Start with Success Scenario

2.1 Basic Flow – Add Student

1. The Registrar selects "add student."
2. The system displays a blank student form.
3. The Registrar enters the following information for the student: name, date of birth, social security number, status, and graduation date, then selects "save " option.
4. The system validates the data to insure the proper format and searches for an existing student with the specified name. If the data is valid the system creates a new student and assigns a unique system-generated id number.
5. Steps 2-4 are repeated for each student added to the system. When the Registrar is finished adding students to the system the use case ends.

2.2 Alternative Flows

2.2.1 *Modify a Student*

1. The Registrar selects "modify student."
2. The system displays a blank student form.
3. The Registrar types in the student id number he/she wishes to modify.
4. The system retrieves the student information and displays it on the screen.
5. The Registrar modifies one or more of the student information fields: name, date of birth, social security number, student id number, status, and graduation date.
6. When changes are complete, the Registrar selects "save."
7. The system validates data, then updates the student information.
8. Steps 2-7 are repeated for each student the Registrar wants to modify. When edits are complete, the use case ends.

2.2.2 *Delete a Student*

1. The Registrar selects "delete student."
2. The system displays a blank student form.
3. The Registrar types in the student id number for the student that's being deleted.
4. The system retrieves the student and displays the student information in the form.
5. The Registrar selects "delete."
6. The system displays a delete verification dialog confirming the deletion.
7. The Registrar selects "yes."
8. The student is deleted from the system.
9. Steps 2-8 are repeated for each student deleted from the system. When the Registrar is finished deleting students to the system the use case ends.

2.2.3 *Student Already Exists*

If in the "Add a Student" sub-flow the system finds an existing student with the same name an error message is displayed "Student Already Exists". The Registrar can either change the name, create a new student with the same name, or cancel the operation at which point the use case ends.

Sample user and system requirements for imaginary library system. Please note that there are some important notes that I need to clarify at the class.

US13 – The system shall provide a functionality to allow users to search for books.

13.1 – This feature will be available for librarian, manager, and client.

13.2 – When the user selects the "search" option for his/her workspace, the system will show a search form.

13.3 – Using the search form the user can search for books by typing part of book title.

13.4 – The user can select "advanced search" option, and the system will show the advanced search form. The user then can search for book using any combination of title, author, publish house, and/or category.

13.5 Upon completion of search activity, the system will show a list of matching books. The list will contain book number, year, title, and status. The list shall be sorted by book publish year.

requerment should be as a senario to understand it.

* Supermarket sale :- "use most common scenario"

US14 – The system shall allow the cashier to process sale operation

14.1 – The customer will arrive cashier with his trolly and items, the cashier will inform the system

14.2 – The cashier will start reading par code using par code reader, or manually enter par code

14.3 – The system will display items par code, quantity and price and add price to the ~~total~~. sub total.

14.4 – The system will allow cachier to enter quantity of items,

14.5 – repeating process until items are done.

14.6 – informing finish, system will display total and options of payment.

14.7 – If cash, ~~[redacted]~~ handle it.

14.8 – print invoice ~~[redacted]~~ and handle it to the customer.

WS #1

Software Engineering COMP433
Tutorial -1- Good attributes of Software

Q#1) Which of the following systems, you would describe as dependable or acceptable. Justify your Answer.

a) A Medical system that has a failure rate of 2% in a year.
:? not dependable (high failure)

b) A bank security system that has a 95% reliability. (high risk)
:? not dependable

c) A university registration system that requires 1 day of student training before students are able to use it. (complex system, weak usability)
:? not acceptable

d) A Palestinian banking system that serves a national bank and allows 1000 concurrent users to access the system
:? not reliable, not "dependable"

e) A train station control system that needs **15** days of user training before administrators can use it ?
Acceptable

f) A national pull system (التحليل) that a reliability of 96%?
not Dependable

g) The failure frequency of a heart-monitoring unit that will operate in a hospital's intensive care ward is required to be less than one in 20 years. Its heart attack detection function is required to have a failure rate of less than one per million cases.
Dependable

h) One requirement of the new software system to be installed in a supermarket will not fail, on average, more than 10 minutes per month during the supermarket's working hours. In addition, the probability that the off-time (the time needed for repair and recovery of all the supermarket services) be more than 30 minutes is required to be less than 0.5%.
Dependable

