

LOW CODE APPLICATION USING MENDIX

COURSE OBJECTIVE:	<ul style="list-style-type: none">• Conceptualisation of Technologies of SIEMENS-MENDIX to the students.• To provide hands-on experience in building Low Code Application using SIEMENS MENDIX.• To develop skills in developing Low Code Applications.• To explore advanced techniques and emerging trends in Low Code Application Development.• To explore the wide range of Low Code Applications and industry use cases of MENDIX.
COURSE OUTCOME:	<ul style="list-style-type: none">• Proficient in Mendix Studio for application development.• To Design user-friendly interfaces and layouts.• Expertise in data modeling with entities and relationships• Creation of Microflows for business logic and automation• Competence in integrating Mendix applications with external systems• Implementation of robust security measures in Mendix applications.• Proficiency in testing, debugging, and optimizing application performance.

Course Duration: 45 Hours

Course Content:

Unit 1: Introduction to Low Code Application

Overview of Mendix as a low-code development platform-Historical context and evolution of Mendix-Advantages of using Mendix for application development-Navigating the Mendix Studio Interface-Creating a simple application from scratch-Understanding the core features and functionalities of Mendix Studio.

Unit 2: Design & Build Application

Designing data models with entities and attributes-Defining relationships and associations between entities-Working with various data types in Mendix-Creating visually appealing and user friendly interfaces-Customizing layouts, forms, and pages-Incorporating best practices for responsive design in Mendix applications.

Unit 3: Configuration and Integration

Introduction to Microflows and their role in modeling business processes-Creating and configuring Microflows to automate logic-Understanding the flow of data and actions within Mendix Applications-Connecting Mendix applications with external

databases and APIs-Handling data synchronization and communication between different systems-Implementing best practices for seamless integration.

Unit 4: Testing and Deployment

Implementing user authentication and authorization in Mendix Applications-Ensuring data privacy and protection-Configuring security settings for a secure application environment-Conducting thorough testing of Mendix Applications-Utilizing debugging tools to identify and resolve issues Implementing testing best practices for robust application development.

Unit 5: Collaboration and Manage

Deploying Mendix applications to different environments-Monitoring application performance and troubleshooting deployment issues-Understanding best practices for maintaining applications in a production environment-Working collaboratively on Mendix Projects-Using version control for code management-Implementing team-based development and project management practices in Mendix.

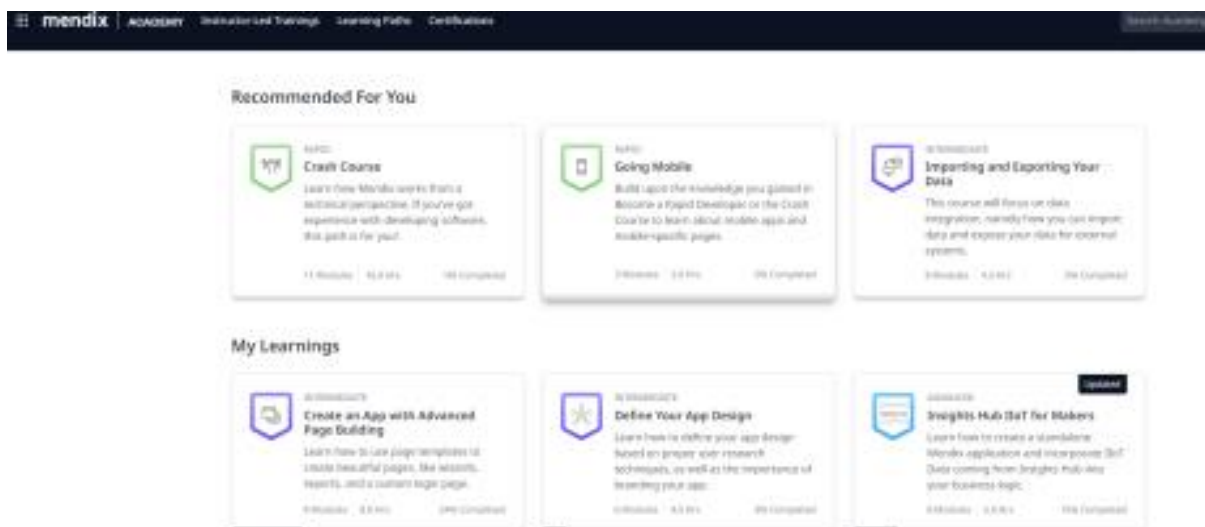
Test Projects:

