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## **METRICS MANAGEMENT SYSTEM**

By

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Of

**KUMARAGURU COLLEGE OF TECHNOLOGY, COIMBATORE**

**A PROJECT REPORT**

**Submitted to the**

**FACULTY OF INFORMATION AND COMMUNICATION ENGINEERING**

*In partial fulfillment of the requirements*

*for the award of the degree*

*of*

**MASTER OF COMPUTER APPLICATION**

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**BONAFIDE CERTIFICATE**

Certified that this project report titled "METRICS MANAGEMENT SYSTEM" is the bonafide work of **Ms. S.Sowmya (Reg No: 71205621049)** who carried out the research under my supervision. certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

  
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Submitted to Project and Viva Examination held on 01-07-08

  
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### **PROJECT COMPLETION CERTIFICATE**

This is to certify that **Miss. S. Sowmya** of **Kumaraguru College of Technology, Coimbatore, Tamil Nadu** was associated with us as a project trainee to carry out her academic project for the partial fulfillment of award of Master of Computer Applications for the year 2008.

She has successfully completed the project titled "Metrics Management System" as per the requirements.

**Senior Project Manager**  
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## **ABSTRACT**

The System “Metrics Management System” is specially designed for the aid of IT Software Solutions based organizations or non IT organizations that comprise an IT sector as one of its department with a purpose to further enhance the quality levels of the IT services rendered by them.

This proposed system helps the organization to discover the current quality standards of various parameters affecting the software development which in turn enables the organization to improve the performance to the stipulated level.

The main purpose behind developing this system is to enable the organization to evaluate their current performance levels of Software Development.

Software Development & Evaluation is a process that is spread across various levels of hierarchy. Each of these levels can evaluate their quality standards using this software.

Based upon the Quality assessment results that are evaluated at each of these levels by the respective authorized users of the system, the authority at the above level can develop a foresight of the future actions and corrective measures that would lead to the improvement of the software development work done under them.

This system helps the organization to overall improve the efficiency and efficacy in delivering the IT services to the customers or the end users.

## ACKNOWLEDGEMENT

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**TABLE OF CONTENTS**

<i>TOPIC</i>	<i>PAGE NO</i>
<b>ABSTRACT</b>	iv
<b>ACKNOWLEDGEMENT</b>	v
<b>LIST OF TABLES</b>	viii
<b>LIST OF FIGURES</b>	ix
<b>I INTRODUCTION</b>	1
1.1 ORGANISATION PROFILE	1
1.2 PROBLEM DEFINITION	3
<b>II SYSTEM ANALYSIS</b>	4
2.1 EXISTING SYSTEM	4
2.2 PROPOSED SYSTEM	4
2.3 USER INTERFACE REQUIREMENTS	5
<b>III DEVELOPMENT ENVIRONMENT</b>	11
3.1 H/W ENVIRONMENT	11
3.2 S/W ENVIRONMENT	12
3.3 SOFTWARE OVERVIEW	13
<b>IV SYSTEM DESIGN</b>	17
4.1 DATA MODEL	17
4.1.1 DATABASE DESIGN	17
4.2 PROCESS MODEL	31
4.2.1 DATA FLOW DIAGRAM (DFD)	31

<b>V SYSTEM IMPLEMENTATION</b>	35
5.1 USER TRAINING	35
5.2 OPERATIONAL DOCUMENTATION	36
5.3 SYSTEM MAINTENANCE	36
<b>VI TESTING</b>	37
6.1 TESTING METHODOLOGIES	37
6.2 TESTING OBJECTIVES	37
6.3 TESTING STRATEGIES	37
6.4 TEST CASE REPORTS	40
<b>VII CONCLUSION AND FUTURE ENHANCEMENTS</b>	41
7.1 CONCLUSION	41
7.2 FUTURE ENHANCEMENTS	41
<b>VIII APPENDICES</b>	42
8.1 SAMPLE SCREENS	42
<b>XI REFERENCES</b>	54

**LIST OF TABLES**

<b>S.NO.</b>	<b>TABLE NAME</b>	<b>PAGE NO</b>
1	LEVEL5	17
2	LEVEL4	19
3	LEVEL3	20
4	LEVEL2	21
5	LEVEL1	22
6	PROCESS COMPLIANCE	23
7	RISK	24
8	ISSUES	24
9	PHASEWISEDEFECT	25
10	DEFECTCAUSE	25
11	DASHBOARD	26
12	PHASE DASHBOARD	27
13	DEFECTDASHBOARD	28
14	RIPDASHBOARD	28
15	USER	29
16	PHASETYPE	29
17	CONTROLLIMIT	30

**LIST OF FIGURES**

<b>S.NO.</b>	<b>FIGURE NAME</b>	<b>PAGE NO</b>
1	LEVEL0 DFD	31
2	LEVEL1 DFD	32
3	DFD FOR PROJECT LEVEL	33
4	DFD FOR OTHER LEVELS	34

## CHAPTER I

### INTRODUCTION

#### 1.1. ORGANIZATION PROFILE

Infosys Technologies Limited (BSE: 500209, NASDAQ: INFY) is a multinational information technology services company headquartered in Bangalore, India. Founded in 1981, it is one of India's largest IT companies, with nine development centers in India and over 30 offices worldwide. The company works with global corporations and new generation technology companies to deliver end to end solutions. The vision of the Infosys India "to be a globally respected corporation that provides best-of-breed business solutions, leveraging technology, delivered by best-in-class people" has helped it in getting listed on NASDAQ.

A technology services company, Infosys defines, designs, and delivers information technology (IT) enabled business solutions. The company, together with its subsidiaries, provides various services, including custom application development; maintenance and production support; software reengineering; package evaluation and implementation; IT consulting; and other solutions, such as independent validation solutions, operations and business process consulting, engineering services, business process management, systems integration, and infrastructure management services. It also develops, markets, and licenses banking products and solutions, such as Finacle suite, a Web-enabled solution that addresses banks' core banking, treasury, wealth management, consumer and corporate e-banking, mobile banking, and Web-based cash management requirements. In addition, the company provides business process management services, such as offsite customer relationship management, finance and accounting, and administration and sales order processing.

Infosys serves various industries through its Industrial Business Units (IBU), such as:

Banking & Capital Markets (BCM)

Communications Media and Entertainment (CME)

Energy, Utilities and Services (EUS)

Insurance, Healthcare and Life Sciences (IHL)

Manufacturing (MFG)

Retail, Consumer Product Goods and Logistics (RETL)

New Growth Engines (NGE)

India Business Unit (IND)

In addition to these, there are Horizontal Business Units (HBUs)

Consulting

Enterprise Solutions (ES)

Infrastructure Management Services (IMS)

Product Engineering and Validation Services (PEVS)

Systems Integration (SI)

With services provided across various industries, its products empower business to increase productivity, enhance customer relations, increase revenue opportunities and create visible competitive advantages in order to lead the market.

## **1.2. PROBLEM DEFINITION**

In the current situation, many IT companies doesn't have an software to know about where they are in the project development at various levels in the company. That is, they doesn't know about whether their development activity is going in the right phase.

In an organisation, there may be many levels of administration like IT Group, Portfolio, etc. They doesn't have an software to know about various metrics like schedule variance, cost variance, etc at different levels in the organisation.

This proposed system enables the organisation to view the metrics for their activities at different levels. Based on the metrics result concerned manager can take corrective actions for providing a quality product to the customer.

## **CHAPTER II**

### **SYSTEM ANALYSIS**

#### **2.1. EXISTING SYSTEM**

Presently the client is using a system through which the software development quality attributes can be assessed separately at each level in the hierarchy.

This would result into a lot of redundant calculation of the quality parameters at each of the level.

Also it was not possible to accurately assess the quality parameters since the evaluations were done separately for each level in the hierarchy.

Also the system doesn't allow customizations for the features like size unit, date format and time interval.

