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ITE182 - IT3D

Final Project

HardWare: Construction and Building Materials Company

Introduction:

As part of the IT department, we have been tasked with creating an Enterprise Resource Planning (ERP) system for the company, which is a large hardware company focusing in the sale of construction equipment, supplies, and home and building materials. This ERP system will streamline their corporate operations, increase efficiency, and boost overall productivity. To achieve a successful implementation, each aspect of the project must be thoroughly planned and executed.

I. Scope and Commitment

1. **Scope Type**: Gap Analysis (*Evaluation of what functions that can be provided by the ERP system*)

System Scope: Develop and ERP that encompasses the following modules.

- **Inventory Management Module** – An ERP system for the hardware company must track and manage the hardware company's construction equipment, supplies, and home/building materials inventories. The ERP's inventory management module will have powerful features and functionalities to provide effective inventory control and optimization. The ERP system will enable the hardware company to have a centralized database of all inventory goods, such as construction equipment, supplies, and various building materials. Each item will be associated with detailed information such as item code, description, amount on hand, location, cost, and supplier details.
- **Sales and Order Management Module** - The ERP system's sales management module is intended to handle all parts of the hardware company's sales process, including sales orders, quotations, sales transactions, and customer relationship management. It offers a consolidated platform via which sales reps may enter and monitor customer orders. Order details such as product information, quantities, pricing, and delivery dates must be recorded. The module makes it simple to track and manage the full order fulfillment process, from order entry to order delivery and billing.
- **Procurement and Supplier Management Module** - The ERP system's procurement and supplier management module is intended to expedite the procurement process, manage supplier relationships, and assure timely and cost-effective material sourcing for the hardware company. The procurement module's primary function is to automate and streamline the procurement process. It provides procurement professionals with a

centralized platform for managing the whole procurement lifecycle, from demand to payment. Users can use the module to establish buy requisitions, acquire approvals, generate purchase orders, and track order fulfillment. The module avoids manual paperwork, decreases errors, and shortens the procurement cycle by automating these procedures. Another critical part of the procurement module is effective supplier management. It enables the hardware company to keep a consolidated database of suppliers, complete with contact information, capabilities, performance history, and contracts. Suppliers can be evaluated and selected using established criteria such as quality, pricing, delivery time, and prior performance. It also makes supplier contract management easier, such as tracking contract terms, renewal dates, and compliance with contractual responsibilities.

- **Financial Management Module** - The ERP system's financial management module is intended to handle numerous financial aspects for the hardware company, such as accounting, invoicing, budgeting, and financial reporting. It provides a solid basis for recording financial activities, generating financial statements, and performing financial analysis. By automating duties such as journal entries, general ledger administration, and account reconciliation, the module facilitates efficient bookkeeping and accounting procedures. It makes accurate and timely invoicing possible by creating invoices based on sales transactions, tracking payment statuses, and issuing overdue payment reminders. The module also helps with budgeting by allowing users to set and track budgets, compare actual financial performance to budgeted amounts, and generate budget reports. In addition, the financial management module has complete financial reporting capabilities such as balance sheets, income statements, cash flow statements, and other financial metrics and ratios. It allows users to examine financial data, spot trends, and make sound business decisions.
- **Human Resource Management Module** - The ERP system's human resources management module is intended to streamline and automate numerous HR operations within the firm. It provides a consolidated platform for managing employee data, including personal information, job history, skills, and qualifications. The module makes payroll processing more effective by automating computations, deductions, and tax withholdings, assuring correct and timely payment to employees. It also helps with employee benefit administration, such as health insurance, retirement plans, and leave management. The module makes it simple to handle performance reviews and goal-setting, allowing supervisors to track employee performance, provide feedback, and identify training and development needs.

2. Top Management Support

To gain top management support, it is critical to properly communicate the ERP system's benefits and value proposition to the firm. This involves emphasizing how the ERP system can improve operational efficiency, streamline corporate operations, improve decision-making, and drive growth and profitability. Presenting a well-defined business case that corresponds with the hardware company's strategic goals and objectives will assist garner the attention and support

of upper management. Top management must be involved in the ERP project from the beginning, such as project planning and scoping. It's critical to actively solicit their feedback and include them in crucial decision-making processes including vendor selection, budget allocation, and project scheduling. This involvement not only assures their buy-in, but also aids in aligning the ERP project with the organization's broader strategic goal.

