Q. Explain user requirement analysis and its processes in data warehousing and explain the methods used including interviews , glossary based requirement analysis and addressing additional requirements.

1. Understanding Requirement Analysis in Data Warehousing

Requirement analysis in data warehousing aims to capture and define what end users need from the data mart or warehouse. This process is essential because it helps ensure the final data warehousing solution aligns with business goals and effectively supports data-driven decision-making.

Importance of Requirement Analysis:

- Establishes the goals and limitations of the project.
- Aims to reduce ambiguities, incomplete information, and unclear requirements, which can lead to failures.
- Helps address the challenges of long-term projects, where requirements may change as the business evolves.

Challenges:

- Projects are often long-term, making it difficult to identify and arrange all requirements from the start.
- Requirements may be unclear or evolve over time, needing periodic review and adaptation.

2. Methods of Requirement Analysis

a. Interviews

Interviews are a primary method in requirement analysis, enabling direct interaction with end-users to understand their data needs. The goal is to gather information that will help shape the data warehousing solution to meet user needs precisely.

Pre-Interview Activities:

- **Research**: Understand the context of the users and their needs to guide the interview's direction.
- **Interviewee Selection**: Identify a representative sample of end users who can provide relevant insights into the data requirements.
- **Question Development**: Develop questions not as rigid questionnaires but as guidelines to keep the conversation productive.
- **Scheduling**: Arrange interviews, starting with key project sponsors.
- **Preparation**: Prepare with an internal meeting to clarify interview goals and plans.

Types of Questions asked:

1. **Open-Ended Questions**:

i. Encourage broad, detailed responses, enabling the interviewer to explore different aspects of data requirements.
ii. Example: "What are the key objectives for your unit, and how do you use data?"
iii. *Advantages*: Helps explore ideas and lets interviewees express themselves freely.
iv. *Disadvantages*: Responses may be lengthy, making analysis challenging and potentially causing the discussion to drift off-topic.

2. Closed Questions:
i. Gather specific, often binary (yes/no) responses that clarify particular details.
ii. Example: "Do you need reports daily or weekly?"
iii. *Advantages*: Keeps focus on specific details and saves time.
iv. *Disadvantages*: Can feel restrictive if overused, limiting deeper insights.

3. Evidential Questions:
i. Ask interviewees for real-life examples, ensuring the requirements are grounded in practical use.
ii. Example: "Can you provide an example of a reporting challenge you face?"
iii. *Advantages*: Assesses the interviewee's knowledge and ensures requirements are based on actual needs.
iv. *Disadvantages*: Can put interviewees on the spot, making them feel pressured.
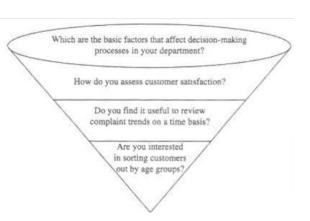
Interview Structures:

1. Pyramid-Shaped Structure:

- Starts with closed questions to gather specific details, then expands to open-ended questions.
- Helps build a broad understanding of goals, perspectives, and needs.

Do you find it interesting to display which stores sell products at higher prices than average?

Which additional features to add to sales are you interested in?

Is there any additional information that may be useful for decision-making purposes?

How do you think data warehousing techniques will be useful for you department?

2. Funnel-Shaped Structure:

- Begins with open-ended questions to explore the general landscape, then narrows down with closed questions for specific information.
- Ideal for gathering focused, detailed requirements and ensuring interviewees feel at ease.

Which are the basic factors that affect decision-making processes in your department?

How do you assess customer satisfaction?

Do you find it useful to review complaint trends on a time basis?

Are you interested in sorting customers out by age groups?

These structures allow interviews to be tailored based on the project phase and ensure data warehousing requirements are both comprehensive and focused.

b. Glossary-Based Requirement Analysis

This informal approach uses glossaries to define key terms, which helps prevent misunderstandings about data terminology. It is particularly useful when a data-driven design is required, and it ensures consistency in communication between users and developers.

Key Components:

1. **Deviation Table**:
    *   Tracks differences in terminology or data formats across departments, ensuring consistency.
    *   Example: Captures differences like date formats (e.g., MM/DD/YYYY vs. DD/MM/YYYY) or codes (e.g., USD for US Dollars).
    *   *Purpose*: To avoid miscommunication and standardize data elements across the data warehouse.
2. **Usage Table**:
    *   Documents how different data terms, metrics, or elements are used across the organization.
    *   Example: A term like "Customer ID" might be defined and used differently in sales and finance.
    *   *Purpose*: Helps align definitions and usage across departments, so everyone uses data elements in the same way(ilide.info-lec-4-user-r…).

3. **Benefits**:

    *   Reduces ambiguity by clarifying key terms.
    *   Ensures that data elements are consistently used throughout the organization.
    *   Supports communication between users and analysts, especially when users from different departments may interpret data differently.

c. Goal-Oriented Requirement Analysis

This approach focuses on aligning the data warehousing project's goals with organizational objectives, ensuring that the requirements gathered will directly support business outcomes.

*   **Process**: Defines clear, measurable, and achievable goals and ensures that all requirements align with specific project objectives and that all outcomes are trackable.
*   **Benefits**: Helps prioritize requirements by focusing on goals that will have the most impact on the organization and ensures that every requirement supports the larger objectives of the data warehousing initiative.

3. Addressing Additional Requirements

Additional requirements often emerge during later phases of a data warehousing project, as the initial phases may not fully cover all technical needs. These additional requirements include:

- **Logical and Physical Design**: Setting up the architecture and structure of the data warehouse.
- **Data Staging Design**: Preparing and cleaning data before it enters the data warehouse.
- **Data Quality**: Ensuring that data meets quality standards for accuracy and consistency.
- **Data Warehouse Architecture**: The structural foundation of the data warehouse, guiding how data is stored and accessed.
- **Data Analysis Applications**: Tools and applications used to analyze the data.
- **Startup Schedule and Training Schedule**: Ensuring that end-users know how to access and use the data warehouse.