AUTOMATION OF

MOTORWORKSHOP

QUAID-I-AZAM UNIVERSITY

ISLAMABAD

Supervised by

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ISLAMABAD

2004-05

In The
Name Of

ALLAH

The Most Merciful
The Most Beneficent

A dissertation submitted to
Qauid-i-Azam University Islamabad
In partial fulfillment of the requirement of the
Post Graduate Diploma
In
Information Technology

DEDICATED TO

Our dear parents and honorable teachers as all what we have gained in life owes to them.

DECLARATION

We hereby declare and affirm that this software neither as a whole nor as a part thereof has been copied out from any source. It is further declared that we have developed this software and the accompanied reports entirely on the basis of our personal efforts, made under the sincere guidance of our teachers. If any part of this system is proved to be copied out or found to be a report of some other, we shall stand by the consequences. No portion of work presented in this report has been submitted in support of an application for another degree or qualification of this or any other University or Institute of learning.

MUBASHIR AHMAD

&

ABDUL JABBAR

ACKNOWLEDGEMENT

CERTIFICATE

The Computer Center Quaid-I-Azam University, Islamabad accepts this thesis by Mr. Abdul Jabbar and Muhashir Ahmad in its present form, as satisfying the thesis requirements for the postgraduate diploma in CS/IT

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PROJECT BRIEF

Project Title	:	Automation of Motor Workshop
Undertaken By	:	Abdul Jabbar
		&
		Mubashir Ahmad
Supervised By	:	Mr. Nazim-u-Din
		Director, Computer center
Starting Date	:	January 3, 2005
Completion Date	:	March 31, 2005
Language Used	:	Visual Basic 6.0,
Database Used	:	MS Access XP
Operating System	:	Windows 2000 Professional
System Used	:	Intel 1.4 GHz,
Submitted as	:	Fulfillment of the "Post Graduate Diploma in Information Technology"
Submitted to	:	Computer Center
		Qauid-i-Azam University, Islamabad.

PREFACE

The automation of the working of an auto workshop is a project which will benefit this business a lot. This includes the automation of its HR system, Payroll System, customer information, vehicle information and other workshop expenses. The implementation of this system would result in efficiency and swiftness in the working of a workshop. The documentation of this report include, among others, details regarding the existing system, proposed system, system design & development, implementation, data entry screens and the output reports.

ABSTRACT

A computer-based record keeping system called "Automation of a Motor Workshop" has been developed in Microsoft Visual Basic and Microsoft Access XP. It addresses the issue of efficient information storage and retrieval of latest information about workers, customers, workshop expenditure etc. at finger tips.

The system receives input data through screen and generates reports. During storage of information certain validation checks have been provided which improves the accuracy of the system and makes it more reliable.

Advantages of the computerized system over the manual system are high because it provides the facility of on-line retrieval of information and the reports required by the organization.

TABLE OF CONTENTS

Existing system

INTRODUCTION TO THE EXISTING SYSTEMS:

Presently, the record of the workshop is being maintained on manual basis. The entries of the customers who visit the workshop are made on files and registers. This record is also not being arranged in a proper sequence. So when updation of record is required it becomes very difficult to re-open the old record and update it. The work of entering the customer's data is not assigned to a particular worker of workshop hence the entries are made by the one who is available in the workshop. Moreover there is no proper pattern/specimen on which the entries are made. The workshop is divided into different sections according to the nature of work such as administration, repair/replace, color/painting etc. Each section maintains its own record separately. There is a need of a consolidated management data. Due to lack of consolidated management of data the workshop cannot assess the future prospects; the progress of the workers also cannot be assessed. The workshop is not in a position to make suitable budget estimates. To estimate the income and expenditures of the workshop for a particular time is very difficult. It takes a lot of time and also has a probability of error and omission.

In view of the above complications and hurdles the workshop needs software that can remove the difficulties being faced by it. The software would make the functioning of the workshop more fast and accurate.

DRAWBACKS IN THE EXISTING SYSTEM

There are a number of drawbacks in the existing systems, which greatly increase the cost, manpower and time consumption, and on other hand the existing system decreases the efficiency and accuracy of record. The following are the main drawbacks.

WASTAGE OF TIME

The existing system is time consuming and difficult to use because the record is maintained in the bulk of paper files. When a particular record is to be search out the staff has to consult many files and registers to find the same.

LACK OF MANAGEMENT

The system has not been completely maintained. The complex modules are not defined and the system is just a storage place. Most of the functions are occurring on the conceptions of user.

MAINTENANCE PROBLEM

The maintenances of the system is difficult due to huge bulk of stationary, that requires a lot of time for searching or sorting any specific record. To maintain the manual record in form of files and registers is a difficult, insecure way and also requires a lot of space. The paper record perishes away very soon therefore a workshop is in dire need of a safe and sound mode to record the data.