3. Selection of Implementation Team

Assemble a team of skilled professionals who will be in charge of the ERP implementation. Assign roles and duties, ensuring that team members are knowledgeable about ERP systems and essential business processes.

- **IT specialists** – these staffs are responsible for developing the ERP system. It includes Database Administrators who are capable of managing the data (inventory, sales, and HR). IT operations support, developers, and etc.
- **Project Manager** – This role is very important in the developing of the ERP system since they are the one who leads the team. They are the one in charge if the ERP system fails or succeeds. They will lead a good and harmonious team while developing the system.
- **End users** – It could be the client who is capable of using the system for their job. They will test the functionalities of the system and give some feedback about it. They are the one who will give what are the needs of the company while developing the ERP system.

4. Roles of Internal Employees and SMEs

Internal employees and subject matter experts (SMEs) play an important role in the effective installation of an ERP system within a hardware company. Engaging these personnel from other departments enables the use of their knowledge, insights, and skills to ensure that the ERP system corresponds with the organization's specific goals and workflows. Internal employees and SMEs have valuable subject knowledge and are familiar with the complexities of the hardware company's operations. Their participation in the ERP project allows them to have a thorough awareness of the existing processes, pain spots, and needs that the system must meet. Their experience can be used to build and configure the ERP system in a way that maximizes efficiency and effectiveness by actively involving them.

Internal employees and SMEs can provide critical input in identifying essential functionalities and system needs during the analysis and design phase. Their assistance aids in mapping existing business processes and workflows, ensuring that the ERP system corresponds with the hardware company's unique needs and practices. They can also help with system design and configuration to fulfill specific departmental needs like inventory management, sales order processing, or procurement.

5. Decision of the consultant’s role

Determine whether external consultants are required to give extra knowledge and direction during implementation. Assess their roles and responsibilities, and develop a clear communication and collaboration strategy between the internal team and the consultants.

6. Vendor Selection and Contract

The team will conduct a thorough evaluation of ERP vendors and select a vendor that best fits the requirements of the hardware company. The team will negotiate and finalize the contract, ensuring it covers all necessary aspects such as implementation timeline, deliverables, support, and maintenance.

Microsoft's Microsoft Dynamics 365 suite is one ERP vendor that meets the requirements you've specified. Microsoft Dynamics 365 includes a number of modules that can meet the demands of a hardware store that sells construction equipment, supplies, and building materials. Here's how Microsoft Dynamics 365 corresponds to the modules you mentioned:

- **Inventory Management Module**: The Microsoft Dynamics 365 Supply Chain Management module includes complete inventory management capabilities such as real-time inventory level tracking, demand forecasting, warehouse management, and supply chain optimization.
- **Sales and Customer Relationship Management Module**: The Microsoft Dynamics 365 Sales module manages sales orders, generates quotes, manages customer relationships, and tracks sales performance. It makes it possible to manage sales transactions and customer contacts more efficiently.
- **Procurement and Supplier Management Module**: The Microsoft Dynamics 365 Supply Chain Management module contains powerful procurement and supplier management tools that enable efficient procurement procedures, supplier relationship management, and cost-effective material sourcing.
- **Financial Management Module**: Accounting, invoicing, budgeting, financial reporting, and financial analysis are all handled by the Microsoft Dynamics 365 Finance module. It offers extensive financial management capabilities for the financial operations of the hardware company.
- **Human Resource Management Module**: The Human Resources module in Microsoft Dynamics 365 manages employee data, payroll, benefits administration, performance assessments, and training. It guarantees that human resources are managed efficiently inside the organization.

