MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

Deemed to be University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC Accredited with A++ Grade

Project Report

on

Development of Restaurant System (User Site)

A project report submitted in partial fulfilment of the requirement for the degree of

MASTER IN COMPUTER APPLICATION

in

COMPUTER SCIENCE AND ENGINEERIN

Submitted By:

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE

GWALIOR – 474005 (MP) est. 1957

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TECHIES SHUBH DEEP
IT SOLUTIONS (P) Ltd.

PROJECT COMPLETION CERTIFICATE

CIN: U72900MP2014PTC032827 Date: 23/04/2024

Ref. No: 002024/E-244

This is to certify that Mr. Rahul Batham has successfully completed a 4-month internship as a MERN Stack Developer with TechieShubhdeep IT Solutions Pvt Ltd.

During this time, he has performed at an **Very Good** level, highlighting the importance ofcontinued learning and skill enhancement.

We value his contribution to TechieShubhDeep IT Solutions Pvt Ltd.

TechieShubhDeep IT Solutions (P) Ltd.

Rajat Jain
General Manager

Sandeep Gupta
CEO & Director

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CERTIFICATE

This is certified that **Rahul Batham (0901CA221048)** has submitted the project report titled Development of **Restaurant System (User Site)** under the mentorship of **Mr. Himanshu Gupta** in partial fulfilment of the requirement for the award of degree of Master in Computer Application in Computer Science and Engineering from Madhav Institute of Technology and Science, Gwalior.

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MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
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DECLARATION

I hereby declare that the work being presented in this project report, for the partial fulfilment of requirement for the award of the degree of Master in Computer Application in Computer Science and Engineering at Madhav Institute of Technology & Science, Gwalior is an authenticated and original record of my work under the mentorship of **Mr. Himanshu Gupta,** Project G ide, Techieshubhdeep IT Solution Pvt. Ltd. Gwalior.

I declare that I have not submitted the matter embodied in this report for the award of any degree or diploma anywhere else.

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2nd Year,
Master of Computer Application,
Computer Science and Engineering

ACKNOWLEDGEMENT

The full semester project has proved to be pivotal to my career. I am thankful to my institute, **Madhav Institute of Technology and Science** to allow me to continue my disciplinary project. I extend my gratitude to the Director of the institute, **Dr. R. K. Pandit** and Dean Academics, **Dr. Manjaree Pandit** for this.

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ABSTRACT

The abstract introduces a sophisticated Development of Restaurant System (RMS) tailored to modern dining establishments. This system is meticulously crafted to optimize every aspect of restaurant operations, from order processing and inventory management to customer engagement and staff administration. Through an intuitive interface, the RMS facilitates seamless communication between restaurant personnel and management, enhancing efficiency and coordination. It leverages advanced technology to automate order taking, minimize errors, and ensure precise inventory control through real-time tracking and supplier integration. Staff management functionalities streamline scheduling, payroll processing, and training, fostering a collaborative work environment. Furthermore, the system enables personalized customer relationship management (CRM), empowering restaurants to implement targeted marketing strategies and gather valuable feedback for continuous improvement. Robust analytics tools provide insights into sales trends and operational performance, facilitating informed decision-making. With a focus on security, compliance, scalability, and integration, the RMS offers a comprehensive solution to meet the evolving needs of restaurants in today's competitive landscape.

the RMS is underpinned by powerful analytics tools, furnishing operators with valuable insights into sales trends, customer behaviour, and operational performance, thereby facilitating data-driven decision-making and strategic planning. With a steadfast commitment to security, compliance, and scalability, this RMS stands as a comprehensive and indispensable solution poised to empower restaurants to thrive in the dynamic and competitive landscape of the hospitality industry.

सार

सार आधुनिक भोजन प्रतिष्ठानों के अनुरूप एक परिष्कृत रेस्तरां प्रबंधन प्रणाली (आरएमएस) का परिचय देता है। इस प्रणाली को ऑर्डर प्रोसेसिंग और इन्वेंट्री प्रबंधन से लेकर ग्राहक जुड़ाव और स्टाफ प्रशासन तक, रेस्तरां संचालन के हर पहलू को अनुकूलित करने के लिए सावधानीपूर्वक तैयार किया गया है। एक सहज इंटरफ़ेस के माध्यम से, आरएमएस रेस्तरां कर्मियों और प्रबंधन के बीच निर्बाध संचार की सुविधा प्रदान करता है, जिससे दक्षता और समन्वय बढ़ता है। यह ऑर्डर लेने को स्वचालित करने, त्रुटियों को कम करने और वास्तविक समय ट्रैकिंग और आपूर्तिकर्ता एकीकरण के माध्यम से सटीक इन्वेंट्री नियंत्रण सुनिश्चित करने के लिए उन्नत तकनीक का लाभ उठाता है। कर्मचारी प्रबंधन कार्यप्रणाली सहयोगात्मक कार्य वातावरण को बढ़ावा देते हुए शेड्यूलिंग, पेरोल प्रसंस्करण और प्रशिक्षण को सुव्यवस्थित करती है। इसके अलावा, सिस्टम व्यक्तिगत ग्राहक संबंध प्रबंधन (सीआरएम) को सक्षम बनाता है, रेस्तरां को लक्षित विपणन रणनीतियों को लागू करने और निरंतर सुधार के लिए मूल्यवान प्रतिक्रिया इकट्ठा करने के लिए सशक्त बनाता है। मजबूत विश्लेषण उपकरण बिक्री के रुझान और परिचालन प्रदर्शन में अंतर्दृष्टि प्रदान करते हैं, जिससे सूचित निर्णय लेने में सुविधा होती है। सुरक्षा, अनुपालन, स्केलेबिलिटी और एकीकरण पर ध्यान देने के साथ, आरएमएस आज के प्रतिस्पर्धी परिदृश्य में रेस्तरां की बढ़ती जरूरतों को पूरा करने के लिए एक व्यापक समाधान प्रदान करता है।

आरएमएस शक्तिशाली एनालिटिक्स टूल पर आधारित है, जो ऑपरेटरों को बिक्री के रुझान, ग्राहक व्यवहार और परिचालन प्रदर्शन में मूल्यवान अंतर्दृष्टि प्रदान करता है, जिससे डेटा-संचालित निर्णय लेने और रणनीतिक योजना की सुविधा मिलती है। सुरक्षा, अनुपालन और स्केलेबिलिटी के प्रति दृढ़ प्रतिबद्धता के साथ, यह आरएमएस आतिथ्य उद्योग के गतिशील और प्रतिस्पर्धी परिदृश्य में रेस्तरां को सशक्त बनाने के लिए एक व्यापक और अपरिहार्य समाधान के रूप में खड़ा है।

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Chapter – 1 Introduction:

Welcome to our Development Restaurant System (RMS), where we've simplified the complexities of running a restaurant into an easy-to-use digital solution! Our RMS is like having a super-efficient assistant who helps you with everything from taking orders to managing your inventory and staff. Imagine being able to handle customer orders seamlessly, ensuring that each one is correct and delivered on time. With our system, you can do just that, making sure your customers leave happy and satisfied every time they dine with you. Keeping track of your ingredients and supplies is a breeze with our RMS. You'll always know what you have in stock and when it's time to reorder, so you never run out of your customers' favorite dishes. Managing your staff has never been easier. Our system helps you schedule shifts, process payroll, and keep track of your employees' performance, so you can focus on providing excellent service to your customers.

Speaking of customers, our RMS helps you build strong relationships with them. From personalized recommendations to loyalty programs, you can keep your customers coming back for more. And with powerful analytics tools, you'll have valuable insights into your restaurant's performance, helping you make informed decisions to grow your business. In short, our RMS is here to make running your restaurant smoother, more efficient, and more enjoyable. Welcome to the future of restaurant management – welcome to our RMS.

1.1 Problem identification:-

Running a restaurant entails numerous challenges, from efficiently managing orders and inventory to ensuring exceptional customer service. Identifying these key pain points is crucial for developing an effective Restaurant Management System (RMS). Here are the primary problems faced by restaurant owners and managers:

a. **Order Processing Inefficiencies:** Manual order taking leads to errors and delays. Difficulty in managing large volumes of orders during peak hours. Lack of coordination between kitchen and serving staff resulting in order discrepancies.

b. **Inventory Management Challenges:** Difficulty in tracking ingredient usage and stock levels in real-time. Manual inventory management leads to inaccuracies and stockouts. Overstocking or understocking due to lack of accurate data on consumption patterns.

c. **Staff Management Issues:** Manual scheduling processes are time-consuming and prone to errors. Inefficient communication between staff and management. Challenges in monitoring staff performance and ensuring accountability

d. **Customer Experience Shortcomings:** Difficulty in providing personalized service and managing customer preferences. Lack of efficient feedback mechanisms for gathering customer insights. Inability to offer loyalty programs and incentives to enhance customer retention.

e. **Operational Inefficiencies:** Limited visibility into sales trends and performance metrics. Manual reporting processes result in delayed decision-making. Security concerns related to data management and compliance with regulations.

