

TOTAL INDUSTRIAL ENGINEERING

Submitted by

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

MASTER OF SCIENCE

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
KUMARAGURU COLLEGE OF TECHNOLOGY
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CERTIFICATE



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TUV
MANAGEMENT SYSTEMS

CERTIFICATE

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“TOTAL INDUSTRIAL ENGINEERING”

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TO WHOMSOEVER IT MAY CONCERN

We are pleased to issue this certificate in the process of operationalising our
"Industry- Institute interaction synergy" drive.

Name of Student : **K. SRINITHYA**

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Area of Project : **TOTAL INDUSTRIAL ENGINEERING**

Project imparted at : **Information System**

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Performance : **Good**

Conduct / Decorum : **Good**

For **PREMIER INSTRUMENTS & CONTROLS LTD.,**



ANTHONY THIAGARAJAN
DY. MANAGER - HRD

DECLARATION

Dedicated To
My Beloved
Parents

ACKNOWLEDGEMENT

ACKNOWLEDGEMENT

With heartfelt gratitude to lord almighty I wish to express my sincere thanks to **Dr. K. K. Padmanaban**, Principal, **Prof. S. Thangaswamy**, Head Of the Department-Computer Science and Engineering, **Mr. Dinesh Ranganathan**, Course co-ordinator Department of Computer Science and Engineering, KUMARAGURU COLLEGE OF TECHNOLOGY, Coimbatore for providing the opportunity to undertake this project.

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SYNOPSIS

SYNOPSIS

The project work entitled “**TOTAL INDUSTRIAL ENGINEERING**” has been developed at **PREMIER INSTRUMENTS AND CONTROLS LIMITED, Coimbatore.**

The software has been developed using **SQL Server 7.0** as back end and **VISUAL BASIC 6.0** as front end. The application is developed to computerize the processes involved in Total Industrial Engineering. The aim of Total Industrial Engineering is to find the Overall Equipment Efficiency factor accurately for each and every machine in various departments of each plant in the company.

The company has four plants, which has various departments in which there are various types of machines. The machines are used in such a way that the production is maximum within the specified time period. The details about the machines such as to which department it belongs, their gross available time, idle time, down time, planned down time, standard time, production quantity, rejection quantity and details about the employees in that particular department of the plant are entered as inputs. These are maintained in various tables. The processing of the various time are done through various formulas accordingly and reports are generated as per the requirements.

The system is well designed so that by having proper inbuilt system controls, the possibility of the unavoidable system failures has been considerably reduced. The system provides extensive reports to help take decisions based on them by the user. The reports generated for the project are daily wise, weekly wise, Monthly wise reports. The system is online, menu driven, multi-user and user friendly.

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INTRODUCTION

INTRODUCTION

ORGANIZATION PROFILE

PRICOL commenced operations in 1975 in precision engineering field of automotive instruments & continues to be the market leader with 58% share in India. In 1985, Pricol entered into a technical collaboration with M/s N. S. International Ltd. USA (a subsidiary of Nippon Seiki Co. Ltd., Japan) for up gradation of technology for two-wheeler instruments and in 1991-92, entered into a technical collaboration with Denso Corporation (formerly known as Nippondenso Co Ltd., Japan, for up gradation of technology for four-wheeler instruments. In 1996, Pricol again entered into technical collaboration with M/s. Nippon Seiki Co. Ltd., Japan, for the development of instruments and accessories for Honda EK car. In 1997, M/s. Denso Corporation, Japan, joined Pricol as a partner with 12.5% Equity. Pricol's R & D is government-recognized.

PRODUCTS

Pricol offers varied product ranges like,

- Automotive Dashboard Instruments and accessories for two-wheelers, three-wheelers, four-wheelers, commercial vehicles, tractors, earth-moving equipments and industrial applications.
- Programmable Electronic Speedometers and tachometers, mechanical speedometers, mechanical and electrical pressure gauges, ammeters, Electronic RPM meters.

EXPORTS

PRICOL exports about 10% of its turnover to the Mexico, South America, Europe, USA, Turkey, Egypt, Middle East Asia, Australia, and Newzeland. Prickle spends, on an average 3.33% of its turnover on R & D.

PLANT DETAILS

- Plant I was established at Coimbatore, Tamilnadu, India in 1975.
- Plant II at Gurgaon near NewDelhi, India was established in 1988 to cater to the needs of the OEM customers in North India.
- Plant III and Plant IV were established at Coimbatore, Tamilnadu, India in 1999 for rationalizing at New Delhi, Kolkatta, Mumbai and Chennai.

ACHEIVEMENTS

PRICOL is the first auto ancillary in the whole of India to be awarded the ISO 9001 certificate by BVQI, UK. Pricol is certified for QS 9000 since December 2001.

QUALITY POLICY

Strive for excellence in all we do through socially and environmentally acceptable means. Pricol's broad aim is to achieve international standards but also provides engineering solutions to suit customized equipments.

1.1 PURPOSE

The project work entitled “Total Industrial Engineering” is a modular system developed to calculate the Overall Equipment Efficiency (OEE) of each and every machine in various departments of the company. Every concern will be interested in utilizing the available facility to maximum extent without any inconvenience. Maximum production is expected from each and every machines within the specified time period. The machine should run well in order to achieve the required production and to attain the maximum profit. Overall Equipment Efficiency is the factor, which is to be calculated for each and every machine in order to know how far the machine is efficient to give good production within the specified time period.

The OEE factor calculation shows the machines efficiency and production. The organization from which they purchase the machine will give details about the machine like total production capacity of the machine within the specified time and other specifications about the machines. So in PRICOL labours take in charge in calculating the OEE factor in order to know whether the machine is efficient to the specified extent or not. If not they would service the machine or replace the machine according to its progress.

Since the existing system is a manual the OEE factor calculated is not accurate and highly labour oriented. The entire calculations are stored in documents, hence maintenance is tedious. Also manual system lacks data security and can be easily tampered. The whole existing system lacks in higher accuracy, Quick calculations and time factor. At any instance generation of reports is time consuming.

To solve these problems and overcome the hurdles of existing system, the entire flow are brought into customized and computerized “Total Industrial Engineering”.

1.2 SCOPE

The main objective of the proposed system is to provide an efficient and effective system. The system develops processed data very quickly to relieve users from tedious calculations and can easily retrieve information. The “Total Industrial Engineering “is developed to computerize the calculation of Overall Equipment Efficiency of the machine in an accurate manner.

The general objectives of the system are as follows.

- ✓ To provide data security against unauthorized access.
- ✓ To provide the user with data entry screens that can be easily understood.
- ✓ To better utilize the time.
- ✓ To make code generation easier.
- ✓ To generate reports as per the requirements of the user.
- ✓ To ensure accuracy and consistency of data.
- ✓ To update database constantly without any users command.
- ✓ To provide adequate backup facilities to avoid data losses.

Advantages of the proposed system

- ✓ Graphical user interface.
- ✓ Data consistency is maintained.
- ✓ Once masters are defined and codified, look up table is provided for selection and hence avoiding the code to be entered again and again.
- ✓ User need not remember codes.
- ✓ Facilitates multi-user environment.
- ✓ Supports Multi-years operations.
- ✓ Provide more accurate information updated as and when required.

1.3 DEFINITIONS

LANGUAGE DESCRIPTION

VISUAL BASIC 6.0

Visual Basic 6.0 is an Integrated Development Environment (IDE) using which we can develop, execute, test and debug the application. The “Visual” part refers to the method used to create the Graphical User Interface (GUI). Rather than writing numerous lines of code to describe the appearance and location of interface elements, pre-built objects can be placed on the screen. Visual Basic has evolved from the original BASIC language and now contains several hundred statements, functions and keywords, many of which relate directly to the windows GUI.

Visual Basic 6.0 is specifically designed to utilize the internet. It comes with several controls that allows to create Web-based applications, called ActiveX executables.

