

University of Toronto

Department of Computer Science

CSC340S - Information Systems Analysis and Design

March 14, 2003

John Mylopoulos

Assignment 3: Detailed Design for an Information System

Due Date: 12:00midnight Friday April 11, 2003

This assignment counts for 15% of the final grade

This assignment is to be undertaken by students working in teams of three. Teams of two will be allowed when no third member is available.

The Assignment

The objective of the assignment is to give you practice in doing a detailed design for the information system you have been working on for assignments 1 and 2. The detailed design should include selecting hardware, networking and software for the new system, designing a global architecture, proposing a detailed software architecture, also defining a relational database schema and suitable I/O procedures and interfaces.

Directions: This assignment consists of eight steps:

1. Adopt the requirements specification of assignment 2. You may want to revise it on the basis of the comments you received from the marker.
2. Define a global system architecture, consisting of computer networks (existing or new), hardware (existing or new) and software platform (operating system, other commercial software you will be using for your system).
3. Select hardware, software and networking to be purchased for the new system. Specify clearly the criteria and alternatives you are using for your decision.
4. Propose a software architecture for the new system and justify your choice.
5. Based on the general design you have proposed, design the database schema for the database component of your system. Take into account workloads in proposing a relational database schema. Use both class diagrams and ER diagrams to describe the contents of your database before you generate a relational schema.
6. Design I/O procedures and user interfaces.
7. Do a detailed design of the classes that are part of your system using class, interaction and state diagrams.
8. Write a report that describes the complete system design. The report should include as an appendix the requirements specification on which your design was based, along with a careful account of how all requirements (functional and non-functional) were addressed in your proposed design.

What to Hand In

Please submit your assignment electronically by the assignment deadline by visiting the CDF electronic submission system at <http://www.cdf.toronto.edu/students/submit.html>. Also hand in a hardcopy to the instructor's office on Friday April 11, or on Monday April 14.

There is no limit on the length of the report that you have to hand in. It is suggested however, that you turn in a report of reasonable length, sufficient to convince the marker that you have done a good job, without boring him/her.

CSC340S Asst3 - Information System Design

Detailed Marking Scheme

Marker:

Team: _____

Total Marks: _____/101

Marks for this assignment depend on the factors listed below.

A: Global Architecture (20%). Description and justification of the hardware, networking and software platform selected for the design; also, description and justification of the software architecture adopted.

Value 20

marks: _____

- Specification of the computer network (existing or new)
() insufficient () partially sufficient () adequate
- Specification of the hardware (existing or new)
() insufficient () partially sufficient () adequate
- Specification of the software platform (operating system and other commercial software you will be using for your system)
() insufficient () partially sufficient () adequate
- Specification of the software architecture, for example, client-server, MVC, layered, etc
() insufficient () partially sufficient () adequate
- Identification of sub-systems and major components
() insufficient () partially sufficient () adequate
- Justification that the overall design meets all requirements
() insufficient () partially sufficient () adequate

B: Program Design (21%). A description of the detailed design of the application component of the system, given in terms of class, sequence, and state diagrams.

Value: 21

marks: _____

B1. Class Diagrams (7%)

Value: 7

marks: _____

- (Informal) Description of class diagrams, including a data dictionary.
☐ insufficient ☐ partially sufficient ☐ adequate
- Quality of the diagrams
☐ Little understanding of class diagrams.
☐ Some understanding, but there are serious flaws or omissions.
☐ Reasonable diagrams, but not enough to capture the design of the application and/or there is missing information from some diagrams, e.g., attributes, operations, multiplicities
☐ Good and complete diagrams, cover pretty well the design
☐ Excellent work
- Justification that the design meets relevant requirements
☐ insufficient ☐ partially sufficient ☐ adequate

B2. Sequence Diagrams (7%)

Value: 7

marks: _____

- (Informal) Description of sequence diagrams.
☐ insufficient ☐ partially sufficient ☐ adequate
- A description derived from the data dictionary was included.
☐ yes ☐ no
- Quality of the diagrams
☐ Little understanding of sequence diagrams.
☐ Some understanding, but there are serious flaws or omissions.
☐ Reasonable diagrams, but not enough to capture the design of the application and/or there is missing information from some diagrams, e.g., conditional branching or terminations
☐ Good and complete diagrams, cover pretty well the design
☐ Excellent work
- Justification that the design meets relevant requirements
☐ insufficient ☐ partially sufficient ☐ adequate

B3. Statechart Diagrams (7%)

Value: 7

marks: _____

- (Informal) Description of statechart diagrams.
() insufficient () partially sufficient () adequate
- A description derived from the data dictionary was included.

() yes () no
- Quality of the diagrams
() Little understanding of statechart diagrams.
() Some understanding, but there are serious flaws or omissions.
() Reasonable diagrams, but not enough to capture the design of the application and/or there is missing information from some diagrams, e.g., events, conditions and actions for various transitions
() Good and complete diagrams, cover pretty well the design
() Excellent work
- Justification that the design meets relevant requirements
() insufficient () partially sufficient () adequate

C. Database Diagrams (20%)

Value: 20

marks: _____

- Class and ER diagrams describing all data to be stored in the database, along with identifiers and other constraints
() insufficient () partially sufficient () adequate
- Workload data (expected number of instances for different classes, frequency of most important operations)
() insufficient () partially sufficient () adequate
- Restructuring of the class diagram
() insufficient () partially sufficient () adequate
- Generation of the relational schema
() insufficient () partially sufficient () adequate
- Normalization of the schema
() insufficient () partially sufficient () adequate
- Justification that the design meets relevant requirements
() insufficient () partially sufficient () adequate

D. User Interface Design (20%). Covers the design of all user interfaces to be supported by your system.

Value: 20% **marks:** _____

- Clear description of the different user groups
() insufficient () partially sufficient () adequate
- State diagrams describing the dialogues supported by the interface
() insufficient () partially sufficient () adequate
- Mockups of windows
() insufficient () partially sufficient () adequate
- Website design (if relevant)
() insufficient () partially sufficient () adequate
- Input/Output design
() insufficient () partially sufficient () adequate
- Justification that the interface design meets relevant requirements
() insufficient () partially sufficient () adequate

E. Supporting Documentation (10%). Supporting documentation for the selections you made for hardware, software and networking (eg, prices, configurations, vendors considered,...), meetings with your customer (if any), meeting among team members, supporting evidence for some of your design decisions,...

Value: 10 **marks:** _____

F. Presentation (10%): The style of your presentation, including language, grammar, clarity, organization of appendices, etc.

Value: 10 **marks:** _____

F1. Language: Deduction of marks for each spelling or grammatical error.

Value: 5 **marks:** _____

F2. Style and clarity: Deduction of marks for each unlabeled figure or point of confusion, or missing style requirement (e.g., table of contents, proper title page, page numbers, introduction, conclusion, etc.).

Value: 5 **marks:** _____