Addressing these challenges is essential for developing a robust Restaurant Management System that can streamline operations, enhance efficiency, and elevate the overall dining experience for both customers and restaurant staff.

1.2 Parent Organization:-

Techieshubhdeep IT Solution Pvt. Ltd. Gwalior:

Techieshubhdeep IT Solutions Pvt. Ltd. has earned a reputation as a leading institute for C, C++, Java, .NET, PHP, Website Designing And Development, Application Development, Research and Development training. We specialize in guiding B Tech, M Tech, B E, BCA, MCA, and M.Sc. students to develop strong programming skills.

At Techieshubhdeep Solution Pvt. Ltd., we are committed to providing high-quality guidance to our students without compromising on excellence. Our team of specialist IT professionals offers live project training to help students excel in the software industry.

In addition to training, we also offer web design and development services tailored to businesses. Our primary goal is customer satisfaction, ensuring continuous support in website development and maintenance to help upgrade their businesses. We pay close attention to our clients' ideas, color preferences, and overall vision to deliver the best possible website.

Our team understands the importance of usability, functionality, and visualization in designing interfaces and websites. We work closely with clients to ensure their goals are met through our designs.

Our services are flexible and cater to our clients' needs and budget, offering:

- Custom Website
- Design Custom Interface
- Design Customized
- Website Packages Template Designs

With our experienced designers, we strive to create designs that meet your company's specific requirements and exceed your expectations.

1.3 Hardware and Software Specification:-

The Restaurant Management System is designed and developed using the MERN stack. It is a popular technology stack that includes MongoDB, Express.js, React.js, and Node.js. The system uses these technologies to provide a scalable, efficient, and user friendly platform for Customer to save their time Ensure that your development environment meets these specifications, and you'll be all set to start building your web app using the MERN stack.

1.3.1 Hardware Specification:-

a. **Processor**: A modern multi-core processor like Intel Core i5 or equivalent is recommended. This ensures smooth performance during development and can handle multiple tasks and servers efficiently.
b. **Memory**: 8 GB RAM is the minimum, but 16 GB or more is ideal. This allows you to run multiple applications and virtual machines without experiencing sluggish performance.
c. **Storage**: A 256 GB Solid State Drive (SSD) is the minimum, but a 512 GB SSD or larger is recommended. An SSD significantly reduces loading times for your development environment and tools.
d. **Display**: A monitor with a resolution of at least 1920x1080 is comfortable for coding. Consider a larger display or even a dual-monitor setup to maximize productivity.
e. **Network**: A stable internet connection is necessary for downloading dependencies, updates, and collaborating with team members if applicable.

1.3.2 Software Specification:-

a. **Operating System**: Choose from Windows 10 or 11 (64-bit), macOS (latest version), or Linux (popular distributions include Ubuntu and Fedora).
b. **Development Environment**: Install Node.js (latest LTS version), MongoDB Community Edition, and a text editor or IDE like Visual Studio Code for writing code.
c. **Dependencies**: Use npm or yarn to manage dependencies for the project. This includes packages for Express.js, React, and any other libraries or frameworks used in your application.
d. **MongoDB**: This NoSQL database serves as the data storage backbone for your MERN applications.
e. **Browser**: Make sure you have the latest versions of modern web browsers like Chrome, Firefox, or Edge for testing and debugging frontend components.

f. **Version Control**: Git is optional but recommended for version management. Platforms like GitHub provide collaboration features and make it easier to manage code changes.

g. **Deployment**: Choose a deployment environment compatible with Node.js and MongoDB. This could be cloud platforms like AWS or Azure, or hosting services like Heroku or DigitalOcean.

1.3.3 Additional Tools:-

a. **Postman or Thunder Client**: For testing API endpoints during development.

b. **DevTools**: Browser developer tools for debugging your front-end code.

c. **API Documentation Tools**: Optionally, you might want to use tools like Swagger or Postman for documenting your APIs.

Chapter - 2 Systems Analysis:

2.1 Problem analysis:-

Designing a restaurant management system requires thorough problem analysis to identify the key challenges and requirements. Here's a breakdown of potential areas to consider

2.1.1 Order Management:

a. How are orders taken? Is it through waitstaff, self-service kiosks, or online platforms?
b. Is there a need for table-based ordering or kitchen-based ordering?
c. How are modifications, substitutions, and special requests handled?

2.1.2 Question Bank Management:

a. How frequently does the menu change?
b. Are there seasonal or daily specials?
c. Is there a need for categorization (appetizers, mains, desserts, etc.)?
d. How are dietary restrictions and allergens managed?

2.1.3 Inventory Management:

a. How is inventory tracked and managed?
b. Are there perishable goods that need special attention?
c. How are orders placed with suppliers?
d. Is there integration with POS systems to update inventory in real-time?

2.1.4 Table Management:

a. How are reservations managed?
b. How are walk-in customers accommodated?
c. Is there a need for table assignment optimization to maximize seating efficiency?

2.1.5 Staff Management:

a. How are shifts scheduled?
b. How is staff performance tracked?
c. Are there different roles (servers, chefs, managers) with different access levels?
d. How is payroll managed?

2.1.6 Customer Relationship Management (CRM):

a. How are customer preferences and feedback captured?

b. Is there a loyalty program or rewards system?

c. How are reservations and customer history tracked?

2.1.7 Billing and Payment:

a. How are bills generated?

b. What payment methods are accepted (cash, credit card, mobile payments)?

c. Is there a need for split bills or itemized receipts?

2.1.8 Reporting and Analytics:

a. What key performance indicators (KPIs) need to be tracked (sales, inventory turnover, customer satisfaction)?

b. How are reports generated and accessed?

c. Is there a need for real-time analytics?

2.2 Feasibility study:-

The feasibility study for implementing a restaurant management system involves a comprehensive assessment of various factors to determine the viability and potential success of the project. This study begins with a clear definition of the objectives, outlining the desired features and functionalities of the proposed system. Market analysis plays a crucial role, examining the current landscape of restaurant management systems, identifying competitors, and gauging the demand for such a solution in the target market. Technical feasibility assesses the technological requirements and challenges, ensuring that the necessary resources and expertise are available. Operational feasibility evaluates how well the system aligns with the restaurant's operations and the ease of integration into existing processes. Financial feasibility involves estimating costs, conducting a cost-benefit analysis, and determining the project's financial viability.

2.2.1 Technical feasibility:

a. Hardware Requirements-

S. No.	Component	Specification
1.	Processor (CPU)	Intel Core i5 or AMD Ryzen 5 or higher
2.	Monitor	FHD (1920x1080)
3.	Memory (RAM)	At least 8 GB or above
4.	Storage (SSD)	256 GB
5.	Internet	512 KB (Speed)
6.	Keyboard	USB Wired or Wireless
7.	Mouse	USB Wired or Wireless
8.	Printer	HP Laser MFP 136w

b. **Programming Languages-**

S. No.	Site	Details
1.	Front-End	HTML, CSS, JS6, ReactJs
2.	Back-End	ExpressJs, NodeJs
3.	Database	MongoDB

c. **Software Requirements-**

S. No.	Component	Minimum Requirement
1.	Operating System	Windows XP, 7 or later, MacOS, Ubuntu
2.	Internet Browser	Chrome, Edge, Mozilla and Similar
3.	IDE	Visual Studio Code, Sublime Text Editor
4.	Dependencies	npm or yarn
5.	Deployment Server	AWS or Azure, or hosting services like Heroku or DigitalOcean.

2.2.2 Economical feasibility:

a. Personal Expenses-

S. No.	Resource	Cost
1.	System Analyst (1) [8 days/month]	₹4000 /-
2.	Programmer (1) [25 days/month]	₹5000 /-
3.	Database Specialist (1) [10 days/month]	₹3000 /-
	Total	**₹12000 /-**

b. Other Expenses-

S. No.	Resource	Cost
1.	Electricity(120 unit × 8rs/unit)	₹1060 /-
2.	Stationery	₹600 /-
3.	Workspace facility	₹1600 /-
4.	Internet/Wi-Fi	₹1800 /-
	Total	**₹5060 /-**

2.2.3 Behavioural feasibility:

Behavioural feasibility assesses the readiness and willingness of the people involved, such as restaurant staff, managers, and customers, to accept and use the proposed restaurant management system. In the context of a feasibility study for such a system, behavioural feasibility would encompass several key considerations:

a. **User Acceptance:** Evaluate the willingness of restaurant staff and management to adopt new technology. Consider factors such as resistance to change, existing skills, and attitudes toward technology.

b. **Training Needs:** Assess the level of training required for staff to effectively use the system. Determine the availability of resources and support for training initiatives.

c. **User Experience:** Consider the usability of the system from the perspective of different user roles. Evaluate factors such as interface design, navigation, and intuitiveness.

d. **Customer Adoption:** Determine the potential impact of the system on the customer experience. Assess customers' willingness to interact with the system for tasks such as placing orders or making reservations.

e. **Communication and Support:** Evaluate the effectiveness of communication channels for introducing and supporting the new system. Consider how feedback and concerns from staff and customers will be addressed during and after implementation.