NO REPORT GENERATION

The report generation for the management is in the form of a book that is updated on annual basis. Presently the workshop is not generating any report on the annual basis and hence has no idea of the progress/performance of the workshop. Currently the workshop is not in possession of valid statistics in order to measure the weekly, monthly, quarterly and annual income and expenditure. The workshop also has no figures that how many workers joined and leave it. In the present manual system the workshop has no detailed information about the workers, customers, expenditures and vehicles etc. as the salaries are also being maintained manually there is a high probability of errors and omissions. This document doesn't provide the exact situation because the management does not have the latest information about the Employees, customers, if in case they some how manage to get the latest information

about the equivalent cases, it takes lot of time, currently data is maintained in simple text files.

LACK OF KNOWLEDGE

The management has no idea of current scenario. They don't know the efficiency of computerized data structure. They don't have advance technology. They need a user-friendly computerized system to maintain the whole record. The existing manual system is very time consuming and difficult to handle.

THE PROPOSED SYSTEM

SCOPE OF THE PROPOSED SYSTEM:

The scope of a proposed system means that which areas are being covered by the system. The scope clearly defines the boundaries of the proposed systems. The functional area of the organization that lies under the scope of the proposed systems is "Automation of Motor Workshop".

PROJECT OVERVIEW

Following will be the sub system of the proposed " Automation of a Workshop".

- Complete information about the Expenditure of the Workshop.
- Complete information about the customer.
- Complete information about the Defects in vehicle.
- Information about Parts.
- Consolidated record of receipts.
- Management of salaries.
- User authentication.
- Information about the vehicle.
- Management and Information of the Worker.
- It will make easy for the management to work on it.
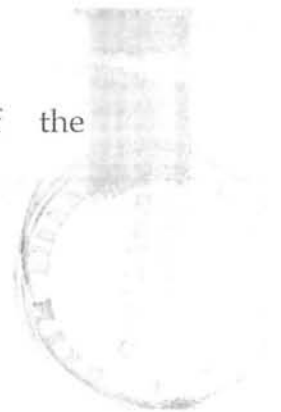
MANAGEMENT OF WORKSHOP EXPENDITURE.

This sub system will provide ease for the management of the Workshop expenditure. This system facilitates the user by reducing the burden of writing in the simple text files and table that are usually made in Microsoft Word and Excel. The management of organization is done in such a way that system will maintain all the data that is made in tables. It includes the complete expenditure detail. User can ADD in it, can DELETE a particular record, and can UPDATE the data with the help of these buttons that will make the change in the database. The user can know expenditure type, payment date and amount paid in a particular expenditure head.

MANAGEMENT OF DATA

Te use of access data base would make it convenient to maintain the millions of records. Access facilitates the user. The operator can ADD data in it, can DELETE a specific record, and can UPDATE the data with the help of forms that will make the change in the database.

COMPLETE INFORMATION OF THE CUSTOMER.

The proposed project provides a form named "Customer Information" which contains the detailed information about the customer including customer name, id, phone, address, and cell phone no, city,

country etc. The user can add a new record and save it. This form also provides the facility to delete a specific record.

COMPLETE INFORMATION OF THE DEFECTS IN THE VEHICLE.

This sub system provides the complete information about the defects in the vehicle. It tells weather the part was replaced or repaired. If replaced then what kind of part was used and also about the part id. Here also the data can be changed and saved.

INFORMATION ABOUT THE PARTS

It describes the part and also gives the part id.

MANAGEMENT OF RECEIPTS.

Here the operator can get the complete information of receipts. The operator can have information about the vehicle name, vehicle id, customer id, name, payment date, the amount paid. With the help of this system the user can estimate the monthly income of the workshop etc.

MANAGEMENT OF SALARIES.

The system would also maintain complete information of worker salaries. The employee salary includes the components like name of the employee, medical allowances, house rent, transport allowance, basic pay and others. New entries and changes can also be made in this form.

USER AUTHENTICATION.

While developing the software for motor workshop the security measures have also given due consideration. The system requires a user name and password by the user and opens the software after verifying the validity.

WORKER INFORMATION.

This part of the system contains the detailed information about the worker which includes name of the worker, designation, sex, address, contact number appointment date etc.

PROJECT OBJECTIVES

The objective of the project describe that what is to be ultimately achieved from the development of the project. It is always essential and helpful before designing a computer based system, to understand the entire objective and requirements that Computer Based System is expected to satisfy. In addition, the relative importance of each objective should also be understood.

The proposed system is required to fulfill the following objectives:

- To increase the reliability of the system to an extent meeting the actual requirement of the Workshop.
- To assure the availability of the information at the right time.
- To increase the performance of the organization.
- To complete the conversion of the manual system into a Computerized System.
- To remove the drawbacks of the existing system.
- To make the information storage, processing and retrieving efficient.
- To provide a system with a user interface which is simple to understand and efficient to use.

MAIN FEATURE OF THE PROPOSED SYSTEM

The proposed system has the following major features.

EFFICIENT

Efficiency of any system is concerned with the minimum transaction processing time as well as the optimal use of the system resources. In designing the proposed system, the efficient factor has been taken well into consideration.

USER FRIENDLY INTERFACE

The interface of the system will be user friendly. The data retrieval, insertion, editing will be made easy and simple, so that a common user can handle the database efficiently.

MINIMUM REDUNDANCY

In the proposed system all the master data is stored in unique tables and other tables can access this data through their child tables of values. So, there are minimum chances of data redundancy.

