EMPLOYEE DEVIATION APPROVAL FORM

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WIPRO INFOTECH BANGLORE – 58

PROJECT REPORT

Submitted in partial fulfillment of the requirements for the award of the

Degree of

M.Sc. (Applied Science) Software Engineering,

Bharathiar University,

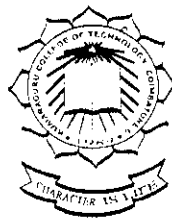Coimbatore.

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

KUMARAGURU COLLEGE OF TECHNOLOGY

AFFILIATED TO BHARATHIAR UNIVERSITY

COIMBATORE – 641 006

SEPTEMBER - 2004

KUMARAGURU COLLEGE OF TECHNOLOGY

(Affiliated to Bharathiar University)

Department of Computer science and Engineering

Coimbatore – 641 006

CERTIFICATE

This is to certify that the project work entitled

EMPLOYEE DEVIATION APPROVAL FORM

Done By

D.REUBAN PAUL

Reg. No. 0137S0051

Submitted in partial fulfillment of the requirements for the award of the degree M.Sc Applied Science Software Engineering of Bharathiar University.

Professor and Head

Internal Guide

Submitted for the University examination held on ...30 – 9 – 04......

Internal Examiner

External Examiner

WIPRO

Applying Thought

CERTIFICATE

This is to certify that **Reuban Paul** a student of "**Kumaraguru College**" worked on a project entitled "**E-DAF**" from 14th June to 6th September 2004 as a part of his M.Sc curriculum and completed Successfully. His performance during the period was found to be Excellent.

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DECLARATION

This is to certify that this project work entitled "E-DAF" submitted to Kumaraguru College of Technology, Coimbatore (affiliated to BHARATHIAR University) is a record of original work done by **Mr.D.REUBAN PAUL Reg.No.0137S0051** under the guidance of **Mr.RAJAN KRUPA MCA**, (Internal Guide) Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore and **Mr.M.Narendra Prakash**, (External Guide) Wipro InfoTech, Bangalore and that this project formed the basis for the award of any Degree/Associate ship/Fellowship or similar title to any candidate of any university.

Signature of the Candidate

(D.REUBAN PAUL)
0137S0051

Place : Coimbatore
Date : 24-09-04

Staff in-Charge

Acknowledgement

Before going into thick of things I would like to add a few heartfelt words for the people who have contributed directly or indirectly in making this project.

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I take this opportunity to give sincere regards to my parent for their constant support, encouragement, understanding and love. Without it, it would have been impossible for me to achieve all that I have.

REUBAN PAUL.D

SYNOPSIS

The prime objective of the 'E-DAF' system is developing a web based intranet application to assist the officials of Wipro InfoTech to keep track of the contracts in an efficient way, besides building a proper interface between the SFA module and the SAP database.

The E-DAF integrates two live projects of Wipro InfoTech group –DAF (Deviation Approval Form) and CAF (Contract Approval Form). The project links the SFA (Sales force Automation) module and the SAP database.

These two cases correspond to the applications side programming of the project. The system side consists of application of BAPI code and Remote Scripting.

The contracts are directly passed over to the various level officials. The final approver approves or rejects it. The various officials are chosen based on various deviation terms like DSO, BG (Bank Guarantee), EMD, Debts, and LD etc. The various officials start from the ME (Marketing Executive), PM (Product Manager), RBH (Regional Business Head), BH (Business Head), GMO, CEO (Chief Executive Officer),and the President. These officials check out for the deviations and their limits. They approve or reject the customer if thee criterion is satisfied.

The BAPI (Business Application Programming Interface) is applied to generate the SAP code so that it is generated in the SAP database. Remote scripting is used through out the project for server side scripting which makes the work much easier.

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1. INTRODUCTION

1.1 Project overview

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These two cases correspond to the applications side programming of the project. The system side consists of application of BAPI code and Remote Scripting.

The contracts are directly passed over to the various level officials. The final approver approves or rejects it. The various officials are chosen based on various deviation terms like DSO (Days Of Sales Order), BG (Bank Guarantee), EMD (Earnest Money Deposited), Debts, and LD (Liquidated Damages) etc. The various officials start from the ME (Marketing Executive), PM (Product Manager), RBH (Regional Business Head), BH (Business Head), GMO, CEO (Chief Executive Officer), and the President. These officials check out for the deviations and their limits. They approve or reject the customer if these criterions are satisfied.

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1.2 About the organization

Wipro InfoTech is the IT Services, Solutions & Products division of the Rs.34,926 million (USD 715 Million) Wipro Limited. With over two decades of experience, 6000 employees and 275 business partners serving over 40,000 customers, Wipro Infotech has stamped its presence on the Indian market and leads the Indian IT industry. Headquartered at Bangalore, the business spans India, Asia Pacific and the Middle East.

Position of leadership in the IT business is built on a strong foundation of quality processes (Six Sigma and ISO 9000), Knowledge Management, Innovation & People processes (P-CMM: People Capability Maturity Model). Wipro Infotech was also one of the earliest adopters of Six Sigma. Besides offering Six Sigma consulting services, the company has used Six Sigma methodology to improve internal process performance in diverse areas to bring about quicker deliveries, higher reliability, simplified processes for customers and employees, call response and personal productivity. Today, Wipro addresses the IT needs of a diverse base of India's largest corporate houses and multi-nationals.

Wipro InfoTech serves its customers round the clock through 8 call centers located across the country. Customer base straddles various cross-sections of the industry including Government, Banking & Insurance; Finance, Telecom, Manufacturing, Healthcare and IT enabled services.

Wipro has extended its expertise to customers in Asia Pacific and the Middle East. They bring to these markets a unique combination of domain knowledge, experienced skill sets and a high thrust on quality. Wipro has established offices in Australia, Middle East, Hong Kong, Taiwan and Singapore, besides India. Fuelled by quality and excellence Wipro blazes ahead with the vision to become the world's leading IT services provider.

A customer centric vision fuelled by Quality

The year 2003-04 saw Wipro Infotech established itself as a comprehensive IT services provider, with the strong success of software solutions business. From architectonic & integrating IT solutions to managing IT infrastructure, Wipro's customers today, recognize and appreciate Wipro's ability to deliver high quality, reliable & cost effective IT solutions. A proposition that is by the day getting wider & deeper, ranging from core IT infrastructure & value added IT services.

Wipro InfoTech believes that IT is a business enabler. Thus it is a great challenge to provide continued value to its customers in difficult market conditions. This was made possible by its comprehensive range of offerings & single-minded devotion to Quality on all fronts – products, services, people & processes. This powerful combination drove the company closer to its customers. Consequently, its journey through the fiscal has seen several prestigious customer wins, recognition by principals & the industry.

Successful year in software services

This year was Wipro InfoTech's first full year in the domestic market. Today it offers the strength of its global best practices in India including robust project management methodologies & Quality processes. A combination of re-usable framework coupled with best of breed solutions helps it to offer reduced cost of ownership & enhanced value on customers' total IT investments. It has won several prestigious projects in core business areas of end-to-end ERP implementation, transport optimization, web based dealer integration, HR information systems, mediation implementation & IT consulting. Most of these were won against stiff competition from global IT services companies. It has won over 65 projects during the year including a few from multinational organizations in India.

Technology Products

- Enterprise Platforms

- Storage Platforms

- Networking Solutions

- Desktop Computing

- Mobile computing

- Packaged Software

Enterprise Solutions

- Custom Application Development

- E-Commerce Solutions

- Enterprise Applications – ERP, SCM, CRM

- Enterprise Applications Integration computing

- Industry Solutions – Finance, Telecom & Manufacturing

- Business Intelligence & Data warehousing

Consulting Services

- IT Strategy Consulting

- IT Governance & Optimization

- Process Consulting & Change Management

- Business Continuity & Risk-Management

Professional IT Services

- Infrastructure Management

- Asset Management

- Network Management

- Data Center Services

- Remote Management

- Technology Integration

- Platform Integration

- Network Integration

- Call Center Integration

- Storage Integration

- Availability Services

- Software Support

- Hardware Support

- Multi-Vendor Support

- Communication Services

Procurement services (01 Markets)

- E-procurement Services

- E-procurement Solutions

2 System Study & Analysis

2.1 Software Requirement Specifications

Introduction

SRS is a document describing the requirements of a computer system from the user's point of view. An SRS document specifies:

The required behavior of a system in terms of input data, required processing, output data, operational scenarios and interfaces and the attributes of a system including performance, security, maintainability, reliability, auditability, availability and safety requirements and design constraints.

Purpose

This document describes the technical architecture and design for the development of the E-DAF module for the Wipro InfoTech. This document discusses the various software development artifacts that are used during the lifecycle of the project. The basic aim of a design document is to provide a clear- cut view of the system to be developed with all the vital design aspects clearly outlined.

Scope

The technical architecture specifications detailed in this document aims at providing a preview of the target architecture for the delivered application.

The users of this system include

The Marketing Executive (ME)

The Contract Manager (CM)

The Product Manager (PM)

The Regional Business Head (RBH)

The GMO

The Business Head (BH)

The Chief Executive Officer (CEO)

President

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Methodology

A system development model or methodology is a framework used to structure, plan and control the information development process.

The Spiral model is an approach to application development that focuses on minimizing risk. Each transition around the spiral involves repeating the same four (4) steps. (1) Determine the objectives, alternatives, and constraints of this iteration; (2) evaluate alternatives; identify and resolve risks; (3) develop and verify deliverables from this iteration; and (4) Plan the next iteration.

The Spiral model is most suitable for E-DAF, because the specification stated implies incompletion and necessity for dynamic requirements. By applying this methodology the
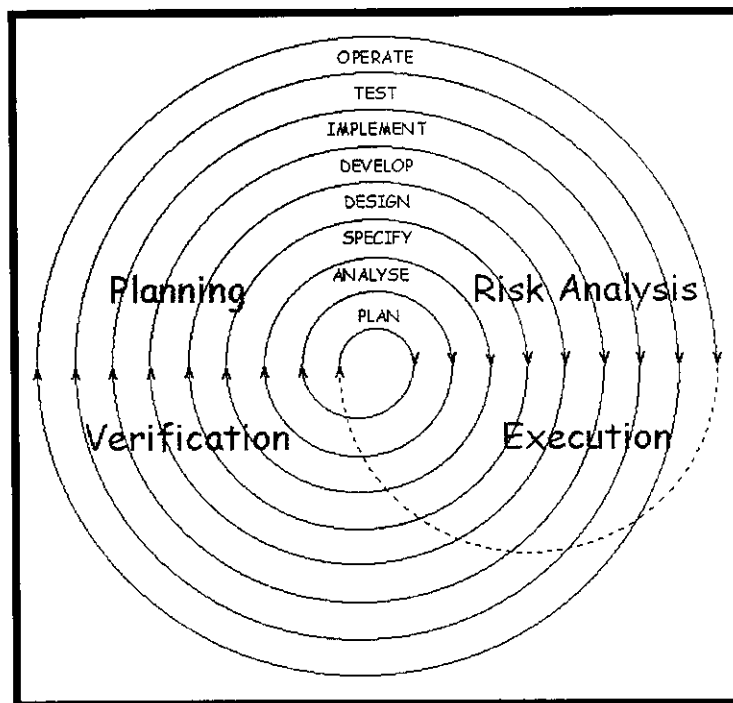
following advantages are acquired.

Avoidance of Risk is enhanced

Minimizing Resource consumption

Strong approval and documentation control

Organization and team cultures embrace controls and precision

Can incorporate other methodologies into the Spiral framework.

Implementation has priority over functionality.

Additional Functionality can be added at a later date.

2.2 Existing System

Present system

The existing system consisted of the SFA (Sales Force Automation) wherein each customer is been given an opportunity number. The DAF module applies its criterion and gives it a DAF number. The CAF module produces the CAF number. But the approval of the contract was all done manually. It was very difficult for the officials to keep track of all the deviation terms and conditions. The officials had to get the necessary information and they had to escalate them to the next respective official for approval.

It consumed a lot of time too. So this whole process carried out offline and had lot of complication with this. A proper interface was needed to be established between the SFA and SAP database. Therefore they need to develop this application.

Limitations of Present System

The following are the limitations of the existing system

Proper interface was not established between the SFA and SAP database.

The DAF and CAF modules were not integrated.

Difficult to maintain all the deviation terms and conditions.

Communication gap between the officials.

Dependency on the SAP was very high.

SAP usage cost was very high.

Delay in approving a contract.

2.3 Proposed system

Project Description – General

✓ The intended project – "E-DAF" would have the following salient features

✓ Integrate DAF and CAF.

✓ Build a proper interface between the SFA module and SAP database.

✓ Minimize the SAP dependency.

✓ Escalate the contract through different officials for final approval.

✓ Apply the deviation terms and conditions for finding the respective officials.

✓ Apply proper limits and check through the deviation terms and conditions to approve the project.

✓ Generation of reports for easy user interface.

✓ Provide Admin Screens for easy modifications.

✓ Easy generation of SAP code using BAPI.

✓ Application of remote scripting to avoid reloading of pages.

It is intended to have an application, which will keep track of the approval of a contract. Upon logging on to the 'mywipro.Wipro.net' it provides the utility to 'SFA (Sales Force Automation)' application. On receiving the opportunity number the user logs on to "E-DAF". Depending on the user type, user will be given links to various options and features

Advantages of Proposed System

The following are the benefits accrued on meeting the requirements.

✓ E-DAF integrates the two live modules DAF and CAF.

✓ E-DAF builds a proper interface between SFA and SAP.

✓ It minimizes the dependency on SAP.

✓ The deviation terms and conditions are well applied.

✓ The Final approval is established in a cost and time efficient manner.

✓ Complexity in accessing the SAP database is highly reduced.

✓ The application of remote scripting avoids reloading of pages.

✓ Reports and Admin Screens are provided for implementing changes easily.

✓ BAPI implementation helps in quick SAP code generation.

✓ Impact on customer satisfaction.

3.0 Programming Environment

3.1 Hardware Configuration
Platform Selection
Performance Requirements

The proposed system is supposed to have the maximum speed of performance in the conditions available. Taking into consideration the connectivity to SAP server where the site will be hosted is going to be in the same LAN.

Design Constraints

The Site will Work on IE 5.0+ browsers.

Hardware Limitations

The configurations of the system with minimum of 128MB RAM is required for the smooth development and hosting of the server.

Development Environment

Software Requirement

Operating System	: Windows 9X/NT/XP
Development Environment	: Visual Interdev 6.0
Configuration Management	: Visual Source Safe
Database	: SQL Server 7.0, Oracle 8.1
Web Languages	: ASP
Markup Languages	: HTML, DHTML
Scripting Languages	: JavaScript, VB Script
Web Server	: IIS/PWS
Browser	: IE/Netscape Navigator
Document Tools	: MS Office

Hardware Requirement

Web Server

P III XEON

2GB RAM

18 GB X 3 HDD

Windows 2000 Advanced Server

Database Server

P III XEON

2GB RAM

18 GB X 3 HDD

Windows 2000 Advanced Server

3.2 Description of Software and Tools used

Literature Survey

Problem Definition

✓ The development of E-DAF is justifiable on the grounds of being more cost effective.

✓ Integration of DAF and CAF.

✓ Builds an efficient interface between the SAP and SFA.

✓ Minimize dependency on SAP.

✓ Avoids reloading of pages by extreme usage of Remote Scripting.

✓ Provides timely/accurate information with regard to the approval.

✓ Proper and efficient application of deviation terms and conditions.

✓ Provides a simple easy-to-use interface to the users of this application.

✓ Easy access via Internet or Intranet.

Software Selection

WWW

The Internet is the largest computer network in the world. It links computer of every model and operating system together to facilitate the sharing of information.

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Every web site (such as http://www.wipro.co.in) on the Internet assigned a unique address similar to the way that all of the buildings located on a particular street have an address. Computers that connect to the Internet uses Internet protocol (IP) addresses, which are understand by the TCP/IP protocol suite.

