Goa University

Internship Report

NAAC Data Entry Web App

Kenrich G. O. Pinto

Roll No. 2044

Major: M.C.A.

NAAC Data Entry Web Application

Completed by

Kenrich G. O. Pinto

2044

for the partial fulfillment of

MCA Degree for Semester VI

Discipline of Computer Science and Technology (CST),

Goa Business School (GBS),

Goa University

At

Goa University

Taleigao Plateau, Goa, India

Under the guidance of

Professor Hanumant Harichandra Redkar

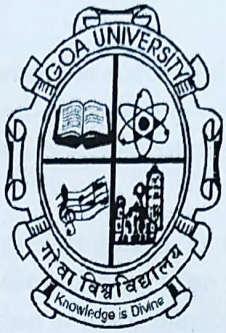
(Assistant Professor, CST, Goa University)

&

Professor Ramdas N. Naik Karmali

(Assistant Professor, CST, Goa University)

Goa University



Goa Business School

Certificate of Evaluation

This is to certify that Mr. **Kenrich G. O. Pinto** has successfully completed her internship at Goa University, Taleigao Plateau in partial fulfillment of the award of the degree in Master of Computer Application.

Examiner 1

Examiner 2

Place: Goa University

Date: 15/06/2023

Dean, Goa Business School

Acknowledgement

The satisfaction that accompanies the successful completion of any task would be incomplete without the mention of people whose cooperation made it possible, whose constant guidance and encouragement crown all efforts with success.

I am extremely grateful to my project guides, Sir Hanumant Redkar and Sir Ramdas Karmali for being a source of inspiration and for their constant support in the design and implementation of the project. I am also thankful to the Head of the department, Sir Ramrao Wagh for his support throughout the project, which helped me a lot for developing this project. They have been a source of inspiration and motivation for hard work. Through this column, it would be my utmost pleasure to express my warm thanks to them for their encouragement, cooperation and consent without which I would not be able to accomplish this project.

I also express my gratitude to our office staff Ms. Shubada and Ms. Shweta for providing me with the resources and information to carry out the project.

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Index

Introduction

A web-based application to simplify the data entry process for IQAC, provide error checking and correction, search capabilities for the entered data, and to make the data accessible to the required audience.

Institute Profile

Goa University is the only university to exist in the state of Goa. It has it's own campus situated across Taleigao Plateau, Tiswadi.

Established in 1984, it provides higher education with modern infrastructure and various programs. It is currently accredited to NAAC with a 'B' grade.

Over the past 35 years, the university has steadily extended it's reach in terms of affiliated and professional colleges as well as general education to a total of 61 institutes.

There exist 10 schools across the university which offer different programmes leading to 3 Undergraduate degrees, 35 Masters degrees and 25 PhD's in various disciplines. In addition, 7 institutions in various disciplines situated in Goa are also recognized for research programmes leading to PhD degrees by the university.

Institute role

My role in this institute is that of a student intern. I am interning through the discipline of Computer Science and Technology.

As an intern I am given the task of completing a project which will benefit the university. Through this project I will develop my skills and learn new technologies and concepts.

Problem Statement

The problem statement consists of 4 main issues:

- The existing system consists of data that is submitted by various disciplines via online forms or spreadsheets to the IQAC department. Staff then manually merge the data into a single spreadsheet for each data category.
- There is no error checking for the current data.
- Data is requested and sent through emails. Once the data is merged to the main spreadsheet, any update of data from a discipline is ignored.
- The data needs to be manually searched across the various documents and excel sheets till the required data is found.

Overview

Problem statement

The problem statement is as explained above.

Proposed system

The proposed system is as explained below through the following points.

- The proposed system will take the data from the student's forms and spreadsheets and under supervision will enter them into the database.
- While doing so, it will also check for the correct format, errors, and inconsistencies.
- The data will be stored in a database, therefore providing search capabilities.
- The proposed system will reduce the time needed to enter new data or update existing data.
- The system will also contain the data of previous years.
- The proposed system will be able to generate up-to-date reports as well as based on past data whenever needed.
- The proposed system will also enable security access on an individual user basis, therefore limiting access to only the files/data required by them.
- The system will be user friendly and accessible across all platforms including mobile devices.

