A green shield with red and white text

AI-generated content may be incorrect. A shield with a tree and a bird

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University Of Jordan

School Of Business

Management Information Systems

Business Hub

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# Abstract

The Business Hub platform is designed to enhance student life by providing a centralized system for book exchange, academic staff information, and campus navigation. Many students struggle to access course materials, locate faculty offices, and navigate the university efficiently. This project addresses these challenges by integrating essential academic services into a single, user-friendly platform.

The platform enables students to buy, sell, and trade books, access faculty contact details and office hours, and utilize an interactive campus map. Developed with React for the front end, Node.js for the back end, and MySQL for database management, it ensures smooth, scalable, and responsive experience.

A feasibility study confirms the project’s technical and financial viability, with low development costs and potential monetization through advertising and premium features. The structured development roadmap, including planning, design, implementation, and testing, guarantees a robust and efficient system.

By digitizing academic support services, the Business Hub improves accessibility, communication, and efficiency, making university life more organized and convenient for students, faculty, and administrators.

# 

# 1.Introduction

# 1.1 Background

This project operates within the educational technology domain, specifically focusing on student support services in higher education. In many universities, business students face a lack of centralized access to academic resources, departmental information, and campus guidance. The current reliance on scattered social media platforms, informal communication, and outdated systems creates confusion and inefficiencies. Our project addresses this gap by offering a unified digital platform that simplifies access to study materials, faculty information, campus navigation, and student guidance.

## 1.2 Problem Statement (What, Where, How)

* **What:** The business provides a platform that solves the issue of scattered student resources and unorganized access to academic services.
* **Where:** The business operates on an online website designed specifically to serve business students within the Faculty of Business.
* **How:** Students currently search for materials through social media groups, ask peers for staff locations, or rely on word of mouth to find campus info. These methods are unorganized, unreliable, and time-consuming. The business solves this by organizing all services in a clear structure categorized by majors and departments and making them accessible with just a few clicks through the website.

1.3 People Involved (Who)

The business owners are the three student developers who built and manage the platform. Employees include student volunteers from the Faculty of Business who help update information and materials when needed. The customers are regular students seeking easy access to academic resources and support.

## 1.4 Proposed Solution (Why, How)

* **Why:** The new system is needed to replace scattered, inefficient methods with a centralized, reliable platform. It adds value by saving time, reducing confusion, and providing organized access to essential services for business students.
* **How:** The proposed Business Hub platform will consolidate essential academic services, offering interactive multimedia for classroom navigation, structured book exchange systems, comprehensive staff directories, and detailed academic roadmaps tailored to each business major.

## 1.5 Objectives

* Provide business students with centralized access to academic resources, including course materials and a structured course tree by major.
* Simplify student life by gathering essential services such as hall locations, faculty contacts, university bus routes, and nearby support resources in one platform.
* Offer interactive tools and features like a book exchange, GPA calculator, and FAQ section to enhance academic support and engagement.
* Guide students through important academic transitions, especially graduation procedures, through a clear and accessible graduate guide.
* Promote student well-being and campus involvement by showcasing fun activities, unique campus spots, and underrated student-friendly services.

1.6 Target Users

Business students within the Faculty of Business, including regular users & volunteer

# 2. Problem Definition

## 2.1 Problem Statement

Business students often face difficulties accessing academic materials, locating faculty offices, and discovering important university resources due to the absence of a centralized platform. This creates a fragmented experience where students waste time, miss out on valuable services, and often spend more money than necessary. Without proper guidance, many navigate university life randomly, relying on scattered advice. This system aims to solve that by providing a well-organized, accessible website that gathers all essential services in one place—helping students save time, reduce costs, and enjoy a smoother, more informed academic journey.

## 2.2 Project Scope

The project aims to develop a web-based platform that centralizes all essential academic and campus-related services for business students. It will include features such as a structured course tree with downloadable materials, a book exchange system, academic staff information, hall locations, updated faculty news, guides for graduation procedures, tools like a GPA calculator, and access to nearby useful services. The system is designed to be easy to navigate and regularly updated with the help of student volunteers. The platform will cover almost every important need for business students, except for a missing item reporting feature, which is currently outside the project scope. The target audience includes all students within the Faculty of Business who seek organized, fast, and reliable access to the resources that support their academic journey.

