IGNOU

Project Proposal (Synopsis) Of

BACHELOR IN COMPUTER APPLICATION (BCA)

On

Institute Management System

or

Java Based User-Faculty Institute Workspace (Web Application)

Submitted By

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INTRODUCTION

Institute Management System

Institute Management System is the software made for the user and faculty to find, manage, and perform a maximum of functions. Many modules are included in the software to perform full operation like, For user student: - searching courses, getting full details about the respective course, getting enrolled in the respective course by full-filling a form with required detail which on completion provide a pdf file having all submitted details with a unique enrolment no, find details about the institute, get details to connect with the institute in different ways, For faculty: - they can see no. of students in the institute in a list and details of a student with their specific enrollment number, list of faculties in the institute and their detail, with all these only the owner will be able to add and delete new faculty in the list of the institute having real-time all data visible to him/her.

At very first when a user will open the institute site, the site will open its home page which will contain a nice image with a logo and inspiring line at the center nothing else, but on scrolling it will show other content like achievements, few courses, hyperlink to all the courses page, about the institute and few location contactable details with a hyperlink containing full contact page which will have a form for user or guardian to contact online through an online form, mail, and mobile numbers to contact in the institute to clear all the query.

OBJECTIVE OF THE PROJECT

As the title of the project suggests, the objective of this software (web application) is to automate all the works (excluding teaching) of the Institute related to the management of admission getting details etc. Some of the features of this software would be: -

- Creating a system to automate the services offered by the Institute Management, would be more flexible than human to human contact as of today's corona situation.
- It allows a user search for their loved and required course within the institute and get enrolled in it without coming in contact with other humans and reduce the spread of COVID-19.
- It keeps track of the students enrolled to date and faculty in the institute.

PROJECT CATEGORY

- The project is based on a **three-tier architecture.** The three-tier architecture where the application is divided into three logical constituents
    - User tier – Provide services such as user interface. (JSP, CSS, JavaScript, etc.) also known as **View**.
    - Business tier – Implement business rules which will control how our web app will work (Java and JavaScript) also known as **Controller**.
    - Data tier – Provide handling and validation of data getting and saving data in the database. (MySQL in this case) also known as **Model**.

      Why three-tier not two-tier model or Disadvantages of two-tier architecture model**.**
    - It puts extra load on the server
    - It increases the network traffic.
    - Difficult to implement incremental improvements.
    - Applications are bound to the data source.

REASONS FOR USING Eclipse

Eclipse is a powerful Java project management and build management IDE. That means we can manage java project builds very easily using eclipse IDE. Eclipse can help us to minimize our project and build management time and efforts as comparison to any other non-ide code editor. It Is fine to manage the project manually if it is small. But If the project Is huge like our and future project or there are many, then It Is very hard for a developer to manage each of them manually.

Advantages of Eclipse IDE project

- ✓ It makes the project build process easy.
- ✓ It provides an easy and uniform build system.
- ✓ It provides quality project document Information.
- ✓ Managing project dependencies.
- ✓ Provides guild lines for better project management practices.
- ✓ Facilitate easy and transparent migration to new features.
- ✓ It allows to building projects using project object model (POM).
- ✓ It downloads required dependency's jar files automatically from Maven central repositories.
- ✓ Gives auto-correction and suggestions for code completion.

THE ADVANTAGES OF RDBMS (in my case- **MySQL**)

A database system is essentially a sophisticated, computerized record-keeping system, a repository for a collection of computerized data files. A database system maintains information and makes that information available on-demand, for this purpose a database system provides a set of facilities to perform such operations.

The benefits of a database system over any traditional system are obvious as the database is integrated as well as shared, thus a database eliminates redundancy, and also as a consequence, the database lets multiple users access the same piece of data.

The most important advantage of the database is to maintain integrity, i.e.; it ensures that the change made to the database by authorized users does not result in a loss of data consistency and guard against accidental damage to the database.

RDBMS has the following facilities

- Creation of files, Addition of data, Deletion of data, Modification of data.
- Retrieving data collectively or selectively.
- The data stored can be sorted or indexed at the user's discretion or direction.
- Various reports can be produced from the system. These may either be standardized reports or that may be specifically generated according to specific user definition.
- The mathematical function can be performed and the data stored in the database can be manipulated with functions to perform the desired calculations.
- To maintain data integrity and database use.
- Data integrity for multiple users.
- Providing a form-based interface for easy accessibility and data entry.