Visual Basic is a highly successful and powerful front-end tool.

The key features of VB are:

- User-friendliness.
- Easier comprehension.
- Faster application development.
- Introduction to ActiveX technology and Internet features.

Meeting the challenge of Graphical Application

GUI environment generally make computing make computing easier for the user. But these environments create new challenges for developers, who must think visually, write code that responds to events, and anticipate how users will interact with applications. Visual Basic helps the user to think visually because it enables the user to view objects just as the user wants them to appear to the application user.

Visual Basic Environments

Visual Basic is unlike any programming language, in which step by step processing is carried out, but Visual Basic uses Event Driven approach that enables the user to share computing time and other resources. The implications of Event Driven approach are that an application consists of objects that wait for particular event to happen. In other words, Visual Basic code does not work in linear fashion of DOS (Top-Down approach) starting at top, proceeding towards the bottom, and finally stopping. Instead in the Event driven programming, the code remains idle until called upon to respond to specific user-caused or system-caused actions.

While your application is waiting for some event happen, it remains in the environment. In the meantime, the user can run some other applications, resize windows or customize system setting like color.

Parts of VB Project

Standard VB projects usually contain 3 types of items –global items, forms, and modules.

Forms

Forms acts as templates. VB also supports Multiple Document Interface (MDI) forms as well as a number of predefined forms.

Modules

Collection of code and data that function something like object in OOPs. The point behind modules is to enclose procedures and data in a way that hides them from the rest of the program. VB also supports class modules.

Global items

Global items are accessible to all modules and forms in a project as we declare them with the public keyword.

The Visual Basic Interface

Visual Basic 6.0 interface is a Multiple Document Interface (MDI). Several windows open, but only within a main window.

The other key features of the Visual Basic 6.0 interface include the following:

- Standard EXE
- ActiveX EXE
- ActiveX DLL
- VB Application Wizard
- VB Wizard Manager
- Data Project
- IIS Application
- Add-In
- ActiveX Document DLL
- ActiveX Document EXE
- DHTML Application
- VB Enterprise Edition Controls

SQL SERVER 7.0

SQL is a data sublanguage used to organize, manage and retrieve data from a relational database, which is managed by a relational database management system (RDBMS). Using SQL one can create and maintain data manipulation objects such as tables, views, sequences etc.

- SQL sentences that are used to create objects are called Data Definition Language (DDL).
- SQL sentences that are used to manipulate objects are called Data Manipulation Language (DML).
- SQL sentences that are used to control objects are called Data Control Language (DCL).
- SQL Server Query Analyzer is a graphical tool that allows us to:
 - Edit and author SQL scripts and queries.
 - Query Microsoft SQL Server databases.
 - View a graphical representation of a query's (estimated) execution plan.
 - Return query results to a grid or text.
 - Perform index analysis.
 - Retrieve Transact – SQL syntax help.
 - View statistics information about an executed query.
 - Execute multiple Transact – SQL scripts or stored procedures.

SQL Server is a client server relational database management system (RDBMS) that uses structured query language. A database software is responsible for enforcing the structure of the database including.

- Maintaining the relationship between the data in the database.
- Ensuring that the data is stored correctly, that the rules defining the relationship between the data are not violated.
- Recovering all data to a point of known consistency in case of system failure.

ACRONYMS

P.No	-	Project Number
P.Dt	-	Production Date
Proj.Dt	-	Project Date
GAT	-	Gross Available Time
ADT	-	Allotted Down Time
NAT	-	Net Available Time
DT	-	Down Time
RT	-	Running Time
AV	-	AVailability
IT	-	Idle Time
OT	-	Operating Time
US	-	USability
PQ	-	Production Quantity
ST	-	Standard Time
PE	-	Performance Efficiency
QR	-	Quality Rate
RQ	-	Rejection Quantity
OEE	-	Overall Equipment Efficiency

1.4 OVERVIEW

The “Total Industrial Engineering” provides facility to calculate the Overall Equipment Efficiency for the machines. There are three stages in achieving OEE factor accurately.

The first stage is inputs. A list of inputs are entered through forms. Validation checks are performed at each and every stage. The next stage is processing of the inputs through various formulas. The final one is the output that is the OEE factor, which is calculated in the processing stage, is shown as output as per the users requirements.

The system is well designed so that by having proper inbuilt system controls. The system provides extensive reports to help take decisions based on them by the user.

The system provides a complete security such as each user will have user-id and password provided by the administrator. Hence unauthorized access is restricted. So it provides a complete security over the system.

GENERAL DESCRIPTION

2.1 PRODUCT FUNCTIONS

The task of the product “Total Industrial Engineering” is to build an application that enables to calculate Overall Equipment Efficiency (OEE) factor accurately without any loss of data and better utilize the available time.

“Total Industrial Engineering” process

- When the product is executed first there appears a dialog box in which the user enter the product key and click the ‘ok’ button.
- Next appears another dialog box in which the user need to enters the database information such as driver name, server name, database name, userid and password. Validations are done at each and every step of process. When the user clicks ‘ok’, if the data provide above are correct, the user enters into another form which is pass through form where he need to enter his userid, password and date to logon into the main screen. On clicking ‘ok’ the user enters into the Main screen i.e. menu editor.
- There are six main menus provided for the product to function. They are Masters, Transactions, Reports, Housekeeping, Windows and Exit.
- The master menu contains seven master tables, the transaction menu contains ten transaction tables, the report menu contains four report views, the housekeeping menu contains the OEE calculation form and finally the exit menu has two options such as logoff or quit.
- The input data are entered into the masters and transactions for processing.

- After entering the data the user needs to click the housekeeping menu and choose OEE calculation in order to calculate the Overall Equipment Efficiency (OEE) factor. This option will calculate the OEE factor.
- To view the reports generated for OEE calculation the user should click the reports menu in which they are categorized into four options namely Daily_OEE, Weekly_OEE, and Monthly_OEE and chart view for weekly OEE.
- After viewing the reports, hardcopy or softcopy of the reports can be taken as per the requirements by the user.
- The windows menu shows currently which are all the forms selected.
- Finally the user goes to exit where there are two categories - quit or logoff.

2.2 USER CHARACTERISTICS

Training is given to all the users. The training varies from one user to another user depending upon the information pertaining to the user, whereas data entry operator needs only information on how to key in suitable data.

Training comes after education. The most important task to be learnt by the user is how to get into and out of the system at any point of time. The training should include everyone associated with the implementation, operation or maintenance of new system. Hands on training to the company staff are essential to make them comfortable with the system.

The more the user can do know their own, the easier it will be for them to use the application. If the user can teach themselves it can serve to give them greater confidence in their ability to use the application and so therefore they will feel more at ease using it.

2.3 GENERAL CONSTRAINTS

- The user-id and password are unique for each and every user who login into the system so that illegal access is prohibited.
- The user is allowed to change only their password.
- Only administrator has rights to access the user level form.
- The data entry operator has rights only to key in the data and has no rights to modify the data.
- The rights are given to the users depending upon the user levels whether he/she is administrator or data entry or others.

SPECIFIC REQUIREMENTS

3.1 FUNCTIONAL REQUIREMENTS

3.1.1 INTRODUCTION

Database design is the basic functional requirement with which the system can be maintained. It includes input design, output design and database design. The database design in this system incorporates seven master tables and ten transaction tables.

Master Tables

A master table is a collection of records about the important aspect of organization activities. They are permanent and exist as long as the system exists.

The Masters used in this system are:

- Plant Table
- Department Table
- Employee Table
- Idle Time Losses Table
- Down Time Losses Table
- Machine Table
- Userlevel Tables
 - Treeview
 - Userlevel
 - Password

Transaction Tables

A Transaction Table is a table which accumulates data about event as they occur and updation in master table is reflected in the transaction table.