## 2.3 Uniqueness and Innovation

What sets this system apart is its shift away from unreliable, scattered solutions like social media groups and word-of-mouth communication. Existing methods depend on slow approval processes, inconsistent responses, and the risk of outdated or inaccurate information. In contrast, our platform offers a structured, reliable, and instantly accessible source tailored specifically to business students. One of the most innovative features is the integrated book exchange section, which replaces the random, inefficient way students currently trade books. By allowing users to post, search, and connect directly through the platform, we eliminate the missed opportunities and confusion common in scattered Facebook posts. This system is not just a replacement it’s a smart upgrade that saves students time, improves accuracy, and creates a more seamless academic experience compared to traditional or informal alternatives.

## 2.4 Issues

While the system offers clear benefits, it may face certain challenges during and after launch. One potential issue is resistance from individuals who are hesitant about change or innovation, and may discourage others through negative word of mouth rather than supporting the platform's growth. Additionally, language barriers could affect usability for some students; however, this has been addressed by providing a fully translated Arabic version of the site to ensure accessibility for all users. Another concern is the possibility of minor technical issues or system downtime upon launch, especially during the early access phase. While such problems are typically easy to fix once reported, they may initially create a negative impression among users. Despite these challenges, the long-term value and convenience the platform brings to business students far outweigh the temporary obstacles.

# 3. Business model

## 3.1 Value Proposition

The system eliminates the confusion of scattered information by offering business students a centralized, reliable platform. It saves time, cuts frustration, and delivers organized, up-to-date content far more effective than social media or random advice.

## 3.2 Target Customers and Market Segment

The primary users of the system are business students at the University of Jordan, including those from all academic years and majors. The system serves the governmental educational institution JU Business School.

## 3.3 Key Activities

The main processes required to operate the system successfully include completing front-end and back-end development, integrating the platform with a functional database, creating a secure user login portal, and hosting the system on a public domain. Additionally, the platform will be promoted through faculty-related Facebook pages with a small marketing campaign to reach the target audience. Once launched, the system will function as a 24/7 accessible website, providing continuous support and resources for business students.

## 3.4 Key Resources

To develop and sustain the system, several key resources are required. On the technical side, we rely on our personal laptops and mobile phones for development and content creation, along with tools such as Visual Studio Code for coding, draw.io for designing page layouts, Microsoft Office for documentation, and Adobe Photoshop for icon editing. Human resources include the three student developers responsible for building the platform, and in the future, a team of up to 5 to 8 student volunteers may be needed to support maintenance, updates, and user feedback. Financial resources involve subscriptions to Microsoft Office and Adobe Photoshop, as well as domain hosting costs. While partnerships or third-party services are not essential for launch, we may propose future collaboration with the Deanship of Student Affairs to support hosting and funding the project.

## 3.5 Customer Relationships

The system will interact with users through a direct, self-service interface where students can easily access the information and tools they need without intermediaries Customer satisfaction will be maintained through regular content updates, responsive support from volunteers, and a user-friendly bilingual interface that adapts to students’ needs.

## 3.6 Distribution Channels

The system will reach customers through a publicly accessible website promoted via faculty Facebook pages and student groups. Users can access the service anytime through their web browsers on both computers and mobile devices.

# 4. Revenue Model

## 4.1 Revenue Streams

The main source of income for the system will come from displaying advertisements within the platform. By integrating ad space in a non-intrusive way, the system can generate ongoing revenue to help cover maintenance and hosting costs while keeping the service free and accessible for students.

## 4.2 Cost Structure

Development costs include software tools such as Visual Studio Code (free), Adobe Photoshop subscription (approx. $20/month), and Microsoft Office (around $10/month). Hosting and domain costs are estimated at $100/year for a reliable hosting plan and domain registration. Maintenance costs involve updates, security, and volunteer support, which could range around JD250, Marketing expenses include creating brochures within the faculty to be distributed among students, featuring a QR code for easy website access, which may cost around JD30 for printing and design. These costs

# 5. Feasibility studies

A feasibility study is an in-depth evaluation of a project's viability, analyzing its technical, financial, and operational aspects to support informed decision-making. It ensures that a project is practical, sustainable, and capable of addressing real needs before committing resources. In the case of **Business Hub**, this study assesses the platform’s potential to streamline academic resource access, book exchanges, and faculty support within the University of Jordan's Business School. By examining user demand, technical requirements, and implementation feasibility, we ensure the platform is both functional and impactful. This structured analysis helps validate its long-term sustainability, ensuring it effectively serves students while allowing for future growth.

