KUVEMPU UNIVERSITY

GOVERNMENT FIRST GRADE COLLEGE

SHIVAMOGGA –577 201.

A PROJECT REPORT ON

"COLLEGE STAFF DATA MANAGEMENT"

Submitted for the partial fulfilment of the requirements for the award of

BACHELOR OF COMPUTER APPLICATIONS

Submitted by

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CERTIFICATE FROM THE PRINCIPAL

This is to certify that the project entitled **"COLLEGE STAFF DATA MANAGEMENT"** submitted by **YOGEESH S** student of BCA under the guidance of **VANISHREE K S,** Assistant Professor, Departmentof Computer Science, Government First Grade College for the partial fulfilment of the requirement for the completion of Bachelor of Computer Applications Degree from the Kuvempu University during the academic year 2021-2022.

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CERTIFICATE FROM THE GUIDE

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Declaration

I hereby declare that the project entitled **"COLLEGE STAFF DATA MANAGEMENT"** submitted to Dept. of Computer Science has been carried under the supervision of **VANISHREE K S**, **Assistant Professor, Department of Computer Science**,GFGC, Shivamogga, as the partial fulfilment of the requirement of Bachelor of Computer Applications Degree and further I certified that this has not been previously formed as the award of any degree/diploma of such other similar title.

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1. INTRODUCTION

1.1 PROBLEM DEFINITION

Existing system of managing of staff data already replaced the traditional manual system, but it doesn't have the facility to extract the data on some specific grounds like number of paper published, involvement of staff in various college committees, activities/functions conducted in the institution, etc. These information have to be computed manually using the data stored in the existing system. To overcome these flaws, this software is designed that satisfies most of the analytics required by the institution.

1.2 OBJECTIVE

- The COLLEGE STAFF DATA MANAGEMENT application stores and accesses data easily.
- The objective of this project is to provide detailed information of every staff.
- Ability to add staff easily and flexibly.
- This software can record the staff information efficiently. This includes employee experience, entry of service, book published etc.

1.3 ABSTRACT

The project "**COLLEGE STAFF DATA MANAGEMENT**" is a Web based application developed with the aim of providing information about college staff, their personal information, service information, books and papers published by them , guide ship information, award details, project details etc. The user can fetch the information about the college employees. The web application contains the details of the employee. The employee information can fetch through the employee name. This COLLEGE STAFF DATA MANAGEMENT system is being developed for a college to maintain and facilitate easy access to information.

1.4 METHODOLOGY

To implement the above goals, the following methodology needs to be followed:

- Specifying the Application and various components of the Architecture.
- Specifying the bindings between the tasks and the resources either partially or by the design tools.
- Specifying the port inter connections between the resources.

2. SCOPE

2.1 EXISTING SYSTEM

Existing system already replaced the traditional system, but it doesn't have the facility to extract the data on some specific grounds like paper published, involvement of staff in various college committees, activities/functions conducted in the institution. These information have to be computed manually using the data stored in the existing system. To overcome these flaws, this software is designed that satisfies most of the analytics required by the institution.

- Most of the colleges maintain staff information in records.
- When the number of records increased, it is difficult to maintain the information of each employee of college.
- Maintaining the records partially leads to less efficient system.
- Error prone and requires more man power and it consumes more time for processing records.
- The old partial system has series of drawbacks as the maintenance of records is being done manually where the process of keeping, maintaining and retrieving the information was very tedious and lengthy.
- The records were never used to be in a systematic order.
- There used to be lots of difficulties in associating any particular transaction with a particular context. If any information is to be searched, we have to go through different registers, documents and reports have to be generated manually.
- There would always be unnecessary consumption of time while entering and retrieving records.
- One more problem is that it is very difficult to find errors while entering the records. Once the records were entered it is very difficult to update these records.
- Needs extra effort.
- Less Accurate and has the danger of losing some files.

2.2 PROPOSED SYSTEM

- This is a web-related application that permits us to store the entire knowledge regarding the college, employees, faculties etc. digitally and keep them in a proper manner and retrieved as per the requirement.
- Documents and reports can be generated to help the management in decision-making.
- With the implementation of computerized system, the task of keeping records in an organized manner is possible.
- The greatest of all is the retrieval of information, which will be at the click of the mouse.
- The proposed system helps in saving the time in different operations and making information flow easy and gives valuable reports.

ADVANTAGES OF PROPOSED SYSTEM:

- Several controls help the application to be friendly to access data.
- The entire project maintenance is made simpler and more adaptable.
- Several tiers have been employed data related features are added.
- During the process of project progression, there is no chance of data mishandling.
- It offers great degree of security.

3. FEASIBILITY STUDY

After doing the project COLLEGE STAFF DATA MANAGEMENT System, study and analyzing all the existing or required functionalities of the system, the next task is to do the feasibility study for the project. All projects are feasible - given unlimited resources and infinite time.

Feasibility study includes consideration of all the possible ways to provide a solution to the given problem. The proposed solution should satisfy all the user requirements and should be flexible enough so that future changes can be easily done based on the future upcoming requirements.

3.1 TECHNICAL FEASIBILITY

This included the study of function, performance and constraints that may affect the ability to achieve an acceptable system. For this feasibility study, we studied complete functionality to be provided in the system, as described in the System Requirement Specification (SRS), and checked if everything was possible using different type of frontend and backend platforms.

3.2 ECONOMICAL FEASIBILITY

Economic analysis is the most frequently used method for evaluating the effectiveness of a new system. More commonly known as cost/benefit analysis. PHP and MySQL database easily available in internet.

This is a very important aspect to be considered while developing a project. We decided the technology based on minimum possible cost factor.

- All hardware and software cost has to be borne by the college.
- Overall, we have estimated that the benefits the college is going to receive from the proposed system.

3.3 OPERATIONAL FEASIBILITY

No doubt the proposed system is fully GUI based that is very user friendly and all inputs to be taken all self-explanatory even to a staff. Besides, a proper filling the fields of the given application, to let know the information of staffs with new system. This software is very user friendly and does not require any technical person to operate. Thus, the project is even operationally feasible.

4. MODULES OF THE PROJECT:

1. **HOME PAGE MODULE**
2. **TEACHING STAFF REGISTRATION MODULE**
3. **NON -TEACHING STAFF REGISTRATION MODULE**
4. **GET TEACHING STAFF DATA MODULE**
5. **GET NON-TEACHING STAFF DATA MODULE**
6. **ADD TEACHING STAFF DATA MODULE**
7. **FUNCTION DATA MANAGEMENT**

4.1 HOME PAGE MODULE:

- HOMEPAGE is an entry point of this project.
- It gives links to Add and Access data.
- It has all shortcut links to Register and Get different type of data.

4.2 TEACHING STAFF REGISTRATION MODULE:

- It accepts teaching staff data.
- It accepts personal information, qualification data, department exam data, service data, training data, book published data, committee membership data etc.
- This form sends data into multiple tables.

4.3 NON -TEACHING STAFF REGISTRATION MODULE:

- It accepts non teaching staff data.
- It accepts personal information, qualification data, department exam data, service data and award data.
- This form sends data into multiple tables.

4.4 GET TEACHING STAFF DATA MODULE:

- It has two different types of data accessing
- One way is to fetch data using employee name.
- In the second method it gives overall information like experience, total conferences attended etc.
- It has 20 sub modules

➢ **Teacher's Complete Data**
  - It gives complete data of staff
  - It displays personal Information
  - It displays qualification Details
  - It displays department exam details
  - It displays award details
  - It displays service data

➢ **Service Data**
It displays service data of individual employee.

➢ **Department Exam Data**
It displays department exam data of individual employee.

➢ **RC / OC / Short Term Course / Workshop / Training / FDP / Conference / Seminar Data**
It displays training data and all data of RC OC short term course etc. of individual employee.

➢ **Paper Data**
It displays paper data of individual employee.

➢ **Book Published Data**
It displays book published data of individual employee.

➢ **Project Minor / Major Data**
It displays project major / minor data of individual employee.

➢ **BOS / BOE / Valuation Data**
It displays BOS or BOE or valuation data of individual employee.

➢ **Guideship Data**
It displays guideship data of individual teacher.

➢ **Awards Data**
It displays awards data of individual employee.

- **Committee Membership Data**
  It displays committee membership data of individual employee.

- **Experience Data**
  It displays experience data of every employee using joining data range.

- **Paper Details**
  It shows information of papers published by every employee.

- **Research Guideship**
  It displays research guideship data of every employee.

- **Book Data**
  It displays book published by every employee.

- **Research Student**
  It displays research student data of every employee.

- **RC / OC / Short Term Course / Workshop / Training / FDP / Conference / Seminar Data**
  It displays RC or OC or short term courses attended by every employee.

- **BOS / BOE / Valuation Member Data**
  It displays membership in BOS or BOE committee of every employee.

- **Project Minor / Major Data**
  It displays minor or major project undertaken by every employee.

4.5 NON-TEACHING STAFF DATA MODULE:

It has five sub modules

- **Personnel Data entry**
  - It gives complete data of staff
  - It displays personal Information
  - It displays qualification Details
  - It displays department exam details
  - It displays award details
  - It displays service data
- **Service Data**

  It displays the employee's joining and leaving dates based on their service in various institutions.
- **Department Exam Data**

  It displays the employee's department exam details.

- **Award Data**

  It displays the employee award data.

- **Experience Data**

  It displays experience in present college and his total experience.

4.6 TEACHING STAFF ADDITIONAL DATA ADDING MODULE:

It has two sub modules

- **Add Guideship.**

It accepts guideship details and guideship student details.

- **Add BOS / BOE / Valuation Details**

It accepts BOS, BOE and Valuation Details

4.7 FUNCTION DATA MANAGEMENT MODULE:

It has three sub modules

- **Add Function Data.**

It accepts function or event data.

- **Get Function Data**

It displays function or event information with pictures.

- **Add Function organizer details.**

It accepts organizer information like NSS, NCC etc.

5. SOFTWARE AND HARDWARE REQUIREMENTS:

5.1 HARDWARE REQUIREMENT:

- **Processor**: i3 or i5.
- **RAM:** 2GB and above.
- **Storage:** 5GB.
- **Monitor:** LED.
- **Keyboard:** Logitech.
- **Mouse:** Optical.

5.2 SOFTWARE REQUIREMENT:

- **Operating System:** Windows 7 and above.
- **Front End**: HTML, CSS, JAVA SCRIPT.
- **Integrated Development Environment:** Visual Studio Code.
- **Back End**: My SQL, PHP.

5.3 DEVELOPMENT ENVIRONMENT

- Text Editor: Sublime Text Editor
- Platform: XAMPP.
- Designing Language: HTML and CSS.
- Coding Language: PHP and JavaScript.
- Database: MySQL.

6. TOOLS AND TECHNOLOGIES USED

6.1 SUBLIME TEXT EDITOR:

Sublime Text Editor is a full featured Text editor for editing local files or a code base. It includes various features for editing code base which helps developers to keep track of changes. Various features that are supported by Sublime are as follows

- Syntax Highlight
- Auto Indentation
- File Type Recognition
- Sidebar with files of mentioned directory
- Macros
- Plug-in and Packages

Sublime Text editor is used as an Integrated Development Editor (IDE) like Visual Studio code and NetBeans. The current version of Sublime Text editor is 3.0 and is compatible with various operating systems like Windows, Linux and MacOS.

Sublime Text editor is a sophisticated text editor which is widely used among developers. It includes wide features such as Syntax Highlight, Auto Indentation, File Type Recognition, Sidebar, Macros, Plug-in and Packages that make it easy for working with code base. This tutorial gives you a comprehensive coverage of concepts of Sublime Text and makes you comfortable to use it in your software development projects.

6.2 XAMPP:

XAMPP is a free and open-source cross-platform web server solution stack package developed by Apache Friends, consisting mainly of the Apache HTTP Server, MariaDB database, and interpreters for scripts written in the PHP and Perl programming languages. Since most actual web server deployments use the same components as XAMPP, it makes transitioning from a local test server to a live server possible. XAMPP's ease of deployment means a WAMP or LAMP stack can be installed quickly and simply on an operating system by a developer, with the advantage a number of common add-in applications such as Wordpress and Joomla! Can also be installed with similar ease using bitnami.

What Does XAMPP Mean?

