



ELEVATE YOUR MANUFACTURING ENTERPRISE:

Comprehensive ERP Solution Proposal

MGs 613 – DBMS – SECTION 4S FALL 2023

SUBMITTED BY,

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OVERVIEW

The project aims to create a comprehensive Enterprise Resource Planning (ERP) Database Schema for a manufacturing and supply chain company. The database will streamline the workflow from design to production, regulate internal departmental structures and roles, and optimize the management of materials procured from diverse vendors. It will also handle invoices, ensuring exact sender details and meticulous processing by the accounting department. The database will manage employees, oversee the product lifecycle, manage the flow of raw materials, and track and process vendor-supplied invoices.

METHODOLOGY

Based on the project requirements and the need for constant changes to attributes and entities, We recommend incorporating the Scrum Agile methodology into the SDLC stages for the ERP Database Schema project. Scrum is well-suited for projects that require frequent adjustments and adaptability due to its iterative and incremental approach. Scrum focuses on delivering small, incremental improvements through short iterations called sprints. We will use Scrum to break down the project into smaller tasks and prioritize them based on their importance. Each sprint lasts for two weeks.

To incorporate Scrum methodology into the System Development Life Cycle (SDLC) stages for the ERP Database Schema project, we will follow these steps:

1. Planning In this stage, we will identify the scope, objectives, and requirements of the ERP database schema. We will create a product backlog, which is a prioritized list of features and tasks to be completed during the project[2].

2. Sprint Planning: We will conduct sprint planning meetings to determine the tasks to be completed during the upcoming sprint[2]. We will select items from the product backlog based on their priority and estimate the effort required to complete them.

3. Development and Testing: During the sprint, we will work on completing the tasks selected during sprint planning. We will follow an iterative and incremental approach, allowing for constant adjustments and adaptability[3]. As tasks are completed, they are tested to ensure they meet the project requirements and align with the business rules and attributes[1].

4. Sprint Review: At the end of each sprint, We will conduct a sprint review to demonstrate the completed tasks to the Professor and gather feedback[2]. This feedback helps We will identify potential issues and make necessary adjustments to the product backlog and future sprints.

5. Sprint Retrospective: After the sprint review, We will hold a sprint retrospective to discuss what went well, what can be improved, and the lessons learned during the sprint[2]. This reflection helps us continuously improve our processes and adapt to changes in the project requirements.

6. Deployment and Maintenance: Once the database schema has been developed and tested through multiple sprints, it can be deployed to the online GitHub repository and submitted as a final project draft. We will continue to monitor and maintain the database schema, addressing any issues that arise and making updates and improvements as needed[1].

By incorporating Scrum methodology into the SDLC stages, we can effectively develop a robust and efficient database schema that meets the operational needs of the manufacturing and supply chain company while accommodating constant changes to attributes and entities.

REPOSITORY AND OVERALL STRUCTRE

In this business flow, the company functions through distinct departments, warehouses, and production lines. Each department creates unique product designs, and employees are allocated to specific areas. Raw materials come from warehouses, supplied directly by vendors or through them. Vendors submit invoices, processed by accounting. Production lines manufacture specific products, avoiding duplication. Lines can pause for repairs. This systematic approach ensures efficient operations, optimal resource usage, and transparent accountability within the organization.

The database comprises of 7 entities such as Employee (ID, First Name, Last Name, Salary, Position), Department (Name, Location, Number of Employees, Phone Number), Product (Product Number, Name, Price, Cost, Dimensions, Color, Weight, Raw Material), Production Line (Line Number, Line Capacity), Vendor (Company Name, Address, Phone Number, Specialty), Warehouse (Address, Phone Number), and Invoice (Invoice Number, Total Amount). These entities form the foundational structure for managing the company's workforce, products, production lines, suppliers, storage, and financial transactions.

Below, we presented an example of the metadata of one of the 7 entities- Department and ER diagram describing the relationship between Department and Employee

DEPARTMENT					
AttributeName	DataType	Minimum Length	Maximum Length	Description	Source
dept_name	VARCHAR	1	30	Department Name	HR Database
dept_location	VARCHAR	05	50	Department Location	HR Database
no_of_employee	INT	1	5	Number of Employees in each department	HR Database
phone_number	INT	10	10	COn tact details of the department	HR Database