Actual system

The actual system is as explained below

- The system takes the data from the various disciplines spreadsheets and merges them into the database.
- While doing so, it also checks for the correct format, errors, and inconsistencies.
- The data will be stored in a database, therefore providing search capabilities.
- The system reduces the time needed to enter new data or update existing data.
- The system also contains the data of previous years.
- The system is able to generate up-to-date reports as well as based on past data whenever needed.
- The system also implements role based access on an individual user basis, therefore limiting access to only the files/data required by them.
- The system creates regular backups of the data, ensuring minimal loss in the case of failure.

Project Status

Completed

- Database created
- Database data inserted
- Wireframes designed
- Web Application created (front end & back end)

Ongoing

- Testing
- Deployment

Languages, Technologies and Tools

- **Languages**
  - HTML

    The HyperText Markup Language or HTML is the standard markup language for documents designed to be displayed in a web browser. It is often assisted by technologies such as Cascading Style Sheets (CSS) and scripting languages such as JavaScript.

    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 its appearance.

    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.

  - W3.CSS

    W3.CSS is a modern CSS framework with built-in responsiveness. It supports responsive mobile-first design by default, and it is smaller and faster than similar CSS frameworks.

    W3.CSS can also speed up and simplify web development because it is easier to learn and easier to use than other CSS frameworks.

    It is inspired from Google's Material design.

- JavaScript

  JavaScript, often abbreviated as JS, is a programming language that is one of the core technologies of the World Wide Web, alongside HTML and CSS. As of 2022, 98% of websites use JavaScript on the client side for webpage behavior, often incorporating third-party libraries. All major web browsers have a dedicated JavaScript engine to execute the code on users' devices.

  JavaScript is a high-level, often just-in-time compiled language that conforms to the ECMAScript standard. It has dynamic typing, prototype-based object-orientation, and first-class functions. It is multi-paradigm, supporting event-driven, functional, and imperative programming styles. It has application programming interfaces (APIs) for working with text, dates, regular expressions, standard data structures, and the Document Object Model (DOM).

  The ECMAScript standard does not include any input/output (I/O), such as networking, storage, or graphics facilities. In practice, the web browser or other runtime system provides JavaScript APIs for I/O.

  JavaScript engines were originally used only in web browsers, but are now core components of some servers and a variety of applications. The most popular runtime system for this usage is Node.js.

- PHP

  PHP is a general-purpose scripting language geared toward web development. It was originally created by Danish-Canadian programmer Rasmus Lerdorf in 1993 and released in 1995. The PHP reference implementation is now produced by The PHP Group. PHP was originally an abbreviation of Personal Home Page, but it now stands for the recursive initialism PHP: Hypertext Preprocessor.

  PHP code is usually processed on a web server by a PHP interpreter implemented as a module, a daemon or as a Common Gateway Interface (CGI) executable. On a web server, the result of the interpreted and executed PHP code – which may be any type of data, such as generated HTML or binary image data – would form the whole or part of an HTTP response. Various web template systems, web content management systems, and web frameworks exist which can be employed to orchestrate or facilitate the generation of that response. Additionally, PHP can be used for many programming tasks outside the web context, such as standalone graphical applications and robotic drone control. PHP code can also be directly executed from the command line.

  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 a variety of operating systems and platforms.

- SQL

  Structured Query Language (SQL), is a domain-specific language used in programming and designed for managing data held in a relational database management system (RDBMS), or for stream processing in a relational data stream management system (RDSMS). It is particularly useful in handling structured data, i.e., data incorporating relations among entities and variables.

  SQL offers two main advantages over older read–write APIs such as ISAM or VSAM. Firstly, it introduced the concept of accessing many records with one single command. Secondly, it eliminates the need to specify how to reach a record, i.e., with or without an index.

  Originally based upon relational algebra and tuple relational calculus, SQL consists of many types of statements, which may be informally classed as sublanguages, commonly: a data query language (DQL),[a] a data definition language (DDL),[b] a data control language (DCL), and a data manipulation language (DML). The scope of SQL includes data query, data manipulation (insert, update, and delete), data definition (schema creation and modification), and data access control. Although SQL is essentially a declarative language (4GL), it also includes procedural elements.

- NoSQL

  A NoSQL database provides a mechanism for storage and retrieval of data that is modeled in means other than the tabular relations used in relational databases. Such databases have existed since the late 1960s, but the name "NoSQL" was only coined in the early 21st century, triggered by the needs of Web 2.0 companies. NoSQL databases are increasingly used in big data and real-time web applications. NoSQL systems are also sometimes called Not only SQL to emphasize that they may support SQL-like query languages or sit alongside SQL databases in polyglot-persistent architectures.

