

# **INFORMATION MANAGEMENT SYSTEM**

## **(xConnect Module)**



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Affiliated to  
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## CERTIFICATE

This is to certify that the project report on “INFORMATION MANAGEMENT SYSTEM (xConnect Module)” is a record of project work under the curriculum of Maulana Abul Kalam Azad University of Technology(MAKAUT) for the MCA 3rd year, 5th semester Examination, 2021-2022, for the subject “MINOR PROJECT AND SEMINAR (MCA 591)” carried out by “ Alok Sarkar (Roll: 10201019009) and Subrata Halder (Roll: 10201019005)“ students of Kalyani Govt. Engineering College, under the guidance of “Dr. Partha Garai”, Assistant Professor as a requirement for the partial fulfillment of the Degree of Master of Computer Application.

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## **Acknowledgement**

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3rd year  
Department of Computer Application, KGEC

Place: Kalyani

Date:

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# Chapter: 1 | Introduction

Traditionally, if any student, teacher or other faculty wanted to contact to others, he/she had to contact through email, mobile or other social media and the process was very much decentralized. The information related to academics can be viewed previously and getting job or project related information through the existing search was not there and direct contact or communication was not possible in Information management System. In this chapter we can learn about objective, purpose and motivation behind development of Information management System, basic definitions, abbreviations, brief description of other chapters in this project.

## 1.1 Motivation

Every Institution has lots of employee and student data. It is very difficult to check information about any employee and student particularly among the huge amount of data. Due to many reasons, we want to create a system which can handle employee information so that these difficulties can be overcome. Our design facilitates a common platform, where the faculty and the students can access their individual profile. If any student wants to check job opportunities, workshop details provided by other ex-students or faculties or communicate directly through IMS, he/she can know and do it after getting logged in. Anyone logged in IMS, can search on various topics, job related information or communicate by using chat connect module. Ex-students and faculties can also provide job or workshop related notice or information either by adding notice or through group chat. Student can search other students by their interest on programming language or project also. This is the main motivation of this project. Using this project all staffs from all departments can easily know and communicate, provide related information and all students can get the information or ask queries related to that directly through IMS and also check profile for a overview on that topic of interest. They don't have to take much headache on all works which is done in a decentralized and manual way for now.

## 1.2 Objective

The purpose is to design this system is to help all (faculty, HOD of all departments, ex-students, recruiter) of any college and students.

1. Our design facilitates a common platform, where the faculty and the students can access their individual profiles.

2. It helps to provide information of job related or other non-academic events.
3. A student can easily search student that are related to any project, language, company or job position.
4. Anyone logged on IMS, can communicate and chat with others connected through IMS.
5. There is one global chat that is visible to all in real time and another personal chat based on connection.

### **1.3 Scope**

Currently used decentralized systems will be replaced with this centralized system.

1. Our module provides the functionality to having a connection between student and ex-student based on academics, internship, workshop, project and job related.
2. Faculties can also communicate and provide details directly to students.
3. Project guide can assign and have the project done by using this xconnect module.
4. Academic seminar and workshop organization will be much easier and hustle free.
5. Important document sharing or group discussion between faculties can be done also in a effective way.

### **1.4 Constraints**

1. All the users of this system must login through their respective IMS userid.
2. The same credentials are needed to use this system and that also verify automatically after login.
3. After login one can directly use this system and can search, view, chat, follow various information according to their need.

# Chapter: 2 | System Study

Traditionally, if any student, teacher or other faculty wanted to contact to others, he/she had to contact through email, mobile or other social media and the process was very much decentralized. The information related to academics can be viewed previously and getting job or project related information through the existing search was not there and direct contact or communication was not possible in Information management System.

In this chapter we can learn about objective, purpose and motivation behind development of Information management System, basic definitions, abbreviations, brief description of other chapters in this project.

## Existing Systems

- Traditionally, if any student, teacher or other faculty wanted to contact to others, he/she had to contact through email, mobile or other social media and the process was very much decentralized.
- One had to scour different apps for some information that they have shared. One might have to use different devices for this purpose because some apps are mobile only, while other software are PC only.
- There is also data accuracy issue, in some data it can be different than other apps, so data reliability can be major issue.
- Another problem was that if one needed particular info on a topic, he/she would have to search all the apps or deices just to get one information.
- Even then not apps support this search functionality. In that scenario we had to manually comb through all the devices and apps for that information.
- Although sometimes things were not that simple either. As some apps backup data locally, it was impossible to retrieve some data if one had deleted/uninstalled that app. Since some of the data must be in these apps if any crucial data is deleted, it could potentially render rest of the information useless.

- Not to mention, to have all kinds of devices one had to have access to all these different service providing applications, which not all students can afford to have.
- Some mobile devices have limitations such that one can't install apps after a certain storage or CPU limitations are hit.
- If we look more closely, we had to deal with & rely on these app policies, which could change at any moment. The data privacy policies of these apps are also sometimes questionable.
- There is also the risk being left out, some apps might stop supporting particular devices, rendering those perfectly working connections useless. But we had to use them for the sake of connectivity.
- The information related to academics can be viewed previously and getting job or project related information through the existing search was not there and direct contact or communication was not possible in Information management System either.

#### New System & How it tries to address the above issues:

- This new system is centralized in nature. So, no need to have different apps/software, different devices for same communication needs.
- All the information in one place, one website, managed under same host. So, all the information is stored in same location & accurate at the same time, so data can be more reliable.
- There is search functionality in our system. So, data can be found in one go on various categories simultaneously.
- The data is centralized so data is never lost from client even in client devices damage.
- And data could be replicated on different servers, ensuring the data availability even in major problems & natural disasters like earth-quake.

- All we need from client side is a modern web browser, that is all, so it is super affordable even for students with very poor financial background, giving them the opportunity that they could've missed otherwise. Since all the latest browsers run on most devices, so this system could reach to more students.
- There is strong encryption facility in our system, so data privacy is industry standard. And one does not need to rely on different third-party service provider's privacy policy. And also, no need to deal with different policies.
- There is no fear of being left out in our system. Our system will upgrade itself without any major over haul from client side.
- This system will also provide additional functionality, like cross-departmental student search, job specific search, skill specific search & many more granular search facilities.
- Communications can be more direct & inside the same IMS umbrella system. Users can communicate with other follow each other & keep each other up to date.

# Chapter: 3 | System Analysis and Requirement Specifications

Traditionally, if any student, teacher or other faculty wanted to contact to others, he/she had to contact through email, mobile or other social media and the process was very much decentralized. The information related to academics can be viewed previously and getting job or project related information through the existing search was not there and direct contact or communication was not possible in Information management System.

In this chapter we can learn about objective, purpose and motivation behind development of Information management System, basic definitions, abbreviations, brief description of other chapters in this project.

## 3.1 Functional Requirements

Such requirements describe system behavior under specific conditions and include the product features and functions that makes the system work.

### Login

- checkLoginCred:

The xConnect shall allow anyone having a valid credential to successfully login and use the system.

- providingAccess:

All unauthorized access without IMS is blocked.

### Overview

- `collapsibleSections:`

In the overview page, all the sections like notice, contacts, recent messages are collapsible.

- `noticeOverview:`

Overview of latest four notices are shown here.

- `contactsOverview:`

Overview of latest five contacts are shown here.

- `messagesOverview:`

Overview of latest five messages are shown here.

## Search

- `searchFromAnywhere:`

A very flexible search functionality is developed that is accessible from anywhere of our xConnect module.

- `searchByCrossDepartment:`

In the search page, search by cross-department is done easily.

- `searchByName:`

Student or faculty can be searched by their names.

- `searchByCompany:`

Search by company name also available that shows search result according to company.

- `searchBySkill:`

Input skill is matched and result of searched entries shown.

- **searchByDesignation:**

Search by designation provide in input is searched and returned results.

## Contacts

- **crossDepartmentContacts:**

List of contacts from not only a particular department but all are shown as a result in this functionality.

- **dynamicAcademicSessionChanger:**

The functionality added dynamic entry view for different session that can be changed using simple front-end ui.

- **followPersonally:**

Clicking follow that is present in every entry in the contact page,

- **messagePersonally:**

The functionality added dynamic entry view for different session that can be changed using simple front-end ui.

## Global Room

- **crossDepartmentCentralizedChatSystem:**

In the chat section, all the students, faculties can exchange information and have chat globally in a centralized window with a simple and modern chat without any refresh.