FACILITATED DATA INPUT

The simple to use data entry form will be provided to facilitate the user to enter the data in the database. The powerful data entry controls have been provided to view, add and modify the field of a record.

SYSTEM DESIGN

&

DEVELOPMENT

4   SYSTEM DESIGNING

In order to computerize a system, system designing is a prerequisite and before designing a few things must be studied and kept in mind.

4.1   DATABASE:

A database is a shared collection of logically related data, designed to meet the information needs of multiple users in an organization.

A database is a collection of complete and non-redundant data about that subject and has appropriate structure.

It means that database contains complete information about the subject for which database is organized and individual piece of data exists only once in the database. The suitable structure is chosen with the objective to reduce the overall cost of processing, storage and to facilitate the processing of stored data.

The objectives of database system are to overcome the problem in the conventional file system by providing.

- Non-Redundancy
- Data independence
- Security Protection

4.2 DATA MODELS:

The relationship structure amongst the data items within a database is represented by data model. A data model is a pattern or method according to which data are logically organized. There are three types of data models.

- Hierarchical Data Model
- Network Data Model
- Relational Data Model

4.2.1 HIERARCHICAL DATA MODEL:

It depends on every entity being subject to higher one, up to the top. In hierarchical model each entity, except the top most, is associated with only one entity at higher level but may be associated with more than one entity at lower levels. The hierarchical model is frequently thought of an inverted tree, this has one trunk from which all branches are subdivided and further offshoots occur right up to the finest twinges. The significant thing about a tree is that sub-divisions ate all one way; a hierarchical data model can represent only one to many relationships.

4.2.2 NETWORK DATA MODEL:

With a network any record may have menu immediate superior as well as many dependents. In other words the restriction to one hierarchical parent does not apply. The network data model is thus able to relation between the entities is basically the relation between the two record types.

4.2.3 RELATIONAL DATA MODEL:

The relational model contains data arranged logically in tabular form. The tables in the relational model are known as relations. Rows of the table are known as records. In one table each record must have same format and there must be a key field, which must be unique. The records are represented horizontally; whereas the vertical columns show the types of field of data items, which are also termed, as domains.

4.3 SELECTED DESIGN:

Database designing is the most important and definitely the most difficult part of the any dynamic website. As we are designing the database for a workshop, therefore, the following aspects are to be taken care of:

i.   Customer information.

ii.   Employees' information.

iii.   Payroll of the employees.

iv.   Workshop's recurring expenses.

v.   Information about vehicle and its defects.

vi.   Inventory of automobile parts.

In our project as we are developing windows based application, the MS Access was the most suitable choice for backhand database. It is not only easy to use but a very power full database as well. Moreover, it is fully compatible with the Visual Basic. For restricting the redundancy of the data stored, normalization technique is used. In this technique one field is chosen as primary key, and then those fields are chosen which depend upon that primary key. Combination of all such fields becomes a table.

After carefully studying the working of an auto workshop and keeping in view the aforesaid aspects 9 tables are to be designed. The structure of each is given hereunder:

Table Name   :   Billing

Field Name	Data Type	Field Size
Bill-num	AutoNumber	Long Integer
Bill-id	Text	15
Payment-date	Date/Time	
Description	Text	50
Fine	Number	Long Integer
Amount-paid	Number	Long Integer
Bill-type	Text	50

Table Name   :   Customer

Field Name	Data Type	Field Size
Cust_id	AutoNumber	Long Integer
Cust_name	Text	40
Address	Text	50
Phone	Text	20
City	Text	30
Country	Text	20
Cell	Text	15
Marital status	Text	15
Gender	Text	15
Nic	Text	15
Blood group	Text	10

Table Name   :   Defects

Field Name	Data Type	Field Size
Receipt_id	Number	Long Integer
Defects	Text	30
Replace/repair	Text	15
Part_descr	Text	25
Part_id	Number	Long Integer
Repair_date	Date/Time	
Miner/Major	Text	10
Cost	Number	Long Integer

Table Name   :   Expenditure

Field Name	Data Type	Field Size
Expenditure_id	AutoNumber	Long Integer
Description	Text	25
Payment_date	Date/Time	
Amount	Number	Long Integer
Remarks	Text	25
Within/after_due_date	Text	15

Table Name　:　Part

Field Name	Data Type	Field Size
Part_id	AutoNumber	Long Integer
Price	Number	Long Integer
Description	Text	40
Model	Number	Long Integer

Table Name　:　Receipt

Field Name	Data Type	Field Size
Receipt-id	AutoNumber	Long Integer
Customer-id	Number	Long Integer
Cust_name	Text	40
Payment	Number	Long Integer
Payment-date	Date/Time	
Vehicle name	Text	25
Vehicle-id	Number	Long Integer

Table Name : Salaries

Field Name	Data Type	Field Size
Worker-id	Number	Long Integer
Name	Text	Long Integer
Basic pay	Number	Long Integer
Medical	Number	Long Integer
House-rent	Number	Long Integer
Transport	Number	Long Integer
Others	Number	Long Integer
Phone-bill	Number	Single
Mess-bill	Number	Single
Extra-charges	Number	Single

