

SYNOPSIS

Building construction has become a complex problem today due to a number of factors like advancement in planning ideas, developments of new forms for architectural beauty of the building, techniques of construction, high rise structures in town and cities, wide range of materials and finishing's, demand for improved services and equipments tools and regulations of the statutory bodies and above all changes in the living standards of those persons for whom the building is proposed to be constructed.

The main aim of the project **“BUIDING CONSTRUCTION MANAGEMENT SYSTEM”** is to develop software package for maintaining the administration taking place in **“S.S.S CONSTRUCTIONS”**, Madurai.

This project is meant for maintaining administration of construction works going on different places at different stages, which deals with large amount of data.

This system has five main modules.

- Construction
- Material
- View
- Report
- and
- Exit

In first main module, consists of following options. They are

- New
- Payment Entry
- Expense
- Labor
- Material

In the second main module deals with purchasing and entering new construction materials for the company's requirements

- Product Entry
- Purchase

The third module is used for exposing the various information's for different building constructions.

- Payment
- Labor Expense
- Material Expense
- Stock
- Total Expense
- Complete Purchase

The Report module is used for generating reports

- Material Expense
- Labor Expense
- Material Stock

The final option is for exiting from the software package

- Quit

1. INTRODUCTION

1.1 ABSTRACT

Building Construction is the process of constructing a building or infrastructure. Construction differs from manufacturing in that manufacturing typically involves mass production of similar items without a designated purchaser, while construction typically takes place on location for a known client. Construction as an industry comprises six to nine percent of the gross domestic product of countries. Construction starts with planning, design, and financing; it continues until the project is built and ready for use.

Construction is a course that will offer hands-on activities and real world experiences related to the skills essential in residential, commercial and civil building construction. Students will be introduced to the history and traditions of construction trades. They will also learn and apply knowledge of the care and safe use of hand and power tools as related to each trade. In addition, students are introduced to blueprint reading, applied math, basic tools and equipment usage, and safety.

Students will demonstrate building construction techniques, including concrete and masonry, framing, electrical, plumbing, dry walling, HVAC, and painting as developed locally in accordance with available space and technologies. Students learn how architectural ideas are converted into projects and how projects are managed during a construction project in this course. Students study construction technology topics such as preparing a site, doing earthwork, setting footings and foundations, building the superstructure, installing systems, finishing the structure, and completing the site. Students also investigate topics related to the purchasing and maintenance of structures, special purpose facilities, green construction and construction careers.

1.2 ORGANIZATION PROFILE

The responsibilities of the architect has increased by many folds and one of the them being to provide a reliable assessment of the ultimate cost of the project to his client who does not expect that the architect will take him for a ride when ultimate cost shoots up his financial resources.

The importance of the subject of estimating can be well realized from the fact that in foreign countries professionals specialized in the job of quantity surveying are appointed for eliminating the cost of project, cost planning and for making up of interim and final accounts of the contractors.

It is a forecast of the cost of the project prior to the commencement of the job. It calls for skill, experience, foresight and good judgement besides one having a good knowledge of cost or materials and labor relating to construction works.

This company should prepare the drawings and details in such a manner that cost of element is not disturbed. This should not be done at the cost of producing cheap quality of constructions.

When tenders are invited, the tendered amount must be as close to the target amount as possible.

If the architect and engineer followed the main line of design as planned out, there will not be major variations from the amount set out in cost plan and cost checking.

1.3 PROJECT OVERVIEW

This project is developed for maintaining administration work regarding different projects going on different places in, which deals with large amount of data. This system has five main modules.

- Construction
- Material
- View
- Report and
- Exit

In first main module, consists of following options. They are

- New
- Payment Entry
- Expense
- Labor
- Material

The **New** module in **Entry** module is designed for entering data related to new construction assignment such as party_name, address, advance_amount, type_of_building, construction_site etc.

The **Payment Entry** is developed for storing various parties giving various amounts for their constructions.

The **Expense** module has two sub modules, **Labor** and **Material**. The **Labor** module is used to add expenses occurred during construction of different projects and **Material** module is used to feed the expenses related to material like Cement, Iron rod etc for various projects.

In the second main module deals with purchasing and entering new construction materials for the company's requirements

- Product Entry

- Purchase

Since the “S.S.S. CONSTRUCTION” itself will provide the materials required for constructions going under their management, the purchase and the corresponding products to be entered are dealt with the second main module.

The **Product Entry** module is used to feed data regarding various products they are utilizing and **Purchase** module is used for maintaining purchase of different materials from different companies.

The third module is used for displaying various information's of different constructions.

- Payment

- Labor Expense

- Material Expense

- Stock

- Total Expense

➤ Complete Purchase

The **Payment** module is used to view various payments made by the parties for their construction works.

Labor Expense module is used to view the labor expenses occurred during construction.

Material Expense module is used to view the material expenses occurred during construction.

Stock module is used to view the stock of the construction materials.

Total Expense module is used to get information's regarding amount, balance, total labour cost, and total material cost incurred for different projects.

Complete Purchase module is used to view complete purchases taken place for the company.

The Report module is used for generating reports of material expenses, labor expenses and material stock.

➤ Material Expense

➤ Labor Expense

➤ Material Stock

The **Material Expense** module is used to print out the material expenses occurred for various constructions.

The **Labour Expense** module is used to print out the labour expenses occurred for various constructions.

The **Material Stock** module is used to take print out the current stock of different materials.

The final option is for exiting from the software package

❖ Quit

This option is used to come-out from the software package.