- X - The cross-browser tool which may be launched on Windows, Linux, OS Mac, and etc.
- A - Apache - the web server software.
- M - MySQL - the database type.
- P - PHP - scripting language.
- P - Perl - scripts' language too.

6.3 MySQL server:

MySQL server is an open source relational database management system

(RDBMS). Its name is a combination of "My", the name of co-founder Wideness's daughter, and "SQL", the abbreviation for Structured Query Language. The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL was owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, now owned by Oracle Corporation. For proprietary use, several paid editions are available, and offer additional functionality.

MySQL is a central component of the LAMP open-source web application software stack (and other "AMP" stacks). LAMP is an acronym for "Linux, Apache, MySQL, Perl/ PHP/ Python". Applications that use the MySQL database include: TYPO3, MODx, Joomla, WordPress, Simple Machines Forum, phpBB, MyBB, and Drupal. MySQL is also used in many high-profile, largescale websites, including Google (though not for searches), Facebook, Twitter, Flickr, and YouTube.

6.4 Apache:

Apache is a freely available Web server that is distributed under an "open source" license. Version 2.0 runs on most UNIX-based operating systems (such as Linux, Solaris, Digital UNIX, and AIX), on other UNIX/POSIX-derived systems (such as Rhapsody, BeOS, and BS2000/OSD), on Amiga OS, and on Windows 2000. According to a Netcraft (www.netcraft.com) Web server survey 60% of all Web sites on the Internet are using Apache (62% including Apache derivatives), making Apache more widely used than all other Web servers combined.

7. LANGUAGES USED

7.1 PHP: HYPERTEXT PREPROCESSOR:

PHP is a server-side scripting language designed for Web development. It was originally created by Rasmus Lerdorf in 1994; the PHP reference implementation is now produced by The PHP Group. PHP originally stood for Personal Home Page,[4] but it now stands for the recursive initialism PHP: Hypertext Preprocessor.

PHP code may be embedded into HTML code, or it can be used in combination with various web template systems, web content management systems, and web frameworks. PHP code is usually processed by a PHP interpreter implemented as a module in the web server or as a Common Gateway Interface (CGI) executable. The web server combines the results of the interpreted and executed PHP code, which may be any type of data, including images, with the generated web page. PHP code may also be executed with a command-line interface (CLI) and can be used to implement standalone graphical applications.

The standard PHP interpreter, powered by the Zend Engine, is free software released under the PHP License. PHP has been widely ported and can be deployed on most web servers on almost every operating system and platform, free of charge.

The PHP language evolved without a written formal specification or standard until 2014, with the original implementation acting as the de facto standard which other implementations aimed to follow. Since 2014 work has gone on to create a formal PHP specification.

7.2 HTML

Hypertext Markup Language (**HTML**) is the standard markup language for creating web pages and web applications. With Cascading Style Sheets (CSS) and JavaScript, it forms a triad of cornerstone technologies for the World Wide Web.

Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.

HTML elements are the building blocks of HTML pages. With HTML constructs, images and other objects such as interactive forms may be embedded into the rendered page. HTML provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. HTML elements are

delineated by tags, written using angle brackets. Tags such as <img/> and <input/> directly introduce content into the page. Other tags such as <p> surround and provide information about document text and may include other tags as sub-elements. Browsers do not display the HTML tags, but use them to interpret the content of the page.

7.3 MYSQL

MySQL is an open-source relational database management system (RDBMS). Its name is a combination of "My", the name of co-founder Michael Widenius's daughter, and "SQL", the abbreviation for Structured Query Language. The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL was owned and sponsored by a singlefor-profit firm, the Swedish company MySQL AB, now owned by Oracle Corporation. For proprietary use, several paid editions are available, and offer additional functionality.

MySQL is a central component of the LAMP open-source web application software stack (and other "AMP" stacks). LAMP is an acronym for "Linux, Apache, MySQL, Perl/ PHP/ Python". Applications that use the MySQL database include: TYPO3, MODx, Joomla, WordPress, Simple Machines Forum, phpBB, MyBB, and Drupal. MySQL is also used in many high-profile, large-scale websites, including Google (though not for searches), Facebook Twitter, Flickr, and YouTube.

Features

MySQL is offered under two different editions: the open-source MySQL Community Server and the proprietary Enterprise Server. MySQL Enterprise Server is differentiated by a series of proprietary extensions which install as server plugins, but otherwise shares the version numbering system and is built from the same code base.

Major features as available in MySQL 5.6:

- A broad subset of ANSI SQL 99, as well as extensions
- Cross-platform support
- Stored procedures, using a procedural language that closely adheres to SQL/PSM
- Triggers
- Cursors

7.4 CSS

CSS is the language for describing the presentation of Web pages, including colors, layout, and fonts. It allows one to adapt the presentation to different types of devices, such as large screens, small screens, or printers. CSS is independent of HTML and can be used with any XML-based markup language.

The separation of HTML from CSS makes it easier to maintain sites, share style sheets across pages, and tailor pages to different environments. This is referred to as the separation of structure (or: content) from presentation.

This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple web pages to share formatting by specifying the relevant CSS in a separate .CSS file which reduces complexity and repetition in the structural content as well as enabling the .CSS file to be cached to improve the page load speed between the pages that share the file and its formatting.

7.5 JAVASCRIPT

JavaScript is everywhere, and for the seventh year in a row, it has been ranked the most commonly used programming language, with 67.8% of developers employing it in 2019. Its ascent to the world's most popular programming language is synonymous with the rise of the internet itself.

Created out of necessity, it is used to build 95.2% (1.52 billion) of websites today, including some of the world's largest, like Facebook and YouTube. Without it, we would not have popular and useful web apps such as Google Maps and eBay.

So, without further ado, let's take a look at what JavaScript is, how and why it was created, and what's next for the language.

JavaScript is a scripting language that is one of the three core languages used to develop websites. Whereas HTML and CSS give a website structure and style, JavaScript lets you add functionality and behaviours to your website, allowing your website's visitors to interact with content in many imaginative ways.

7.6 jQuery

jQuery is a lightweight, "write less, do more", JavaScript library. The purpose of jQuery is to make it much easier to use JavaScript on your website.

jQuery takes a lot of common tasks that require many lines of JavaScript code to accomplish, and wraps them into methods that you can call with a single line of code.

jQuery also simplifies a lot of the complicated things from JavaScript, like AJAX calls and DOM manipulation.

The jQuery library contains the following features:

- HTML/DOM manipulation
- CSS manipulation
- HTML event methods
- Effects and animations
- AJAX

Utilities

All the different visitors' actions that a web page can respond to are called events.

Examples:

- moving a mouse over an element
- selecting a radio button
- clicking on an element

8. INPUT & OUTPUT REPRESENTETION

Input design is a part of overall system design. The main objective during the input design is as given below:

- To produce a cost-effective method of input.
- To achieve the highest possible level of accuracy.
- To ensure that the input is acceptable and understood by the user.

8.1 INPUT STAGES:

The main input stages can be listed as below:

- Data recording
- Data transcription
- Data conversion
- Data verification
- Data control
- Data transmission
- Data validation
- Data correction

8.2 INPUT TYPES:

It is necessary to determine the various types of inputs. Inputs can be categorized as follows:

- External inputs, which are prime inputs for the system.
- Internal inputs, which are user communications with the system.
- Operational, which are computer department's communications to the system? Interactive, which are inputs entered during a dialogue.

8.3 INPUT MEDIA:

At this stage choice has to be made about the input media. To conclude about the input media consideration has to be given to.

- Type of input
- Flexibility of format
- Speed
- Accuracy
- Verification methods
- Rejection rates
- Ease of correction
- Storage and handling requirements
- Security
- Easy to use
- Portability

Keeping in view the above description of the input types and input media, it can be said that most of the inputs are of the form of internal and interactive. As Input data is to be the directly keyed in by the user, the keyboard can be considered to be the most suitable input device.

8.4 OUTPUT DESIGN:

In general, are:

- External Outputs whose destination is outside the organization.
- Internal Outputs whose destination is with in organization and they are the User's main interface with the computer. Outputs from computer systems are required primarily to communicate the results of processing to users. They are also used to provide
- a permanent copy of the results for later consultation. The various types of outputs
- Operational outputs whose use is purely with in the computer department.
- Interface outputs, which involve the user in communicating directly with the system.

8.5 OUTPUT DEFINITION

The outputs should be defined in terms of the following points:

- Type of the output
- Content of the output
- Format of the output

- Location of the output
- Frequency of the output
- Volume of the output
- Sequence of the output

It is not always desirable to print or display data as it is held on a computer.

It should be decided as which form of the output is the most suitable.

For Example

Will decimal points need to be inserted, should leading zeros be suppressed.

8.6 OUTPUT MEDIA:

In the next stage it is to be decided that which medium is the most appropriate for the output. The main considerations when deciding about the output media are:

- The suitability for the device to the particular application.
- The need for a hard copy.
- The response time required.
- The location of the users
- The software and hardware available.

Keeping in view the above description the project is to have outputs mainly coming under the category of internal outputs. The main outputs desired according to the requirement specification are:

The outputs were needed to be generated as a hard copy and as well as queries to be viewed on the screen. Keeping in view these outputs, the format for the output is taken from the outputs, which are currently being obtained after partial processing. The standard printer is to be used as output media for hard copies.

9. SYSTEM DESIGN

INTRODUCTION

Software design sits at the technical kernel of the software engineering process and is applied regardless of the development paradigm and area of application. Design is the first step in the development phase for any engineered product or system. The designer's goal is to produce a model or representation of an entity that will later be built. Beginning, once system requirement have been specified and analysed, system design is the first of the three technical activities design, code and test that is required to build and verify software.

The importance can be stated with a single word "Quality". Design is the place where quality is fostered in software development. Design provides us with representations of software that can assess for quality. Design is the only way that we can accurately translate a customer's view into a finished software product or system. Software design serves as a foundation for all the software engineering steps that follow. Without a strong design we risk building an unstable system – one that will be difficult to test, one whose quality cannot be assessed until the last stage.

During design, progressive refinement of data structure, program structure, and procedural details are developed reviewed and documented. System design can be viewed from either technical or project management perspective. From the technical point of view, design is comprised of four activities – architectural design, data structure design, interface design and procedural design.

NORMALIZATION

It is a process of converting a relation to a standard form. The process is used to handle the problems that can arise due to data redundancy i.e. repetition of data in the database, maintain data integrity as well as handling problems that can arise due to insertion, updation, deletion anomalies.

Decomposing is the process of splitting relations into multiple relations to eliminate anomalies and maintain anomalies and maintain data integrity. To do this we use normal forms or rules for structuring relation.

Insertion anomaly: Inability to add data to the database due to absence of other data.

Deletion anomaly: Unintended loss of data due to deletion of other data.

Update anomaly: Data inconsistency resulting from data redundancy and partial update.

Normal Forms: These are the rules for structuring relations that eliminate anomalies.

FIRST NORMAL FORM:

A relation is said to be in first normal form if the values in the relation are atomic for every attribute in the relation. By this we mean simply that no attribute value can be a set of values or, as it is sometimes expressed, a repeating group.

SECOND NORMAL FORM:

A relation is said to be in second Normal form is it is in first normal form and it should satisfy any one of the following rules.

1) Primary key is a not a composite primary key

2) No non key attributes are present

3) Every non key attribute is fully functionally dependent on full set of primary key.

THIRD NORMAL FORM:

A relation is said to be in third normal form if their exits no transitive dependencies.

Transitive Dependency: If two non-key attributes depend on each other as well as on the primary key then they are said to be transitively dependent.

The above normalization principles were applied to decompose the data in multiple tables thereby making the data to be maintained in a consistent state.

9.1 DATAFLOW DIAGRAM

A data flow diagram is graphical tool used to describe and analyze movement of data through a system. These are the central tool and the basis from which the other components are developed. The transformation of data from input to output, through processed, may be described logically and independently of physical components associated with the system. These are known as the logical data flow diagrams. The physical data flow diagrams show the actual implements and movement of data between people, departments and workstations. A full description of a system actually consists of a set of data flow diagrams. Using two familiar notations Yourdon, Gene and Sarson notation develops the data flow diagrams. Each component in a DFD is labeled with a descriptive name. Process is further identified with a number that will be used for identification purpose. The development of DFD'S is done in several levels. Each process in lower-level diagrams can be broken down into a more detailed DFD in the next level. The lop level diagram is often called context diagram. It consists a single process bit, which plays vital role in studying the current system. The process in the context level diagram is exploded into other process at the first level DFD.

