Requirements Gathering Methods

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- Requirements gathering is a critical phase in the development of a data warehouse, as it sets the foundation for the entire project. In this, we will explore various methods and techniques for gathering requirements effectively.

Users of Data Warehouse:

- Before diving into requirements gathering methods, it's important to understand the users of the data warehouse:
- Senior executives (including sponsors)
- Key departmental managers
- Business analysts
- Operational system
- DBAs Others nominated by the above

- **Senior Executives (including sponsors):**
- Example: In an automotive company, the CEO and other C-suite executives are senior executives who would utilize the data warehouse for strategic decision-making. They might be interested in high-level insights such as overall sales performance across different regions, profitability analysis of different car models, and market trends to make informed decisions about expansion, marketing strategies, and investment priorities.

- **Key Departmental Managers:**
- Example: The sales manager of the automotive company mentioned earlier would be a key departmental manager. They might use the data warehouse to track sales performance metrics, analyze customer demographics to identify target markets, and monitor inventory levels to ensure efficient stock management. Additionally, the marketing manager might use the data warehouse to analyze the effectiveness of marketing campaigns and customer segmentation strategies.

- **Business Analysts:**
- Example: Business analysts in the automotive company would play a crucial role in analyzing data from the data warehouse to provide insights for decision-making. They might create reports and dashboards to visualize sales trends, identify patterns in customer behavior, and forecast future sales. For instance, they might analyze historical sales data to identify the factors influencing sales performance and recommend strategies for improving profitability.

- **Operational System DBAs (Database Administrators):**
- Example: DBAs in the automotive company would be responsible for maintaining and optimizing the data warehouse infrastructure. They would ensure the smooth functioning of the database systems, handle data backups and recovery procedures, and optimize queries for efficient data retrieval. For example, they might monitor database performance metrics such as query execution times, disk usage, and system resource utilization to identify and resolve performance bottlenecks.

- **Others nominated by the above:**
- Example: This category could include various stakeholders who are identified by senior executives, departmental managers, business analysts, or DBAs based on their specific expertise or involvement in the data warehouse project. For instance, it could include data stewards responsible for data quality, IT developers responsible for implementing data integration processes, or external consultants brought in for specialized expertise in data analytics or data visualization tools.

Requirements to Gather:

- Data elements: Fact classes, dimensions
- Recording of data in terms of time
- Data extracts from source systems
- Business rules: Attributes, ranges, domains, operational records

- **Data Elements:**
- Example: In a retail company, data elements might include sales transactions (fact), customer demographics (dimension), product categories (dimension), and store locations (dimension).
- Gathering requirements for data elements involves identifying the specific types of data that need to be collected and stored in the data warehouse to support various analytical queries and reporting needs.

- **Recording of Data in Terms of Time:**
- Example: In a healthcare organization, recording data in terms of time could involve capturing timestamps for patient admissions, discharge dates, and medical procedures.
- Gathering requirements for recording data in terms of time involves determining the granularity and frequency of time-related data needed for analysis, such as hourly, daily, or monthly aggregates.

- **Data Extracts from Source Systems:**
- Example: In a manufacturing company, data extracts from source systems might include production data from manufacturing equipment, inventory levels from warehouse management systems, and supplier information from procurement systems.
- Gathering requirements for data extracts involves identifying the specific data sources, formats, and frequencies required to extract data from operational systems into the data warehouse.

- **Business Rules:**
- Example: In a banking institution, business rules might include criteria for approving loans, credit scoring models, and compliance regulations for customer data privacy.
- Gathering requirements for business rules involves documenting the specific rules, constraints, and calculations that govern the processing and analysis of data within the data warehouse to ensure accuracy and compliance with regulatory standards.

- **Attributes, Ranges, Domains:**
- Example: In an e-commerce platform, attributes for product data might include price, color, size, and availability. Ranges and domains for customer data might include age ranges, income brackets, and geographic regions.
- Gathering requirements for attributes, ranges, and domains involves defining the allowable values, data types, and constraints for each data attribute to ensure consistency and integrity within the data warehouse.

Methods for Gathering Requirements:

- **Interviews:**
  - Conducted one-on-one or in small groups.
  - Suitable for intricate details and when users are comfortable with it.
  - Requires good preparation and pre-interview research.
- **Group Sessions:**
  - Groups of twenty or less persons.
  - Useful for confirming requirements, not ideal for initial data gathering.
  - Requires careful organization and baseline understanding of requirements.

- **1. Interviews:**
- **Example:** Suppose a software development company is building a project management tool. They conduct one-on-one interviews with project managers, team leads, and individual team members to gather requirements.
- During these interviews, they discuss specific features, user interface preferences, reporting needs, and integration requirements.
- For instance, in an interview with a project manager, they might delve into intricate details such as task dependencies, milestone tracking, and resource allocation preferences.
- Good preparation for the interview might involve researching common project management practices, understanding industry standards, and reviewing existing project management tools.
- Pre-interview research might also involve reviewing project documentation, such as past project plans and status reports, to identify potential areas for improvement or additional features.

- **2. Group Sessions:**
- **Example:** Continuing with the project management tool example, the software development company organizes a group session with a cross-functional team consisting of project managers, developers, testers, and customer support representatives.
- During this session, which includes twenty or fewer participants, they review the findings from individual interviews and solicit feedback on proposed features and functionalities.
- While the group session might not be ideal for initial data gathering, it serves as a valuable forum for confirming requirements, resolving conflicting priorities, and fostering collaboration among stakeholders.
- Careful organization of the group session involves setting a clear agenda, establishing ground rules for participation, and providing relevant background information to participants. Additionally, having a baseline understanding of requirements ensures that the discussion remains focused and productive, with participants building upon the insights gathered during individual interviews.

