BUSINESS PROCESS AUTOMATION

Course Objective: 45 Periods

- The objective of this course is to provide students with a comprehensive understanding of Industrial Process Automation, specifically focusing on Enterprise Resource Planning (ERP) systems.
- Students will learn the fundamental concepts, principles, and technologies associated with ERP systems and their role in automating industrial processes.
- Through practical exercises and case studies, students will develop the skills necessary to design, implement, and manage ERP solutions in an industrial setting.

Course Content:

Unit 1: Introduction to Business Process Automation and ERP

Overview of industrial process automation- Introduction to Enterprise Resource Planning (ERP) systems- Benefits and challenges of implementing ERP in industrial processes- ERP modules and their functionalities- ERP architecture and integration with other systems

Unit 2: ERP Implementation and Project Management

ERP project lifecycle and methodology- Requirement gathering and business process analysis- ERP system selection and customization- Data migration and system integration- Change management and user training

Unit 3: ERP Functional Modules

Sales and Distribution (SD) module- Materials Management (MM) module- Production Planning and Control (PPC) module- Quality Management (QM) module- Financial Accounting (FI) module- Human Resources (HR) module

Unit 4: ERP Technical Components

Database management and data warehousing- ERP system configuration and customization- User interface design and development- Reporting and analytics in ERP systems- Security and access control in ERP

Unit 5: ERP Maintenance, Upgrades, and Industrial Application

ERP system maintenance and support- Upgrades and migration to newer versions- Mobile and cloud-based ERP solutions- Internet of Things (IoT) integration with ERP- Artificial Intelligence (AI) and Machine Learning (ML) in ERP- Industrial Application.

Course Outcomes:

- Understand the fundamentals of Business Process Automation and the role of ERP systems.
- Analyze business processes and requirements for implementing ERP in an industrial setting.
- Design and customize ERP solutions to meet specific organizational needs.
- Manage and execute ERP implementation projects, considering factors such as budget, time, and resources.
- Utilize various ERP modules to streamline and automate industrial processes.
- Perform data analysis and generate reports using ERP systems.
- Maintain and support ERP systems, including upgrades and integration with emerging technologies.
- Identify and propose innovative solutions using ERP in industrial environments.

References:

- Shanks, G., & Seddon, P. (2020). Enterprise resource planning (ERP) systems: A research agenda. European Journal of Information Systems, 29(4), 315-334.
- Laudon, K. C., & Laudon, J. P. (2019). Management information systems: Managing the digital firm. Pearson.

Hardware and software requirements:

- Computer with Intel Core i5 or equivalent processor
- Minimum 8 GB RAM
- Operating System: Windows 10, macOS, or Linux
- Web Browser: Latest version of popular browsers like Chrome, Firefox, or Safari
- ERP Software: Access to a suitable ERP system
- Office Productivity Suite (e.g., Microsoft Office)

- Virtualization Software (e.g., VMware, VirtualBox) if virtual machines are needed
- Communication Tools (e.g., Zoom, Microsoft Teams, Slack)
- Development Environments (e.g., Eclipse, Visual Studio, NetBeans) if programming exercises are included

20 Simple Industry Use Cases and Task:

1. Streamlining inventory management and tracking in a manufacturing company using ERP:

Task1: Set up automated alerts for low inventory levels.

Task2: Generate Realtime reports on stock availability and usage.

Task3: Implement barcode scanning for efficient inventory tracking.

Task4: Automate the reordering process based on predefined inventory thresholds.

Task5: Integrate the ERP system with suppliers for seamless purchase order processing.

2. Automating the odontoclast process for a distribution company with an ERP system:

Task1: Create an automated order processing workflow from order placement to invoicing.

Task2: Enable online order tracking for customers.

Task3: Implement automated invoice generation and delivery.

Task4: Integrate the ERP system with shipping carriers for Realtime tracking of shipments.

Task5: Generate reports on order status, fulfilment, and payment history.

3. Optimizing production planning and scheduling in a food processing plant using ERP:

Task1: Develop a production schedule based on demand forecasts and available resources.

Task2: Automate the generation of work orders for each production run.

Task3: Implement realtime monitoring of production progress.

Task4: Optimize production line efficiency by analyzing downtime and bottlenecks.

Task5: Integrate the ERP system with equipment sensors for datadriven maintenance planning.

4. Implementing quality control and tracking for a pharmaceutical company with ERP:

Task1: Define quality control checkpoints and inspection criteria.

Task2: Implement Realtime data capture of quality test results.

Task3: Automate the rejection of noncompliant products.

Task4: Generate quality reports and analytics for continuous improvement.

Task5: Establish traceability by linking product batches with quality data.

5. Managing customer relationship and sales processes in a retail chain using ERP:

Task1: Maintain a centralized customer database with contact information and purchase history.

Task2: Implement targeted marketing campaigns based on customer segmentation.

Task3: Automate sales order processing and order confirmation.

Task4: Enable customer self-service portals for order tracking and returns.

Task5: Generate sales performance reports and analyze customer buying patterns.

6. Automating financial accounting and reporting for a service organization with ER:

Task1: Automate the generation of financial statements such as balance sheets and income statements.

Task2: Implement electronic invoicing and online payment processing.

Task3: Enable Realtime tracking of financial transactions and cash flow.

Task4: Generate automated alerts for overdue payments and outstanding invoices.

Task5: Integrate the ERP system with tax software for accurate tax calculations and reporting.

7. Enhancing supply chain visibility and coordination through ERP in a logistics company:

Task1: Implement realtime tracking of shipments and delivery status.