Major Advantages of Using MySQL (and why not any other RDBMS tech)

MySQL is a free-to-use, open-source database that facilitates effective management of databases by connecting them to the software. It is a stable, reliable and powerful solution with advanced features like the following:

1. Data Security

MySQL is globally renowned for being the most secure and reliable database management system used in popular web applications like WordPress, Facebook and Twitter.

2. On-Demand Scalability

MySQL offers unmatched scalability to facilitate the management of deeply embedded apps using a smaller footprint even in massive warehouses that stack terabytes of data. On-demand flexibility is the star feature of MySQL.

3. High Performance

MySQL features a distinct storage-engine framework that facilitates system administrators to configure the MySQL database server for a flawless performance. Whether it is an eCommerce website that receives a million queries every single day or a high-speed transactional processing system, MySQL is designed to meet even the most demanding applications while ensuring optimum speed, full-text indexes, and unique memory caches for enhanced performance.

4. Round-the-clock Uptime

MySQL comes with the assurance of 24X7 uptime and offers a wide range of high availability solutions like specialized cluster servers and master/slave replication configurations.

5. Comprehensive Transactional Support

MySQL tops the list of robust transactional database engines available on the market. With features like complete atomic, consistent, isolated, durable transaction support, multi-version transaction support, and unrestricted row-level locking, it is the go-to solution for full data integrity. It guarantees instant deadlock identification through server-enforced referential integrity.

6. Complete Workflow Control

With the average download and installation time being less than 30 minutes, MySQL means usability from day one. Whether your platform is Linux, Microsoft, Macintosh, or UNIX, MySQL is a comprehensive solution with self-management features that automate everything.

7. Reduced Total Cost of Ownership

By migrating current database apps to MySQL, enterprises are enjoying significant cost savings on new projects.

8. The Flexibility of Open Source

All the fears and worries that arise in an open-source solution can be brought to an end with My SQL’s round-the-clock support and enterprise indemnification. The secure processing and trusted software of MySQL combine to provide effective transactions for large volume projects. It makes maintenance, debugging and upgrades fast and easy while enhancing the end-user experience.

TOOLS/PLATFORM, HARDWARE, AND SOFTWARE REQUIREMENT SPECIFICATION

Tools/Platform

Project is developed using **Eclipse & MySQL 2017 command line** for storing data.

→Use of Technologies/Tools

It is going to be a java web application.

1. Unconditionally java
2. JSP
3. CSS
4. JavaScript
5. MySQL
6. Hibernate

→Project type

Java-based web application

→Use of IDE

Eclipse

→Use of Browser

Google Chrome, and

Microsoft Edge

Hardware requirement Specification

Altogether a Personal Computer with following components**:**

To use Browser on Windows®, you'll need:

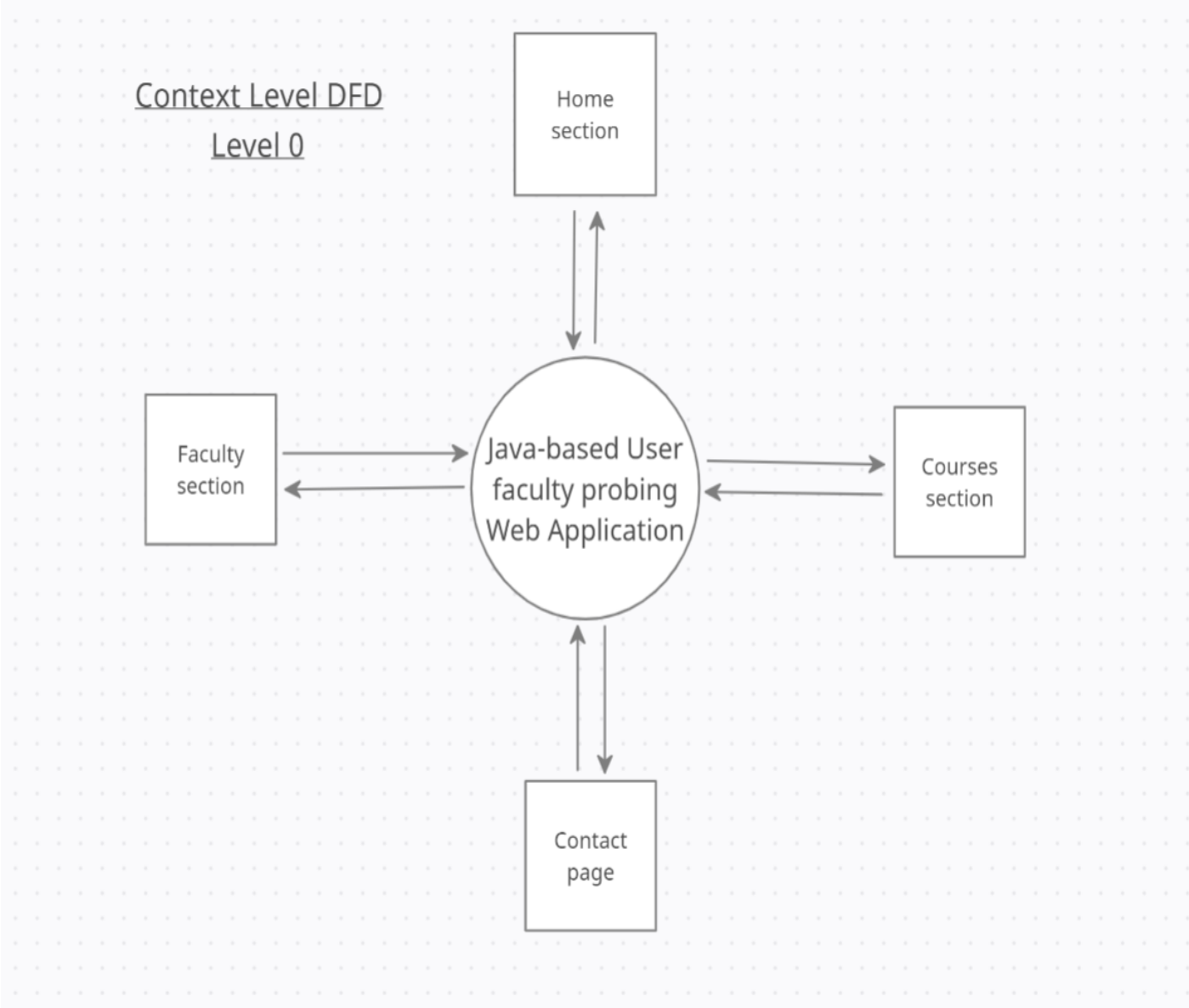
- Windows 7, Windows 8, Windows 8.1, Windows 10 or later
- An Intel Pentium 4 processor or later that's SSE3 capable (as we need only a browser)
- 2 GB Memory (RAM)
- Hard Disk 125 GB
- Color Monitor
- Keyboard
- Mouse
- Printer

Software requirement Specification

The software which was required for using the software is a new advanced **web browser** like Google Chrome, Microsoft Edge, Opera, mac Safari.