Use Cases

Use Case: 1

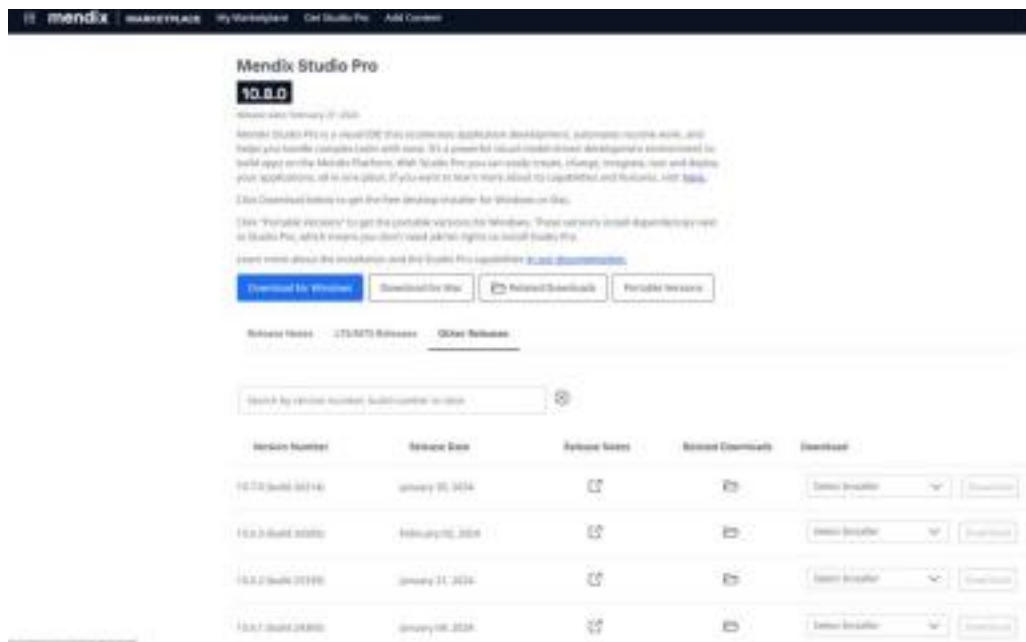
Task 1: Introduction to Mendix Development

Mendix is a low-code application development platform that enables users to create and deploy applications with minimal hand-coding, making it accessible to both developers and business users. With a visual development environment, Mendix allows for the rapid creation of web and mobile applications, facilitating collaboration between technical and non-technical teams.



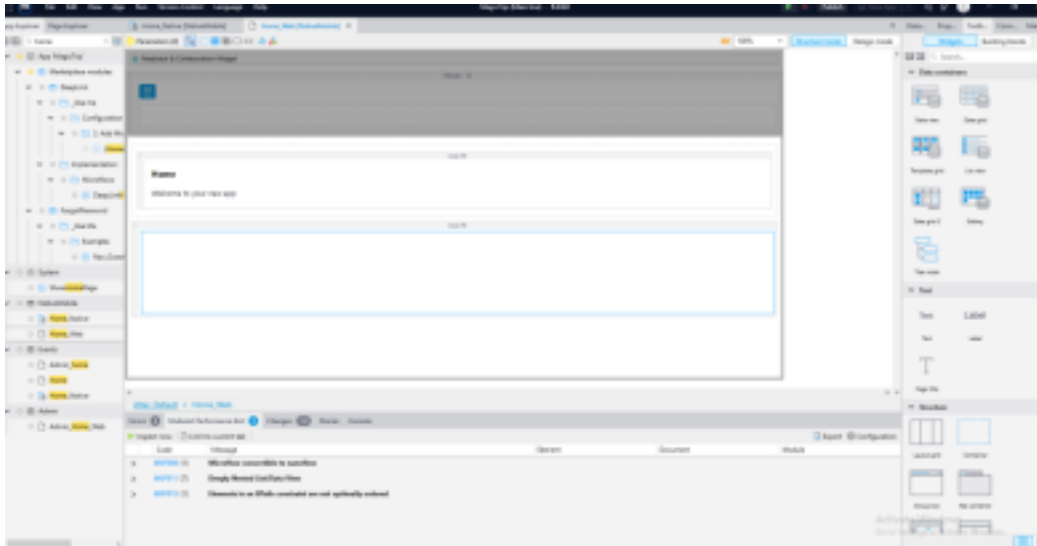
Task 2: How to build Mendix Application

Building a Mendix application involves creating a low-code application using Mendix Studio or Mendix Studio Pro. To build a Mendix application, start by defining your data model and business logic using the visual development environment. Use pre-built widgets to design the user interface, ensuring a responsive and intuitive application.