Each IP host is assigned a domain name system (DNS) name. This is the name used to refer by the users who wish to access a particular host. Web servers have typically have means in the following format: www.domainname.com

To access a particular web server, a user launches a web browser application and specifies a uniform resource locator (URL) with which they wish to connect. URLs that refer to the web server always begin with http:// .The remainder of the URL refers to the host (typically "www") and domain information, such as "wipro.com".

The client browser running on user computer generates http requires for documents based on user selections. Prior to the introduction of the hyper text transfer protocol and world wide web, some universities and other organizations try to organize information in a format that allowed you to find, view, access information in a loan-geographical format with protocols like Archie, verolica and gopher. With the development of the http, html, www, search engines and geographical web browsers, the Internet has become increasingly user friendly. This has lead to the explosive growth of Internet traffic in recent years. The www provides access to text, pictures, sounds and multimedia content from anywhere in the world. By using hyper media hypertext, users are able to retrieve information by a simple mouse click. Currently, there are over 34 million users accessing the internet. Clearly, the www is the fuel feeding the incredible growth of the internet.

Web Clients

The browser is the client component required to view documents stored on an http web server. When designing a web site, your contents should be formatted for both of the popular browsers (Netscape navigator and Microsoft Internet explorer). Documents must provide consistent functionality across both applications platforms.

Both Netscape navigator 4 and Microsoft Internet explorer 4 provide support for ASP. This allows us to create dynamic moving web pages. Html and Java script is compiled in the browser itself so the validation is easy for the user that makes it efficient and reduce the workload of server since the ASP code only get executed on the server.

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Web Servers

A basic Internet server provides web documents over http and files over ftp. In addition, certain programs can run on the web server to enhance the information sent to the browser. These are:

✓ Common gateway interface (CGI)

✓ Internet server application programming interface (ISAPI)

✓ Active server pages (ASP)

The primary difference between CGI and ISAPI is that with CGI programs, a new copy of the program is loaded into memory of the server every time the client browser requests the page containing the program. With an ISAPI program one copy is loaded in the memory and shared by all applications.

While CGI and ISAPI are usually written in either Pearl or C or C++, an active server page is a script that is interpreted by a dynamic link library that is loaded in the internet information server's memory. This means that active server page can be written in any active scripting language, including VBScript and JavaScript. An active server page can also run ActiveX components, making it a very powerful tool for server side web solutions.

ASP, CGI and ISAPI programs can provide many types of services to client browsers, including:

✓ Database lookups.

✓ Capturing information and updating database.

✓ Page hit counters.

✓ Online updating.

✓ What happens when we click on a hyper link

The following is a description of the events behind the operation of a typical http server and client:

The client browser translates the URL embedded in the user specified URL into a fully qualified domain name and path to the document.

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- ✓ The browser request name resolution for the domain name and path from a DNS server. The DNS server returns an IP address of the server containing the requested document.
- ✓ A TCP/IP connection is established to the server's IP address.
- ✓ The browser uses http to request the document from the server.
- ✓ The server transmits the html document at the path indicated in the URL to the browser.
- ✓ The TCP/IP connection to the web server is broken. Each page request makes a unique, temporary TCP/IP connection.

The html document is formatted by the browser and presented to the user.

Because html pages may contain main embedded objects such as graphics and frames, the request-response process is repeated until all objects have been retrieved.

Microsoft Internet Information Server (IIS)

Microsoft provides support for web application through the Microsoft Internet information server. IIS transmits documents in hypertext markup language (html) pages using the hypertext transfer protocol (http). It listens for request from the user responds by providing the information that satisfies the request. IIS uses functions that formerly had to be done with a complied application could now be done with text files that were interpreted by the web server. Documentation's and program example files are included with IIS server 3.0 and IIS server 4.0.

IIS 4.0 provide support for the distributed components object model (DCOM), Java script, VB script and ActiveX programs that run on the server.

The latest version of IIS, version 4.0 offers so much flexibility is providing dynamic information that previous versions should be used only until version 4 is installed.

Active Server Pages 3.0

An active server page (ASP) is a server-side scripting environment that that can be used to create and run dynamic, inter ActiveX high performance web server application. When scripts run in the server rather than on the client, web server does all the work involved in generating the Hypertext Markup Language (HTML) pages that we send to browsers.

Pages that include server-side script are called active server pages (ASP) and use the .asp extension. ASP provides functionality to web pages through the use of a script language. ASP automatically supports VBScript and JavaScript.

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How Active Server Pages really Work:

An active server page is a standard HTML file that is extended with additional features. Like a standard HTML file, an active server page contains HTML tags that can be interpreted and displayed by a web browser. However the following three features make an ASP page unique:

- ✓ An active server page can contain server-side scripts with which one can create web pages with dynamic content. To take an extremely simple example, we can create a web page that displays different messages at different time of the day.

- ✓ An active server page provides several built-in objects. By using the built-in objects, we can make our scripts much more powerful; we can retrieve information from browser and send information to the browser.

- ✓ An active server page can be extending with additional components. Active server pages come bundled with several standards, server-side active components. These components enable you to work with databases, send email and access the file system.

Active server page application is:

- ✓ Completely integrated with HTML files.
- ✓ Easy to create with no manual compiling or linking of programs required.
- ✓ Object-oriented and extensible with ActiveX server components

Scripting Languages

Java Script:

JavaScript is Internet Explorer cross platform object-based scripting languages for client and server applications. There are two types of JavaScript.

- ✓ Explorer's JavaScript is also called "client-side JavaScript".
- ✓ Live Wire JavaScript is also called"server-side JavaScript".

JavaScript is used for client side validations. It is known as scripting languages. Scripting stands for validation. JavaScript is used in millions of Web pages to improve the design, validate forms,

and much more. JavaScript was developed by Netscape and is the most popular scripting language on the Internet.

JavaScript works in all major browsers that are version 3.0 or higher.

Features of JavaScript:

✓ It is browser dependent and platform-independent.

✓ It cannot work independently. It has to be embedded in HTML.

✓ It is partially case sensitive.

✓ It is object-based language.

✓ JavaScript is an interpreter-oriented language.

✓ HTML document can contain multiple <script> tags.

VBScript

Vbscript is used in the input form at the client side validations. It is useful when the users enter the email-id, employee name, while confirming their profiles. If the user enters invalid data then the scripting languages will give appropriate message asking them to reenter the data.

Vbscript, Microsoft's visual basic scripting edition, is scaled down version of visual basic. While it doesn't offer the functionality of visual basic, it does provide a powerful, easy to learn tool that can be used to ass interaction to web pages. Working with Vbscript is easy and should be immediately productive. Vbscript is easy to learn, even for the novice developer.

ORACLE 8i

Oracle is a relational database management system that uses SQL as its data manipulation language. Information on SQL is given separately to these notes. These notes are a fast-start to the way we will use Oracle in the labs and supplement the SQL*Plus User's Guide and Reference manual available on the web. The Oracle database resides on a server. This is where the binaries are and your databases. Your database tables DO NOT reside in your own file store and can only be accessed by using an Oracle tool. When you log onto a machine and start an Oracle tool the server must be notified to serve the tool to your machine. This can be slow. However, once the tool is loaded onto the client it runs the program locally so this is faster.

Once you have started a tool don't close it down unless you are finished. You will be developing your database implementations in pairs. To avoid confusion and wasted disk space do

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not create multiple tables with the same things in them. There should only be one team database, looked after by one person and the other should be granted permission to use that database.

Introduction to SAP

SAP stands for *Systems Application and Products in Data processing*

SAP Connectors:

SAP connectors allow integration of different applications and technologies with SAP systems via Open Standards.

Connectors are means for Technical Interoperability of SAP Components (Written in ABAP Or ABAP Object) and other Components (e.g. Written in Java, C++, VB, Net etc.)

BAPI (Business Application Programming Interface)

✓ BAPI`s are Programming to access SAP Database from within SAP or other development platforms external to R/3 that support the Remote function Call (RFC).

✓ The main objective of the BAPI`s to achieve integration between the R/3 system and external applications.

✓ BAPI gives us option to have non-SAP front end for occasional users.

BAPI`s can be accessed from various programming environments for example, Java, C++, VB.

4 System Design

Inputs

Input Design is the method by which valid data are accepted from the user. This part of the designing requires very careful attention. If the data going into the system is incorrect then the processing and output will magnify these errors. Inaccurate input data are the most common cause of errors in data processing.

The input design is carried out in such a way that the input screens are user-friendly. The goal of designing input design is to make input data entry as easy and error free. Input screen takes care to filter the invalid data from becoming an operational data at each entry phase. This is achieved by providing proper checks and validation procedures and certain features to the users wherever possible.

In the "E-DAF" package most of the input data is taken from SAP. The users would be Wipro employees and they need to select the data from the respective select boxes. The Customer logon details are updated in the SAP. Besides these inputs the requirements of BG, EMD, LD, Debts, DSO etc are also entered. All the screens are validated appropriately.

The ME/PM alone have the rights to upload files. They can also view each other's files. In the PEG login they input the SAP code for updating in the SAP.

Outputs

The Output Design defines the output required and the format in which it is to be produced. Care must be taken to present the right information so that right decisions are made.

A very important and effective way of presenting information is reports. In this module the more emphasis is given to the data reports. Various reports will be generated by the system. These reports will be used for various verifications and analysis. Pending reports, Approved reports, Rejected reports etc are also generated.

The main purpose of the project is to process the information and give it to user in a user-friendly manner. Most of the screens are used to display the information based on the criteria given. Admin screens are provided for easy modification in the database.

There are several tools and techniques used for designing. These tools and techniques are:

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Application Architecture:
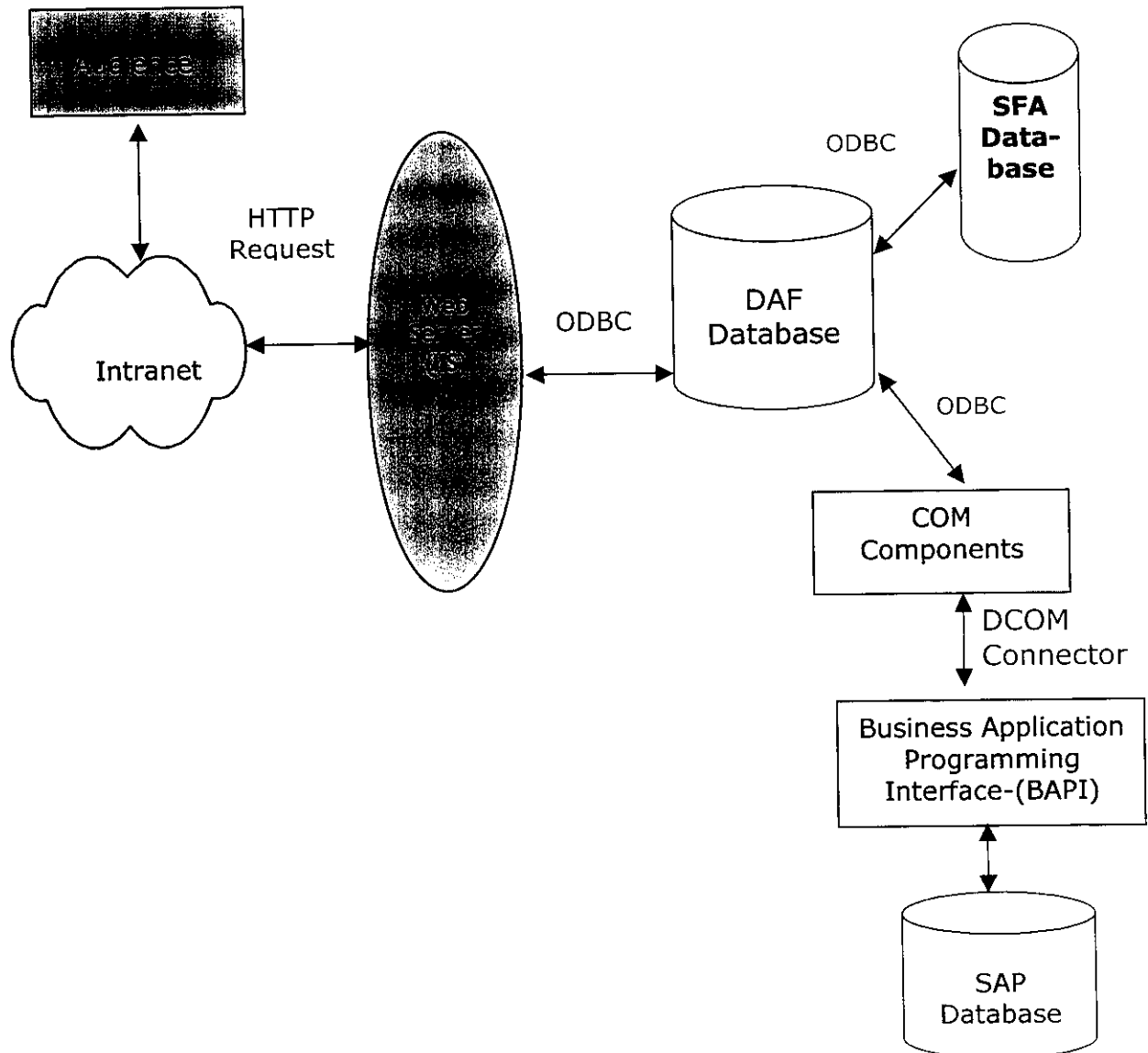
System design provides the understanding and procedural details necessary for implementing the system recommended in the system study. Emphasis is on translating the requirement into design specifications. The design phase is transition from a user-oriented document (system document) to a document oriented to the programmers or database personnel.

System design goes through two phase of the development:

- ✓ Logical design
- ✓ Physical design

A data flow diagram shows the logical flow of the system. For a system it describes the input (source), output (destination), database (data stores) and procedures (data flows) all in a format that meets the user's requirement. When analysis prepares the logical system design, they specify the user needs at a level of detail that virtually determines the information flow into an out of the system and the required data resources. The logical design also specifies input forms and screen layouts.

The activities following logical design are the procedure followed in the physical design e.g., producing programs, software, file and a working system. Design specification instructs the user about what the system should do.

Output sources:

Retrieval from data source.

Transmission from a process or system activity

Directly from input source

The information produced in an output can be presented in the form of tabular contents

Output definition:

The output should be defined in terms of:

Types of outputs

Format- hard copy and screen

Geographical- local remote

Frequency- daily, weekly, monthly, yearly

Response- immediate within a period

Data items:

The name given to each data item should be recorded and its characteristics described clearly in a standard form:

Whether numeric or alphanumeric

Legitimate and specific range of characteristics

Number of characters

Position of decimal points, arithmetic design, etc.

Format of date

Input Design

The input design is the link that ties the information system into the user's world. Input specifications describe the manner in which data enters the system for processing. Input design features can ensure the readability of the system and produce system results from accurate data, or they can result in the production of erroneous information.

Input design consists of

✓ Developing specifications and procedures for data preparation.

✓ Steps necessary to put data into a usable form for processing.

✓ Data entry, the activity of putting data into the computer processing.

Objectives of input design

✓ Controlling the amount of input required

✓ Avoid delay

✓ Avoiding errors in data

✓ Avoiding extra steps

✓ Keeping the process simple

Input stages several activities have to be carried out as part of the overall input process. They include some or all of the following.

✓ Data recording (i.e., collection of data)

✓ Data encapsulation (i.e., transfer of data)

✓ Data conversion (i.e., controlling the flow of data)

✓ Data transmission (i.e., checking the input data)

✓ Data correction (i.e., correcting the error)

Input Performa were designed, after a careful discussion with the users. It was attempted to cover all the user requirements. Designed Performa were given to user for any suggestion and final approval.

Various data items were identified and wherever necessary was recorded. As the data concerning of SIA is voluminous in nature and number of case will grow dynamically in future, proper care was taken for accuracy and consistency in data.

Input design is aimed at reducing the chances of mistakes of errors. As the human beings are prone to errors there is a possibility of occurrence of chance of errors. Adequate validation checks are incorporated to ensure error free data storage. Some of the data validation checks applied is as follows:

✓ Redundancy of data is checked. It means the record of primary key does not occur twice.