- **realTimeChatGenerator:**

After loading previous chats, all the chats sent from various sources are shown dynamically and in realtime.

- dynamicDesignGenerator:

Chats that are coming dynamically are designed according to users or self-verifying functionality and suitable designed added in realtime.

## My Section

- viewProfileDetails:

In this section, profile details that was not available previously in IMS are shown here like company name, job description, preferred languages and skills.

- updateProfileDetails:

All the existing fields can be edited and easily get updated after editing is done.

## Messages

- recentChatsListView:

In the recent chat functionality, latest 5 chats history along with person name and the latest chat are stored separately and fetched accordingly in 5 list elements.

- personalChatWindowSelection:

After selecting a item in the recentChatsListView, the redirection to the personal chat take place where personal chat between two persons are viewed and stored.

## Favorites

- viewFollowingList:

The persons who follow the login user are listed here for better accessibility.

- viewFollowedList:

List of followed entries are shown here.

- personalChatWindowSwitcherFromFavorites:

Personal chat window can be switched directly from here after clicking message from this section.

## Notice Board

- createNotice:

Notice can be easily created with a urgency tag and then wait for the approval.

- approvalStatus:

Status for each created notice can be viewed.

- publishedNotice:

After the approval, all the published notices are shown here.

## Database Information

- Student Mandatory Information:

Each student shall have the following mandatory information: Student userid, password, name, category, batch, dept, section, semester, year, roll etc.

- Student\_extra Information:

The xConnect shall allow the student to update extra information like job position, job company, job description.

- Skills Mandatory Information:

Each person shall have the following mandatory information: skill name, skill category, skill count.

- **Follow\_followed Mandatory Information:**

Each student shall have the following mandatory information: following id, following details, followed id, followed details.

- **Chat Mandatory Information:**

Each person shall have the following mandatory information: userid, message, time\_stamp (created\_on) according to global and personal chat.

## **3.2** Non-Functional Requirements

A nonfunctional requirement is an attribute that dictates how a system operates. It makes applications or software run more efficiently and illustrates the system's quality.

### **3.2.1** Security

- **User Identification:**

The system requires the user to identify himself/herself using college id.

- **Login ID:**

Any user who uses the system shall have a Login ID and Password.

- **Modification:**

Any modification (insert, delete, update) for the Database shall be synchronized and by the administrator in the ward.

- **User Rights:**

User can use the system to add any informative information that carries value, other than that would not be appreciated and reviewed.

- **Administrator's Rights:**

Administrators shall be able to view and modify all information in xConnect Module.

### 3.2.2 Reliability

How general the form generation language is Simplicity vs. functionality of the form language =  
Speeds up form development but does not limit functional.

### 3.2.3 Availability

The system should be available all the time as long as server is up and running.

### 3.2.4 Safety

Humans are error-prone, but the negative effects of common error should be limited. E. g. user  
should realize that a given command will delete data, and be asked to confirm their intent or have  
the option to undo.

### 3.2.5 Software Quality

Good quality to the framework = product robust, bug free software which contains all necessary  
requirements Customer satisfaction.

### 3.2.6 Reusability

Is part of the code going to be used elsewhere = produces simple and independent code modules  
that can be reused.

### 3.2.7 Maintainability

- Back Up:

The system shall provide the capability to back-up the Data

- Errors:

The system shall keep a log of all the errors.

### **3.3** Hardware Requirements

The minimum system requirements list the basic hardware that is required to run the specific process. If your system configuration meets the minimum system requirements, you can run the process with no problems. However, it may result in slower processing of program features, and you may need more time to finish the task. Additionally, lesser memory (RAM) implies that in some occasions, larger files may not be processed correctly.

#### **A.** Minimum Requirements

##### **1.** Server Site:

- A 2.40 GHz x64-capable processor.
- 2 GB of available (free) hard disk space.
- 2 GB or more RAM

##### **2.** Developer Site:

- A 2 GHz x64-capable processor.
- 2 GB of available (free) hard disk space.
- 2 GB or more RAM.

##### **3.** Client Site:

- Pentium III 1.5 GHz processor.
- 512 MB of RAM.
- 500 MB of free hard disk space.

#### **B.** Recommended Requirements

##### **1.** Server Site:

- A Xeon Hexa Core X5690 (3.46 GHz) processor.
- 10 GB of available (free) hard disk space (SAS).
- 32 GB or more RAM.

##### **2.** Developer Site:

- A Intel Core i7-7700 (3.6 GHz) processor.
- 10 GB of available (free) hard disk space.
- 8 GB or more RAM.

### 3. Client Site:

- Intel Core i5-7200 (2.50 GHz) processor.
- 4 GB of RAM.
- 2 GB of free hard disk space.

## 3.4 Software Requirements

The software requirement is the list of the software which is needed to develop the project. This requirement is achieved with detailed knowledge of the development process till the completion of the software. There are two types of software requirements, one as client site and another is sever site.

### 1. Server Site:

- Php 5.6.25 or higher.
- MySQL Server 5.7.14 or higher.
- Operating systems like Ubuntu 18.04, Windows Server 2016.

### 2. Developer Site:

- Php 5.6.25 or higher.
- MySQL Server 5.7.14 or higher.
- Text editor like Notepad++.
- Operating systems like Windows 10 Pro.

### 3. Client Site:

- Browsers like Safari, Google, Chrome, Firefox etc.

# Chapter: 4 | System Design

Traditionally, if any student, teacher or other faculty wanted to contact to others, he/she had to contact through email, mobile or other social media and the process was very much decentralized. The information related to academics can be viewed previously and getting job or project related information through the existing search was not there and direct

## 4.1. Software Development Life Cycle

Agile SDLC model is a combination of iterative and incremental process models with focus on process adaptability and customer satisfaction by rapid delivery of working software product. Agile Methods break the product into small incremental builds. These builds are provided in iterations. Each iteration typically lasts from about one to three weeks. Every iteration involves cross functional teams working simultaneously on various areas like –

- Planning
- Requirements Analysis
- Design
- Coding
- Unit Testing and
- Acceptance Testing.

At the end of the iteration, a working product is displayed to the customer and important stakeholders.

### 6 Stages of the Agile Development Life Cycle

- Scope out and prioritize projects
- Diagram requirements for the initial sprint
- Construction/iteration
- Release the iteration into production
- Production and ongoing support for the software release
- Retirement



**Fig. Agile Model**

#### *Agile Software Development Life Cycle Overview*

The agile lifecycle is a structured series of stages that a product goes through. It consists of six phases:

## **Requirements**

Stakeholders conduct an overall project assessment to determine the time and resources required for the development process. At the same stage, the owner assesses the risks and prioritizes the various functions depending on their business value.

## **Design**

The software owner meets with the software development team and introduces them to the requirements outlined in the first step. The group then discusses the sequence for introducing functions and identifies the essential tools – the programming language, syntax libraries, and basic

frameworks. At the same stage, software development teams can prototype the expected user interface.

## **Development and coding**

After agreeing on the plan with the customer, the team develops the product itself. The product is delivered in stages, in separate sprints, each designed to improve the current version of the product. The initial release is likely to undergo many changes to provide improved functionality and new features.

Each cycle includes testing, and the final product must also undergo final testing. For this phase, you can use Scrum and the Kanban methodology, the development process based on individual tasks.

## **Integration and testing**

At this point, the product becomes available to consumers, so the team must conduct a series of tests to ensure that the software is fully functional. If potential bugs or flaws are found, the developers will fix them immediately. At this stage, they also collected consumer feedback.

## **Implementation and deployment**

The software is now fully deployed and available to customers. This action puts him in the maintenance phase. During this phase, the software development team provides ongoing support to keep the system running smoothly and fix any new bugs. Over time, further iterations are possible to update an existing product or add other functionality.

## **Review**

That is the last stage of the Agile development cycle. After completing all the previous stages of development, the development team presents to the owner the result achieved in meeting the requirements. After that, the Agile software development phases start over – either with a new iteration or moving to the next stage and scaling Agile.

## 4.2. Process Model used with Justification

The fundamental principles of Agile development

When 17 software developers came up with a new way of developing software almost 20 years ago, they did not know how quickly their ideas would spread outside their industry. These principles of incremental development made the Agile model what it is today.