Table Name : Vehicle

Field Name	Data Type	Field Size
Vehicle_id	AutoNumber	Long Integer
Description	Text	30
Model	Text	20
Name	Text	40

Table Name   :   Worker

Field Name	Data Type	Field Size
Worker_id	AutoNumber	Long Integer
Worker_ name	Text	50
Appointment_date	Date/Time	
Designation	Text	30
Phone	Text	15
Address	Text	50
City	Text	20
Country	Text	20
Nic	Text	15
Marital status	Text	15
Cell	Text	15
Gender	Text	15
Blood group	Text	10

4.4 PROGRAM SPECIFICATION:

The program specification is a piece of documentation with the purpose of saying exactly what a program does. Its original purpose is unambiguous communication between the designer and the programmer. A program specification becomes part of the overall system documentation, to be used by systems analyst and programmer, responsible for maintaining the system.

4.5 APPROACHES TO PROGRAM DESIGN:

There is no one such way by which program can be designed. This is not explained by the fact that there is no such thing as the perfect program, and the best that can be hoped for is a program in which the compromise between objectives has been carefully chosen. To use a colonial expression, there are more than one ways to skin a cat, which translates into general system terminology as the principle of Equifinality. System can not be developed without thoughts, because tools need selecting and applying carefully. It follows that a good designer may employ standard but will consistently be reviewing is effectiveness and looking for improvements. In order to do this effectively, designer need to be aware of some of the common methods and emphasis in program design. These methods in design are:

- Top down approach
- Bottom up approach
- Critical first approach

4.5.1 TOP DOWN APPROACH:

Top down is based around the idea that there are various levels of decisions which need to be made. Progressively "functional decomposition", "stepwise refinement" refers to gradually increasing the precision of a statement. These may both be considered as specific varieties of top down development method. This method leads to well structured system, with the various components being well defined, having sample interfaces and working together towards overall goal.

4.5.2 BOTTOM UP APPROACH:

Bottom up design starts with the basic units of a system and builds up to higher levels. A system created in this way could start the design of input document and output layout, eventually arriving at the point where system has been built.

4.5.3 CRITICAL FIRST APPROACH:

Critical first is a method of system design which emphases the identification of the most critical component in the system. If potential problems can be identified at an early stage, it is possible to try to solve these before going on to further design work. It is very difficult to know for certain at the beginning of a project what constitute the biggest potential practical way of commencing system design in terms of difficulty working down the list, although this is not done frequently.

4.6 PROPOSED SYSTEM APPROACH:

Keeping in view the requirement the abstraction in the case is made in a TOP DOWN manner.

4.7 HARDWARE & SOFTWARE REQUIREMENT:

The minimum hardware requirements for this system are:

- Pentium II or higher
- Standard mouse and keyboard.
- VGA Display.
- Windows 98 or higher
- Microsoft Office 97 or higher
- Printer

WHAT I HAVE ACHIEVED

After development and finalizing this project I feel a real taste of achievement. Developing a system by self analysis, design and test is a bit difficult but provides a real chance of practical learning. During the development of this project I have achieved the following benefits:

- Project management and time scheduling
- Thinking about the system
- Good working knowledge of system design and test
- During designing phase, I learnt some new features of the software

FUTURE ENHANCEMENTS

Following enhancements can be made after sometime, probably, in summer holidays (for later experience):

- Designing of the Web pages to show the data in Internet Explorer browsers
- Designing of different type of reports to meet the requirements of the modern development & requirement