#### **2.2. PROPOSED SYSTEM**

The proposed system 'Metrics Management system' provides the following features to the Users

- Enables the user to create/ View/ Edit/ Drill down of IT Group/ Portfolio(s)/ Program(s)/ Project(s)/ Phase(s).
- User can view the metrics information for an IT Group, Portfolio, Program, and Project through a Dashboard screen which gives a graphical representation of various details like Cost Variance, Effort Variance, and Schedule variance, Risk, Issues and Process Compliance.
- Organization and IT Group/Portfolio/ Program/ Project level Customizations are also allowed for certain features.
- The user is allowed to perform the above explained features according to the access right given by the Admin.

Proposed System enables the organization to define any number of hierarchical Levels present in that company.

It also enables the organization to set the threshold limit values for each of the quality assessment parameter.

With help of this threshold limit organizations gets a clear visualization of status of the particular parameter in the form of RAG status(R-RED, A-AMBER, and G-GREEN)

Thus the quality assessment can be collectively evaluated at all the levels based upon the values obtained from the evaluations done in the lower levels. This would avoid any redundant calculations of the parameters at each of the level.

When a user logs in he can see the links for navigating to the ITGroup, portfolios, programs, projects and phases. The links will be Visible/ Hidden according to the highest role the user has. For example when a program manager who does not have portfolio assigned will only see programs,projects and phase links.

Also the system supports sending mail to the manager if the status of the project is put to on-hold.

### **2.3. USER INTERFACE REQUIREMENTS**

The modules in the metrics management system can be broadly classified as

- IT Group
- Portfolio
- Program
- Project
- Phase
- Customizations

**IT GROUP:**

IT Group is a consolidation of all Portfolio information. This is an optional hierarchy for large organizations. There will be only one IT Group for an installation. IT Group information will be allocated to an IT Manager.

The IT Manager can

- View/Edit IT Group Details
- Add New Portfolio level to the IT Group.
- Navigate to the Lower levels assigned
- Navigate to the IT Group Dashboard.
- View Dashboard details for all lower levels(Portfolio, Programs and Projects)
- View Defects/Risks/Issues/Process Compliance

**PORTFOLIO:**

Portfolio consists of Application which supports the business processes, software tools used for tactical or operational purposes and new/existing programs. Admin/IT Manager creates a portfolio and assigns it to a Portfolio Manager.

The Portfolio manager can

- View/Edit Portfolio Details
- Add New Program level for each open Portfolios assigned to him.
- Navigate to the Lower levels assigned
- Navigate to the Portfolio Dashboard.
- View Dashboard details for all lower levels(Programs and Projects)
- View Defects/Risks/Issues/Process Compliance

**PROGRAM:**

A program is a group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually. Programs may include elements of related work outside of the scope of the discrete projects in the program. Program is the second highest level in the hierarchy a Company can have. Portfolio Manager creates a Program under a Portfolio and assigns it to a Program Manager.

The assigned Program manager can

- Edit/View a Program Details
- View Next Level details of a selected Program
- Add New Projects level for each open Programs assigned to him.
- Navigate to the Program Dashboard.
- Drill down Dashboard details
- View Defects/ Risks/ Issues/ Process compliance

**PROJECT:**

A project is a temporary and one-time endeavor undertaken to create a unique product or service, which brings about beneficial change or added value. It consists of many tasks which could be grouped logically into Phases. Project is the third highest level in the hierarchy a Company can have. Program Manager creates a Project under a Program and assigns it to a Project Manager.

The Project manager can

- Edit/View Project Details
- Add New Phases level for each open Projects assigned to him.
- Navigate to the Lower levels assigned
- View Dashboard details
- Drilldown Dashboard details
- Edit/View Defects/ Risks/ Issues/ Process Compliance

**EDIT/VIEW PROJECT DETAILS:**

This module allows the Project manager to edit/view the Project details. The project manager can edit the details of the project based on the status of the project. In the view module, the derived fields are highlighted with the gray shade.

**ADD NEW PHASE:**

This module allows the project manager to add a new phase under the project for which he is responsible.

**NAVIGATE TO THE LOWER LEVELS:**

This module allows the project manager to navigate to the lower levels and view the details. This can be accomplished by using the wild card search option available.

**VIEW PROJECT DASHBOARD DETAILS:**

This module displays the various graphs and RAG Status table to demonstrate the activities of the project. The graphs demonstrate various parameters like Schedule Variance, Cost Variance, etc. The dashboard details are calculated based on the threshold limits set at the project level. The sub modules that comes under this module are

- Exclude Parameters
- Edit RAG Remarks

**DRILLDOWN DASHBOARD DETAILS:**

This module allows the project manager to select any graph from dashboard and view the phase level details of the project for that particular graph.

**EDIT/VIEW DEFECTS/RISKS/ISSUE/PROCESS COMPLIANCE:**

This module allows the user to edit or view the details about the defects, risks, issues and process compliance.

**PHASE:**

Phase is the fourth highest level in the hierarchy a Company can have. Project Manager creates a Phase under a Project and assigns it to a Phase Lead.

The assigned Phase Lead can

- View the Project Details Dashboard
- View/Edit Phase details
- Update Defects/ Issues/ Risks/ Process compliance for the Project

**CUSTOMIZATIONS:**

This module allows the user to perform customizations for various things. This module includes the sub modules such as,

- Location
- Threshold Limits
- Users
- Size Units- KLOC, Function Points
- Effort Unit – Person Months, Person Days, Person Hours
- Root causes for Defects
- Phase Types
- Date Format
- Change Password
- Currency
- Dashboard time interval

**THRESHOLD LIMITS:**

This module is used to set the threshold limits as No Risk limit and High Risk limit separately for each of the parameters – Schedule variance, Cost variance, Effort variance, Open High Impact Risk, Open High Impact Issues, and Process Compliance at organization level.

For Schedule variance, Cost variance, Effort variance, Risk and Issues control limits values increase from No Risk Limit to High Risk Limit. But for Process compliance control limit values decrease from Green No Risk Limit to High Risk Limit.

The control limits are set by the Admin at the organization level.

User can perform Portfolio/Program/Project level Customizations for Control limits. It Provides checkboxes to select the parent level baseline for Schedule, Cost, Effort, Risk, Issues and Process Compliance or User can define Portfolio/Program/Project specific Control Limits that override parent level baseline for Schedule, Cost, Effort, Risk, Issues, and Process Compliance.

## CHAPTER III

### DEVELOPMENT ENVIRONMENT

#### 3.1. HARDWARE ENVIRONMENT

Processor : Intel Pentium 4

RAM : 1 GB

Hard Disk : 40 GB

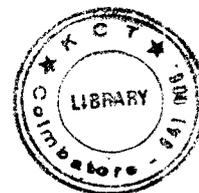
Clock speed : 2.4 GHz

FDD : 1.44 MB

CD-DRIVE : 52X

Keyboard

Mouse



*P-2297*

### **3.2. SOFTWARE ENVIRONMENT**

- Windows XP Service Pack
- SQL Server 2005
- SQL Server Reporting Services
- C#.Net 2.0
- ASP.Net 2005
- .Net Framework 2.0/3.0
- Microsoft Visual SourceSafe
- Microsoft Guidance Automation Toolkit
- Internet Explorer 5.5 and above

### **3.3. SOFTWARE FEATURES**

#### **SQL SERVER 2005**

SQL Server is a client/server Relational Database Management System (RDBMS) that uses Transact – SQL to send request between client and SQL Server. SQL Server is designed to be a client / server system.

SQL Server can work with thousands of client applications simultaneously. The server has to prevent logical problems that occur is a user tries to read or modify data currently being used by others. It is also capable of working as a stand-alone database directly on the client. The scalability and ease-of-use features of SQL Server allow it to work efficiently on a client without consuming too many resources, such as memory, network bandwidth, and disk I/O, among multiple users.

SQL Server integrates with Windows NT and hence takes advantages of many of its features:

- Security
- Multiprocessor Support
- Microsoft Event Viewer
- Windows NT Services
- Windows NT Performance Monitor
- Microsoft Cluster Server
- Integration with Microsoft BackOffice

## **ASP.NET**

ASP.NET is a unified web development platform that provides the services necessary to build enterprise-class web applications. ASP.NET provides a new programming model and infrastructure that allow creating new class of applications. ASP.NET is fully supported by the .NET framework, allowing to take full advantage of the common language runtime (CLR), type safety, inheritance and all of the other features of the platform.