✓ Primary key field of any table must not be left blank.

✓ Wherever items are coded, input code is checked for its validity with respects to several checks

✓ Utmost care has been taken to incorporate the validation at each stage of the system. E.g. when entering details of an employee email id into a table (s_userlist), it is checked that whether the corresponding email-id exists in the table or not.

Enough messages and dialogue boxes have been provided while designing screen, which guides at the time of errors, or at time of entry. This feature provides a user-friendly interface to native users. It can be emphasized that input design of SIA system is so designed that it ensures

easy and error free data entry mechanism. Once one is sure of input data the output formatting becomes a routine work.

4.2 Database Design

Conceptual Design

The goal of this stage is to analyze the application and do a conceptual design on the application. The goal is to provide a conceptual design and description of reality.

At the end of this stage, each group is expected to provide the following:

A description of the application.

Goal of the project: specific what will the system achieve and why it is important. This should be a nice `sales-pitch' to your system.

Specification of the entire task that your system is going to perform. Each task should have a statement describing its purpose, and a list of input and output.

Specify what database management system (DBMS) you want to use (see below).

At this phase the focus is on conceptual design. Your design should not be dependent on the logical database model that you are going to use.

Logical Database Design

You are required to use a relational DBMS to implement your system. However, you are free to choose which relational DBMS to use. The only requirement is that you would be able to demonstrate the system within the main campus of the University of Memphis. (For instance, you are welcomed to upload your favorite database system onto a Laptop and bring the Laptop to campus to demonstrate your program). However, you are fully responsible for figuring out the operation of the DBMS and how to implement your system on it.

At the end of this phase each group have to hand in a full report. This will consists of:

✓ The (updated) report from the previous phase, together with a summary of changes.

✓ A description of problems encountered at this phase, and any justification for the solutions.

✓ A user manual for the system, describing to the causal user how to get things done in the system. You should not assume the user to know the database system that you are using.

✓ A description of your testing efforts, highlighting the erroneous cases.

✓ A description of the system's limitations and the possibilities for improvements.

At the end of the project each group will be required to perform a 35-40 minutes demo. The group will be responsible for setting up all the software (and even hardware) necessary. The demo should be scheduled such that every member of the group is presented. I am flexible of scheduling demos in the evening or weekend to accommodate the group's need.

Physical Database Design

Introduction

We have established that there are three levels of database design:

Conceptual: producing a data model which accounts for the relevant entities and relationships within the target application domain;

Logical: ensuring, via normalization procedures and the definition of integrity rules, that the stored database will be non-redundant and properly connected;

Physical: specifying how database records are stored, accessed and related to ensure adequate performance.

It is considered desirable to keep these three levels quite separate -- one of Codd's requirements for an RDBMS is that it should maintain logical-physical data independence. The generality of the relational model means that RDBMS are potentially less efficient than those based on one of the older data models where access paths were specified once and for all at the design stage. However the relational data model does not preclude the use of traditional techniques for accessing data - it is still essential to exploit them to achieve adequate performance with a database of any size.

We can consider the topic of physical database design from three aspects:

What techniques for storing and finding data exist,

Which are implemented within a particular DBMS,

Which the designer for a given application, knowing the properties of his data, might select.

Fundamentals:

A basic fact about data storage is that using conventional machine architecture, data must be moved repeatedly between disc (optical or magnetic), main memory, and processor

registers. (An arrangement known as the *Von Neumann bottleneck*, after one of the original designers of the first stored-program computer.)

A computer disc is a semi-random device - data is stored at physical addresses based on surfaces, tracks and sectors, and there are a minimum number of bytes, which can be moved into or out of the memory at a time. System managers may specify physical block sizes and database designers, subject to constraints set by the machine architecture and operating system. One important aspect of file and database design is producing a good match between physical "pages" and logical units like tables and records.

Requirements

Two basic requirements when using a database are:

Given a logical reference to a data item, to find it within the physical database.

Codd demands that all items be accessible via a combination of table-name, key value, and column name. In practice the key-address mapping presents the greatest challenge, since ANY database field can constitute a search "key" for a relational select.

To represent the fact that a relationship exists between two data items.

Most importantly between entries in two different tables. At the logical level matching field values reflects this, but to handle join operations in a large database some extra physical mechanisms are often needed.

Summary of Basic Techniques

There are three possible ways of mapping a logical key to a physical address:

Sequential search,

Applying a hashing function to the key to get an address,

Using an index or look-up table,

The principles of hashing and indexing are discussed in sections 6.5 and 6.6 below. In practice combinations between the three techniques are possible - hashing can be used to find an approximate position in an index, and short sequential searches may follow hashing or indexed look-up, to locate the exact record being sought.

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There are two possible ways of physically representing relationships between data items:

Implicitly, by physical proximity, or address calculation,

Explicitly, using address pointers to link items together.

An array is an example of a data structure whose elements are related implicitly by their relative addresses. At the lowest level, all data relationships depend on knowing which item is next to which other one in memory. However the use of pointers allows larger-scale structures to be generated dynamically, when data elements need not be adjacent.

List of the Database Table

Primary Key: **‒ Given by Bold Font**

Secondary/ Foreign Key: **‒ Given by Bold + Italic**

TEMP_CAF_BASKET_ITEM

Column name	Data type	Length	Precision	Scale	Null
BASKET_ID	varChar	20	0	0	Yes
PROD_LINE_ID	varChar	20	0	0	Yes
PROD_TYPE	varChar	20	0	0	Yes
PROD_DESC	varChar	1000	0	0	Yes
PROD_CONFIG_OTHERS	varChar	1000	0	0	Yes
CODE_CREATION_FLAG	varChar	3	0	0	Yes
PROD_DPT	varChar	50	0	0	Yes
PROD_ENTRY_DATE	date time	8	0	0	Yes
CAF_ID	varChar	20	0	0	Yes
ASKED_EUP	varChar	50	0	0	Yes
QTY	varChar	50	0	0	Yes
MATERIAL_DESC	varChar	40	0	0	Yes
CLEARED_EUP	varChar	50	0	0	Yes
SALES_TEXT	varChar	1000	0	0	Yes
SAP-CODE	varChar	50	0	0	Yes
MATERIAL_COST	varChar	50	0	0	Yes

SHIP_TO_ADDRESS	varChar	50	0	0	Yes
PROD_RANDOM_ID	decimal	9	18	0	No
STP_VALUE	varChar	50	0	0	Yes
CLEARE_STP	varChar	50	0	0	Yes
TOTAL_CLEARED_EUP	varChar	50	0	0	Yes
TOTAL_CLEARED_STP	varChar	50	0	0	Yes
BILL_VALUE	varChar	50	0	0	Yes
TATAL_BILL_VALUE	varChar	50	0	0	Yes

DAF_BG

Column Name	Datatype	Length	Precision	Scale	Null
DAF_NUM	varChar	50	0	0	yes
OPP_NUM	varChar	50	0	0	yes
CHKADV	varChar	50	0	0	yes
ADVAMT	varChar	50	0	0	yes
ADVPER	varChar	50	0	0	yes
CHKWAR	varChar	50	0	0	yes
WARAMT	varChar	50	0	0	yes
CHKINST	varChar	50	0	0	yes
INSTAMT	varChar	50	0	0	yes
INSTPER	varChar	50	0	0	yes
CHKOTR	varChar	50	0	0	yes
OTRAMT	varChar	50	0	0	yes
OTERPER	varChar	50	0	0	yes
BG_OTHER	varChar	2000	0	0	yes
BG_ISSUE_AUT	varChar	50	0	0	yes
BG_NOT_CORP	varChar	8000	0	0	yes

DAF_CAF_STATUS

Column Name	Datatype	Length	Precision	Scale	Allow
DAF_NUM	varChar	50	0	0	yes
CAF_NUM	varChar	50	0	0	yes
OPP_NUM	varChar	50	0	0	yes
SL_NO	varChar	50	0	0	yes

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B_LINE	varChar	100	0	0	yes
DIV	varChar	100	0	0	yes
PRODUCT	varChar	50	0	0	yes
EST_VALUE	varChar	50	0	0	yes
APP_REQUIRED	varChar	50	0	0	yes
ORDER_VALUE	varChar	8	0	0	yes
ENTERED_DATE	varChar	100	0	0	yes
ME_MAIL	varChar	100	0	0	yes
CAF_RAISED_DATE	datetime	8	0	0	yes
STSTUS	varChar	50	0	0	yes
PENDING	varChar	100	0	0	yes
PM_DATE	datetime	8	0	0	yes
FREEZ	bit	1	0	0	No
BH_STATUS	varChar	50	0	0	yes
BH_DATE	datetime	8	0	0	yes
ITERATION	Int	4	10	0	yes
OLD_CAF_NUM	varChar	50	0	0	yes
TEXT_FILE	varChar	50	0	0	yes
PM_TEXT_BOM	varChar	50	0	0	yes

DAF_CEO_LIMIT

Column Name	Datatype	Length	Precision	Scale	Allow
PRODUCT	varChar	255	0	0	yes
ORDER_VALUE	varChar	10	0	0	yes
ROLE	varChar	10	0	0	yes

DAF_CM_MASTER

Column Name	Datatype	Length	Precision	Scale	Allow
EMP_MAIL	varChar	100	0	0	yes
EMP_NAME	varChar	100	0	0	yes
REGION	varChar	50	0	0	yes
BLOCK	varChar	2	0	0	yes

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DAF_EMD

Column Name	Datatype	Length	Precision	Scale	Null
DAF_NUM	varChar	50	0	0	yes
OPP_NUM	varChar	50	0	0	yes
RADIO1	varChar	50	0	0	yes
EMD_AGE_ORDER	varChar	100	0	0	yes
EMD_VALUE	varChar	255	0	0	yes
EMD_REASON	varChar	50	0	0	yes
EMD_OTHER	varChar	2000	0	0	yes
EMD_ISSUE_AUT	varChar	50	0	0	yes
EMD_NOT_CORP	varChar	8000	0	0	yes

DAF_JUST

Column Name	Datatype	Length	Precision	Scale	Null
DAF_NUM	varChar	50	0	0	yes
JUSTIFICATION	varChar	8000	0	0	yes

DAF_LD

Column Name	Datatype	Length	Precision	Scale	Null
DAF_NUM	varChar	50	0		
OPP_NUM	varChar	50	0	0	yes
LD_DELIV_LEAD_TIME	Int	4	10		
LD_CLAUSE	varChar	10	0	0	yes
LD_CLAUSE_ATT_ID	varChar	50	0	0	yes
LD_RANGE1	varChar	50	0	0	yes
LD_PERIOD1	varChar	50	0	0	yes
LD_ORDER_VALUE1	varChar	50	0	0	yes
LD_RANGE2	varChar	50	0	0	yes
LD_ORDER_VALUE2	varChar	50	0	0	yes

DAF_LOCATION

Column Name	Datatype	Length	Precision	Scale	Null
REGION	varChar	10	0	0	yes
LOCATION	varChar	50	0	0	yes

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LOCATION_CODE	varChar	50	0	0	yes

DAF_LIMIT

Column Name	Datatype	Length	Precision	Scale	Null
DEVIATION	varChar	50	0	0	yes
ROLE	varChar	10	0	0	yes
F_VALUE	Real	4	24	0	yes
T_VALUE	Real		24	0	yes

DAF_MAIN

Column Name	Datatype	Length	Precision	Scale	Null
DAF_NUM	varChar	50	0	0	No
OPP_NUM	varChar	50	0	0	No
ACC_ID	varChar	50	0	0	Yes
ME_MAIL	varChar	100	0	0	Yes
ME_NAME	varChar	100	0	0	Yes
DSO_DAYS	varChar	50	0	0	No
A_DSO	varChar	10	0	0	Yes
B_BG	varChar	10	0	0	Yes
C_DEBTS	varChar	10	0	0	Yes
D_LD	varChar	10	0	0	Yes
E_CONT	varChar	10	0	0	Yes
F_EMD	varChar	10	0	0	Yes
REGION	varChar	10	0	0	Yes
AREA_OFFICE	varChar	100	0	0	Yes
SAM	varChar	10	0	0	Yes
VERTICAL	varChar	75	0	0	Yes
CONTRACT_BY	varChar	100	0	0	Yes
CH_PART_NAME	varChar	255	0	0	Yes
CURR	varChar	5	0	0	Yes
CUST_NAME	varChar	255	0	0	Yes

NEW_CUST	varChar	50	0	0	Yes
CUST_PROFILE	varChar	50	0	0	Yes
TOTAL_VALUE	varChar	50	0	0	Yes
CM_NAME	varChar	100	0	0	Yes
CM_MAIL	varChar	100	0	0	Yes
PAYMENT_INSTRUMENT	varChar	50	0	0	Yes
OPP_DESCRIPTION	varChar	2000	0	0	Yes
DIVISION	varChar	100	0	0	Yes
PISTATUS	varChar	50	0	0	Yes

DAF_REGION

Column Name	Datatype	Length	Precision	Scale	Null
REGION	varChar	50	0	0	Yes
REG_ID	varChar	50	0	0	Yes
REG_NO	varChar	50	0	0	Yes

DIVISION

Column Name	Datatype	Length	Precision	Scale	Allow Null
DIVISION	varChar	50	0	0	Yes
RBH_LIMT	varChar	50	0	0	Yes
CEO_LIMT	varChar	50	0	0	Yes
BLOCK	varChar	10	0	0	Yes

DAF_WORK_FLOW

Column Name	Datatype	Length	Precision	Scale	Null
DAF_NUM	varChar	50	0	0	Yes
STAGE	varChar	50	0	0	Yes
EMP_MAIL	varChar	100	0	0	Yes
EMP_NAME	varChar	100	0	0	Yes
ROLE	varChar	5	0	0	Yes
STATUS	varChar	50	0	0	Yes
ASSIGNE_DATE	Datetime	8	0	0	Yes
APP_DATE	Datetime	8	0	0	Yes
REMARKS	varChar	8000	0	0	Yes

DSO_CALCULATOR_DETAILS

Column Name	Datatype	Length	Precision	Scale	Null
DAF_NUM	varChar	50	0	0	Yes
OPP_NUM	varChar	50	0	0	No
SL_NO	varChar	50	0	0	Yes
PAYMENT_TERM	varChar	255	0	0	Yes
BREAK_UP	varChar	50	0	0	Yes
BREAK_UP_ADD	varChar	50	0	0	Yes
NORMS_FOR_DOC	varChar	50	0	0	Yes
CREDIT_PERIOD	varChar	50	0	0	Yes
PROCESS_TIME	varChar	50	0	0	Yes

DSO_MASTER_PAYMENT_TERMS

Column Name	Datatype	Length	Precision	Scale	Null
Sl_no	varChar	50	0	0	No
PAYMENT_TERM	varChar	255	0	0	Yes
NORMS_FOR_DOC	varChar	50	0	0	Yes
PROCESS_TIME	varChar	50	0	0	Yes
YES_OR_NO	bit	1	0	0	No
ADD_01	varChar	50	0	0	Yes
ADD_02	varChar	50	0	0	Yes
ADD_03	varChar	50	0	0	Yes
ADD_04	varChar	50	0	0	Yes
SUB_01	varChar	50	0	0	Yes
SUB_02	varChar	50	0	0	Yes
SUB_03	varChar	50	0	0	Yes
SUB_04	varChar	50	0	0	Yes

HIS_CAF_REQ_MASTER

Column name	Data type	Length	Precision	Scale	Null
CAF_ID	varChar	20	0	0	Yes
BASKET_ID	varChar	20	0	0	Yes
CP_ID	varChar	100	0	0	Yes