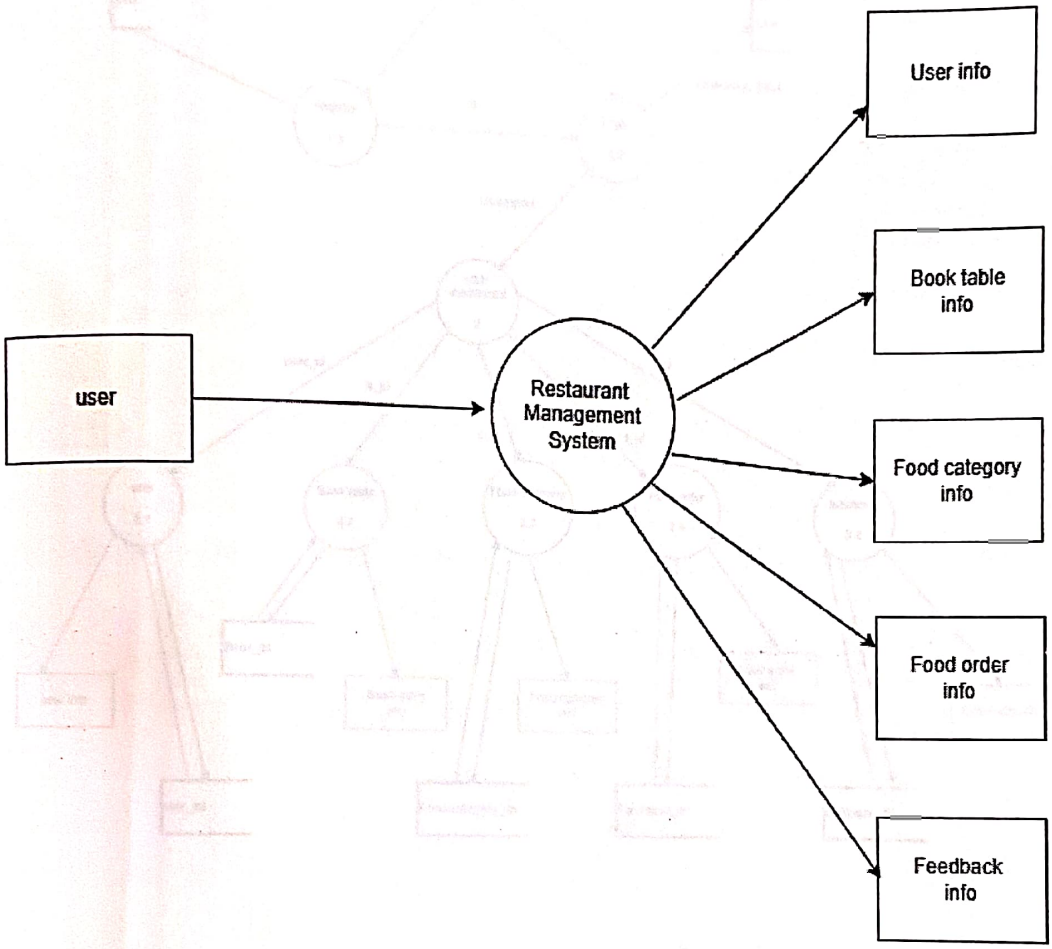
f. **Organizational Culture:** Assess the compatibility of the system with the existing organizational culture. Consider factors such as hierarchy, communication norms, and decision-making processes.

g. **Change Management:** Develop strategies for managing resistance to change and promoting buy-in from stakeholders. Consider the need for change champions or pilot testing to demonstrate the benefits of the system.

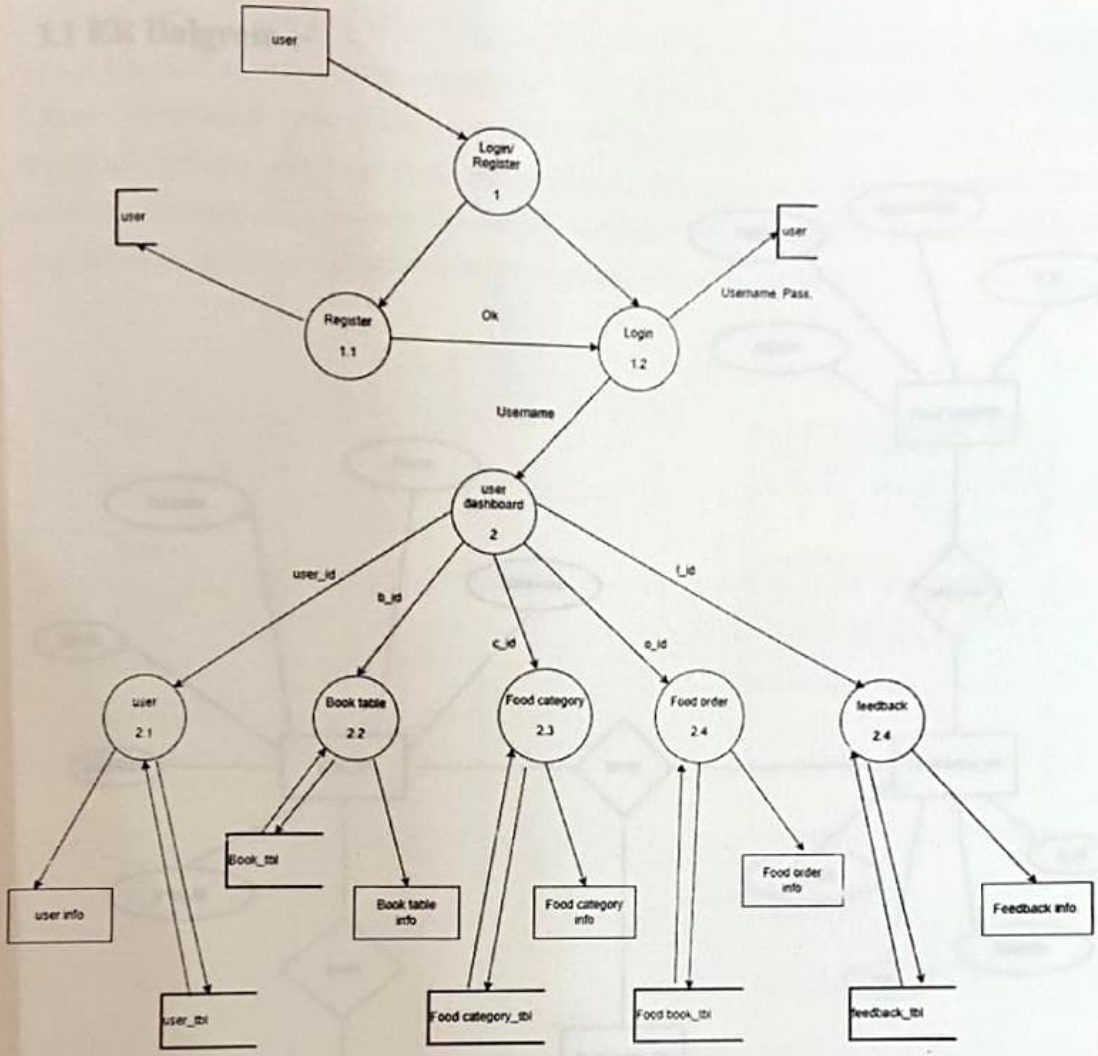
h. **Continuous Improvement:** Plan for ongoing evaluation and improvement of the system based on feedback and evolving needs. Establish mechanisms for collecting feedback and making iterative enhancements to the system.