- The top priority is customer satisfaction through the timely and continuous delivery of valuable software.
- Changes in agile processes are used to create a competitive advantage for customers.
- Changing requirements is possible even at a later stage of development.
- Working software is delivered in a couple of weeks to a couple of months, with a preference for shorter terms. And this is the primary indicator of progress.
- Employers and developers need to be in contact daily throughout the project.
- Motivated people create projects in the right environment and with the proper support.
- Self-organizing teams make the best requirements, architectures, and designs.
- The most effective method of communicating information to and within the development team is face-to-face communication.
- The team should regularly review their performance metrics and tune and adjust their performance accordingly.
- Agile processes contribute to sustainable development. Investors, developers, and users must move at a constant pace.
- A relentless focus on technical excellence and impeccable design enhance maneuverability.
- Simplicity – the art of maximizing the amount of work in progress – is essential.

Any modern organization must react quickly to changing market trends driven by fierce competition and dynamic customer requirements. And it is Agile that is changing the paradigm of how companies operate in the digital world.

Agile is categorized into its subset of project management methodologies: Adaptive Software Development, Extreme Programming, Lean Software Development, Dynamic Systems Development Method, Feature-Based Development, Kanban (depending on usage), Scrum, etc. We have described many of them in our blog. This post aims to answer the question: why is Agile so prevalent in the software development industry?

That is understandable because of the flexible, iterative, and incremental character of Agile. Companies can focus on the essentials without forgetting about the product or services they want to launch. Development teams can consistently adapt their approach as they progress, gaining consistent feedback on their product.

As stated in Agile Report, the pace of Agile adoption in both IT teams and other groups has doubled this year. Almost half of the respondents focused on business value (49%) and customer satisfaction (49%). In addition, a 45% increase in delivery speed is considered an equally important indicator of flexibility.

We found that Scrum ranked as the most used Agile approach in the 2021 report. 66% of people use it. Another 15% chose Scrum derivatives (ScrumBan 9% and Scrum / XP 6%).

## **What is meant by Agile SDLC?**

The Agile SDLC methodology is based on joint decision-making between teams and cyclical, iterative progress of creating working software. The work is done in regularly repeating sprints, which are usually a few weeks.

That contrasts markedly with the time frame of traditional project management, which sometimes stretches indefinitely.

The Agile SDLC model emphasizes process adaptability and customer satisfaction by rapidly delivering a working software product.

Agile methods break the product down into small incremental builds that are provided in iterations. At the end of the iteration, the developers show the customer and other interested parties a work product that contains all the customer's functionality.

Each iteration usually lasts from one to three weeks and includes:

- Planning
- Analyzing
- Architectural design
- Coding
- Unit testing

- Acceptance testing
- Delivery
- Feedback

You repeat the steps until all items in the product backlog are complete. There is a cyclical rather than a linear process. The sequence is visible on the Agile software development life cycle diagram.

According to the Agile model, each project is handled differently, and existing methods are adapted to fit the project's requirements best. You focus on more achievable goals that guide your team's immediate actions.

## **What are the benefits of Agile for your businesses?**

Agile project management is reminiscent of the Pareto principle, known as the 80/20 rule (20% of the effort gives 80% of the result, and the remaining 80% of the action gives only 20% of the effect) vice versa.

With Agile SDLC, you get 80% of the product delivered in just 20% of the time. It focused your attention on the main parts of the software that bring real value to the clients and the project.

The advantages of the methodology are so transparent. We can describe each point in one sentence. So, with Agile, you will have access to:

- Agile delivery and functionality demonstration.
- Minimum resource requirements.
- A sensible approach to software development.
- Productive collaboration and cross-training.
- The ability to use in a constantly changing environment and with fixed or changing needs.
- Early provision of partially working solutions.
- Minimum rules and easy-to-use documentation.

- Possibility of parallel development and delivery within a familiar planned context.
- Easy handling and great flexibility.

#### **4.2.1. Requirement Analysis**

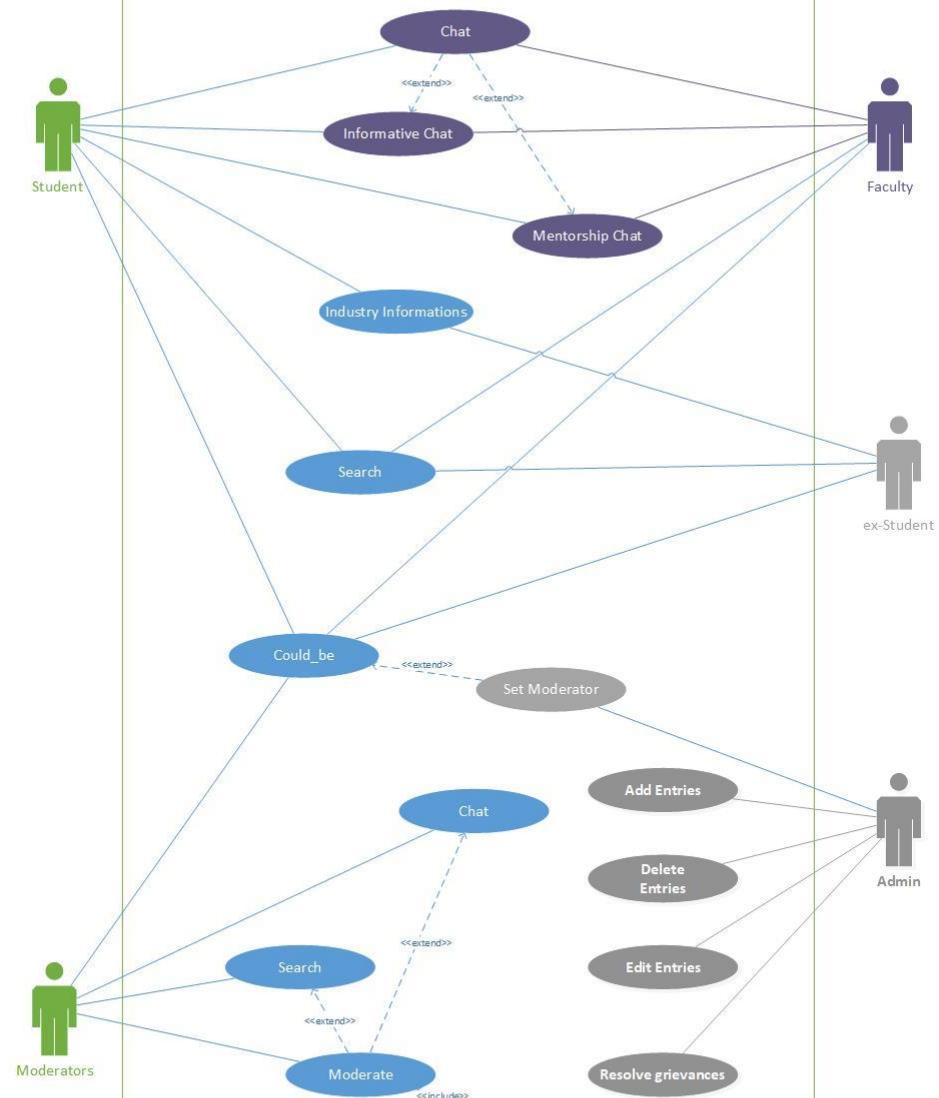
Requirement analysis, also called requirements engineering, is the process of determining user expectations for a new or modified product. These features, called requirements, must be quantifiable, relevant and detailed. In software engineering, such requirements are often called functional specifications. Requirement analysis is an important aspect of project management.