The Transactions Tables used in this system are:

- Total Production Main Table
- Small Group Activities Table
- Tpm Members Implementation Table
- Internal Trainer Table
- Driving Committee Member Table
- Theoretical Cycle Time Table
- Production Details Table
- Down Time Table
- Idle Time Table
- Planned Down Time Table

3.1.2 LIST OF INPUTS

MASTER TABLES

DEPARTMENT

- 1. DEPT_NO*
- 2. DEPT_NAME*

PLANT

- 1. PLANT CODE*
- 2. PLANT DESCRIPTION*

IDLETIME

- 1. IDLE_NO*
- 2. IDLE_DESC*

DOWNTIME

- 1. DOWN_NO*
- 2. DOWN_DESC*

MACHINE

- 1. MACHINE_CODE*
- 2. MACHINE_DESC*

EMPLOYEE

- 1. DEPT_NO*
- 2. EMP_NO*
- 3. EMP_NAME*

USER LEVEL INPUTS

- 1. USER_LEVEL*
- 2. ULEVEL_NAME*
- 3. USERID*
- 4. USERNAME*
- 5. PASSWORD*

TRANSACTION TABLES

TPM_MAIN

1. *PROJECT_NO*
2. *PROJECT_DATE*
3. *PROJECT_NAME*
4. *TEAMLEADER_NO*
5. *PLANT_CODE*
6. *MACHINE_CODE*
7. *GROSS_AVAILABLE_TIME*

SMALL_GRP_ACT

1. *PROJECT_NO*
2. *PROJECT_DATE*
3. *GRP_DEPT_NO*
4. *GRP_EMP_NO*

TPM_MEMBERS_IMPLN

1. *PROJECT_NO*
2. *PROJECT_DATE*
3. *IMPLN_DEPT_NO*
4. *IMPLN_EMP_NO*

INTERNAL_TRAINER

1. *PROJECT_NO*
2. *PROJECT_DATE*
3. *INTERNAL_DEPT_NO*
4. *INTERNAL_EMP_NO*

DRIVE_COMMITTEE

1. *PROJECT_NO*
2. *PROJECT_DATE*
3. *DRIVE_COMMITTEE_NO*

THEORY_TIME

1. *PROJECT_NO*
2. *PRODUCTION_DATE*
3. *SHIFT_CODE*
4. *PROD_QTY*
5. *REJECT_QTY*
6. *DEPT_NO*
7. *EMP_NO*

DOWNTIME

1. *PROJECT_NO*
2. *DOWN_DATE*
3. *DOWN_NO*
4. *DOWNTIME*

IDLETIME

1. *PROJECT_NO*
2. *IDLE_DATE*
3. *IDLE_NO*
4. *IDLE_TIME*

PLANNED_DOWNTIME

1. *PROJECT_NO*
2. *DOWN_NO*
3. *ALLOTED_DOWNTIME*

The formulas used to calculate Overall Equipment Efficiency are

A Gross Available Time (GAT)

B Planned DownTime (PDT)

C Net Available Time (NAT) = GAT - PDT

D DownTime Losses (DT)

E Running Time (RT) = NAT – DT

F Availability (AV) = (NAT - DT/NAT) * 100

G IdleTime (IT)

H Operating Time (OT) = RT-IT

I Usability (US) = ((RT – IT) / RT) * 100

J Production Quantity (PQ)

K Standard Time (ST)

L Performance Efficiency (PE) = (PQ * ST) / OT

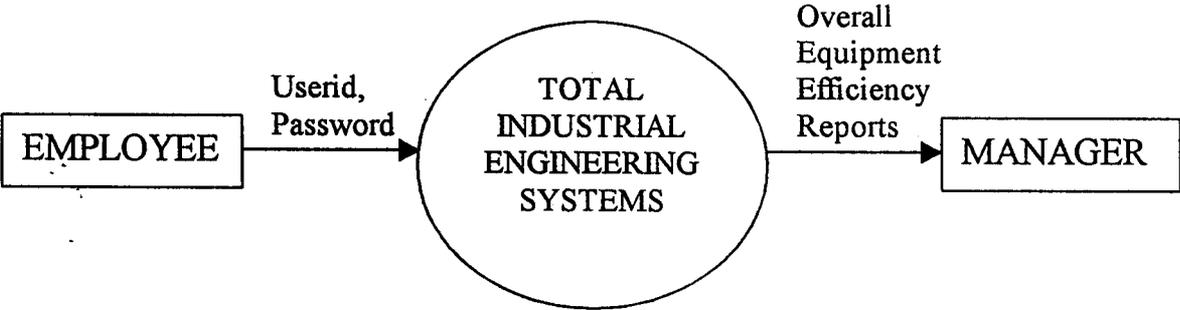
M Rejection Quality (RQ)