Task 3: Development of Mendix

Mendix development involves utilizing the platform's visual modeling tools to design data models, business logic, and user interfaces without extensive coding. Developers can leverage pre-built modules and widgets to streamline the creation of web and mobile applications, focusing on business requirements and functionality.



Task 4: Data Modelling

In Mendix, data modeling is achieved through a visual interface where developers define entities, attributes, and associations to structure the application's data. This low-code platform simplifies database design by providing an intuitive environment to establish relationships and constraints between entities without manual coding.



Task 5: Pages and layouts

In Mendix applications, pages serve as the user interface components, representing different screens or views within the application. Layouts in Mendix define the structure and arrangement of widgets on a page, offering flexibility in designing responsive and visually appealing interfaces. By combining various layouts and widgets, developers can create dynamic and interactive pages.

interfaces to different devices and screen sizes for a seamless user experience. With drag-and-drop functionality and customization options,



Task 3: Configuring

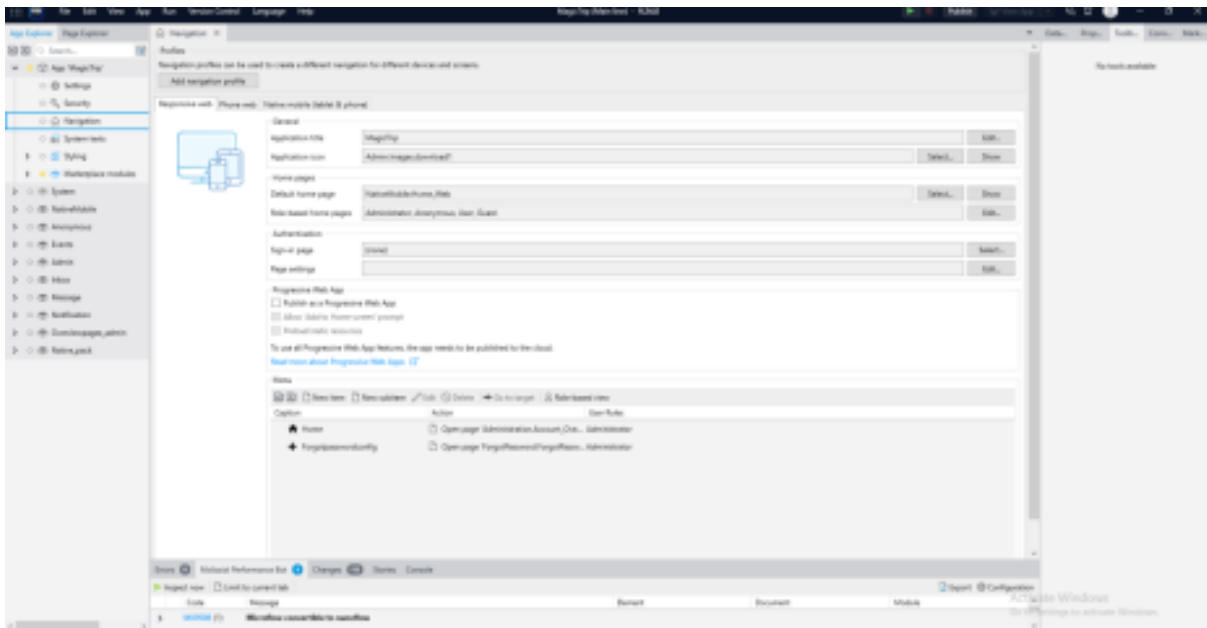
In Mendix, configuration involves tailoring application behavior without extensive coding, utilizing visual tools and settings within the platform. Configuration options include defining security roles, setting up workflows, and configuring data sources to align the application with specific business requirements.

Task 4: Advanced Logic

Advanced logic in Mendix applications is implemented through microflows, allowing developers to create intricate workflows and business processes using visual models. With capabilities such as conditional logic, error handling, and integration with external services, Mendix supports the development of sophisticated application behavior without the need for extensive coding.