ASP.NET is identified by the .ASPX suffix that is attached to the end of the filename instead of .ASP extension. When the ASP.NET DLL receives a request with a .ASPX suffix, it parses and compiles the file into a .NET class, or uses an already compiled .NET class. Even pure HTML files with a .ASPX suffix will be sent to the parser. In fact, ASP pages and ASP.NET pages are sent to different places. The DLL that processes ASP.NET pages are the xspisapi.dll and this is of course separate to the ASP.DLL. The ASP.dll does still exist and your standard ASP pages will be sent to this DLL for processing. So, traditional Asp will still be supported for legacy applications.

## **ADVANTAGES OF ASP.NET WITH ASP**

ASP.NET offers several important advantages over previous web development models:

### **ENHANCED PERFORMANCE**

ASP.NET is compiled Common Language Runtime code running on the remote server. ASP.NET does early binding, just-in-time compilation, native optimization, and caching services.

## **POWER AND FLEXIBILITY**

ASP.NET is language-independent, so you can choose a language from the Common Language Runtime's Base Class libraries, messaging and Data Access solutions are all seamlessly accessible from the web. Common Language Runtime interoperability guarantees that existing investment in COM-based development is prevented when migrating to ASP.NET.

## **SIMPLICITY**

The ASP.NET Page Framework allows building user interfaces that cleanly separate application logic from presentation code, and handle events in a simple, VB-like forms processing model. ASP.NET makes it easy to perform common tasks, from simple form submission and client authentication to deployment and site configuration.

## **MANAGEABILITY**

ASP.NET employs a text-based, hierarchical configuration system, which simplifies applying settings to your server environment and web applications. Because configuration information is stored as plain-text, new settings may be applied without the aid of local administration tools.

## **SCALABILITY**

ASP.NET scalability features helps to improve performance in multi-processor environments. The processes are closely monitored and managed by the ASP.NET runtime, so that if one misbehaves, a new process can be created in its place, which helps keep the application constantly available to handle requests from the client.

## **CUSTOMIZABILTY AND EXTENSIBILTY**

ASP.NET architecture allows developers to plug-in their code at the appropriate level. In fact, it is possible to extend or replace any sub-component of the ASP.NET runtime with the own written component. Implementing custom authentication or states service has never been easier.

## CHAPTER IV

### SYSTEM DESIGN

#### 4.1. DATA MODEL

##### 4.1.1. DATABASE DESIGN

##### 4.1.1.1. LEVEL5 TABLE

This table stores the details about the each phase in various projects.

FieldName	DataType	Size	Constraint
Level1Id	int	max	FK_Level5_Level1_Level1Id
Level2Id	int	max	FK_Level5_Level2_Level2Id
Level3Id	int	max	FK_Level5_Level3_Level3Id
Level4Id	int	max	FK_Level5_Level4_Level4Id
Level5Id	int	max	PK_Level5_Level5Id
Level5Code	varchar	15	UK_Level5_Level5Code
Level5Name	varchar	50	
Level5Desc	varchar	250	
Level5ManagerId	int		FK_Level5_User_Level5ManagerId
PhaseTypeId	int	max	FK_Level5_PhaseType_PhaseTypeId
LocationId	int	max	FK_Level5_Location_LocationId
PlannedStartDate	smalldatetime		
PlannedEndDate	smalldatetime		

Table 4.1.1.1(continued)

ActualStartDate	smalldatetime		
ActualEndDate	smalldatetime		
PlannedEngEffort	float		Default_Zero
PlannedReviewEffort	float		Default_Zero
ActualReviewEffort	float		Default_Zero
ActualReworkEffort	float		Default_Zero
ActualTrainingEffort	float		Default_Zero
PercentComplete	float	5,2	Default_Zero
StatusId	int	max	FK_Level5_Status_StatusId
ActionBy	int	max	FK_Level5_User_ActionBy
ActionDate	smalldatetime		
Remarks	varchar	1000	
Dataversion	rowversion		

#### 4.1.1.2. LEVEL4 TABLE

This table stores the details about various projects under the program.

FieldName	Data Type	Size	Constraint
Level1Id	int	max	FK_Level4_Level1_Level1Id
Level2Id	int	max	FK_Level4_Level2_Level2Id
Level3Id	int	max	FK_Level4_Level3_Level3Id
Level4Id	int	max	PK_Level4_Level4Id
Level4Code	varchar	15	UK_Level4_Level4Code
Level4Name	varchar	50	
Level4Desc	varchar	250	
Level4ManagerId	int		FK_Level4_User_Level4ManagerId
LocationId	int	max	FK_Level4_Location_LocationId
PlannedStartDate	smalldatetime		
PlannedEndDate	smalldatetime		
ActualStartDate	smalldatetime		
ActualEndDate	smalldatetime		
BudgetedAmount	money		Default_Zero
ActualCost	money		Default_Zero
EstimatedSize	float		Default_Zero
ActualSize	float		Default_Zero
SizeUnitId	int	max	FK_Level4_SizeUnit_SizeUnitId
RAGStatusId	int		FK_Level4_RAGStatus_RAGStatusId
RAGStatusRemarks	varchar	1000	
StatusId	int	max	FK_Level4_Status_StatusId
ActionBy	int	max	FK_Level4_User_ActionBy
ActionDate	smalldatetime		
Remarks	varchar	1000	

### 4.1.1.3. LEVEL3 TABLE

This table stores the details about the various programs under a portfolio.

FieldName	Data Type	Size	Constraint
Level1Id	int	max	FK_Level3_Level1_Level1Id
Level2Id	int	max	FK_Level3_Level2_Level2Id
Level3Id	int	max	PK_Level3_Level3Id
Level3Code	varchar	15	UK_Level3_Level3Code
Level3Name	varchar	50	
Level3Desc	varchar	250	
Level3ManagerId	int		FK_Level3_User_Level3ManagerId
LocationId	int	max	FK_Level3_Location_LocationId
PlannedStartDate	smalldatetime		
PlannedEndDate	smalldatetime		
ActualStartDate	smalldatetime		
ActualEndDate	smalldatetime		
BudgetedAmount	money		Default_Zero
ActualCost	money		Default_Zero
RAGStatusId	int		FK_Level3_RAGStatus_RAGStatusId
RAGStatusRemarks	varchar	1000	
StatusId	int	max	FK_Level3_Status_StatusId
ActionBy	int	max	FK_Level3_User_ActionBy
Remarks	varchar	1000	
DataVersion	rowversion		

#### 4.1.1.4. LEVEL2 TABLE

This table stores the details about various portfolio under IT Group.

FieldName	DataType	Size	Constraint
Level1Id	int	max	FK_Level2_Level1_Level1Id
Level2Id	int	max	PK_Level2_Level2Id
Level2Code	varchar	15	UK_Level2_Level2Code
Level2Name	varchar	50	
Level2Desc	varchar	250	
Level2ManagerId	int		FK_Level2_User_Level2ManagerId
LocationId	int	max	FK_Level2_Location_LocationId
PlannedStartDate	smalldatetime		
PlannedEndDate	smalldatetime		
ActualStartDate	smalldatetime		
ActualEndDate	smalldatetime		
BudgetedAmount	money		Default_Zero
ActualCost	money		Default_Zero
RAGStatusId	int		FK_Level2_RAGStatus_RAGStatusId
RAGStatusRemarks	varchar	1000	
StatusId	int	max	FK_Level2_Status_StatusId
ActionBy	int	max	FK_Level2_User_ActionBy
ActionDate	smalldatetime		
Remarks	varchar	1000	
Dataversion	rowversion		

#### 4.1.1.5. LEVEL1 TABLE

This table stores the details about the IT Group.