#### **4.2.2. Design**

##### **4.2.2.1. Use Case Diagram**

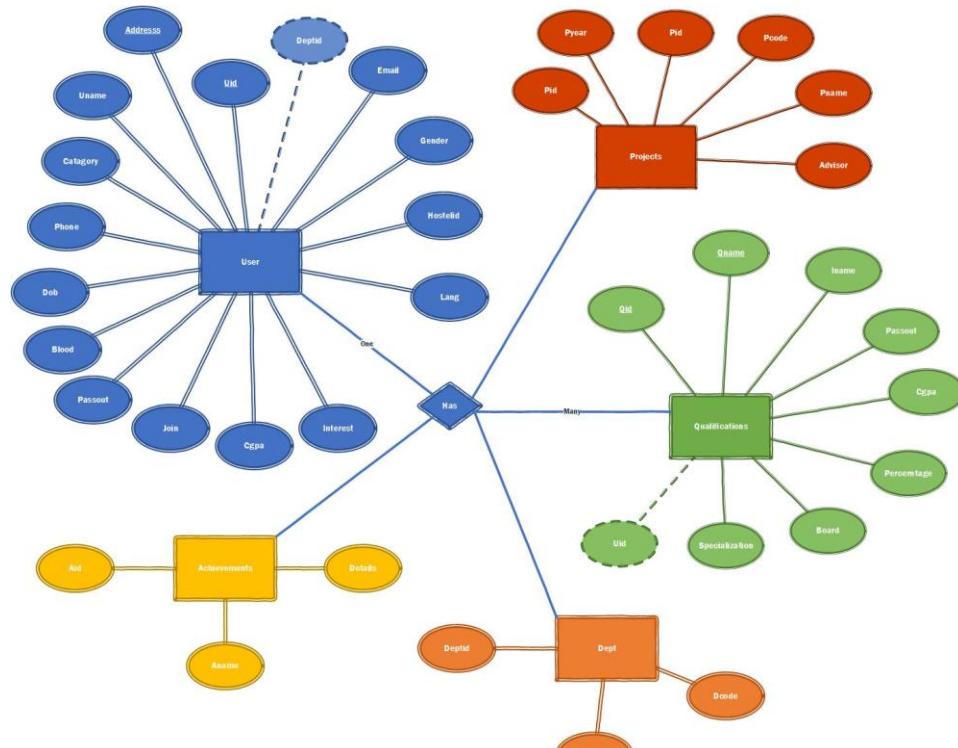
In order to provide a clearer picture of the functionality provided by the Employee Assignment module, we have done a use case analysis. It is also known as UML diagram. Figure below is a use case diagram to present the functionality in the Employee Attendance module. One external entity can interact with the Employee Attendance module that is Employee.

## Information Management System (xConnect)

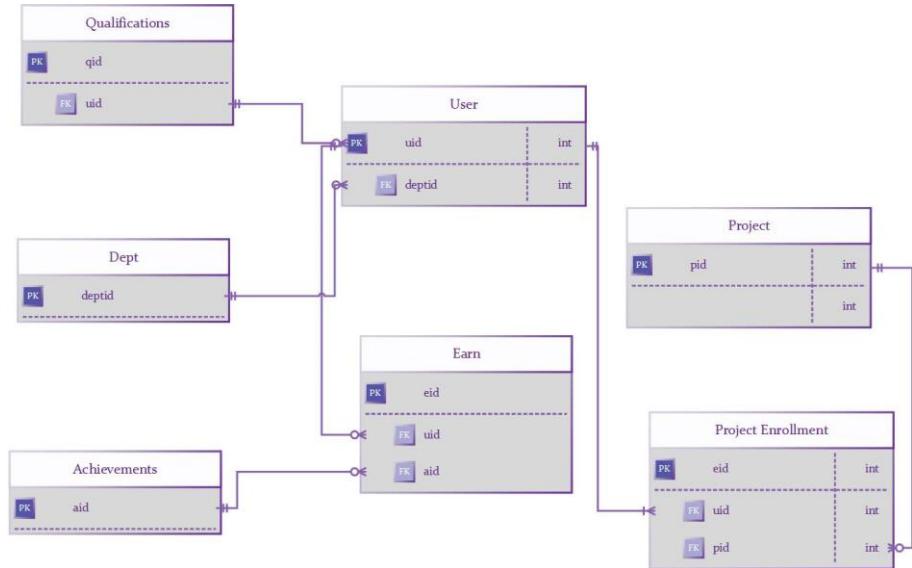


#### 4.2.2.2. Entity Relationship Diagram

An ER diagram is a model that identifies the concept or entities that exist in a system and the relationships between those entities. An ERD [12], [13], [14], [15], [16], [17], [18], [19], [20] is often used as a way to visualize a relational database: each entity represents a database table and the relationship lines represents the key in one table that point to specific records in related tables. Underlined attribute represents as primary key. In ERD total and partial relationship is pointed using double line and single line from entity to entity. Here many to many (m: n), one to one (1:1) and one too many (1: m) relationships are also point out.



**ERD Diagram**



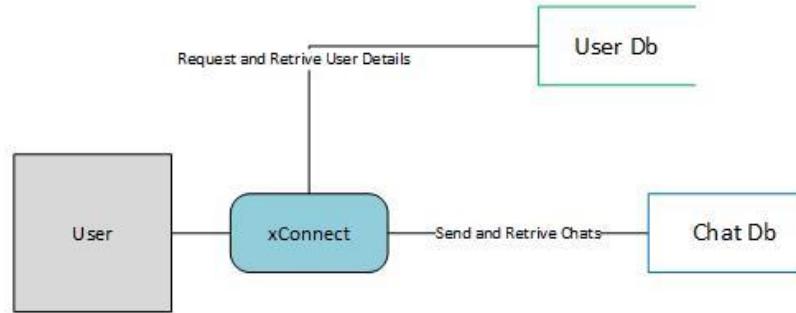
## Table Diagram

### 4.2.2.3. Data Flow Diagram

A Data flow diagram (DFD) is used to express system requirements in a graphical form. It is also known as a bubble chart. A DFD depicts information flow and transform that are applied as data moves from input. Use of DFD helps to clarify the system requirements. DFD are drawn surging analysis and are the starting point for the design phase. A DFD could be used as representative of physical system, at the beginning of analysis, or a logical system at alter point in the system development life cycle. Being graphical, it is easy to understand.

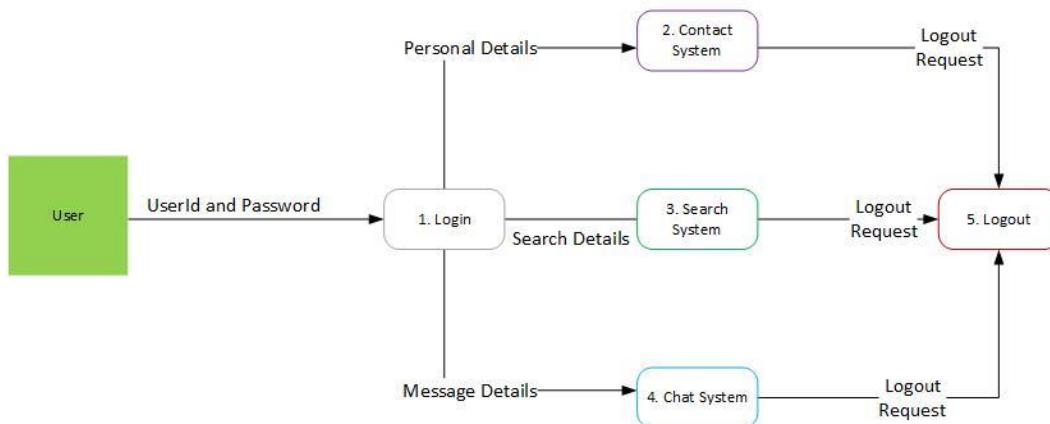
A DFD [1] is used to describe what data flows rather how if flows. The concern about understands the transforms that are required to convert the input to output. It is independent of hardware, software, data structure and file organization. In level-0 or context level DFD has only external entity & a process. In the following diagram we express that. In level 1 DFD we just divide the process of level 0 in some parts to elaborately describe it. Here we describe DFD of level 0, 1 & 2.