  Motivations for this approach include simplicity of design, simpler "horizontal" scaling to clusters of machines (which is a problem for relational databases), finer control over availability, and limiting the object-relational impedance mismatch. The data structures used by NoSQL databases (e.g. key–value pair, wide column, graph, or document) are different from those used by default in relational databases, making some operations faster in NoSQL. The particular suitability of a given NoSQL database depends on the problem it must solve. Sometimes the data structures used by NoSQL databases are also viewed as "more flexible" than relational database tables.

  Many NoSQL stores compromise consistency (in the sense of the CAP theorem) in favor of availability, partition tolerance, and speed. Barriers to the greater adoption of NoSQL stores include the use of low-level query languages (instead of SQL, for instance), lack of ability to perform ad hoc joins across tables, lack of standardized interfaces, and huge previous investments in existing relational databases. Most NoSQL stores lack true ACID transactions, although a few databases have made them central to their designs.

- **Technologies**
  - PHPRBAC

    PHP-RBAC is the de-facto authorization library for PHP. It provides developers with NIST Level 2 Standard Role Based Access Control and more, in the fastest implementation yet. It was initially developed in 2008 for use in early versions of jframework, but was matured and ripped later from the jframework to be a stand-alone library.

    RBAC separates the concepts of Users, Roles and Permissions. Roles are defined in a system, then Permissions defined separately. Then the security administrator decides what role should be permitted to do what action, by assigning that role to the permission. Finally users are assigned to roles. The system does the rest.

    NIST Level 2 RBAC requires Roles and/or Permissions to be hierarchical, so that management of them can easily be handled in hierarchies.

    NIST Level 2 RBAC compliance means a secure, flexible, reliable, and standardized RBAC system that will conform to your application's custom Access Control Policy needs.

- **Tools**
  - 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 that common add-in applications such as WordPress can also be installed.

    XAMPP is regularly updated to the latest releases of Apache, MariaDB, PHP and Perl. It also comes with a number of other modules, including OpenSSL, phpMyAdmin, MediaWiki, WordPress and more. Self-contained, multiple instances of XAMPP can exist on a single computer, and any given instance can be copied from one computer to another.

- MongoDB

  MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas. MongoDB is developed by MongoDB Inc. and licensed under the Server Side Public License (SSPL) which is deemed non-free by several distributions. MongoDB is a member of the MACH Alliance.

  MongoDB supports field, range query, and regular-expression searches. Queries can return specific fields of documents and also include user-defined JavaScript functions. Queries can also be configured to return a random sample of results of a given size.

  It has features such as Indexing, Replication, Load balancing, File storage, Aggregation, Server-side JavaScript execution, Capped collections and Transactions.

  There are 3 main editions availalble depending on the use case.

- Monday.com

  Monday.com is a cloud-based platform that allows users to create their own applications and project management software.

  Monday.com is a customizable web and mobile work management platform, designed to help teams and organizations with operational efficiency by tracking projects and workflows, visualizing data, and team collaboration. It includes automation capabilities and supports integration with other work apps.

  Version 1 of Monday.com's API is a REST-based JSON API capable of handling cross-origin resource sharing (CORS) requests and uses an API Token as authentication.

  Version 2 of their API is a GraphQL API that allows users to pull and/or alter data about users, updates, items, boards, tags and more.

  In June 2020, Monday.com released its API to third-party developers. Monday.com's open API allows customers, partners or any third-party developer to build on top of the platform and extend its capabilities to fit the needs of different teams and organizations. Common use cases include custom views, dashboard widgets, automation, and integration with other work apps.