FieldName	Data Type	Size	Constraint
Level1Id	int	max	PK_Level1_Level1Id
Level1Code	varchar	15	UK_Level1_Level1Code
Level1Name	varchar	50	
Level1Desc	varchar	250	
Level1ManagerId	int		FK_Level1_User_Level1ManagerId
LocationId	int	max	FK_Level1_Location_LocationId
BudgetedAmount	money		Default_Zero
ActualCost	money		Default_Zero
Remarks	varchar	1000	
ActionBy	int	max	FK_Level1_User_ActionBy
ActionDate	smalldatetime		
Remarks	varchar	1000	
Dataversion	rowversion		

#### 4.1.1.6. PROCESS COMPLIANCE TABLE

This table stores the details about the process compliance for various projects.

FieldName	DataType	Size	Constraint
Level4Id	int	max	FK_ProcessCompliance_Level4_Level4Id
ProcessComplianceId	int	max	PK_ProcessCompliance_ProcessComplianceId
TotalCompliance	int	5	Default_Zero
HighNonCompliance	int	5	Default_Zero
MediumNonCompliance	int	5	Default_Zero
LowNonCompliance	int	5	Default_Zero
PercentProcessCompliance	float	5,2	Default_Zero
ActionBy	int	max	FK_ProcessCompliance_User_ActionBy
ActionDate	smalldatetime		
Dataversion	rowversion		

#### 4.1.1.7. RISK TABLE

This table stores the details about the risk factors for various projects.

FieldName	DataType	Size	Constraint
Level4Id	int	max	FK_Risk_Level4_Level4Id
RiskId	int	max	PK_Risk_IssueRiskId
HighOpen	int	5	Default_Zero
HighClosed	int	5	Default_Zero
HighMaterialized	int	5	Default_Zero
MediumOpen	int	5	Default_Zero
MediumClosed	int	5	Default_Zero
MediumMaterialize d	int	5	Default_Zero
LowOpen	int	5	Default_Zero
LowClosed	int	5	Default_Zero
LowMaterialized	int	5	Default_Zero
ActionBy	int	max	FK_Risk_User_ActionBy
ActionDate	smalldatetime		
Dataversion	rowversion		

#### 4.1.1.8. ISSUE TABLE

This table stores the details about the issues for the projects.

FieldName	DataType	Size	Constraint
Level4Id	int	max	FK_IssueRisk_Level4_Level4Id
IssueId	int	max	PK_IssueRisk_Issued
HighOpen	int	5	Default_Zero
HighClosed	int	5	Default_Zero
MediumOpen	int	5	Default_Zero
MediumClosed	int	5	Default_Zero
LowOpen	int	5	Default_Zero
LowClosed	int	5	Default_Zero
ActionBy	int	max	FK_Issue_User_ActionBy
ActionDate	smalldatetime		
Dataversion	rowversion		

#### 4.1.1.9. PHASEWISEDEFECT TABLE

This table stores the details about the phasewise defects for the projects.

FieldName	Data Type	Size	Constraint
Level4Id	int	max	FK_DefectPhase_Level4_Level4Id
DefectPhaseId	int	max	PK_DefectPhase_DefectPhaseId
DetectionStage	int	max	FK_DefectPhase_Level5_Level5Id
InjectionStage	int	max	FK_DefectPhase_Level5_Level5Id1
High	int	5	Default_Zero
Medium	int	5	Default_Zero
Low	int	5	Default_Zero
ActionBy	int	max	FK_Level1_User_ActionBy
ActionDate	smalldatetime		
rowversion	rowversion		DF_rowversion

#### 4.1.1.10. DEFECT CAUSE TABLE

This table stores the details about the causes for defects appearing in the project.

FieldName	Data Type	Size	Constraint
Level4Id	int	max	FK_DefectCause_Level4_Level4Id
DefectCauseId	int	max	PK_DefectCause_DefectCauseId
DefectCauseId	int	max	FK_DefectPhase_DefectCause_DefectCauseId1
InjectionStage	int	max	FK_DefectCause_DefectCause_DefectCauseId
DefectCount	int	5	Default_Zero
ActionBy	int	max	FK_Level1_User_ActionBy
ActionDate	smalldatetime		
Dataversion	rowversion		

#### 4.1.1.11. DASHBOARD TABLE

This table stores the details about the dashboard for the projects.

FieldName	Data Type	Size	Constraint
DashboardId	int	max	PK_Dashboard_DashboardId
Level1Id	int	max	FK_Dashboard_Level1_Level1Id
Level2Id	int	max	FK_Dashboard_Level2_Level2Id
Level3Id	int	max	FK_Dashboard_Level3_Level3Id
Level4Id	int	max	FK_Dashboard_Level4_Level4Id
StatusId	int	max	FK_Dashboard_Status_StatusId
OverallRAGStatus	tinyInt	1	CK_Dashboard_OverallRAGStatus
CostVariancePercent	float	5,2	DF_zero
CostVarianceRAG	tinyInt	1	CK_Dashboard_CostVarianceRAG
EffortVariancePercent	float	5,2	DF_zero
EffortVarianceRAG	tinyInt	1	CK_Dashboard_EffortVarianceRAG
ScheduleVariancePercent	float	5,2	DF_zero
ScheduleVarianceRAG	tinyInt	1	CK_Dashboard_ScheduleVarianceRAG
DeliveredDefectDensity	float	5,2	DF_zero
OverallDefectDensity	float	5,2	DF_zero
OverallDefectRemovalEffectiveness	float	5,2	DF_zero
OverallCOQ	float	5,2	DF_zero
OpenHighImpactRiskPercent	float	5,2	DF_zero

Table 4.1.1.11(continued)

OpenHighImpactRiskRAGStatus	tinyInt	1	CK_Dashboard_OpenHighImpactRiskRAGStatus
OpenHighImpactIssuePercent	float	5,2	DF_zero
OpenHighImpactIssueRAGStatus	int		FK_Level2_RAGStatus_RAGStatusId
ProcessCompliancePercent	float	5,2	DF_zero
ProcessComplianceRAGStatus	tinyInt	1	CK_Dashboard_ProcessComplianceRAGStatus
Dataversion	rowversion		

#### 4.1.1.12. PHASEDASHBOARD TABLE

This table stores the details about the dashboard for various phases.

FieldName	Data Type	Size	Constraint
PhaseDashboardId	int	max	PK_PhaseDashboard_PhaseDashboardId
Level4Id	int	max	FK_PhaseDashboard_Level4_Level4Id
Level5Id	int	max	FK_PhaseDashboard_Level4_Level4Id
StatusId	int	max	FK_PhaseDashboard_Status_StatusId
PlannedEffort	float	5,2	DF_Zero
ActualEffort	float	5,2	DF_Zero
EffortVariance	float	5,2	DF_Zero
PlannedSchedule	float	5,2	DF_Zero
ActualSchedule	float	5,2	DF_Zero
ScheduleVariance	float	5,2	DF_Zero
Dataversion	rowversion		

#### 4.1.1.13. DEFECTDASHBOARD TABLE

This table stores the details about the dashboard for the defects in the projects.

FieldName	Data Type	Size	Constraint
DefectDashboardId	int	max	PK_DefectDashboard_DefectDashboardId
Level4Id	int	max	FK_DefectDashboard_Level4_Level4Id
DefectChartType	TinyInt	1	CK_DefectDashboard_DefectChartType
DefectTypeStage	int	max	
DefectPercentage	float	5,2	DF_Zero
DataVersion	rowversion		

#### 4.1.1.14. RIPDASHBOARD TABLE

This table stores the details about risk, issue and process compliance dashboard.

FieldName	Data Type	Size	Constraint
RIPChartTypeId	int	max	PK_RIPChartType_RIPChartTypeId
Level1Id	int	max	FK_Dashboard_Level1_Level1Id
Level2Id	int	max	FK_Dashboard_Level2_Level2Id
Level3Id	int	max	FK_Dashboard_Level3_Level3Id
Level4Id	int	max	FK_RIPChartType_Level4_Level4Id
RIPChartType	TinyInt	1	CK_RIPChartType_RIPState
RIPState	TinyInt	1	CK_RIPDashboard_RIPState
HighPercent	float	5,2	DF_Zero
MediumPercent	float	5,2	DF_Zero
LowPercent	float	5,2	DF_Zero
DataVersion	rowversion		

#### 4.1.1.15. USER TABLE

This table stores the details about the user of the system.