2. SYSTEM ANALYSIS

2.1 PROBLEM DEFINITION

Problem

The consultants working out the approximate cost of a building or a project before the work is taken in order to ascertain the financial implications involved and to know whether it can be completed according to given specifications within certain financial limits or required modifications or dropping of the proposal altogether depending upon the available resources.

The consultant's forms the base for the process of cost planning and it is useful in framing the tenders for the works and to check the contractor's works during and after the execution for the purpose of interim and final certificate.

Requirements of controlled materials like cement and steel can be estimated for making applications to the controlling authorities.

Thus the consultants planning are a continuous process from the initial to final stage of the project. Without cost planning the approximate estimate or target cost cannot be practically equal to the tendered amount and if the client is not worried about his financial commitments, planning will have very low degree of importance. It is rightly said that planning means better values for money spend within the predetermined financial set up.

2.2 EXISTING SYSTEM

- * The word “Architect” is derived from Greek word “arch” meaning “chief” and the word “tekton” meaning “carpenter” or “builder”, and hence architect is rightly called the Master Builder.
- * The present system is mainly paper oriented and staff intensive.
- * It is tedious to keep track of the transactions efficiently.
- * It needs more man power to record and retrieve information.
- * It is hard to prepare any report immediately.
- * There is no security for information.
- * There is a delay in information retrieval.
- * There is redundancy of data.
- * Reliability & Maintainability of data is difficult.

2.3 PROPOSED SYSTEM

Proposed System is being developed in Visual Basic 6.0 as front end and MS-Access as back end. It provides the following features.

- * It is user friendly.
- * Accuracy of data is provided by proper validation of inputs.
- * Security of data is provided.
- * Retrieval of necessary information is very easy and fast.
- * Reports can be easily generated.
- * Manual options are reduced to maximum possible extent.
- * Maintenance of data is effective.
- * Backups of data are maintained.
- * On-line access is possible.
- * Latest tools & techniques are used.
- * Error & exceptional situations are handled carefully.
- * Better user – interface and data validation.
- * Faster data processing.
- * Accuracy in updating.
- * Transactions made easy.

3. SYSTEM SPECIFICATION

3.1 HARDWARE SPECIFICATION

CPU type	:	Intel Core 2 Duo
RAM	:	2 GB
Hard Disk	:	500 GB
Display type	:	VGA
Keyboard	:	107 Keys
Mouse	:	Logitech

3.2 SOFTWARE SPECIFICATION

Operating System	:	Windows 7
Front-end Tool	:	Visual Basic 6.0
Back-end Tool	:	Ms-Access

3.2.1 ABOUT WINDOWS

Innovative, easy-to-use features

Windows makes your computer easier to use, with new and enhanced features. Windows is easier to use with true Web Integration and workflow enhancements such as, icon highlighting, forward and backward buttons, and an easy-to-customize **Start** menu.

Multiple display support

Multiple display support makes it possible for you to use several monitors simultaneously to increase the size of your desktop, run different programs on separate monitors, and run programs or play games with multiple views. For example, students can conduct research with Microsoft Encarta displayed on one monitor and type their report in Microsoft Word on a second monitor. To learn more about multiple display support

Windows' makes your computer more responsive by improving startup time. Using power management techniques, you can start your computer in just a few seconds and restore all your programs where you left them. In addition, it allows your computer to continue working even though it appears to be turned off. You can leave all of your programs running, download your favorite Web pages, send and receive e-mail, back up your hard disk, or tune-up your operating system without being at your computer.

Power Management

Power Management works on computers that have Advanced Power Management (APM), and it works even better on newer computers that use the Advanced Configuration and Power Interface (ACPI). Power Management also makes it possible for you to put your computer on standby or hibernate to save power resources

Accessibility wizard

The Accessibility wizard makes it easier for people with disabilities to operate a computer without installing special software. Accessibility options—such as StickyKeys, ShowSounds, and MouseKeys—are designed to help users with specific disabilities make full use of the computer.

Universal Serial Bus

The Universal Serial Bus (USB) makes your computer easier to use with advanced plug-and-play capabilities. Using a new, universally standard connector, you can add devices to your computer easily without having to restart.

Windows improves computer reliability by introducing new wizards, utilities, and resources that help keep your system running smoothly.

System File Checker

System File Checker keeps track of critical files that make your computer run. If these are moved or changed, System File Checker restores them

ScanDisk

ScanDisk runs automatically in the event the operating system is shut down improperly. ScanDisk detects corruptions when they are most likely to occur and then corrects them. You can also run ScanDisk at any time to evaluate your computer.

Windows includes tools that help your computer run faster than Windows 95 without adding new hardware. Windows includes a suite of programs designed to optimize your computer's efficiency, especially when used together.

Maintenance wizard

Maintenance wizard helps you get the best performance from your system. You can run Maintenance wizard to make your programs run faster, check your hard disk for problems, and free hard disk space. By scheduling these utilities to run on a regular basis, you can make sure that your computer is performing at its best.

Disk Defragmenter

Disk Defragmenter optimizes the speed with which your programs load and run. With quick startup and shutdown, you can work, play games, and explore the Internet faster and more efficiently.

Windows makes your computer more entertaining by introducing new features such as enhanced television, video playback, and support for new hardware. These enhancements provide you with hours of fun.

Windows supports a variety of new hardware devices, such as DVD, force-feedback joysticks, digital audio speakers, and recording devices. Improved plug and play capabilities make installing new hardware even easier. You will also enjoy improved graphics, especially 3-D graphics, and video playback.

3.2.2 ABOUT VISUAL BASIC

Visual Basic is an ideal programming language for developing sophisticated professional applications for Microsoft Windows. It make use of Graphical User Interface for creating robust and powerful applications. The Graphical User Interface as the name suggests, uses illustrations for text, which enable users to interact with an application. This features makes it easier to comprehend things in a quicker and easier way.

