

Indian Institute of Technology, Kharagpur

Department of Computer Science and Engineering

Class Test 2, Spring 2014-15

Software Engineering (CS 20006)

Students: 135

Full marks: 40

Date: 08-Apr-15 (AN)

Time: 1 hour

Instructions:

1. Marks for every question is shown with the question.
 2. No clarification to any of the questions will be provided. If you have any doubt, please make suitable assumptions and proceed. State your assumptions clearly. While making assumptions, be careful that you do not contradict any explicitly stated fact in the question.
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1. A Newspaper House publishes daily newspaper and wants to manage its activities through a **Story Management System (SMS)**. You are to develop the **SMS**. The requirements specification of the system is given below. Read the specifications carefully, analyse the requirements, and design the following aspects of the system using UML and DP.
 - (a) Identify the use-cases and design suitable Use-Case Diagrams for **SMS**. Highlight the relationships amongst the actors and the use-cases. [5]
 - (b) Design Class Diagrams for *Story*, detailing the attributes and operations with their properties. [5]
 - (c) Show the State-chart Diagram for a *Story* as it passes through the **SMS**. [5]
 - (d) Show all other classes / objects (in addition to Question 1b) by brief Class Diagrams (with name and key attributes). For the entire collection of classes (that is, including *Story*) show the associations, aggregations/compositions, generalization/specialization, and abstract/concrete etc. [10]
 - (e) Design suitable Sequence Diagrams for use-cases arising from *Submit* (of *Reporter*), *Review* (of *Manager*), *Revise* (of *Reporter*), and *Approve* (of *Manager*) actions. [10]
 - (f) Choose appropriate Design Patterns for your design. Briefly justify your choice. [5]

Requirements Specification for Story Management System (SMS)

- (a) The staff structure of the Newspaper House is as follows:
 - *Editor*. The *Editor* is responsible for the overall activities and directly manages the *Editorial Division*.
 - *Associate Editors*. Every *Associate Editor* is responsible for a *Division* and reports to the *Editor*. No *Associate Editor* manages more than one *Division*.
 - *Reporters*. Every *Reporter* works for a *Division* and reports to the corresponding *Associate Editor*. *Reporters* working for the *Editorial Division* reports directly to the *Editor*.Every employee is identified by the *Employee Code*, and has *Name*, *Email* and *Mobile Number*.
- (b) The Newspaper House has 3 *Divisions*:
 - *Editorial Division*: This publishes the *Editorial* expressing the views of the Newspaper House, *Special News Items* and the *Letters from Readers*.
 - *News Division*: This publishes stories on national and international news. A story here is political, social or economic in nature.

- *Features Division*: This publishes national and international feature stories in art, culture, cinema, sports, and the like. A story here is an entertainment event report, critique, celebrity interview, match report, team analysis, or statistics.

Every *Division* has a *Manager*. With the exception of the *Editorial Division*, every *Division* is managed by an *Associate Editor*. The *Editorial Division* is managed directly by the *Editor*.

(c) At the Newspaper House a *Reporter* needs to:

- *Collect*: A reporter goes to places or liaison with external agencies to collect news items.
- *Compose*: A collected news item is cast in the form of a story.
- *Submit*: A completed story is submitted to the corresponding *Manager*.
- *Revise*: Up on review, if the *Manager* desires, the story is revised and re-submitted.

(d) At the Newspaper House the responsibilities of an *Associate Editor* include all responsibilities of a *Reporter*. Naturally she / he can report their own stories. In addition, an *Associate Editor* needs to:

- *Review*: A story submitted by a reporter (of the *Division*) needs to reviewed and edited. Up on review, the *Associate Editor* may request the *Reporter* to revise and re-submit.
- *Approve*: A submitted story may and may not be approved – with or without revision.
- *Paginate*: Compose the day's page/s with the approved stories of the *Division*.

(e) At the Newspaper House the responsibilities of the *Editor* include all responsibilities of an *Associate Editor* (and hence those of a *Reporter*). In addition, the *Editor* needs to:

- *Edit*: Manage the *Editorial Division*, write the editorial, and set & comply with the policies for the Newspaper House.

(f) A *Story*:

- Is a piece of text for publication in the newspaper.
- Has title, place, date-time, sources (optional), and reporter / associate editor (optional).
- Is of a type that matches the *Division* in which it is published.
- Has a nature as specified above under different *Divisions*.

(g) The *Work flow* in the Newspaper House is as follows:

- A *Reporter* collects a news item from primary lead, secondary agency or continuity of events. She / he explores the details and prepares the facts.
- The *Reporter* then composes the facts in terms of a *Story* filling in the necessary and auxiliary parts.
- Once composed, the *Reporter* submits the *Story* for review.
- The *Manager* of the *Division* retrieves the submitted *Story* and takes one of the actions as follows:
 - Review & edit and approve the *Story* for publication.
 - File review comments on the *Story* for the *Reporter* (who wrote the *Story*) to make revisions. The *Reporter* then revises the *Story* and submits again for review.
 - Review and disapprove the *Story*. This *Story* will not be published.
- Once the cut-off time for the day is over, the *Associate Editor* of the *Division* will preview the approved stories and prepare the page/s for the *Division*. Stories selected for a day during pagination are marked published and will not be selected again. Other stories continue to remain in **SMS** for possible publication in future.
- The *Editor* reviews the page/s for compliance to the policies of Newspaper House. If a *Story* is found to be non-compliant, the *Editor* may ask the corresponding *Associate Editor* to revise or replace the *Story*.
- Once all stories become compliant, the *Editor* adds the *Editorial* and orders publication.
- The newspaper goes to press.

Every action in **SMS** generates notification (by email) to all concerned stakeholders.