FieldName	DataType	Size	Constraint
UserId	int	max	PK_User_UserId
UserName	varchar	50	
LoginID	varchar	10	Unique
Password	varchar	10	
EmailID	varchar	50	
EmployeeCode	varchar	15	
IsAdmin	Bit		
StatusId	int		FK_User_Status_StatusId
Remarks	varchar	1000	
Dataversion	rowversion		

#### 4.1.1.16. PHASETYPE TABLE

This table stores the various phases and their sequence in the project.

FieldName	DataType	Size	Constraint
PhaseTypeId	int	max	PK_PhaseType_PhaseTypeId
PhaseTypeName	varchar	50	
Sequence	int	2	
StatusId	int	max	FK_PhaseType_Status_StatusId
IsTestingPhase	Bit		
CanInjectDefects	Bit		
IsDeliveredDefectPhase	Bit		
Dataversion	rowversion		

#### 4.1.1.17. CONTROLLIMIT TABLE

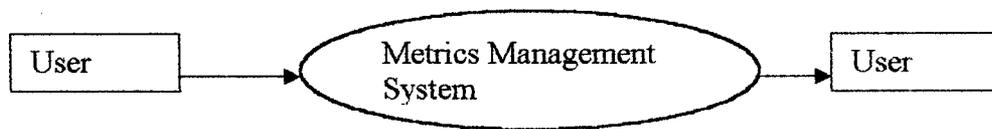
This table stores the details about the risk limits for various parameters.

FieldName	DataType	Size	Constraint
ControlLimitId	int	max	PK_ControlLimit_ControlLi mitId
LevelId	int	max	
ControlLimitLevel	tinyInt	1	CK_ControlLimit_ControlLi mitLevel
ControlLimitType	tinyInt	2	CK_ControlLimit_ControlLi mitType
UseParent	bit		
GreenLimit	float	5,3	DF_Zero
RedLimit	float	5,6	DF_Zero
ActionBy	int	max	FK_Level1_User_ActionBy
ActionDate	smalldatetime		
Dataversion	rowversion		