CP_NAME	varChar	50	0	0	Yes
ME_CODE	varChar	100	0	0	Yes
ME_NAME	varChar	100	0	0	Yes
ACCOUNT_NAME	varChar	50	0	0	Yes
LOCATION	varChar	50	0	0	Yes
CURRENCY_TYPE	varChar	10	0	0	Yes
PROD_CATEGORY	varChar	20	0	0	Yes
EXP_ORD_DATE	datetime	8	0	0	yes
EXP_DELIV_DATE	datetime	8	0	0	yes
RFP_DUE_DATE	datetime	8	0	0	yes
ASKED_ORC	varChar	10	0	0	yes
PAYMENT_TERMS	varChar	50	0	0	yes
CURRENT_OUTSTANDING	varChar	50	0	0	yes
ME_REMARKS	varChar	1000	0	0	yes
WME_APPROVAL	varChar	2	0	0	yes
PM_APPROVAL	varChar	2	0	0	yes
PEG_APPROVAL	varChar	1000	0	0	yes
WME_REMARKS	varChar	1000	0	0	yes
PEG_REMARKS	varChar	10	0	0	yes
CLEARED_ORC	varChar	10	0	0	yes
WIPRO_CONTRIBUTION	varChar	10	0	0	yes
EXPECTED_CONTRIBUTION	Int	4	10	0	yes
CAF_VALIDITY_DATE	Datetime	8	0	0	yes
CAF_GENERATED_DATE	Datetime	8	0	0	yes
STATUS_SAP_CODE	varChar	2	0	0	yes
CAF_STATUS	varChar	2	0	0	yes
SCCOUNT_NO	varChar	50	0	0	yes

HIS_DAF_CAF_STATUS

Column Name	Datatype	Length	Precision	Scale	Null
DAF_NUM	varChar	50	0	0	Yes
CAF_NUM	varChar	50	0	0	Yes
OPP_NUM	varChar	50	0	0	Yes
SL_NO	varChar	50	0	0	Yes
B_LINE	varChar	100	0	0	Yes
DIV	varChar	100	0	0	Yes

PRODUCT	varChar	100	0	0	Yes
EST_VALUE	varChar	50	0	0	Yes
APP_REQUIRED	varChar	50	0	0	Yes
OREDER_VALUE	varChar	50	0	0	Yes
ENTERED_DATE	datetime	8	0	0	Yes
ME_MAIL	varChar	100	0	0	Yes
ME_NAME	varChar	100	0	0	Yes
CAF_RAISE_DATE	datetime	8	0	0	Yes
STATUS	varChar	100	0	0	Yes
PENDING	varChar	100	0	0	Yes
PM_DATE	datetime	8	0	0	Yes
FREEZ	bit	1	0	0	Yes
BH_STATUS	varChar	50	0	0	Yes
BH_DATE	datetime	8	0	0	Yes
ITERATION	Int	4	10	0	Yes
OLD_CAF_NUM	varChar	50	0	0	Yes
TEXT_FILE	varChar	50	0	0	Yes
PM_TEXT_BOM	varChar	50	0	0	Yes

HIS_TEMP_CAF_BASKET_ITEM

Column Name	Datatype	Length	Precision	Scale	Null
BASKET_ID	varChar	20	0	0	Yes
PROD_LINE_ID	varChar	20	0	0	Yes
PROD_TYPE	varChar	20	0	0	Yes
PROD_DESC	varChar	1000	0	0	yes
PROD_CONFIG_OTHERS	varChar	1000	0	0	yes
CODE_CREATION_FLAG	varChar	3	0	0	yes
PROD_DTP	varChar	50	0	0	yes
PROD_ENTRY_DATE	datetime	8	0	0	yes
CAF_ID	varChar	20	0	0	yes
ASKED_EUP	varChar	50	0	0	yes
QTY	varChar	50	0	0	yes
MATERIAL_DESC	varChar	40	0	0	yes
CLEARED_EUP	varChar	50	0	0	yes
SALES_TEXT	varChar	1000	0	0	yes
SAP_CODE	varChar	50	0	0	yes

MATERIAL_COST	varChar	50	0	0	yes
SHIP_TO_ADDRESS	varChar	50	0	0	yes
PROD_RANDOM_ID	decimal	9	18	0	yes
STP_VALUE	varChar	50	0	0	yes
CLEARED_STP	varChar	50	0	0	yes
TOTAL_CLEARED_EUP	varChar	50	0	0	yes
TOTAL_CLEARED_STP	varChar	50	0	0	yes
BILL_VALUE	varChar	50	0	0	yes
TOTAL_BILL_VALUE	varChar	50	0	0	yes

DSO_MASTER_PAYMENT_TERMS

Column Name	Datatype	Length	Precision	Scale	Null
SL_NO	varChar	50	0	0	No
PAYMENT_TERM	varChar	255	0	0	Yes
NORMS_FOR_DOC	varChar	50	0	0	Yes
PROCESS_TIME	varChar	50	0	0	Yes
YES_OR_NO	bit	1	0	0	No
ADD_01	varChar	50	0	0	Yes
ADD_02	varChar	50	0	0	Yes
ADD_03	varChar	50	0	0	Yes
ADD_04	varChar	50	0	0	Yes
SUB_01	varChar	50	0	0	Yes
SUB_02	varChar	50	0	0	Yes
SUB_03	varChar	50	0	0	Yes
SUB_04	varChar	50	0	0	Yes

REM

Column Name	Datatype	Length	Precision	Scale	Null
DAF_NUM	varChar	10	0	0	Yes
SL_NO	Int	4	10	0	Yes
ROLE	varChar	10	0	0	Yes
REMARKS_BY	varChar	50	0	0	Yes
REMARKS_DATE	Datetime	8	0	0	Yes
REMARKS	varChar	8000	0	0	Yes

NON_MPG_MASTER

Column Name	Datatype	Length	Precision	Scale	Null
PROD_ID	varChar	255	0	0	Yes
PROD_TYPE	varChar	255	0	0	Yes
PROD_DTP	Float	8	53	0	Yes
PROD_DESC	varChar	50	0	0	Yes
PLANT_DELIV_TIME	Float	8	53	0	Yes
PROC_LEAD_TIME	Float	8	53	0	Yes
MATERIALGROUP	varChar	255	0	0	Yes

SFA

Column Name	Datatype	Length	Precision	Scale	Null
OPPORTUNITYID	varChar	50	0	0	Yes
ACCOUNTID	varChar	50	0	0	Yes
VERTICAL	varChar	50	0	0	Yes
USERNAME	varChar	50	0	0	Yes
REGION	varChar	50	0	0	Yes
DEPARTMENT	varChar	50	0	0	Yes
EMAIL	varChar	50	0	0	Yes
ACCOUNT	varChar	50	0	0	Yes
DEALER_TYPE	varChar	50	0	0	Yes
ACCOUNT_NAME	varChar	50	0	0	Yes
CURRENCY	varChar	50	0	0	Yes
OPPTYPE	varChar	50	0	0	Yes
COMPETITOR	varChar	50	0	0	Yes

TEMP_CAF_BASKET

Column Name	Datatype	Length	Precision	Scale	Null
BASKET_ID	varChar	20	0	0	No
ME_ID	varChar	100	0	0	Yes
ME_TYPE	varChar	10	0	0	Yes
BASKET_DESC	varChar	1000	0	0	Yes
CREATION_DATE	Datetime	8	0	0	Yes

TEMP_CAF_BASKET_ITEM

Column Name	Data type	Length	Precision	Scale	Null
BASKET_ID	varChar	20	0	0	Yes
PROD_LINE_ID	varChar	20	0	0	Yes
PROD_TYPE	varChar	20	0	0	Yes
PROD_DESC	varChar	1000	0	0	Yes
PROD_CONFIG_OTHERS	varChar	1000	0	0	Yes
CODE_CREATION_FLAG	varChar	3	0	0	Yes
PROD_DTP	varChar	50	0	0	Yes
PROD_ENTRY_DATE	Datetime	8	0	0	Yes
CAF_ID	varChar	20	0	0	Yes
ASKED_EUP	varChar	50	0	0	Yes
QTY	varChar	50	0	0	Yes
MATERIAL_DESC	varChar	40	0	0	Yes
CLEARED_EUP	varChar	50	0	0	No
SALES_TEXT	varChar	1000	0	0	No
SAP_CODE	varChar	50	0	0	Yes
MATERIAL_COST	varChar	50	0	0	Yes
SHIP_TO_ADDRESS	varChar	50	0	0	Yes
PROD_RANDOM_ID	Decimal	9	18	0	Yes
STP_VALUE	varChar	50	0	0	Yes
CLEARED_STP	varChar	50	0	0	Yes
TOTAL_CLEARED_EUP	varChar	50	0	0	Yes
TOTAL_CLEARED_STP	varChar	50	0	0	Yes
BILL_VALUE	varChar	50	0	0	Yes
TOTAL_BILL_VALUE	varChar	50	0	0	Yes

EMP_NON_MPG_CONFIG

Column Name	Datatype	Length	Precision	Scale	Null
BASKET_ID	varChar	20	0	0	Yes
PROD_ID	varChar	20	0	0	Yes
LINE_ITEM	varChar	100	0	0	Yes
LINE_ITEM_DESC	varChar	1000	0	0	Yes
LINE_ITEM_DTP	Decimal	9	18	0	Yes

USER_ADMIN_MASTER

Column Name	Datatype	Length	Precision	Scale	Null
SNO	varChar	50	0	0	No
EMP_NAME	varChar	75	0	0	Yes
EMP_MAIL	varChar	100	0	0	Yes
SUP_NAME	varChar	75	0	0	Yes
SUP_MAIL	varChar	100	0	0	Yes
REGION	varChar	20	0	0	Yes
LOCATION	varChar	50	0	0	Yes
DIVISION	varChar	35	0	0	Yes
ROLE	varChar	10	0	0	Yes
BLOCK	varChar	4	0	0	Yes

DAF_DSO

Column Name	Datatype	Length	Precision	Scale	Null
PAYMENT_TERMS	varChar	50	0	0	Yes
LOCATION	varChar	50	0	0	Yes
ROLE	varChar	50	0	0	Yes
LOVALUE	Real	4	24	0	Yes
TOVALUE	Real	4	24	0	Yes

SFA_TABLE

Column Name	Datatype	Length	Precision	Scale	Null
DAF_NUM	varChar	50	0	0	No
REGION	varChar	50	0	0	Yes
AREA_OFFICE	varChar	50	0	0	Yes
EMAIL	varChar	50	0	0	yes
ME_NAME	varChar	50	0	0	yes
OPPORTUNITYID	varChar	50	0	0	yes
ACCOUNTID	varChar	50	0	0	yes
SAM_AC	varChar	50	0	0	yes
VERTICAL	varChar	50	0	0	yes
DEALER_TYPE	varChar	50	0	0	yes
CH_PARTNER	varChar	50	0	0	yes
CUR	varChar	10	0	0	yes

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CUST	varChar	100	0	0	yes
TENDER	varChar	10	0	0	yes
LD	varChar	10	0	0	yes
EMD	varChar	10	0	0	yes
DEBTS	varChar	10	0	0	yes
NEW_CUST	varChar	50	0	0	yes
CUSTOMER_PROFILE	varChar	50	0	0	yes
NAME	varChar	50	0	0	yes
CMMAIL	varChar	50	0	0	yes
RAISED_DATE	datetime	8	0	0	yes
DAF_STATUS	varChar	50	0	0	yes

4.4 Flowchart

Architectural Design (HIPO CHART)

Architecture Document

In the design phase the architecture is established. This phase starts with the requirement document delivered by the requirement phase and maps the requirements into architecture. The architecture defines the components, their interfaces and behaviors. The deliverable design document is the architecture. The design document describes a plan to implement the requirements. This phase represents the ``how" phase. Details on computer programming languages and environments, machines, packages, application architecture, distributed architecture layering, memory size, platform, algorithms, data structures, global type definitions, interfaces, and many other engineering details are established.

Program design is an orderly methodical process often involving creative insight. It progresses through repeated partitioning of the model of the problem to be solved. It should stop when key abstractions are simple enough to require no further decomposition and can be composed from existing reusable software components. A good design adheres to the following principles:

Object interaction:

Minimize object interactions

Cleanly separate functionality: each module should perform one action or achieve a single goal.

Develop modular systems

Visibility: Minimize data and functional dependencies

The primary objective of architectural design is to develop a modular program Structure and represent the control relationships between modules. A Hipo Chart is implemented to show the **Data Flow Design**.

```
                    ┌─────────────────┐
                    │    SAP Dump     │
                    └─────────────────┘
                             │
                             ▼
              ┌──────────────────────────┐
              │  Uploading the SAP dump  │
              │  as per schedule         │
              └──────────────────────────┘
                             │
                             ▼
   ┌───────────────────────────────────────────────────────┐
   │ Users logging in to MyWipro→Sales Force Automation→E-DAF │
   └───────────────────────────────────────────────────────┘
                             │
                             ▼
              ┌──────────────────────────┐
              │    Raise the DAF and CAF  │
              └──────────────────────────┘
                             │
                             ▼
          ┌──────────────────────────────────────┐
          │  Pass over to the next official on approval │
          └──────────────────────────────────────┘
                             │
                             ▼
         ┌────────────────────────────────────────┐
         │  If approved generate SAP code using BAPI │
         └────────────────────────────────────────┘
                             │
                             ▼
              ┌──────────────────────────┐
              │     Update in the SAP     │
              └──────────────────────────┘
```

4.4 Process Design

ME's Enters Detail in SFA then Raise the DAF for the Oppurtunities Created for that Particular Account.

Based in the Inputs System will decide If Approval/deveations Required for Like A,B,C,D,E

Display the > 180 days debts details from RMS for this particular Account

As Per Previous Appproved Norms

Yes

Yes

Pre approved customer

No

No

(Commercial Terms & Price)
Goes for Level 1 Approval Follwing the Respective W/F as Given

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BH Contribution

ME's Log into CA and Raise the Same Incomplete DAF for their
Respective Opportunity and respective PM updates the cost &
contribution L1 Approval

ME1	→	X PM
ME2	→	Y PM
ME3	→	Z PM

RBH Limit → No → Within BH limit → Yes →

Respective BH takes Decision

→	X BH
→	Y BH
→	Y BH

FYI Mail sent to RBH

RBH Approve/Reject

Approved

No then Recommend

Within CE → Yes

President → Appro ve ? → Yes
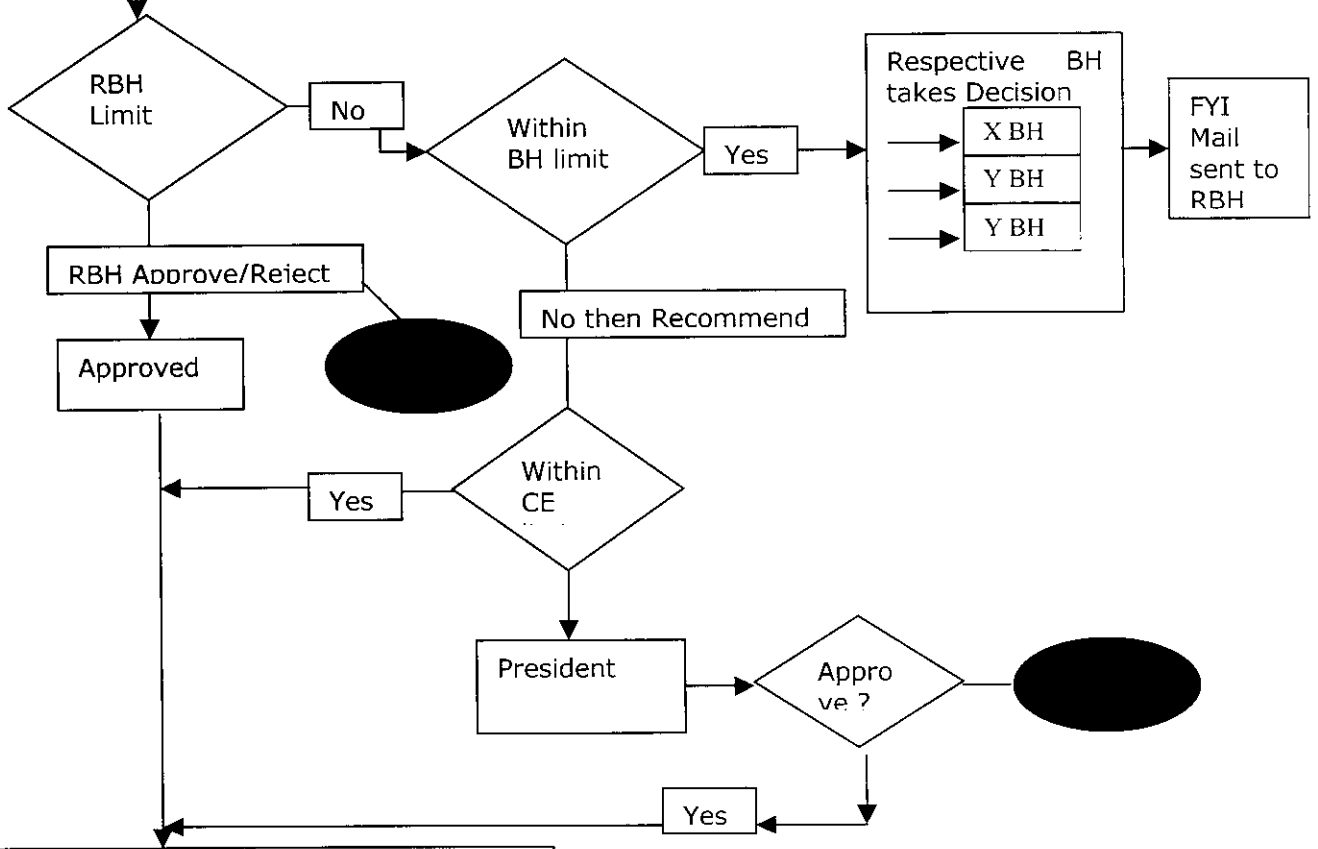
Respective PM updates the cost &
contribution L2 Approval