CONTEXT LEVEL DFD

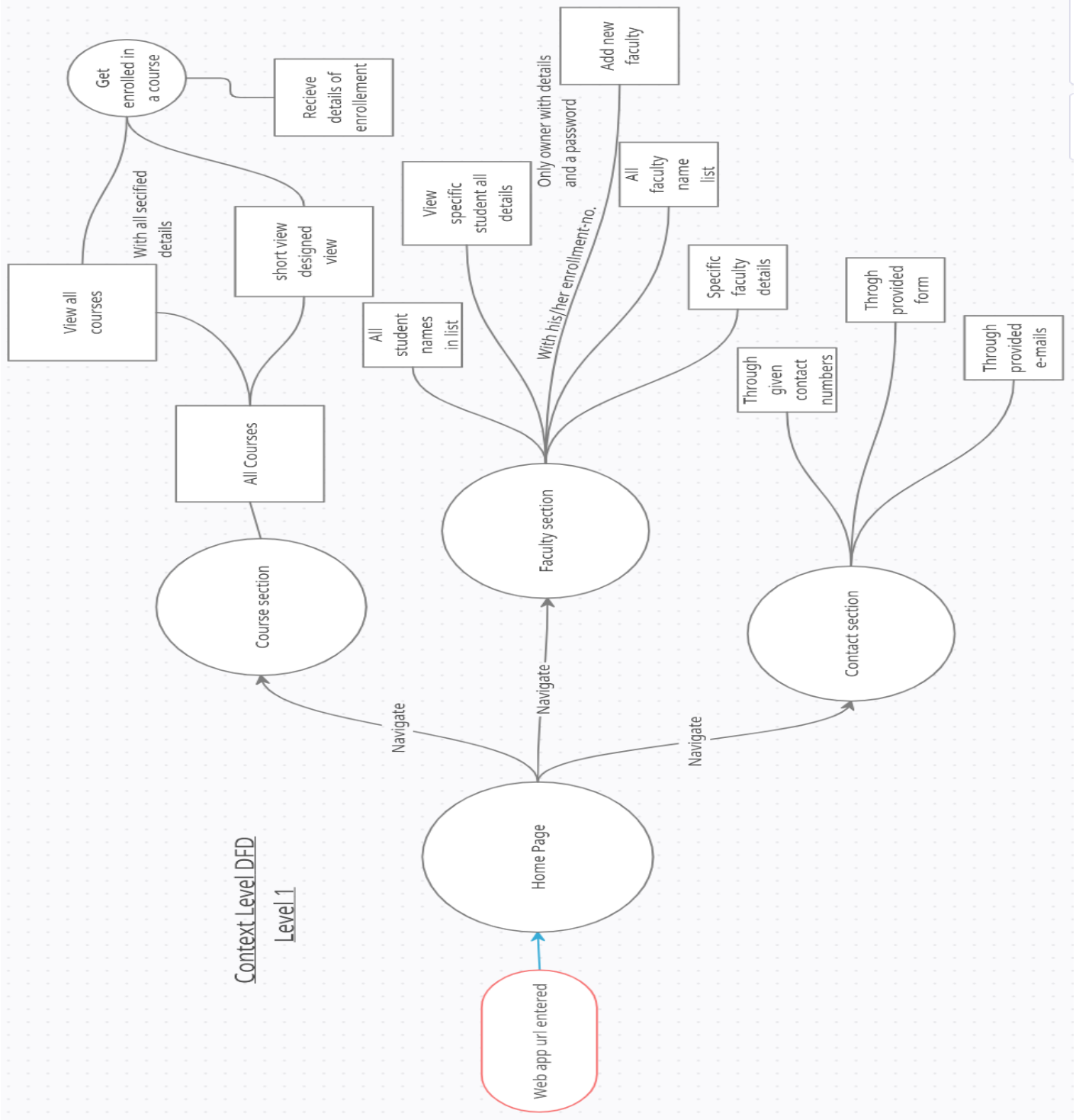
Created on www.app.creately.com



DFD level 0

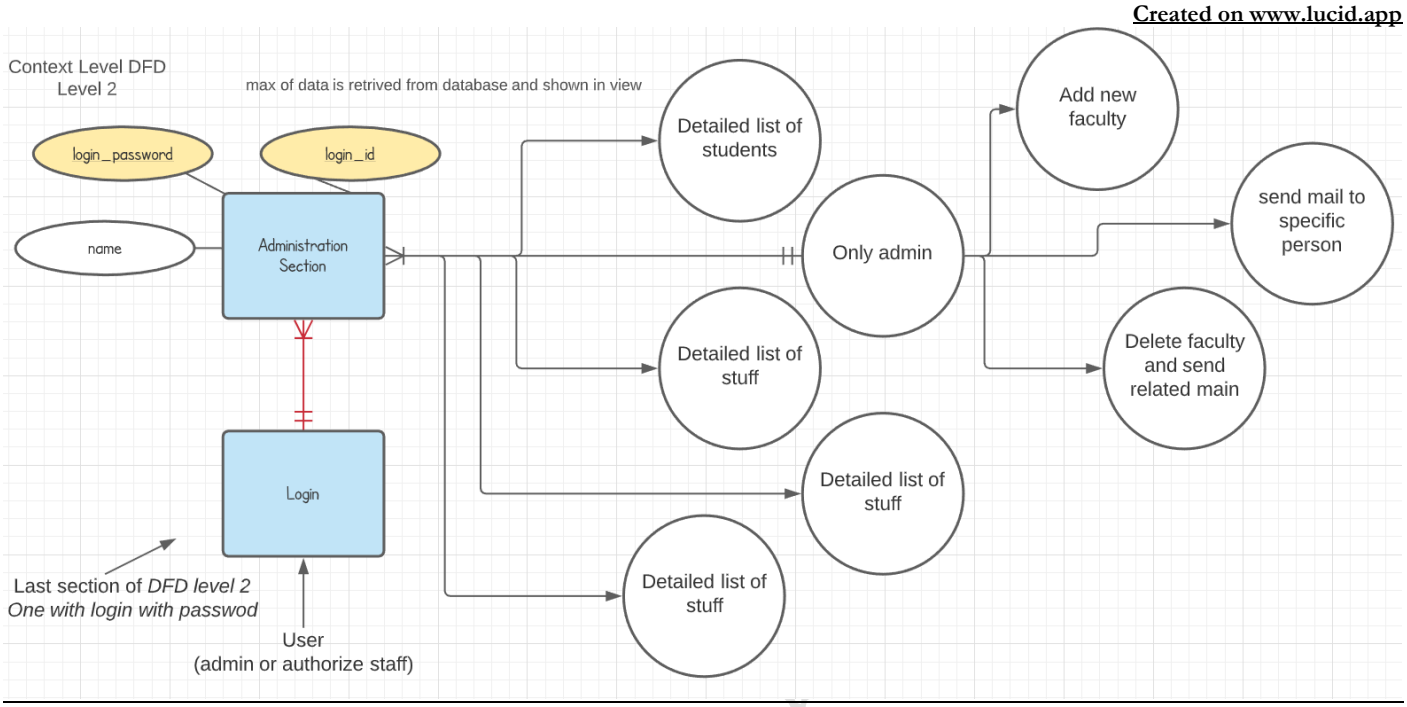
CONTEXT LEVEL DFD

Created on www.app.creately.com



DFD level 1

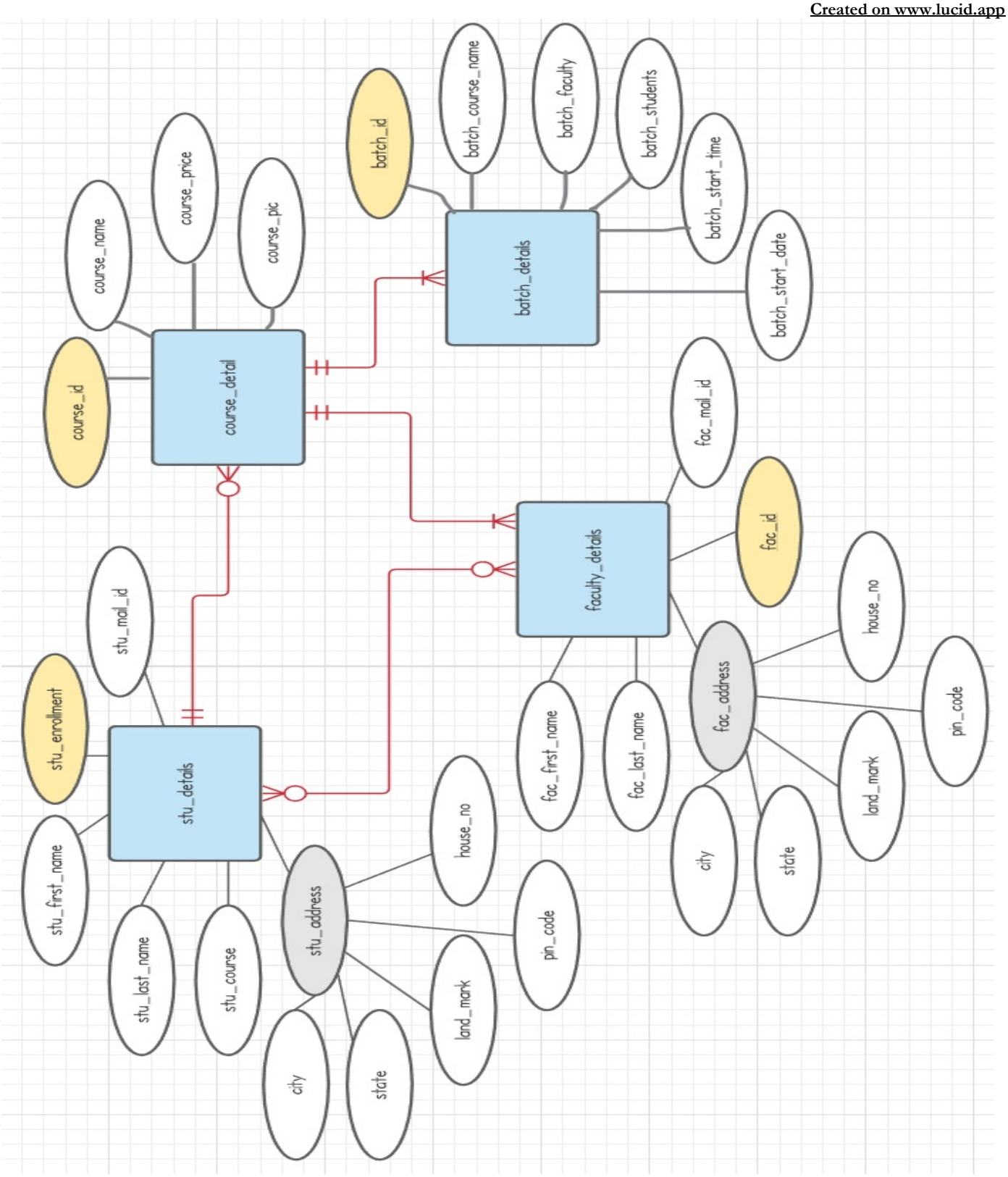
CONTEXT LEVEL DFD



DFD level-2

ER-Diagram

Created on www.lucid.app



DATA-STRUCTURES

Table Name: stu_details

Column Name	Data Type	Constraints	Description
stu_enrollment	INT(6)	primary key NOT NULL	unique identity number of the student (most imp)
stu_first_name	VARCHAR(10)		name of user
stu_last_name	VARCHAR(10)		password
stu_mail_id	VARCHAR(20)		role of the user
stu_course	VARCHAR(30)		Name of course
stu_city	VARCHAR(10)		City living in
stu_state	VARCHAR(10)		State living in
stu_land_mark	VARCHAR(10)		Land mark of address
stu_pin_code	INT(6)		Pin code
stu_house_no	VARCHAR(10)		House no with floor no

Table Name: faculty_details

Column Name	Data Type	Constraint	Description
fac_id	INT(6)	PRIMARY KEY	Unique id of faculty
fac_mail_id	VARCHAR(30)	NOT NULL	Mail-id of faculty
fac_subject	VARCHAR(20)		Subject taught by the teacher
fac_first_name	VARCHAR(10)		Faculty first name
