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Implementation of System Application and Product in Data Processing (SAP) Enterprise Resource Planning (ERP) System

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ABSTRACT: ERP SAP is the best application to meet the industry's business needs. The SAP technical infrastructure supports the integration of application within the enterprise as well as serves as a connection point for integration with applications runs by business partners. It helps in automating the tasks necessary to perform the business processes. The new features of the SAP product replace the old techniques and tricks. Nevertheless, such systems are more strong to replace the old techniques immediately. But, there are still important solutions present using the old method and tricks in the SAP system. This paper gives an overview of how successfully the implementation of the ERP SAP systems can upgrade businesses in many different ways and helps in giving a company a competitive edge.

KEYWORDS: SAP R/2, SAP R/3, ABAP/4, Dispatcher, Spool, Enqueue;

I. INTRODUCTION

Besides Internet, the SAP R/3 became one of the most recent topics in the computer technology, The company which developed the SAP AG has become most successful in the software industry and it mostly targets the business software requirements included small scale to large scale industries and organizations in all Sectors. SAP AG was found in 1972 by 4 Formers IBM Employees. Since, it was new so it has gone under several changes in past few years. It consists of Advanced Business Application Program, also known as ABAP/4 which is the 4GL (Fourth generation programming language) in which all R/3 applications (the upper layer) are developed like business applications, Sales and Management, finance and human resource. It is a powerful programming language which is designed to be both platform and database independent. It is the best application to meet the business needs and by using this it can easily manage the data of customers. The technical infrastructure that supports the integration of applications within the enterprise as well as and serve as a connection point for integration with applications runs by business partners. It helps in automating the tasks necessary to perform the business processes. Also integrates all department and functions across a company to create a single software program that runs on a single database. Hence, the ERP aims to serve as the backbone of any businesses.

The SAP also known as SAP R/3 stands for Systems, Applications and Products in data processing which is a standard software package that can be configured in multiple areas and adapted to specific needs of the company. The most targeted industries are: manufacturing, retails, electricity, Healthcare, Pharmaceuticals, Banking, Telecommunication, Transport. etc. SAP converts the independent functional software module to a single enterprise system. The SAP also includes the HR module which manages the business human resource requirements like, managing accounts etc. It also helps organizations in building, implementing providing services and supports the SAP solutions which acquire their unique needs. It helps the organization to fulfill their business needs and goals with better output.

II. LITERATURE SURVEY

The authors[1] have presented the overview of this paper that are the application of objective perspectives on the use of ERP that directly and accurately demonstrate the actual usage of business processes in daily operations and distinguish ERP usage differences between industries. In this paper the authors[2] have presented the process of implementing an ERP system on a single case study. Here, with the analysis of this documentation it is being the main approach for data collection. The activities and the output products were presented for each of the project phases. The effort and the duration needed to accomplish each phases were identified. Hence, the result of the study is a

presentation of a real life ERP system implementing methodology which is verified during the fully-scoped implementation project. This paper[3] tells about the underlying question for the research that, how the principles and processes of the UCD could be applied to make sure about the usability of ERP systems. In this article it presents, firstly, a literature review of ERP implementations, second is, a literature review of UCD applications, third is, about the method used to combine the UCD and ERP systems of implementing processes and finally a discussion of the UCD approach for ERP implementation. This research paper[4] provides a better understanding of SAP’ implementing method which is used for its integrated software packages and also to assure about an effective support of the business processes at LT where LT refers to Lucent Technologies who faces all the competitive threats more than ever before and also is hampered by its inefficient and costly internal systems and processes. In this paper, the author[5] tells about the modeling methods, its architectures and tools which have become increasingly popular because they can help in reducing the cost of the software implementation and also at the same time increases user acceptance of the ERP software solutions. The author[6] of this paper tells about the implementation process of enterprise resource planning (ERP), its evolution of the business model innovation (BMI) and also the organizational outcome. This research paper analyses about how the ERP and BMI are related to each other and what will be the final the impact on organizational performance.

III. FUNCTIONAL DIAGRAM

One of the most leading software systems SAP which is dedicated towards the management of the business processes, facilitates effective data processing and the information flow across the organizations. In the functional diagram, the lower layer is made of operating system, physical database (whose software is included in the SAP kit), and the network.

The middleware layer which is the middle layer interfaces with the lower one and integrates SAP applications on top of it. This middle layer is known as the basis system, or R/3 kernel, and includes components such as the ABAP/4 development work bench, and the system administration tools, batch job handling, authorization and security management, and all cross application modules. In the ABAP/4, which is the 4GL (fourth-generation programming language) in which all R/3 applications (the upper layer) are developed. The middleware are the layered software components that facilitate the development of client/server applications that can be deployed in heterogeneous vendor platforms.