## 5.1 Technical Feasibility

Technical feasibility evaluates the resources, tools, and technologies required to successfully implement the **Business Hub** platform. This includes software, development frameworks, and infrastructure necessary for deployment and maintenance. The key technical components for this system include:

5.1.1 Required Technologies

The system will be developed using HTML, JavaScript, and CSS for the front-end, with PHP for the back end. The platform will be web-based with a progressive web application (PWA) feature, allowing users to install the website on both Android and iOS devices

**Windows operating system** – Essential for development and testing.

**PHP MY ADMIN** – Used for backend development, providing a robust and scalable web.

**Frontend Technologies** – HTML, CSS, JavaScript for UI/UX, ensuring a responsive and dynamic interface.

**Microsoft Visual Studio Code** – The primary integrated development environment (IDE) for coding and debugging.

**Database Management** – PostgreSQL or MySQL for handling user data and system records.

**Draw.io** – Used for designing system architecture, wireframes, and workflow diagrams.

**Adobe Photoshop** – For editing and optimizing images and visual assets.

**Microsoft Word** – Used for documentation, report writing, and drafting content.

**Adobe Acrobat PDF Reader** – For managing and reviewing project documents and PDFs.

**Hardware**

* Dell – 12th Gen Core i7-12650H – 16GB RAM – 512GB SSD – 1TB HDD – NVIDIA RTX 3050Ti.
* HP – 11th Gen Core i5-1135G7 – 8GB RAM – 256GB SSD – 1TB HDD.
* Asus – Ryzen 5 5600H – 16GB RAM – 512GB SSD – Radeon Vega Graphic.

5.1.2 System Integration and Compatibility

The system will not integrate with any existing software or databases; instead, a custom database will be created to gather and manage all necessary information. As for compatibility, the system is fully compatible with most devices since it operates through web browsers, ensuring accessibility on both desktop and mobile devices without specific operating system dependencies.

## 5.2 Economic Feasibility

Economic feasibility evaluates the estimated costs required for the development, deployment, and maintenance of the **Business Hub** platform. The goal is to assess whether the project is financially viable and sustainable. Below is an estimated breakdown of the costs:

## 5.2.1 Cost Estimation

**1.** Software Costs**:**

Microsoft Office Suite – 250 JD

Adobe Photoshop – 300 JD (one-time license or annual subscription)

Draw.io (Free or Premium Version) – 50 JD (if premium is needed)

Adobe Acrobat PDF Reader – 80 JD

2. Hardware Costs:

Laptops (3 units for development team) – 700 JD \* 3 = 2,100 JD

External Hard Drive (Backup & Storage) – 150 JD

3. Internet & Hosting Costs:

High-Speed Internet Connection – 200 JD/year

Domain Registration – 15 JD/year

Cloud Hosting (AWS/Google Cloud/Azure) – 30 JD/month = 360 JD/year

SSL Certificate (Let's Encrypt or Paid) – Free or 40 JD/year

Database Hosting (PostgreSQL/MySQL on Cloud) – 20 JD/month = 240 JD/year

4. Development & Miscellaneous Costs:

PHP (Open-source) – Free

Microsoft Visual Studio Code (IDE) – 25 JD/month = 300 JD/year

Marketing & Initial Promotion – 500 JD

Legal & Business Registration Fees – 300 JD

### **Expected Income After One Year (Google AdSense)**

|  |  |  |
| --- | --- | --- |
| Metric | Value | Notes |
| Estimated Daily Active Users | 150 | Active business students visiting the platform |
| Page Views per User per Day | 4 | Students browse around different pages |
| Total Daily Page Views | 600 | 150 users × 4 pages |
| CPM (Cost per 1000 Impressions) | $2.00 | Conservative AdSense estimate for educational content |
| Daily Ad Revenue | $1.20 | (600 ÷ 1000) × $2.00 |
| Monthly Ad Revenue | $36 | $1.20 × 30 days |
| **Annual Ad Revenue** | **$432** | $36 × 12 months |

### **Expected Costs After One Year**

|  |  |  |
| --- | --- | --- |
| Category | Cost (JD) | Notes |
| Microsoft Office Suite | 250 | Software cost |
| Adobe Photoshop | 300 | Software cost |
| Adobe Acrobat PDF Reader | 80 | Software cost |
| Draw.io Premium | 50 | Optional upgrade |
| Laptops for Dev Team (3) | 2,100 | Hardware for developers |
| External Hard Drive | 150 | Backup and storage |
| High-Speed Internet | 200 | Yearly plan |
| Domain Registration | 15 | Annual domain fee |
| Cloud Hosting (30×12) | 360 | Hosting servers |
| SSL Certificate | 40 | For HTTPS encryption |
| DB Hosting (20×12) | 240 | For MySQL/PostgreSQL |
| Visual Studio Code (25×12) | 300 | IDE usage (estimated as subscription) |
| Marketing & Brochures | 500 | Print, QR codes, on-campus marketing |
| Legal & Registration Fees | 300 | Business setup |
| **Total Annual Cost** | **4,885 JD** |  |