ME1	→	X PM
ME2	→	Y PM
ME3	→	Z PM

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Context Diagram

SAP Database

E-DAF Database

Customer Details

Contract Information

Retrieve Configuration

Product Details

E-DAF

Login Details

Customer

Approval Mail

Mail to the Next level

Employee
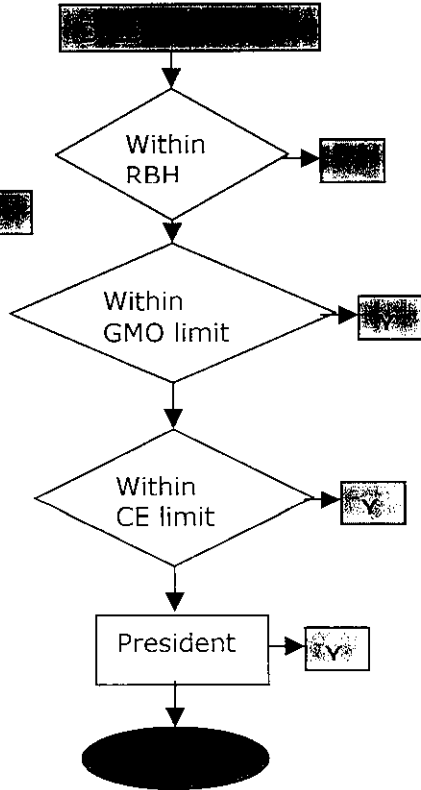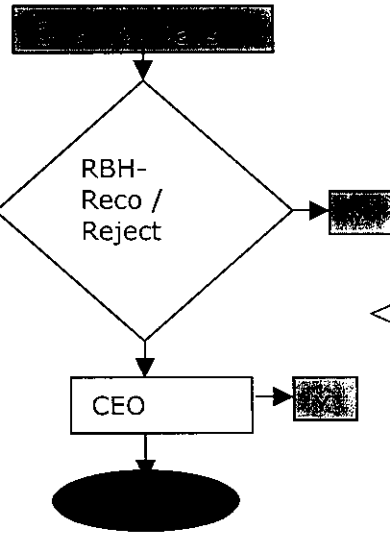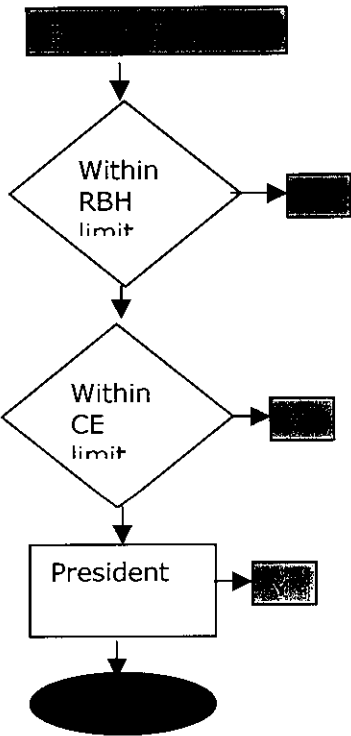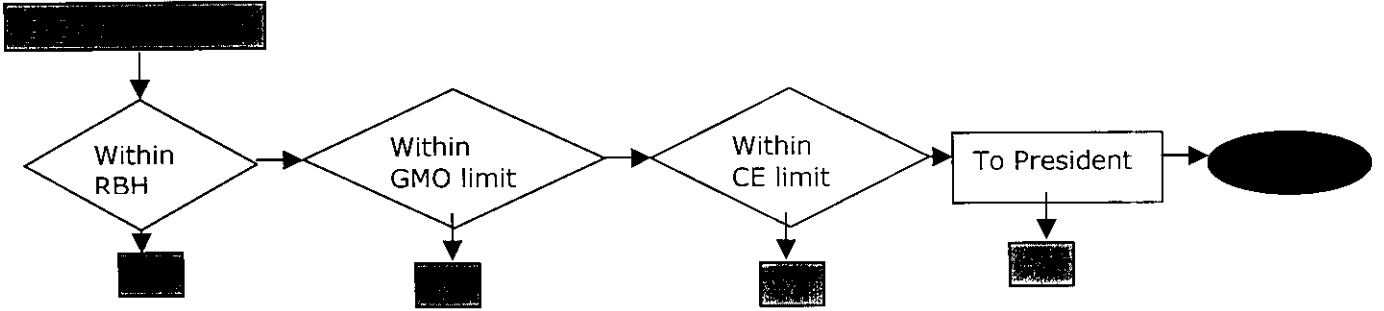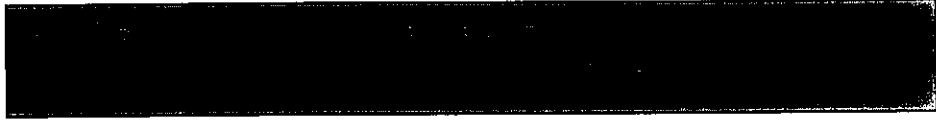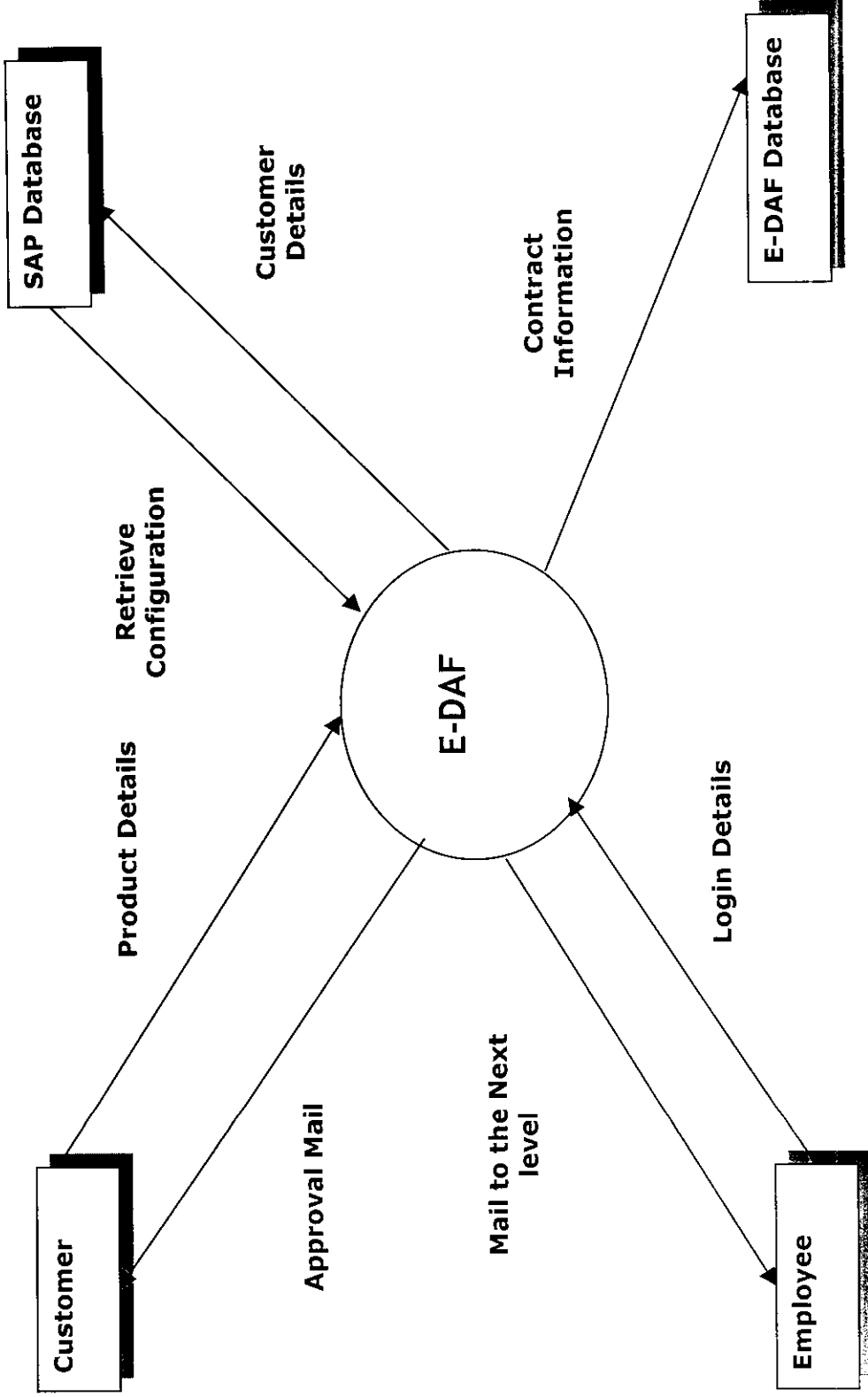
DFD Level-1

Customer Details

SAP Database

Customer Details

CAF

DAF

CAF Num

DAF Num

Customer Details

If Eligible

SFA

E-DAF

Approves or rejects and passes to next level

Customer Details

Opportunity ID

Checks details

Employee

Customer

Customer Details
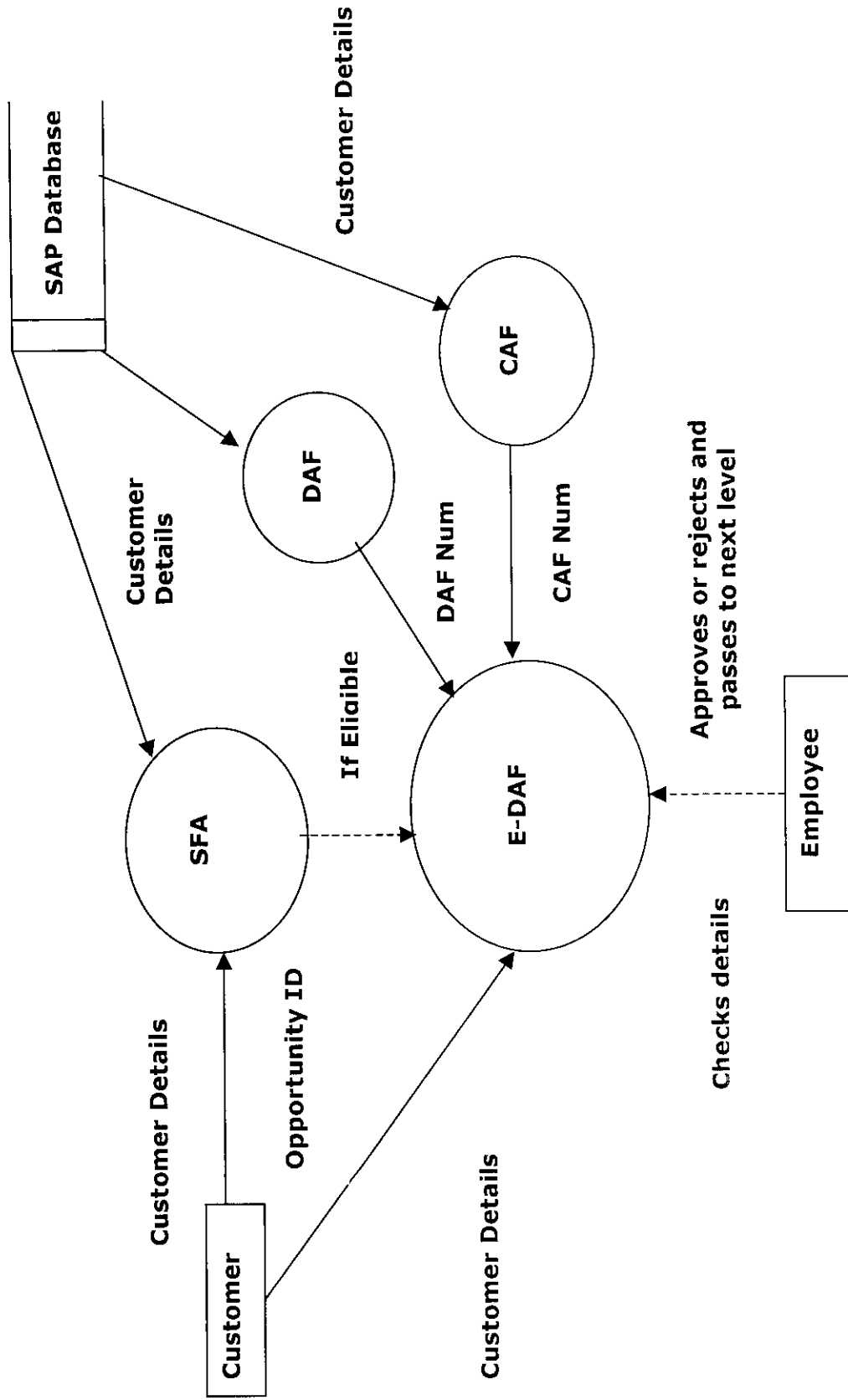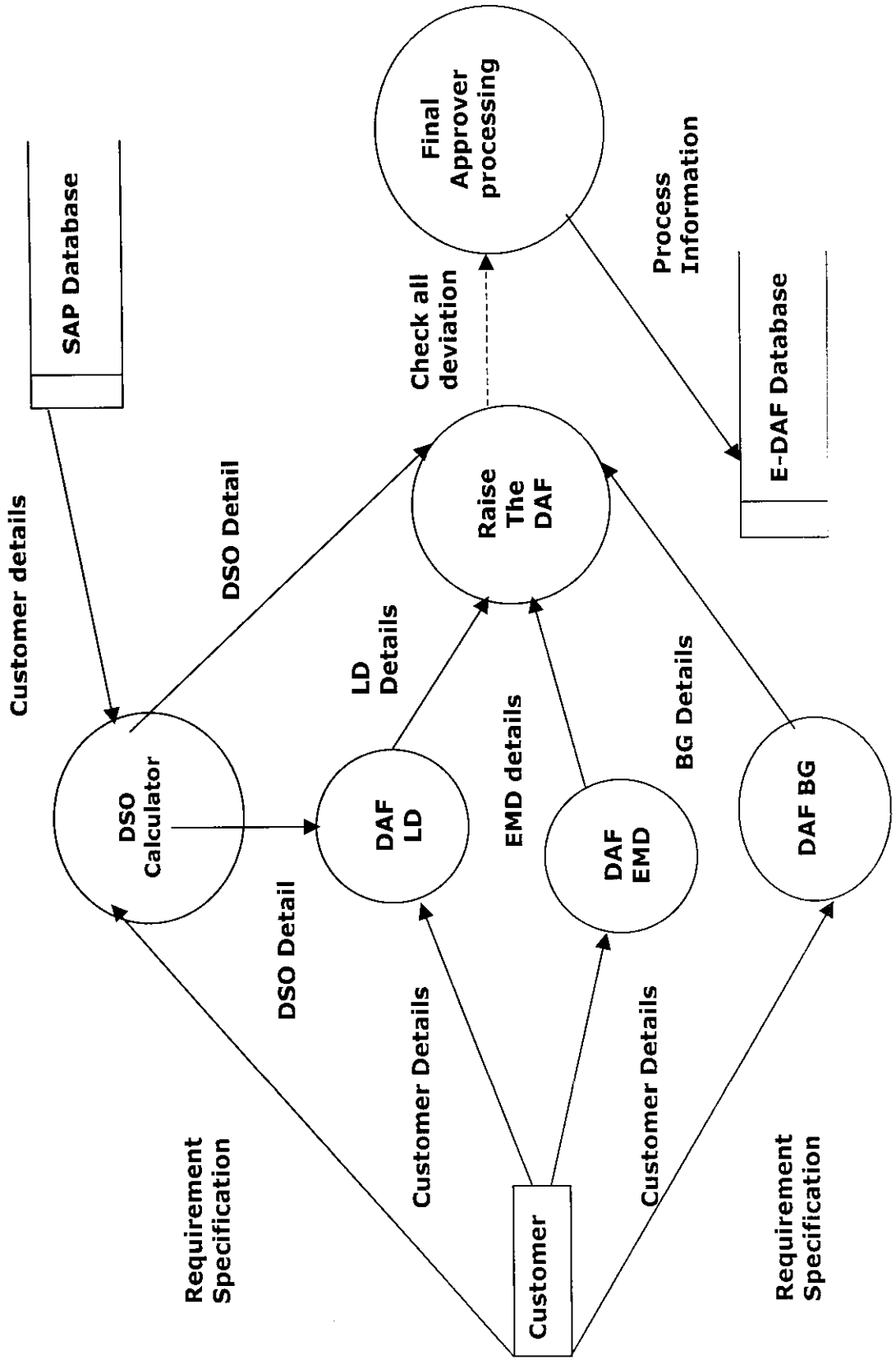
5 System implementation and Testing