The basic system which is also known as kernel is the SAP R/3 middleware system, which is the most upper layer and functional layer which contains the different business applications as financial, human resources, sales and distribution, materials management, and so on. The integration of all these applications relies on the basis system which are provided. The R/3 kernel makes use of standard communications and application program interfaces to access the operating system, the database, and the network. In this functional architecture, it also allows the users to change the configuration of their system and also allow them to install the new systems without any interruption or altering of the applications by themselves.

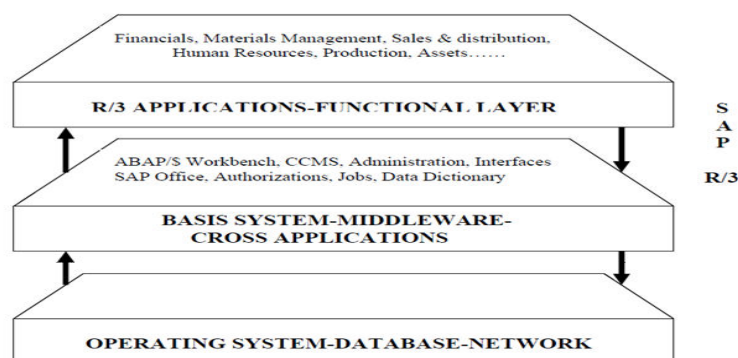


Fig. 1. Functional Diagram of ERP SAP

IV. CLIENT/SERVER SOLUTION

The client/server solution is a way of computing which helps in distributing the workload of a computer application across the several co-operating computer programs. This is a type of computing which separates user-oriented, application, and data management tasks. The Client/server is a software concept which includes a set of service providers and the service requesters. In client/server computing approach, the individual software components acts as service providers and service requesters, or both. So, these services communicates with each other via a predefined interfaces.

The Presentation Server which is also known as Client Layer, contains the system which are capable of providing a graphic interface. It is also work as an user interaction in SAP which uses GUI. Basically, the Application layer component resides in High-end Servers. Some examples: Desktop, Mobile Devices, Laptops etc. The Application Server also known as Kernel Layer and Basic Layer which includes the Specialized System with the multiple CPUs and has a Vast amount of RAM. The SAP Application Programs are executed in the Application Layer. It is a medium of communication between Presentation and Database layer. It is a server where the dispatcher distributes the work load to other work processes to make the job done. The Application Layer components resides in the High-end Server. The Database Server contains the specialized systems which has fast and large hard-drives. This layer is used to store the data which can store the business data, SAP tables, SAP system data and programs. Basically, the Database Layer Components Resides in High-end database Server. Some examples: Oracle, Microsoft SQL Server, Sybase, IBM DB/2.

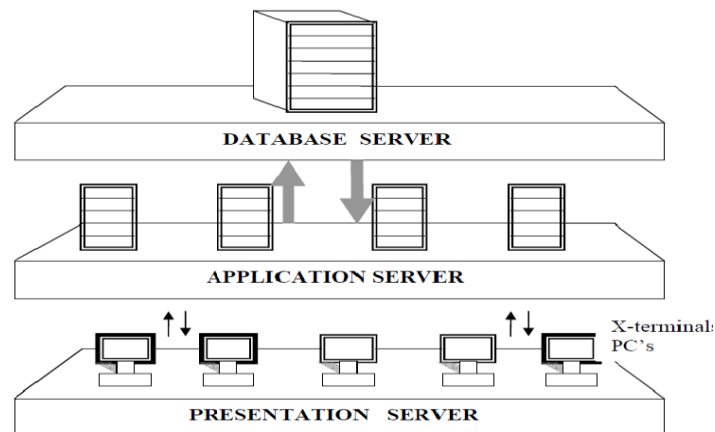


Fig. 2. Client/ Server Solution

V. ABAP/4 DEVELOPMENT WORKBENCH

ABAP/4 is a 4GL (fourth-generation programming language); the acronym stands for Advanced Business Application Programming Language. It refers to the SAP programming language which is used in the development process of all standard applications including R/3. The ABAP/4, SAP has designed a fully-purposed development environment, which is known as the ABAP/4 development workbench and it is integrated with R/3 system and are always available for the customers to develop their solutions and enhance the capabilities of the present applications. It also has all the tools which are necessary in developing and designing of programs, screens, menus, and so on. It also contains performance and debugging facilities and also refers as the central, to the workbench which is the ABAP/4 object repository and data dictionary. The object repository stores all the development objects of workbench including programs, dictionary data, dynpros (dynamic programs) and documentation. The repository is the main process of managing and testing the ongoing development. The data dictionary contains the explanations of the data structures used within the programs. This is a metadata repository which includes the table definitions, also allows values and relationship between the tables.