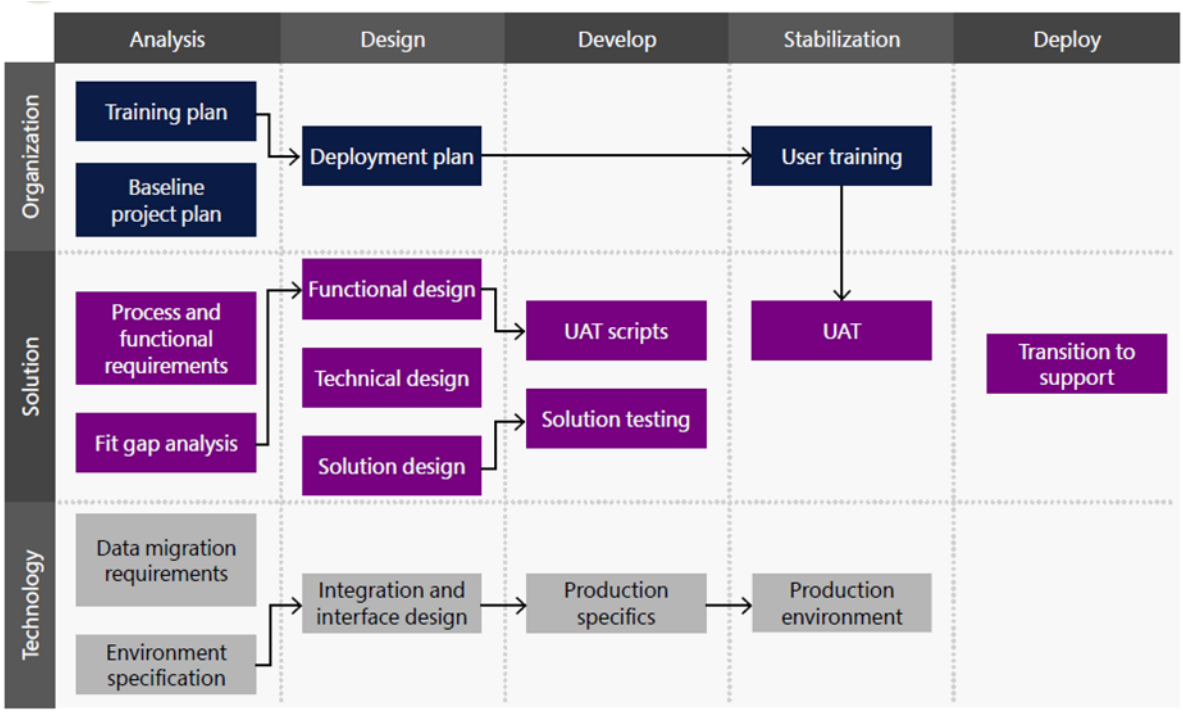
II. Analysis and Design

1. Methodology

Waterfall Model

The waterfall method of solution delivery is a step-by-step procedure. It represents a logical progression of activities from one phase to the next, culminating with the solution being advanced to manufacturing and finally into operation.

The picture below depicts the waterfall model as recommended in Microsoft Dynamics' Sure Step Methodology.



Analysis - The process of acquiring and analyzing requirements, understanding business processes, and defining the hardware company's specific objectives and goals is referred to as analysis. Interviews, workshops, and data analysis are used to define the scope and objectives of the ERP project.

Design - Based on the investigation, the designer creates the blueprint or framework for the ERP system. Designing the system architecture, data model, user interfaces, workflows, and integration needs are all part of it. The design phase focuses on developing an organized and functioning ERP solution based on the identified requirements.

Develop - Development entails constructing the ERP system in accordance with the design specifications. Customizing the ERP software, configuring modules, building additional functionalities or connectors, and providing any necessary interfaces or reports are all part of the process. The development phase brings the ERP solution to life, aligning it with the hardware company's specific demands.

Stabilization - Stabilization is the process of rigorously testing and fine-tuning the ERP system to assure its stability, dependability, and performance. This entails performing several forms of testing, such as unit testing, integration testing, and user acceptability testing, in order to detect and resolve any problems, faults, or functional gaps. The stabilization phase attempts to optimize the ERP system and assure its seamless operation prior to deployment.

Deploy - Deployment is the final stage of the ERP implementation lifecycle, in which the designed and stabilized ERP system is rolled out into the production environment. This includes moving data, configuring the system for production use, configuring user access and security, and providing end-user training. The deployment phase symbolizes the shift from development to operational operation, when the ERP system is ready for day-to-day use by the hardware company.