5.1 System Implementation

The implementation stage is less creative than system design. It is primarily concerned with backing up the existing system (Data & program), data entry, producing user documentation, user training and site preparation or setup of the infrastructure for support of new system.

The implementation process begins with preparing a plan for N mplementation of the system. According to this plan, the activities are to be carried out, discussions made regarding the equipment and resources and the additional equipment has to be acquired to implement the new system.

Implementation is the final and important phase. The most critical stage is achieving a successful new system and in giving the users confidence that the new system will work and be effective. The system can be implemented only after thorough testing is done and if it is found to be working according to the specification.

This method also offers the greatest security since the old system can take over if the errors are found or inability to handle certain type of transactions while using the new system.

To implement the new system we must get the approval from the system manager. A training program should be conducted to familiarize the users with the system. When the implementation coordinator is satisfied, the approval is given to the new system.

The various activities that are involved in the conversation of the existing system to the computerized system come under implementation. The two activities that have been performed are the following:

Training of employees

Post Implementation review

Training of Personnel:

After the system is implemented successfully, training of the user is one of the most important subtasks for the developer.

For this purpose user manuals are prepared and handled over to the user to operate the developed system.

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Thus the users are trained to operate the developed system. Both the hardware and software securities are made to run the SIA system successfully in future.

In order to put this new application system into use, the following activities were taken care of:

✓ Preparation of user and system documentation.

✓ Conducting user training with demo and hands on.

✓ Test run for some period to ensure smooth switching over the system.

✓ The users are trained to use the newly developed functions. User manuals describing the procedures for using the functions listed on menu and circulated to all the users. It is confirmed that the system is implemented up to users need and expectations.

✓ An analysis of user training focuses on two factors:

✓ User capabilities.

✓ The nature of the system being installed.

The existing staff must be acquainted as well as trained in the operation of the system. There has not been much difficulty in making them understand the operation of the SIA system.

As a part of the 'Sales Incentive Automation System' the user is provided with a GUI.

The user manual is provided to the users regarding the usage of the component. Also it contains details regarding what each function do, how they are executed, and how diagnostic messages should be handled. The manual is well organized and indexed for quick implementation is concerned with detail.

Post Implementation Review:

Operational systems are quickly taken for granted. Every system requires periodic evaluation after implementation. A post-implementation review measures the system's performance against predefined requirements. A post-implementation review determines how well the system continues to meet the performance specifications. It also provides information to determine whether major redesign is necessary. A post-implementation review is an evaluation of a system in terms of the extent to which the system accomplishes stated objectives and actual project costs exceed initial estimates.

It is usually a review of major problems that need converting and those that surfaced during the implementation phase. The primary responsibility for initiating the review lies with the user organization, which assigns special staff for this purpose.

The review is also important to gather information for the maintenance of the system since no system is really ever complete, it will be maintained, as changes are required.

The key point is actual operation and user acceptance testing before the system is released to the user. User priorities, changes in organizational requirements, or environmental factors also call for system enhancements.

Implementation is the stage in the project where the theoretical design is turned into a working system and the users put confidence on the new system that it will work efficiently and effectively. It involves careful planning, investigation of the current system and its constraints on implementation, design of methods to achieve the change over, an evaluation of change over methods.

Part from planning, the major task of preparing the implementation is education and training of users. The more complex system being implemented, the more involved will be the system analysis and the design effort required just for implementation. An implementation coordinating committee based on policies of individual organization has been appointed.

Implementation is a process that includes all those activities that take place to convert from the old system to the new system. Implementation is the system development.

There are three types of implementation:

Implementation of a computer system to replace a manual system.

Implementation of a new computer system to replace an existing system.

Implementation of a modified application to replace an existing one, on the same computer.

Implementation of the 'E-DAF 'package comes under the third category.

At the end of the specific period the system performance, reliability is tested. When the two systems are found to be on the same lines, the newly developed system is made operational. This method has the advantages of less risk.

Implementation is the key stage in achieving a successful new system because usually it involves a lot of upheaval in the user department. It must therefore be carefully planned and controlled.

Implementing Client/ Server Architecture

A network architecture in which each computer or process on the network is either a client or a server. Servers are powerful computers or processes dedicated to managing disk

drives (file servers), printers (print servers), or network traffic (network servers). Clients are PCs or workstations on which users run applications. Clients rely on servers for resources, such as files, devices, and even processing power.

Client

The client is a part of client/server architecture. Typically, a client is an application that runs on a personal computer or workstation and relies on a server to perform some operations. For example, an e-mail client is an application that enables you to send and receive e-mail.

Server

A computer or device on a network that manages network resources. For example, a file server is a computer and storage device dedicated to storing files. Any user on the network can store files on the server. A print server is a computer that manages one or more printers, and a network server is a computer that manages network traffic. A database server is a computer system that processes database queries.

Servers are often dedicated, meaning that they perform no other tasks besides their server tasks. On multiprocessing operating systems, however, a single computer can execute several programs at once. A server in this case could refer to the program that is managing resources rather than the entire computer.

Coding

Coding starts immediately after design phase. Coding is the conversion of the abstract designs to clear cut programs, which confirm to the users specifications.

E-DAF SHORT REVIEW OF THE WORK FLOW BETWEEN THE USERS

✓ The customer first has to get an opportunity number. For this he has to log on to the SFA application. Here he gets an opportunity number.

✓ The DAF and CAF numbers are generated in the DAF and CAF modules respectively.

✓ The customer will be sent mails regarding all this.

✓ The different officials are selected on the application of various deviation norms.

✓ Based on the workflow, the mail is sent to the respective officials with the customer info.

✓ The ME starts from him the details go on to the CM, PM, RBH, GMO, BH, CEO and finally the president.

✓ The different officials apply their criterion and approve or reject the proposal.

Modules:

✓ Raise Daf

✓ Price Clearance

✓ Reraise Daf

✓ Pending Daf

✓ Search

✓ Report Generation

✓ Update Profile

Raise Daf:

Users: ME only.

Purpose: Get the opportunity number from the SFA for each customer, it be a unique number. For that number we raise the Daf, it is going for a new contract for that customer.

The different types of deviation used are:

BG – Bank Guarantee: Bank Guarantee can be given for installation, delivery and advance.

LD

EMD

CONT

DSO-Days sales outstanding. The values like advance, delivery, installation, acceptance, warranty will calculate the DSO.

Price Clearance:

In the price clearance, we divide those modules into three types. They are

Pending

User: Only ME

Purpose: In this all the DAF details which are pending with the login person are displayed.

From product link the user can enter the price request details. On submitting the

product will be removed from the pending list and will be entered into the basket.

Approved

User: Only ME

Purpose:

> In this all the DAF approved by the login person will be displayed. From the
> product link the user can see what all details entered while approving the DAF.

Rejected

User: Only ME

Purpose: Only ME's will get the list of rejected DAFs.

Reraise Daf

Users: ME only.

Purpose:

> All the rejected Dave's will be displayed and me can Reraise the DAF.ME can
> edit the details, which he entered previously.

Pending Daf

Users: All users.

Purpose:

> Here the pending lists of all Dave's under him are displayed. He can
> recommend, reject or ask for clarification.

Search Daf

Users: All users.

Purpose:

> Depending on the DAF no. And period within the DAF is raised; all the Daf
> details are displayed

Appendix Abbreviations

CM	-	Contract Manager
ME	-	Marketing Executive
PM	-	Product Manager
PEG	-	Product Engineering Group
RBH	-	Regional Business Head
BH	-	Business Head
GMO	-	General Manager For Operations
CE	-	Chief Executive
PR	-	President
LD	-	Liquidity Clause
BG	-	Bank Guarantee
DSO	-	Days Of Sale Order
SFA	-	Sales Force Automation
DAF	-	Deviation Approval Form
CAF	-	Contract Approval Form

DATA DICTIONARY

FIELD NAME	DESCRIPTION
DAF_NUM	DAF number
CAF_NUM	CAF number
OPP_NUM	Opportunity Number
SL_NO	Serial number
B_LINE	Business Line
DIV	Division
PRODUCT	Product name
EST_VALUE	Estimated Value7
APP_REQUIRED	Approval Required or not
ORDER_VALUE	Order value
ENTERED_DATE	Date of entry
ME_MAIL	Mail Id of ME
ME_NAME	Name of ME
STATUS	Status
PENDING	Pending with whom?
FREEZ	Whether to freeze or not?
OLD_CAF_NUM	Old Caf number
TEXT_FILE	Name of the file uploading
PM_TEXT_BOM	Comments of PM on BOM
ACC_ID	Account ID
ME_MAIL	Mail ID of ME
ME_NAME	Name of ME
DSO_DAYS	DSO days
FIFIELD NAME	**DISCRIPTION**
B_BG	Bank Guarantee
C_DEBTS	Debts

D_LD	LD value
E_CONT	Contribution
REGION	Region name
AREA_OFFICE	Area office
CONTRACT_BY	Contract name
CH_PART_NAME	Partner Name
CURR	Name of Currency
CUST_NAME	Customer name
Payment_Instrument	Name of payment instrument
OPP_description	Description of opportunity
EMP_NAME	Employee name
EMP_MAIL	Employee mail id
SUP_NAME	Supervisor name
SUP_MAIL	Supervisor mail id
REGION	Region
LOCATION	Location
B_LINE	Business Line
B_code	Business code
BH_MAIL	Mail id of BH
ADD_PM1	Address 1of PM
ADD_PM2	Address 2 of PM
ADD_PM3	Address 3 of PM
PAYMENT_TERM	Payment term
PROCESS_TIME	Process time
basket_id	Basket Id
me_code	ME code
me_name	ME name
account_name	Account name
location	Location
currency_type	Currency type
prod_category	Product category

exp_ord_date	Expiry order date
exp_deliv_date	Expiry delivery date
rfp_due_date	RFP due date
B_LINE	Business Line
Product	Product name
P_CODE	Product code
P_NO	Product number
PM_MAIL	PM mail id
BLOCK	Block
File_Name	Name of file

Design Overview

Pictorial representation with subsystems

Users   **Application**

ME/CM

PM

RBH

GMO   ⬌   **E-DAF**

BH

CEO

PR
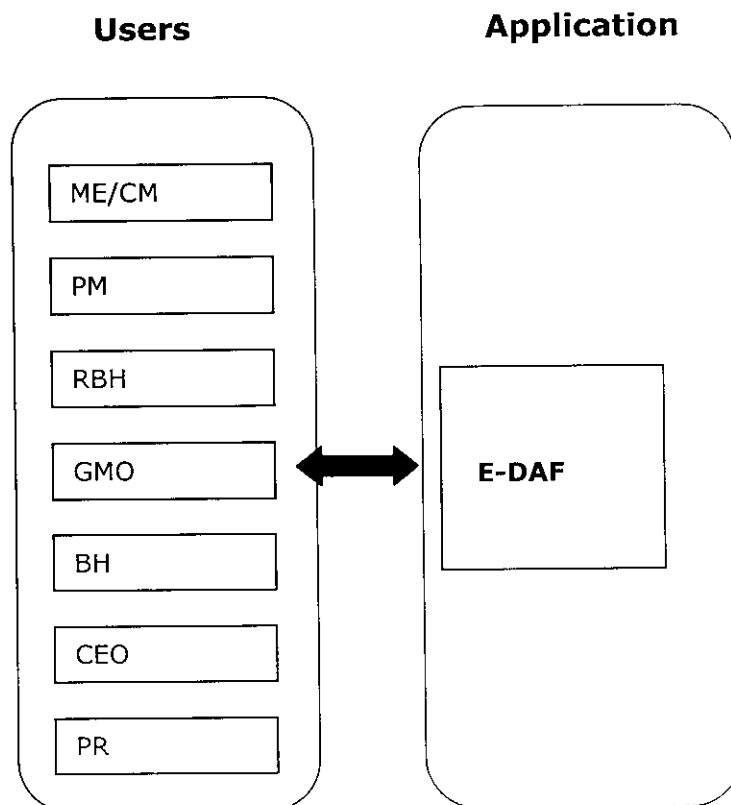
Description:

ORDER ACCEPTANCE AND PROCESSING GUIDELINES
OPERATING GUIDELINES

Objective

The overall objective of this note is to define the discount authorizations, acceptable payment terms, acceptance of EMD, BGs, LD clauses and the process of deviations approvals, if any.

Contents

This note consists on the following sub-notes:

- ✓ Price Guidelines Release Process
- ✓ Discount Authorization Guidelines
- ✓ Payment Terms Guidelines
- ✓ Guidelines for issue of EMDs and BGs
- ✓ Guidelines for acceptance of Liquidated Damages clauses

Applicability

This note is applicable for all sales made from the products group, which includes PC Range including Wipro PC, Servers, Little Genius, MS, MNC PC and servers, Peripherals and Upgrades and EPD Range including Platform, Networking, Call Center, Storage and ESG. It is also applicable for all sales whether direct or channel.

Involvement of Business Finance

For all orders beyond 10M in PCB and 20M in EPD, respective Business Finance Team has to be necessarily involved and will be a part of deviation approval process irrespective of the deal terms and deviations. For all orders beyond 20M and 50M in PCB and EPD respectively, even CFO of TPD will be involved. For all orders less than these values, regional finance managers will play the role of Business Finance. For this purpose, contract approval process, CAF and DAF processes will be amended to take care of this requirement.

Process Owners

The responsibility for execution of this note is with the Regional Business Heads supported by Respective Operations Managers at Regions.

At head office, the responsibility for setting up of process for the clearances of orders per authority levels and deviations is with Operations Head and Chief Executive of TPD.

The responsibility for updating this document with the change in businesses is with the CFO and Chief Executive of TPD.