## 4.2. PROCESS MODEL

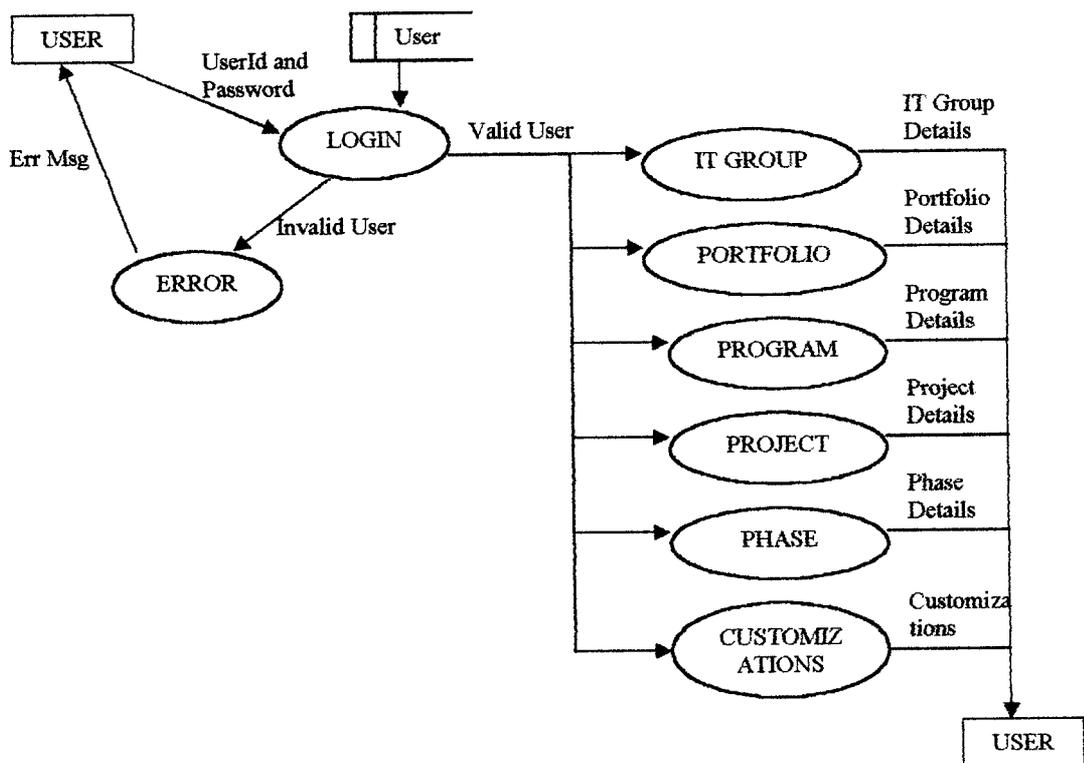
### 4.2.1. DATAFLOW DIAGRAM

#### LEVEL 0 DFD



**Fig 4.2.1.1**

**LEVEL 1 DFD**



**Fig 4.2.1.2**

DFD FOR PROJECT LEVEL

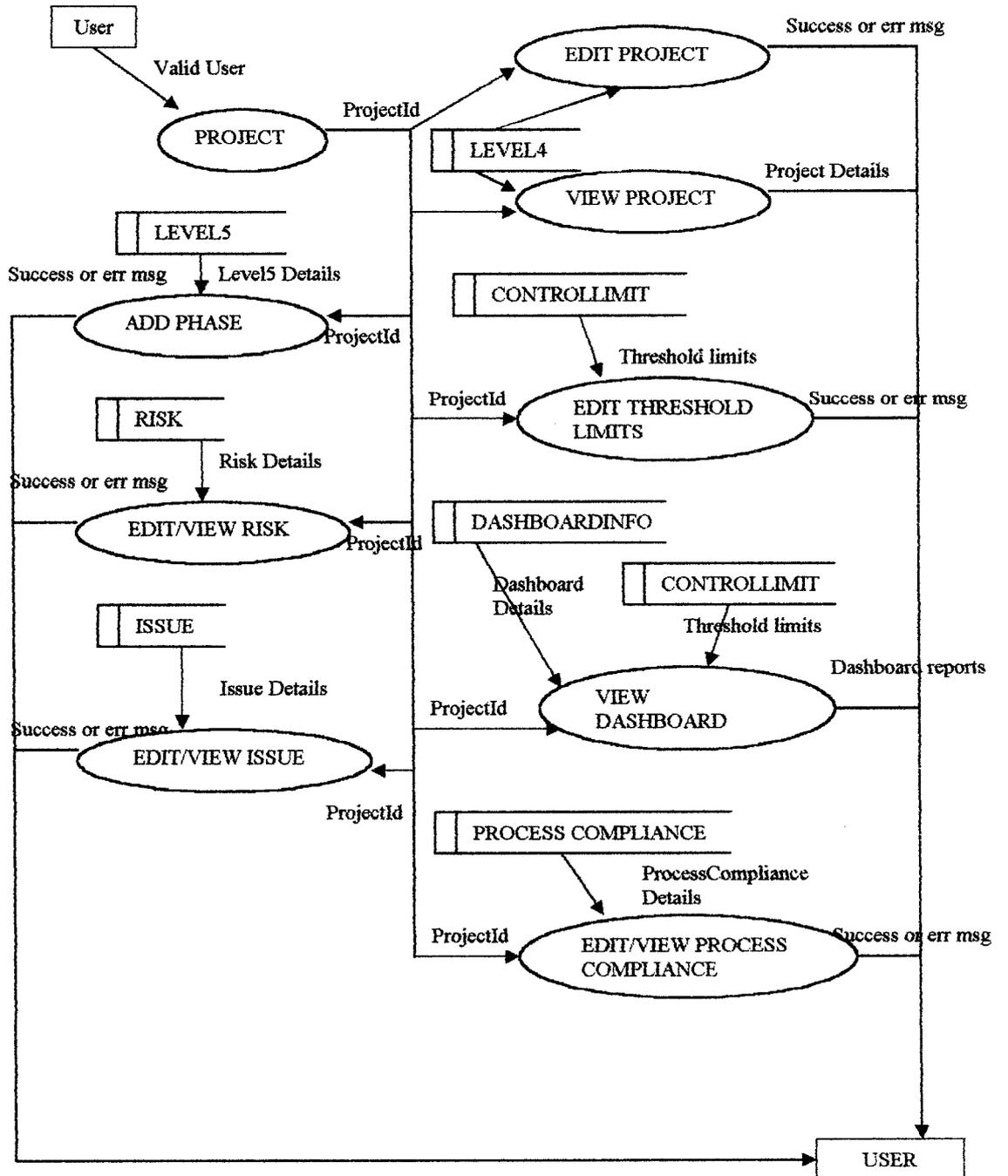
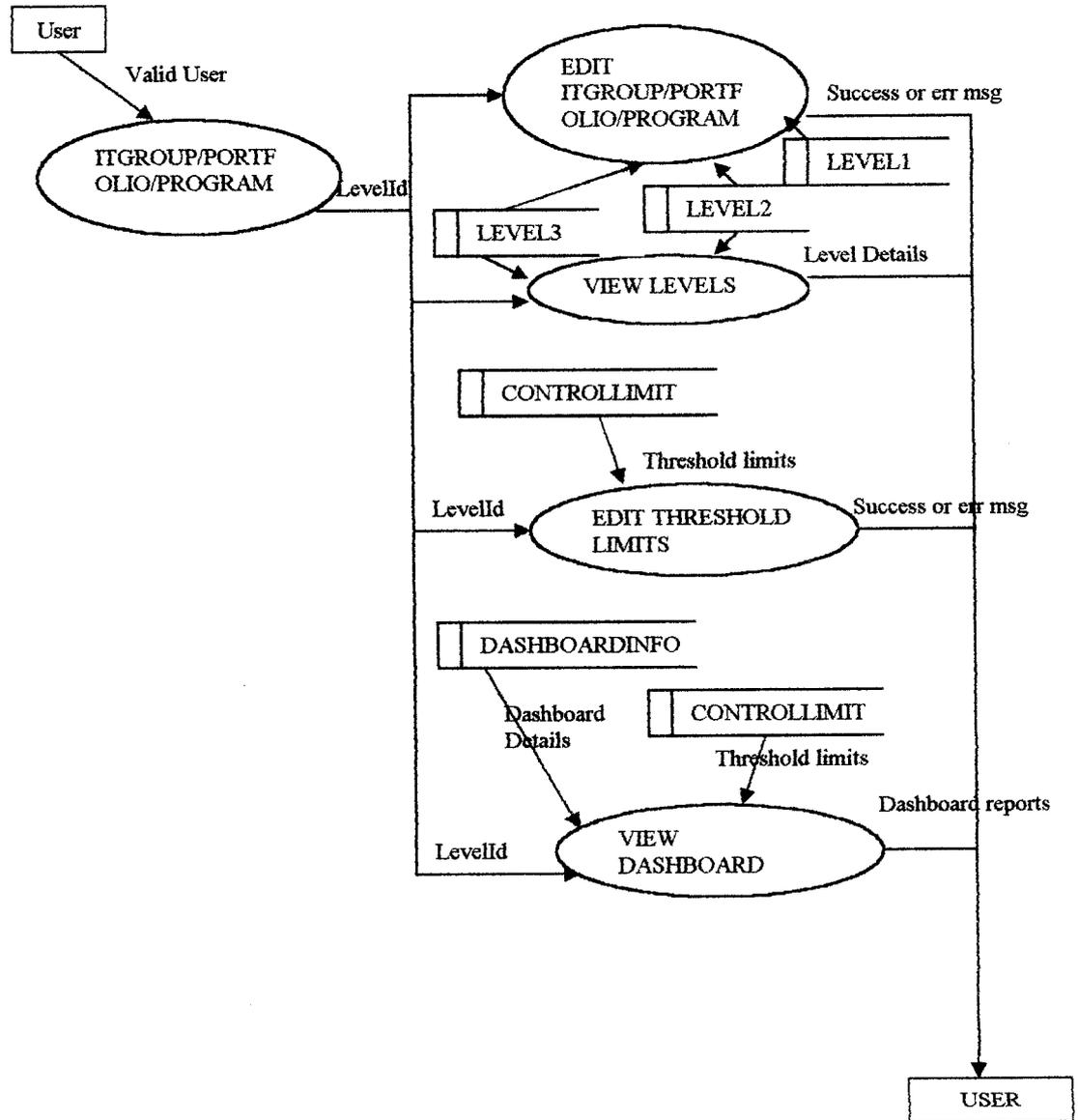


Fig 4.2.1.3

**DFD FOR OTHER LEVELS**



**Fig 4.2.1.3**

## CHAPTER V

### IMPLEMENTATION

The most secure method of a crucial phase in the system is the successful implementation of the new system. Implementation is the process of converting a new system design into operational one. This involves creating computer-compatible files, training the operating staff and installing hardware and network. Conversion is one of the key aspects in implementation review and software maintenance. A critical factor of conversion is not disrupting the functioning of the organization.

Converting old to new system is to run both systems in parallel. Hence the user continues operating the old system in the accustomed manner but they also begin using the new system. This method also offers greatest security since the old system can take over if any errors are found or inability to handle certain type of transactions while using the new system. First the database was created with the necessary security features. Next the system was loaded in the appropriate department.

#### 5.1. USER TRAINING

User managers must be informed of how the whole system works its objectives, new documentation, files and procedures. New jobs may be created, existing jobs changed or eliminated. User staff must be instructed in how to perform their new tasks. Training sessions must aim to give user staff the specific skills required in their new jobs. Thus they should contain large elements of practical activity people (people learn far more by doing than by watching or listening).

Training should be conducted with small groups rather than the full number of staff; this facilitates learning from peers.

Training sessions should be tailored to the learning process, allowing assimilation over a period before more new information is fed in; and providing feedback on progress.

## **5.2. OPERATIONAL DOCUMENTATION**

An Operational Manual is used as a permanent reference document to inform the computer operations department of the system to be implemented, the work to be done in its routine operation, and any special features. The manual is the formal communication of system details to the operations department, but is not the only communication needed. It is essential that provisional details be supplied to the operations department as soon as they are available to give opportunity for preparation of preliminary schedules and forward loading plans and for training and familiarization. The contents should be clear and practical. As it may be necessary for the manual to be partitioned to the requirements, its structure should be determined in consultation with the operations manager. It should be designed to enable problems of operations to be solved without continual reference to programmers or system analysts.

## **5.3. SYSTEM MAINTENANCE**

Maintenance of the software is one of the major steps in the computer automation. Software, which is developed by the engineer, should undergo maintenance process in a regular interval of time goes on new problems arise and it must be corrected accordingly. Maintenance and enhancements are a long-term process. If the problem is diverted or upgraded, then also the software should be changed.

In this project the software is maintained in short term interval. This is because internet facilities and related features are changing day by day and always the clients demand a very advanced media.

## CHAPTER VI

### SYSTEM TESTING

#### 6.1. TESTING METHODOLOGIES

Software testing is the critical element of the software quality assurance and represents the ultimate view of specialization, design and coding. The increasing availability of the software as a system element and the attendant costs associated with a software failure are motivating forces for well planned through testing.

#### 6.2. TESTING OBJECTIVES

The testing objectives are summarized in the following three steps:

- ❖ Testing should be planned long before testing begins.
- ❖ Testing should begin 'in the small' and progress towards testing 'in the large'.
- ❖ Exhaustive testing is not possible.
- ❖ To be more effective, testing should be conducted by an independent third party.

#### 6.3. TESTING STRATEGIES

Software testing is the philosophy to find errors. Test cases are devised with this in mind. A test case is a set of data that the system will process as normal input. However, the data are created with express intent of determining whether the system will process them correctly.