2. Vanilla Implementation

The vanilla method involves the organization modifying its existing processes to accommodate the standard features and best practices provided by the ERP system. This means that the company's workflows and operations may need to be modified to coincide with the pre-configured processes within the ERP system. When a company's procedures are already efficient and successful, and they only need to harness the ERP system to improve their operations, the vanilla method is often used.

3. Data Mapping and Conversation

Data Mapping in the Hardware Company's ERP System:

In the hardware company's ERP system, data mapping entails finding and establishing a relationship between data items in the existing system (such as spreadsheets, databases, or legacy systems) and the appropriate data fields in the ERP system. For example, in the ERP system's inventory module, the data mapping process would entail mapping the existing data fields for item codes, descriptions, quantities, prices, and suppliers to the corresponding fields in the ERP system.

The hardware company's installation team would assess the data elements in the existing system and map them to the appropriate fields in the ERP system during the data mapping phase. This could include mapping the product catalog, customer information, vendor

information, pricing structures, and other pertinent data. The goal is to ensure that data from the existing system is reliably moved and incorporated into the ERP system while preserving data integrity and consistency.

Data Conversion in the Hardware Company's ERP System:

The process of translating and migrating data from the old system to the ERP system is referred to as data conversion in the hardware company's ERP system. This procedure entails extracting data from the present system, converting it to the needed ERP system format or structure, and putting it into the corresponding data fields or tables in the ERP system.

Data conversion in the hardware company's ERP system would entail duties such as cleansing the data to remove duplicates or inconsistencies, validating the data to assure accuracy and completeness, and transforming the data to suit the ERP system's set format and standards. This could include changing units of measurement, standardizing product descriptions, or mapping codes to predefined values in the ERP system.

Once the data has been transformed and imported into the ERP system, it may be used for a variety of purposes, including generating reports, doing analytics, and supporting business operations across several modules such as inventory management, sales, procurement, finance, and human resources.

4. SandBox

A sandbox environment would be a great tool for the hardware industry during the ERP adoption process. It enables the implementation team and end users to test and validate the ERP system in a controlled environment without disrupting production data or operations. The hardware company can utilize a sandbox to simulate various scenarios, do testing, configure settings, and train users on the ERP system. It provides a secure environment for identifying and addressing issues, refining setups, and ensuring the system fits the hardware company's specific demands. As a result, during the implementation phase, a sandbox environment is an excellent fit for the hardware manufacturer.

III. Acquisition and Development

1. Hardware and Software

Hardware - The physical infrastructure necessary to run the ERP system is referred to as the hardware component. Servers, storage devices, networking equipment, and other hardware components are generally included. The particular hardware needs will vary based on the

company's size, the complexity of the ERP system, and the estimated workload. To guarantee that the hardware can handle the ERP system successfully, variables such as processor power, memory, storage capacity, and scalability must be considered.

- **Server** - Servers are high-performance computers that host ERP software and manage data processing and storage. They manage user requests, execute business logic, and store and retrieve data, among other things. Depending on the size of the hardware company's activities, numerous servers may be required to disperse the burden and assure the ERP system's high availability and performance.
- **Storage Devices** - The data generated and processed by the ERP system is stored and managed via storage devices. Databases, file servers, and other storage systems are included. Data volume, performance requirements, data redundancy, and disaster recovery requirements all influence storage device selection. To suit their specific storage demands, the hardware company may explore hard disk drives (HDDs), solid-state drives (SSDs), network-attached storage (NAS), or storage area networks (SANs).
- **Networking Equipment** - Networking equipment allows communication and data transfer between ERP system components. Routers, switches, firewalls, and network cables are all included. Networking hardware ensures that data flows effectively and securely throughout the ERP architecture, allowing users to access the system and simplifying information interchange between servers, client devices, and other networked resources.
- **Others** - Additional hardware components may be required depending on the ERP system's unique requirements and the hardware company's infrastructure. This could include load balancers for dispersing network traffic, uninterruptible power supply (UPS) units to provide backup power in the event of a power outage, and other peripheral devices that interface with the ERP system, such as printers, scanners, or barcode readers.