### **Expected Profit Margin**

|  |  |
| --- | --- |
| Metric | Amount |
| Annual Income (USD) | $432 |
| Annual Cost (JD) | 4,885 JD |
| Profit (Approx.) | **−4,580 JD** |
| Profit Margin | **Negative**  (Initial year loss due to setup and investment phase) |

## 5.3 Operational Feasibility

Operational feasibility assesses how well the **Business Hub** platform will function in a real-world environment, ensuring it effectively supports users and integrates seamlessly into academic processes.

5.3.1 User Readiness and Adoption

The system will be used primarily by students within the Faculty of Business. No formal training will be required, as the platform is designed to be intuitive and easy to navigate

5.3.2 Business Process Integration

The system will complement existing business processes by providing an organized, digital solution to access academic resources and services. It will replace manual processes such as searching for materials through social media or word of mouth, streamlining tasks like book exchanges, faculty contact lookups, and campus navigation into a single, efficient platform.

5.3.3 System Maintenance and Support

System updates and bug fixes will be handled through the "Contact Us" section, where users can report issues by directly emailing the developers. Once a problem is reported, it will be addressed promptly, ensuring ongoing technical support and timely resolution of any issues.

# 6. Project Plan

## 6.1 Project Planning Phase (1 Week)

Define Project Scope: Clarify features, user requirements, and project objectives.

Estimated Time: 1 day

Completion Date: Day 1

Team Formation and Resource Allocation: Assign roles to developers, designers, and other resources.

Estimated Time: 2 days

Completion Date: Day 3

Research and Selection of Tools and Technology: Decide on programming languages, frameworks, and APIs (e.g., React, Node.js, Google Maps).

Estimated Time: 3 days

Completion Date: Day 6

Create Detailed Project Schedule: Plan all future activities and assign deadlines.

Estimated Time: 1 day

Completion Date: Day 7

## 6.2 Design Phase (3 Weeks)

UI/UX Design: Develop wireframes and mockups for the platform.

Estimated Time: 1 week

Completion Date: End of Week 2

Platform Architecture Design: Design database schema, backend structure, and APIs.

Estimated Time: 1 week

Completion Date: End of Week 3

Review and Approval of Designs: Get feedback from stakeholders and make necessary revisions.

Estimated Time: 1 week

Completion Date: End of Week 3

## 6.3 Development Phase (6 Weeks)

**Frontend Development:**

Tasks: Develop website layout, book exchange system, staff directory, and campus map integration.

Estimated Time: 3 weeks

Completion Date: End of Week 6

**Backend Development:**

Tasks: Set up server, database, user management system,

Estimated Time: 3 weeks

Completion Date: End of Week 6

System Integration: Integrate frontend and backend, including API connections.

Estimated Time: 1 week

Completion Date: End of Week 7

## 6.4 Testing Phase (2 Weeks)

Unit Testing: Test individual components for functionality.

Estimated Time: 1 week

Completion Date: End of Week 8

Integration Testing: Test the integration of all components.

Estimated Time: 4 days

Completion Date: Day 4 of Week 9

User Acceptance Testing (UAT): Test with real users (students, faculty) for feedback.

Estimated Time: 3 days

Completion Date: End of Week 9

## 6.5 Deployment Phase (1 Week)

Prepare Hosting Environment: Set up cloud hosting services (AWS, Google Cloud, etc.).

Estimated Time: 2 days

Completion Date: Day 2 of Week 10

Deploy to Production: Upload the platform to the live environment and test deployment.

Estimated Time: 3 days

Completion Date: Day 5 of Week 10

Final Testing: Run final tests after deployment to ensure everything is working as expected.

Estimated Time: 2 days

Completion Date: End of Week 10

## 6.6 Post-Deployment Phase (Ongoing)

Monitoring & Bug Fixing: Address any issues or bugs identified by users.

Estimated Time: Ongoing

Completion Date: Ongoing, with regular updates as needed

User Training & Documentation: Create user guides and FAQs for students and staff.

Estimated Time: 1 week

Completion Date: Week 11

Collect User Feedback & Iterative Improvement: Collect feedback from initial users and iterate it on the platform to make improvements.