There are several testing strategies that are used in the system. They are

- ❖ Unit Testing
- ❖ Integration Testing
- ❖ Validation Testing

## **UNIT TESTING**

The unit testing was done during the actual coding process. For this reason, Unit testing is sometimes called as program testing. The software units in a system are the modules and routines that are assembled and integrated to perform a specific function. Unit testing focuses first on the modules, independently of one another, to locate errors. This enables to detect errors in coding and logic that are contained within the module alone. The following were the targets of unit testing:

1. The loops
2. The variable declaration and initializations
3. The memory overflows in arrays.

In this system, the unit testing was done on the modules like view project, edit project, threshold limits, dashboard, etc.

## **INTEGRATION TESTING**

The objective is to take the unit tested components and build a program structure that has been dictated by the design. Bottom-up integration was performed that starts with the primitive modules and progresses by integrating their functionalities. It is easy to fix the bug in this testing because all the modules that are being integrated are tested error-free.

In this system, various modules are integrated and tested for their performance. Functionalities are also tested by this integration testing.

## **VALIDATION TESTING**

Software validation is achieved through a series of black box test that demonstrate conformity with requirements. Both plan and procedure are designed to ensure that all functional requirements are achieved. Using validation testing we have tested this project. The forms in this project need to be validated. The user should not leave any input area blank and in places where only numbers can be given as input, characters should not be entered. The forms are tested with the some valid and invalid data's. If there were any invalid data the system would give a message box specifying the type of data that is to be entered in the box. All forms are found to be working properly. In this system, validation testing is done by giving various types of input and tested with the expected result.

## **ACCEPTANCE TESTING**

Acceptance Testing is done by the customer. It focuses on overall features and functionalities of the system that are visible and review able by the customer. For the system, the user acceptance testing has been done and the changes said by the user are also incorporated.

#### 6.4. TESTCASE REPORTS

Test case	Navigation	Description	Expected Result	Pass/Fail
1	Home page	Click on the Project tab in the Home page	The status should have the default value Open, and all Open projects belonging to the user logged in should be displayed.	Pass
2	Home page	Select a Project from the projects listed	View details page should open with EditDetails, Add program,Dashboard,Control limit, Historic data	Pass
3	HomePage ->Edit Project page	Click on the Edit details link	The Edit Projects page should open with all the fields.	Pass
4	HomePage ->Defects page	Click on the Defects from the left menu.	View defects page should be displayed with edit defects link.	Pass
5	HomePage ->Dashboard page	Click on the dashboard from the left menu.	Dashboard page should be displayed with various graphs.	Pass
6	HomePage ->Threshold Limits page	Click on the Threshold Limits from the left menu.	Edit Threshold Limits page should be displayed.	Pass
7	HomePage ->Risk page	Click on the Risks from the left menu.	View Risk page should be opened with edit risk link	Pass
8	HomePage ->Issue page	Click on the Issue from the left menu.	View Issue page should be opened with edit issue link	Pass
9	HomePage ->Process Compliance page	Click on the process compliance from menu.	View Process compliance page should be opened with edit link	Pass

## **CHAPTER VII**

### **CONCLUSION AND FUTURE ENHANCEMENTS**

#### **7.1. CONCLUSION**

The software developed has been designed and run to satisfy the requirements and needs of an organization. The software can be used to know about the metrics information for the projects developed.

The entire system is documented and it can be easily understood by the end users. The forms are very user friendly and also easy to handle even by the beginners with very little effort and guidance.

#### **7.2. FUTURE ENHANCEMENTS**

The proposed system is extendable as well as scalable.

If the client intends to add more quality assessment parameters then it can be easily done without affecting the already present components

We can also include some more customizations as per the requirement of the organization.



## 8.1.2. PROJECT MAIN PAGE

The screenshot shows a web browser window displaying the MMS Project Main Page. The browser's address bar shows the URL: [http://myphact123886/MMS\\_Xldata/Menu/index.aspx](http://myphact123886/MMS_Xldata/Menu/index.aspx). The page title is "MMS".

At the top, there is a navigation menu with the following items: **IT Group**, **Portfolio**, **Program**, **Project** (highlighted), **Phase**, and **Customization**. Below the menu, it says "You are here: Project".

On the right side, there is a search bar with the text "Search: Type Here" and a "Go" button. Above the search bar, it says "Welcome, George Albert".

Below the navigation menu, there are filters for "Status" (set to "--Select--") and "Planned Start Date" (set to "2007 to 2007"). There are "Apply" and "Reset" buttons. The "Planned End Date" filter is also present.

The main content area displays a table of projects. The table has the following columns: **Project Code**, **Project Name**, **Program Code**, **Program Name**, **Project Manager**, **Planned Start Date**, **Planned End Date**, **Actual Start Date**, **Actual End Date**, **Budgeted Amount**, **Actual Cost**, and **Status**. There are 5 rows of data.

Project Code	Project Name	Program Code	Program Name	Project Manager	Planned Start Date	Planned End Date	Actual Start Date	Actual End Date	Budgeted Amount	Actual Cost	Status
PAH001	Online Tracker	PAY_ACC	Accounts	Peter	26-Jul-2007	15-Oct-2007	26-Jul-2007	07-Nov-2007	97600.00	97656.00	Closed
TRAN001	Middle level	TRA_TECH	Technical	Joseph	28-Apr-2007	04-Oct-2007	28-Apr-2007		1300000.00	1200000.00	Abandoned
cod	cod	COM_AOL	AOL	Aaming	05-Apr-2008	30-Jun-2008	05-Apr-2008		40000.00	37000.00	Open
COM002	Broadband services	COM_BT	BT	Adam	01-Mar-2008	09-Apr-2008	02-Mar-2008	07-Apr-2008	25000.00	20000.00	Closed
COM003	Mobile services	COM_VER	Verizon	Sam	23-Mar-2007	27-Jun-2007	23-Mar-2007		45000.00	12933.00	On-Hold

At the bottom of the page, it says "Number of pages: 6" and "Go to page: 1 2 3 4 5 6". There is also a "Go" button.



### 8.1.4. EDIT PROJECT PAGE

Address: http://myshact02300a/MMS\_Xdata/Menu/index.aspx

MMS

Welcome, George Albert

Search:  IT Group

IT Group Portfolio Program Project Phase Customization

You are here: Home > Online Tracker

**Project**

View Project Changes not allowed since higher level is not open

**Edit Project**

IT Group Name HP IT Group

Program Name

Project Code

Project Name

Project Manager

Planned Start Date

Actual Start Date

Budgeted Amount

Estimated Size

Status

Remarks

Portfolio Name

Payroll

Project Description

Location

Planned End Date

Actual End Date

Actual Cost

Actual Size

Overall RAG Status

Defects

Risks

Issues

Process Compliance

Performance Parameters

Dashboard

Threshold Limits

Historical Data

What If Scenario

© 2007 Hewlett-Packard Development Company, L.P. Internal Intranet

### 8.1.5. DEFECTS PAGE

**MMS** Welcome, George Albert

IT Group Portfolio Program Project Phase Customization

You are here: [Home](#) > [Online Tracker](#)

**Project** Search:  IT Group

View Project

Edit Project ▲

		Phase Detected	Phase Injected	High	Medium	Low	Total
Defects	Requirements	Requirements		1	2	1	4
	Risks	Build	Design	0	1	1	2
	Issues	Testing	Build	1	2	1	4
		<b>2</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>10</b>	

Process Compliance ▲

Performance Parameters

Root Cause	Phase Injected	High	Medium	Low	Total
Overight	Requirements	1	2	1	4
Education	Design	0	1	1	2
Logic	Build	1	2	1	4
		<b>2</b>	<b>5</b>	<b>3</b>	<b>10</b>

Dashboard

Threshold Limits

Historical Data

What IF Scenario

### 8.1.6. VIEW RISKS PAGE

**MMS** Wolpne, George Albert

Search  IT Group

IT Group Portfolio Program **Project** Phase Customization

You are here: [Home](#) > [Online Tracker](#)

**Project**

[View Project](#) [View Risks](#)