N Quality Rate (QR) = ((PQ – RQ) / PQ) * 100

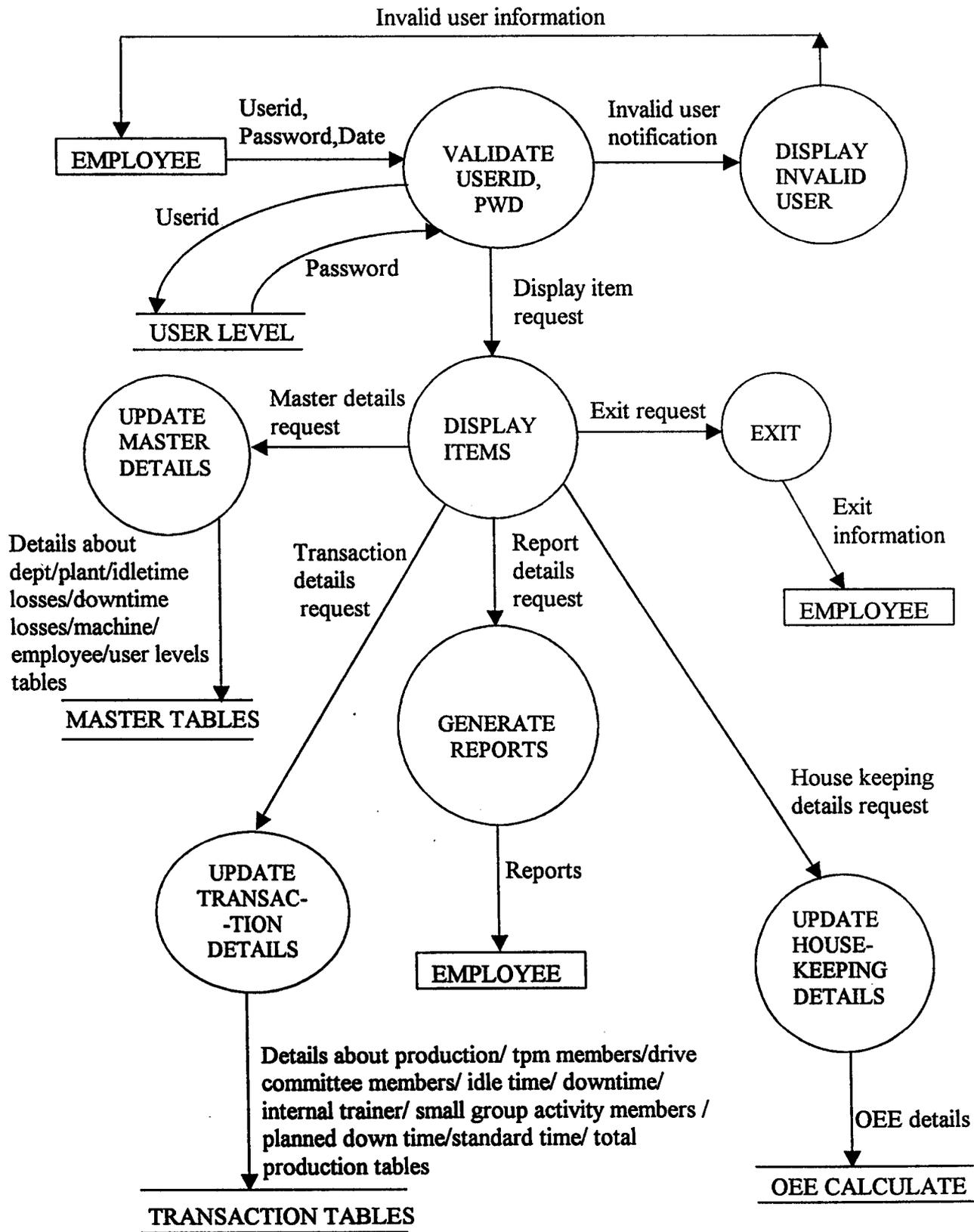
O Overall Equipment Efficiency

$$OEE = ((AV/100) * (US/100) * (PE/100) * (QR/100)) * 100$$

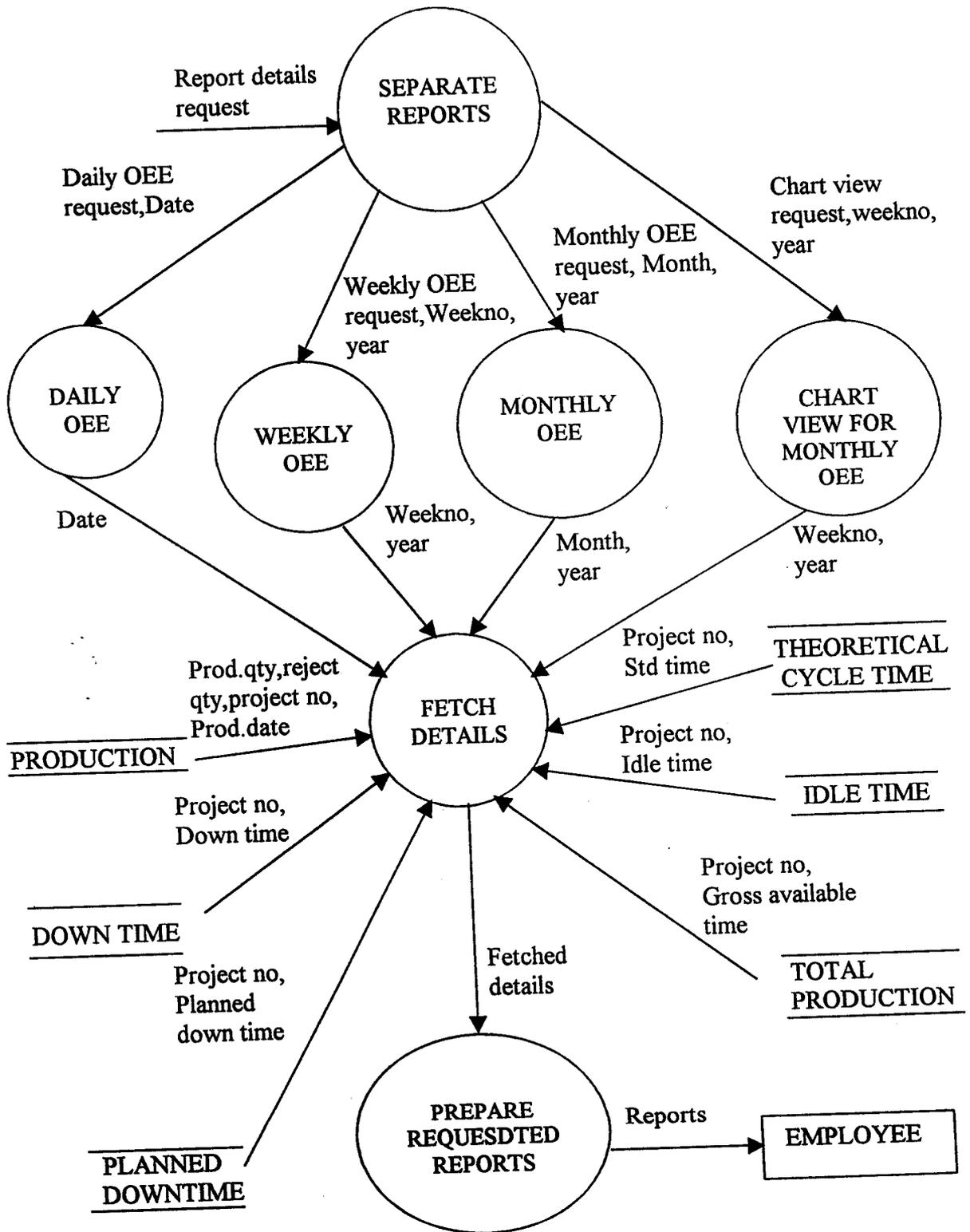
3.1.3 INFORMATION PROCESSING REQUIRED



DATA FLOW DIAGRAM – LEVEL 0



DATA FLOW DIAGRAM – LEVEL 1



LEVEL 2 – DFD FOR REPORT GENERATION

3.2 PERFORMANCE REQUIREMENTS

3.2.1 SECURITY

Security is a critical stage in system development. Any system developed should be secured and protected against possible hazards. A software project without security is useless. Security measure will be provided to prevent unauthorized access of the database at various levels. An uninterrupted power supply should be provided so that the power failure or voltage fluctuations will not erase the data in files.

Every system must provide feature for security and integrity of data. Without safeguards against access, embezzlement, fire and natural disasters system could be so vulnerable as to threaten the survival of the organization.

Password protection and simple procedures will be provided to the users. The system allows the user to enter only through login utility. The user will have to enter the user-id and password.

The user-id and password are validated according to the data available in the user level table. If the user-id and password does not match any of the entries in the records, then the user is warned with a message box. If user-id and password matches then it will connect to the entire system.

The overall security aspects must be kept in mind, so that the valuable data of the system as it plays an important role in data maintenance by

- Giving passwords to various users.
- Creating permissions on the database so that no one can modify the data.

The keying of errors or mistakes of the end users are checked by giving validation checks and messages for each entry. The login level and passwords provide security for the system as a whole importance. Thus stealing of unauthorized data should be restricted, granting access to specific users will give a high range of security to the database.

3.2.2 AVAILABILITY

The system in which the project is to be implemented should have already installed with Visual Basic 6.0 and SQL Server 7.0. Once the project implemented in a system it is available in an elegant manner to all the users with general constraints. The project helps the user to input their data in an efficient manner and the given input is stored in the Structured Query Language(SQL) database connected through Remote Data Object (RDO) in Visual Basic and after processing, the output is available in the form of reports and chart view.

3.2.3 CAPACITY

The “TOTAL INDUSTRIAL ENGINEERING” has a full fledged capacity because it can hold numerous amount of data in the backend Structured Query Language (SQL).

3.2.4 RESPONSE TIME

The response time depends upon the system configuration and the way in which the user access the application.

3.3 DESIGN CONSTRAINTS

3.3.1 STANDARD COMPLIANCE

The level of excellence required by the organization in calculating the Overall Equipment Efficiency factor express dissatisfaction when done manually. The real cause for the compliance of the existing system in the organization includes various calculations that are done manually to find the Overall Equipment Efficiency factor for each and every machine is not accurate. Also the Overall Equipment Efficiency factor derived manually has some other compliances like the process of calculations are very tedious. Maintaining data is also a difficult task and highly labour oriented. The existing system lacks in higher accuracy, quick calculations and time factor. The existing system has to be enhanced further by going in for an automated computerization.