- SqlDBM

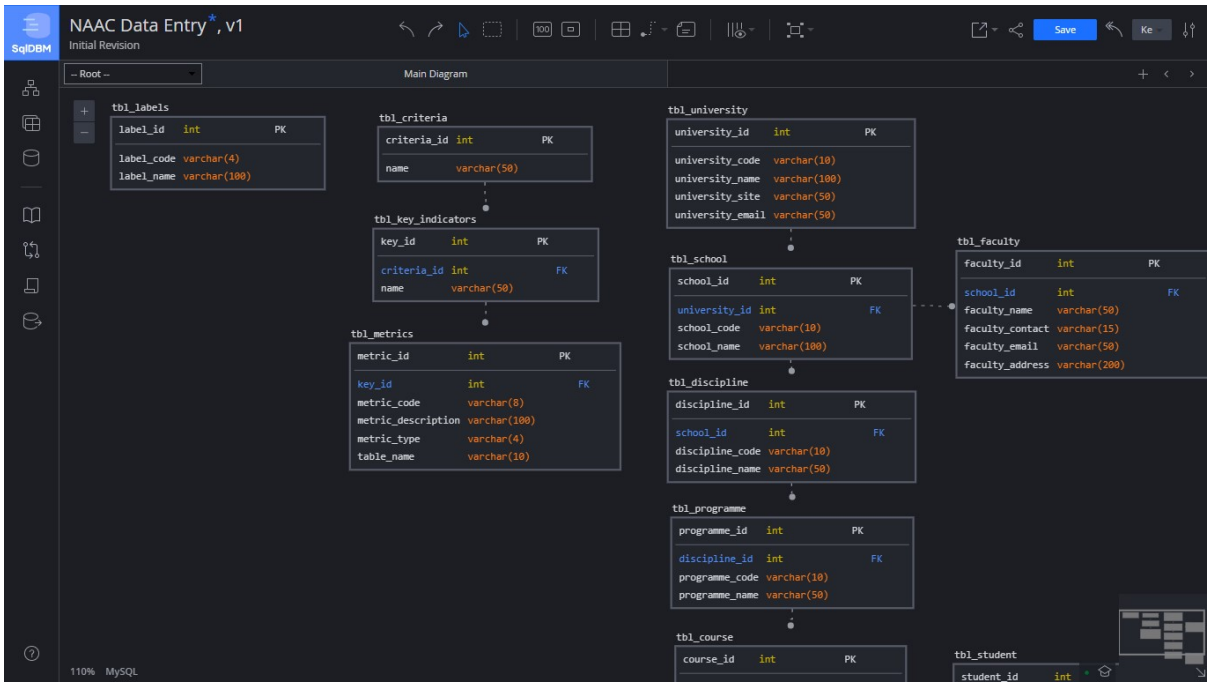
  SqlDBM is a Cloud based Data Modeling Tool that offers you an easy, convenient way to develop your database absolutely anywhere on any browser. All while incorporating any needed database rules and objects such as database keys, schemas, indexes, column constraints and relationships. Work with the most popular databases and cloud data warehouses.

  Use SqlDBM to create a physical model or ERD of your database, then create your actual database using the model, including all database objects – tables and their attendant columns and relationships, indexes and constraints. Alternatively, simply click to generate the necessary SQL statements that will create your database, and save these statements to create your database at a later point. No database credentials are required for this.

  It can create Conceptual, Logical and Physical ERDs. With SqlDBM you can identify, design, visualize, develop and standardize highly valuable data assets and architecture across business domains in your organization and then with a matter of clicks apply changes to your database without providing any credentials.

  It has functionality to work remotely with your team and stakeholders on the same project. Keep a geographically dispersed team collaborating and always in sync.