The idea behind the explosion of a process into more process is that understanding at one level of detail is exploded into greater detail at the next level. This is done until further explosion is necessary and an adequate amount of detail is described for analyst to understand the process.

Larry Constantine first developed the DFD as a way of expressing system requirements in a graphical from, this lead to the modular design.

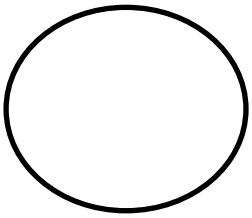
A DFD is also known as a "bubble Chart" has the purpose of clarifying system requirements and identifying major transformations that will become programs in system design. So, it is the starting point of the design to the lowest level of detail.

A DFD consists of a series of bubbles joined by data flows in the system.

DFD SYMBOLS:

In the DFD, there are four symbols

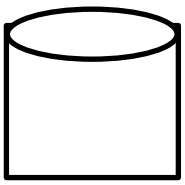
1. A square defines a source(originator) or destination of system data
2. An arrow identifies data flow. It is the pipeline through which the information flows
3. A circle or a bubble represents a process that transforms incoming data flow into outgoing data flows.
4. An open rectangle is a data store, data at rest or a temporary repository of data



Process that transforms data flow.

Source or Destination of data

Data flow



Data Store

CONSTRUCTING A DFD:

Several rules of thumb are used in drawing DFD'S:

1. Process should be named and numbered for an easy reference. Each name should be representative of the process.
2. The direction of flow is from top to bottom and from left to right. Data traditionallyflow from source to the destination although they may flow back to the source. Oneway to indicate this is to draw long flow line back to a source. An alternative way isto repeat the source symbol as a destination. Since it is used more than once in the DFD it is marked with a short diagonal.
3. When a process is exploded into lower level details, they are numbered.
4. The names of data stores and destinations are written in capital letters. Process and dataflow names have the first letter of each work capitalized

A DFD typically shows the minimum contents of data store. Each data storeshould contain all the data elements that flow in and out.

Questionnaires should contain all the data elements that flow in and out. Missing interfaces redundancies and like is then accounted for often through interviews.

TYPES OF DATA FLOW DIAGRAMS

1. Current Physical
2. Current Logical
3. New Logical
4. New Physical

CURRENT PHYSICAL:

In Current Physical DFD process label include the name of people or their positionsor the names of computer systems that might provide some of the overall system- processing label includes an identification of the technology used to process the data. Similarly, data flows and data stores are often labels with the names of the actual physical media on which data are stored such as file folders, computer files,business forms or computer tapes.

CURRENT LOGICAL:

The physical aspects at the system are removed as mush as possible so that the current system is reduced to its essence to the data and the processors that transformthem regardless of actual physical form.

NEW LOGICAL:

This is exactly like a current logical model if the user were completely happy withhe user were completely happy with the functionality of the current system but hadproblems with how it was implemented typically through the new logical model will differ from current logical model while having additional functions, absolute function removal and inefficient flows recognized.

NEW PHYSICAL:

The new physical represents only the physical implementation of the newsystem.

RULES GOVERNING THE DFD'S

PROCESS

1) No process can have only outputs.
2) No process can have only inputs. If an object has only inputs than it must be a sink.
3) A process has a verb phrase label.

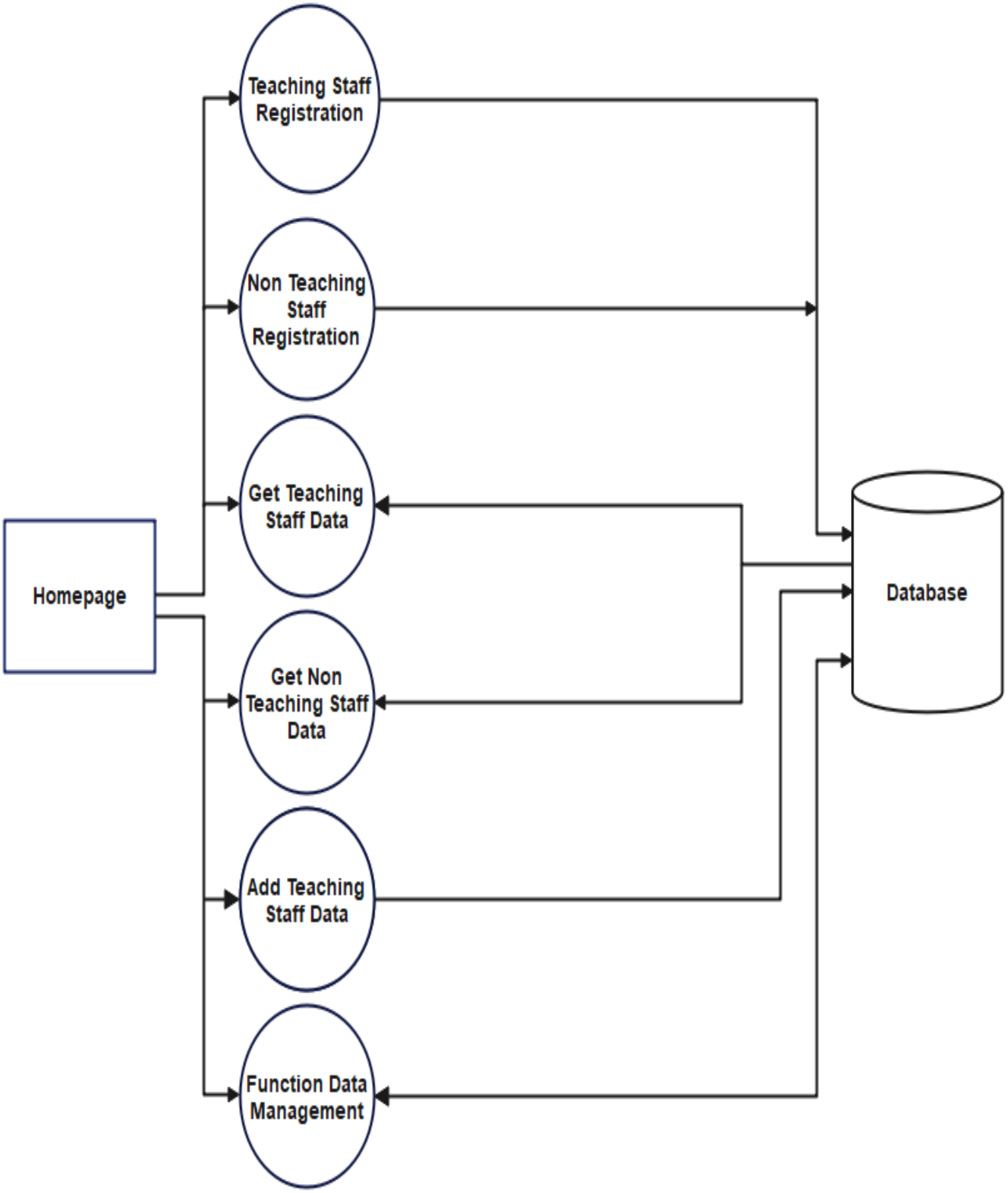
DATA STORE

1) Data cannot move directly from one data store to another data store, a process must move data.
2) Data cannot move directly from an outside source to a data store, a process, which receives, must move data from the source and place the data into data store
3) A data store has a noun phrase label.