2.3 Data Flow Diagram:-

2.3.1 DFD 0

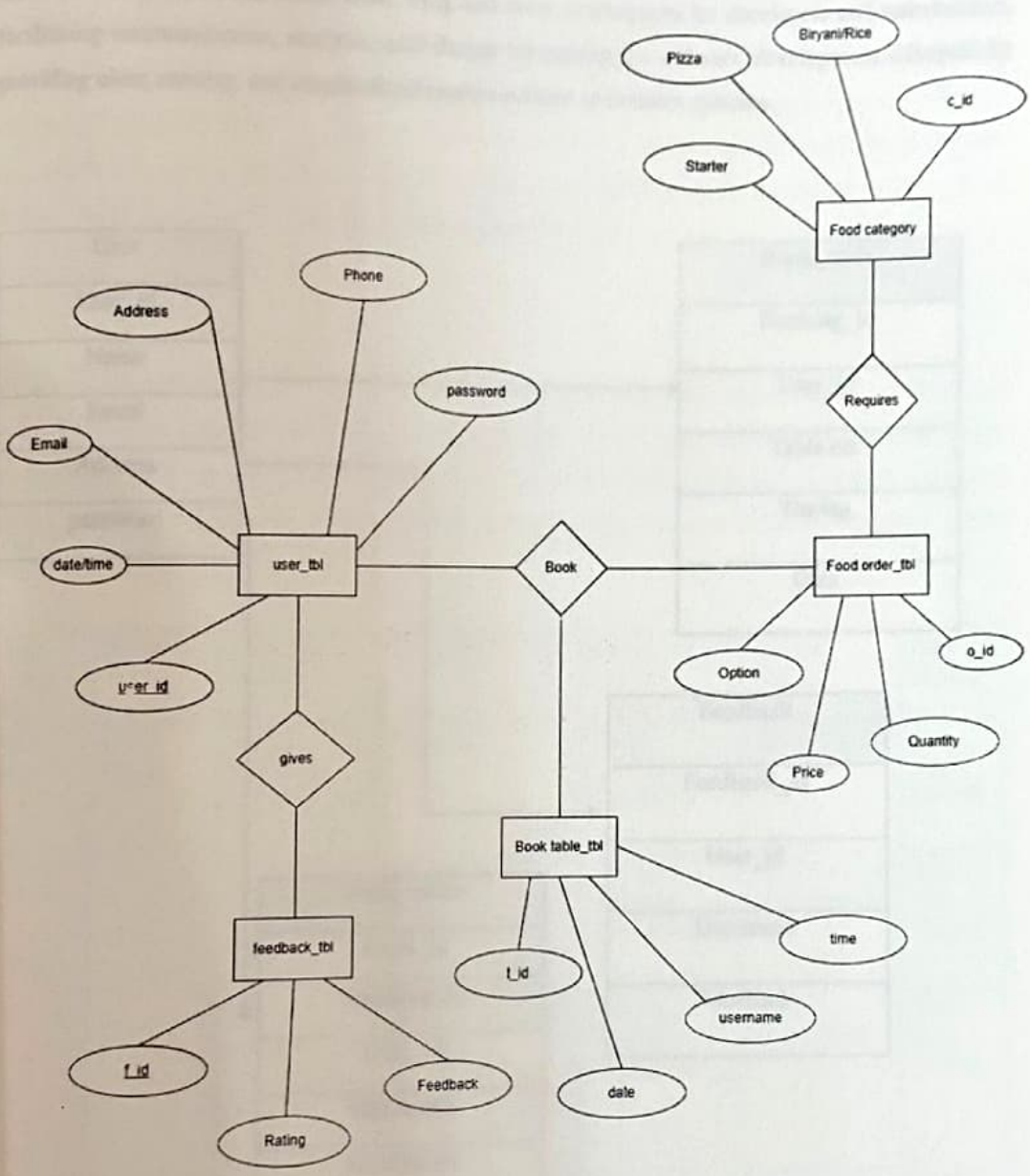


2.3.2 DFD 1 for User



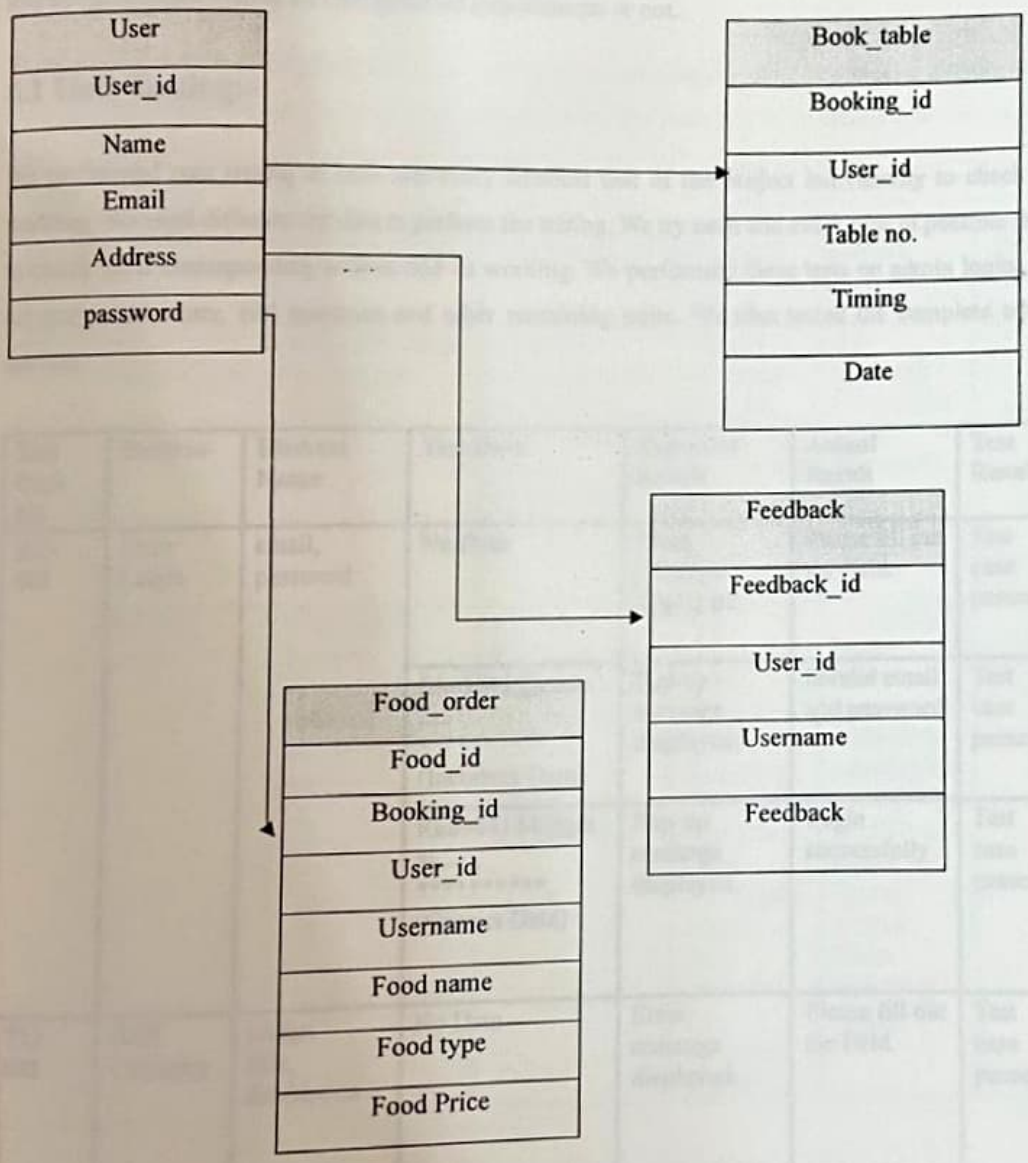
Chapter - 3 Systems Design:

3.1 ER Daigram :-



3.2 UML Diagram:-

Unified Modelling Language (UML) diagrams are visual tools used in software engineering to illustrate various aspects of a system's design, structure, and behaviour. They employ standardized symbols and notation to represent different elements and relationships within the system, such as classes, interactions, activities, and states. UML diagrams serve as blueprints for developers and stakeholders, facilitating communication, analysis, and design throughout the software development lifecycle by providing clear, concise, and standardized representations of complex systems.



Chapter – 4 Testing:

Testing is the process of evaluating an application or system to detect defects, bugs, errors, and other issues that may affect its quality, reliability, or functionality. It involves running the application in a controlled environment to verify that it behaves as expected, and comparing its actual results against its intended results. The main objective of testing is to ensure that the application meets the requirements and specifications set forth by its users or customers, and that it performs the tasks it is designed to do in a consistent, reliable, and efficient manner. So here we are using various testing approaches to check that the developed system met the specified requirements or not.

4.1 Unit Testing:-

We performed unit testing in each and every smallest unit of the project individually to check it's working. We used different test data to perform the testing. We try each and every type of possible input to check their corresponding outputs and its working. We performed these tests on admin login, add category, add exam, add questions and other remaining units. We also tested the complete admin module.

