National Exams

04-Soft-A5, Requirements and Specifications

3 hours duration

Notes:

1. If doubt exists as to the interpretation of any question, the candidate is urged to submit with the answer paper, a clear statement of any assumptions made.

2. This is an OPEN BOOK EXAM. Any non-communicating calculator is permitted.

3. Answer five or six of the seven questions. Questions 2 and 4 must be answered. The marks of each question are indicated between brackets in the question title. A complete paper, depending on question selection, would total 100 marks.

4. Most questions are open-ended and require an answer in essay format. Clarity and organization of the answer are important. Clearly identify the question (e.g., "2.3").

Throughout this examination, we will make use of a hypothetical product, described briefly in the box below. We will focus primarily on the software aspects of this device and not the associated hardware and network infrastructure.

IseeFin:
An Investment Club (IC) Financial Management tool

We envisage developing a software tool (code name IseeFin)to support *Investment Clubs (IC)*. An investment club is a group of persons (typically 4 to a few dozens) who pool their financial resources (i.e., cash) in order to acquire and manage *collectively* a portfolio of securities (such as stocks, or bonds, or other publicly traded financial instruments). Clubs are often organized as limited partnerships, and have a bank checking account as well as one or more web-based on-line brokerage accounts (e.g., ETrade). One member is in charge of doing the actual trades; another one of managing the treasury.

Key Features of IseeFin:

- A web-based tool, hosted in the "cloud", supporting any number of clubs.
- Variable members contributions, based on the concept of an IC "unit", similar to that of a mutual fund. The initial unit price is small enough to allow flexible member contributions (e.g., $10).
- Members buy and sell units of the club and can therefore join and leave the club at any time.
- Members use the tool over the internet: club holdings and individual members' valuation published on web, but restricted to members
- Support for tax reporting, adjustable by country (e.g., T5 form in Canada, Form 1065 in the USA) as usually clubs are limited partnerships, hence "flow through" entities from a tax perspective. (This could be our main selling point!)
- Multiple currencies: clubs often use 2 or more trading accounts, US *and* Canadian dollars, or British pound *and* Euros.
- Configurable set up for each club: name, appearance, access rules, initial unit price.
- More advanced features would later include: synchronization with the clubs' bank account and on-line trading account; a member belonging to more than one club; various graphs.

More info:

Market: There are 4,700 active IC in the USA and 390 in Canada. Estimates are harder to derive for Europe due to market fragmentation: probably only about 1,200. The concept is starting to develop in Asia, China in particular. No data is available for other parts of the world.

Competition: A program sold by the US federation of IC, for $270 (US) used by 20-25% of the clubs. It has an antiquated user-interface (DOS like), a rigid set up, very hard to use and no easy support for tax reporting; it is very US-specific; no multiple currencies; no concept of "unit" (Net asset value). A smaller US tool is $119, but it too has limited functionality. A third one is costly: $119.99 per member. Other clubs do it "manually" (from a paper register to some flat files: Excel etc.). In the UK, ShareScope costs £79.95 per member plus £14 per month subscription. A few big clubs use a professional accountant and its software.

Questions

1. **Stakeholders and eliciting detailed requirements** [15/100]
   1.1. Who are the main stakeholders for the development of IseeFin?
   1.2. How would you proceed to elicit from them their needs, constraints, demands?
   1.3. Imagine what could be the main concern(s) for each class of stakeholders?

2. **Functional requirements and use-case model** [25/100]
   2.1. Explain what is a functional requirement.
   2.2. Briefly define what is a use case, and a use case model.
   2.3. Identify *actors* for IseeFin, and give a short description for each
   2.4. Identify *use cases* for IseeFin. For each use case, give a title and a brief description (2 to 5 lines each).

3. **Use cases** [25/100]
   3.1. Out of your list of use cases (2.4), select 2 critical ones, and provide a more detailed use case description.
   3.2. What additional technique (graph, table, etc.) could you use to complement such use cases?

4. **Non functional requirements** [25/100]
   4.1. Explain what is a non functional requirement.
   4.2. How do non functional requirements map to a use-case model?
   4.3. Identify (or imagine) non functional requirements for IseeFin (capacity, security, accuracy, usability, language, etc., etc.)
   4.4. How do these non functional requirements relate to the 2 use cases you described in question 3.

5. **User experience** [10/100]
   5.1. What technique(s) could you use to specify the user interface of IseeFin?
   5.2. How would you validate these specifications?

6. **Validation** [15/100]
   The requirements document for IseeFin will be developed competitively by separate off-shore software development organizations and you will evaluate them.
   6.1. Outline a check-list of objective criteria you will use to proceed to this evaluation. (Hint: remember questions 1.3, 2.4 and 4.3).

7. **Release planning** [10/100]
   7.1. Time-to-market being a key driver, IseeFin will be released iteratively. What strategy will you use to prioritize the features?
   7.2. Give a possible release definition for the first 3 releases.