PRICING GUIDELINES RELEASE PROCESS

OBJECTIVE

To set process for MPG / multiplier / floor rates based on different skill sets releases (All together hereinafter called the "**Pricing Guidelines**")

To set process for tracking contributions achieved vis a vis the desired contribution as per "Pricing Guidelines"

To communicate discount authorization guidelines at the time of price clearances

PRICING GUIDELINES

The intent of any Pricing Guideline is to release the prices based on plan contribution. The periodicity for release of MPG will be based on market requirements and competition information.

PROCESS FOR MPG RELEASE

The Product Manager in consultation with Business Finance makes MPG.

PM also makes the summary sheet separately for all Guidelines and Businesses as per following format:

SUMMARY SHEET

Date	
Pricing Guidelines to be released on	
Total number of units expected to be sold (for products) or Total number of contracts expected (for services)	
Total sale value expected	
Contribution percentage	
Total contribution value	

The above summary sheet has to be signed off by the BH (Business Head) and BFH. Contribution in the Pricing Guidelines has to be on or above plan percentage. In case of any Pricing Guidelines below plan contribution, the same have to be cleared by CFO with CE of TPD before release of MPG.

Price multipliers (for traded items)

The multiplier can be released by the PM after following the below process:

Takes input for forex rate and any change in sales tax / other duties from BF.

Make draft multiplier and discusses the same with BF. Final multiplier is released after joint discussion and sign off.

Summary sheet as per above format should be signed off between PM and BF.

Forced Change in Pricing Guidelines

In case of the increase in costs during any period, which makes the current MPG contribution go below plan level, BF will lead the updating in Pricing Guidelines within a period of maximum of one week from such increase in costs.

OVERALL AUTHOIRTY LIMITS

Regional Business Head, and Business Head of PCB and EPD will have authority to clear all orders up to value as given in table below without any escalations provided the deviation is within authority levels of CE. In these cases, CE will be approving authority, where approval beyond CE is required.

For the limits against CE, CE will have authority to clear the orders without further escalations.

RBH	0.5M
BH	5.0M
CE	20.0M

This blanket approval process is to enable faster decisions and is subject to meeting monthly plan contribution for the regions and the businesses. No authority comes without accountability. The results will be reviewed periodically and the authority can be withdrawn if continuously 2 months in a row, overall

Plan contribution % is not met for respective region-business and business for RBH and BH respectively.

DISCOUNT AUTHORIZATION GUIDELINES (DAG)

This DAG sets out the escalation process for approving contributions. The empowerment guidelines for authorizing discounts are as given herein below:

> For all orders above CEs limits, the following table will be used to determine the approving authority.

> In case of order with multiple products, it is mandatory to get the required %age of contribution in each product group separately as well as to achieve the weighted average of the required contributions for the total order.

> Irrespective of the final approving authority, deviation approval request have to move thru the defined process. In no case, approving authority can approve deviations unless the same has come to him thru recommendations of respective people in the process.

PAYMENT TERMS GUIDELINES

OBJECTIVE

> Re-articulate guidelines for payment terms

> Re-articulate process for approvals of deviations if any

It is critical for us to track the payment terms for every order before we can accept / reject the order. Currently the awareness of the criticality of payment terms to determining contribution is not high. It is extremely critical to track the payment terms to enable faster collection cycle and ensure that we are not burdened with debts.

As compared to earlier guidelines, we are shifting to DSO approach than payment terms approach. We feel that payment terms guidelines has outlived their life and now have become too complicated to approve and also not been able to sensitize field. The DSO guidelines are set herein below. The guidelines are determined based on industry segments and also considering the past track record of our experience.

This table is applicable to:

> For all direct deals where billing is made directly to end customer (Direct business)

> Direct project cases in case of channel business (Channel Project business)

SEGMENT	No Approval Reqd	RBH	GMO	CE	President
Govt / PSU / Nationalised Banks	45 Days	60 Days	90 Days	180 Days	> 180 Days
Corporates / Private / MNC Banks					
Single Location	15 Days	30 Days	60 Days	120 Days	> 120 Days
Multi Location	30 Days	45 Days	90 Days	120 Days	> 120 Days
Non-Corporates					
Single Location	15 Days	30 Days	45 Days	90 Days	> 90 Days
Multi Location	30 Days	45 Days	60 Days	120 Days	> 120 Days
ISP/IDC/Dot.com's	0 Days	15 Days	30 Days	60 Days	> 60 Days
Orders where finance required	Only with back to back commitment from bankers / financiers. Business Finance confirmation is must for such confirmation from financiers.				

Payment thru secured instruments

In case of payment thru secured means, such as Letter of Credit, co-accepted Hundi, back to back financing etc., RBH can approve any DSO provided the same can be discounted with bankers and cost of discounting has been factored into the contribution calculations.

Creditworthiness of Customers

All these approvals are assuming the basic customer creditworthiness check to be done by regions esc for new customers. In case, RBHs are not comfortable with the customer, they should put controls in place for rejecting orders even if it is within acceptable norms.

Deviation Approval

DAF program is being modified to calculate the computed DSO based on payment terms and norms with existing level of efficiencies. Once the payment terms are captured, DAF system will calculate expected DSO and based on that, approving authority will be determined.

Payment Terms for Channel where billing made to the Channel / Channel Customer:

Refer to Channel Policy issued in July 2003.

There have been huge # of requests for accepting direct billing to partners and treating them as Project Orders. Just to reiterate the policy, no order will qualify as project order unless customer has agreed to accept billing from partner but agreed to pay to Wipro directly in writing. In all other cases, it will be treated as channel order and credit period will be applicable as per the category of partner.

Any partner who has not signed for channel financing program will be only on cash and carry and only CFO of TPD can approve the exceptions after recommendation from National

Channel Manager. Cash and Carry signifies the collection of cheque along with the order and to be deposited before the billing is done to partner.

   ✓ For any request in the change of limits for the partners, formal request should be made to Business Finance team with required documents, which will be subject to bankers' approval. National Channel Manager can approve any deviation to the extent of 10% of the limit approved by bankers subject to maximum of Rs. 1.0M per partner.

   ✓ In case of project orders, partner will have to provide the seed funding as provided in channel policy. At present, the seed funding required is 25%. RBH can approve deviation in the same to the extent of 10%. Only BH can approve any seed funding for less than 10%.

Operating Notes:

Where computed DSO is expected to be higher than normal norms, submission of quote is not allowed unless necessary approvals are taken note prior to submission of quote. All terms of acceptance including detailed description of acceptance tests should be signed off between the client and Wipro. (Responsibility: ME/Account Manager)

Any part delivery / installations will be carried out with specific policy released by Operation team in this regard.

The approved payment terms along with definitions as below should form a part of every final quote when submitted by Wipro.

Definitions:

Advance:

Any cheque physically received by accounts either along with the order or within seven days from the date of order. Receiving Post Dated cheques will not be construed as having received advance. All the commitments including start of Liquidated Damages should start from the date of receipt of advance and not from the date of receipt of the Purchase Order.

No billing will be done where advance is to be collected, without collecting advance. For any exceptions, following limits will apply:

Billing with non-collection of advance amounts up to Rs. 100K : GMO

Billing with non-collection of advance amounts > 100K   : CE

Delivery:

In all cases where delivery has not been effected due to reasons not attributable to default by Wipro (such as site not ready / AC's not installed etc.) the delivery will be deemed to have been effected to the client on the date of intimation to the client of our readiness to deliver, and full payment due against delivery will be made by the client to Wipro as on the date of such intimation.

ICA Clearance Process: Currently we have ICA clearance process in system, whereby delivery money has to be collected before start of the installation. With the objective of cutting down cycle times, which will help in betterment of DSO as well as revenue recognition under US GAAP, the process is being relaxed. *For orders where delivery money involved is less than 1M and any portion of money is linked to installation and acceptance, there will not be any requirement of ICA henceforth.* For all other cases, ICA is strictly required and only approving authority to clear installation without collection of delivery money will be with the Chief Executive only.

Signed Delivery Chelan's:

ME/Account Manager to clarify that any acknowledgment by customer will be deemed proof of delivery unless specified by them as to an individual.

Installation:

Signed Product Installation Reports as per our format.

ISSUE OF BANK GUARANTEES AND EMDs

Coverage

This note covers all Bank Guarantees and Earnest Money Deposits (EMDs) issued for the purpose of either:

1. Performance
2. Tender Submission
3. Collection of money

Avoidance of Bank Guarantees and EMDs

The efforts should be made to minimize the issue of BGs and EMDs. Wherever possible, instead of BG, Corporate Guarantee should be offered. In view of Wipro's corporate standing in the market place, it should not be a difficult task to covert BG to Corporate Guarantee.

Issue of BGs and EMDs

In cases where it is not possible to avoid BGs and EMDs due to the nature of the tender process or customer profile, the following limits will apply for authorizing such an issue:

BGs (non fund based)

	BGs
Empowerment for RBH	Up to 20% of order value
Empowerment for BH	Up to 50% of order value
Empowerment for CE	> 50% of order value

MDs (Fund based)

(Amount in Rs.)

	New Customers
Empowerment for RBH	Up to 50K
Empowerment for BH	Up to 500K
Empowerment for CE	> 500K

ACCEPTANCE OF LIQUIDATED DAMAGES / PENALTIES CLAUSE

Coverage

With the LD exposure increasing everyday due to tighter customer demands, we have decided to include this also in this policy. This note covers the various aspects of the Liquidated Damages (LD) clause being accepted as a part of the order. This includes delivery lead times, LD per week, maximum cap on LD %age etc.

Authority Limits

The following will be the authority for approving the various clauses relating to LD:

Delivery lead times

- ✓ Delivery lead times are within norms circulated by products / operations team: No approval required
- ✓ Delivery lead times are not within norms circulated by products / operations team, but there is written back to back commitment from principal: GMO
- ✓ Delivery lead times are not within norms circulated by products / operations team and there is no written back to back commitment from principal: CEPer week LD
- ✓ Up to 0.5% of the undelivered order value per week: RBH
- ✓ >0.5% of the undelivered order value per week: GMO
- ✓ Any amount of LD, if applicable on the total order value instead of only undelivered portion: CE

Maximum Cap on LD

- ✓ Up to 5% of the undelivered order value per week: RBH
- ✓ >5% of the undelivered order value per week: GMO
- ✓ Any amount of cap on LD, if applicable on the total order value instead of only undelivered portion: CE

If LD rate is not mentioned per week, the conversion to be done from the given parameter to per week rate for approval purposes

DEVIATION APPROVAL PROCESS

All contributions, payment terms, EMD and BG requirements and LD clauses, which are not as per the guidelines set above, should follow the defined process as per the DAF workflow on MyWipro. Till current DAF program is not changed to capture the changes above like DSO capturing and LD, manual approvals should be taken and implementation to be ensured by order processing teams.

5.2   System Testing

Testing Objectives

Testing Objectives can be broadly framed as follows…

✓ Testing is a process of executing a program with the intent of finding an error.

✓ A good test case is not that has a high probability is finding as-yet undiscovered error.

✓ A successful test is one that uncovers an as-yet-undiscovered error.

The above objectives imply a dramatic change in viewpoint. They move counter to the commonly held view that a successful test is one in which no errors are found. Our objective is to design tests that systematically uncover different classes of errors and do so with minimum amount of time and effort.

If testing is conducted successfully (according to the objectives stated above), it will uncover errors in the software. As secondary benefit, testing demonstrates that software functions appear to be working according to specifications and that performance requirements appear to have been met. In addition, data collected as testing is conducted provides a good indication of software reliability and some indication of software quality as a whole. But there is one thing that testing cannot do:

Testing cannot show the absence of defects, it can only show that software errors are present

Note: It is important to keep this statement in mind while testing is being conducted.

Test Case Design

Over the past two decades a rich variety of test case design methods have evolved for software. These methods provide the developer with a systematic approach to testing. More important, methods provide a mechanism that can help to ensure the completeness of tests and provide the highest likelihood for uncovering error in software.

This is a process of finding errors. It leads to the ultimate review of specifications, design and coding. The testing phase guarantees that all elements of an application work together properly, function as expected & meet performance criteria.

Unit Testing

Six rules for unit testing

✓ Write the test first.

✓ Never write a test that succeeds first time.

✓ Start with null cases, or something that doesn't work.

✓ Don't be afraid of doing something trivial to make the test work.

✓ Loose coupling and testability go hand in hand.

✓ Use Mock objects.

Unit Test Cases:

Unit Name: Raise DAF

Sl. No	Test Case	Expected Output	Result Pass/Fail
M1.1	The user enters the name and Email id on the login screen.	The E-DAF Module page will be displayed	P
M1.2	Click on the Raise DAF Menu	The Raise DAF screen should be displayed	P
M1.3	Click on the Opportunity Number to raise DAF	The Deviation approval Form Will be displayed	P
M1.4	The mandatory fields (Payment Instrument, BG Required, Debts > than 180 days, LD Clause Present, Order Expected Date, Current Proposed Date, Break of the payment) user will press the Continue button.	The system prompts the applicant to enter the necessary details	P
M1.5.	If the Total in Payment Breakup is less then 100	The system prompts the applicant to make the total 100.	P

M1.6.	After entering payment Breakup details	The DSO should be calculated.	P
M1.7.	If BG is Required	Then BG detail page should be displayed	P
M1.8.	After submitting the DSO details the ME remark page should be displayed.	The system prompts the user to enter the justification.	P
M1.9	End of the submitting justification	The system will display the DAF No for Particular opportunity.	P

Unit Name: Price clearance

Sl.No	Test Case	Expected Result	Status (P/F)
M2.1.	User clicks the "Price Clearance" for Pending, Approved, Rejected link of the Applicant menu.	The user is shown "Price Request" Page of the Applicant. This page contains the list of DAF pending for Price clearance.	P
M2.2.	User clicks "Product"	Place a Price Request page will be displayed.	P
M2.3.	User has to add product.	The system prompts the user to enter the BOM Details.	P

			P
4.	After submitting Price Request detail it will ask for competitor details.	The system prompts the user to enter the Competitor Detail.	
5	Use Press Submit	The work flow for particular DAF should be generated	P

Unit Name: Reraise DAF

Sly No	Test Case	Expected Result	Status P/F
M3.1	The user clicks on the "Reraise DAF" menu	The user is displayed the page which gives him the details about the List of Rejected DAF.	P
M3.2.	User clicks "Product"	Place a Price Request page will be displayed.	P
M33.	Users have to add product.	The system prompts the user to enter the BOM Details.	P
M3.4.	After submitting Price Request detail it will ask for competitor details.	The system prompts the user to enter the Competitor Detail.	P
M3.5	Use Press Submit	The work flow for particular DAF should be generated	P

Maintenance

Maintenance phase focuses on change that is associated with error correction, adoptions required as the software's environment evolves and changes due to enhancements brought about by changing customer requirements. Software will undoubtedly undergo change after it is delivered to the customer. Change will occur because errors have been encountered, because the software must be adopted to accommodate changes in its external environment, or because the customer requires functional or performance enhancements. Software maintenance reapplies each of the preceding phases to an existing program rather than a new one.

- ✓ Corrective maintenance
- ✓ Adaptive maintenance
- ✓ Perfective maintenance
- ✓ Preventive maintenance

Corrective Maintenance

Even with the best quality assurance activities, it is likely that the customer will uncover defects in the software. Corrective maintenance changes the software to correct the defects.

After the customer uses the system, he can detect the errors in this system. These changes can be easily accommodated in the system because it is well developed.

Adaptive Maintenance

Over time, the original environment for which the software was developed is likely to change. Adaptive maintenance results in modification to the software to accommodate changes to its external environment. As the external environments are changed in the future, these changes also can be accommodated. This system can run under any platform. The changes in the rules of the organization can also be easily accommodated.

Perfective Maintenance

As software is used, the customer or user will recognize additional functions that will provide benefit. Perfective maintenance extends the software beyond its original functional requirements. The required additional functions are also easily added to the system. These additional functions enhance system functionality and the system becomes user friendlier.