Software - The ERP software itself, comprising the core ERP application and any other modules or features required by the hardware company, is referred to as a software component. Inventory management, sales and distribution, finance and accounting, human resources, and other corporate processes and operations are all managed by ERP software. It is critical to choose an ERP software vendor with solid functionality, customization possibilities, integration capabilities, and user-friendly interfaces. The software should be tailored to the demands of the hardware industry and give scalability and flexibility for future expansion.

Furthermore, ERP systems frequently require supporting software components such as operating systems, database management systems, web servers, and other infrastructure software. These components lay the foundation for the ERP software to perform efficiently and safely.

2. Customization

Customization in ERP refers to the act of altering the standard functionality of the ERP software to coincide with the hardware company's specific requirements and business operations. Here's an overview of ERP customization:

- **Tailoring Workflows** - Customization enables the hardware manufacturer to adjust the workflows within the ERP system to their own business operations. This entails designing the system to reflect how various jobs and activities are carried out, as well as ensuring that the ERP software supports and automates the company's specific processes.
- **Data Fields and Forms** - Customization allows you to add, change, or remove data fields and forms from your ERP system. This enables the hardware company to acquire and preserve essential business information, ensuring that the ERP system offers accurate and comprehensive data for decision-making and reporting.
- **Reports and Dashboards** - ERP customization enables the development of customized reports and dashboards to satisfy the reporting and analytical needs of the hardware industry. This entails creating and setting reports that provide insights into key performance indicators, financial metrics, inventory levels, sales statistics, and other pertinent data.
- **Integration with Third-Party Systems** - Customization may entail combining the ERP system with other software applications or systems used by the hardware manufacturer. This facilitates easy data exchange and interoperability between the ERP system and external systems such as CRM (Customer Relationship Management), e-commerce platforms, or supply chain management solutions.
- **User Interface** - Modifications to the ERP system's user interface can be made to improve usability and user experience. This could include reordering menus, introducing shortcuts, or simplifying navigation to increase end-user efficiency and productivity.

3. Data Conversation and Loading

- **Data Assessment** - Examine the hardware company's data sources, such as inventory data, sales data, financial data, and personnel data. Determine the data's quality and integrity, then classify it based on its importance and relevance to the ERP system.
- **Data Mapping** - Define the mapping between legacy system fields and the appropriate fields in the ERP system. Map the SKU code from the inventory management software to the item code in the ERP system, for example, or map customer information from the sales database to the CRM module in the ERP.
- **Data Extraction** - Using appropriate means, extract the identified data from the legacy systems. Exporting data from databases, executing queries, or employing data export/import utilities supplied by legacy systems may be required. Take the required data and place it in a transitional or staging location.

- **Data Transformation** – Transform the extracted data to fit the ERP system's requirements. Cleanse and standardize the data, verify format and structure consistency, and validate the data against set rules. Converting data formats, restructuring data structures, and resolving any anomalies or inconsistencies may be included.
- **Data Loading** - Load the converted data into the appropriate ERP system modules. Fill in the blanks in the appropriate tables, paying attention to the established relationships and dependencies. Loading inventory data into the inventory management module, customer data into the CRM module, financial data into the financial module, and personnel data into the HR module are all part of this process.
- **Data Verification and Reconciliation** - To ensure the accuracy and integrity of the migrated data, conduct extensive verification and reconciliation processes. Check the loaded data against the original source data, do data validation tests, and reconcile any inconsistencies. Check that the data loaded matches the expected outcomes and fits the business criteria.

4. Configuration

Configuration is critical in tailoring the ERP system to the needs of the hardware company. The ERP system becomes a customised solution by modifying it through configuration, supporting the hardware company's unique business processes, improving operational efficiency, and providing accurate and timely information for decision-making.