# Level 0



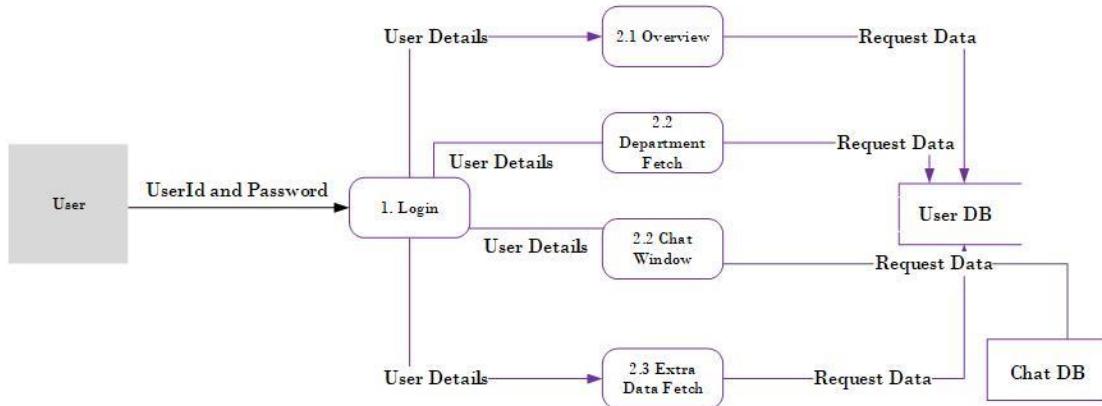
## xConnect

# Level 1



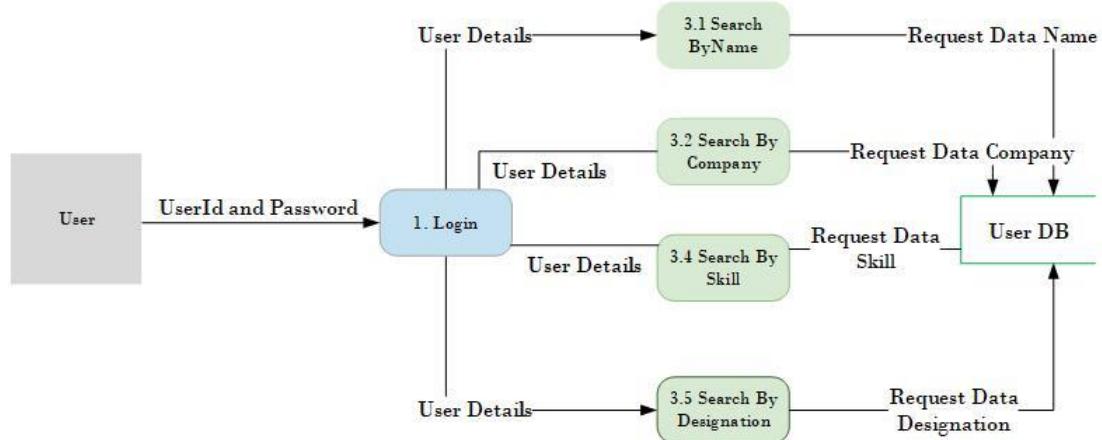
## xConnect Overview

## Level 2.1



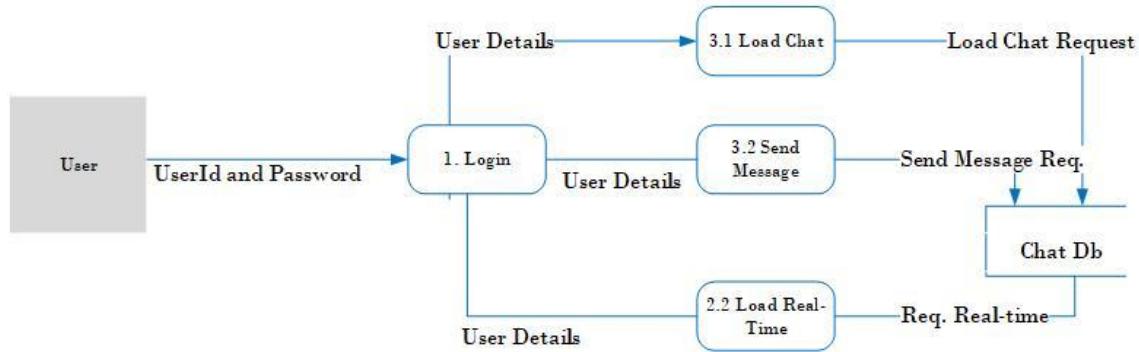
## Contact Module

## Level 2.2



## Search Module

# Level 2.2



## Chat System

### 4.3. Risk Analysis Stage

The prime focus of the feasibility is evaluating the practicality of the proposed system keeping in mind a number of factors. The following factors are taken into account before deciding in favor of the new system.

#### 4.3.1 ECONOMIC FEASIBILITY

The developing system must be justified by cost and benefit. Criteria to ensure that effort is concentrated on project, which will give best, return at the earliest. One of the factors, which affect the development of a new system, is the cost it would require. The following are some of the important financial questions asked during preliminary investigation:

- o The costs conduct a full system investigation.
- o The cost of the hardware and software.
- o The benefits in the form of reduced costs or fewer costly errors.

- o Since the system is developed as part of project work, there is no manual cost to spend for the proposed system. Also, all the resources are already available, it gives an indication of the system is economically possible for development.

#### **4.3.2 TECHNICAL FEASIBILITY**

The system must be evaluated from the technical point of view first. The assessment of this feasibility must be based on an outline design of the system requirement in the terms of input, output, programs and procedures. Having identified an outline system, the investigation must go on to suggest the type of equipment, required method developing the system, of running the system once it has been designed. Technical issues raised during the investigation are: Does the existing technology sufficient for the suggested one?

Can the system expand if developed?

The project should be developed such that the necessary functions and performance are achieved within the constraints. The project is developed within latest technology.

Through the technology may become obsolete after some period of time, due to the fact that never version of same software supports older versions, the system may still be used. So there are minimal constraints involved with this project. The system has been developed using Java the project is technically feasible for development.

#### **4.3.3 OPERATIONAL FEASIBILITY**

This includes the following questions: Is there sufficient support for the users? Will the proposed system cause harm? The project would be beneficial because it satisfies the objectives when developed and installed. All behavioral aspects are considered carefully and conclude that the project is behaviorally feasible.

#### **4.3.4 SCHEDULE FEASIBILITY**

An evaluation of the time needed for the development of this project. The time schedule required for the development of this project is very important, since more development time effects machine time, costs and delays in the development of the other systems. So, the project should be complete within affixed schedule time as far as the organization is concerned.

# Chapter: 5 | Implementation

Software Implementation method is a systematically structured approach to effectively integrate software-based service or component into the workflow of an organizational structure or an individual end user.

## 5.1. Front-end Implementation

We have kept everything simple, clear and much more usable with the use of modern designing scheme and collapsible items with proper navigation UI.

The front end of the system has been implemented to be presented with the following two modules:

- Contact Connect System
- Search Connect System
- Chat Connect System

### Contact Connect System

After entering user can view all the contact from different batch and further can switch academic year by top left switchable navigation buttons (right navigation button and left navigation button). One can message and follow from contact using two buttons present there like follow button and another message button.

### Search Connect System

After entering user can search cross department entries, company, designation, skill, name and get their results as card view in following page.

### Chat Connect System

This section is for sharing information or important chat in a decentralized system with very minimal UI. One can see the previous chat after entering this system. Then he can send message from the write message section and also view the chats in real time.

#### 5.1.1. UI/UX

- We have developed controls responsive as possible, so the interface has been

- simple enough that interactivity is instantaneous
- We have maintained consistency throughout our xConnect module by keeping the elements shape and size according to existing IMS and also color scheme is same as that.
- We have done our best to make the UI intuitive so that anyone can understand easily and can have a good user experience.
- We have maintained a good amount of typography in various fields.
- Extreme care has been shown to make sure that the system communicates what's happening in our system.
- Thinking about the defaults for each user that visits our module was also crucial for us.

### 5.1.2. Technology Used

- We have used,
- Simple html, css to make the basic design.
- Bootstrap to make the module responsive and fluid.
- Java Script for better user experience.