VI. WORK PROCESS ARCHITECTURE

Work process architecture is a program which takes the charge of executing the R/3 application tasks. It consists of task handlers, the ABAP/4 processor, dialog interpreter and also the database interfaces. The activities inside work processes are coordinated by the task handlers. It maintains the control of the programs inside the work process. The

processing of the codes of any application programs are done by ABAP/4 processor. The Dialog interpreter also manages the user dialog and the database interface allows the work processes to establish the direct links with the database.

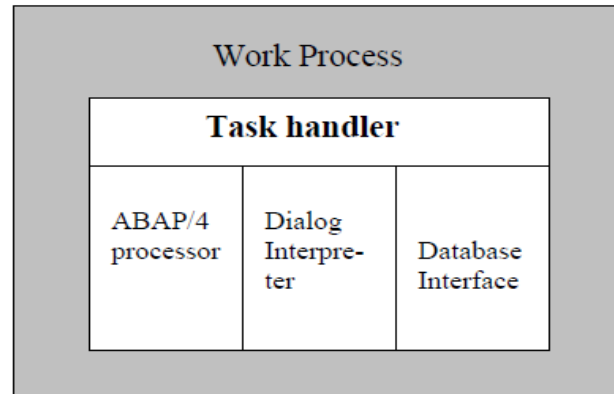


Fig. 3. Work Process Architecture

Depending on the types of services provided work processes are categorized in: dialog, batch, update, enqueue, spool, message, and gateway. A Dialog Work Process is responsible for the interactive task of the R/3 system. It executes just one single dialog step at a time and becomes immediately available for the next user requests, which can be assigned by the dispatcher. The background work processes are responsible for executing ABAP/4 programs submitted, as a background execution. The programs submitted for background processing are executed in the planned duration by the background work processes. The Spool work process is responsible for formatting the data used for printing and passing to the host spool system. It requests indicating the printer and the printing format of the spool requests which are generated during dialog or the background processing and also are held in spool database. The enqueue work process is responsible for obtaining lock management system. It helps to run the system in a consistent manner, where it ensures that when a transaction's dialog steps are handled by different work processes, they are retaining the assigned locks until the end. If the transaction or intentional release of lock, even when the switching work processes then the locks are managed by the enqueue work processes using lock table which mainly resides in the main memory. The Locking objects are of two types which are: type S, where the object can be shared and the type E, where the objects cannot be shared. The update work process is responsible for execution of database changes whenever it is requested by the dialog or background work processes. In a dialog programs, It generates the log records in the VBLOG table which then passes by the update program once the dialog is finished. The updated log record have two components, one as primary update component (V1) and the second as secondary update component (V2). The time critical processes are held in the V1 and the less critical ones in V2. The message server refers to a service used by the different application servers for exchanging data and the internal messages. There is always only one message server on one R/3 system. Every application server has its unique name for the message server and the gateway services, allows the communication between the R/3, R/2 and also external applications.

VII. SAP R/3 COMMUNICATION PROTOCOLS AND INTERFACES

In R/3, the communication is the overall process which involves most of the components of systems as both internally and in the exterior world. As in the operating system level, the protocols which are mostly used is TCP/IP protocol. Hence, the communication with the database is to accomplish using the remote SQL calls. Hence between applications, there are many programming interfaces which is used as an underlying communication layer, example as: CPIC, RFC, ALE, and EDI. As the underlying database the SAP/3 systems acts as the important container for all information managed by the systems. Hence, the database interface supports the different relational databases from different vendors. As the main task of the database interface is to convert the SQL requests from SAP development environment to the databases as own SQL requests. The communication interfaces are applied to integrate all the layers of client/server architecture, from the database server to the application server and to the presentation servers. Also they define the channels for exchange of information.



VIII. CONCLUSION

The SAP R/3 is one of the most suitable software for managing and maintenance of the large number of business processes. The SAP AG provides most online service systems for the administration and also for guidance. It provides consultation, information and the maintenance of services for the customers of the SAP/3 software. The SAP also includes the HR module which manages the business human resource requirements like, managing accounts etc. It also helps organizations in building, implementing providing services and supports the SAP solutions which acquire their unique needs. It helps the organization to fulfill their business needs and goals with better output. Hence, the SAP R/3 is the most suitable software package to almost for every industrial application from medium scale industries as well as large scale industries.

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