Q#2) If you were a consultant responsible of buying a system for your university to manage university student registration, and were offered the choice of two systems:
A) The first system, is only $100k to buy but requires $1k for an annual system support cost. It requires 5 days training and comes with a new version every year.
B) The second system is only $40k to buy, but requires $3k in annual system support cost. It requires 3 days user training and is updated with a new version every 2 year.
In your opinion, which of the two systems has:

1. higher maintainability A
2. higher dependability not enough to decide
3. higher usability B

WS #2

all accepted as functional but not as non-functional requirement

BIRZEIT UNIVERSITY

Computer Science Department

Software Engineering Course Comp433, Tutorial # 2

THE NEED FOR COMPREHENSIVE SOFTWARE REQUIREMENTS.

Read the following sample real-world software development cases. Can you summarize the real causes of these issues? Are there specific requirements that are missing and were not specified?

CASE A:

"Our new sales information system seems okay, the invoices are correct, the inventory records are correct, the discounts granted to our clients exactly follow our very complicated discount policy, **but** our new sales information system frequently fails, usually at least twice a day, each time for twenty minutes or more. Yesterday it took an hour and half before we could get back to work . . . . Imagine how embarrassing it is to store managers . . . . Softbest, the software house that developed our computerized sales system, claims no responsibility . . . ."

not reliable

CASE B:

"Believe it or not, our software package 'Blackboard' for schoolteachers, launched just three months ago, is already installed in 187 schools. The development team just returned from a week in Hawaii, their vacation bonus. **But** we have been suddenly receiving daily complaints from the 'Blackboard' maintenance team. They claim that the lack of failure-detection features in the software, in addition to the poor programmer's manual, have caused them to invest more than the time estimated to deal with bugs or adding minor software changes that were agreed as part of purchasing contracts with clients."

not maintainable bad code

CASE C

"The new version of our loan contract software is really accurate. We have already processed 1200 customer requests, and checked each of the output contracts. There were no errors. **But** we did face a severe unexpected problem – training a new staff member to use this software takes about two weeks. This is a real problem in customers' departments suffering from high employee turnover . . . . The project team says that as they were not required to deal with training issues in time, an additional two to three months of work will be required to solve the problem."

not usable

BIRZEIT UNIVERSITY

Software Testing and Quality Assurance, SWEN 7301

Class tutorial #3: Assessing software quality factors for a sample of real-world software systems

For each of the software requirements below, write their appropriate software quality factor name

No.	Section taken from the software requirements document	Requirements factor
1	The probability that the "Super-lab" software system will be found in a state of failure during peak hours (9 am to 4 pm) is required to be below 0.5%.	Reliability
2	The "Super-lab" software system will enable direct transfer of laboratory results to those files of hospitalized patients managed by the "MD-File" software package.	Interoperability
3	The "Super-lab" software system will include a module that prepares a detailed report of the patient's laboratory test results during his or her current hospitalization. (This report will serve as an appendix to the family physician's file.) The time required to obtain this printed report will be less than 60 seconds; the level of accuracy and completeness will be at least 99%.	responsiveness (processing time) - performance) Correctness - acceptable
4	The "Super-lab" software to be developed for hospital laboratory use may be adapted later for private laboratory use.	reusability
5	The training of a laboratory technician, requiring no more than three days, will enable the technician to reach level C of "Super-lab" software usage. This means that he or she will be able to manage reception of 20 patients per hour.	usability

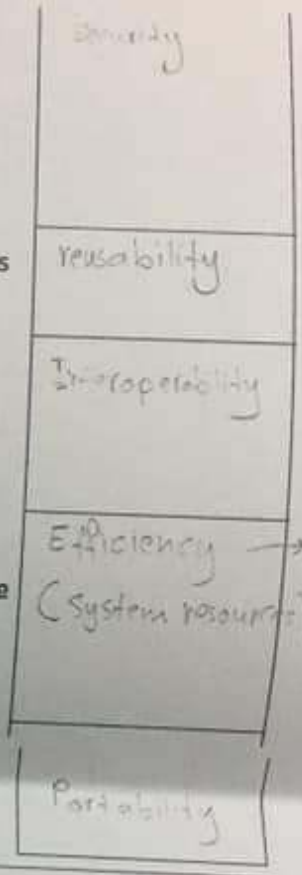
6 The "Super-lab" software system will record a detailed users' log. In addition, the system will report attempts by unauthorized persons to obtain medical information from the laboratory test results database. The report will include the following information: network identification of the applying terminal, system code of the employee who requested that information, day and time of attempt, and type of attempt.