## 5.2. Back-end Implementation

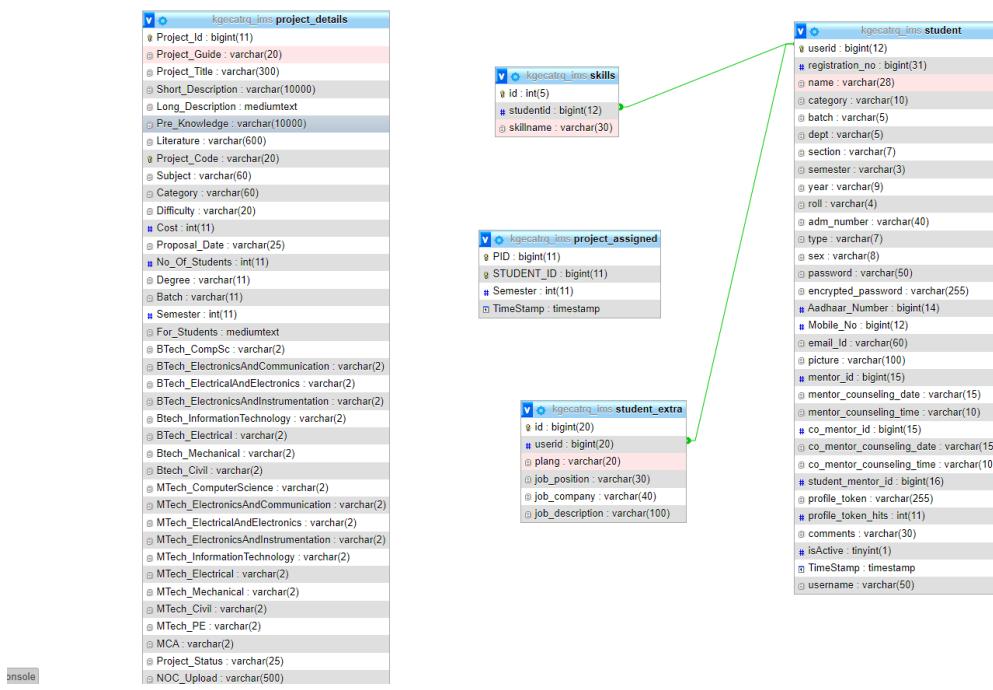
Multiple users can come and share their views here. The MySQL database stores the chats and retrieves it effectively. To implement this application successfully, we had to use PHP code for storing and retrieving from the database. To insert the chats every time a user presses the “send” button, write this code before the initial HTML tag. Attempt MySQL server connection. In this chat application, the very first user's chat is aligned to the right side. If the next message is also from the same user, it is also aligned to the right side of the chat room. If the message is from any other user, then that message will be aligned to the left side. The PHP function to achieve this is given below.

### 5.2.1. Database

#### 5.2.1.1. xConnect

xconnect chat	
id	: int(11)
userid	: bigint(12)
message	: text
created_on	: timestamp

#### 5.2.1.2. KGECKIMS



### 5.2.2. Technology Used

We have used,

- Vanilla PHP for collecting data from servers.
- Java script fetch API for dynamic content fetching without reloading the page.
- Java Script for User events such as button clicks etc.

# Chapter: 6 | System Testing

Traditionally, if any student, teacher or other faculty wanted to contact to others, he/she had to contact through email, mobile or other social media and the process was very much decentralized. The information related to academics can be viewed previously and getting job or project related information through the existing search was not there and direct

System testing describes about testing process, what are the test cases used for the project. It will test about the test conditions in the complete and module done by the user.

## 6.1 Types of Testing

- Smoke testing
- Sanitary Testing
- Regression Testing
- Re-Testing
- Static Testing
- Dynamic Testing
- Alpha Testing
- Beta Testing
- Monkey Testing
- Compatibility testing
- Installation testing

**Smoke Testing** is the process of initial testing in which tester looks for the availability of all the functionality of the application in order to perform detailed testing on them.

**Sanitary Testing** is a type of testing that is conducted on an application initially to check for the proper behavior of an application that is to check all the functionality are available before the detailed testing is conducted by on them.

**Regression Testing** is one of the best and important testing. Regression testing is the process in which the functionality, which is already tested before, is once again tested whenever some new change is added in order to check whether the existing functionality remains same.

**Re-Testing** is the process in which testing is performed on some functionality which is

already tested before to make sure that the defects are reproducible and to rule out the environments issues if at all any defects are there.

**Static Testing** is the testing, which is performed on an application when it is not been executed. Ex: GUI, Document Testing.

**Dynamic Testing** is the testing which is performed on an application when it is being executed. Ex: Functional Testing.

**Alpha Testing** is a type of user acceptance testing, which is conducted on an application when it is just before released to the customer.

**Beta Testing** is a type of User Acceptance Testing (UAT) that is conducted on an application when it is released to the customer, when deployed in to the real time environment and being accessed by the real time users.

**Monkey Testing** is the process in which abnormal operations, beyond capacity operations are done on the application to check the stability of it in spite of the user's abnormal behavior.

**Compatibility Testing** is the testing process in which usually the products are tested on the environments with different combinations of databases (application servers, browsers etc.). In order to check how far the product is compatible with all these environments platform combination.

**Installation Testing** is the process of testing in which the tester try to install or try to deploy the module into the corresponding environment by following the guidelines produced in the deployment document and check whether the installation is successful or not.

## 6.2 Test Levels

**Black Box Testing** is the testing process in which tester can perform testing on an application without having any internal structure knowledge of application. Usually test engineers are involve in the Black Box Testing.

**White Box Testing** is the testing process in which tester can perform testing on an application with having internal structure knowledge. Usually developers are involved in white box testing.

**Gray Box Testing** is the process where the combination of black box and white box are used.

## 6.3 Software Testing Life Cycle (STLC)

### Integration Testing for Database Synchronization

Testing the links that the login user doesn't have enough privileges to invoke a screen, the link should be disabled.

### Acceptance Testing

User Acceptance Testing is a critical phase of any project and requires significant participation by the end user. It also ensures that the system meets the functional requirements.

#### Acceptance Testing for Data Synchronization

The Group controllers have separate roles to modify the database tables. The Group controllers have the provision for to do multicast operations.

## 6.4 Functional Testing

Functional tests provide a systematic demonstration that functions tested are available as specified by the business and technical requirements, system documentation and user manuals. Functional testing is centered on the following items:

**Valid input** : identified classes of valid input must be accepted. **Invalid input** : identified classes of invalid input must be rejected. **Functions** : identified functions must be exercised.

**Output** : identified classes of application outputs must be exercised. **Systems/ Procedures:** interfacing systems or procedures must be invoked.

Organization and preparation of functional tests is focused on requirements, key functions or special test cases. In addition, systematic coverage pertaining to identify business process must be considered for testing. Before functional testing is complete, additional tests are identified and the effective value of current test is determined.

## 6.5 Test Case Design

### Search Module

Test Case ID	Test Scenario	Test Steps	Test Data	Expected Results	Actual Results	Pass/Fail
1	Search students	Enter blanck	Blank or Space	Nothing will be shown or error page shown	All the possible results without filtration	Pass
2	Check result invalid or not according to roll	Enter invalid roll number	Roll=102 01018099	Roll number is invalid	No results found	Pass

Chat Module:

Test Case ID	Test Scenario	Test Steps	Test Data	Expected Results	Actual Results	Pass/Fail
1	Check Send on enter	Click Send button	Value of enter	Send message as soon as enter is pressed	As expected	Pass
2	Check quotes data	Send data with quotes	Data with quote	Send data with quotes	As expected	Pass

# Chapter: 7 | Screen Sorts

This screenshot shows the xConnect index/landing page. At the top, there is a dark blue header bar with a user profile picture, the text "Welcome Subrata Halder Logged in as Student Tuesday 16th Nov, 2021 09:08:02 AM", and navigation links "Back to IMS", "Home", and "Logout". To the right of the header is the "xConnect" logo and a search icon. The main content area has a light blue background. On the left, a vertical sidebar menu is visible with options: "Menu", "Contacts", "Global Room", "My Section", "Messages", "Bookmark", and "Notice Board". The "Notice Board" option is highlighted with a red border. The main content area contains three sections: "Recent Notices", "Favourites", and a footer. The "Recent Notices" section includes a news item about "Jr. Software Engineer Recruitment" and another about an "AI Seminar". The "Event Alert" section is also present. The "Favourites" section shows a row of small thumbnail images. At the bottom right of the main content area, the text "This Site Maintained by Webtech Services, KGEc" is displayed.

## Index/ landing page

This screenshot is identical to the one above, showing the xConnect index/landing page. The only difference is that the entire sidebar menu on the left is now highlighted with a red border, indicating it is the selected or active section of the page.

Back to IMS    Home    Logout

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**xConnect**

**Recent Notices**

**Jr. Software Engineer Recruitment**  
Bachelors Degree/ Masters Degree students are eligible. Currently recruiting Freshers 2021, 2022, 2023 batch. IT-Hardware & Networking / IT-Software / Software Services Functional Area IT Software - Application Programming / Maintenance Qualification Professional Degree. B.C.A. B.Tech/B.E. M.C.A. M.Tech About The Edge Consultancy  
By XYZ Ltd.

