TASK 61C

Estimation Method

SWE30010 - Managing IT Projects

Class: Fri 08:00 DT7.2 **- Tutor:** Pham Thi Kim Dung

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Backlog item selected: Design database schema (Sprint 1)

Task	Estimated Effort	Justification
Identify data requirements	60 minutes	This task involves a thorough understanding of the data stored in the database, what implication of business they will be used for, and the user personas who will be using it (customers and site admins). The task requires gathering information from stakeholders and reviewing any existing documentation. The estimated effort is based on the time necessary to collect and analyse all data requirements, as complex systems will transaction handling, and diverse stakeholders will result in more time allocation.
Define entities and relationships	90 minutes	This task involves identifying the entities (tables) needed to store the data and their relationships. For OutSystems, we must also identify static entities and their records, which resemble the Enumeration (Enum) data type in high-code programming languages. Delete rules, auto-indexing, and unique keys are other considerations when working with an OutSystems database. The entities will be represented using a data model diagram. The complexity of an extensive schema or intricate relationship will require more time to define.
Normalise the schema	60 minutes	This task ensures that the database schema is efficiently defined with minimal redundancy. The task includes removing duplicate data records and columns, splitting tables into smaller tables, removing many-to-many relationships, and creating foreign keys (FKs). The effort required depends on the normalisation level and the data's complexity. A denormalised schema with more redundancy requires additional effort to normalise effectively.
Document the schema	30 minutes	This task involves documenting the database schema clearly and concisely so that other team members and future maintenance teams can easily understand it. We aim to create a Database definition spreadsheet with the entity diagram and description of the tables and their rows, columns, and relationships. The level of detail our documentation requires will determine the effort needed for this task.

Figure 1: WBS

Total estimated effort: 4 hours

Reasoning:

The estimated effort for each task is based on the task's complexity and the team's experience. The following factors were considered when making these estimates:

1. **Volume of Data**: The large amount of data to be stored can profoundly impact the effort required for our database design task. Handling large volumes of data from concurrent users may require other considerations, such as partitioning, sharding, or multiple modules to simulate a distributed database system.
2. **Data Integrity Requirements**: Enforcing constraints, validation rules, and custom data types will be required to ensure the data integrity of the database. Creating additional database exceptions for data validation and maintaining consistency will take a reasonable amount of time.
3. **Integration with External Systems**: To work with third-party APIs, we require extra effort to design and implement data exchange mechanisms and protocols, handle data conversion, and ensure system compatibility.
4. **Data Access Patterns**: After reading documentation and stakeholder requirements, we need to apply our understanding of how users and applications will access and manipulate data. Creating pacific access patterns, such as frequent read operations or complex querying requirements, requires additional effort to maximise performance.
5. **Regulatory Compliance**: Working with sensitive customer data requires the development team to comply with industry-specific standards like HIPAA or GDPR and may impose additional requirements with encryption, auditing, or anonymisation.
6. **Scalability Requirements**: As editing the database schema in production will be costly and time-consuming, getting the scalability requirements upfront, which includes vertical scaling and cache setting for each table, is compulsory.
7. **Collaboration and Communication Overhead**: It may take more time and effort to collaborate with stakeholders, communicate design decisions, and take comments into account. It may be necessary to have repeated talks and adjustments to ensure alignment between the database schema design and stakeholders' expectations.
8. **Tooling and Technology Stack**: Efficiency in database design and development can be influenced by the team's familiarity with the database management system (DBMS) and related tools. The projected time required for tasks like documentation, performance optimisation, and schema normalisation may vary depending on the learning curve related to new technologies or tools. As OutSystems is a relatively new tool, the needed time for our development team may increase.