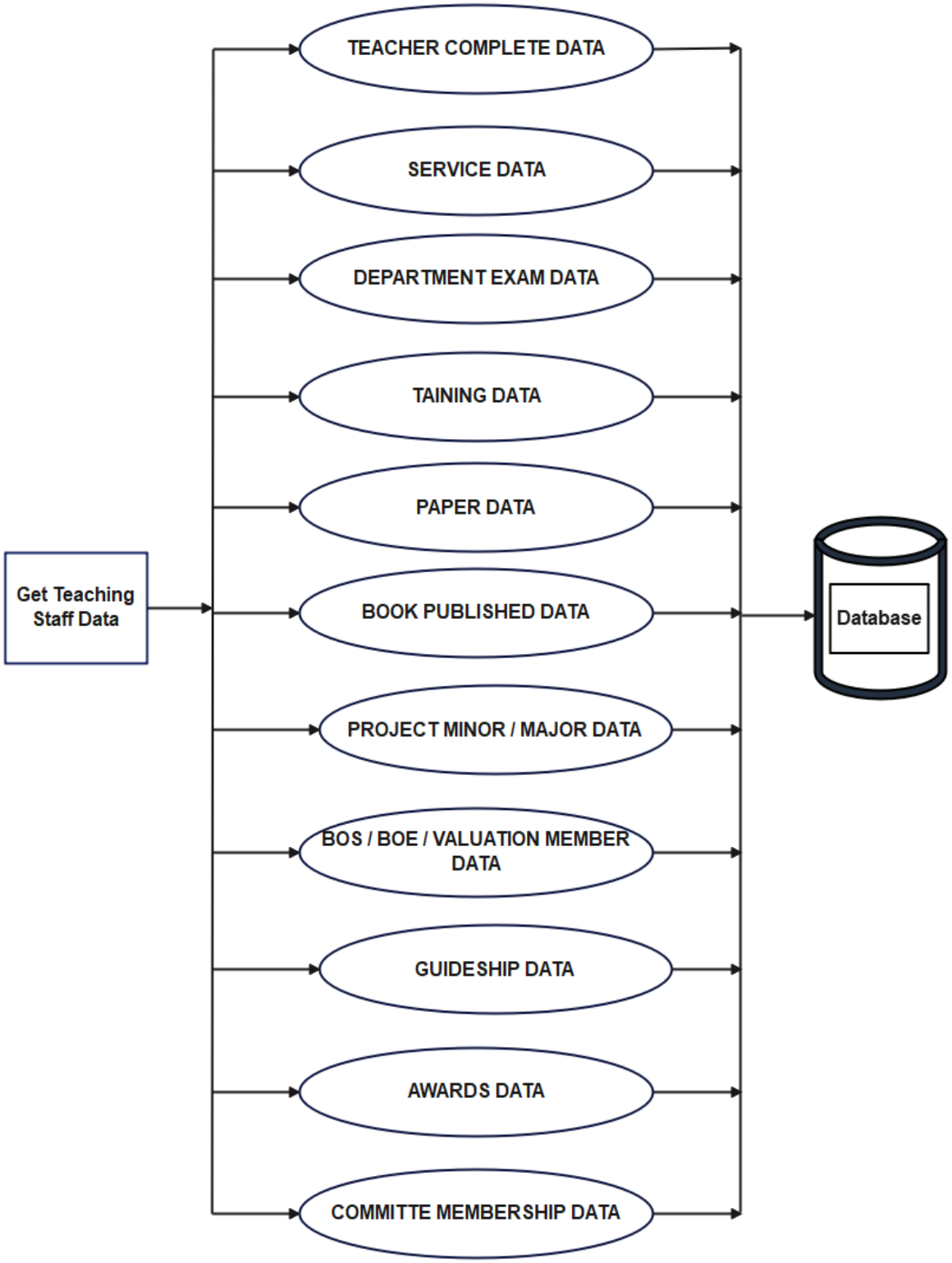
DATA FLOW

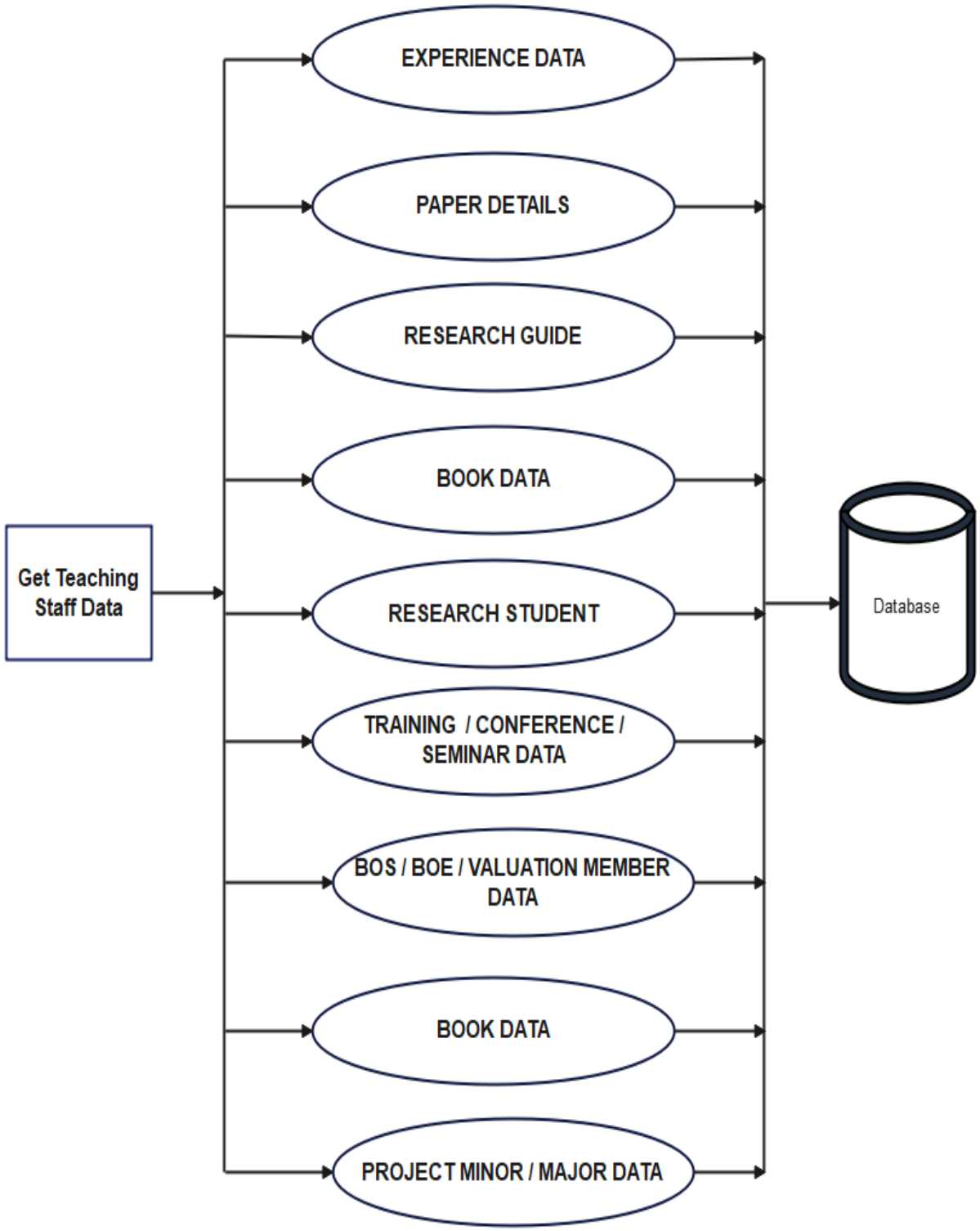
1) A Data Flow has only one direction of flow between symbols. It may flow in both directions between a process and a data store to show a read before an update. The later is usually indicated however by two separate arrows since these happen at different type.
2) A join in DFD means that exactly the same data comes from any of two or more different processes data store or sink to a common location.
3) A data flow cannot go directly back to the same process it leads. There must be atleast one other process that handles the data flow produce some other data flow returns the original data into the beginning process.
4) A Data flow to a data store means update (delete or change).
5) A data Flow from a data store means retrieve or use.
6) A data flow has a noun phrase label more than one data flow noun phrase can appear on a single arrow as long as all of the flows on the same arrow move together as one package.

DFD'S DIAGRAM

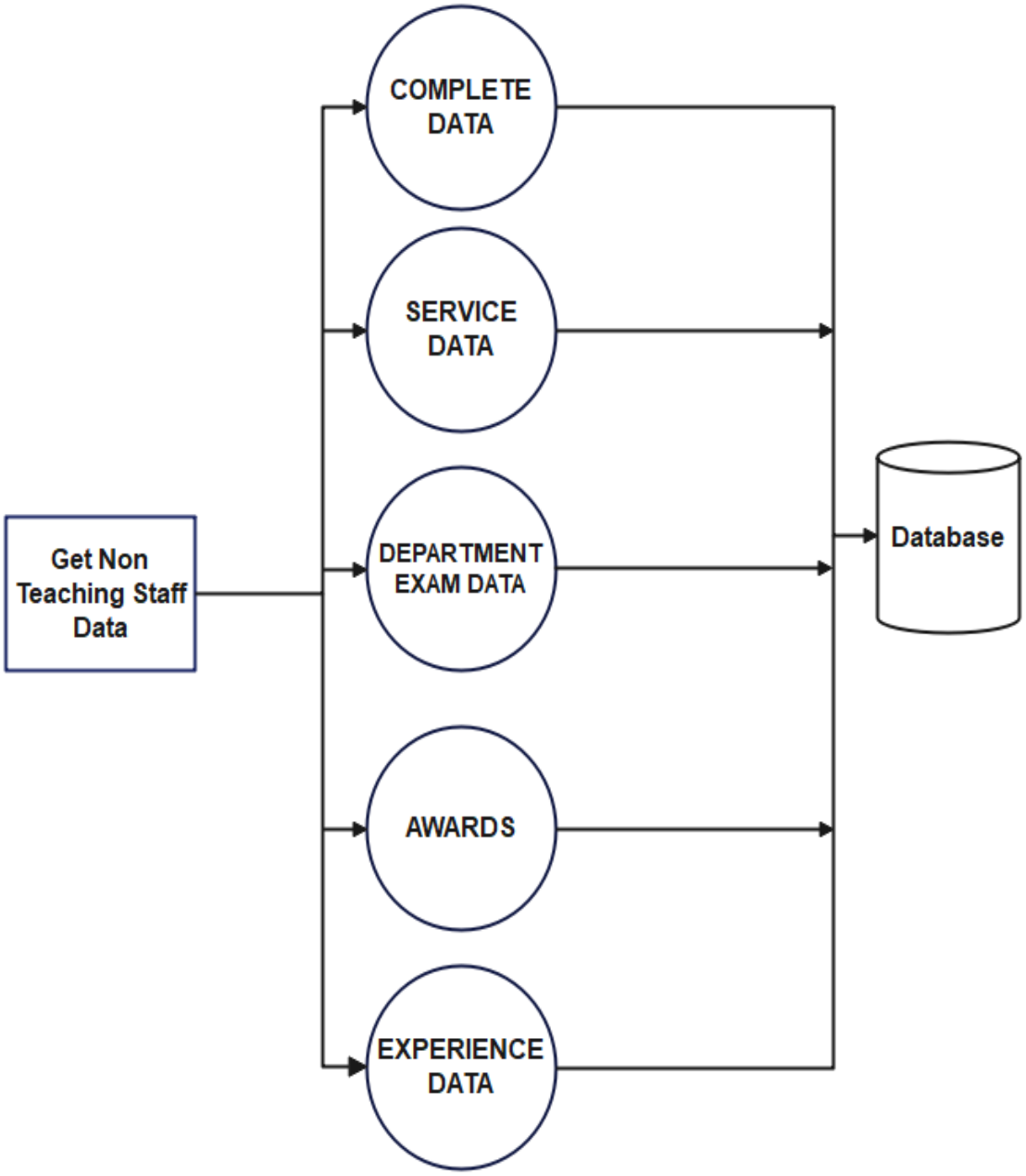


GET TEACHING STAFF DATA - DATA FLOW DIAGRAM (DFD)

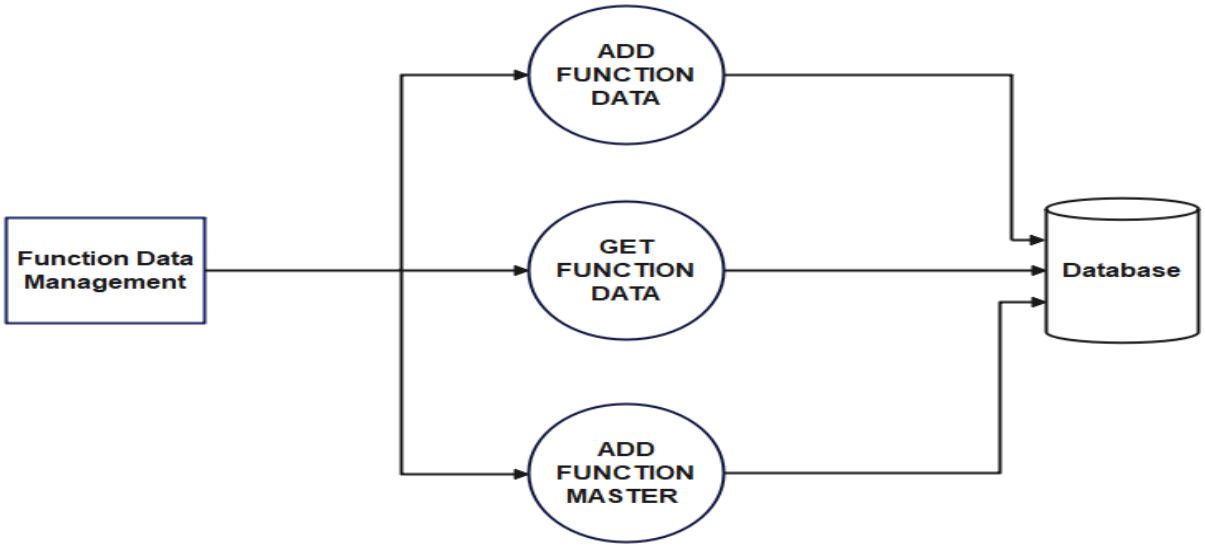



EXPERIENCE DATA
PAPER DETAILS
RESEARCH GUIDE
BOOK DATA
Get Teaching Staff Data
RESEARCH STUDENT
Database
TRAINING / CONFERENCE / SEMINAR DATA
BOS / BOE / VALUATION MEMBER DATA
BOOK DATA
PROJECT MINOR / MAJOR DATA

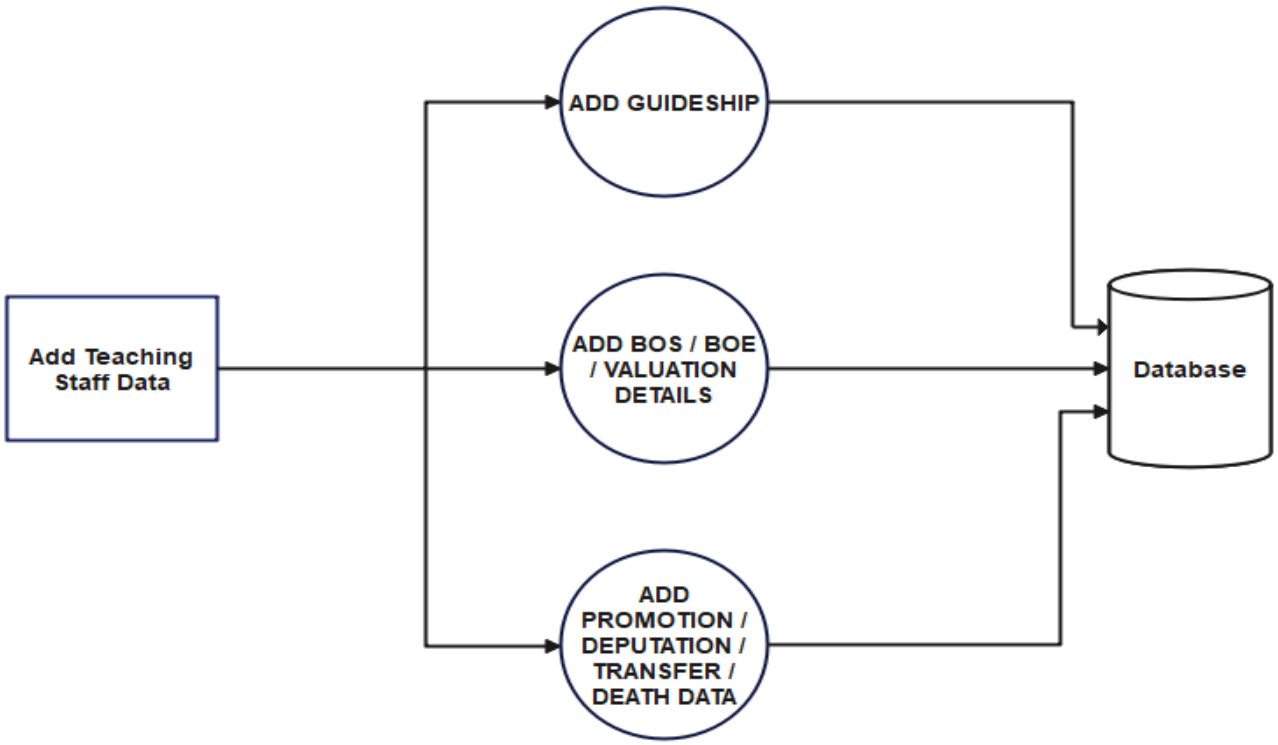
GET NON-TEACHING STAFF DATA - DATA FLOW DIAGRAM (DFD)