Estimated Time: Ongoing

Completion Date: Ongoing, with a major review every 3 months

High-Level Gantt Chart (For MS Project)

Here’s how to input this into MS Project:

Create tasks and assign start dates and end dates for each.

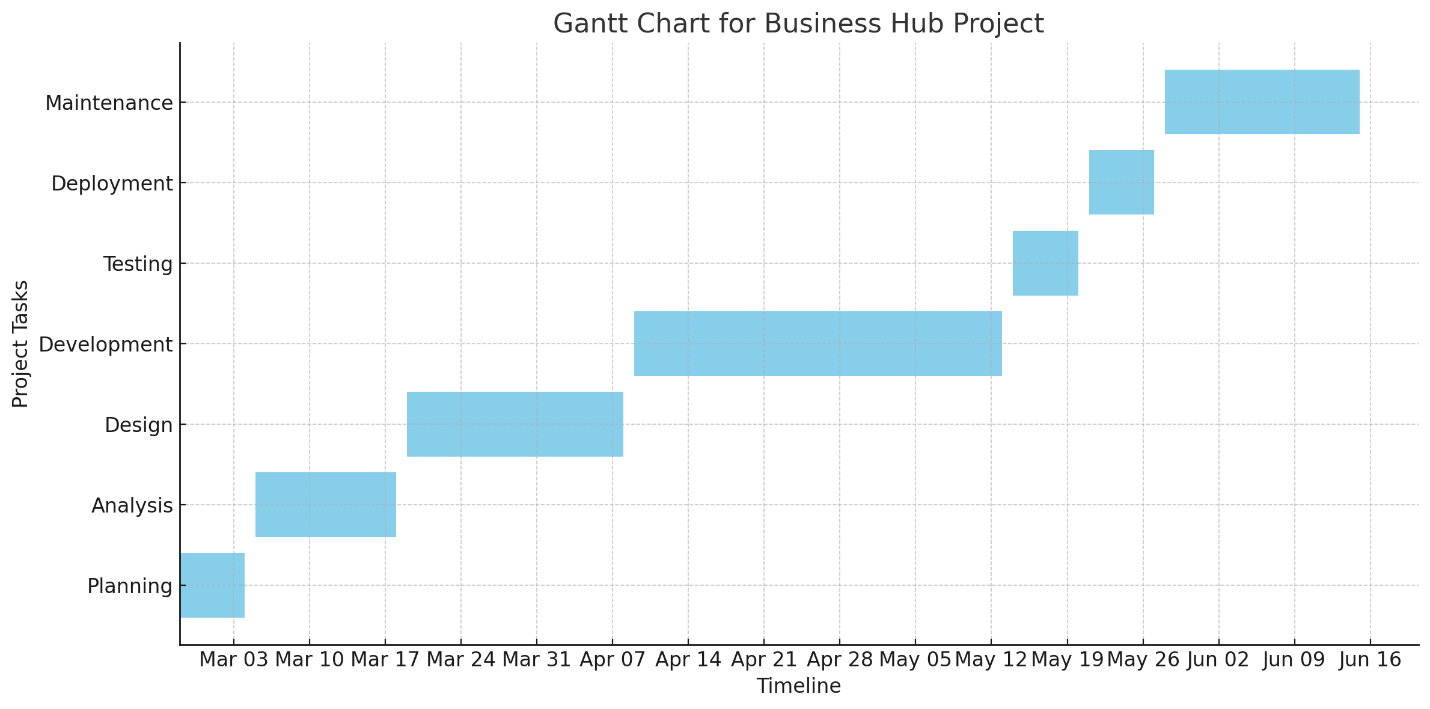
**Dependencies:** Some tasks depend on the completion of others (e.g., Frontend Development depends on Design completion).

**Resources:** Assign your team members to specific tasks, ensuring the right skills are applied where necessary.

Example Structure for **MS Project:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Phase** | **Activities** | **Duration** | **Completion** |
| 1. Planning | Define project objectives, determine scope, resource allocation, preliminary feasibility analysis. | 1 week | 26 Feb - 4 Mar |
| 2. Analysis | Conduct detailed requirement gathering, system requirements analysis, feasibility studies (technical, economic, operational). | 2 weeks | 5 Mar - 18 Mar |
| 3. Design | Develop system architecture, UI/UX design, database schema design, create wireframes and mock-ups. | 3 weeks | 19 Mar - 8 Apr |
| 4. Development | Front-end coding (HTML, CSS, JS), back-end coding (PHP, MySQL), database integration, development of system components. | 5 weeks | 9 Apr - 13 May |
| 5. Testing | Unit testing, integration testing, system testing, user acceptance testing (UAT), and bug fixing. | 1 week | 14 May - 20 May |
| 6. Implementation (Deployment) | Preparation of hosting environment, deployment to production server, final system checks, and launch. | 1 week | 21 May - 27 May |
| 7. Maintenance | Ongoing monitoring, addressing issues, regular updates, user support, continuous improvement based on user feedback. | Ongoing | Ongoing |

