Requirements Engineering– Spring 2018
Homework Assignment #2
Due: March 25, 2018

Assignment Topics:

- **Text-based Requirements Specification Documents**

Part 1: Developing a Vision Document

Background

- Recall that the primary benefits of a text-based (i.e., natural language) requirements representation:
  - Text is highly expressive; there are few requirements that cannot be described in text.
  - Text is usually the preferred representation for capturing content from requirements acquisition sessions since interviews yield a Q&A or transcript format (i.e., text is appropriate for recording discourse).
  - Text is flexible, allowing the same set of requirements to be arranged and presented in different ways.
  - Because everyone understands text, text can be read and understood by almost any audience (i.e., different stakeholders).

- However, the benefits of text are also its drawbacks:
  - Expressiveness and flexibility often result in ambiguity; natural language is not a concise, formal representation that can be evaluated mathematically for completeness and correctness.
  - While text is informal, code is highly formal; therefore there may be a considerable leap in transitioning from the requirements described in text to the software code that is to embody those requirements.
  - Text may *say* what the customer said, but it does not necessarily capture the spirit of the customer's wants and expectations ("Requirements Gap").
  - Given ambiguities and requirements gaps, verification and validation (V&V) are difficult and not an exact science.

- Net result – use the power of text, but constrain language and format to reduce ambiguity (i.e., via a template).

Instructions

- Using the paragraph below that describes requirements for a Course Registration System, create a Course Registration Vision Document that adheres to the structure and content of a Vision document described in class.

Requirements Description for a Course Registration System

The following description outlines current procedures for registration and payment within a continuing education department at a local university. The information provided captures some of the department personnel's current procedures to be automated within a planned computer-based registration and accounts receivable system to support administrative personnel in the department.

These requirements were gathered at an interview with potential users, Inc., whose niche is educational software. Acme has identified a potential business opportunity in providing customizable course registration systems for large universities. By offering a continuing education registration system product, Acme will complete their educational product line, allowing them to become the dominant player in the educational market.

Continuing education for professionals is a must to keep abreast of the current but ever-changing technology. At University X, professional students register in the university's Continuing Education Program (CEP) each August for the Fall semester, each December for the Spring semester and each May for the Summer session. Policies on admission and registration are published by the university in the University Policies Manual. To take a class, students must live in Texas, work in Texas, have a high school diploma, and pass an entrance exam with a score greater than 75. When the given registration period begins at the beginning of the month (August, December, or May), students are given 2 weeks to register and must pay for their tuition during the registration period. Payment in cash, credit card or check is accepted. No financial aid is provided. To register for a class, the student must determine the course to take, make sure the course schedules do not conflict with work, receive approval from work, and receive acceptance from the continuing education admissions office. If a student's registration is in progress and the administrator does not receive approval from the student's employer, the administrator cancels the student's registration. Most people take continuing education course to acquire knowledge or update their knowledge in a given area. A degree plan is not relevant.

Once registration is approved by an authorized department supervisor, payment is requested. According to the 2014-2015 Fee Publication promulgated by the legislature and the university, tuition and fees are $1000 per course. If payment is not received by the end of the registration period, the student's registration is cancelled. A complete payment record will indicate the student name, payment amount, type of payment, payment receipt confirmation number, and confirmation date. The student's registration file will specify the student's course schedule and semester enrolled. A course schedule includes the name, date, time and room

number of each course the student is taking. Students are not allowed to take more than 3 courses in a given semester.

On the last day of enrollment, department personnel access the current enrollment for each class to determine the amount of income for the upcoming semester. If income is greater than cost, all courses will be offered. If income is less than costs, some courses will be cancelled. Once the registration period is over, the primary duties for the registration and accounts receivable system are complete.

Since the registration time is brief and many students are seeking to take courses in the department, the system will be used by a number of department personnel during this peak usage time. During this peak time, users expect (and the University demands) no more than 2 seconds per transaction request. The department personnel will be using the system and accessing professional student files from terminals throughout the building. At their computer screens, they would like to be able to readily access either the registration or payment service by clicking on a respective icon. Additional departmental personnel in student counseling offices and alumni relations may wish to access the data base of student records in the future.

The university currently operates a SQL Server registration system developed in house. University administration has emphasized that the department does not have a great deal of money at this time and intends to implement a minimal core set of functionality with the intention to extend the system with many additional services in the future; the university will not negotiate with any software firm bidding more than $20K. Using currently available budgets, University IT Management has scheduled to invest in new computers and networking systems before the automated system arrives. They are planning to buy Windows-based servers in the range of 1GHz processors, 1GB memory, and 100Mbps communication networks. All the employees have asked for 21" monitors and IT Management has selected Oracle as the DB vendor (rather than being a single site license, Oracle is licensed based on number of users).

The system must interface with the legacy accounting system, ACCTG-X, which is now available through a recently added web interface that was requested by university staff. The system must also be capable of importing approved statewide continuing education course descriptions generated externally by the state's higher education coordinating board that are formatted using the ANSI Course Description Standard (this process may change, possibly obviating the import feature). In response to poor vendor support experienced by the University in the past, IT Management has recently mandated a new standard for all purchased software which requires all installation and user help to be accessible via web pages.

A survey of related Commercial-Off-The-Shelf (COTS) products conducted by ACME has yielded two options: a phone-based system, Phone-a-Course, that provides registration capabilities but does not handle financial functions, and a web-based system, e-Reg, that offers both registration and financial functionality but does not support Oracle. To offer greater value, the proposed product should be web-accessible and offer all the functionality described above.

Assumptions

- ACME Marketing has identified University X as a potential customer and has conducted *one* interview to determine if ACME is capable of developing a product to meet their needs.
- The document audience is *other stakeholders in ACME* (developers, CIO, QA,…) that we're trying to get on the same page. University X will not necessarily see the vision document.
- Users are primarily *continuing education personnel*, not students.
- ACME is trying to move into the continuing education market, and University X is just *one* concrete example of a customer in this market. The specific needs of University X may not reflect the needs of the market in general, but we are starting with them as a baseline.

Comments

- Reasonable interpretations of the description are fine. A little bit of inference is okay, but generally you should work with the description as given. I realize there are some holes/ambiguities in the requirements (as well as some requirements that are possibly unrealistic), but you can think of this as ACME's initial attempt to characterize market potential based on one interview (e.g., not allowing bids greater than 20K may be unrealistic, but that is what was stated).
- The purpose is not to focus on the nuances or ambiguities in the description, but to get a feel for the vision document:
    - It attempts to describe both the problem space and solution space.
    - "Features" may refer to any type of requirement including functionality (use cases), non-functional requirements (NFRs), installation constraints, etc.
    - Since the vision is typically used when first describing a proposed solution, the layout, language, and level of detail must be appropriate for a broad audience (i.e., multiple stakeholders, such as management, marketing, developers, testers, system administrators).
    - The document follows a template (i.e., structured) in an attempt to formalize natural language. However, there are many possible templates.
- A reasonable use case is a domain task the user wants to accomplish using the application (e.g., "Add a class" and not something uninformative like "Course Registration").
- Your vision document must cover all the information in the description. There is no maximum document length.
- Please *select at least two* attributes to associate with your product features, based on a reasonable interpretation of the text. Examples include but are not limited to status (i.e., does the feature currently exist in any form), priority, level of effort, risk, stability, target release, and development team.
- Your use case descriptions may identify exceptional flows as well as alternative flows.

Deliverables

- **Deliverable 1 – Vision Document**

Grading

- Document adheres to Vision template.
- Document is consistent with course registration requirements.
- Document is well presented – clear and easy to follow (including spelling and grammar).