Coding in GUI environment is quite a transition to traditional, linear programming methods where the user is guide through a linear path of execution and is limited to a small set of operations. In a GUI environment, the number of options open to the user is much greater, allowing more freedom to the user and developer. Feature such as easier comprehension, user-friendliness, faster application development and many other aspects such as introduction to ActiveX technology and Internet features make Visual Basic an interesting tool to work with.

Visual Basic was developed from the BASIC for the early microprocessor based computers. In 12, Microsoft Quick Basic revolutionized Basic and was legitimized as a serious development language for MS-DOS environment. Later on, Microsoft corporation created the enhanced version of BASIC called Visual Basic for windows.

Whether our goal is to create a small utility for our self or our work group, a large enterprise-wide system, or even distributed applications spanning the globe via the Internet, Visual Basic has the tools we need.

- Data access features allow we to create databases, front-end applications, and scalable server-side components for most popular database formats, including Microsoft SQL Server and other enterprise-level databases.
- ActiveX™ technologies allow we to use the functionality provided by other applications, such as Microsoft Word processor, Microsoft Excel spreadsheet, and other Windows applications. We can even automate applications and objects created using the Professional or Enterprise editions of Visual Basic.
- Internet capabilities make it easy to provide access to documents and applications across the Internet or Intranet from within our application, or to create Internet server applications.
- Our finished application is a true .exe file that uses a Visual Basic Virtual Machine that we can freely distribute

A complete discussion of the inner workings of Windows would require an entire book. A deep understanding of all of the technical details isn't necessary. A simplified version of the workings of Windows involves three key concepts: windows, events and messages.

The Microsoft Windows operating system manages all of these many windows by assigning each one a unique id number. The system continually monitors each of these windows for signs of activity or events. Events can occur through user actions such as a mouse click or a key press, through programmatic control, or even as a result of another window's actions.

Each time an event occurs, it causes a message to be sent to the operating system. The system processes the message and broadcasts it to the other windows. Each window can then take the appropriate action based on its own instructions for dealing with that particular message (for example, repainting itself when it has been uncovered by another window).

As you might imagine, dealing with all of the possible combinations of windows, events and messages could be mind-boggling. Fortunately, Visual Basic insulates you from having to deal with all of the low-level message handling. Many of the messages are handled automatically by Visual Basic; others are exposed as Event procedures for our convenience. This allows you to quickly create powerful applications without having to deal with unnecessary details.

At design time you can use the Data Environment designer to create a DataEnvironment object. The DataEnvironment object can include Connection and Command objects, hierarchies (relationships between Command objects), groupings, and aggregates. Before designing your DataEnvironment object, you should determine what information you want to present, identify the databases that contain the information, and determine your run time objective

Data Report Designer Features

The Microsoft Data Report designer is a versatile data report generator that features the ability to create banded hierarchical reports. Used in conjunction with a data source such as the Data Environment designer, you can create reports from several

different relational tables. In addition to creating printable reports, you can also export the report to HTML or text files.

- Automatically create reports that are exported in HTML format for instant distribution on the Internet.
- Create reports that show the sums of transactions occurring on a daily basis.

The Data Report designer has several features:

1. **Drag-and-Drop Functionality for Fields**—Drag fields from the Microsoft Data Environment designer to the Data Report designer. When you do this, Visual Basic automatically creates a text box control on the data report and sets the DataMember and DataField properties of the dropped field. You can also drag a Command object from the Data Environment designer to the Data Report designer. In that case, for each of the fields contained by the Command object, a text box control will be created on the data report; the DataMember and DataField property for each text box will be set to the appropriate values.
2. **Toolbox Controls**—The Data Report designer features its own set of controls. When a Data Report designer is added to a project, the controls are automatically created on a new Toolbox tab named DataReport. Most of the controls are functionally identical to Visual Basic intrinsic controls, and include a Label, Shape, Image, Textbox, and Line control. The sixth control, the Function control, automatically generates one of four kinds of information: Sum, Average, Minimum, or Maximum. For more information about the Function control, see "Adding a Function Control to the Data Report."

3. **Print Preview**—Preview the report by using the Show method. The data report is then generated and displayed in its own window.

 Note A printer must be installed on the computer to show the report in print preview mode.
4. **Print Reports**—Print a report programmatically by calling the PrintReport method. When the data report is in preview mode, users can also print by clicking the printer icon on the toolbar.

 Note A printer must be installed on the computer to print a report.
5. **File Export**—Export the data report information using the ExportReport method. Formats for export include HTML and text.
6. **Export Templates**—You can create a collection of file templates to be used with the ExportReport method. This is useful for exporting reports in a variety of formats, each tailored to the report type.
7. **Asynchronous Operation**—The DataReport object's PrintReport and ExportReport methods are asynchronous operations. Using the ProcessingTimeout event, you can monitor the state of these operations and cancel any that are taking too long

3.2.3 ABOUT MS-ACCESS

Microsoft released Access version 1.0 on 13 November 1992, and an Access 1.1 release in May 1993 to improve compatibility with other Microsoft products and include the Access Basic programming language.

Originally, the software worked well with relatively small databases but testing showed that some circumstances caused data corruption. For example, file sizes over 10 MB proved problematic (note that most hard disks held less than 500 MB at the time this was in wide use), and the *Getting Started* manual warns about a number of circumstances where obsolete device drivers or incorrect configurations can cause data loss. With the phasing out of Windows 95, 98 and ME, improved network reliability, and Microsoft having released 8 service packs for the JetDatabase Engine, the reliability of Access databases has been improved and it supports both more data and a larger number of users.