fac_last_name	VARCHAR(10)		Faculty last name
fac_city	VARCHAR(10)		City living in
fac_state	VARCHAR(10)		State living in
fac_land_mark	VARCHAR(10)		Land mark of address
fac_pin_code	INT(6)		Pin code
fac_house_no	VARCHAR(10)		House no with floor no

Table Name: course_details

Column Name	Data Type	Constraints	Description
course_id	INT(6)	Primary key	Identity of the product
course_name	VARCHAR(20)		Name of the product
course_price	INT(5)		Unit of measurement
course_pic	VARCHAR(150)		Unit price
description	VARCHAR(200)		Description of product

Table Name: batch_details

Column Name	Data Type	Constraints	Description
Batch_id	VARCHAR(6)	Primary key	Unique id of the batch
Batch_course_name	VARCHAR(20)		Which course and subject will be taught in this batch
Batch_faculty	VARCHAR(20)		Which faculty will teach
Batch_students	INT(2)		No. of students in a particular batch
Batch_start_time	TIME		Class start time on batch days (hh:mm:ss format)
Batch_start_date	DATE		Date of first-class of batch (CCYY-MM-DD format)

NUMBER OF MODULES AND THEIR DESCRIPTION

01. **List of courses with details**
02. **Admission**
03. **Any user view list of teachers with their respective subjects**
04. **List of batches**
05. **Viewing basic student and students' details**
06. **Viewing the basic details of teacher and teachers**
07. **Viewing batch details**
08. **Secure Login**
09. **Viewing advanced detail of student and all students**
10. **Viewing advanced detail of teacher and all faculties**
11. **Adding more faculty with administration login**
12. **Deleting resigned faculty and sending mail to them by admin**
13. **Update staff and student data**

PROCESS LOGIC OF EACH MODULE

The project will be based on a Multi-User approach, which means that multiple users can use the application simultaneously. Each user will be assigned a specific role and will have limited permissions to operate the web application. User details are as below: –

Administrator – He will have full privilege to operate the entire system as per the requirements of the system. Only he/she will have permission to add new Login IDs (staffs) to the system, change passwords, change connection settings, and perform any other administrative functions which will be provided by the application.

