

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.