With Office 95, Microsoft Access 7.0 (a.k.a "Access 95") became part of the Microsoft Office Professional Suite, joining Microsoft Excel, Word, and PowerPoint and transitioning from Access Basic to Visual Basic for Applications (VBA). Since then, Microsoft has released new versions of Microsoft Access with each release of Microsoft Office. This includes Access 97 (version 8.0), Access 2000 (version 9.0), Access 2002 (version 10.0), Access 2003 (version 11.5), Access 2007 (version 12.0), and Access 2010 (version 14.0).

Versions of Microsoft Jet database engine, 3.0 and 3.5 used by Access 7.0 and the later released Access 97 respectively, had a critical issue which made these versions of

Access unusable on a computer with more than 1 GB of memory. While this problem was fixed for Jet 3.5/Access 97 post release, it was never fixed for Jet 3.0/Access 95.

Access's initial codename was Cirrus; the forms engine was called Ruby. This was before Visual Basic - Bill Gates saw the prototypes and decided that the BASIC language component should be co-developed as a separate expandable application, a project called Thunder. The two projects were developed separately as the underlying forms engines were incompatible with each other; however, these were merged together again after VBA.

Access was also the name of a communications program from Microsoft, meant to compete with ProComm and other programs. This proved a failure and was dropped.^[20] Years later, Microsoft reused the name for its database software.

USES

Microsoft Access is used to make databases.

When reviewing Microsoft Access in the real world, it should be understood how it is used with other products. An all-Access solution may have Microsoft Access Forms and Reports managing Microsoft Access tables. However, Microsoft Access may be used only as the 'front-end', using another product for the 'back-end' tables, such as Microsoft SQL Server and non-Microsoft products such as Oracle and Sybase. Similarly, some applications will only use the Microsoft Access tables and use another product as a front-end, such as Visual Basic or ASP.NET. Microsoft Access may be only part of the solution

in more complex applications, where it may be integrated with other technologies such as Microsoft Excel, Microsoft Outlook or ActiveX Data Objects.

Access tables support a variety of standard field types, indices, and referential integrity. Access also includes a query interface, forms to display and enter data, and reports for printing. The underlying Jet database, which contains these objects, is multiuser-aware and handles record-locking and referential integrity including cascading, updates and deletes.

Repetitive tasks can be automated through macros with point-and-click options. Microsoft Access is popular among non-programmers and professional developers alike. Non-programmers can create visually pleasing and relatively advanced solutions with very little or no code. It is also easy to place a database on a network and have multiple users share and update data without overwriting each other's work. Data is locked at the record level which is significantly different from Excel which locks the entire spreadsheet.

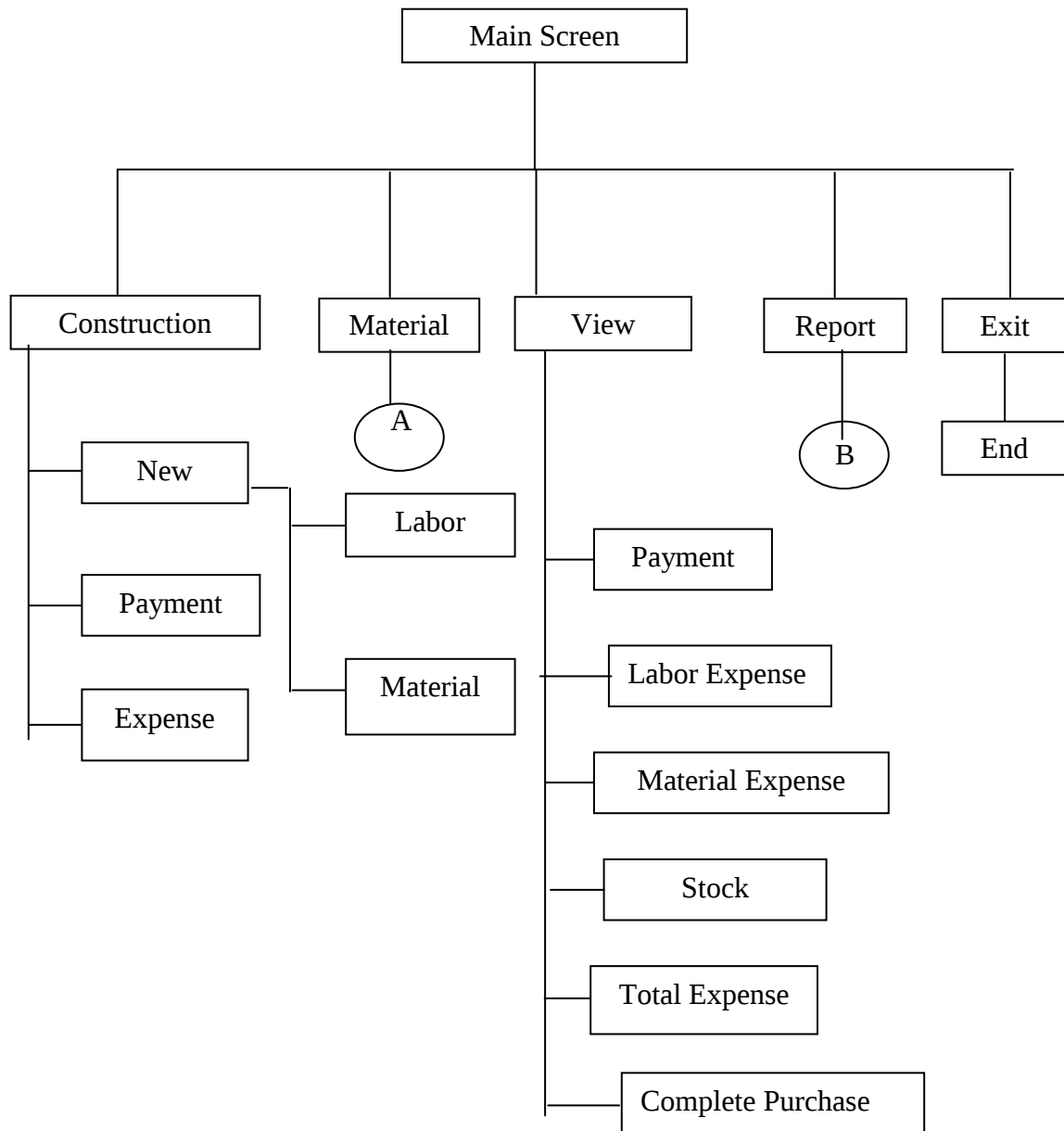
Microsoft offers a wide range of template databases within the program and for download from their website. These options are available upon starting Access and allow users to enhance a database with pre-defined tables, queries, forms, reports, and macros. Popular templates include tracking contacts, assets, issues, events, projects, and tasks. Templates do not include VBA code.