Project Name	Online Tracker	Program Name	Accounts
Defects	Payroll	IT Group Name	HP IT Group
<b>Risks</b>	Number of High Exposure Materialised Risks	2	Number of High Exposure Open Risks 2
Issues	Number of High Exposure Closed Risks	1	Number of Medium Exposure Materialized Risks 3
Process Compliance	Number of Medium Exposure Open Risks	4	Number of Medium Exposure Closed Risks 1
Performance Parameters	Number of Low Exposure Materialised Risks	2	Number of Low Exposure Open Risks 0
Dashboard	Number of Low Exposure Closed Risks	1	

[View Project](#)  
[Edit Project](#)  
[Defects](#)  
[Risks](#)  
[Issues](#)  
[Process Compliance](#)  
[Performance Parameters](#)  
[Dashboard](#)  
[Threshold Limits](#)  
[Historical Data](#)  
[What If Scenario](#)

### 8.1.7. VIEW ISSUES PAGE

**MMS** Welcome, George Albert Change Password Logout

Search:  IT Group

**IT Group** **Portfolio** **Program** **Project** **Phase** **Customization**

You are here: [Home](#) > [Online Tracker](#)

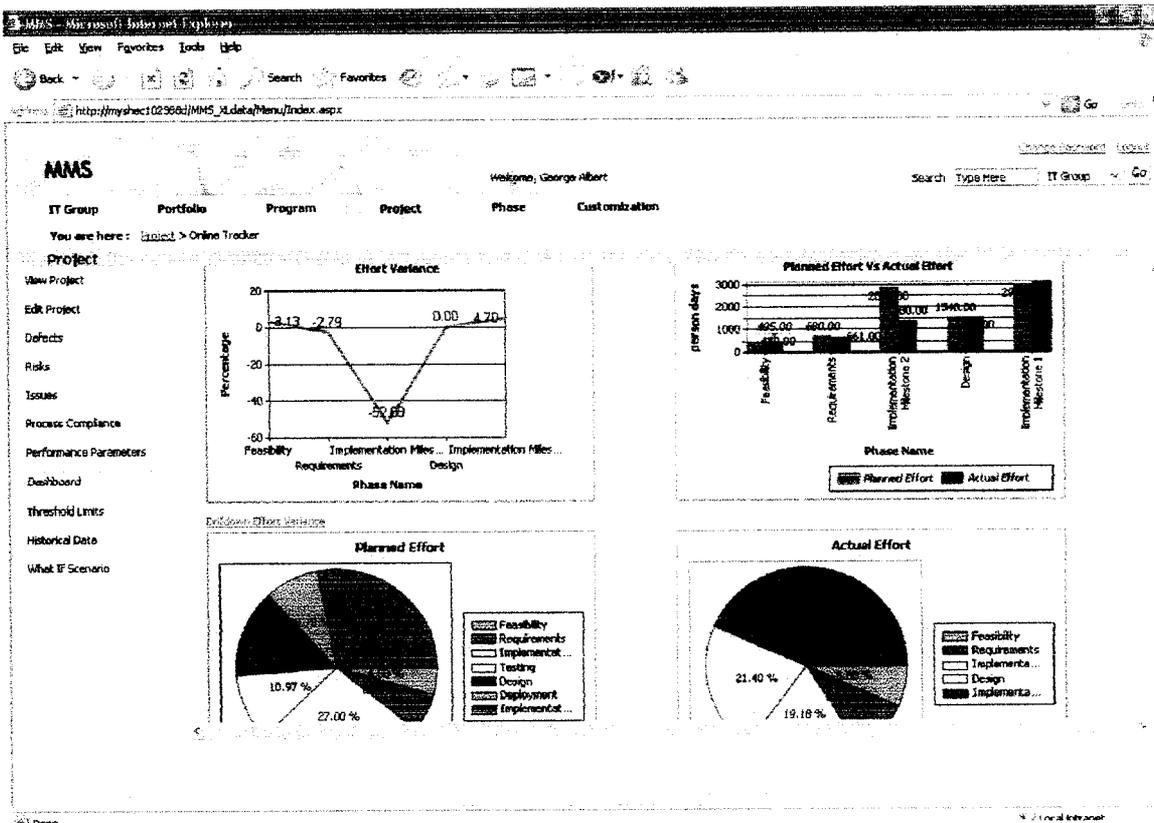
**Project**

- [View Issues](#)
- [Edit Project](#)
- [Defects](#)
- [Risks](#)
- [Issues](#)
- [Process Compliance](#)
- [Performance Parameters](#)
- [Dashboard](#)
- [Threshold Limits](#)
- [Historical Data](#)
- [What If Scenario](#)

Online Tracker	Program Name	Accounts
Portfolio Name	Payroll	HP IT Group
Number Of High Impact Open Issues	2	Number Of High Impact Closed Issues 1
Number Of Medium Impact Open Issues	2	Number Of Medium Impact Closed Issues 2
Number Of Low Impact Open Issues	2	Number Of Low Impact Closed Issues 0



### 8.1.9. DASHBOARD PAGE



## 8.1.10. DRILLDOWN EFFORT VARIANCE PAGE

### Effort Variance - Microsoft Internet Explorer

#### Effort Variance Details

Project Name BMW Car Retail

Name	Planned Effort	Actual Effort	Effort Variance Percentage
Feasibility	483	495	
Requirements	680	651	
Design	1540	1540	
Implementation Milestone 1	2980	3120	
Implementation Milestone 2	2890	1369	

Legend  <=10%  10%-20%  >20%

Close

## 8.1.11. THRESHOLD LIMITS PAGE

MMS - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Print

Address: http://myshec1023062/MMS\_xldata/Menu/Index.aspx

MMS

Welcome, George Albert

Search: Type Here IT Group Go

IT Group Portfolio Program Project Phase Customization

You are here: Project > Online Tracker

Project

View Project

EdR Project

Defects

Risks

Issues

Process Compliance

Performance Parameters

Dashboard

Threshold Limits

Historical Data

What If Scenario

**Threshold Limits**

Program Threshold Limits

	Parameters	Unit	No Risk Limit	High Risk Limit
<input checked="" type="checkbox"/>			Less Than or Equal To	Greater Than
<input checked="" type="checkbox"/>	Schedule Variance	%	Less Than or Equal To	Greater Than
<input checked="" type="checkbox"/>	Cost Variance	%	Less Than or Equal To	Greater Than
<input checked="" type="checkbox"/>	Effort Variance	%	Less Than or Equal To	Greater Than
<input checked="" type="checkbox"/>	Open High Exposure Risks No		Less Than or Equal To	Greater Than
<input checked="" type="checkbox"/>	Open High Impact Issues No		Less Than or Equal To	Greater Than
<input checked="" type="checkbox"/>	Process Compliance	%	Greater Than or Equal To	Less Than

Note: Deselect checkboxes to edit the respective fields Any value within No Risk Limit is green. Any value between No Risk Limit and High Risk Limit is amber

Remarks

Preview Reset

### 8.1.12. WHAT-IF-SCENARIO PAGE

**MMS** - Microsoft Internet Explorer  
 File Edit View Favorites Tools Help  
 http://myshec102398d/MMS\_MLdata/Menu/index.aspx  
 Welcome, George Albert  
 Search Type Here IT Group Go

**IT Group Portfolio Program Project Phase Customization**

You are here: Project > Online Tracker

**Project**

View Project  
 Edit Project  
 Defects  
 Risks  
 Issues  
 Process Compliance  
 Performance Parameters  
 Dashboard  
 Threshold Limits  
 Historical Data  
 What If Scenario

What If Scenario				
Defects	37620.00	37656.00	0.1489 %	Calculate
Risks	26-Jul-2007	15-Oct-2007	28.0488 %	Calculate
Issues	7030	7030	0 %	Calculate

Done Local Intranet

## **CHAPTER IX**

### **REFERENCES**

#### **9.1. WEBSITES**

- [www.google.com](http://www.google.com)
- [www.dotnetspider.com](http://www.dotnetspider.com)
- [www.codeproject.com](http://www.codeproject.com)
- [www.w3schools.com](http://www.w3schools.com)
- [www.wikipedia.com](http://www.wikipedia.com)