Gantt Chart :



# 7. Questionnaire

This section presents a structured survey designed to collect key insights from students at the University of Jordan’s Business School. The questionnaire aims to evaluate the feasibility, usability, and necessity of the **Business Hub** platform by addressing common academic and administrative challenges faced by students.

## 7.1 Survey Questions

1. **Which year of study are you in?**
   * 1st year
   * 2nd year
   * 3rd year
   * 4th year
2. **Do you prefer to have a website for your faculty to help with your studies?**
   * Yes
   * No
   * Maybe
3. **Do you offer study materials to others?**
   * Yes
   * No
   * Occasionally
4. **Do you have difficulty enjoying your break time on campus?**
   * Yes
   * No
   * Sometimes
5. **Do you find it difficult to locate information about your major subjects in a simple form?**
   * Yes
   * No
   * Occasionally
6. **Are you experiencing difficulties when registering for courses?**
   * Yes
   * No
   * Sometimes
7. **Are you having trouble finding the right study resources for your courses?**
   * Yes
   * No
   * Occasionally

A diagram of a survey results

AI-generated content may be incorrect.

## 7.2 Survey Results Summary

A total of **[126]** students participated in the survey, and the responses were analyzed to determine the most critical student concerns. The results indicate:

**75%** of students prefer having an academic support website.

**60%** of students struggle with locating their major subjects' information.

**55%** of students experience difficulties in registering for courses.

**70%** find it challenging to access proper study materials.

# 8. Use Case

A diagram of a business hub

AI-generated content may be incorrect.A use case is a methodology used in system analysis to identify, clarify and organize system requirements. The use case is made up of a set of possible sequences of interactions between systems and users in a particular environment and related to a particular goal.

# 9.Flowcharts

A flowchart is a type of diagram that represents a workflow or process. A flowchart can also be defined as a diagrammatic representation of an algorithm, a step-by-step approach to solving a task.

## A diagram of a flowchart AI-generated content may be incorrect.Student/Admin Login F.C

## A diagram of a diagram AI-generated content may be incorrect.9.2 Student Register F.C

## A diagram of a flowchart AI-generated content may be incorrect.9.3 Book Exchange F.C

## 2.4 Monitor Book ExchangeA black background with white rectangles AI-generated content may be incorrect. F.C

## 

A black and white image of a diagram

AI-generated content may be incorrect.2.5 Manage Academic Staff F.C

## A diagram of a diagram AI-generated content may be incorrect.2.6 Manage Department F.C

# 3. Data Flow Diagram

A data-flow diagram is a way of representing a flow of data through a process or a system. The DFD also provides information about the outputs and inputs of each entity and the process itself.

## Context-Level Diagram

A black screen with white text

AI-generated content may be incorrect.

## Zero-Level Diagram

## 

## A screenshot of a computer screen AI-generated content may be incorrect.Child-Level Diagram

A screenshot of a computer screen

AI-generated content may be incorrect.

**A black screen with white text

AI-generated content may be incorrect.**

**A black screen with white text

AI-generated content may be incorrect.**

# 4. ER-Diagram

A diagram of a person

AI-generated content may be incorrect.

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**Business Hub – Entity Relationship Diagram (ERD) Explanation**

This ER diagram represents the database structure for the Business Hub platform, designed to support book exchanges, academic resources, and student-staff interactions in a university setting.

Users**:** Stores all registered users (students or super admins). Each user has personal info like name, email, phone, and a role (user or super\_admin) that controls their permissions.

Departments: Represents academic departments (e.g., MIS, Finance). It links to most academic content across the site.

Book\_exchange: Lists all available books for exchange, categorized by department.

Book\_offers: When a user clicks “Give” on a book, an offer is created and stored here. It includes optional details (e.g., book condition), and may include a desired\_book\_id if the user is using the "Give for Take" feature.

Book\_requests: If another user clicks “Take,” a request is recorded here. It links to the original offer and tracks its status (pending, accepted, or rejected).