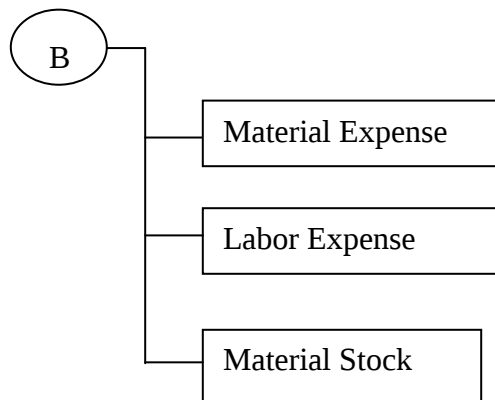
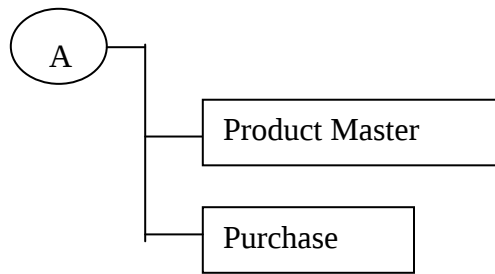
Microsoft Access also offers the ability for programmers to create solutions using the programming language Visual Basic for Applications (VBA), which is similar to Visual Basic 6.0 (VB6) and used throughout the Microsoft Office programs such as Excel, Word, Outlook and PowerPoint. Most VB6 code including the use of Windows API calls can be used in VBA. Power users and developers can extend basic end solutions to a professional solution with advanced automation, data validation, error trapping, and multi-user support.