FUNCTION DATA MANAGEMENT - DATA FLOW DIAGRAM (DFD)



GET NON-TEACHING STAFF DATA - DATA FLOW DIAGRAM (DFD)



9.2 E – R DIAGRAMS

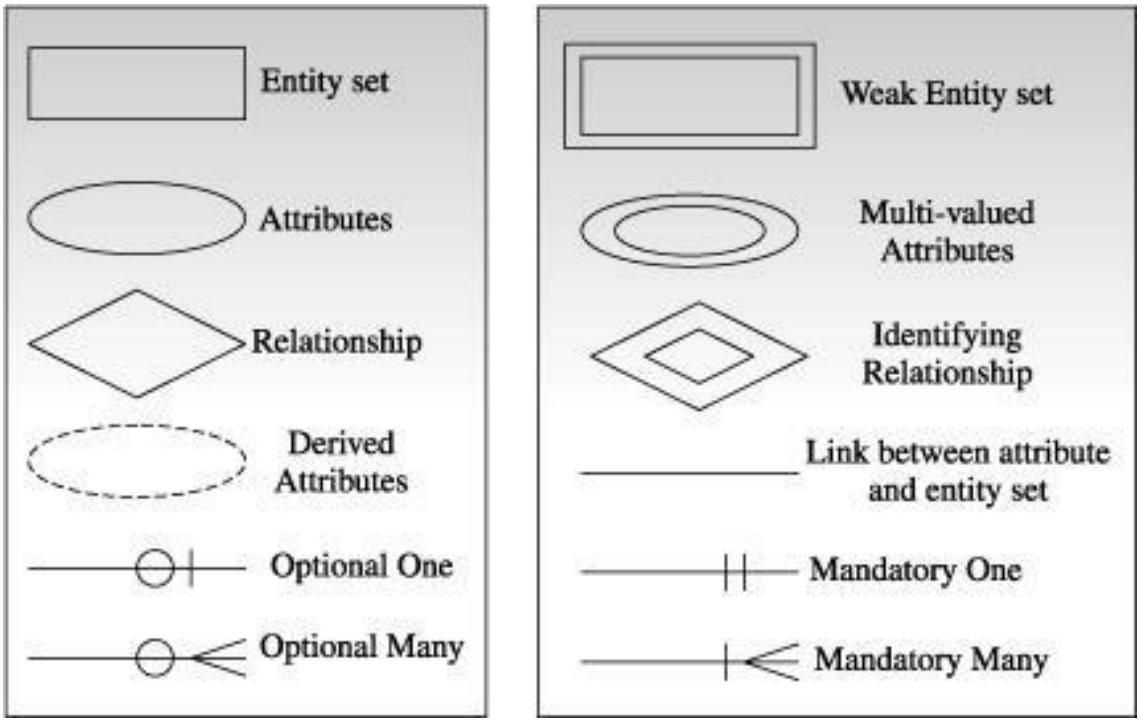
The relation upon the system is structure through a conceptual ER-Diagram, which not only specifics the existential entities but also the standard relations through whichthe system exists and the cardinalities that are necessary for the system state to continue.

The entity Relationship Diagram (ERD) depicts the relationship between the data objects. The ERD is the notation that is used to conduct the date modelling activity the attributes of each data object noted is the ERD can be described resign a data object description.

The set of primary components that are identified by the ERD are

- Data object
- Relationships
- Attributes
- Various types of indicators.

The primary purpose of the ERD is to represent data objects and their relationships.



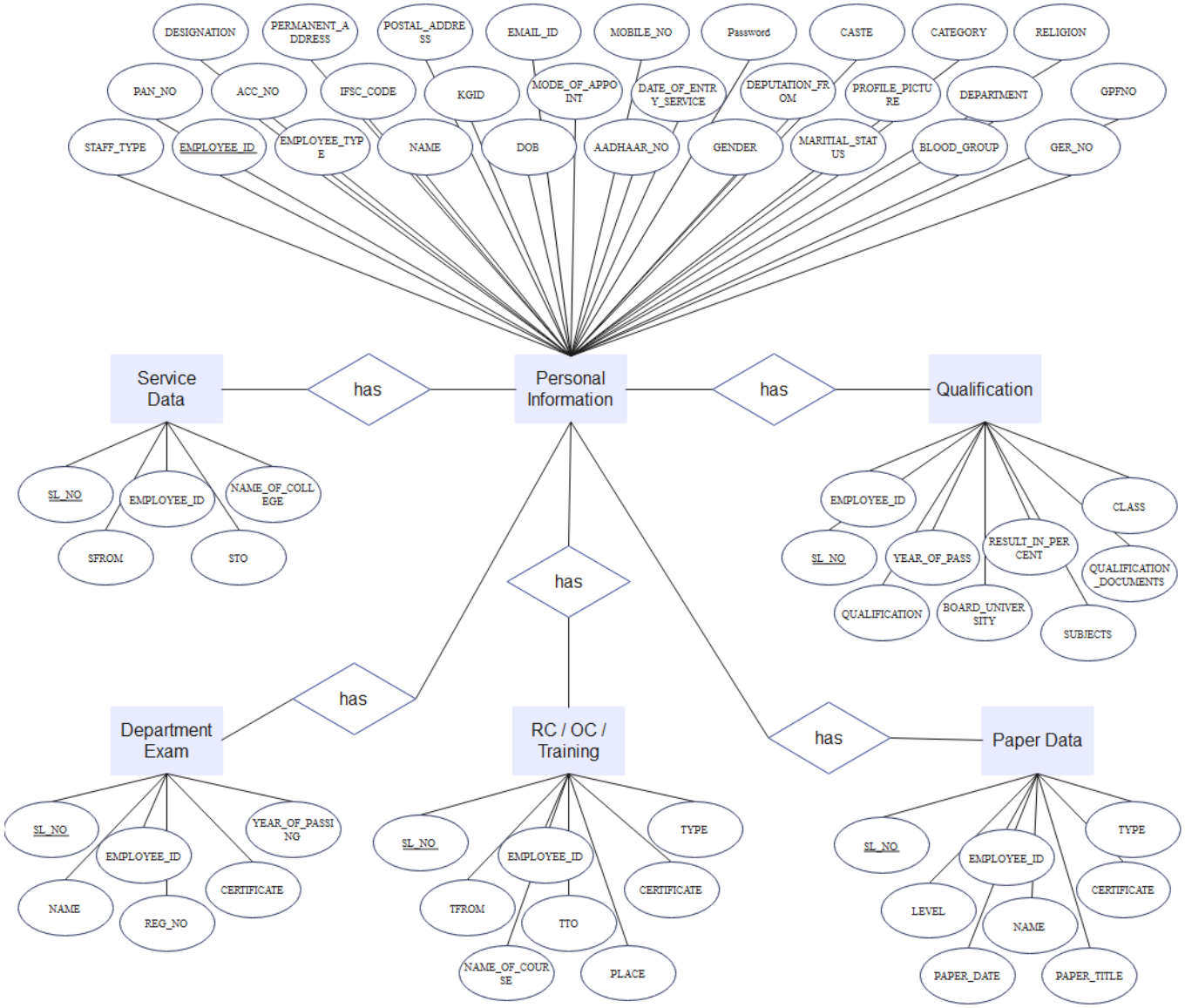


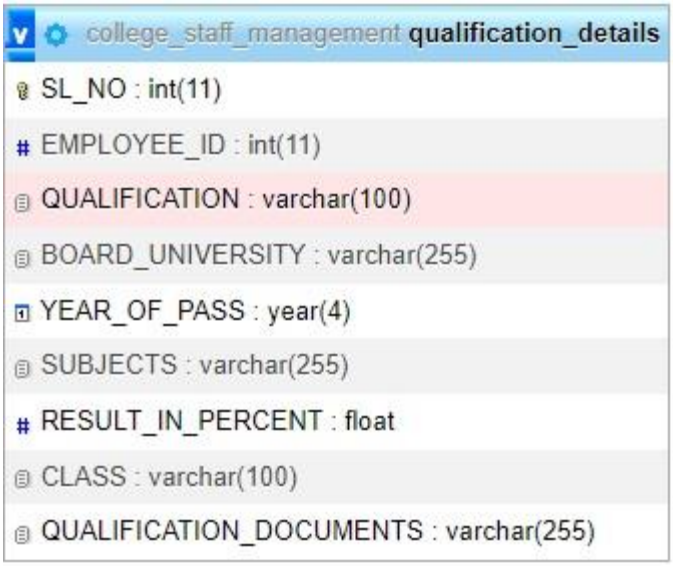
FIG: ER DIAGRAM FOR COLLEGE STAFF DATA MANAGEMENT

9.3 DATABASE DESIGN:

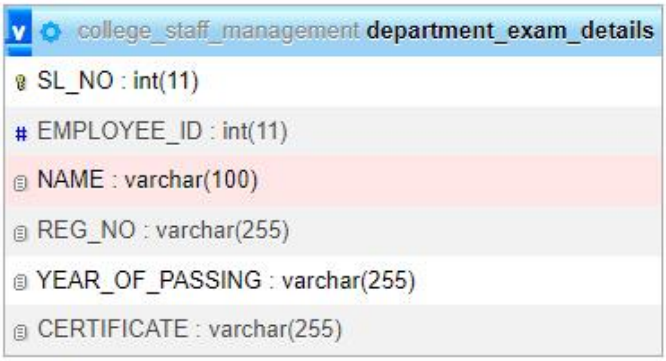
PERSONAL INFORMATION TABLE

college_staff_management personal_information_details
STAFF_TYPE : varchar(50)
EMPLOYEE_ID : int(11)
EMPLOYEE_TYPE : varchar(50)
NAME : varchar(50)
DOB : date
AADHAAR_NO : varchar(20)
GENDER : varchar(8)
MARITIAL_STATUS : varchar(10)
BLOOD_GROUP : varchar(5)
PAN_NO : varchar(20)
ACC_NO : varchar(20)
IFSC_CODE : varchar(20)
KGID : varchar(20)
GPFNO : varchar(20)
GER_NO : varchar(20)
RELIGION : varchar(50)
CATEGORY : varchar(20)
CASTE : varchar(20)
MOBILE_NO : varchar(20)
EMAIL_ID : varchar(255)
POSTAL_ADDRESS : varchar(255)
PERMANENT_ADDRESS : varchar(255)
DESIGNATION : varchar(255)
DEPARTMENT : varchar(255)
MODE_OF_APPOINT : varchar(255)
DATE_OF_ENTRY_SERVICE : date
DEPUTATION_FROM : date
PROFILE_PICTURE : varchar(255)