Database Schema



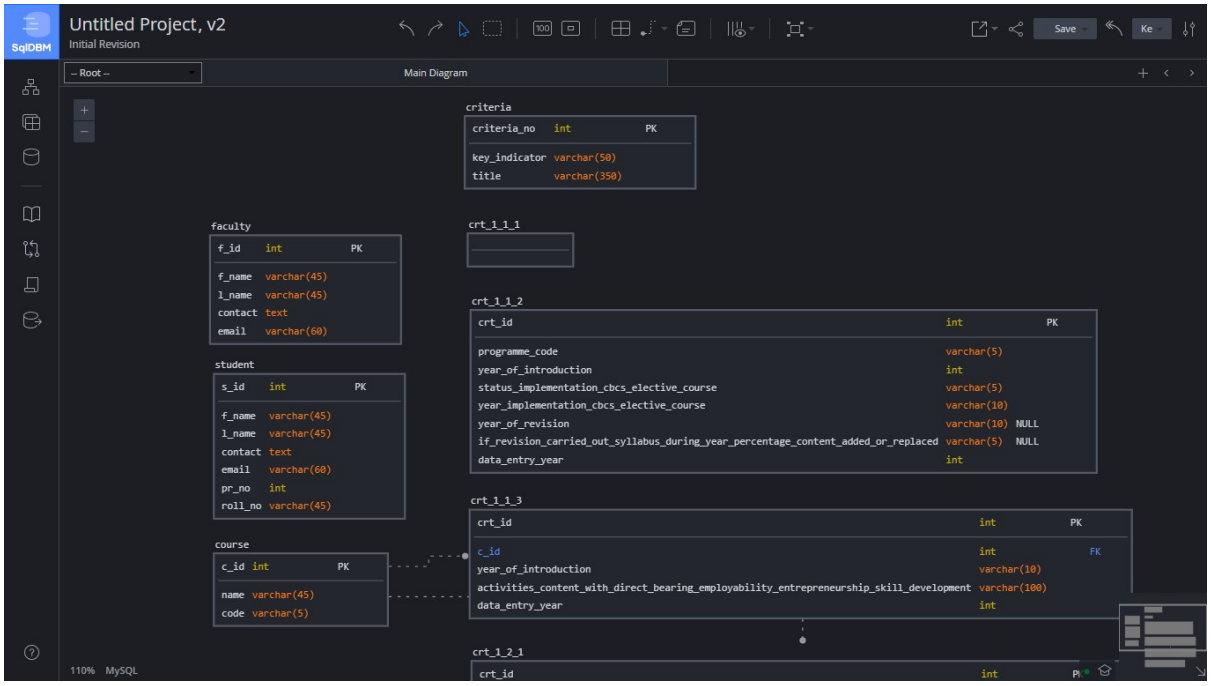


Table: tbl_user

Purpose: Maintain different users

Sr. No.	Field	Data type	Description
1	user_id	int	Uniquely identifies the rows
2	user_name	varchar(50)	Stores the user name
3	user_contact	varchar(15)	Stores the user contact
4	user_email	varchar(50)	Stores the user email
5	user_address	varchar(200)	Stores the user address

Primary key: user_id

Table: tbl_university

Purpose: To maintain a record of the university

Sr. No.	Field	Data type	Description
1	university_id	int	Uniquely identifies the rows
2	university_code	varchar(10)	Stores the university code
3	university_name	varchar(100)	Stores the university name
4	university_site	varchar(50)	Stores the university website
5	university_email	varchar(50)	Stores the university default email

Table: tbl_school

Purpose: To maintain a record of the different schools

Sr. No.	Field	Data type	Description
1	school_id	int	Uniquely identifies the rows
2	school_code	varchar(10)	Stores the school code
3	school_name	varchar(100)	Stores the school name
4	university_id	int	Foreign key to identify which university the school belongs to

Table: tbl_discipline

Purpose: To maintain a record of the different disciplines

Sr. No.	Field	Data type	Description
1	discipline_id	int	Uniquely identifies the rows
2	discipline_code	varchar(10)	Stores the discipline code
3	discipline_name	varchar(50)	Stores the discipline name
4	school_id	int	Foreign key to identify which school the discipline belongs to

Table: tbl_programme

Purpose: To maintain a record of the different programmes

Sr. No.	Field	Data type	Description
1	programme_id	int	Uniquely identifies the rows
2	programme_code	varchar(10)	Stores the programme code
3	programme_name	varchar(50)	Stores the programme name
4	discipline_id	int	Foreign key to identify which discipline the programme belongs to

Table: tbl_course

Purpose: To maintain a record of the different courses

Sr. No.	Field	Data type	Description
1	course_id	int	Uniquely identifies the rows
2	course_code	varchar(10)	Stores the course code
3	course_name	varchar(50)	Stores the course name
4	programme_id	int	Foreign key to identify which programme the course belongs to

Table: tbl_faculty

Purpose: To maintain a record of the faculty

Sr. No.	Field	Data type	Description
1	faculty_id	int	Uniquely identifies the rows
2	faculty_name	varchar(50)	Stores the faculty name
3	faculty_contact	varchar(15)	Stores the faculty contact
4	faculty_email	varchar(50)	Stores the faculty email
5	faculty_address	varchar(200)	Stores the faculty address
6	school_id	int	Foreign key to identify which school the faculty belongs to

