Software Engineering I

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Chapter 4
Functional Modeling(V)

Steps(I)

1. Preparing proposal
2. Requirements determination
   - User story
3. Abstract Business Process Modelling
4. Analysis
   - Functional Modelling
   - Structural Modelling
   - Behavioral Modelling

Steps(II)

5. Design
   - Optimization
   - Database Management
   - User Interface
   - Physical Architecture

Verifying and Validating Functional Models

- **Walkthroughs:** is essentially a peer review of a product. In the case of the functional models, a walkthrough is a review of the different models and diagrams created during functional modeling.
- The purpose of a walkthrough is to thoroughly *test* the fidelity of the functional models to the functional requirements and to ensure that the models are consistent. That is, a walkthrough uncovers *errors* or *faults* in the evolving specification.

Walkthrough

- Walkthroughs are very interactive. As the presenter walks through the representation, members of the walkthrough team should ask questions regarding the representation.
- For example, if the presenter is walking through an activity diagram, another member of the team could ask why certain activities or objects were not included.
- The actual process of simply presenting the representation to a new set of eyes can uncover obvious misunderstandings and omissions.

Roles

- There are specified roles that different members of the walkthrough team can play.
- *Presenter:* should be played by the person who is primarily responsible for the specific representation being reviewed.
- *recorder,* or *scribe*: should be a member of the analysis team. This individual carefully takes the minutes of the meeting by recording all significant events that occur during the walkthrough. In particular, all errors that are uncovered must be documented so that the analysis team can address them.

Functional Model Verification and Validation

- First, when comparing an activity diagram to a use-case description, there should be at least one event recorded in the normal flow of events, subflows, or alternative/exceptional flows of the use-case description for each activity or action that is included on an activity diagram, and each event should be associated with an activity or action.
- Second, all objects portrayed as an object node in an activity diagram must be mentioned in an event in the normal flow of events, subflows, or alternative/exceptional flows of the use-case description.
- Third, sequential order of the events in a use-case description should occur in the same sequential order of the activities contained in an activity diagram.

Functional Model Verification and Validation(Cnt’d)

- Fourth, when comparing a use-case description to a use-case diagram, there must be one and only one use-case description for each use case, and vice versa.
- Fifth, all actors listed in a use-case description must be portrayed on the use-case diagram. Each actor must have an association link that connects it to the use case and must be listed with the association relationships in the use-case description.
- Sixth, in some organizations, we should also include the stakeholders listed in the use-case description as actors in the use-case diagram.
- Seventh, all other relationships listed in a use-case description (include, extend, and generalization) must be portrayed on a use-case diagram.

Reference

- **Dennis, Wixon, Tegarden**, "**System Analysis and Design, An Object Oriented Approach with UML", 5th Edition, 2015.**