4. SYSYTEM DESIGN

4.1 ARCHITECTURAL DESIGN

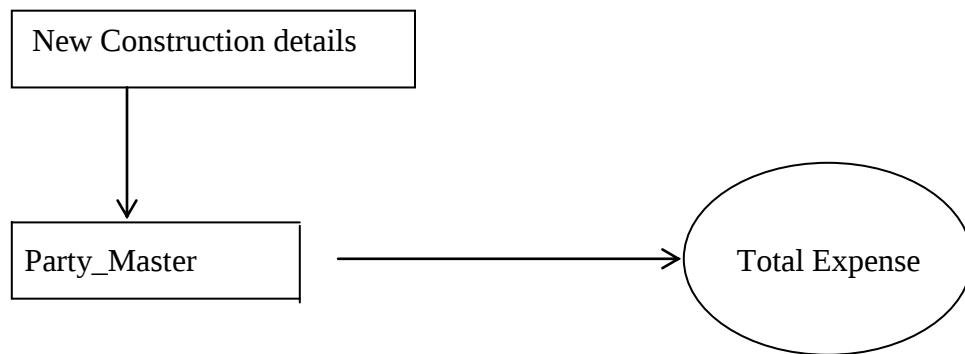
4.1.1 SYSTEM FLOW CHART



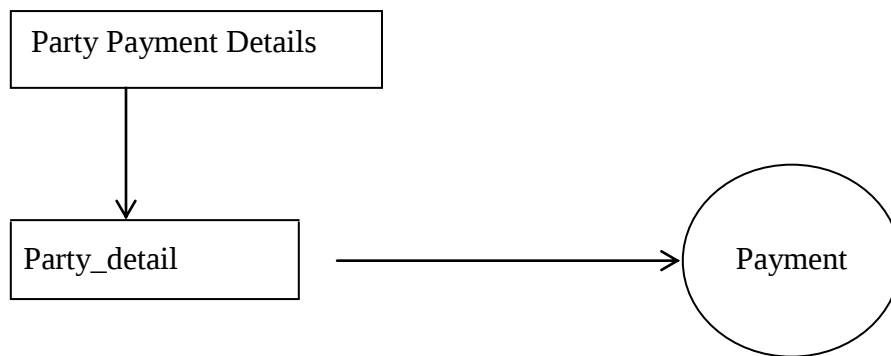


4.1.2 DATA FLOW DIAGRAM

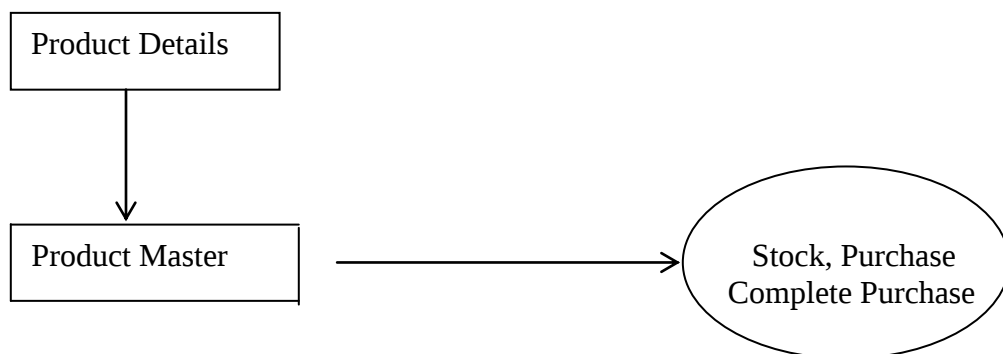
1) Party_Master



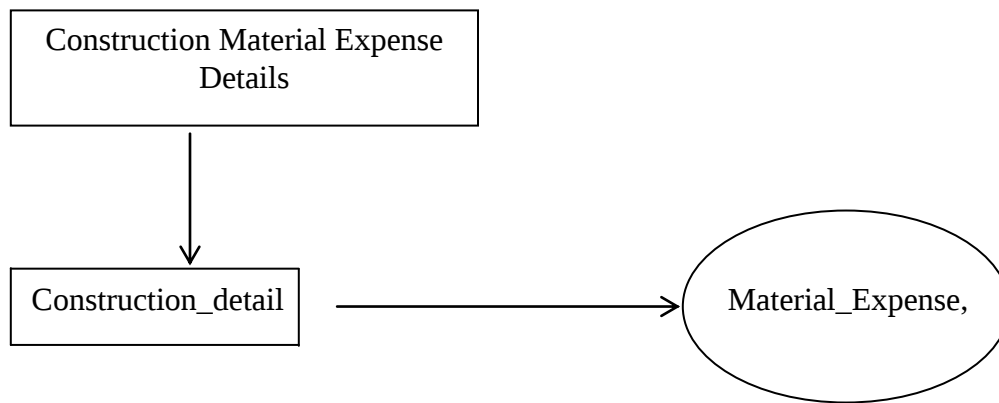
2) Party_detail



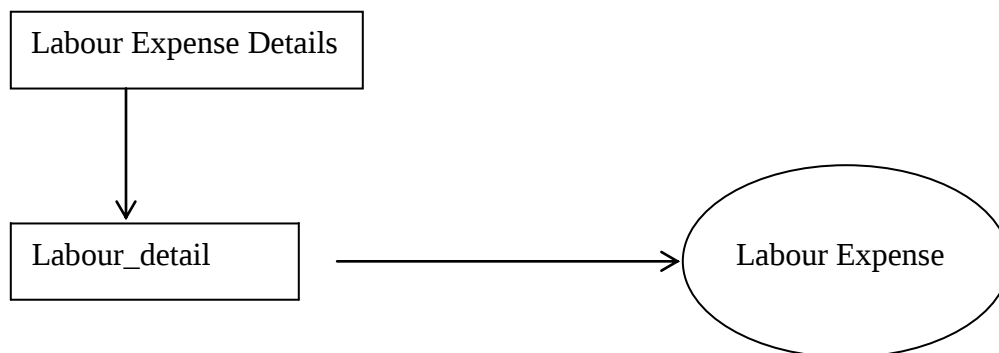
3) Product Master

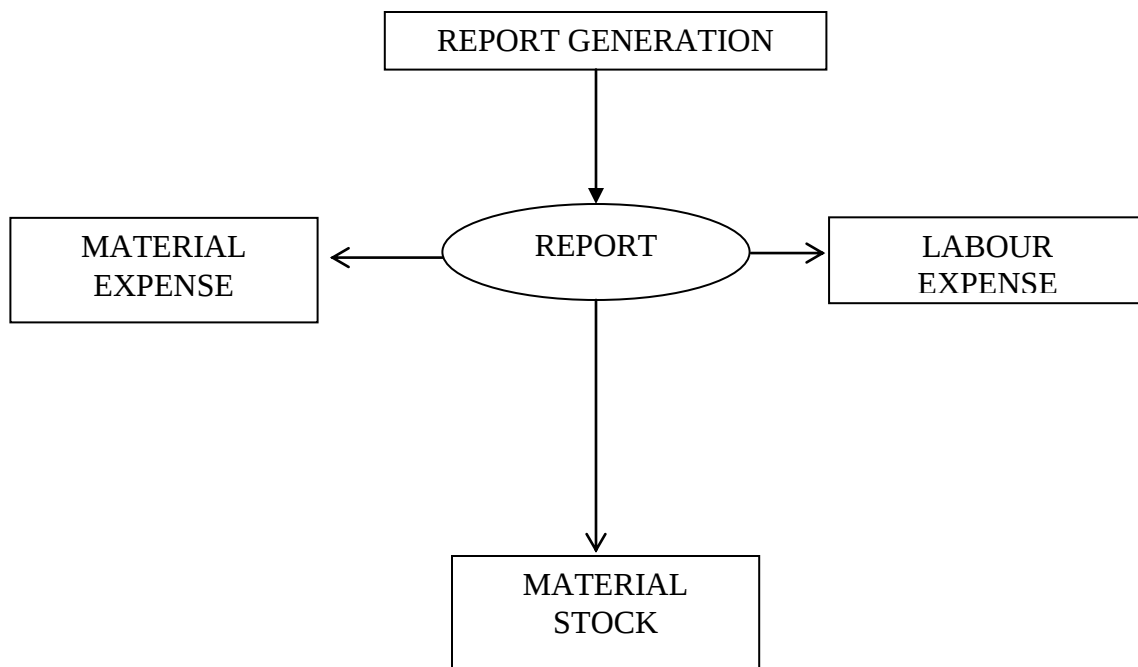


4) Const_detail



5) Labour_Detail





4.2 DATA BASE DESIGN

PARTY_MASTER

Field Name	Type
PROJECT_ID	NUMBER(4)
PARTY_NAME	VARCHAR2(25)
ADDRESS	VARCHAR2(50)
PHONE_NO	NUMBER(10)
CONST_SITE	VARCHAR2(25)
TYPE_BUILDING	VARCHAR2(25)
EST_AMOUNT	NUMBER(10)
EST_DURATION	VARCHAR2(25)
STARTING_DATE	DATE
AMOUNT	NUMBER(10)
TOTAL_EXPENSE	NUMBER(10)
BALANCE	NUMBER(10)

PARTY_DETAIL

Field Name	Type
RECEIPT_NO	NUMBER(10)
CONST_NO	NUMBER(7)
AMOUNT_PAID	NUMBER(7)

PAID_DATE	DATE
PAY_MODE	VARCHAR2(10)

CONSTRUCTION DETAIL

Field Name	Type
BILL_NO	NUMBER
CONST_NO	NUMBER(5)
MATERIAL_NAME	VARCHAR2(25)
SIZE_TYPE	VARCHAR2(20)
QTY	NUMBER(5)
AMOUNT	NUMBER(8,2)
PUR_DATE	DATE

PURCHASE MASTER

Field Name	Type
INVOICE_NO	NUMBER
COMPANY_NAME	VARCHAR2(25)
ADDRESS	VARCHAR2(50)
PURCHASE_DATE	DATE
BILL_AMOUNT	NUMBER(9,2)
FRIGHT_CHARGE	NUMBER(5)
MISC_CHARGE	NUMBER(7,2)

PURCHASE DETAIL

Field Name	Type
P_ID	NUMBER
INVOICE_NO	NUMBER(5)
MATERIAL_NAME	VARCHAR2(25)
SIZE_TYPE	VARCHAR2(20)
QUANTITY	NUMBER(5)
RATE	NUMBER(8,2)
AMOUNT	NUMBER(8,2)

PRODUCT MASTER

Field Name	Type
MATERIAL_CODE	VARCHAR2(10)
MATERIAL_NAME	VARCHAR2(25)
SIZE_TYPE	VARCHAR2(20)
QTY_ON_HAND	NUMBER(7)
RATE	NUMBER(8,2)

LABOR_DETAIL

Field Name	Type
BILL_NO	NUMBER
CONST_NO	NUMBER(5)
LABOR_NAME	VARCHAR2(25)
TYPE_OF_WORK	VARCHAR2(25)
AMOUNT	NUMBER(8,2)
WORK_DATE	DATE

5. SYSTEM TESTING AND IMPLEMENTATION

5.1 SYSTEM TESTING

Internal Testing

The software testing was given equal priority to the system study phase. The question raised during system study was “how to do?” and during testing the importance was given to the question that “how it should be done?”

Each and every user screen, database structures etc., have been designed after consulting the considering the user requirements.

Unit Testing

For successful implementation each and every module of the new system was tested separately to rectify the error within its boundaries. Detail design description was used as a guide in the process. The database was checked with sample data to ensure its normal form. Each query result and reports were also checked for their integrity.

The tests that were done under the unit testing are,

(a) Interface Testing

To assure that the information properly flows into and out of program unit.

(b) Data Structure Testing

To ensure that the data are stored properly in the underlying tables.

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(c) Interface Testing

To assure that the information properly flows into and out of program unit.