REFERENCE

➢ MASTERING VISUAL BASIC 6.0

BY

DEITEL & DEITEL

AND

➢ VISUAL BASIC (AIKMAN SERIES)
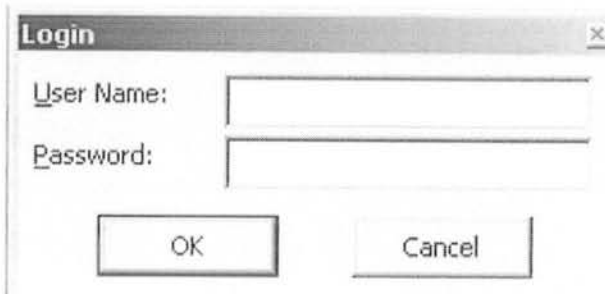
By

CM ASLAM & TA QURASHI
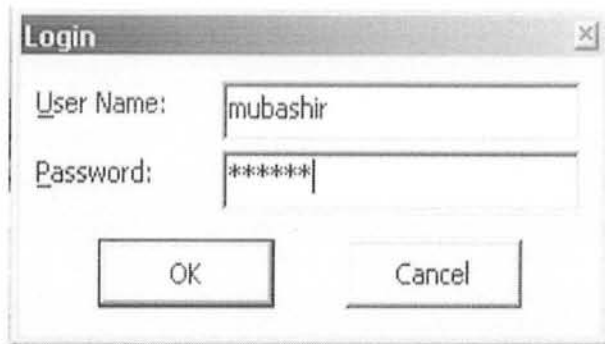
REVIEW

DATA ENTRY SCREENS

LOGIN FORM
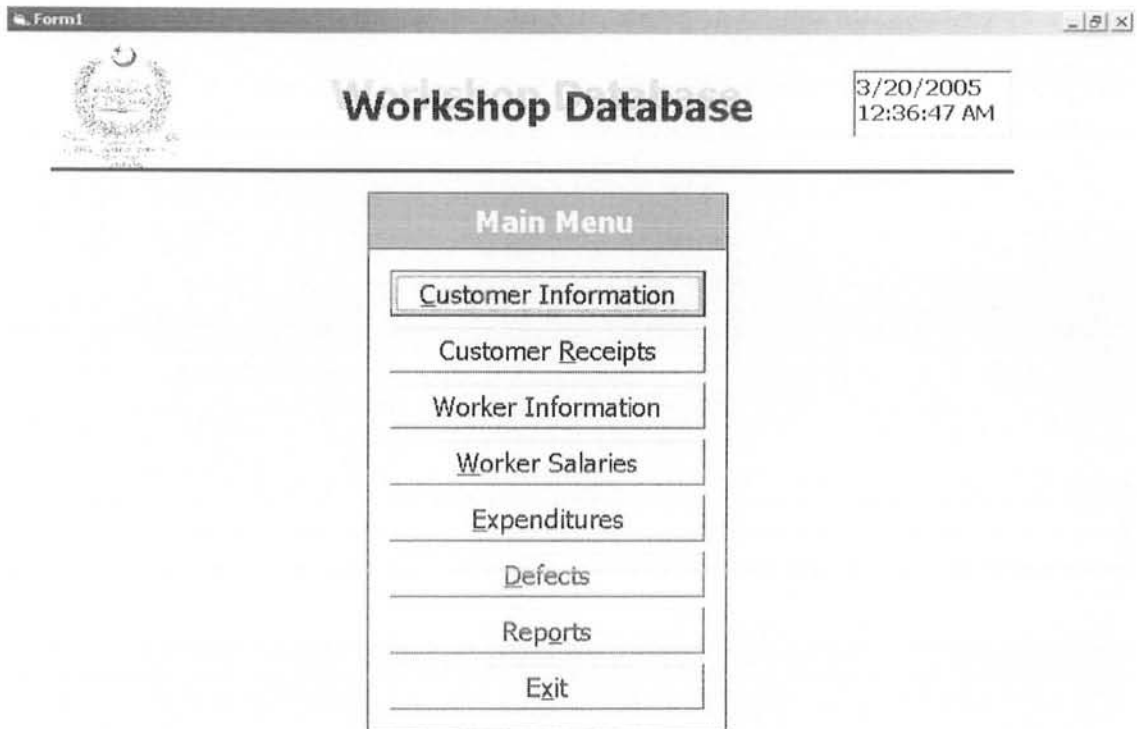
This form checks the validity of the user.

Main Menu

It is the main menu screen. All of the options are here.

Customer Information Screen

On the Customer Information screen the user can Add, Delete, Save and display the records of customer.

Delete Record Message Screen
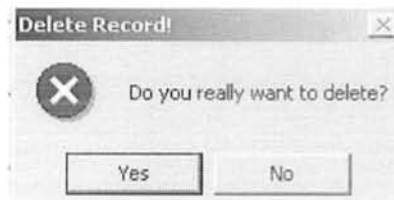
If the user choose [Yes] button then the record 'ill be deleted and if the user choose [No] button the record 'ill not be deleted.

Customer Receipts Screen

Customer Receipts

Customer Receipts

Receipt ID	Customer Name	Payment	Payment Date	Vehicle Name
1		3333	1/1/205	
2		3333	2/2/2004	
3		3333		
4		3333		
5	í	3333		
6	Waseem Mehmood	3333		
7		3333		
8		3333		
9		3		
10		0		
11		0		

|◄ ◄ Receipts ► ►|

Add   Delete   Save   Exit

This screen holds the receipt which will be given to the customer. Where we can add, save and Delete data.

Worker Information Screen

This screen holds the complete information about the Workers working in the Workshop. The user can Add, Delete and update the information about the workers.

Worker Salary Screen

This screen holds the complete information about a worker on the basis of Credit and Debit.

Expenditure Detail Screen

This screen displays Expenditures of the Workshop in detail.

Defects in Vehicle Screen

Workshop Database

3/31/2005
:03 AM

Defects in Vechile

Defects in Vechile

Defects in Detail	Replace/Repair	Part Used
steering problem	repair	1
wheel alignment	repair	0
engin problem	repair	15
silencer damaged	replace	1
kamani alignment	repair	2
fuling system problem	repair	2
fuling system problem	repair	0
kamani alignment	repair	1
silencer problem	replace	5
steering alignment	repair	3
kamani alignment	repair	2
engine problem	repair	15

|◄ ◄ Defects ► ►|

| Add | Delete | Save | Exit |

In this screen complete information of the defects in a vehicle are displayed.