Preventive Maintenance

Computer software deteriorates due to change and because of this preventive maintenance, often called software re-engineering, must be conducted to enable the software to serve the needs of its end users. In essence, preventive maintenance makes changes to computer programs so that they can be more easily corrected, adapted and enhanced. As changes are made, it is likely that some new defects will be introduced, causing the failure. Before the failure is

corrected, another change is requested, causing another failure. Slowly, the minimum failure rate begins to rise and the software is deteriorating due to change. Every software failure indicates an error in design or in the process through which the design was translated in to machine executable code. Therefore, software maintenance involves more complexity than hardware maintenance.

6.0 Conclusion

The project was successfully designed and developed as per the user requirements and specifications. The system was thoroughly tested with extensive set of data and found to work correctly. Project security is maintained and several validations and checks have been performed during data entry and retrieval. It also provides a user-friendly environment and reduces user difficulties.

Finally I would like to thank all those who were behind the successful completion of the project.

7.0 Scope for future development

The application meets the requirements comprehensively but there is always a room for progress in the future. The E-DAF project can further be improved by the following up gradation.

- ✓ Here we have done this project for five regions namely East, West, North, South1, South2 and have plans to do for other regions also.
- ✓ Remote Scripting may be used in many other parts of the code to avoid reloading of pages.
- ✓ Based on the requirements some other modules may also be integrated.

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9.0 Appendix

9.1 Sample screens
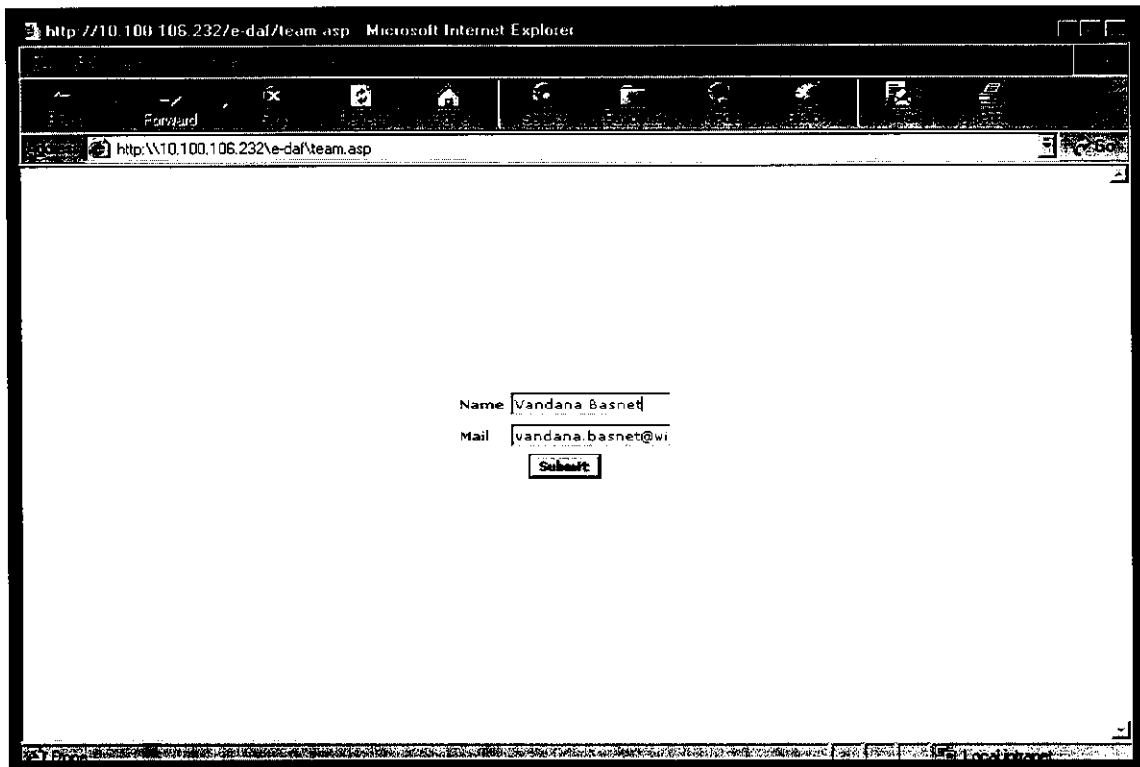
Mywipro login path:

The path for E-DAF module is shown in screen shot below. The user gets the opportunity number from the SFA module. The product details are also provided there.

Login Page:

The user finds an entry screen with name and email .The user details are verified in the master tables and if valid precedes with the main module else the new user details are updated.

E-DAF Main Menu (HOME Page):

This page shows the menus with their submenus, the user can make his choice and select any of the options. Proper validations and displays are provided if the option is not available to that particular user. Each linking page description is also provided in this documentation
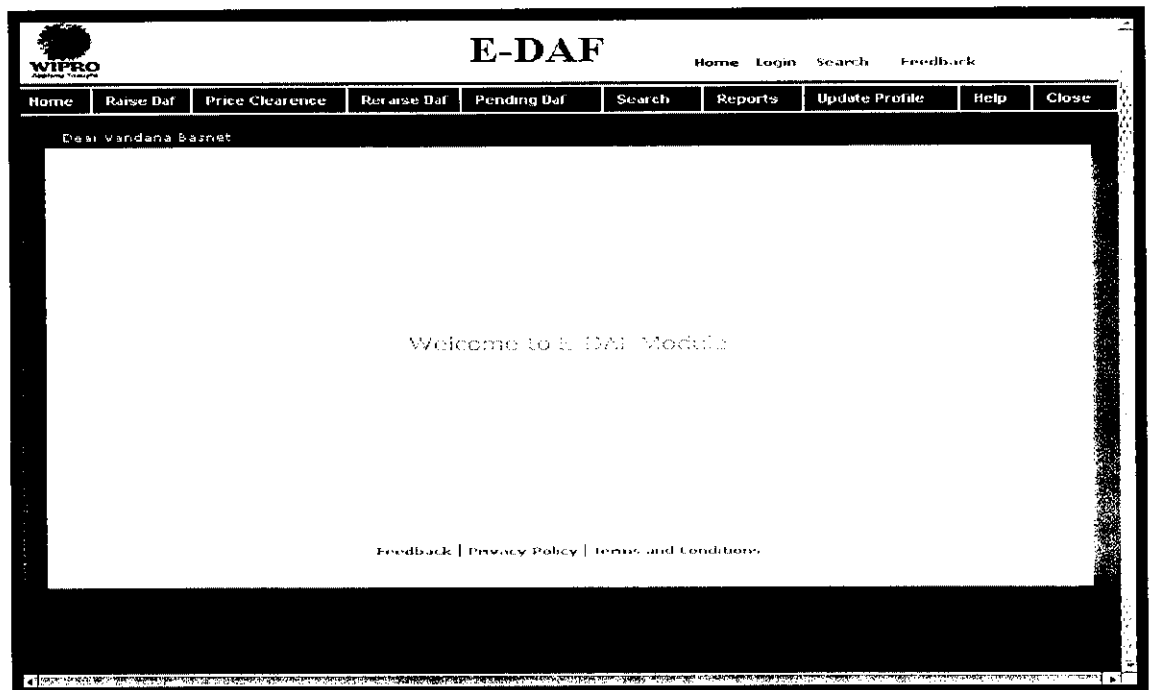
Raise DAF:

On click of the Raise DAF option in the menu of the main module page the ME gets a list of all the Opportunity number's he has under him with some description. He can choose the particular opportunity number for which he wants to raise the DAF. The page is displayed as shown below.

	E-DAF		Home Login Search Feedback	

Home	Raise Daf	Price Clearence	Reraise Daf	Pending Daf	Search	Reports	Update Profile	Help	Close

Raise DAF

Kindly Click on the Opportunity to which you want to Raise the DAF

Opportunity ID	Description	Tender/Non-Tender	Opportunity Raise Date	Customer Name
06UJ9A000NGG	Servers and Desktops	Non-Tender	7/6/2004 10:47:10 AM	poovayya & Co
06UJ9A000N7N	Enterprise Agreement	Non-Tender	6/28/2004 3:24:39 PM	Mindtree Consulting Pvt.
06UJ9A000MDK	Desktops	Non-Tender	6/3/2004 9:12:07 AM	Socrates Software India Pvt. Ltd
06UJ9A000LVY	Itanium Servers	Non-Tender	5/17/2004 6:00:57 PM	Adaptech (India) Pvt ltd
06UJ9A000LO1	Exchange Licenses	Non-Tender	5/10/2004 5:37:33 PM	Celstream Technologies Pvt. Ltd.
06UJ9A000LIP	Microsoft Licenses	Non-Tender	5/4/2004 6:26:46 PM	IBM GS
06UJ9A000LIO	Custom Built Wokstations	Non-Tender	5/4/2004 6:22:58 PM	GE Medical systems
06UJ9A000LHC	Desktops and Notebooks	Non-Tender	5/3/2004 3:01:52 PM	Wipro ePeripherals
06UJ9A000LDL	Microsoft Licenses	Non-Tender	4/28/2004 6:10:46 PM	Metlife India Insurance Company Private Limited
06UJ9A000KKQ	CRMTEST	Non-Tender	3/19/2004	k
06UJ9A000JF9	test	Non-Tender	2/5/2004 11:36:52 AM	24/7 Customer. Com
06UJ9A000IID	Microsoft Licenses	Non-Tender	1/8/2004 10:27:58 AM	ITC Infotech
06UJ9A000IG7	Hardware for RTGS	Tender	1/6/2004 4:37:25 PM	Syndicate Bank
06UJ9A000IA4	EA True Up	Non-Tender	12/31/2003 10:05:31 AM	GE Power Controls
06UJ9A000IA2	MS- Select	Non-Tender	12/31/2003 9:37:47 AM	AXA Business Services Pvt Ltd
06UJ9A000I46	EA True up- Final	Non-Tender	12/24/2003 12:51:00 PM	GE Medical systems
06UJ9A000HQR	hardware of DPOperations	Tender	12/11/2003 2:42:41 PM	Canara Bank

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Raise DAF details:

This page presents the user with all the details of the DAF.it also asks the user for the various deviation terms he requires like BG, LD, EMD etc. This page also asks for the DSO details. The product lines will be displayed and the ME has the rights to assign some other ME for proceeding with the details.

Raise DAF details: (Continue...)

Forward   ×

http://10.100.106.232/e-daf/RAISE_DAF1.asp

DSO Calculator

Sl no.	Payment Term	Please enter break up of payment terms %	Credit Period Days
01	Advance	40	
02	Delivery	40	0
03	Installation	20	0
04	Acceptance	0	0
05	Warranty	0	0
	Total :	100	
06	SI/Project	NA	
07	SNR Clause	NA	
08	Multi Location (non RO/AO)	NA	
09	NE / J & K	NA	
10	Redistribution required	NA	
11	Partpayment in case of SNR	NA	
12	Redistribution clause present	NA	
13	Non Tender	NA	

DSO   37

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Deviation details input page:

Based on the user input this page shows the various deviation terms. For example if he had selected Yes for BG then the BG details will presented. He would have to make his choice, enter his percentage, issuing authority etc. If the user forgets any details the validations are provided to prompt him. The ME should also rovide the Justification.

This page is one of the most important pages of the module. All the deviation limits are applied in this page. The mail is also sent to the ME's to complete the incomplete DAF. The following points explain the operations done on this page.

NOTE: The annexure document Order Processing Guidelines can be referred to, for getting the statistical data. The table structures if needed can also be referred (Database Structure)

Price request:

This page shows the incomplete DAFs for which the price request has to be put forth.This page directs the ME to put up his price request and this is based on the product. If the product is EPD then the ME may upload the BOM file during the price request. If PC he will provide different types of products like MPG or NON MPG or others. If the product line is services or solutions then the ES-CAF module is linked to. The pending details are shown in the INC_DAF page and the ones approved by the PM are shown in the INC_DAF1 page. The approval required option is also provided for user convenience.

CAF Details Page:

The expected contribution, due date, EUP, Quantity etc are provided by the user for the products he had selected. The competition details are also provided. These details are updated in the respective tables. On submit if all the CAF's are cleared the mail is sent to the next level.

Pending DAF Report:

This report shows the details of those DAF, which are pending.

Sl no	DAF No	ME/RM Name	Opportunity No			Tender/T Tende
1	E-P-5.0	Sangeeta Roy	O6UJ9A000H5C	Punjab & Sind Bank		Non-Ten
2	E-P-9.0	Mridul Dutta	O6UJ9A000HHF	Indian Oil Corporation Limited, Assam Oil Division		Tender
3	E-E-12.0	Tulsyan Satyam	O6UJ9A000FIP	Oil & Natural Gas Commiss		Tender
4	E-E-2.0	Jayant	O6UJ9A000824	Geological survey of India		Non-Ten
5	E-E-4.0	Tulsyan Satyam	O6UJ9A000H5S	IBP Co. Limited		Tender
6	E-P-6.0	Mridul Dutta	O6UJ9A000HCL	Sales Tax Department , Govt. of Meghalay		Tender
7	E-P-10.0	Mridul Dutta	O6UJ9A000HHG	Indian Oil Corporation Limited, Assam Oil Division		Tender
8	E-P-14.0	Mridul Dutta	O6UJ9A000CZL	N F Rly, Maligaon, Guwahati		Tender
9	E-P-16.0	Sohel Rahman	O6UJ9A000HJQ	Computer Maintenance Company Ltd		Non-Ten
10	E-P-17.0	Sohel Rahman	O6UJ9A000HKH	Computer Maintenance Company Ltd		Non-Ten
11	E--18.0	Ajay Agarwal	O6UJ9A000HJ8	Jharkhand State Polution Control Board		Tender
12	E--19.0	Ajay Agarwal	O6UJ9A000HKG	BSNL, Durg		Tender
13	E-P-33.0	Pradeep Bhattacharya	O6UJ9A000HQI	United Bank Of India		Non-Ten
14	E-P-21.0	Sohel Rahman	O6UJ9A000HLL	Computer Maintenance Company Ltd		Non-Ten
15	E-P-23.0	Sangeeta Roy	O6UJ9A000HN2	Wizer Technologies		Non-Ten
16	E-P-24.0	Pradeep Bhattacharya	O6UJ9A000HNI	State Bank Of India		Tender

Cleared DAF Report:

This report shows the details of those DAF, which are cleared.

SI no	DAF No	ME/RM Name	Opportunity No	
1	E-E-7.0	Tulsyan Satyam	O6UJ9A000HHC	IIT-Kharagpur
2	E-E-11.0	Tulsyan Satyam	O6UJ9A000HIQ	Paradeep Phosphates Ltd
3	E-P-28.0	Sangeeta Roy	O6UJ9A000HPW	Digital Matrix
4	E-P-30.0	Birendra Kumar	O6UJ9A000HQ1	NALCO CPP
5	E-P-32.0	Sohel Rahman	O6UJ9A000HJT	Computer Maintenance Company Ltd
6	E-P-20.0	Sohel Rahman	O6UJ9A000HLB	NISC
7	E-P-63.0	Sangeeta Roy	O6UJ9A000I3U	Digital Matrix
8	E-P-37.0	Sohel Rahman	O6UJ9A000GS6	ACE Mrketing
9	E-E-34.0	Tulsyan Satyam	O6UJ9A000GTL	Oil India Ltd
10	E-E-35.0	Tulsyan Satyam	O6UJ9A000FIW	CESC Ltd.
11	E-P-22.0	Pradeep Bhattacharya	O6UJ9A000HLX	IIT-Kharagpur
12	E-E-362.0	Anirban Ghosh	O6UJ9A000LGJ	ITC
13	E-P-365.0	Sanchari Banerjee	O6UJ9A000LHZ	H.K Industries Private Limited
14	E-E-366.0	Anirban Ghosh	O6UJ9A000LIC	Thomas Cook (India) Ltd.
15	E-P-367.0	Sangeeta Roy	O6UJ9A000LJF	ICI India Limited
16	E-P-368.0	Sohel Rahman	O6UJ9A000LJN	CMC

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