Fig 1: Repository Structure

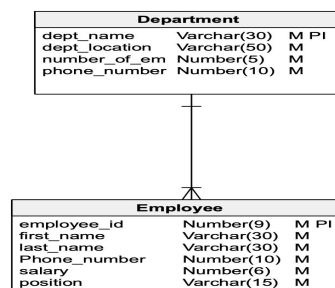
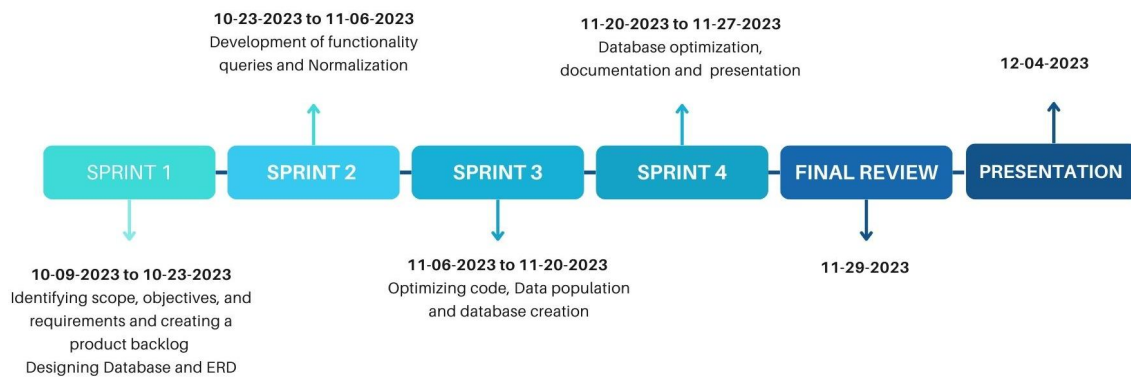


Fig2: ER diagram

EXPECTED TIMELINE



Sprint Reviews will be held with Professor Arman Falahati during his office hours on the following dates.

Sprint-1 Review on 10-23-2023

Sprint-2 Review on 11-06-2023

Sprint-3 Review on 11-17-2023

Sprint-4 Review on 11-27-2023

Dates are subjected to change depending on Professor's availability.

Internal meetings: We scheduled to have Zoom meetings every Monday and Wednesday, from 8 PM to 9 PM.

<https://buffalo.zoom.us/j/98495176847?pwd=WkRFK2p0RWtXYnFEVEEdGN1RRRU5nQT09>

Meeting ID: 984 9517 6847

Passcode: 056208

ROLES

Tech Lead (RAHUL)

Curated the overview and repository for the project proposal, ensuring its comprehensive structure and organization

- Address technical challenges and optimize the final database schema, ensuring efficiency.
- Mentor team members, fostering a learning environment and helping them overcome technical hurdles.

Coordinator(BHAVIKA)

Assigned tasks to all the teammate and created a feasible teamline keeping in mind the avaiability of the team members and deadlines.

- Monitor task progress, facilitate seamless communication, and identify process bottlenecks for improved efficiency.
- Manage resources effectively, ensuring tasks align with team members' strengths and expertise, fostering collaboration and productivity.

Coresearcher (AKASH)

Assisted in documenting research findings for the repository, worked on the appropriate approach for the problem and chose the most suitable method.

- Conduct research on database management concepts, provide insights for business rule interpretation, and contribute to creating precise and relevant EER diagrams.
- Collaborate on designing relationships, identifying integrity constraints, and ensuring the relevance of relationships within the database schema.

Presentation Lead (NITISHA)

Organized, visually created and prepared the project proposal, ensuring clarity and comprehensive coverage of data.

- Create engaging visual aids, including EER diagrams and presentation materials, ensuring clarity and appeal.
- Organize project documentation comprehensively, delivering project updates in an understandable manner, explaining technical aspects and project progress.

However, all the team members will engage in brainstorming, research, work sessions, and reviews of each task ensuring diverse perspectives and high-quality project outcomes.

CONCLUSION

In summary, this project proposal aims to develop a robust and efficient ERP Database Schema for a manufacturing and supply chain company using a combination of the System Development Life Cycle (SDLC) and Scrum Agile methodology. This approach will ensure a structured and adaptable development process, accommodating constant changes. The benefits of this approach include improved collaboration, faster adaptation to changing requirements, and a flexible and responsive database schema. By following these methodologies, we will be well-equipped to deliver a high-quality solution that meets the operational needs of the company and addresses potential concerns. The next steps include initiating the project, setting up the Scrum framework, and engaging with the Professor in the development process.

REFERENCES

- [1] Modern Database Management, 13th edition. Jeff Hoffer; Ramesh Venkataraman; Heikki Topi
- [2] <https://brocoders.com/blog/agile-software-development-life-cycle/>
- [3] <https://xbsoftware.com/blog/software-development-life-cycle-sdlc-scrum-step-step/>