Reports Menu

Form1

Workshop Database

3/21/2005
1:47:01 PM
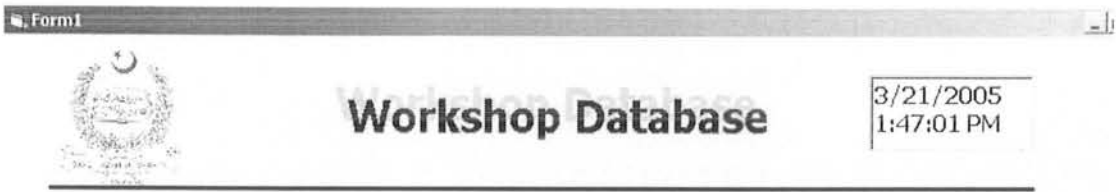
Reports Menu

Customer Information
Customer Receipts
Worker Information
Worker Salaries
Expenditures
Defects
Exit

It is the main menu of Reports

Reports

Customer Information Report

Zoom 75% ▼

Customer Information

ID:	Customer Name	Gender	Address	City	Country	Phone
2	Imran Aziz	Pata nahi	Kh-1009 Muree Lahore	Karachi	Pak	3939393
3	Ali Zafar	male	asfl jasf Jasflkjastlkas hf	rawalpindi	Pakistan	393939
4	JAMSHED	MALE	ST# 10 ALI COLONY	BAHAWAL	PAKISTAN	0625-125487
5	ALI ZAFAR	MALE	ST# 1 JINNAH COLONY	BAHAWAL	PAKISTAN	0632-417849
6	MOHMMAD ALI	MALE	NEAR MASJID MOHMMADIA	BAHAWALNAG	PAKISTAN	0632-72353
7	Atta ur Rehman	Male	Hose # 3,Street No: 88, Jinnah	Bahawal Nagar	Pakistan	0632-779015
8	Ms.Ala Malik	Female	Malik Louge, Dr.Abdul Qadir Road,	Bahawal Nagar	Pakistan	0632-910632
9	Ghazala kanwal	Female	House # 2,Street # 2, F-7/2	Islamabad	Pakistan	051-2875904
10	Saba Mehmood	Female	House # 989, Street # 23, Jinnah	Islamabad	Pakistan	0632-517892
79			asdasfdcas			
21		adg	adga	dga		dga

Pages: |◄| ◄ |1   ►|►| ◄

This is customer information printable screen that holds the whole record of a customer in detail.
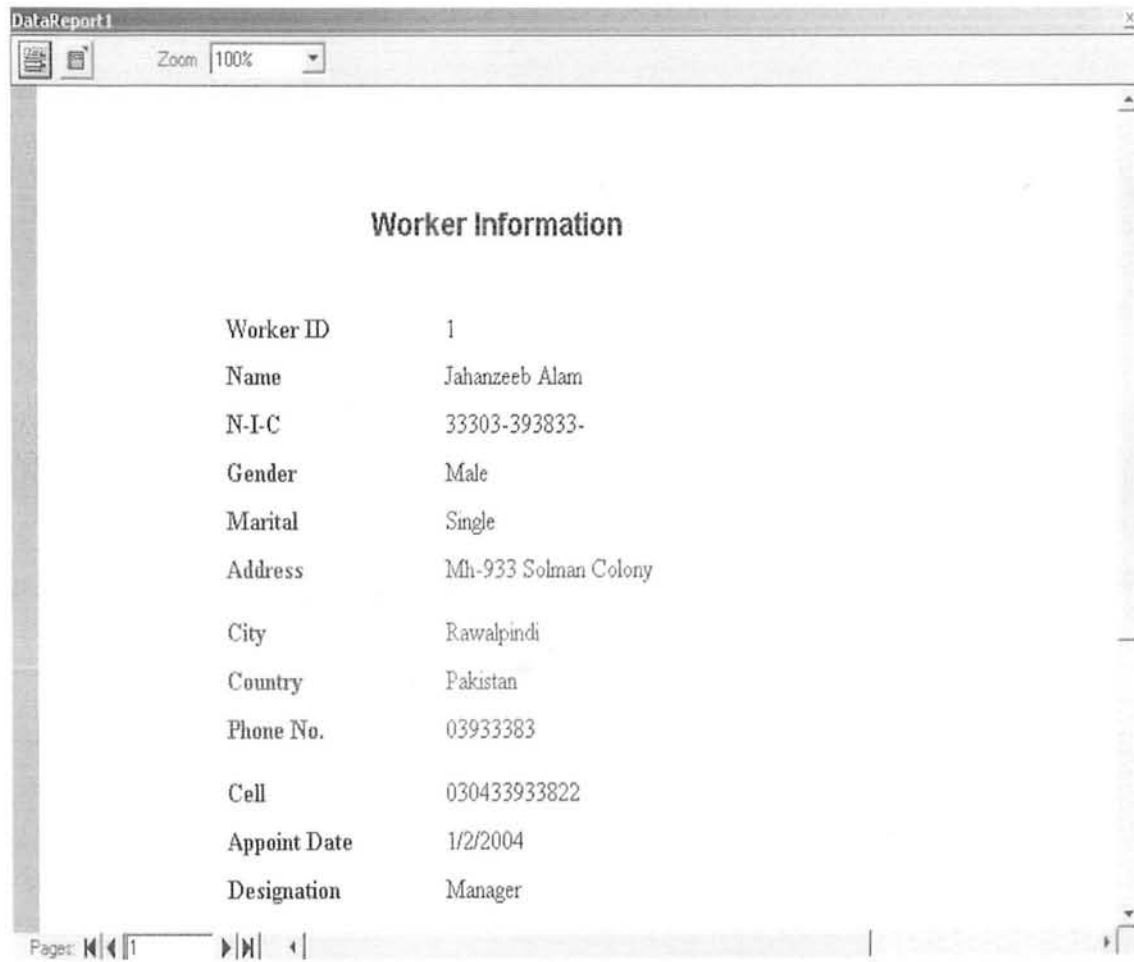
Customer Receipts Screen

This is the customer printable receipt report where customer ID, name, the amount he paid, the date of payment and vehicle name is placed.