(d) Data Structure Testing

To ensure that the data are stored properly in the underlying tables.

(e) Independent Path Testing

All independent paths through the module were executed at least once to assure that they are behaving as per expectations.

Integration Testing

It is a system technique for construction of the program structure while at the same time conducting tests to uncover errors associates with interfacing. The objective is to take unit-tested modules and build a program structure as specified by the system design.

All the modules that go under the unit testing are integrated together to get the whole software as a single module. Integration separate modules are done in a systematic manner. This integration is a formal procedure that must be executed carefully and according to the need.

Validation Testing

To cover functional errors ie., to check whether functional characteristic confirm to the specifications or not. The goal of validation testing is to demonstrate the software traceability to the requirements. Validation test confirms whether the software is functional.

Testing plays a vital role to reach the cent percentage perfectness in any system. It is the major quality control measure used to determine the status and usefulness of the system. Its basic function is to find the errors in the software by examining all the possible loop holes. The goal of testing is to find out uncovered requirements, designs or coding errors or invalid acceptance or storage of data etc.

Testing of the new system has been done successfully in different levels. There are so many testing activities that help to find the errors and to reach a safer state in the system implementation.

In the case of on-line response it is found out that the response time is normal. In volume testing even when the number of records increased the software and hardware was found to be functioning satisfactorily. By stress testing, it gives good response to the volume testing and also takes only short time interval to finish. Hence pass the stress test too.

In the usability test, the user friendly nature of the system was tested and found to be outstanding. All these tests make the expectation about the well functioning of the system helpful.

5.2 VERIFICATION AND VALIDATION

This system has been verified and validated by using the

(a). Test data

(b). Live data

Verified With Test Data

In this case of testing, the data were developed artificially and these data are applied to the system. The result of the system was checked, whether it satisfies the specification of the system. Each module in this system has been tested independently and finally tested as a package.

Verified With Live Data

In this case, the real data are applied to the system and its result was checked with original result that was calculated manually.