Task 5: Navigations

Mendix facilitates seamless navigation within applications through its visual modeling environment, allowing developers to define navigation paths between different pages and modules. The platform offers easy-to-use navigation widgets, enabling the creation of intuitive menus, buttons, and links for users to interact with the application. With drag-and-drop functionality and configurable actions



Use Case: 3

Task 1: Advanced Mendix Development

Advanced Mendix development involves leveraging the platform's extensibility through custom widgets, modules, and integrations to meet unique business requirements. Developers can utilize advanced microflow logic, incorporating features such as error handling, parallel execution, and integration with external APIs for intricate application behavior. With support for custom styling, JavaScript actions, and backend logic.

Task 2 : Collaboration

Mendix promotes collaboration in software development by providing a visual, low-code environment that allows both technical and non-technical stakeholders to participate in the application development process. The platform enables real-time collaboration with features such as version control, allowing multiple team members to work on different aspects of the application simultaneously. With Mendix's collaborative capabilities

Task 3: Data security

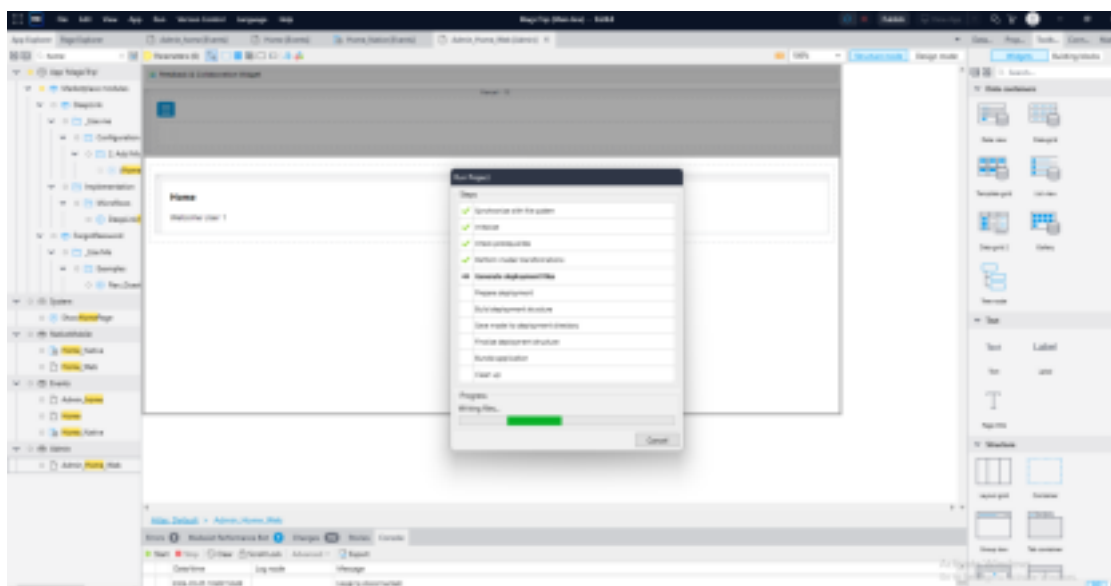
Mendix ensures robust data security in applications through features like role-based access control, allowing developers to define and manage user permissions at a granular level. The platform supports secure authentication protocols,

including OAuth and SAML, to protect user credentials and control access to sensitive data. Additionally, Mendix applications benefit from built-in encryption mechanisms.



Task 4: Debugging

Debugging in Mendix involves using the built-in debugger, allowing developers to set breakpoints, inspect variables, and step through microflows for efficient issue identification. The platform provides detailed logging and error handling features to assist in diagnosing and resolving issues during development and testing. Developers can also leverage Mendix Studio Pro's debugging tools to trace the flow of microflows,



Task 5: Deployment

Deploying a Mendix application involves using the platform's built-in deployment features to package and distribute the application to various environments such as development, testing, and production. Mendix supports continuous integration and deployment, allowing for automated deployment pipelines to streamline the release process. The platform provides version control and rollback capabilities

Industry Use Cases And their Tasks:

1. Manufacturing and Supply Chain:

Task 1: Production Optimization

Design a Mendix application to optimize production schedules based on real-time demand, inventory levels, and machine capacities.