7 The "Super-lab" subsystem that deals with billing patients for their tests may eventually be used as a subsystem in the "Physiotherapy Center" software package.

8 The "Super-lab" software system will process all the monthly reports for the hospital departments' management, the hospital management, and the hospital controller according to Appendix D of the development contract.

9 The software system should be able to serve 12 work-stations and eight automatic testing machines with a single model AS20 server and a CS25 communication server that will be able to serve 25 communication lines. This hardware system should conform to all availability requirements as listed in Appendix C.

10 The "Super-lab" software package developed for the Linux operating system should be compatible for applications in a Windows NT environment.



* new non-functional requirement :

- Interoperability : The ability of one system to exchange data with another system.
- Reusability : re-use of the system / component in another system.
- Portability : The ability to deploy the system on another platform.

Software Engineering COMP433
Tutorial -2- Software Process Models

1. Which software process model (or models) you would apply for the following scenarios. Justify your Answer.

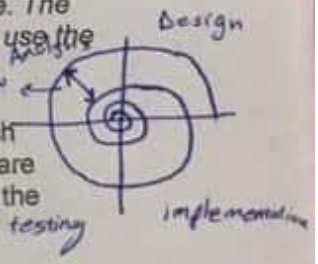
a) To develop a secure ATM sub-system to integrate with an existing banking system. The developed ATM sub-system will be deployed across a 1000 ATM machines. It should have an availability rate of 99%, accurate. It should also have a 99.9% accuracy money notes counting dispenser, and three-level security that requires a card, a pin code and a biometric code.
:? : why? – justify your answer
waterfall → It's a critical system. "banking system"

b) To develop university student management/registration system that can support 75000 students, and up-to 15000 concurrent students' access, would not need more than 1 hour (student/user) training and need to be delivered in 4 years for operational use.
:? : why? – justify your answer
incremental Agile → Business, limitted budget and can be built as portions with discovering requirement.

c) To develop a mobile app, that monitors health indicators (e.g. blood pressure, sugar level, pulse) of patients, by collecting readings through special medical sensors, and then provides medical advice based on the collected readings by an external medical decision system, which your system must be connected to it.
:? : why? – justify your answer
waterfall → critical "health Rlife" and small project.

d) To develop a word processing application, that uses existing print, graphic, font styles, spelling check, and grammar check components. The application must be designed to be used by people with dyslexic/learning difficulty.
:? : why? – justify your answer
reuse oriantad

2. *If you were a project manger responsible to develop a system for a product-line ordering system for a manufacturer of car parts. The system, should allow telephone and online ordering of car parts, and has a dedicated team to process the orders. The system should keep inventory of existing stock and be accessed by the manufacturer's product-line to manufacture parts according to sales. The users of the system are online users, who should register an account online and store users' information including their credit card details to enable them ordering online within a secure login sub-system. To enable users order online, the system will be required to connect to the respective credit card bank to authorize payment. Other system users also include salesmen who can place orders through telephone calls, and process payment through the system, and inventory users who manage availability of car parts and system administrators who manage the system database. The system should allow 10 concurrent salesmen and 10 inventory men to use the system.*



How would you project manage the above scenario?- particularly which software process model (or models) would you apply and use? If you are applying more than one model, indicate for what parts/components of the project and at what stage of its development life cycle.

incremental → كل طار
E-payment → critical sub system → waterfall

اسم المشروع ← Course Registration System

نوع الـ doc ← Use-Case Specification

verb phrase ← Maintain Student Information Use Case

Version 2.0

Revision History

Date	Version	Description	Author
21/Dec/2011	Draft	Draft version	S. Gamble
15/Feb/2011	Version 1.0	Minor corrections based on review.	S. Gamble
19/Feb/2011	Version 2.0	Modify section on use case extends. Final cleanup. Add alternative flows. Resolve remaining issues.	S. Gamble

Maintain Student Information Use Case

1. Brief Description

This use case allows the Registrar to maintain student information in the registration system. This includes adding, modifying, and deleting students from the system.