- **System Settings** - Defining system-wide settings such as language preferences, currency formats, and time zones specific to the hardware company's activities would be part of the configuration process. These options ensure that the ERP system is operating in the correct regional and organizational context.
- **Organizational Structure** - Configuration would entail establishing the hardware company's organizational structure within the ERP system. Defining departments, divisions, and business units to reflect the company's hierarchy and linkages would be part of this. It offers precise reporting, access control, and data segmentation based on the organizational structure of the hardware company.
- **Master Data** - Configuration would entail creating the master data structure for the hardware company within the ERP system. This would require establishing data fields and structures for customers, suppliers, goods, and other hardware-specific entities. Master data configuration guarantees consistent and accurate data management, which is critical for inventory management, sales, procurement, and other parts of the hardware company's operations.
- **Workflows and Processes** - Configuration entails tailoring workflows and processes inside the ERP system to the hardware company's specific business processes. Setting up workflows for sales order processing, inventory management, procurement, and other critical operations is part of this. By setting these workflows, the ERP system may automate and optimize the business activities of the hardware industry, enhancing efficiency and accuracy.

- **Reporting and Analytics** - Configuration would include creating reporting structures and identifying key performance indicators (KPIs) within the hardware company's ERP system. This would entail identifying important data pieces and creating reports and dashboards to track sales performance, inventory levels, procurement activities, and financial measures. The hardware manufacturer can create valuable insights and make data-driven decisions thanks to configuration.
- **User roles and permissions** - Configuration would entail specifying user roles, access permissions, and security settings within the hardware company's ERP system. This guarantees that employees have access to data and functionalities that are appropriate for their roles and responsibilities. The hardware manufacturer can enforce data security and ensure data integrity within the ERP system by configuring user roles and permissions.

IV. Go-Live

This stage marks the shift from the development and configuration stages to the actual usage of the ERP system in the operations of the hardware company. The hardware ERP is implemented and made available to users during Go-Live. It entails actions such as final system testing, data migration, and ensuring the hardware company has the appropriate infrastructure and resources in place to begin using the ERP system.

1. **Conversion** - During the conversion phase, data is transferred from legacy systems or existing databases to the new ERP system. In the case of hardware ERP, this would entail transferring data from the old systems to the ERP system pertaining to customers, suppliers, products, inventory, and other pertinent information. To avoid disruptions in the hardware company's operations, the data conversion procedure must assure data integrity, precision, and consistency.

2. **Testing** - The testing step is critical for validating the hardware ERP system's functionality, performance, and dependability. Before the ERP system is fully implemented, various forms of testing, such as unit testing, integration testing, and system testing, are performed to discover and correct any errors or difficulties. Validating procedures relating to sales order management, inventory control, procurement, financial transactions, and other modules particular to the hardware company's activities would be part of testing in the context of the hardware ERP.

3. **Training** - Training is a crucial component of ERP deployment to ensure that users understand how to utilize the system and complete their responsibilities properly.

Training in the context of hardware ERP would entail organizing training sessions for personnel from various departments such as sales, procurement, inventory management, accounting, and human resources. The training would focus on familiarizing users with the ERP system's capabilities, processes, data entry, reporting, and any hardware-specific functionalities.

V. Operations

1. **Support and Ongoing Training** - After the hardware ERP system is installed and operational, it is critical to provide continuing support to users and address any difficulties or questions that may occur. This can be accomplished by a specialized support team or help desk, which is in charge of diagnosing and answering user questions about the ERP system. To maintain seamless operations, the support personnel should be well-versed with the hardware ERP functions and capable of offering prompt assistance. Furthermore, continuing training programs should be implemented to keep users informed of any system advancements, new features, or process changes. These training sessions assist users in maximizing their productivity and effectiveness with the hardware ERP system, as well as adapting to any changes or improvements.

2. **Patch and Upgrades** - As technology advances and new vulnerabilities emerge, it is critical to upgrade and patch the hardware ERP system on a regular basis. Patching entails installing software upgrades, security patches, bug fixes, and performance enhancements made available by the ERP vendor. These updates aid in the resolution of any known issues, the enhancement of system security, and the enhancement of overall system performance. Similarly, updates entail moving to newer versions of the hardware ERP software in order to benefit from updated features, improved functionality, and improved integration capabilities. Patching and upgrades are required to keep the hardware ERP system current, reliable, and consistent with the hardware company's developing demands. To prevent system interruptions, proper planning and testing should be performed prior to installing patches or executing upgrades.

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