Table: tbl_student

Purpose: To maintain a record of the students

Sr. No.	Field	Data type	Description
1	student_id	int	Uniquely identifies the rows
2	student_name	varchar(50)	Stores the student name
3	student_contact	varchar(15)	Stores the student contact
4	student_email	varchar(50)	Stores the student email
5	student_pr	int	Stores the student pr no
6	student_roll	varchar(10)	Stores the student roll no
7	student_address	varchar(200)	Stores the student address
8	programme_id	int	Foreign key to identify which programme the student belongs to

Table: tbl_criteria

Purpose: To maintain a record of the NAAC criteria

Sr. No.	Field	Data type	Description
1	criteria_id	int	Uniquely identifies the rows
2	criteria_name	varchar(50)	Stores the Criteria name

Table: tbl_key_indicators

Purpose: To maintain a record of the various key indicators

Sr. No.	Field	Data type	Description
1	key_id	int	Uniquely identifies the rows
2	criteria_id	varchar(50)	Foreign key to identify which criteria the key indicator belongs to
3	ki_name	varchar(75)	Stores the key indicator name
4	weight	int	Stores the weightage associated with the key indicator

Table: tbl_metrics

Purpose: To maintain a record of the various metrics

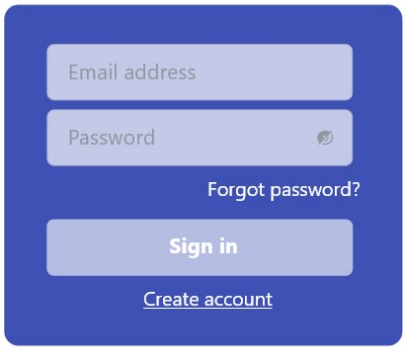
Sr. No.	Field	Data type	Description
1	metric_id	int	Uniquely identifies the rows
2	key_id	int	Foreign key to identify which key indicator the metric belongs to
2	metric_number	varchar(8)	Metric number associated with the metric
3	metric_description	varchar(150)	Stores the metric description
4	metric_type	varchar(4)	Stores the metric type
5	table_name	varchar(15)	Stores the table name of each metric from this table

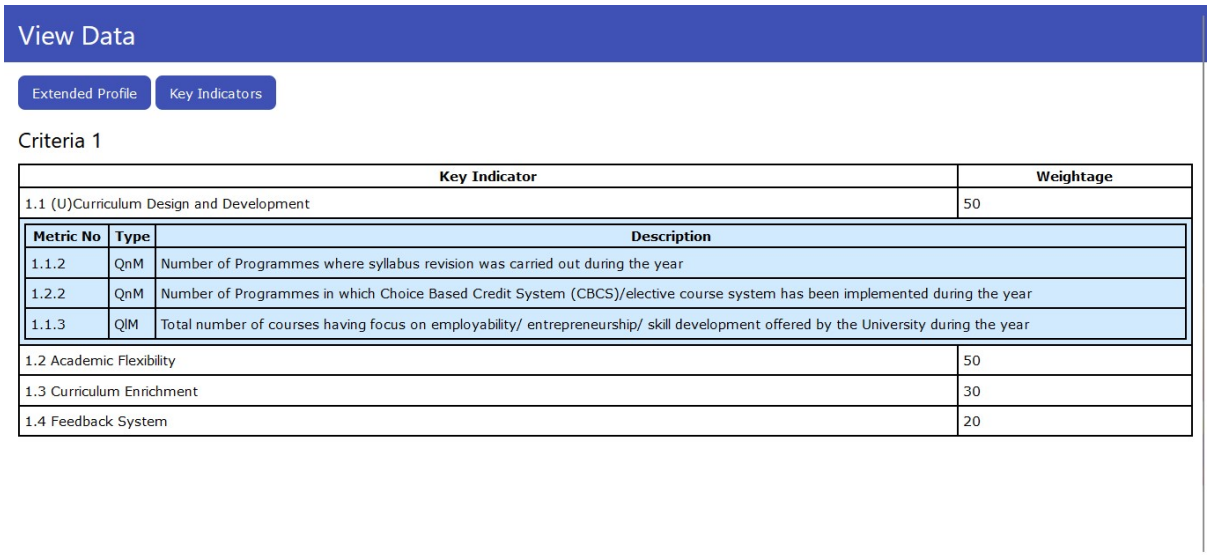
Table: tbl_labels

Purpose: To maintain a record of the labels of column names of different tables

Sr. No.	Field	Data type	Description
1	label_id	int	Uniquely identifies the rows
2	label_code	varchar(4)	Unique identifier that corresponds as an abbreviation of the label_name
3	label_name	varchar(150)	Stores the label name
4	metric_id	int	Foreign key to identify which metric the label belongs to