The actor for this use case is the Registrar.

2. Flow of Events

The use case begins when the Registrar selects the "maintain student" activity from the Main Form.

2.2.4 *Student Not Found*

If in the "Modify a Student" or "Delete a Student" sub-flows the student name is not located, the system displays an error message, "Student Not Found". The Registrar can then type in a different id number or cancel the operation at which point the use case ends.

3. Special Requirements

There are no special requirements associated with this use case.

4. Entry Conditions

4.1 Log In

Before this use case begins the Registrar has logged onto the system.

5. Exit Conditions

There are no postconditions associated with this use case.

Software Engineering COMP433
Tutorial -3- Requirements Engineering

1. Consider the following two sets of Requirements.

Requirement Set-1:

user req. ← 1: The system shall provide a service for users (students) to register and create an account. (simple, complete, no bugs, ... , free problems)
user req. ← 2: Users shall be able to submit queries
user req. ← 3: The system shall adhere to the guidelines set by the ministry of higher education
user req. ← 4: Users should be able to listen to music when using the website
user req. ← 5: The system shall allow only the registered users to use the services of the website. (no problems)

Requirement Set-2:

Syst. req. ← R1.0: Registered users shall be able to submit a new application to study at the university during normal working hours, adhering to the education submission procedures.
System requirement ← R2.0: The system shall create an application template and opens it in a new web page when users press new application button, from the "create new application" web page. The template should have the following data fields: Full Name, DoB, address, telephone numbers, Tawjihi Grade, and three Subjects to be studied in the order of preference.
System ← R3.0: The system shall fill the template automatically and detect and extract, intelligently, user details, as per the template, using advanced detection technologies, e.g. biometeric.
System requirement ← R4.0: The system shall check all the applications' data fields are complete and valid before submission and within a reasonable time. The system shall check number data fields contain only number values and text data fields contain at least some text values.

a) What do you consider the type of each of the above two sets of requirements? user requirements, system requirements (both)? Why? Justify your Answer. user requirements / System req
Set-1 / Syl-2

b) Identify domain requirements in each of the above sets of requirements.
Why? Justify your Answer. 3

c) You are asked to validate the above two sets of requirements on the following characteristics, identify the ones that do not validate.

Correctness: 4
Unambiguous: 2
Completeness: R4 , R1
Consistency: —
Traceability: — nothing (not traceable)
Realistic/Feasibility: R3
(un realistic un feasibility)

Why? Justify your Answer.

2. *If you were a project manger responsible to develop a system for improving the efficiency of a complex integrated manufacturing and ordering system. The environment is very complex and has multilevel hierarchies of end-users. The manufacturing part is complex, has large number of stakeholders, who work in a large area, highly fragmented and could not provide valuable input individually to influence the efficiency of the overall of the manufacturing process. The ordering system is simpler and has limited (or smaller number of) stakeholders, who could provide direct input.*

Which requirement discovery technique (or techniques) would you think would be most suitable or efficient for engineering the requirements? Justify your answer.

manufacturing part
① interviews ← (focus groupes)
② because area is complex → do Observation

Ordering
① Interview

Use case name: Validate PIN
Summary: System validates customer PIN.
Actor: ATM Customer
Precondition: ATM is idle, displaying a "Welcome" message.
Main sequence:

1. Customer inserts the ATM card into the card reader.
2. If system recognizes the card, it reads the card number.
3. System prompts customer for PIN.
4. Customer enters PIN.
5. System checks the card's expiration date and whether the card has been reported as lost or stolen.
6. If card is valid, system then checks whether the user-entered PIN matches the card PIN maintained by the system.
7. If PIN numbers match, system checks what accounts are accessible with the ATM card.
8. System displays customer accounts and prompts customer for transaction type: withdrawal, query, or transfer.

Hotel System Case Study

In an imaginary hotel system, the customer can search and book a room online if it is available. Of course, the customer has to provide his profile information to reserve the room. Later on, when the customer arrives to the hotel, the receptionist will check in the room for the customer. During the customer stay, we need to record room services expenses so that the customer can pay for them when he/she checks out. Room services management should be able to track room-cleaning activities. The room services employees will be responsible of cleaning the room of course.