Interview Techniques:

- Conduct pre-interview research.
- Prepare interview questionnaires.
- Gather information about current information sources, subject areas, key performance metrics, and information frequency.

1. Pre-interview Research:

- **Example:** Suppose a retail company is planning to develop a customer relationship management (CRM) system.
- Before conducting interviews with stakeholders, the project team conducts pre-interview research to understand the company's current CRM practices, challenges, and goals. They review existing CRM systems, analyze customer feedback, and study industry trends to identify best practices and potential areas for improvement.
- For instance, they might research customer segmentation strategies, sales pipeline management techniques, and omnichannel integration approaches to gain insights that inform their interview questions and discussions with stakeholders.

Prepare Interview Questionnaires:

- **Example:** Continuing with the CRM system example, the project team prepares interview questionnaires tailored to different stakeholder groups, such as sales representatives, customer service agents, and marketing managers.
- Each questionnaire includes a mix of open-ended and structured questions designed to gather specific information about user requirements, pain points, and expectations for the new CRM system.
- For instance, they might ask sales representatives about their current process for managing leads and opportunities, their preferred features for tracking customer interactions, and any challenges they face in accessing customer data on-the-go.

- **3. Gather Information about Current Information Sources, Subject Areas, Key Performance Metrics, and Information Frequency:**
- **Example:** As part of the interview process, the project team gathers information about the retail company's current information sources, subject areas of interest, key performance metrics, and information frequency requirements.
- For instance, they interview sales managers to understand the types of data they currently use to track sales performance, such as revenue by product category, conversion rates by sales channel, and customer satisfaction scores. They also inquire about the frequency at which sales reports are generated, whether daily, weekly, or monthly, and any specific timeframes or deadlines for accessing critical sales data.

Joint Application Development (JAD) Methodology:

- A methodology for developing computer applications jointly by users and IT professionals.
- Involves discussion workshops under the direction of a facilitator.
- Consists of five phases: Project Definition, Research, Preparation, JAD Sessions, Final Document.

Example: Developing a Customer Relationship Management (CRM) System

- **1. Project Definition:**
- The project team, consisting of stakeholders from sales, marketing, customer service, and IT departments, gathers to define the objectives and scope of the CRM system project.
- They identify key functionalities such as lead management, contact tracking, and sales forecasting, as well as integration requirements with existing systems.

- **2. Research:**
- The project team conducts research to gather insights into customer relationship management practices, industry standards, and best practices.
- They review case studies, analyze competitor CRM systems, and study customer feedback to identify features and functionalities that align with organizational goals.

- **3. Preparation:**
- The facilitator of the JAD sessions prepares agendas, presentation materials, and discussion topics for the upcoming workshops. They coordinate with stakeholders to ensure that all relevant parties are informed and available to participate in the JAD sessions.
- **4. JAD Sessions:**
- The project team conducts multiple JAD sessions, bringing together users and IT professionals in collaborative workshops to discuss requirements, design options, and implementation strategies for the CRM system. During these sessions, stakeholders brainstorm ideas, prioritize features, and resolve any conflicting requirements or concerns.

- **Example Scenario:**
- In one JAD session, sales representatives express the need for a user-friendly interface with customizable dashboards for tracking leads and opportunities. They provide input on the specific data fields and reporting metrics they require for effective sales management.
- Meanwhile, IT professionals share insights into data integration challenges and technical considerations for building the CRM system, such as scalability, security, and compliance requirements.
- Through collaborative discussions and iterative feedback, the project team iteratively refines the CRM system requirements and design, ensuring that it meets the needs of both users and technical stakeholders.

- **5. Final Document:**
- Following the JAD sessions, the project team compiles all gathered requirements, design decisions, and action items into a final document. This document serves as a comprehensive blueprint for the CRM system project, outlining its scope, objectives, functionalities, and implementation plan.

Review of Existing Documentation:

- Review reports, screens, processes, and procedures used by users.
- Augment findings from interviews with information from IT, including data dictionaries and data structures.

Example: Enhancing Inventory Management System

- **1. Review Reports, Screens, Processes, and Procedures Used by Users:**
- The project team is tasked with enhancing an existing inventory management system used by a retail company. They begin by reviewing reports, screens, processes, and procedures currently in use by warehouse managers, inventory clerks, and other end-users.
- They analyze existing inventory reports generated by the system, such as stock levels, and inventory turnover rates. They also examine user interfaces and screens used to input and retrieve inventory data, including barcode scanning functionality and data entry forms.
- Additionally, the project team reviews the existing processes and procedures for inventory management, including receiving shipments, storing inventory in designated locations, and fulfilling customer orders.

- **Example Scenario:**
- During the review process, the project team identifies inefficiencies in the current inventory replenishment process, where manual intervention is required to reorder stock once it reaches a predefined threshold. They also observe that warehouse managers struggle to quickly locate specific items within the warehouse due to inconsistent labeling and storage practices.

- **2. Augment Findings from Interviews with Information from IT:**
- To supplement their findings from user interviews, the project team collaborates with IT professionals responsible for maintaining and supporting the inventory management system.
- They gather additional insights from data dictionaries, system documentation, and data structures to gain a deeper understanding of the underlying architecture and technical constraints.

- **Example Scenario:**
- The project team meets with database administrators (DBAs) and system architects to review the data model and database schema of the inventory management system. They examine data tables, fields, and relationships to understand how inventory data is stored and accessed within the system.
- Additionally, they discuss integration points with other systems, such as the company's e-commerce platform and accounting software, to ensure seamless data flow and synchronization across different business processes.

Example

- By consulting IT professionals, insights from user interviews are enriched with technical knowledge such as database structure and constraints. For instance, identifying slow performance in the inventory system prompts optimization efforts in indexing, resulting in improved efficiency.