3.3.2 HARDWARE LIMITATIONS

Processor	:	Pentium III
RAM Main memory	:	128 MB
Hard Disk Drive	:	20GB
Floppy Disk Drive	:	1.44MB
Keyboard	:	110 Keys
Operating System	:	Windows ME
Clock Speed	:	869 MHz
Monitor	:	15" Color Monitor
Mother Board	:	810 Chipset Mother Board
CD Rom	:	52x CD Rom Drive

SOFTWARE LIMITATIONS

Front end	:	Visual Basic 6.0
Back end	:	SQL Server 7.0
Operating system	:	Any Windows platform

3.3.3 EXTERNAL INTERFACE REQUIREMENTS

External interfaces are not required by the system. The product works well with the required software installed in the system without any compliance. The system is well designed so that by having proper inbuilt system controls, the possibility of any unavoidable system failures has been considerably reduced. So the external interfaces are not required by this application.

3.3.4 HARDWARE INTERFACES & SOFTWARE INTERFACES WITH OTHER SYSTEMS

Hardware interfaces and software interfaces with other systems are not required by this application. The software environment Visual basic 6.0 interface is a Multiple Document Interface (MDI) as already specified in the language description. So the hardware interfaces and software interfaces with other systems are not required.

3.4 OTHER REQUIREMENTS

3.4.1 OPERATIONS REQUIRED BY THE USER

- The user enters into the system with the userid, password and date. If the userid and password are correct then the user enters into the next stage.
- Validations are performed at each and every step of process.
- Menu editor appears in which there are menus like masters, transactions reports, housekeeping, windows and exit.
- The user chooses the menus for processing based on the user levels.
- He/She may enter the data into the master and transaction forms and processing is done on clicking the OEE Calculation in the Housekeeping menu and proceeds.
- Various types of reports are generated on daily, weekly and monthly basis. The chart view for the weekly OEE Calculation is also provided.
- To view the daily report the user should enter the date and year for which day the report is to be generated.
- To view the weekly report the user should enter the week no and corresponding year for which week the report should be generated.
- To view the Monthly report the user should choose the month from dropdown combo and enter the year of the month for which the report is to be generated.

- To view the chart for weekly OEE the user should enter the week no and year for which the chart is to be generated. On entering these values the corresponding project no and machine no appears if present for that particular week in that year. Then the chart is viewed.
- Finally for exit there are two options in which the user may quit from the system or change user by log off.

3.4.2 SITE ADAPTATION REQUIREMENTS

The project can be executed on any windows platform with the specified front end and backend tools. The software platform is totally compatible and the database can be easily ported among them.

CONCLUSION

CONCLUSION

The system was successfully developed to fully satisfy the objective of the application. The system was tested with real data during the months and all the reports were successfully taken and were found to satisfy the needs of the concern. A good amount of the user-friendly GUI features have been incorporated and it is possible for anyone to exploit these features to get maximum benefit.

The system takes care of effective storage and retrieval of information as and when the information is supplied and needed respectively. It provides eases of entry for the user. It makes necessary validations thus making data, error – free. The system performs the right procedures properly, presents information in an acceptable and effective way, produces accurate results, and provides an acceptable interface and a method of interaction, perceived by users as a reliable system.

SYSTEM DEVELOPMENT

FUTURE ENHANCEMENTS

SYSTEM DESIGN

BIBLIOGRAPHY

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2. Denise Santro and Gary Masters, "Visual Basic 6 Complete", BPB Publications, 1999.
3. John Fronckowiak, "Microsoft SQL Server 7.0 Administrator's companion", Prentice-Hall of India Private Limited, 2001.
4. "Microsoft Developer Network CD-ROM" – October 2000 Issue.

WEBSITES

www.sybex.com

www.microsoft.com

APPENDIX-A

DATABASE DESIGN

TABLE DESCRIPTION

MASTER TABLES

Table Name : Department

Field Name	Data Type	Size	Attributes	Description
Dept_no	Numeric	10	Primary key	Department number
Dept_name	Varchar	60	Not null	Name of the department

Table Name : Machine

Field Name	Data Type	Size	Attributes	Description
Machine_code	Varchar	10	Primary key	Machine Code
Machine_desc	Varchar	60	Not null	Name of the machine

Table Name : Plant

Field Name	Data Type	Size	Attributes	Description
Plant_code	Varchar	1	Primary key	Plant Code
Plant_name	Varchar	30	Not null	Name of the plant

Table name: Idle time losses

Field Name	Data Type	Size	Attributes	Description
Idle_no	Numeric	4	Primary key	Idle Code
Idle_desc	Varchar	60	Not null	Idle time description

Table name: Down time losses

Field Name	Data Type	Size	Attributes	Description
Down_no	Numeric	3	Primary key	Down Code
Down_desc	Varchar	60	Not null	Down time description

Table Name: Employee Master

Field Name	Data Type	Size	Attributes	Description
Dept_no	Numeric	10	Foreign key references dept_no of department master	Department number
Emp_no	Numeric	10	Primary key	Employee number
Emp_name	Varchar	50	Not null	Name of the employee

Table name: Userlevel

Field Name	Data Type	Size	Attributes	Description
Module	Numeric	2	Not null	Modules in the project
Ulevel	Numeric	3	Not null	Level of the user
Ulevel name	Varchar	35	Not null	Name of the User level
Group name	Varchar	50	Not null	Name of the group
Group_flag	Char	1	Not null	Group flag
Form_name	Varchar	50	ForeignKey references form_name of treeview table	Name of the form
Form_flg	Char	1	Not null	Form flag
Add_flg	Char	1	Not null	Addition flag
Mod_flg	Char	1	Not null	Modification flag
Menu_name	Varchar	50	ForeignKey references menu_name of treeview table	Name of the Menu
Sno	Numeric	3	Not null	Serial number

Table name : Password

Field Name	Data Type	Size	Attributes	Description
User_id	Varchar	10	Not null	User identification
User_name	Varchar	35	Not null	Name of the user
User_level	Numeric	5	Not null	Level of the user
Password	Varchar	8	Not null	Password of the user
Module	Numeric	5	FK references module of treeview table	Modules in the project

Table name : TreeView

Field Name	Data Type	Size	Attributes	Description
Module	Numeric	2	Primary key	Modules in the project
Groups	Varchar	50	Not null	No of groups in the project
Form_name	Varchar	50	Primary key	Name of the forms
Menu_name	Varchar	50	Primary key	Name of the Menu
Sno	Numeric	3	Not null	Serial Number for the menus
Add_mod_flg	Char	1	Not null	Addition modification flag

TRANSACTION TABLES

Table Name : Total Production

Field Name	Data Type	Size	Attributes	Description
Project_no	Numeric	5	Primary key	Project Number
Project_date	Datetime	-	Primary key	Project start date
Project_name	Varchar	60	Not null	Name of the project
Teamleader_no	Numeric	10	Not null	Team leader number
Plant_code	Varchar	1	Foreign key references plant_code of plant master	Plant code
Machine_code	Varchar	10	Foreign key references machine_code of machine master	Machine code
Gross_available time	Varchar	8	Not null	Gross available time of the machine

Table Name : Small group activity

Field Name	Data Type	Size	Attributes	Description
Project_no	Numeric	5	Primary key	Project number
Project_date	Datetime	-	Not null	Project start date
Grp_dept_no	Numeric	10	Foreign key references dept_no of employee master	Small group department number
Grp_emp_no	Numeric	10	Foreign key references emp_no of employee master	Small group employee number

Table Name : Tpm members implementation

Field Name	Data Type	Size	Attributes	Description
Project_no	Numeric	5	Primary key	Project number
Project_date	Datetime	-	Not null	Project start date
Impln_dept_no	Numeric	10	Foreign key references dept_no of employee master	Tpm members department number
Impln_emp_no	Numeric	10	Foreign key references emp_no of employee master	Tpm members employee number

Table Name : Internal Trainer

Field Name	Data Type	Size	Attributes	Description
Project_no	Numeric	5	Primary key	Project number
Project_date	Datetime	-	Not null	Project start date
Internal_dept_no	Numeric	10	Foreign key references dept_no of employee master	Internal trainer department number
Internal_emp_no	Numeric	10	Foreign key references emp_no of employee master	Internal trainer employee number