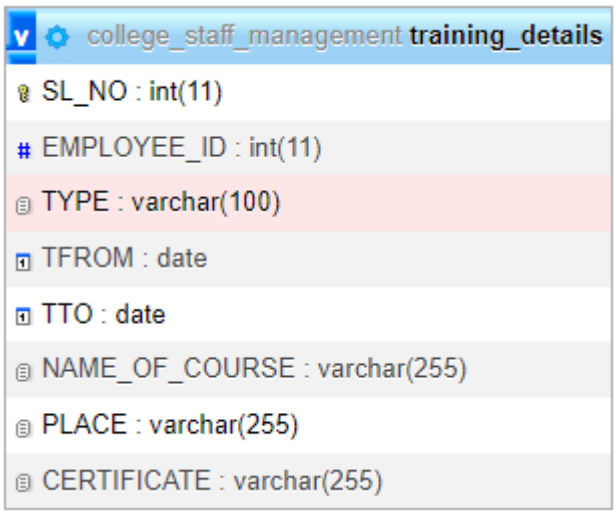
QUALIFICATION DETAILS TABLE



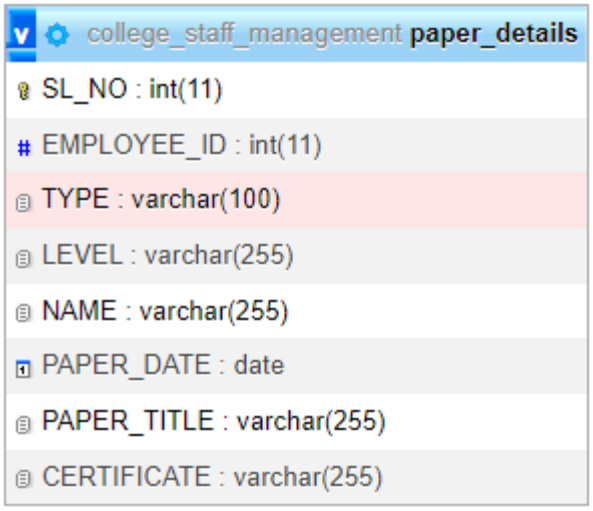
DEPARTMENT EXAM TABLE



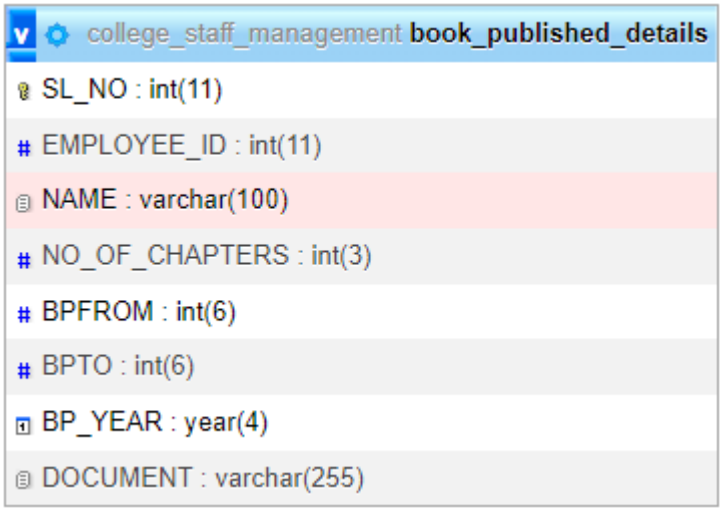
RC / OC / SHORT TERM COURSE / WORKSHOP / TRAINING / FDP / CONFERENCE / SEMINAR TABLE