Test Case ID	Section	Element Name	Test Data	Expected Result	Actual Result	Test Result
TC-001	User Login	email, password	No Data	Error message displayed.	Please fill out the field.	Test case passed.
			Rk69841@gmai...., **********, (Incorrect Data)	Pop-up message displayed.	Invalid email and password	Test case passed.
			Rk6984144@gmai....., **********, (Correct Data)	Pop-up message displayed.	Login successfully	Test case passed.
TC-002	Add Category	image, title, description	No Data	Error message displayed.	Please fill out the field.	Test case passed.

			test.jpg, Computer, This is for only testing purpose.	No error message displayed.	Data inserted without any message.	Test case passed
TC-003	Add Food	image, title, category, description	test.jpg, Reactjs,	No error message displayed.	Data inserted successfully.	Test case passed

4.2 Compatibility Testing:-

Compatibility testing refers to the process of testing its compatibility across different platforms, devices, browsers, operating system, and network environments. The objective is to ensure that the website functions work properly and consistently for users.

Test Case ID	Element Name	Element Type	Test Condition	Expected Result	Actual Result	Test Result
TC-001	Device Compatibility	Responsiveness on different devices	Checking Responsiveness on devices for e.g., Laptops, tablets, Smartphones	Website will adapt different screen sizes on different devices without any disbalancing	As expected, the website is full responsive and working perfectly	Test case passed
TC-002	Operating System	Checking website behavior on different operating systems	Working on different Operating Systems e.g., Android systems, macOS, iOS, Windows, etc.	There shouldn't be any changes in website Designing, Working, Accessibility and Performance speed, while switching the Operating System	Compatibility As Expected, The Website is working all same even on different Operating System expect Linux operating system	Partially Passed

	End-user Security	Data Security	Testing security measures of users	The logged in user will be able to see his/her own details related information only or correct user-profile is opened for user while logging in	As Expected, Details of login Email is shown, no details of other user are visible to all. Hence Secured	Test case passed

4.3 Functionality Testing:-

Functionality testing for a restaurant management system involves a meticulous examination of its various components to ensure smooth operations. This testing encompasses menu management, validating the system's ability to create, update, and organize menus accurately across all platforms.

Staff management features are tested to ensure proper scheduling and communication capabilities among team members. Reporting and analytics tools are evaluated for generating insightful data on sales, inventory, and employee performance. Integration with third-party services and compatibility across devices and browsers are also tested, alongside security measures to safeguard sensitive data and prevent unauthorized access. Usability testing rounds out the process, ensuring an intuitive user experience for both staff and customers. Through comprehensive functionality testing, the restaurant management system can be fine-tuned to deliver efficient and reliable performance in restaurant operations.

Chapter - 5 Implementation:

Firstly, we need to install some IDE and other software for implementing our project successfully which are as follows: -

5.1 Visual Studio Code

a. Go to the official Visual Studio website: Download Visual Studio Code - Mac, Linux, Windows
b. Click on the " Download " button for the version of Visual Studio according to your operating system (e.g. Windows, macOS, or Linux).
c. Choose the components you want to install, such as languages, frameworks, and tools.
d. To install this, click on the "Install" to start the installation process and follow the instruction of installation wizard.
e. Follow the instruction of installation wizard and select the options that suit your needs.
f. Click on exit

5.2 MongoDB

a. Go to the official MongoDB website: MongoDB Community Server Download
b. Select the suitable version of MongoDB from the website for according to your operating system (e.g. Windows, macOS, or Linux).
c. Click on the "Download" button to start the download.
d. Once the download is completed, run the downloaded installer and follow the instruction of installation wizard and select the options that suit your needs. Also make sure to check the box of Compass Installation which is a GUI to manage MongoDB.

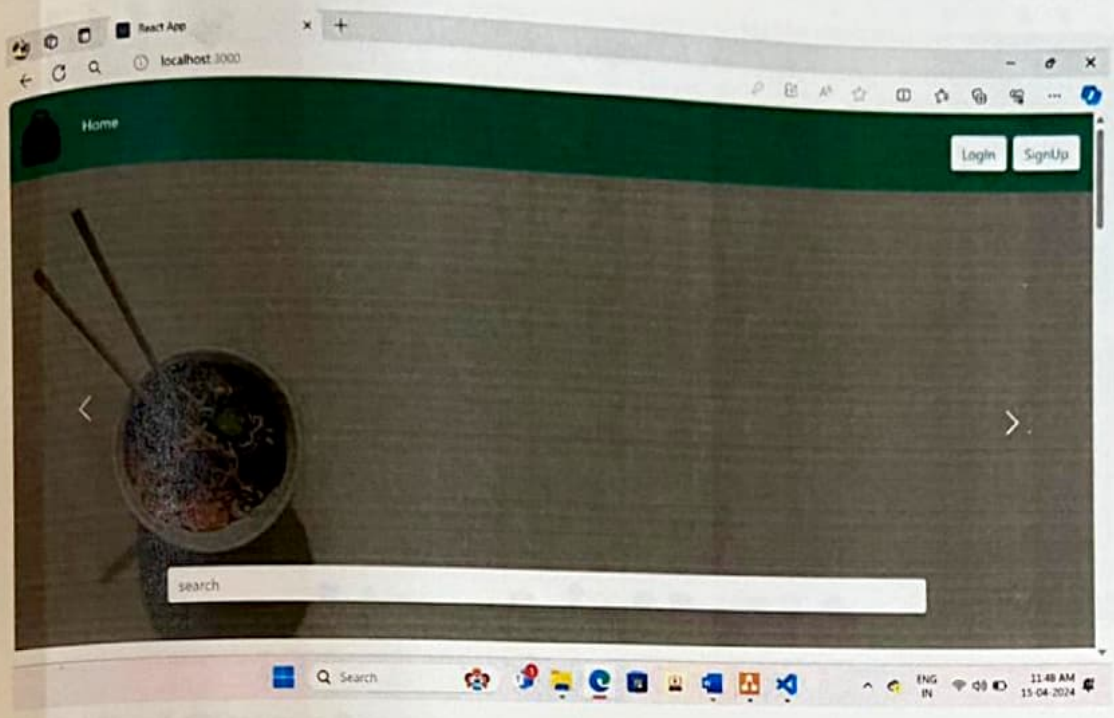
5.3 NodeJS

a. Go to the official Node.js website: Download Node.js
b. Select the appropriate version of Node.js for your operating system (e.g. Windows, macOS, or Linux).
c. Click on the "Download" button to start the download.
d. Once the download is complete, run the installer. Follow the installation wizard and select the options that suit your needs.

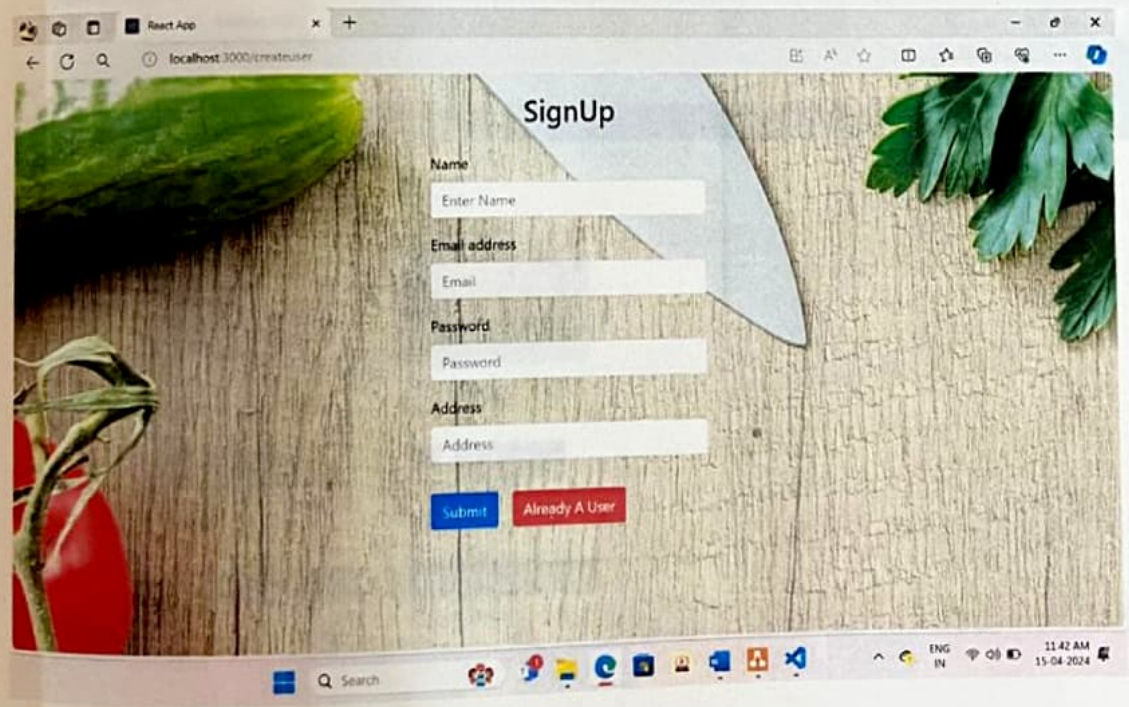
e. Once the installation is complete, you can open a terminal or command prompt and type node -v to check if Node.js is installed correctly. This should display the version of Node.js that you just installed which confirms the successful installation.