Table Name : Driving Committee member

Field Name	Data Type	Size	Attributes	Description
Project_no	Numeric	5	Primary key	Project number
Project_date	Datetime	-	Not null	Project date
Drive_committee_no	Numeric	10	Not null	Driving committee number

Table Name : Theoretical cycle time

Field Name	Data Type	Size	Attributes	Description
Project_no	Numeric	5	Primary key	Project number
Product_code	Varchar	12	Null	Product code
Std_time	Varchar	8	Not null	Standard time

Table Name : Production Details

Field Name	Data Type	Size	Attributes	Description
Project_no	Numeric	5	Primary key	Project Number
Production_date	Datetime	-	Primary key	Production date
Shift_code	Numeric	1	Primary key	Shift code
Prod_qty	Numeric	18,3	Not null	Production quantity
Reject_qty	Numeric	18,3	Not null	Rejection quantity
Dept_no	Numeric	10	Foreign key references dept_no of department master	Department number
Emp_no	Numeric	10	Foreign key references dept_no of department master	Employee number

Table Name : Idle time

Field Name	Data Type	Size	Attributes	Description
Project_no	Numeric	5	Primary key	Project number
Idle_date	Datetime	-	Not null	Project start date
Idle_no	Numeric	3	Foreign key references Idle_no of idle time losses master	Idle number
Idletime	Varchar	8	Not null	Idle time of a machine

Table Name : Planned down time transaction

Field Name	Data Type	Size	Attributes	Description
Project_no	Numeric	5	Primary key	Project number
Down_no	Numeric	3	Foreign key references down_no of down time losses master	Down number
Allotted_downtime	Varchar	8	Not null	Allotted down time of a machine

Table Name : Down time transaction

Field Name	Data Type	Size	Attributes	Description
Project_no	Numeric	5	Primary key	Project number
Down_date	Datetime	-	Not null	Project start date
Down_no	Numeric	3	Foreign key references down_no of down time losses master	Down number
Downtime	Varchar	8	Not null	Down time of a machine

APPENDIX-B

Welcome to PRICOI - Total Industrial Engineering

Type of User (U), and Password to Log on to PRICOI - Total Industrial Engineering



User ID:

Processing Date:

Password:

Master: Inspections

- 1. Department
- 2. Plant
- 3. Job: Time Losses
- 4. Cross Time Losses
- 5. Metrics

Reports: Hourly Log Window EQ



Department: 1 Purchase

Employee No: 12

Name of the Employee: Ramesh m

User Level

PRICOL - Total Industrial Engin

- Masters
- Department
- Addition
- Modifiers
- Plant
- Idle Time Losses
- Down Time Loss
- Machines
- Employee
- User Levels
- Transactions
- Addition
- Modifiers
- Small Group Act
- Typa Members In
- Internal Trainer

Level: **Show Users**

Name:

edit Modify Before Save

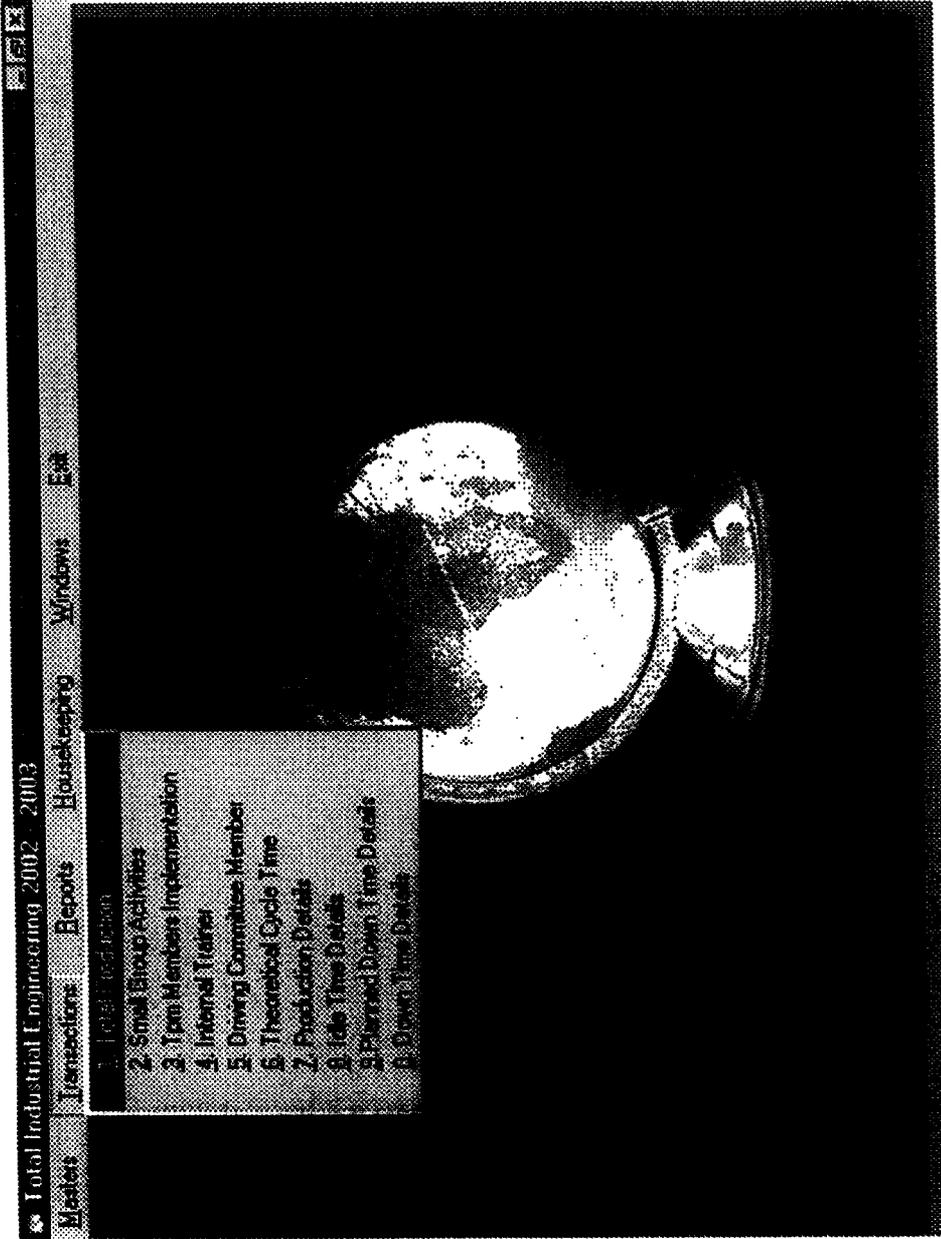
User Id:

User Name:

Password:

Retype Password:

Add Modify Delete Save

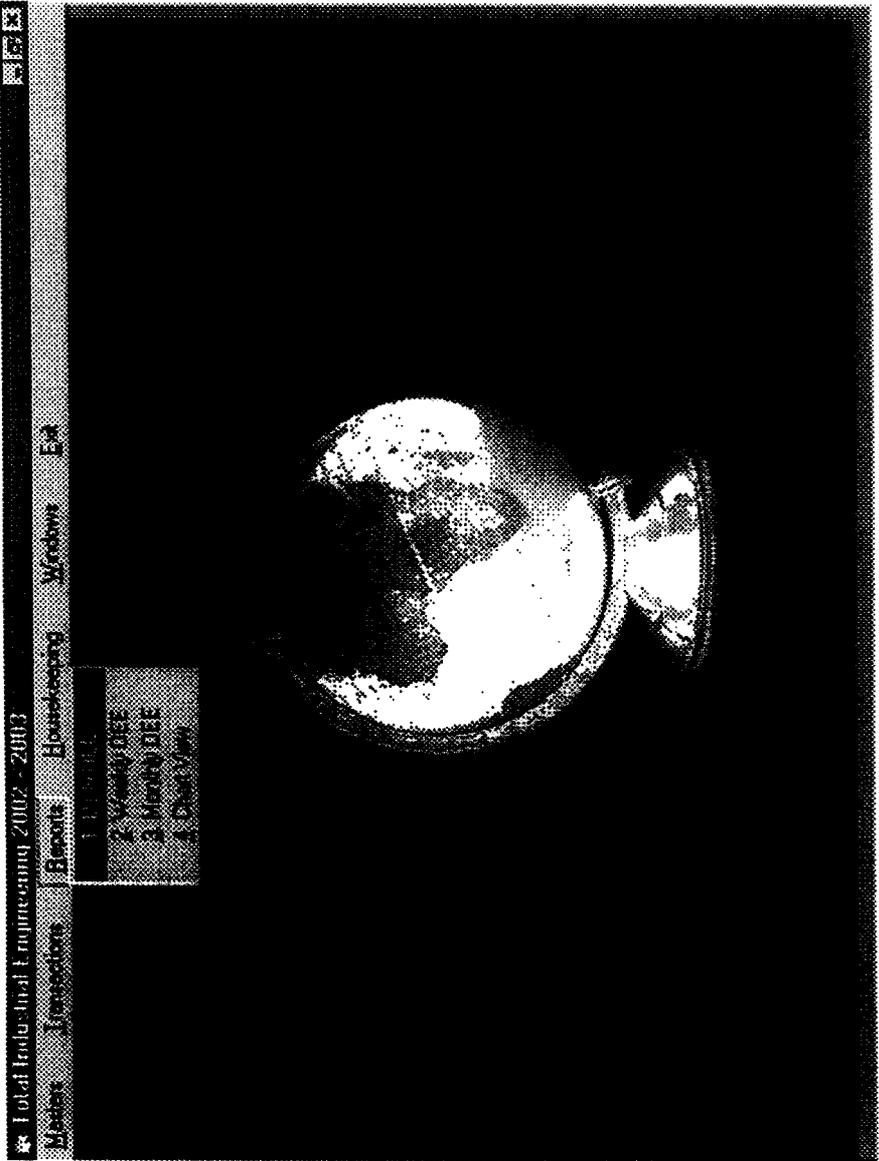


Total Industrial Engineering 2002 - 2003

Master Inspections Reports Housekeeping Windows Exit

- 1. Total Inspection
- 2. Small Group Activities
- 3. Team Members Implementation
- 4. Internal Tester
- 5. Dining Committee Member
- 6. Theoretical Cycle Time
- 7. Production Details
- 8. Idle Time Details
- 9. Planned Down Time Details
- 10. Down Time Details

Date	07/02/2003	Shift Code	1
Project No	2		
Production Qty	10000.000		
Rejection Qty	20.000		
Department	2	Sales	
Employee	12	Capel	



Daily Overall Equipment Efficiency

Date: 03/04/2003

Report Cancel

Monthly Overall Equipment Efficiency

Month: April

Year: 2003

Report Cancel

Weekly Overall Equipment Efficiency

Week: 13

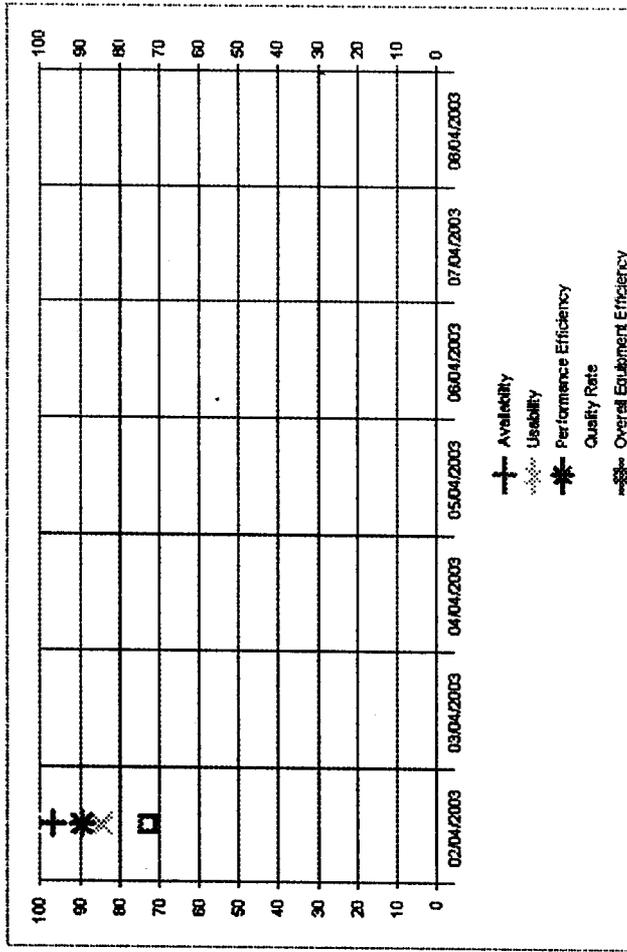
Year: 2003

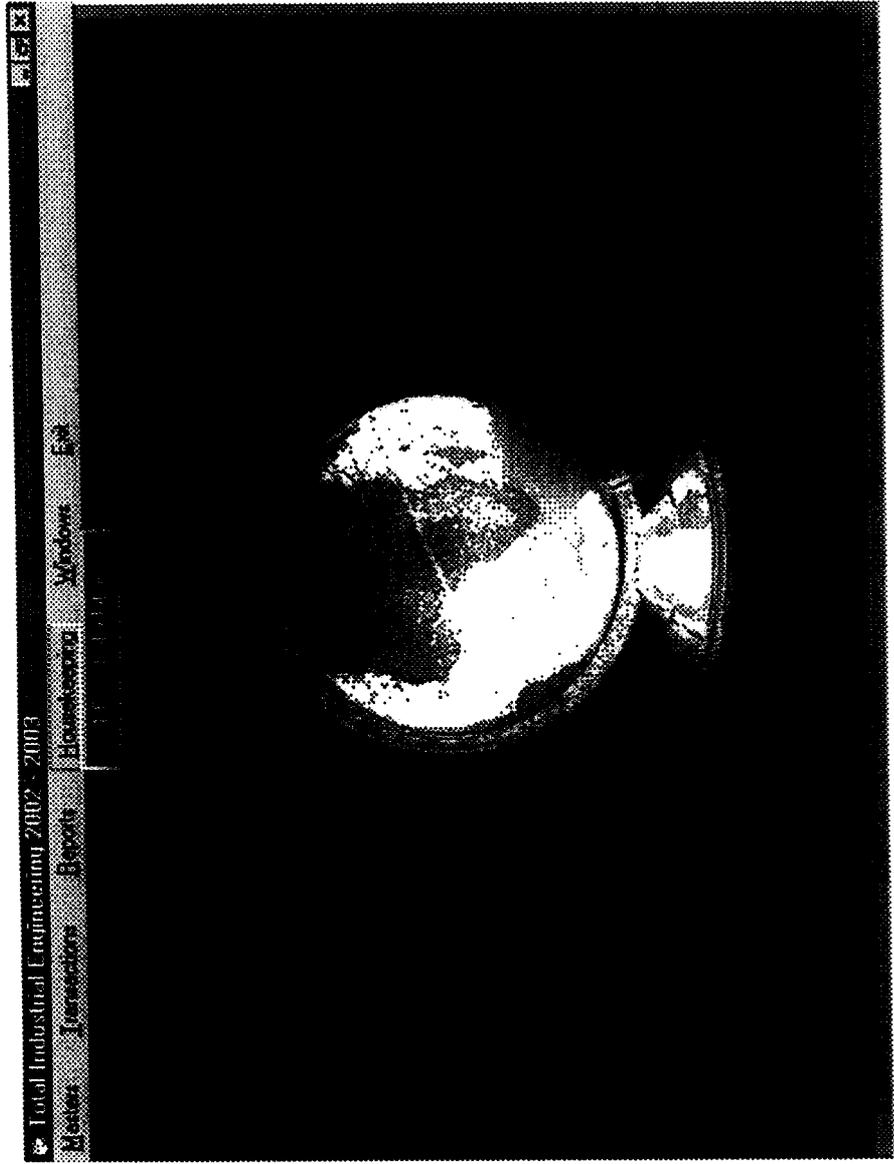
Project: 1

Machine: 01 ----- Mc101

View Detail Report Cancel

OEE Report for the week: 13 From 02/04/2003 To 06/04/2003
 Date: 02/04/2003
 Project No.: 1
 Machine Code: 01