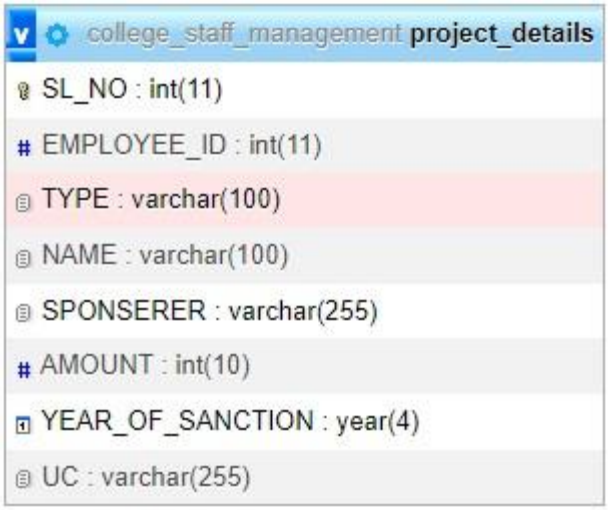
PAPER DATA TABLE



BOOK PUBLISHED DATA TABLE

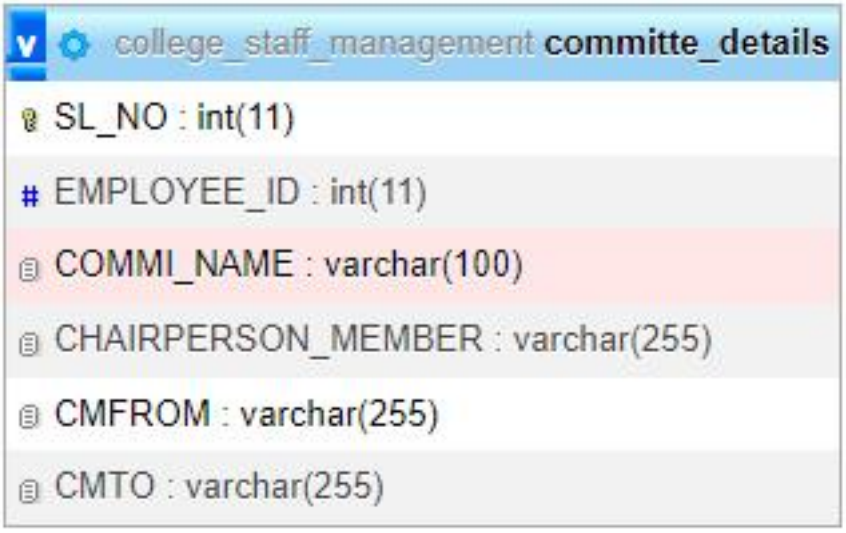


PROJECT MINOR / MAJOR



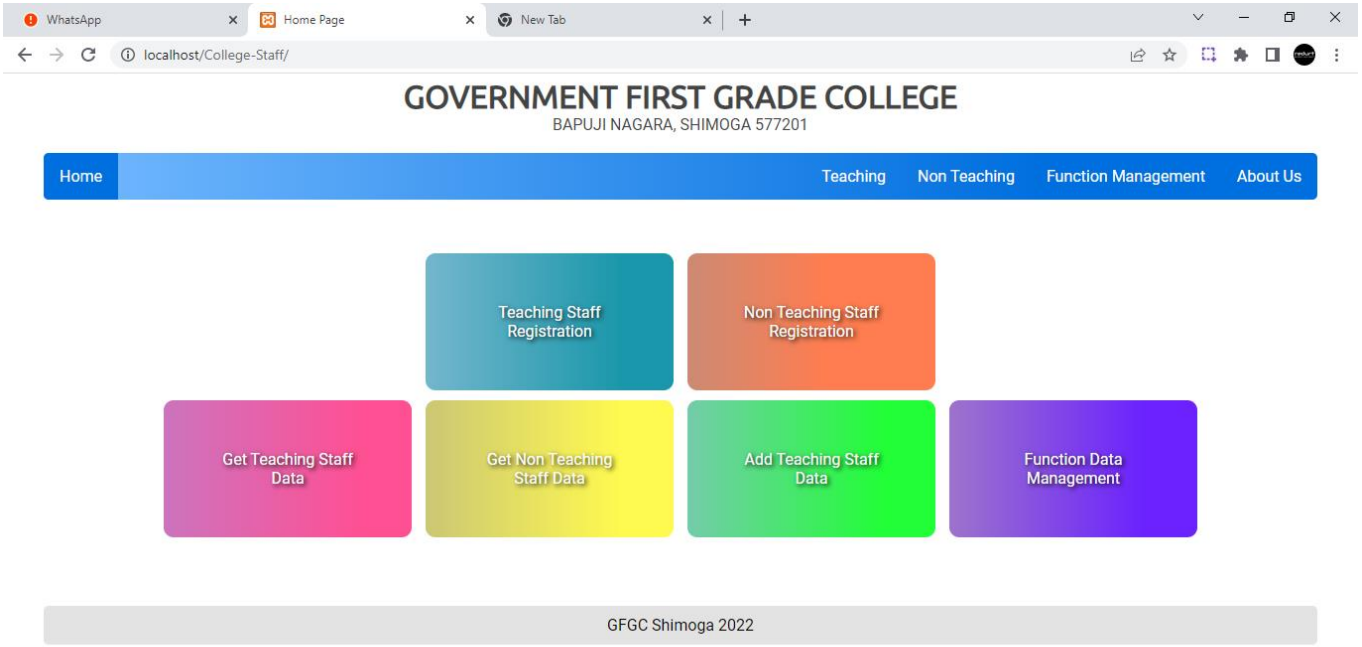
AWARDS TABLE

COMMITTEE MEMBERSHIP DATA TABLE

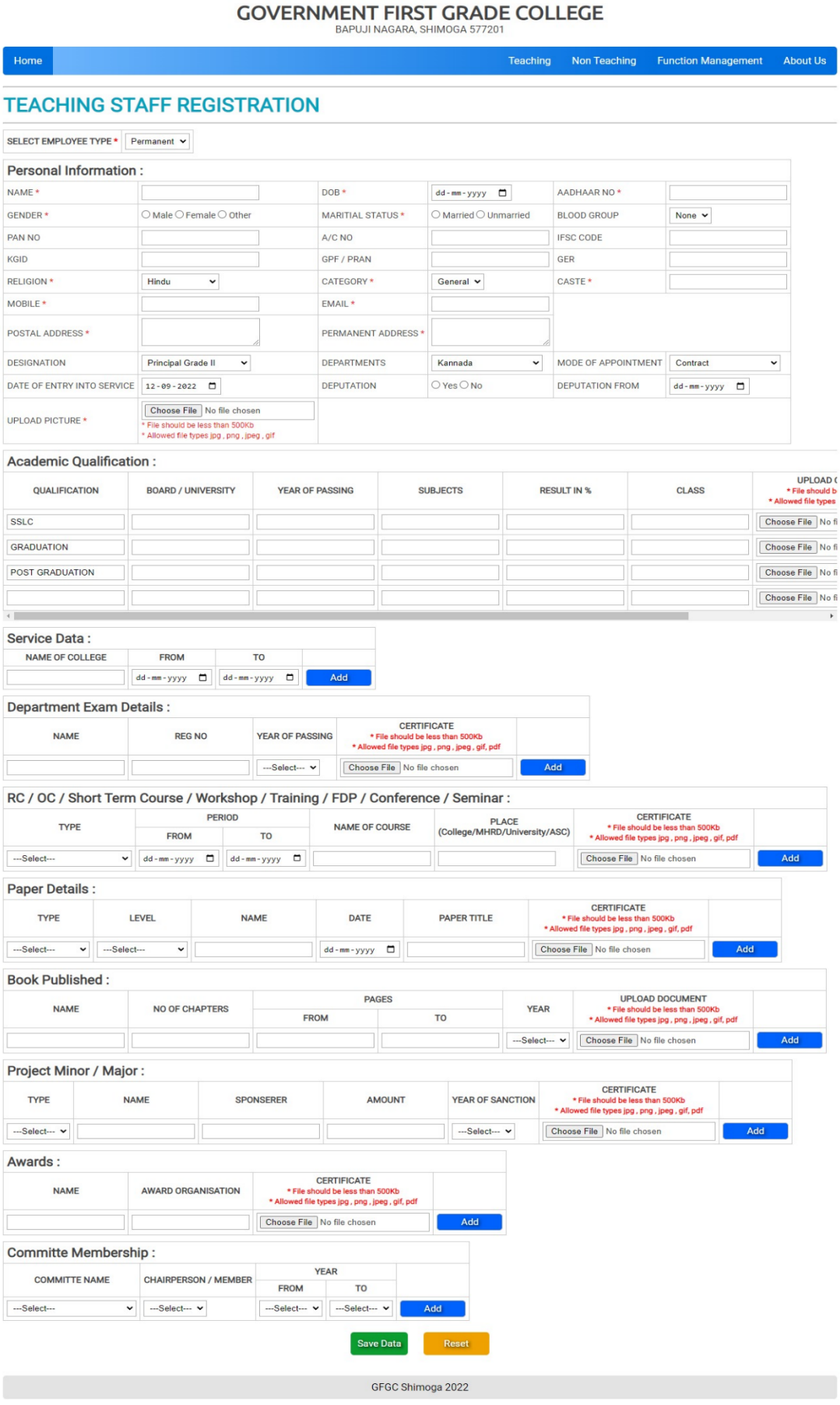


10. OUTPUT SCREENS (SNAPSHOTS):

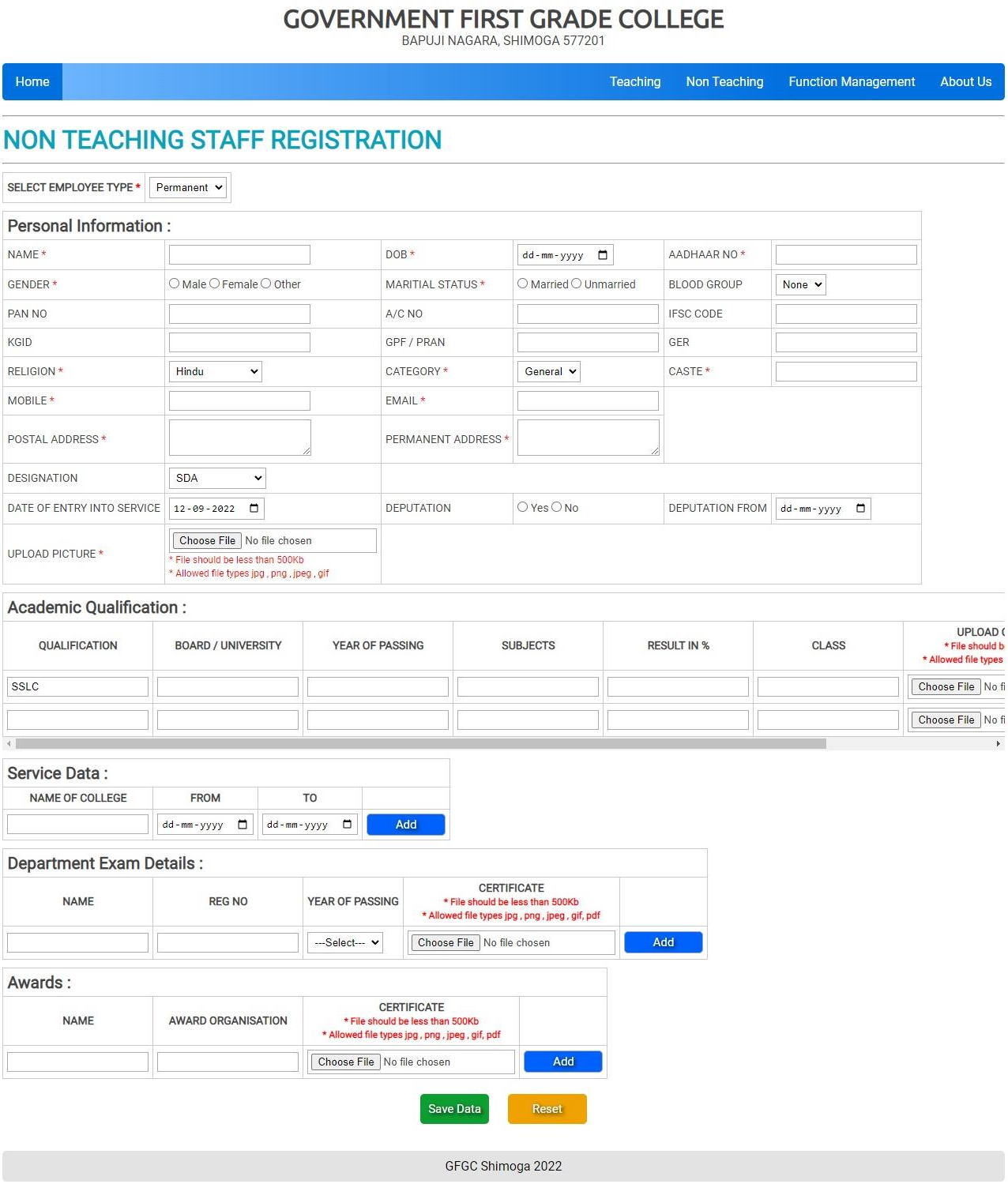
HOMEPAGE



TEACHING STAFF REGISTRATION



NON TEACHING STAFF REGISTRATION



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NON TEACHING STAFF REGISTRATION

SELECT EMPLOYEE TYPE * Permanent

Personal Information :

NAME *		DOB *	dd-mm-yyyy	AADHAAR NO *	
GENDER *	Male Female Other	MARITIAL STATUS *	Married Unmarried	BLOOD GROUP	None
PAN NO		A/C NO		IFSC CODE	
KGID		GPF / PRAN		GER	
RELIGION *	Hindu	CATEGORY *	General	CASTE *	
MOBILE *		EMAIL *			
POSTAL ADDRESS *		PERMANENT ADDRESS *			
DESIGNATION	SDA				
DATE OF ENTRY INTO SERVICE	12-09-2022	DEPUTATION	Yes No	DEPUTATION FROM	dd-mm-yyyy
UPLOAD PICTURE *	Choose File No file chosen * File should be less than 500Kb * Allowed file types jpg , png , jpeg , gif				

Academic Qualification :

QUALIFICATION	BOARD / UNIVERSITY	YEAR OF PASSING	SUBJECTS	RESULT IN %	CLASS	UPLOAD C * File should b * Allowed file types
SSLC						Choose File No fi
						Choose File No fi

Service Data :

NAME OF COLLEGE	FROM	TO	
	dd-mm-yyyy	dd-mm-yyyy	Add

Department Exam Details :

NAME	REG NO	YEAR OF PASSING	CERTIFICATE * File should be less than 500Kb * Allowed file types jpg , png , jpeg , gif, pdf	
		---Select---	Choose File No file chosen	Add

Awards :

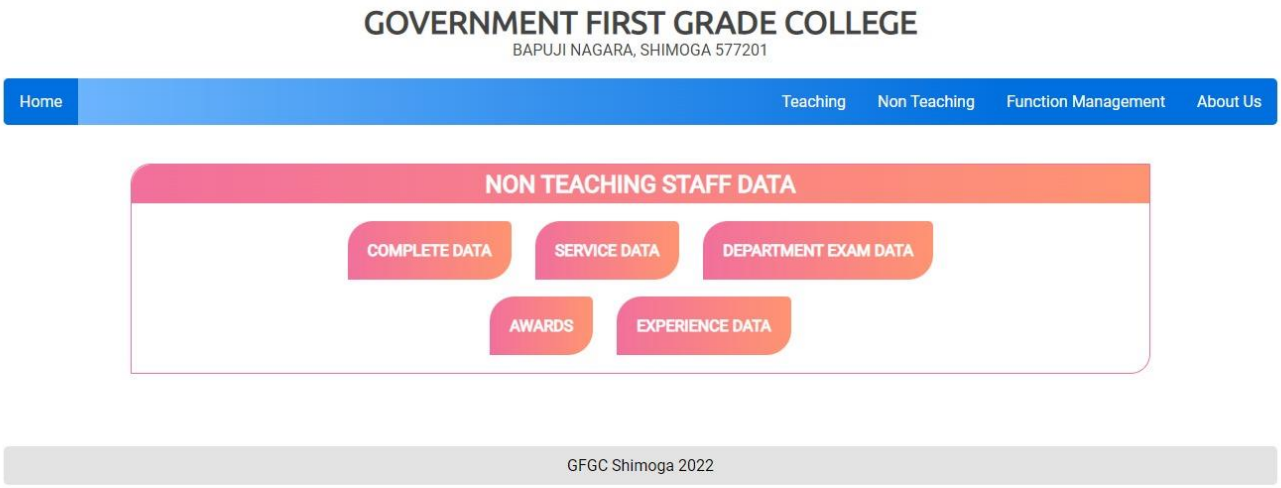
NAME	AWARD ORGANISATION	CERTIFICATE * File should be less than 500Kb * Allowed file types jpg , png , jpeg , gif, pdf	
		Choose File No file chosen	Add

Save Data | Reset

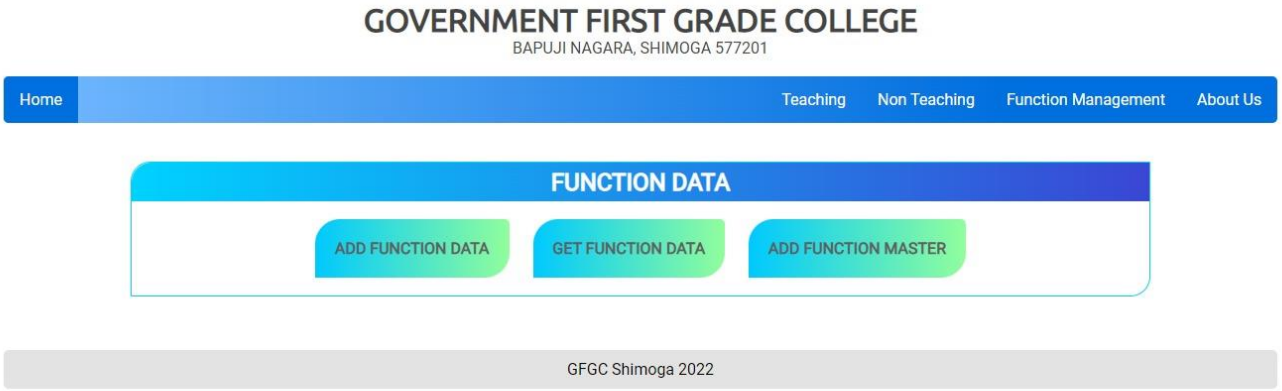
GFGC Shimoga 2022

GET TEACHING STAFF DATA

GET NON TEACHING STAFF REGISTRATION



FUNCTION DATA MANAGEMENT



TEACHER COMPLETE DATA

GOVERNMENT FIRST GRADE COLLEGE

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Personal Information :

NAME	Demo	DOB	1971-01-01	AADHAAR NO	123456789012
GENDER	Male	MARITIAL STATUS	Married	BLOOD GROUP	A+
PAN NO	MYS65465	A/C NO	8545454545	IFSC CODE	CNRB025151
KGID	54846	GPF	3265	GER	546846
RELIGION	Hindu	CATEGORY	General	CASTE	Lingayath
MOBILE	7898798754	EMAIL	demo@demo.com		
POSTAL ADDRESS	Shimoga, Shimoga, Shimoga	PERMANENT ADDRESS	Shimoga, Shimoga, Shimoga		
DESIGNATION	Associate Professor II	DEPARTMENT	Computer Science	EMPLOYEE TYPE	Permanent
DATE OF ENTRY INTO SERVICE	1995-01-01	MODE OF APPOINTMENT	KPSC	DEPUTATION FROM	2000-01-01

Qualification Details:

QUALIFICATION	BOARD / UNIVERSITY	YEAR OF PASSING	SUBJECTS	RESULT IN %	CLASS	CERTIFICATE
SSLC	KSEEB	1986	Mandatory	85	Distinction	View
GRADUATION	Kuvempu	1990	BSC(Computer)	85	Distinction	View
POST GRADUATION	Kuvempu	1992	MSC(Computer)	85	Distinction	View

Service Details :

NAME OF COLLEGE	FROM	TO
GFGC Sagar	1995-01-01	1998-01-01
GFGC Bhadravthi	1998-01-01	2000-01-01

Department Exam Details :

NAME	REG NO	YEAR OF PASSING	CERTIFICATE
Exam1	5465123	1994	View
Exam2	8465165	1996	View

RC / OC / Short Term Course / Workshop / Training / FDP / Conference / Seminar :

TYPE	PERIOD		NAME OF COURSE	PLACE (College/MHRD/University/ASC)	CERTIFICATE
	FROM	TO			
RC	2022-09-01	2022-09-03	Course1	Kuvempu University	View
OC	2022-08-01	2022-08-05	Course2	Kuvempu University	View

Paper Details :

TYPE	LEVEL	NAME	DATE	PAPER TITLE	CERTIFICATE
JOURNAL	LOCAL	Paper1	2022-09-01	Title1	View
CONFERENCE	STATE	Paper2	2022-09-02	Title2	View
SEMINAR	NATIONAL	Paper3	2022-09-03	Title3	View

Book Published Details :

NAME	NO OF CHAPTERS	PAGES		DOCUMENT
		FROM	TO	
Book1	2	5	10	View
Book2	3	10	30	View
Book3	4	50	65	View

Project Minor / Major Details :