Task 2: Supplier Collaboration

Develop a Mendix app to streamline communication and collaboration with suppliers, providing a centralized platform for order processing, inventory updates, and shipment tracking.

Task 3: Inventory Management Application

Create a Mendix application to track and manage inventory levels. Implement features for real-time updates on stock levels, reorder points, and low-stock alerts. Enable users to input and update inventory data, as well as generate reports on stock movements and availability.

Task 4: Order Management System

Develop an order management system to handle customer orders from initiation to fulfillment. Implement workflows for order processing, including order entry, order confirmation, picking, packing, and shipping. Integrate the order management system with inventory and customer relationship management (CRM) functionalities.

Task 5: Predictive Maintenance Application

Develop an application that uses predictive analytics to anticipate equipment maintenance needs. Integrate IoT (Internet of Things) sensors to collect real-time data from manufacturing equipment. Implement machine learning algorithms to analyze data patterns and predict when maintenance is required, reducing downtime.

2. Financial Services:

Task 1: Loan Approval Automation

Implement a Mendix application for automating the loan approval process, integrating with credit scoring systems, and providing a transparent and efficient experience for applicants.

Task 2: Financial Reporting Dashboard

Develop a Mendix dashboard for financial institutions to consolidate and visualize data from various sources, providing insights into key performance indicators and regulatory compliance.

Task 3: Account Management

Create modules for managing user accounts, including functionalities such as account creation, profile editing, and password reset. Develop logic to link user accounts with financial data, such as bank accounts or investment portfolios.

Task 4: Transaction Processing

Build workflows for processing financial transactions, including deposits, withdrawals, transfers, and payments. Implement validation checks and security measures to ensure the integrity and security of financial transactions.

Task 5: Reporting and Analytics

Develop dashboards and reporting tools to provide users with insights into their financial activities. Integrate with data analytics tools or build custom logic to generate financial reports, summaries, and visualizations.

3. Healthcare:

Task 1: Patient Care Coordination

Create a Mendix application that facilitates seamless coordination among healthcare providers, ensuring timely sharing of patient information, appointment scheduling, and treatment plans.

Task 2: Telehealth Platform

Build a Mendix telehealth platform that integrates with electronic health records (EHRs), allowing patients to schedule virtual appointments, access medical records, and communicate securely with healthcare professional.

Task 3: Electronic Health Records (EHR) System

Design a comprehensive EHR system to store and manage patient health records electronically. Include features for adding, updating, and retrieving medical records, lab results, prescriptions, and other relevant health information.

Task 4: Telemedicine Integration

Implement telemedicine capabilities by integrating video conferencing and communication tools. Allow healthcare providers to conduct virtual consultations, share documents securely, and maintain a record of telehealth interactions

Task 5: Medication Tracking and Alerts

Build a module for tracking medication prescriptions, dosage schedules, and patient adherence. Implement alerts and reminders for both healthcare providers and patients to ensure timely medication intake, reducing the risk of missed doses.

4.Retail and E-commerce:

Task 1: Inventory Management

Design a Mendix application for real-time inventory management, integrating with point-of-sale systems and supplier databases to optimize stock levels and reduce overstock or stockouts.

Task 2: Customer Loyalty Program

Create a Mendix app that manages a customer loyalty program, allowing users to earn and redeem points for purchases, and integrating with CRM systems for personalized marketing.

Task 3: Shopping Cart Functionality:

Create a module for managing shopping carts. Allow users to add/remove products to/from their cart. Implement a real-time calculation of the total order amount.

Task 4: User Authentication and Authorization:

Implement a secure user authentication system. Set up user roles and permissions for different functionalities (e.g., admin, customer). Ensure that only authorized users can access and modify certain parts of the application.

Task 5: Integration with Payment Gateway:

Integrate the e-commerce application with a payment gateway for secure online transactions. Implement functionalities for processing payments and handling payment confirmation. Ensure compliance with security standards for handling sensitive payment information

5.Energy and Utilities:

Task 1: Asset Maintenance

Build a Mendix application to schedule and track maintenance activities for energy assets, integrating with IoT devices for real-time monitoring and predictive maintenance.

Task 2 : Sustainability Dashboard

Develop a Mendix dashboard that visualizes energy consumption, environmental impact, and sustainability metrics, helping organizations track and improve their green initiatives.