**AI Seminar**  
This seminar aims to cover a wide variety of AI topics, such as computer vision, natural language processing (NLP), theoretical ML, AI fairness & ethics, cognitive science, AI hardware, etc. See more about CMU AI initiative here. Please contact Shaojie or Asher for arrangement or questions about this page.  
By Dr. Rajshrekhara Murthy

**Event Alert**  
KGEC organized an flash mob by the Fest ground. Multiple dedicated teams of dancers will gather out of thin air. Various forms of dance Will be performed by KGEC students. Stay tuned on event alerts for next alert.  
KGEC Students Union

**Favourites**

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Department  Name  Company  Designation  Skills

BTech  MCA  MTech

**2019-2020** BTech

	<b>PRAHALLAD DAS</b> Junior Software Developer At Xyz Ltd. <a href="#">Follow</a> <a href="#">Message</a>		<b>Bishal Sarkar</b> Junior Software Developer At Xyz Ltd. <a href="#">Follow</a> <a href="#">Message</a>		<b>ANIK DANDAPATH</b> Junior Software Developer At Xyz Ltd. <a href="#">Follow</a> <a href="#">Message</a>		<b>SAYANTAN SADHU</b> Junior Software Developer At Xyz Ltd. <a href="#">Follow</a> <a href="#">Message</a>		<b>MOYUKH SARKAR</b> Junior Software Developer At Xyz Ltd. <a href="#">Follow</a> <a href="#">Message</a>
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## Department specific search

Welcome Subrata Halder  
Logged in as Student  
Tuesday 16th Nov, 2021 09:08:02 AM

**Kgec Students**

Filter  Search

**BTech**

	<b>SOURAV NASKAR</b> Junior Software Developer At Xyz Ltd.	<a href="#">Follow</a> <a href="#">Message</a>		<b>AVIJIT GHOSH</b> Junior Software Developer At Xyz Ltd.	<a href="#">Follow</a> <a href="#">Message</a>		<b>MOYUKH SARKAR</b> Junior Software Developer At Xyz Ltd.	<a href="#">Follow</a> <a href="#">Message</a>		<b>ANIKET KUMAR</b> Junior Software Developer At Xyz Ltd.	<a href="#">Follow</a> <a href="#">Message</a>		<b>TIYASH KHAN</b> Junior Software Developer At Xyz Ltd.	<a href="#">Follow</a> <a href="#">Message</a>
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→ More

**MCA**

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Welcome Subrata Halder  
Logged in as Student  
Tuesday 16th Nov, 2021 09:08:02 AM

**Search Results**

**BTech**

	<b>KSHETRANATH GHOSH</b> Junior Software Developer At Xyz Ltd.	<a href="#">Follow</a> <a href="#">Message</a>		<b>SAUVIK MONDAL</b> Junior Software Developer At Xyz Ltd.	<a href="#">Follow</a> <a href="#">Message</a>		<b>RIJU CHATTERJEE</b> Junior Software Developer At Xyz Ltd.	<a href="#">Follow</a> <a href="#">Message</a>		<b>SUWASANKAR MUKHERJEE</b> Junior Software Developer At Xyz Ltd.	<a href="#">Follow</a> <a href="#">Message</a>		<b>SUBRATA HALDER</b> Junior Software Developer At Xyz Ltd.	<a href="#">Follow</a> <a href="#">Message</a>
	<b>SOUVIK ROY</b> Junior Software Developer At Xyz Ltd.	<a href="#">Follow</a> <a href="#">Message</a>		<b>ALOK DAS</b> Junior Software Developer At Xyz Ltd.	<a href="#">Follow</a> <a href="#">Message</a>		<b>SUDIPTA GHOSH</b> Junior Software Developer At Xyz Ltd.	<a href="#">Follow</a> <a href="#">Message</a>		<b>ALOK SARKAR</b> Junior Software Developer At Xyz Ltd.	<a href="#">Follow</a> <a href="#">Message</a>		<b>SOUMEN SAMANTA</b> Junior Software Developer At Xyz Ltd.	<a href="#">Follow</a> <a href="#">Message</a>

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**Cross academic-year search**

Welcome Subrata Halder  
Logged in as Student  
Tuesday 16th Nov, 2021 09:08:02 AM

**Kgec Students**

Menu    Filter   Search

Department     Name     Company     Designation     Skills  
 BTech     MCA     MTech

2019-2020 BTech

	<b>SOURAV NASKAR</b> Junior Software Developer At Xyz Ltd. <a href="#">Follow</a> <a href="#">Message</a>		<b>AVIJIT GHOSH</b> Junior Software Developer At Xyz Ltd. <a href="#">Follow</a> <a href="#">Message</a>		<b>MOYUKH SARKAR</b> Junior Software Developer At Xyz Ltd. <a href="#">Follow</a> <a href="#">Message</a>		<b>ANIKET KUMAR</b> Junior Software Developer At Xyz Ltd. <a href="#">Follow</a> <a href="#">Message</a>		<b>TIYASH KHAN</b> Junior Software Developer At Xyz Ltd. <a href="#">Follow</a> <a href="#">Message</a>
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Welcome Subrata Halder  
Logged in as Student  
Tuesday 16th Nov, 2021 09:08:02 AM

**Search Results**

Back to IMS    Home    Logout

Menu   

	<b>SUMIT MONDAL</b> Junior Software Developer At Xyz Ltd. <a href="#">Follow</a> <a href="#">Message</a>		<b>SUMIT GUHA</b> Junior Software Developer At Xyz Ltd. <a href="#">Follow</a> <a href="#">Message</a>
--	--	--	--

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Welcome Subrata Halder  
Logged in as Student  
Tuesday 16th Nov, 2021 09:08:02 AM

**Kgec Students**

Menu    Filter **Alok**    Search

Department     Name     Company     Designation     Skills

**BTech**

**2019-2020**

**SHUVRANSHU KHANRA**  
Junior Software Developer At Xyz Ltd.  
[Follow](#) [Message](#)

**SUMIT GUHA**  
Junior Software Developer At Xyz Ltd.  
[Follow](#) [Message](#)

**AAYUSH AGARWAL**  
Junior Software Developer At Xyz Ltd.  
[Follow](#) [Message](#)

**KATHAK MISTRY**  
Junior Software Developer At Xyz Ltd.  
[Follow](#) [Message](#)

**RANJAN KUMAR DAS**  
Junior Software Developer At Xyz Ltd.  
[Follow](#) [Message](#)

[→ More](#)

**MCA**

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Welcome Subrata Halder  
Logged in as Student  
Tuesday 16th Nov, 2021 09:08:02 AM

**Search Results**

[Search](#)

**BTech**

**2019-2020**

**ALOK DAS**  
Junior Software Developer At Xyz Ltd.  
[Follow](#) [Message](#)

**ALOK SARKAR**  
Junior Software Developer At Xyz Ltd.  
[Follow](#) [Message](#)

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**Name search Cross departmental, cross academic session.**

Welcome Subrata Halder  
Logged in as Student  
Tuesday 16th Nov, 2021 09:08:02 AM

Back to IMS Home Logout

# Kgec Students

Department  Name  Company  Designation  Skills

**BTech**

	<b>SOMEN DAS</b> Junior Software Developer At Xyz Ltd. <input type="button" value="Follow"/> <input type="button" value="Message"/>		<b>APARESH BHUNIA</b> Junior Software Developer At Xyz Ltd. <input type="button" value="Follow"/> <input type="button" value="Message"/>		<b>GITAN DAS</b> Junior Software Developer At Xyz Ltd. <input type="button" value="Follow"/> <input type="button" value="Message"/>		<b>AVISHAK BAGCHI</b> Junior Software Developer At Xyz Ltd. <input type="button" value="Follow"/> <input type="button" value="Message"/>		<b>RAJESWARI MONDAL</b> Junior Software Developer At Xyz Ltd. <input type="button" value="Follow"/> <input type="button" value="Message"/>
--	---	--	--	--	---	--	--	--	--

**MCA**

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Welcome Subrata Halder  
Logged in as Student  
Tuesday 16th Nov, 2021 09:08:02 AM

Back to IMS Home Logout

# Search Results

**ABBUSSUDIN SK**  
Junior Software Developer At Xyz Ltd.

**ABHIJIT PATRA**  
Junior Software Developer At Xyz Ltd.

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## Skill specific search

The screenshot shows a university notice board system. At the top, there is a dark blue header bar with the following elements from left to right: a user profile picture of a man, the text "Welcome Subrata Halder", "Logged in as Student", the date "Tuesday 16th Nov, 2021 09:08:02 AM", a "Back to IMS" link, a "Home" link, a "Logout" link, the word "Notices" in a large white serif font, and a magnifying glass icon for search.