Screenshots





View Data

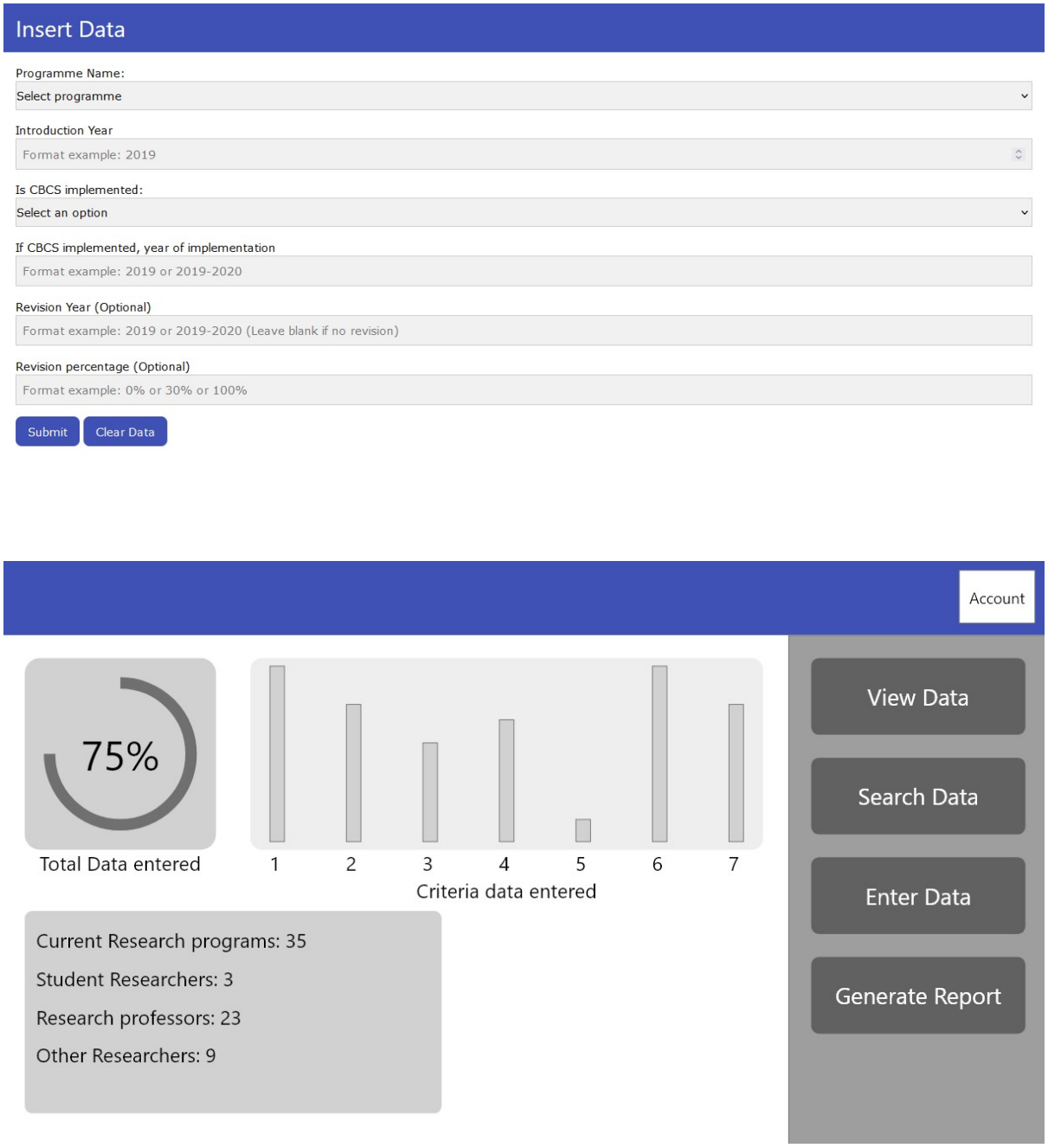
Extended Profile | Key Indicators

Criteria 1

Key Indicator	Weightage
1.1 (U)Curriculum Design and Development	50

Metric No	Type	Description
1.1.2	QnM	Number of Programmes where syllabus revision was carried out during the year
1.2.2	QnM	Number of Programmes in which Choice Based Credit System (CBCS)/elective course system has been implemented during the year
1.1.3	QlM	Total number of courses having focus on employability/ entrepreneurship/ skill development offered by the University during the year