Notifications: Generated when a book request is made. This alerts the user who posted the offer and helps facilitate communication.

Chat\_messages: Stores real-time messages exchanged between users once a book request has been accepted. This enables them to coordinate the physical exchange.

Courses: Contains downloadable/viewable course resources for each department (e.g., links, descriptions).

Books: Represents static learning materials uploaded for each department, available through department pages (not part of the exchange system).

Academic\_staff: A directory of academic staff members, including their office location, university email, and LinkedIn profile. Each is assigned to a department.

# 5. Data Dictionary

A Data Dictionary is a collection of names, definitions, and attributes about data elements that are being used or captured in a database, information system, or part of a research project.

## 5.1 Users Table

|  |  |  |  |
| --- | --- | --- | --- |
| Column | Type | Description | Constraints |
| id | INT | Unique user identifier | PK  (Not Null) |
| first name | VARCHAR | User’s given name | (100) |
| last name | VARCHAR | User’s family name | (100) |
| email | VARCHAR | Login email (must be unique) | (255) Unique |
| phone | VARCHAR | 10‑digit phone number | (20) |
| password | VARCHAR | Hashed password | (255) |
| role | ENUM | Account type / permission level | ('user','super\_admin') |
| created at | TIMESTAMP | Account creation timestamp | DEFAULT CURRENT\_TIMESTAMP |

## 5.2 Departments Table

|  |  |  |  |
| --- | --- | --- | --- |
| Column | Type | Description | Constraints |
| id | INT | Unique department identifier | PK  (Not Null) |
| name | VARCHAR | Department name (e.g. “MIS”, “Finance”) | (100) |

## 5.3 Book exchange Table

|  |  |  |  |
| --- | --- | --- | --- |
| Column | Type | Description | Constraints |
| id | INT | Unique book listing identifier | PK  (Not Null) |
| book name | VARCHAR | Title of the book | (255) |
| department\_id | INT | Which department this book belongs to | FK→ departments.id |

## 5.4 Book offers Table

|  |  |  |  |
| --- | --- | --- | --- |
| Column | Type | Description | Constraints |
| id | INT | Unique offer identifier | PK  (Not Null) |
| book\_id | INT | The book being offered | FK→ book\_exchange.id |
| user\_id | INT | Who is offering the book | FK→ users.id |
| desired\_book\_id | INT | (Optional) Book they want in exchange (“Give‑for‑Take”) | FK → book\_exchange.id |
| details | TEXT | Notes on book condition, extras, etc. |  |
| timestamp | DATETIME | When the offer was created | DEFAULT CURRENT\_TIMESTAMP |

## 5.5 Book Requests Table

|  |  |  |  |
| --- | --- | --- | --- |
| Column | Type | Description | Constraints |
| id | INT | Unique request identifier | PK  (Not Null) |
| offer\_id | INT | Which offer is being requested | FK→ book\_offers.id |
| requester\_id | INT | Who is requesting the book | FK→ users.id |
| status | ENUM | Current request state | ('pending','accepted','rejected') |
| timestamp | DATETIME | When the request was made | DEFAULT CURRENT\_TIMESTAMP |

## 5.6 Chat Messages Table

|  |  |  |  |
| --- | --- | --- | --- |
| Column | Type | Description | Constraints |
| id | INT | Unique message identifier | PK  (Not Null) |
| sender\_id | INT | Who sent the message | FK→ users.id |
| receiver\_id | INT | Who receives the message | FK→ users.id |
| message | TEXT | The chat message content |  |
| timestamp | DATETIME | When the message was sent | DEFAULT CURRENT\_TIMESTAMP |

## 5.7 Courses Table

|  |  |  |  |
| --- | --- | --- | --- |
| Column | Type | Description | Constraints |
| id | INT | Unique course identifier | PK  (Not Null) |
| department\_id | INT | Which department offers this course | FK→ departments.id |
| course\_name | VARCHAR | Course title | (255) |
| course\_link | TEXT | URL or path to download/view course materials |  |
| course\_description | TEXT | Summary or syllabus description |  |

## 5.8 Books Table (Static Materials) Table

|  |  |  |  |
| --- | --- | --- | --- |
| Column | Type | Description | Constraints |
| id | INT | Unique static‑book identifier | PK  (Not Null) |
| department\_id | INT | Which department this resource belongs to | FK→ departments.id |
| book\_name | VARCHAR | Title of the static learning material | (255) |
| book\_material | TEXT | URL or path to the file |  |