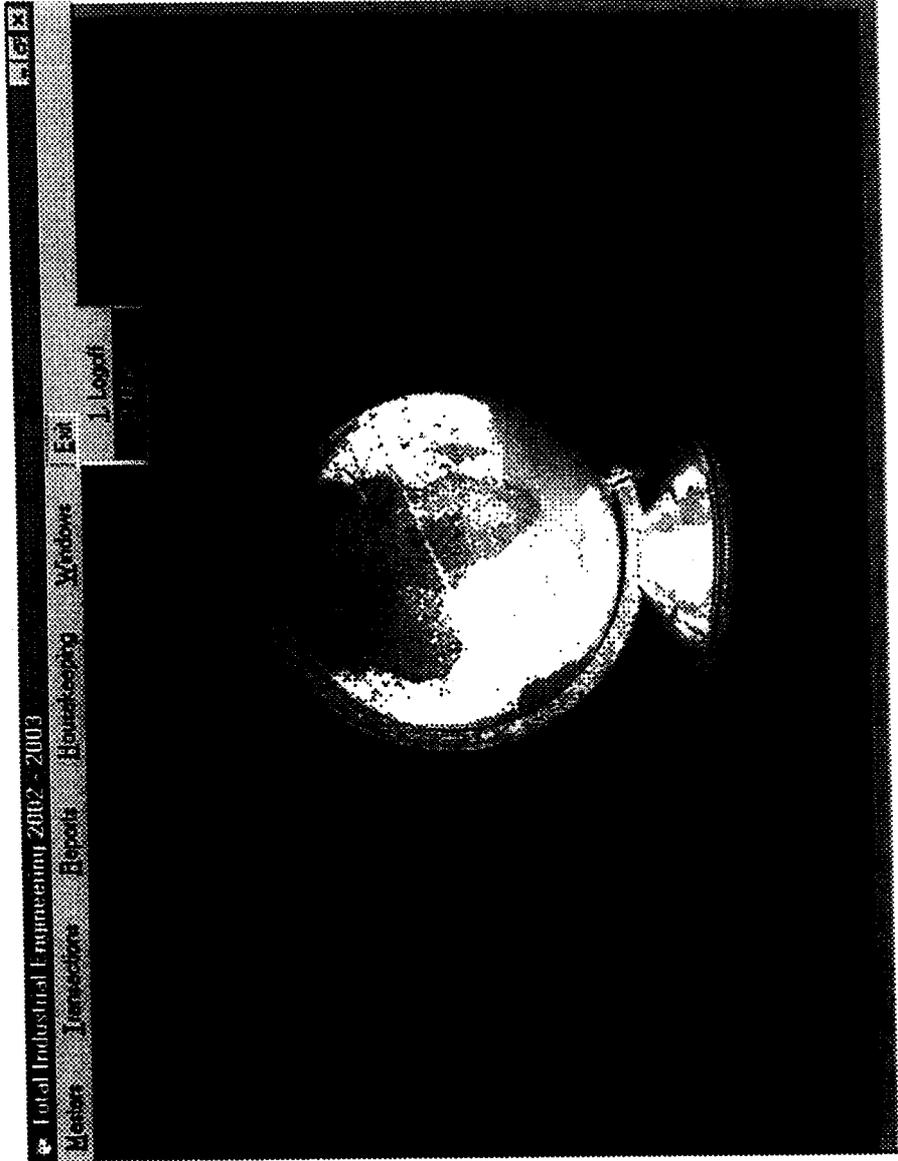




Overall Equipment Efficiency

This Process will calculate the Overall Equipment Efficiency.

 Overall Equipment Efficiency Calculation Completed



Production details

pricol

		Production Details			
Date	Proj.No.	Quantity	Department	Employee	
Shift code	Code	Production Quantity	Rejection Quantity	No Name	No Name
02/04/2003	1	60.000	2.000	1 InformationSystems	1 Priya.S
03/04/2003	7	2000.000	7.000	2 Production	1 Ramya.D
		1000.000	5.000	3 QualityControl	1 Sam.R

Machine details

pricoix

Machine Details

Code Description

01 Mc101
02 Mc102
04 Mc104
03 Mc103

pricol

Employee Details

Department No.	Department Name	Employee No.	Employee Name
1	Information Systems	1	Priya.S
		2	Srini.K
2	Production	1	Ramya.D
		2	Vicky.D
3	Quality control	1	Venkat.G
		2	Sam.G
4	Package	1	Vennila.S
5	Machine shop	1	John.P

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Total Production Details

Date	<-Project-> No Name	Team Leader no	<----Plant----> Code Name	<-----Machine-----> Code Description	Gross Available Time
<hr/>					
02/04/2003					
	1 p101	1	1 Plant I	01 Mc101	08:00:00
	2 p102	1	1 Plant I	02 Mc102	08:00:00
03/04/2003					
	1 p301	30	1 Plant I	01 Mc101	08:00:00
	2 p302	31	1 Plant I	02 Mc102	08:00:00
	7 p701	07	1 Plant I	01 Mc101	08:00:00

pricol

Daily Overall Equipment Efficiency
Date 03/04/2003

Machine Code 01
Project No. 7

Gross Availability Time	480.00	Minutes
Planned Downtime	25.00	Minutes
Net Available Time	455.00	Minutes
Down Time	10.00	Minutes
Running Time	445.00	Minutes
Availability	97.80	%
Idle Time	70.00	Minutes
Operating Time	375.00	Minutes
Usability	84.26	%
Production Quantity	1000.000	Nos
Standard Hours	35.00	Minutes
Performance Efficiency	93.33	%
Rejection Quantity	5.000	Nos
Quality Rate	99.50	%
Overall Equipment Efficiency	76.53	%

pricol

Monthly Overall Equipment Efficiency
Month : April Year 2003

Machine Code 01
Project No. 1

Gross Availability Time	480.00 Minutes
Planned Downtime	20.00 Minutes
Net Available Time	460.00 Minutes
Down Time	15.00 Minutes
Running Time	445.00 Minutes
Availability	96.73 %
Idle Time	70.00 Minutes
Operating Time	375.00 Minutes
Usability	84.26 %
Production Quantity	960.000 Nos
Standard Hours	35.00 Minutes
Performance Efficiency	89.60 %
Rejection Quantity	2.000 Nos
Quality Rate	99.79 %
Overall Equipment Efficiency	72.87 %

pricol

Monthly Overall Equipment Efficiency
Month : April Year 2003

Machine Code 01
Project No. 7

Gross Availability Time	480.00 Minutes
Planned Downtime	25.00 Minutes
Net Available Time	455.00 Minutes
Down Time	10.00 Minutes
Running Time	445.00 Minutes
Availability	97.80 %
Idle Time	70.00 Minutes
Operating Time	375.00 Minutes
Usability	84.26 %
Production Quantity	1000.000 Nos
Standard Hours	35.00 Minutes
Performance Efficiency	93.33 %
Rejection Quantity	5.000 Nos
Quality Rate	99.50 %
Overall Equipment Efficiency	76.53 %
