainment of organizational goals.

5.0 Summary, Conclusion and Recommendations

5.1 Summary

From this study, it can be suggested that Management teams take a period of unprecedented dynamic transformation of the operating environment, which is throwing up tremendous business challenges. Tomorrow will not be the same again as yesterday for large, medium or small business enterprises as changes need to be managed in a pro-active manner.

Management of such enterprises must, therefore, modify existing management practice and culture, and take on methodologies more appropriate to tomorrow's rapidly changing environment. The world is going through fundamental changes. This is caused by the on-going advances in computers and telecommunications. Without the computer, sophisticated and even unsophisticated information systems would be difficult to attain in today's complex organization. Such organizations may deal with data in some kind of magnitudes that involves numerous vendors, stock holders, numerous facilities, equipment, inventories, resources, and thousands and even millions of different records and reports. Therefore management should strive at achieving an effective information system. The organization should therefore benefit from the following characteristics of an effective information system to achieve an effective organization.

- (a) Selection of information that is relevant to particular situations (management by exception), thus preventing either an excess scarcity of information.
- (b) Comparison of current information, with plans (feedback) to discover deviations and if needed, trigger corrective action.
- (c) Immediate access to information to support management decisions in unpredictable situations.
- (d) Delivery of information in a timely fashion to facilitate decision making.
- (e) Horizontal and vertical dissemination of needed information so that all affected persons will be informed properly.

A planned database therefore constitutes the foundation of the Management Information System. The database contains not only rigorously selected and defined data elements that represent the organizations activities, but also pertinent external inputs. Considerable care is given to making sure that data element, which, collectively make up the database, are accurate,

consistent and up to date. In essence, the data is a supra-file with flexibility, quick irretrievability and expandability.

Management should understand the purpose of integration, which is in two folds. First, departments that can share information resources should be linked together. Second, integration should reduce data redundancy. How many times is a customer's address entered into the system? On quick count: Four - once each in accounts receivable, accounts payable, order processing, and shipping and handling. This information should be entered once.

If products are being sold, produced, depleted, shipped, paid for, replenished, and sold again on a day-in, day-out basis, it is wise to keep this information flowing among the departments on an as-it-happens basis.

5.2 Conclusion

Performance of activities must be well supported so that tasks can be completed in a reasonable time and also information can remain accessible. Software integration remains therefore one of the best way for information accessibility, portability, flexibility, balancing and timing in an organization which enhances operations in a greater way for the achievement of the desired results. Indeed, software integration is a powerful design force because of the increasing need for co-ordination and synchronization of operation inside and outside organization. It is this co-ordination that enables every department to carry out its function in consult with others, therefore avoiding the situation where each unit is doing its own thing, in its own way.

5.3 Recommendations

a) The Management of the organization should not view integration as a 'straight jacket' but that it affords them flow of information which increases their efficiency and wellbeing. Management should strive for corporate goal instead of functional or departmental goal attainment.

b) The Management needs not be overstressed that higher level of performance demands ought to be matched by higher levels of education and development to equip people in organizations with the wherewithal for acquiring matching capabilities to meet the sophistication in global communication, client needs and the technology of customer service delivery. Therefore management should train and retrain its human resources who would be the catalyst for promoting creativity, productivity and ultimately an effective organization.

c) As the Management builds its strategic plan, an organization should systematically identify its position with regard to its core competencies/capabilities. Many planning teams seem to have difficulty in this area, as individual managers tend to focus on their own areas of responsibility and fail to see their own company's larger picture. These core competencies/capabilities are bodies of expertise, organizational skills or systems, which are perceived by the customer as providing exceptional value. They are substantially unique, and they typically lead the company into new products and/or markets.

d) Organizations are advised to take advantage of the global communication network provided by the internet. This computer network is without doubt one of the most important achievement in the present time. It became the only practical method for computers from different manufacturers to communicate effectively. Generally, it facilitates resource sharing between organizations, governments, universities, commercial, private corporations and individuals.

e) The organization's database that contains rigorously selected and well - defined data elements that represents the organization's activities, together with pertinent external inputs must be protected. Considerable care should be taken to ensure that the data elements that make up the databases are accurate, consistent and up-to-date. In essence, this database must be flexible, easily retrievable and expandable.

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