1.2 Academic Flexibility	50
1.3 Curriculum Enrichment	30
1.4 Feedback System	20


Insert Data
Programme Name:
Select programme
Introduction Year
Format example: 2019
Is CBCS implemented:
Select an option
If CBCS implemented, year of implementation
Format example: 2019 or 2019-2020
Revision Year (Optional)
Format example: 2019 or 2019-2020 (Leave blank if no revision)
Revision percentage (Optional)
Format example: 0% or 30% or 100%
Submit
Clear Data
Account
75%
Total Data entered
1
2
3
4
5
6
7
Criteria data entered
Current Research programs: 35
Student Researchers: 3
Research professors: 23
Other Researchers: 9
View Data
Search Data
Enter Data
Generate Report

View Data

Criteria 1 > 1.1 > 1.1.3

1.1.3 Total number of courses having focus on employability/ entrepreneurship/ skill development offered by the University during the year

Course Name	Introduction Year	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development
Human Resource Developmet	2010	Skill to design, implement & evaluate HRD programmes
Advanced Econometrics	2010	Data analysis using software
Introduction to Econometrics	2010	Data analysis using software
Techniques of Geo Spatial Analysis	2021	Application of remote sensing in Economic analysis
Mathematics for Optimisation	2010	learn the mathematical tools and concepts that aid in analysing economic optimisation.
STATISTICS FOR ECONOMIC ANALYSIS	2010	statistical techniques and concepts that aid economic analysis.
Entrepreneurship	2016	Design Business Plan
IT Skills	2016	Data analysis using excel and computing skills required for business decisions
Interview Facing Skills and Mock Interviews	2016	Skills for facing interviews
Communication Skills	2016	learn the skills for effective written and oral communication
		Types of organisations; Entrepreneurial competencies and motivations; Funding fundamentals; Different Government/

View Data

Criteria 1 > 1.1 > 1.1.2

1.1.2 Number of Programmes where syllabus revision was carried out during the year

Programme Name	Introduction Year	CBCS implemented	Year CBCS impl	Revision Year	Revision percentage
Bachelor of Library & Information Science	2013	No	Nil	Nil	Nil
M.Sc. Biotechnology	2013	No	Nil	Nil	Nil
PG D in Clinical Genetics and Medical Laboratory Techniques	1999	No	Nil	Nil	Nil
M. A. Electronics	1992	No	Nil	Nil	Nil
M.Sc in Physical Chemistry	1965	No	Nil	Nil	Nil
M.Sc. Biochemistry	2014	No	Nil	Nil	Nil
Masters in Commerce	1988	Yes	2010-2011	Nil	Nil
MBA(FS)	2000	Yes	2011	Nil	Nil
Masters in Business Administration	1988	Yes	2004	2020-2021	75%
Masters in Business Administration (Executive)	2019	Yes	2019	2020-2021	Nil
Integrated MBA in Hospitality, Travel and Tourism	2011	Yes	2011	2016	Nil
Masters in Computer Applications	1987	Yes	1987	2021-2023	30%
M.Sc. Integrated	2020	Yes	Nil	Nil	Nil

Future Scope

- Server side language can be shifted to a modern or more object oriented language.
- With slight changes, can be implemented across other institutes
- Can be improved to include data of all institutes under the university

Summary

From my internship at Goa University, I was able to get a better understanding of how software should be developed according to industry standard. I enjoyed working in the role as I found out more about how the university works aside from education. This internship also allowed me to learn new technologies an previously learnt concepts in detail.

Overall it was a enlightening experience and I am positive I will be able to use this knowledge in my career later.

Internship Timeline

- Phase 1 (01 January 2022 - 31 January 2022)
  - Creation of Software Requirement Specifications
  - Determining technologies, software and libraries to be used
  - Creation and review of application prototype
- Phase 2 (01 February 2022 - 28 February 2022)
  - Database creation
  - Database testing
- Phase 3 (01 March 2022 - 31 May 2022)
  - Application development
  - Application security
  - Application hosting and deployment
  - Data Insertion
- Phase 4 (01 June 2022 - 30 June 2022)
  - Testing
  - System Review

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