Staff – He/she can view any details with few limitations desired by them regarding students or teacher (other staff) details. They don't have any power to change any data.

Secure Login

This module of this Project will authorize users and block any unauthorized users after checking. With this, we can maintain only authorized login. This will help to maintain the security of the system and institute data.

List of courses with details

This module's business logic takes data from the model and shows it on view on a specified JSP page. It comprises of query language of MySQL with java (used hibernate framework which makes work easier with HQL).

Admission

This module consists of a form on the view page through which the user will interact and fill in all the given details and submit it online with just a single click. Then details will be added to the database and a computer generate pdf is provided to the admission-taking student.

Any user view list of teachers with their respective subjects

This module is interactable through a single button and the data will be visible on the screen with the help of java, hibernate extracting data from database and showing on the JSP page.

List of batches

This module is as simple as other view lists the same process but the query used and data extracted is changed. The most visible change is in their way of presentation.

Viewing basic student and students' details

This module consists of extracting and presenting on the page. It does not have the authority to show all the details of a student like a fee, address, etc.

Viewing basic teacher and teachers' details

This module consists of extracting and presenting on the page. It does not have the authority to show all the details of a faculty like a salary, date of joining, address, etc.

Viewing batch details

This module will show the list of ongoing batches of subjects with just a single button click.

Secure Login

This module is used while login in by authorities and is properly secure, all the data used to check login details are fetched from the database which can't be changed by any unauthorized person. Only the admin or owner of the institute can do so.

Viewing advanced detail of student and all students

This is used by only the owner/admin of the institute. It is different from all other list presenting modules as it fetches all the student detail available in the database without hiding anything from the owner.

Viewing advanced detail of teacher and all faculties

This is used by only the owner/admin of the institute. It is different from all other list presenting modules as it fetches all the student detail available in the database without hiding anything from the owner.

Adding more faculty with administration login

This is used by the owner only. He/she can add new faculty after confirming they're joining in institute. When he/she adds their details in the database, a mail is sent to them as congratulation.

Deleting resigned or left faculty and sending mail to them

Same as adding the only difference is that it gives a warning before deleting the data and then on confirmation it deletes the data with a mail to left faculty. The mail received by the leaving faculty contains ‘Thanks for being with us’

Updating staff and student data

This module performs more than one work. First, it takes the enrollment id or any unique id filled in the section and then fetches their data from the database which after successful fetching presents on the screen, and gets an update after editing by the owner.

LIMITATION OF THE PROJECT

- Needs internet connection
- Needs advanced browser which supports new functions added after 2005

FUTURE SCOPE OF THE PROJECT

This project is designed and developed in such a manner that it provides maximum efficiency & speed and has a vast scope for further development. A number of modules can be added without any modifications in the database and with a minimum modification in its code. It is armed with a powerful query support system and is capable of supporting advanced and complex queries for much more advanced processes and reports.

This application fits into the current scenario, which is the Coronavirus and information age. This application with some modifications can be used by other institutes to automate their services, increase their efficiency, and to make their presence felt in the present fast online world.

In the future, I have decided to add more features like a login system for students too, online classes, live chat with teachers, performance, progress, and so on.

All the present and addable features will definitely help the world to run faster and give a better of teaching with data saving.

BIBLIOGRAPHY

WEBSITEs used to get help while creating projects –

1. www.google.com
2. http://www.microsoft.com/en-in/download/
3. https://www.javatpoint.com/mysql-tutorial
4. https://app.creately.com/diagram/IZYu0470DJu/edit
5. https://lucid.app/lucidchart/9e136d93-4545-4cd1-b26f-8bb69ac6484d/edit?beaconFlowId=E7D9D2D1265439AA&page=0_0#
6.

Referenced Books

1. All books of NIIT (I am a student of NIIT). They taught me:
    a. Core java
    b. Advanced java
    c. RWD
    d. RDBMS
    e. MYSQL
    f. SPRING
    g. JSP
    h. HIBERNATE
2. IGNOU Blocks

referenced books (SQL Server 2005)–

1. Leonard Lobal, *Andrew J. Brust, Stephen Forte, Programming Microsoft SQL Server 2005 (Pro Developer),* 29 Oct 2008
2. Robert Vieira, *Professional Microsoft SQL Server 2005 Programming,* 23 Aug 2009
3. IGNOU Blocks