The goals of verification and validation activities are to access and improve the quality of the work products generated during development and modification of software. Quality attributes of interest include correctness, completeness, consistency, reliability, usefulness, usability, efficiency to standards and overall cost effectiveness.

Verification is a rigorous mathematics demonstration that source code confirms to its specification. Validation is the process of evaluating software at the end of the software development process to determine the compliance with requirements.

5.3 SYSTEM IMPLEMENTATION

The new system was started to operate along with existing system. The result of the new system was compared with the old system. Suppose the result is wrong, the error must be debugged. After the acceptance of the user, the existing system will be placed by the new system. This software package has been made user friendly and menu driven. So any user can handle this package very easily and it does not require any intensive training for the user.

Documentation

Before implementing the system two important documents should be proposed.

User Manual

It explains the user about the guidelines and procedures to use various functions available in the system. It includes the complete list of error message and the appropriate action to be taken.

System Manual

It explains all the aspects of design which is useful mainly for the further maintenance of the system.

User Training and Documentation

After successful completing of acceptance testing, the application project is ready to use. In order to put new application system into use, following activities should be completed.

- ❖ Preparation of User & System documentation
- ❖ User training kit
- ❖ Test run for a period of one month to ensure smooth switching over.

A presentation of the project will be made to user followed by demonstration explaining about the usage of the software. General training would be given to the user of the system. The main aim of the training would to furnish the user with a working knowledge of newly developed system. User manuals describing the procedures for invoking the function listed on menu will be circulated to user departments.

6. MAINTENANCE

MAINTENANCE FUNDAMENTALS

The term “software maintenance” is used to describe the software engineering activities that occur following delivery of a software product to the customer. The maintenance phase of the software life cycle is the time period in which a software product performs useful work.

Maintenance activities involve making enhancement to software products, adapting products to new environments and correcting problems. Software product enhancement may involve providing new functional capabilities, improving user display and modes of interaction, and upgrading external documents. Adaptation of software to a new environment may involve moving the software to a different machine. Problem correction involves modification and revalidation of software to correct errors.

The enhancement of this project can be accomplished easily. That is, any new functional capabilities can be added to the project by simply including the new module in the homepage and giving a hyperlink to that module. Adaptation of this project to a new environment is also performed easily.

6.1. CORRECTIVE MAINTENANCE

This includes modifications and updations done in order to correct or fix problems, which are either discovered by user or concluded by user error reports.

Identification & Tracing - It involves activities pertaining to identification of requirement of modification or maintenance. It is generated by user or

system may itself report via logs or error messages. Here, the maintenance type is classified also.

Analysis - The modification is analyzed for its impact on the system including safety and security implications. If probable impact is severe, alternative solution is looked for. A set of required modifications is then materialized into requirement specifications. The cost of modification/maintenance is analyzed and estimation is concluded.

Design - New modules, which need to be replaced or modified, are designed against requirement specifications set in the previous stage. Test cases are created for validation and verification.

6.2. ADAPTIVE MAINTENANCE

An activity that modifies the software to properly interface with a changing environment. The system has been modified so that various change include to the new system.

Implementation - The new modules are coded with the help of structured design created in the design step. Every programmer is expected to do unit testing in parallel.

System Testing - Integration testing is done among newly created modules. Integration testing is also carried out between new modules and the system. Finally the system is tested as a whole, following regressive testing procedures.

Acceptance Testing - After testing the system internally, it is tested for acceptance with the help of users. If at this state, user complaints some issues they are addressed or noted to address in next iteration.

Delivery - After acceptance test, the system is deployed all over the organization either by small update package or fresh installation of the system. The final testing takes place at client end after the software is delivered.

Training facility is provided if required, in addition to the hard copy of user manual.

Maintenance management - Configuration management is an essential part of system maintenance. It is aided with version control tools to control versions, semi-version or patch management.

6.3. ENHANCEMENT MAINTENANCE

As software is used, the customer/user will recognize additional functions that will provide benefit. Perceptive maintenance extends the software beyond its original functional requirements.

In the case of Net banking system can be added new functions such that the user can able to retrieve the information in a user friendly and it will be very helpful for future development.

Market Conditions - Policies, which changes over the time, such as taxation and newly introduced constraints like, how to maintain bookkeeping, may trigger need for modification.

Client Requirements - Over the time, customer may ask for new features or functions in the software.

Host Modifications - If any of the hardware and/or platform (such as operating system) of the target host changes, software changes are needed to keep adaptability.

Organization Changes - If there is any business level change at client end, such as reduction of organization strength, acquiring another company, organization venturing into new business, need to modify in the original software may arise.

7. FUTURE ENHANCEMENT

This Project has been developed to overcome the problems encountered in the existing manual system.

But it used MS-Access as its back-end database software. Instate of MS-Access, in future it can be replaced with MS-SQL or Oracle.

Network concepts can be included in future.

Voice recognition can be included to give input in future.

Bar code reader can be used in future to get input.

Security can be implemented in thump pressing using sensor in future.

In future, this application can be changed over to internet basis application program.

Sending alert information as an SMS regarding important modules requirement can be implemented in future.

8. CONCLUSION

This Project has been developed to overcome the problems encountered in the existing manual system. The new system has successfully completed and run.

The goals that have been achieved by this new system are as follows

1. User friendly screens for data entry and other operations.
2. Less processing time.
3. Database Security.
4. The reports can be produced easily and very fast.
5. Only the correct data can be given as input. If the data are invalid, they cannot be stored at all.
6. It is also flexible, easy and reliable.
7. Higher level authorities can easily ascertain the man power utilization.

9. BIBILIOGRAPHY

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APPENDIX