Chapter - 6 Sample Forms and Reports:

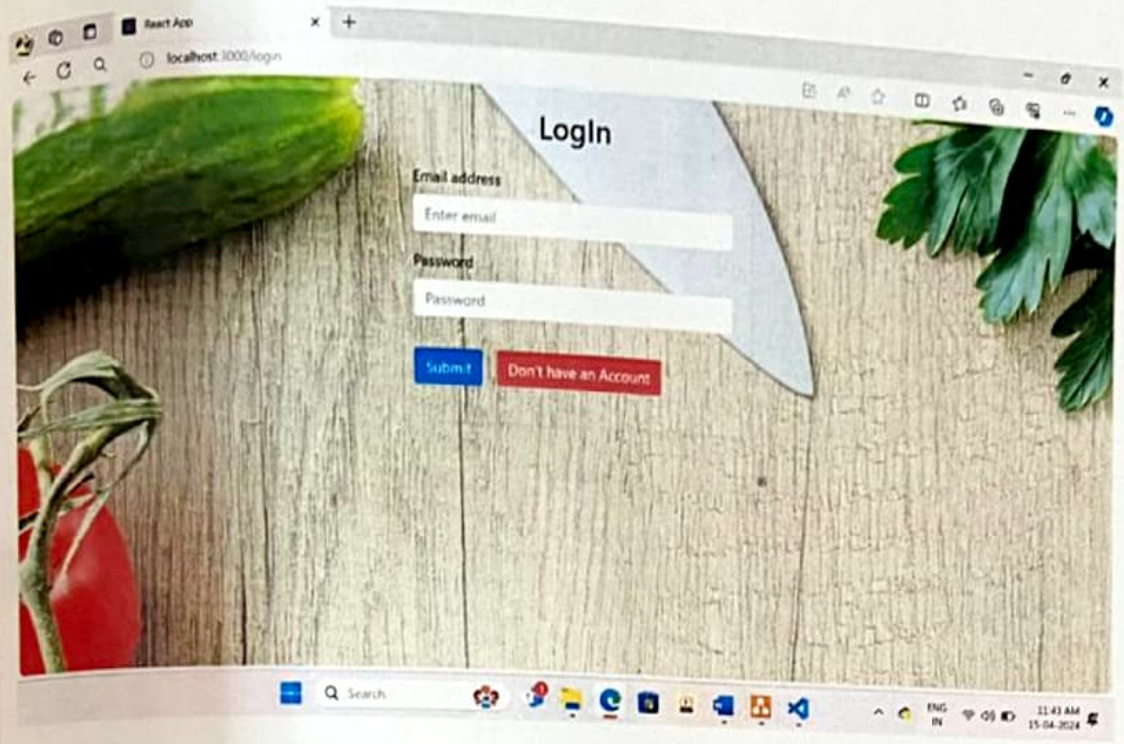
6.1 Dashboard Page-



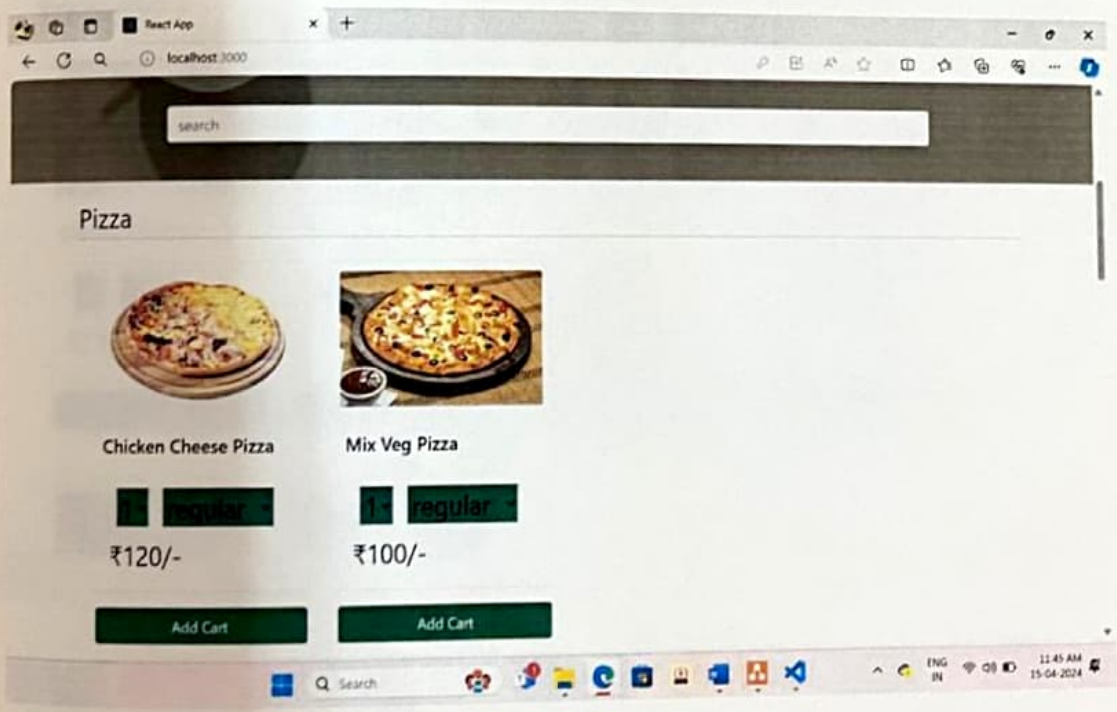
6.2 SignUp Page-

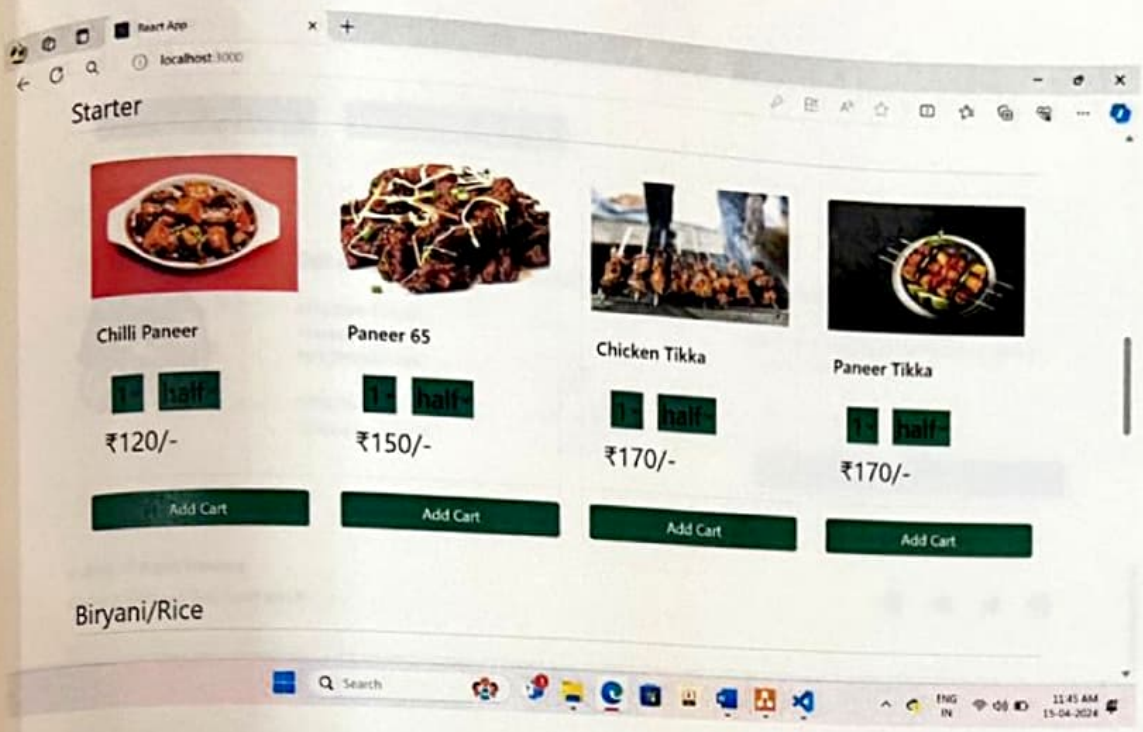


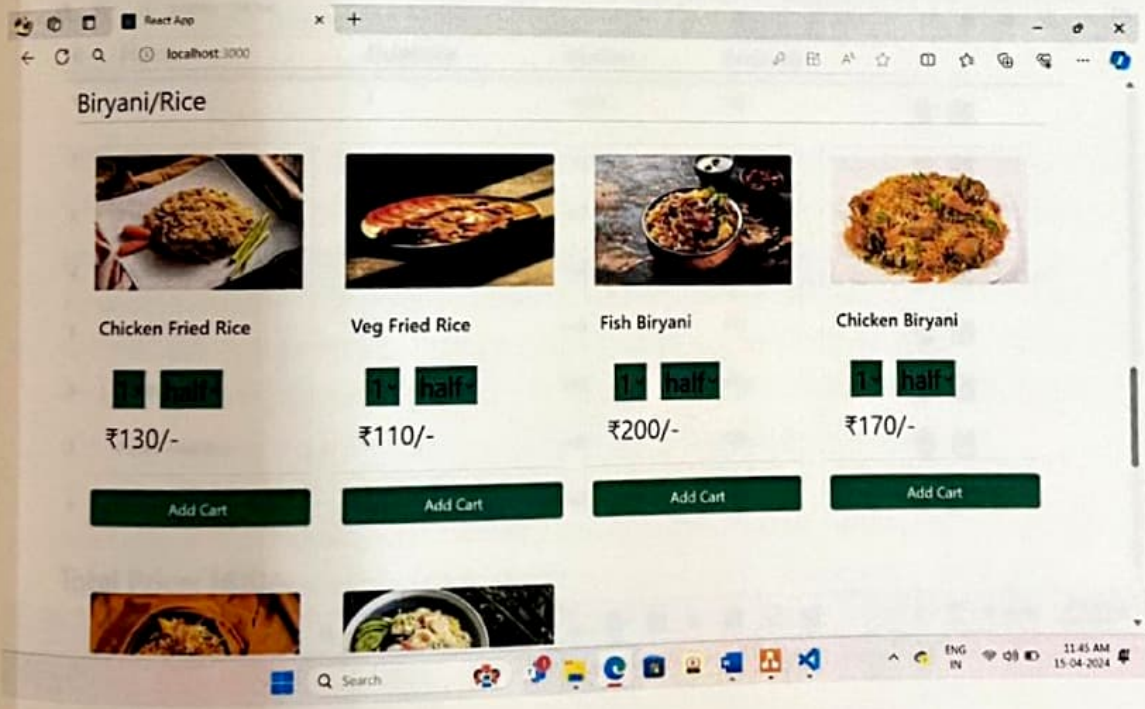
6.3 Logging Page-

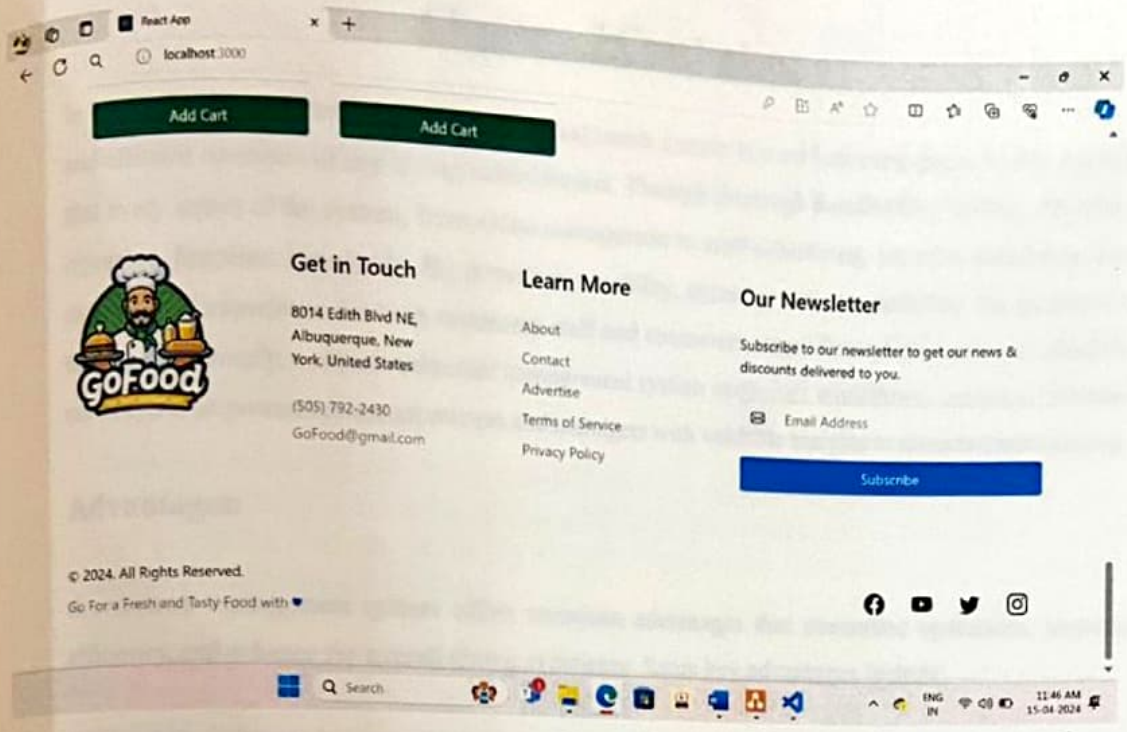


6.4 Food Category Pages-

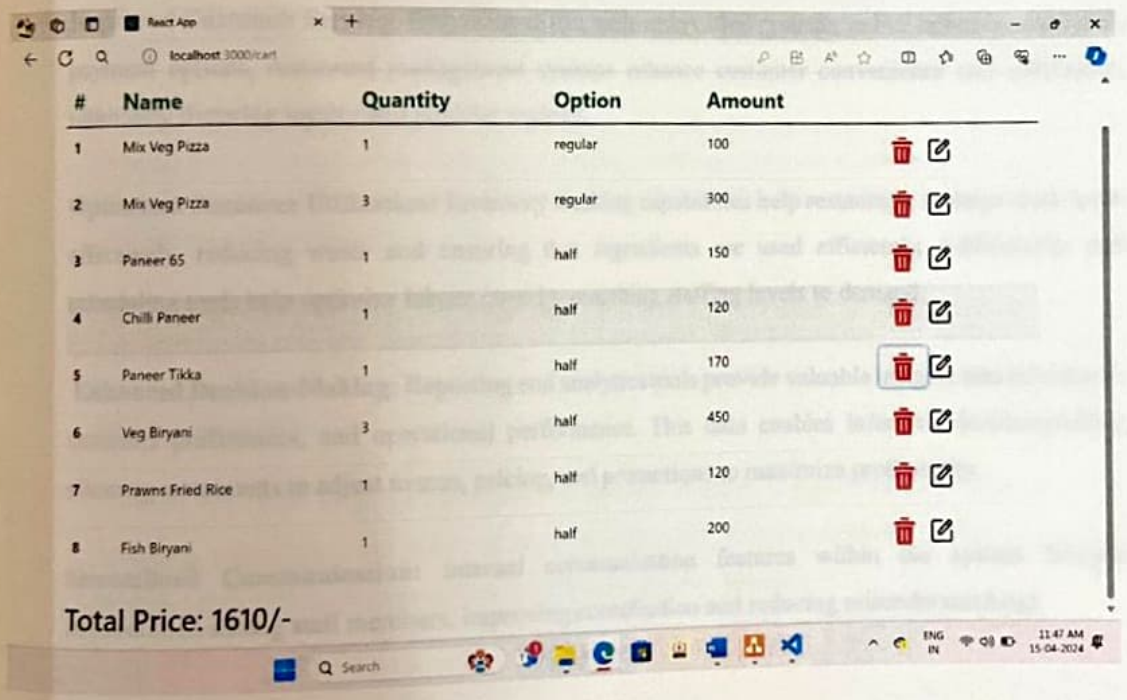








6.5 Add to Cart page-



Chapter - 7 Conclusion:

In conclusion, a well-executed restaurant management system is a critical component for the smooth and efficient operation of any dining establishment. Through thorough functionality testing, we ensure that every aspect of the system, from menu management to staff scheduling, payment processing, and reporting, functions seamlessly. By prioritizing usability, security, and compatibility, we guarantee a user-friendly experience for both restaurant staff and customers, regardless of the device or platform they use. Ultimately, a robust restaurant management system optimizes workflows, enhances customer service, and empowers restaurant owners and managers with valuable insights to drive business success.