## 5.9 Academic Staff Table

|  |  |  |  |
| --- | --- | --- | --- |
| Column | Type | Description | Constraints |
| id | INT | Unique staff member identifier | PK  (Not Null) |
| name | VARCHAR | Full name | (255) |
| email | VARCHAR | University email | (255) |
| linkedin | VARCHAR | Link to LinkedIn profile (optional) | (255) |
| image | TEXT | Path or URL to profile picture |  |
| office\_location | VARCHAR | Office room or building (e.g., “Main 4th Floor”) | (255) |
| department\_id | INT | Department the staff belongs to | FK→ departments.id |

## 5.10 Notification Table

|  |  |  |  |
| --- | --- | --- | --- |
| Column | Type | Description | Constraints |
| id | INT | Unique notification identifier | PK  (Not Null) |
| user\_id | INT | Who triggered the notification (e.g. requester) | FK→ users.id (sender) |
| receiver\_id | INT | Who should receive the notification | FK→ users.id |
| action\_id | INT | What action this notification is about (link to request) | FK→ book\_requests.id |
| type | VARCHAR | Notification category (e.g. “book\_request”) | (100) |
| message | TEXT | Human‑readable notification text |  |
| is\_read | BOOLEAN | Whether the notification has been seen by the receiver | DEFAULT FALSE |
| created\_at | TIMESTAMP | When the notification was created | DEFAULT CURRENT\_TIMESTAMP |

## 5.11 Entity Interactions Overview

After identifying and describing each table individually in the ER Dictionary, it is important to highlight how these entities are interconnected to form the core of the Business Hub system.

The *Users* table links to several other entities such as Book\_Offers, *Book\_Requests*, Notifications, and Chat\_Messages, enabling students to exchange books, request materials, communicate with others, and receive system updates. The Departments table serves as a central hub connecting Academic\_Staff, Books, and Courses, ensuring each major field of study is well-structured and its related academic resources are accessible.

Through the Book\_Exchange, Book\_Offers, and Book\_Requests tables, the platform facilitates an organized, role-based book-sharing ecosystem. The Notifications table supports user interaction by alerting users to important events, while the Chat\_Messages table enhances user experience through real-time communication.

# 6. Entity-Event Matrix

A CRUD matrix is a table showing the actions in an application containing SQL statement affecting parts of a database. CRUD Matrix is an excellent technique to identify the Tables in a Database to be used in any User interaction with a Web Site. CRUD means ‘Create, Read, Update or Delete’, and the CRUD Matrix identifies the Tables involved in any CRUD operation.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Event / Entity | Users | Departments | Book Exge | Book Offers | | Book Requests | Notifications | Chat Messages | Courses | Books | Academic Staff |
| Register Account | **C** |  |  | |  |  |  |  |  |  |  |
| Log in | **R** |  |  | |  |  |  |  |  |  |  |
| Offer Book | **R** |  | **R** | | **C,R** |  |  |  |  |  |  |
| Request a Book | **R** |  | **R** | | **R** | **C,R** | **C** |  |  |  |  |
| Give for Take | **R** |  | **R** | | **C** |  |  |  |  |  |  |
| Browse Public Services | **R** | **R** |  | |  |  |  |  | **R** | **R** | **R** |
| Monitor Book Exchange | **R** |  | **R,U,D** | | **R,U,D** | **R,U,D** | **R** |  |  |  |  |
| Manage Academic Staff | **R,U,D** |  |  | |  |  |  |  |  |  | **C,R,U,D** |
| Manage Departments |  | **C,R,U,D** |  | |  |  |  |  | **C,R,U,D** | **C,R,U,D** |  |
| Manage Users | **R,U,D** |  |  | |  |  |  |  |  |  |  |
| Send Message | **R** |  |  | |  |  |  | **C,R,U,D** |  |  |  |
| Send Notification | **R** |  |  | |  |  | **C,R,U,D** |  |  |  |  |

# Mock Screens

Mock screens are visual drafts that show how a website or application’s pages will look and behave, helping to plan layout, design, and user flow before actual development.

A screenshot of a computer

AI-generated content may be incorrect.

A screenshot of a computer

AI-generated content may be incorrect.

A screenshot of a computer

AI-generated content may be incorrect.

A screenshot of a computer

AI-generated content may be incorrect.

A screenshot of a book

AI-generated content may be incorrect.

A screenshot of a computer

AI-generated content may be incorrect.

A close up of a computer screen

AI-generated content may be incorrect.

A screenshot of a cellphone

AI-generated content may be incorrect.

A screenshot of a computer

AI-generated content may be incorrect.