Task2: Enable electronic collaboration with suppliers and logistics partners.

Task3: Automate the generation and sharing of shipping documents and customs forms.

Task4: Implement demand forecasting and inventory optimization algorithms.

Task5: Generate supply chain performance reports and analytics for process improvement.

8. Centralizing employee information and HR processes with ERP in a multinational corporation:

Task1: Implement a self-service employee portal for accessing and updating personal information.

Task2: Automate employee onboarding and offboarding processes.

Task3: Streamline performance management and goal setting through the ERP system.

Task4: Integrate the ERP system with payroll software for accurate and timely salary processing.

Task5: Generate HR reports and analytics for workforce planning and talent management.

9. Improving project management and resource allocation in a construction firm using ERP:

Task1: Implement project scheduling and resource allocation modules within the ERP system.

Task2: Enable realtime collaboration and document sharing for project teams.

Task3: Automate the tracking of project expenses and budget management.

Task4: Generate project status reports, including progress tracking and milestone achievement.

Task5: Integrate the ERP system with project management software for comprehensive project visibility.

10. Integrating CRM functionality in a call center's operations through ERP:

Task1: Maintain a centralized customer database with contact details, interactions, and history.

Task2: Automate call logging and tracking within the ERP system.

Task3: Implement case management and resolution workflows for customer inquiries.

Task4: Enable realtime access to customer information for call center agents.

Task5: Generate customer satisfaction reports and analyze call center performance metrics.

11. Tracking and managing maintenance activities in a manufacturing plant using ERP:

Task1: Establish preventive maintenance schedules and automate work order generation.

Task2: Implement realtime monitoring of equipment performance and health.

Task3: Enable maintenance technicians to log work performed and parts used in the ERP system.

Task4: Generate maintenance reports, including equipment downtime and maintenance costs.

Task5: Integrate the ERP system with asset management software for comprehensive maintenance tracking.

12. Automating the procurement process and supplier management with ERP:

Task1: Implement automated purchase requisitions and approvals within the ERP system.

Task2: Enable electronic procurement and integration with supplier catalogs.

Task3: Automate the supplier evaluation and selection process.

Task4: Generate realtime reports on purchase orders, delivery status, and supplier performance.

Task5: Integrate the ERP system with inventory management for seamless inventory replenishment.

13. Streamlining the hiring and onboarding processes in a recruitment agency using ERP:

Task1: Create a centralized candidate database with resumes and application history.

Task2: Automate candidate screening and interview scheduling within the ERP system.

Task3: Implement onboarding workflows for new hires, including document management.

Task4: Enable realtime collaboration with clients and hiring managers on candidate selection.

Task5: Generate recruitment reports and analytics for performance tracking and process improvement.

14. Enhancing customer service and support through ERP in a telecommunications company:

Task1: Implement a customer service ticketing system within the ERP system.

Task2: Automate the assignment and routing of customer service requests.

Task3: Enable realtime access to customer information for customer support agents.

Task4: Implement escalation workflows for priority issues and servicelevel agreements.

Task5: Generate customer service reports and analyze response times and issue resolution.

15. Managing student enrollment, registration, and academic records in an educational institution with ERP:

Task1: Implement online enrollment and registration processes within the ERP system.

Task2: Automate student record creation and management.

Task3: Enable realtime access to student information for administrative staff and teachers.

Task4: Implement grading and transcript generation workflows within the ERP system.

Task5: Generate reports on student enrollment, academic performance, and course offerings.

16. Tracking and managing fleet operations for a transportation company using ERP:

Task1: Implement realtime tracking of vehicles and shipments within the ERP system.

Task2: Enable electronic dispatching and route optimization.

Task3: Automate fuel consumption tracking and maintenance scheduling.

Task4: Generate reports on fleet utilization, delivery performance, and driver efficiency.

Task5: Integrate the ERP system with telematics devices for accurate vehicle data collection.

17. Optimizing production and inventory planning in a fashion apparel company with ERP:

Task1: Implement demand forecasting and sales trend analysis within the ERP system.

Task2: Automate the generation of production plans and schedules.

Task3: Enable realtime monitoring of production progress and capacity utilization.

Task4: Implement automatic reorder point calculations for inventory replenishment.

Task5: Generate reports on production efficiency, stock levels, and order fulfillment.

18. Automating billing and revenue recognition processes in a utility company using ERP:

Task1: Implement automated meter reading and consumption calculations within the ERP system.

Task2: Enable online billing and selfservice payment options for customers.

Task3: Automate revenue recognition and accruals based on predefined rules.

Task4: Generate financial reports on revenue, arrears, and billing accuracy.

Task5: Integrate the ERP system with customer relationship management software for comprehensive customer billing.

19. Centralizing data and streamlining reporting for a healthcare organization with ERP:

Task1: Implement electronic health record (EHR) integration and data consolidation within the ERP system.

Task2: Enable rolebased access control for secure data handling.

Task3: Automate report generation for patient demographics, medical histories, and billing.

Task4: Implement billing code validation and claims processing within the ERP system.

Task5: Generate analytics reports on patient outcomes, resource utilization, and financial performance.

20. Enhancing project collaboration and document management through ERP in an engineering firm:

Task1: Implement document management workflows for version control and collaboration within the ERP system.

Task2: Enable realtime access to project documents and drawings for project teams.

Task3: Automate document approval processes and ensure document traceability.

Task4: Implement task assignment and progress tracking functionalities within the ERP system.

Task5: Generate reports on project document status, document revisions, and collaboration history.