Worker Information Screen

```
DataReport1                                                                    x
[icons]  Zoom  100%  ▼
```

Worker Information

Worker ID	1
Name	Jahanzeeb Alam
N-I-C	33303-393833-
Gender	Male
Marital	Single
Address	Mh-933 Solman Colony
City	Rawalpindi
Country	Pakistan
Phone No.	03933383
Cell	030433933822
Appoint Date	1/2/2004
Designation	Manager

```
Pages: |◄|◄|1        ►|►|  ◄|                                        ►|
```

This screen is print able and holds the record about the workers working in the work shop in detail.
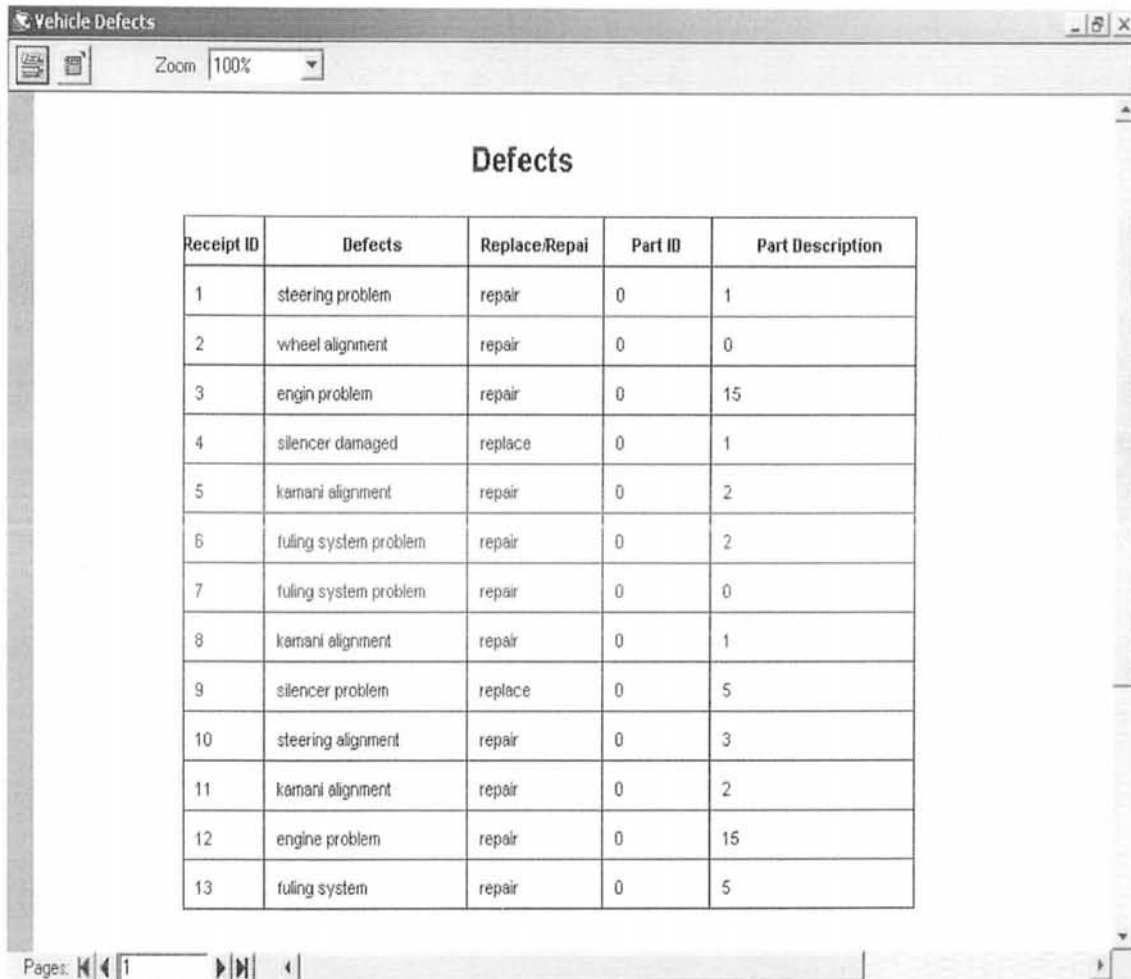
Workshop Expenditures Screen