Task 3: Energy Consumption Monitoring:

Develop a real-time dashboard to monitor energy consumption for different locations or facilities. Integrate with sensors or external data sources to capture energy usage information. Implement alerts or notifications for abnormal energy consumption patterns.

Task 4: Work Order Management:

Build a work order management system to streamline maintenance tasks and repairs. Include features to create, assign, and track work orders for field technicians. Integrate with GIS (Geographic Information System) for location-based work assignments.

Task 5: Customer Engagement Portal:

Develop a customer portal for utility customers to view and manage their energy usage. Include features like bill payment, consumption history, and outage reporting. Implement personalized dashboards for customers to analyze and optimize their energy usage.

6. Recruitment and Applicant Tracking System:

Task 1: Job Posting:

Create and manage job postings, Publish job openings on various job boards and company career pages.

Task 2: Candidate Database:

Store and organize candidate resumes and profiles. Enable easy retrieval of candidate information for future reference.

Task 3: Application Submission:

Allow candidates to submit their resumes and applications online. Standardize the application process for consistency.

Task 4: Resume Parsing:

Automatically extract and categorize information from resumes. Populate candidate profiles with relevant details.

Task 5: Applicant Tracking:

Track the status of each applicant throughout the hiring process. Monitor the progress of candidates through different stages (e.g., application review, interviews, assessments).

7. Project Collaboration:

Task 1: User Authentication and Authorization:

Implement secure user authentication to ensure that only authorized users can access the platform. Define different user roles with varying levels of permissions (admin, project manager, team member, etc.).

Task2. Dashboard:

Provide a centralized dashboard for users to get an overview of their projects, tasks, and important updates. Include widgets or modules for quick access to key project metrics.

Task 3: Project Management:

Enable the creation of projects with details such as start and end dates, project goals, and team members. Implement task management with features like task creation, assignment, priority setting, and due dates.

.Task 4: Communication and Collaboration:

Incorporate real-time messaging and chat features for team communication. Integrate discussion forums or channels for project-specific conversations. Implement file sharing and version control for collaborative document editing.

Task 5: Calendar and Scheduling:

Include a shared calendar for scheduling meetings, milestones, and deadlines. Allow users to set reminders and receive notifications for upcoming events.

8. Social Intranet:

Task 1: Profiles and User Directory:

Employees can create profiles with their professional information, skills, and interests. A user directory allows easy searching and connecting with colleagues.

Task 2: Activity Feed:

Similar to social media platforms, a social intranet typically includes an activity feed where users can post updates, share content, and engage with each other.

Task 3.Groups and Communities:

Employees can join or create groups based on projects, departments, or common interests. These spaces facilitate focused discussions and collaboration.

Task 4: File Sharing and Collaboration:

Social intranets often provide tools for sharing documents, collaborating on projects, and editing files in real-time.

Task 5 : Messaging and Chat:

Instant messaging and chat features allow for quick and direct communication between individuals or within groups.

9. Property Management System:

Task 1: Reservation Management:

Allows for the easy and centralized management of reservations, including booking details, guest information, and room availability.

Task 2: Check-In and Check-Out:

Streamlines the check-in and check-out processes, automating tasks such as key card issuance, room assignment, and payment processing.

Task 3: Billing and Invoicing:

Manages financial transactions, generates invoices, and tracks payments. It may integrate with accounting systems for seamless financial management.

Task 4. Guest Profiles:

Maintains comprehensive guest profiles with information such as contact details, preferences, and stay history to enhance the guest experience.

Task 5. Inventory Management:

Tracks and manages inventory, such as rooms or units, along with their availability, rates, and status. Provides reporting tools to analyze performance metrics, occupancy rates, revenue, and other key performance indicators.

10. E-commerce Platform:

Task 1:Product Listings:

Sellers can create and manage product listings, including images, descriptions, prices, and other relevant details.

Task 2: Shopping Cart:

Customers can add products to a virtual shopping cart, review their selections, and proceed to checkout.

Task 3: Checkout Process:

The platform facilitates a secure and user-friendly checkout process, allowing customers to provide shipping details, select payment methods, and complete the purchase.

Task 4: Payment Gateway Integration:

Integration with secure payment gateways for processing online payments, supporting various payment methods such as credit/debit cards, digital wallets, and other payment options.

Task 5. User Accounts:

Customers can create accounts to track order history, save preferences, and expedite future purchases. Robust security measures to protect customer information and ensure secure transactions.