**Left Sidebar (Menu):**

- Menu (with three horizontal lines icon)
- Contacts
- Global Room
- My Section
- Messages
- Bookmark
- Notice Board

**Content Area:**

- Jr. Software Engineer Recruitment**

Bachelors Degree/ Masters Degree students are eligible. Currently recruiting Freshers 2021, 2022, 2023 batch. IT-Hardware & Networking / IT-Software / Software Services Functional Area IT Software - Application Programming / Maintenance Qualification Professional Degree, B.C.A, B.Tech/B.E, M.C.A, M.Tech About The Edge Consultancy

By XYZ Ltd.
- AI Seminar**

This seminar aims to cover a wide variety of AI topics, such as computer vision, natural language processing (NLP), theoretical ML, AI fairness & ethics, cognitive science, AI hardware, etc. See more about CMU AI initiative here. Please contact Shaojie or Asher for arrangement or questions about this page.

By Dr. Rajshrekhara Murthi
- Event Alert**

KGEC organized a flash mob by the Fest ground. Multiple dedicated teams of dancers will gather out of thin air. Various forms of dance Will be performed by KGEC students. Stay tuned on event alerts for next alert.

KGEC Student's Union
- Jr. Software Engineer Recruitment**

Bachelors Degree/ Masters Degree students are eligible. Currently recruiting Freshers 2021, 2022, 2023 batch. IT-Hardware & Networking / IT-Software / Software Services Functional Area IT Software - Application Programming / Maintenance Qualification Professional Degree, B.C.A, B.Tech/B.E, M.C.A, M.Tech About The Edge Consultancy

By XYZ Ltd.

**Footer:**

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## Notice Page for various updates

The screenshot shows a web-based communication platform named "xConnect". At the top, there is a dark blue header bar with the following elements from left to right: a small user icon, the text "Back to IMS", "Home", "Logout", a search input field with the placeholder "Search", and the "xConnect" logo.

The main content area has a light gray background. On the left side, there is a vertical sidebar with a blue header labeled "Menu" and a three-line menu icon. Below this are several blue buttons with white text: "Search", "Contacts", "Global Room", "My Section", "Messages", "Bookmark", and "Notice Board".

The central part of the screen displays a "Welcome AMAN BANS!" message in a large, bold, dark blue box. Below this, there is a chat interface with a white background. It shows a conversation between two users:

- User 1 (blue bubble): 10200114075 : Hi
- User 2 (gray bubble): Hello
- User 1 (blue bubble): 10200114075 : I'm from Btech CSE. I'm looking for a internship on Java.
- User 2 (gray bubble): Yah! I know an alumni @10201019001 please help
- User 1 (blue bubble): 10200120065 : I'm also from Btech CSE and it will be helpful for me also

At the bottom of the chat window, there is a text input field with the placeholder "Write Your Messeage Here!" and a blue send button with a white arrow icon.

At the very bottom of the page, there is a dark blue footer bar with the text "This Site Maintained by Webtech Services, KGEU".

## Global Chat Page from AMAN's Side

The screenshot shows the xConnect Global Chat interface. At the top, there is a dark blue header bar with the following elements from left to right: a user profile icon, the text "Welcome Tarun Kumar Singh", "Logged in as Student", the date "Tuesday 16th Nov, 2021 09:08:02 AM", a "Logout" link, a search input field with the placeholder "Search", and the xConnect logo.

The main content area has a white background. On the left, there is a vertical sidebar menu with the following items: "Menu" (with a three-line icon), "Search", "Contacts", "Global Room", "My Section", "Messages", "Bookmark", and "Notice Board".

The central area displays a welcome message: "Welcome TARUN KUMAR SINGH !". Below this, there is a chat window showing the following messages:

- 10200119001 : Hello
- Hi
- I'm from Btech CSE. I'm looking for a internship on Java.
- 10200119001 : Yah! I know an alumni @10201019001 please help
- 10200120065 : I'm also from Btech CSE and it will be helpful for me also
- "checking data"

At the bottom of the chat window, there is a text input field with the placeholder "Write Your Messeage Here!" and a blue send button with a white arrow icon.

At the very bottom of the page, there is a dark blue footer bar with the text "This Site Maintained by Webtech Services, KGEC".

## Global Chat Page from TARUN's Side

Back to IMS    Home    Logout

Welcome SONALI PAUL  
Logged in as **Student**  
Tuesday 16th Nov, 2021 09:08:02 AM

**xConnect**

**Welcome SONALI PAUL !**

10200119001 : Hello

10200114075 : Hi

10200114075 : I'm from Btech CSE. I'm looking for a internship on Java.

10200119001 : Yah! I know an alumni @10201019001 please help

I'm also from Btech CSE and it will be helpful for me also

Write Your Messeage Here!

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Menu   

Search

Contacts

Global Room

My Section

Messages

Bookmark

Notice Board

Search

Logout

Back to IMS

Welcome SONALI PAUL

Logged in as **Student**

Tuesday 16th Nov, 2021 09:08:02 AM

**xConnect**

**Welcome SONALI PAUL !**

10200119001 : Hello

10200114075 : Hi

10200114075 : I'm from Btech CSE. I'm looking for a internship on Java.

10200119001 : Yah! I know an alumni @10201019001 please help

I'm also from Btech CSE and it will be helpful for me also

Write Your Messeage Here!

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## Global Chat Page from SONALI'S Side

The screenshot shows the xConnect application interface. At the top, there is a dark blue header bar with the following elements from left to right: a user profile picture, the text "Welcome Subrata Halder", "Logged in as Student", the date "Tuesday 16th Nov, 2021 09:08:02 AM", a "Logout" link, and a "Search" input field. To the right of the search field is the "xConnect" logo.

On the left side, there is a vertical sidebar with a light gray background and a dark blue header. The sidebar contains the following menu items: "Menu" (with a three-line icon), "Search", "Contacts", "Global Room", "My Section", "Messages", "Bookmark", and "Notice Board".

The main content area has a white background and features a form titled "Enter Details". The form includes four input fields: "Company \*", "Position \*", "Programming Language \*", and "Job Description (currently) \*". Below these fields is a large blue "UPDATE" button.

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## View of My Section

# Chapter: 8 | Conclusion and Future Plan

Traditionally, if any student, teacher or other faculty wanted to contact to others, he/she had to contact through email, mobile or other social media and the process was very much decentralized. The information related to academics can be viewed previously and getting job or project related information through the existing search was not there and direct

## 8.1 Conclusion

It has been great pleasure for me to work on this exciting and challenging project. The main objective of the project is to develop a Secure Chat & social Application. I had taken a wide range of literature review in order to achieve all the tasks, where I came to know about some of the products that are existing in the market. I made detailed research in that path to cover the loop holes that existing systems are facing and to eradicate them in our application. In the process of research, I came to know about the latest technologies and different algorithms. As a result, the product has been successfully developed in terms of extendibility, portability, and maintainability and tested in order to meet all requirements that are Authentication, Integrity, Confidentiality which are specified as the four basic concepts for the secure communication over a network.

This project has huge potential to have an impact on KGEC, as well as on its' students. This XConnect project could bring various departments closer than ever before. It could facilitate junior-senior bonding, cross departmental peer connections, faculty-student bonding. As a whole this could bring entire KGEC feel more like a family. If we could add analytics on the gathered data, we can understand student's interests, trending skills, trending job positions from etc. for the administration side to better prepare our students for the industry. This project can revolutionize the way KGECians connect with each other. We can have our senior's guidance more easily, on a one-to-one basis or as a fellow KGECian. This could become the first of its kind of centralized chat for academic institutions. Faculty could also interact through IMS in an organized manner. Students can't miss out since only one place to follow for all the updates. This module could also make freshers up to speed with KGEC trends.

## 8.2 Future Plan:

Currently, this module only supports connections between students, but we could add faculty in this module, to make them connect to students & other faculties.

We could add encryption to the private chats to make them more secure from prying eyes.

We could add large file support in the chat window.

We could add emoji support in the chat section.

There could be create notice section for students to publish notices to other students. The admin panel can be added for administration of various services. For approving the various notices.

For keeping the environment more academia friendly we could add students with "moderator" privileges.

We could add data analytics module for understanding the students' behavior, their field of interests, trending skills, trending job positions, trending topics.

# Chapter: 9 | Bibliography

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