	Zoom	100%		

Workshop Expenditures

Exp ID	Description	Payment Date	Payment Month	Amount
1	water bill	3 Feb 04	January-04	800
2	electricity bill	5 Mar 04	February-04	5500
3	gas	5 Apr 04	March-04	1500
4	water bill	6 Apr 04	March-04	650
5	electricity bill	15 Apr 04	March-04	1000
6	gass	11 May 04	April-04	900
7	watter bill	9 May 04	April-04	500
8	electric bill	6 Jun 04	May-04	6000
9	water bill	9 Jun 04	May-04	755
10	gass bill	7 Jun 04	May-04	950
11	Tax	15 Jun 04	May-04	8000
12	electric bill	11 Jul 04	June-04	9000
13	gass bill	9 Jul 04	June-04	1100

Pages: 1

It is printable Workshop Expenditure report that holds the record about the expenditures of the workshop date wise, expenditure type, month and amount etc.
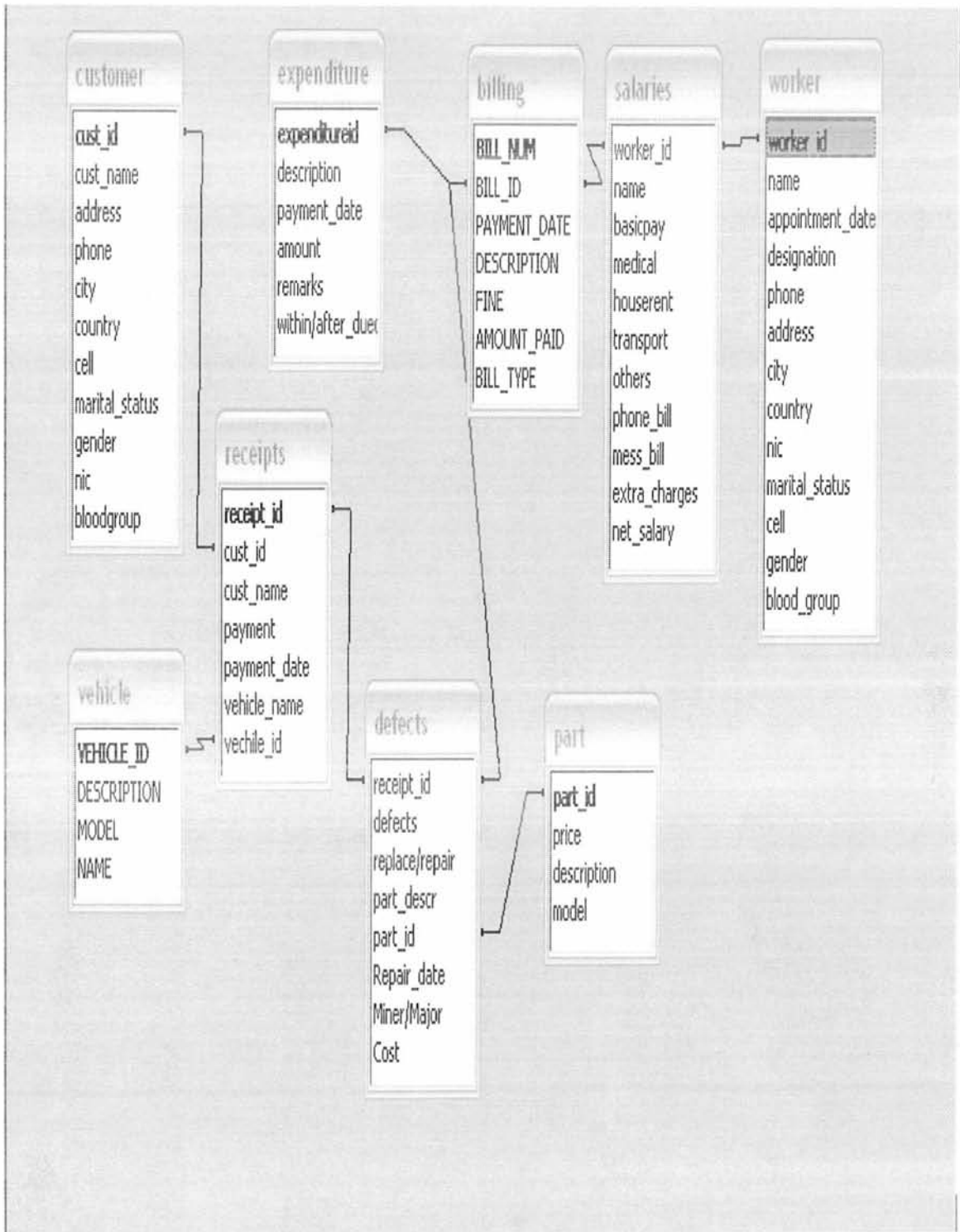
Defects Report

Zoom 100%

Defects

Receipt ID	Defects	Replace/Repair	Part ID	Part Description
1	steering problem	repair	0	1
2	wheel alignment	repair	0	0
3	engin problem	repair	0	15
4	silencer damaged	replace	0	1
5	kamani alignment	repair	0	2
6	fuling system problem	repair	0	2
7	fuling system problem	repair	0	0
8	kamani alignment	repair	0	1
9	silencer problem	replace	0	5
10	steering alignment	repair	0	3
11	kamani alignment	repair	0	2
12	engine problem	repair	0	15
13	fuling system	repair	0	5

Pages: 1

This report holds information about the defects in a vehicle.

Entity Relationship Diagram