TYPE	NAME	SPONSERER	AMOUNT	YEAR OF SANCTION	DOCUMENT
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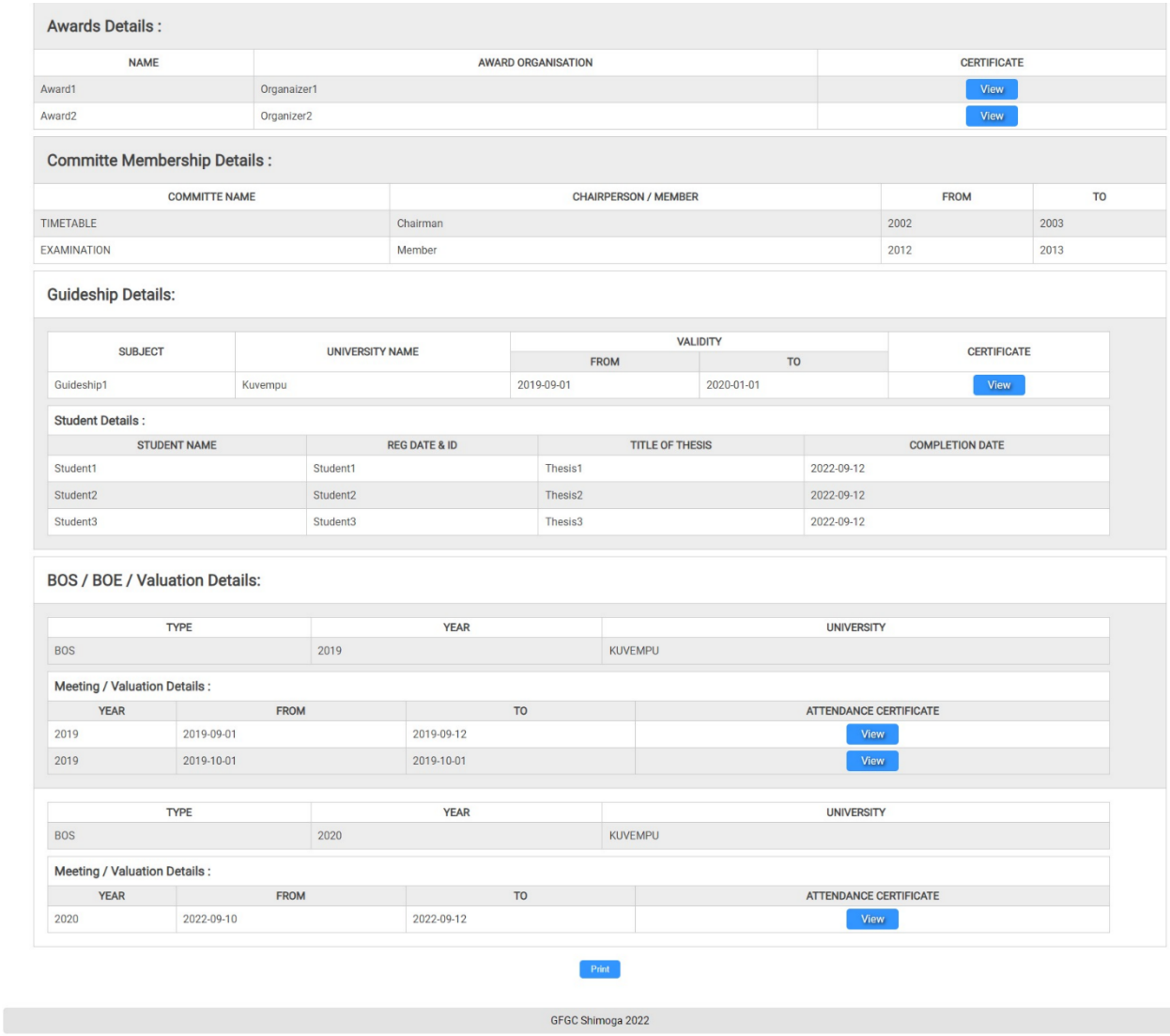
MAJOR	Project2	Reliance	50000	2016	View



Awards Details :

NAME	AWARD ORGANISATION	CERTIFICATE
Award1	Organaizer1	View
Award2	Organizer2	View

Committe Membership Details :

COMMITTE NAME	CHAIRPERSON / MEMBER	FROM	TO
TIMETABLE	Chairman	2002	2003
EXAMINATION	Member	2012	2013

Guideship Details:

SUBJECT	UNIVERSITY NAME	VALIDITY		CERTIFICATE
		FROM	TO	
Guideship1	Kuvempu	2019-09-01	2020-01-01	View

Student Details :

STUDENT NAME	REG DATE & ID	TITLE OF THESIS	COMPLETION DATE
Student1	Student1	Thesis1	2022-09-12
Student2	Student2	Thesis2	2022-09-12
Student3	Student3	Thesis3	2022-09-12

BOS / BOE / Valuation Details:

TYPE	YEAR	UNIVERSITY
BOS	2019	KUVEMPU

Meeting / Valuation Details :

YEAR	FROM	TO	ATTENDANCE CERTIFICATE
2019	2019-09-01	2019-09-12	View
2019	2019-10-01	2019-10-01	View

TYPE	YEAR	UNIVERSITY
BOS	2020	KUVEMPU

Meeting / Valuation Details :

YEAR	FROM	TO	ATTENDANCE CERTIFICATE
2020	2022-09-10	2022-09-12	View

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EXPERINCE DATA

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Sl No	Name	Department	Experience		Designation
			Total	Present Institute	
1	Demo	Computer Science	27 Years 8 Months	22 Years 8 Months	Associate Professor II

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11. SYSTEM TESTING AND IMPLEMENTATION

INTRODUCTION

Software testing is a critical element of software quality assurance and representsthe ultimate review of specification, design and coding. In fact, testing is the one step inthe software engineering process that could be viewed as destructive rather thanconstructive.

A strategy for software testing integrates software test case design methods intoa well-planned series of steps that result in the successful construction of software. Testing is the set of activities that can be planned in advance and conducted systematically. The underlying motivation of program testing is to affirm software quality with methods that can economically and effectively apply to both strategic to both large and small-scale systems.

11.1 STRATEGIC APPROACH TO SOFTWARE TESTING

The software engineering process can be viewed as a spiral. Initially system engineering defines the role of software and leads to software requirement analysis where the information domain, functions, behavior, performance, constraints and validation criteria for software are established. Moving inward along the spiral, we cometo design and finally to coding. To develop computer software, we spiral in along streamlines that decrease the level of abstraction on each turn.

A strategy for software testing may also be viewed in the context of the spiral. Unit testing begins at the vertex of the spiral and concentrates on each unit of the software as implemented in source code. Testing progress by moving outward along the

spiral to integration testing, where the focus is on the design and the construction of thesoftware architecture. Talking another turn on outward on the spiral we encounter validation testing where requirements established as part of software requirements analysis are

validated against the software that has been constructed. Finally, we arrive at system testing, where the software and other system elements are tested as a whole.

Unit Testing

Unit testing focuses verification effort on the smallest unit of software design, the module. The unit testing, we have is white box oriented and some modules the steps areconducted in parallel.

11.2 WHITE BOX TESTING

This type of testing ensures that

- All independent paths have been exercised at least once
- All logical decisions have been exercised on their true and false sides
- All loops are executed at their boundaries and within their operational bounds
- All internal data structures have been exercised to assure their validity.

To follow the concept of white box testing we have tested each form we have created independently to verify that Data flow is correct, all conditions areexercised to check their validity, all loops are executed on their boundaries.

BASIC PATH TESTING

Established technique of flow graph with Cyclomatic complexity was used to derive test cases for all the functions. The main steps in deriving test cases were:

Use the design of the code and draw correspondent flow graph.

Determine the Cyclomatic complexity of resultant flow graph, using formula:
V(G)=E-N+2 or
V(G)=P+1 or
V(G)=Number of Regions

Where V(G) is Cyclomatic complexity.

E is the number of edges,

N is the number of flow graph nodes, P is
the number of predicate nodes.
Determine the basis of set of linearly independent paths.

CONDITIONAL TESTING

In this part of the testing each of the conditions were tested to both true and false aspects. And all the resulting paths were tested. So that each path that may be generate on particular condition is traced to uncover any possible errors.

DATA FLOW TESTING

This type of testing selects the path of the program according to the location of definition and use of variables. This kind of testing was used only when some local variables were declared. The definition-use *chain* method was used in this type of testing. These were particularly useful in nested statement.

11.3 SYSTEM SECURITY

INTRODUCTION

The protection of computer-based resources that includes hardware,software, data, procedures and people against unauthorized use or natural Disaster is known as System Security.

System Security can be divided into four related issues:

- Security
- Integrity
- Privacy
- Confidentiality

SYSTEM SECURITY refers to the technical innovations and procedures appliedto the hardware and operation systems to protect against deliberate or accidental damage from a defined threat.

DATA SECURITY is the protection of data from loss, disclosure, modification and destruction.

SYSTEM INTEGRITY refers to the power functioning of hardware and programs, appropriate physical security and safety against external threats such aseavesdropping and wiretapping.

PRIVACY defines the rights of the user or organizations to determine what information they are willing to share with or accept from others and how the organization can be protected against unwelcome, unfair or excessive dissemination of information about it.

CONFIDENTIALITY is a special status given to sensitive information in a database to minimize the possible invasion of privacy. It is an attribute of information that characterizes its need for protection.

11.4 SECURITY IN SOFTWARE

System security refers to various validations on data in form of checks and controls to avoid the system from failing. It is always important to ensure that only valid data is entered and only valid operations are performed on the system.

The systememployees two types of checks and controls:

CLIENT-SIDE VALIDATION

Various client-side validations are used to ensure on the client side that only validdata is entered. Client-side validation saves server time and load to handle invaliddata. Some checks imposed are:

- JavaScript in used to ensure those required fields are filled with suitable data only. Maximum lengths of the fields of the forms are appropriately defined.
- Forms cannot be submitted without filling up the mandatory data so that partial mistakes of submitting empty fields that are mandatory can be sorted out at the clientside to save the server time and load.
- Tab-indexes are set according to the need and taking into account the ease of user while working with the system.

SERVER-SIDE VALIDATION

Some checks cannot be applied at client side. Server-side checks are necessary to save the system from failing and intimating the user that some invalid operation has been performed or the performed operation is restricted. Some of the server- side checks imposed is:

- Server-side constraint has been imposed to check for the validity of primary key and foreign key. A primary key value cannot be duplicated. Any attempt to duplicate theprimary value results into a message intimating the user about those values throughthe forms using foreign key can be updated only of the existing foreign key values.
- User is intimating through appropriate messages about the successful operations or exceptions occurring at server side

12. CONCLUSION

Our project is only a humble venture to satisfy the needs to manage the College Staff Data. Several user-friendly coding has also adopted. This package shall prove to be a powerful package in satisfying all the requirements of the college. The objective of web application is to collect the information and store them with appropriate retrievals. The authority member can fetch the stored information. This application is successfully implemented with all the features mentioned in system requirement specification. Awareness of information about staff is essential for data collection and retrieval.

BENEFITS:

The project is identified by the merits of the system offered to the user. The merits of this project are as follows: -

- It's a web-enabled project.
- This project offers user to enter the data through simple and interactive forms. This is very helpful for the employee to enter the desired information through so much simplicity.
- The user is mainly more concerned about the validity of the data, whatever he is entering. There are checks on every stages of any new creation, data entry or updating so that the user cannot enter the invalid data, which can create problems at later date.
- Sometimes the user finds in the later stages of using project that he needs to update some of the information that he entered earlier. There are options for him by which he can update the records. Moreover, there is a restriction that he cannot change the primary data fields. This keeps the validity of the data to longer extent.
- User is provided the option of monitoring the records he entered earlier. He can see the desired records with the variety of options.
- From every part of the project the user is provided with the links through staff so that he can go from one option of the project to other as per the requirement. This is bound to be simple and very friendly as per the user is concerned. That is whay , we say that the project is user friendly which is one of the primary concerns of any good project.

- Data storage and retrieval is one faster and easier to maintain because data is stored in a systematic manner in a single database.
- Decision making process would be greatly enhanced because of faster processing of information since data collection from information available on computer takes much less time than partial system.
- Allocating of employee information becomes much faster because at a time the user can see the records of previous years.
- Easier and faster data transfer through latest technology associated with the computerand communication.
- Through these features higher efficiency, accuracy and transparency are achieved.

LIMITATIONS:

- The size of the database increases day-by-day, increasing the load on the database back up and data maintenance activity.
- Training for simple computer operations is necessary for the users working on the system.

13. FUTURE IMPROVEMENT

- We can give more advance software for COLLEGE STAFF DATA MANAGEMENT System including more facilities
- We will host the platform on online servers to make it accessible worldwide
- Integrate multiple load balancers to distribute the loads of the system
- Create the master and slave database structure to reduce the overload of the database queries
- Implement the backup mechanism for taking backup of codebase and database on regular basis on different servers.

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