11. Quality Control and Inspection App:

Task 1. User Authentication:

Implement secure user authentication to ensure that only authorized personnel can access the app. Facilitate real-time collaboration by allowing multiple users to work on the same inspection simultaneously. This is particularly useful for teams working on different aspects of the inspection

Task 2. Dashboard:

Provide a user-friendly dashboard that gives an overview of ongoing and completed inspections, along with key metrics and trends.

Task 3. Inspection Templates:

Allow users to create customizable inspection checklists or templates that can be tailored to specific products or processes.

Task 4. Media Capture:

Enable the capture of photos, videos, or other media to document inspection findings and issues. This helps in visualizing and understanding the context of the inspection.

Task 5. Offline Mode:

Incorporate offline functionality so that inspections can be conducted in areas with poor or no internet connectivity. Data can be synced once the device is back online.

12. Help Desk and Support Ticket System:

Task 1: Define Your Requirements:

Identify the types of issues you'll be handling (customer support, IT issues, etc.). Determine the expected volume of tickets. Define the level of priority for different types of issues.

Task 2. Choose a Ticketing System:

There are various ticketing systems available, both open-source and commercial. Examples include Zendesk, Freshdesk, Jira Service Desk, and osTicket. Consider factors like scalability, customization options, integration capabilities, and ease of use.

Task 3. Installation and Configuration:

Set up the chosen ticketing system on your servers or use a cloud-based solution. Configure system settings, including email integration, ticket categories, and user roles.

Task 4. User Training:

Train your support team on using the ticketing system effectively. Educate users (customers or internal staff) on how to submit tickets and use self-service options if available.

Task 5. Automation and Workflow:

Implement automation rules to categorize and prioritize tickets. Set up workflows to streamline ticket resolution processes. Ensure integration with communication channels like email and chat

13. Workforce Scheduling App:

Task 1: User Authentication and Roles:

Admin, Manager, and Employee roles with different levels of access. Secure login/authentication methods.

Task 2: Dashboard:

Overview of current schedules, upcoming shifts, and important notifications. Allow employees to set and update their availability. Consider constraints when generating schedules.

Task 3. Employee Management:

Add, edit, and delete employee profiles. Track employee availability, skills, and preferences. Generate reports on employee productivity, attendance, and schedule adherence. Analytics to optimize scheduling efficiency.

Task 4: Shift Scheduling:

Drag-and-drop interface for easy shift planning. Define regular shifts, on-call shifts, and custom shifts. Set shift priorities and constraints.

Task 5:Automated Scheduling:

Auto-generate schedules based on predefined rules and constraints. Take into account employee preferences, availability, and skill matching.

14. Patient Management System:

Task 1: Patient Registration:

Capture and store patient demographics, contact information, and insurance details. Generate unique patient identifiers for accurate record-keeping.

Task 2. Appointment Scheduling:

Manage and schedule patient appointments. Send reminders to patients about upcoming appointments. Connect with other healthcare systems and databases for a more comprehensive view of patient health.

Task 3. Electronic Health Records (EHR):

Maintain a comprehensive digital record of patient medical history, diagnoses, treatments, and medications. Ensure security and compliance with privacy regulations.

Task 4. Billing and Invoicing:

Handle billing processes, including generating invoices and tracking payments. Integrate with insurance systems for claims processing.

Task 5. Prescription Management:

Digitize prescription creation and management. Enable electronic prescription submission to pharmacies. Interface with laboratory and imaging systems to retrieve and store test results. Provide healthcare professionals with easy access to diagnostic information

15. Social Impact Tracking App:

Task 1: User Registration and Profile Management:

Users can create accounts to track their involvement in social initiatives. Profile management to update personal information and preferences.

Task 2. Initiative Dashboard:

Displays a list of ongoing social initiatives or project Information about the purpose, goals, and impact metrics of each initiative.

Task 3. Tracking and Logging:

Users can log their participation in specific initiatives or volunteer activities. Logging could include time spent, tasks completed, or specific contributions made.

Task 4. Media Uploads:

Users can upload photos, videos, or testimonials related to their participation. Provides a visual representation of the impact and engagement.

Task 5. Impact Metrics:

Allows organizations to define key performance indicators (KPIs) for each initiative. Users can view real-time impact metrics and progress toward goals.