Advantages:

A restaurant management system offers numerous advantages that streamline operations, improve efficiency, and enhance the overall dining experience. Some key advantages include:

Efficient Operations: By automating tasks such as order processing, inventory management, and staff scheduling, a restaurant management system reduces manual effort and minimizes errors, leading to smoother operations.

Improved Customer Service: With features like table reservation systems, online ordering, and mobile payment options, restaurant management systems enhance customer convenience and satisfaction, ultimately fostering loyalty and positive reviews.

Optimized Resource Utilization: Inventory tracking capabilities help restaurants manage stock levels effectively, reducing waste and ensuring that ingredients are used efficiently. Additionally, staff scheduling tools help optimize labour costs by matching staffing levels to demand.

Enhanced Decision-Making: Reporting and analytics tools provide valuable insights into sales trends, customer preferences, and operational performance. This data enables informed decision-making, allowing restaurants to adjust menus, pricing, and promotions to maximize profitability.

Streamlined Communication: Internal communication features within the system facilitate collaboration among staff members, improving coordination and reducing misunderstandings

Chapter - 8 Future Scope:

The future scope for restaurant management systems is promising, with advancements in technology and changing consumer preferences driving innovation in the industry. Here are some potential future developments and opportunities:

Integration of AI and Machine Learning: AI-powered features, such as predictive analytics for demand forecasting and personalized recommendations for menu items, will become more prevalent. Machine learning algorithms can analyze data to optimize pricing strategies, menu engineering, and staffing decisions.

Enhanced Mobile Experience: As mobile technology continues to evolve, restaurant management systems will prioritize mobile-first design, offering intuitive mobile apps for both customers and staff. Mobile ordering, payment, and loyalty programs will become increasingly popular, catering to the preferences of on-the-go consumers.

Internet of Things (IoT) Integration: IoT devices, such as smart kitchen appliances and sensors, can be integrated into restaurant management systems to automate tasks, monitor equipment performance, and track inventory levels in real-time. This connectivity improves efficiency and reduces operational costs.

Blockchain for Supply Chain Management: Blockchain technology can enhance transparency and traceability in the food supply chain, enabling restaurants to verify the authenticity and origin of ingredients. Smart contracts on the blockchain can automate procurement processes and ensure compliance with food safety regulations.

Virtual and Augmented Reality Experiences: Virtual and augmented reality technologies can be leveraged to create immersive dining experiences, allowing customers to preview menu items in 3D or virtually explore restaurant interiors before making reservations. This technology enhances engagement and fosters customer loyalty.

Voice-Activated Interfaces: Voice-activated assistants, such as smart speakers and virtual concierges, can be integrated into restaurant management systems to facilitate hands-free interactions for both customers and staff. Voice commands can be used to place orders, make reservations, and access information quickly.

Overall, the future scope for restaurant management systems is vast, with opportunities to leverage emerging technologies and trends to improve efficiency, enhance customer experiences, and drive business growth in the increasingly competitive hospitality industry.

Bibliography

S. No.	Website
1	https://react.dev/
2	https://reactrouter.com/en/main
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5	https://www.npmjs.com/
6	https://stackoverflow.com/
7	https://www.youtube.com/

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Summary

Fortnightly Progress Report

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FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

Name of student	Rahul Batham		Department	CSE	
Industry/Organization	TechieShubhdeep IT solutions PVT Ltd.		4 months	16/01/2024 -24/01/2024	
Criterion	**Poor**	**Average**	**Good**	**Very Good**	**Excellent**
Punctuality/Timely completion of assigned work			✓		
Learning capacity/Knowledge up gradation				✓	
Performance/Quality of work				✓	
Behaviour/Discipline/Team work					✓
Sincerity/Hard work				✓	
Comment on nature of work done/Area/Topic	He is a good learner. Learn JS, NodeJS				
OVERALL GRADE (Any one)	**POOR/AVERAGE/GOOD/VERYGOOD/EXCELLENT**				
Name of Industry Mentor	**Mr. Himanshu Gupta**				
Signature of Industry Mentor					

Receiving Date	6/2/24	Name of Faculty Mentor	Dr. Anshu Chaturvedi	Sign	

FORMAT

(2)

FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

Name of student	Rahul Batham		Department	CSE (Program: MCA)	
Industry/Organization	Techie Shubhdeep IT Solution Pvt Ltd		Date/Duration	25/01/2024-31/01/2024	
Criterion	**Poor**	**Average**	**Good**	**Very Good**	**Excellent**
Punctuality/Timely completion of assigned work			✓		
Learning capacity/Knowledge up gradation				✓	
Performance/Quality of work				✓	
Behaviour/Discipline/Team work					✓
Sincerity/Hard work				✓	
Comment on nature of work done/Area/Topic	He is learning React and React tools.				
OVERALL GRADE (Any one)	**POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT**				
Name of Industry Mentor	Mr. Himanshu Gupta				
Signature of Industry Mentor					

Receiving Date	6/2/24	Name of Faculty Mentor	Dr. Anshu Chaturvedi	Sign	

FORMAT

FORTNIGHTLY PROGRESS REPORT (FPR) FOR INDUSTRY MENTOR

Name of student	Rahul Batham		Department	CSE	
Industry/Organization	TechieShubhdeep IT solutions PVT Ltd.		Date/Duration	01/02/2024 -15/02/2024	
Criterion	Poor	Average	Good	Very Good	Excellent
Punctuality/Timely completion of assigned work				✓	
Learning capacity/Knowledge up gradation			✓		
Performance/Quality of work			✓		
Behaviour/Discipline/Team work				✓	
Sincerity/Hard work			✓		
Comment on nature of work done/Area/Topic	React Setup, Hooks, React Bootstrap Integration.				
OVERALL GRADE (Any one)	POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT				
Name of Industry Mentor	Mr. Himanshu Gupta				
Signature of Industry Mentor	HR Manager, TechieShubhdeep IT Solutions Pvt. Ltd.				

Receiving Date	20/2/24	Name of Faculty Mentor	Dr. Anshu Chaturvedi	Sign	

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FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

Name of student	Rahul Batham		Department	CSE (Program: MCA)	
Industry/Organization	Techie Shubhdeep IT Solution Pvt Ltd		Date/Duration	16/02/2024-29/02/2024	
Criterion	**Poor**	**Average**	**Good**	**Very Good**	**Excellent**
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Learning capacity/Knowledge up gradation				✓	
Performance/Quality of work				✓	
Behaviour/Discipline/Team work					✓
Sincerity/Hard work				✓	
Comment on nature of work done/Area/Topic	He is learning Figma tool for making UI/UX				
OVERALL GRADE (Any one)	POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT				
Name of Industry Mentor	Mr. Himanshu Gupta				
Signature of Industry Mentor					

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Industry/Organization	Techie Shubhdeep IT Solution Pvt Ltd		Date/Duration	01/03/2024-15/03/2024	
Criterion	Poor	Average	Good	Very Good	Excellent
Punctuality/Timely completion of assigned work			✓		
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Performance/Quality of work				✓	
Behaviour/Discipline/Team work					✓
Sincerity/Hard work				✓	
Comment on nature of work done/Area/Topic	He is working on restaurant management system. He is working on responsiveness.				
OVERALL GRADE (Any one)	POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT				
Name of Industry Mentor	Mr. Himanshu Gupta				
Signature of Industry Mentor					

Receiving Date	9/4/24	Name of Faculty Mentor	Dr. Anshu Chaturvedi	Sign	

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Sincerity/Hard work				✓	
Comment on nature of work done/Area/Topic	Restaurant Management Project Now Responsible.				
OVERALL GRADE (Any one)	**POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT**				
Name of Industry Mentor	Mr. Himanshu Gupta				
Signature of Industry Mentor					

Receiving Date	24/4/24	**Name of Faculty Mentor**	**Dr. Anshu Chaturvedi**	**Sign**	

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Industry/Organization	Techie Shubhdeep IT Solution Pvt Ltd		Date/Duration	01/04/2024-15/04/2024	
Criterion	**Poor**	**Average**	**Good**	**Very Good**	**Excellent**
Punctuality/Timely completion of assigned work			✓		
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Performance/Quality of work				✓	
Behaviour/Discipline/Team work					✓
Sincerity/Hard work				✓	
Comment on nature of work done/Area/Topic	He is Working on Restaurant Management project His project almost done.				
OVERALL GRADE (Any one)	**POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT**				
Name of Industry Mentor	Mr. Himanshu Gupta				
Signature of Industry Mentor					

Receiving Date	24/4/24	**Name of Faculty Mentor**	**Dr. Anshu Chaturvedi**	**Sign**	