

# **PROJECT 1**

**User Centered Design Methods**

**Prof. Evelyn Rozanski**

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# PROJECT 1

## REDESIGN OF COURSE REGISTRATION SYSTEM (RIT's SIS)

### 1. ROOT CONCEPT

**High Level Vision** – The objective of this project is to implement RIT's Student Information System (SIS) on PDA-type devices so that students, faculty and staff have easy access to the registration process through their hand held devices.

**Rationale** – The new application will enable users from numerous locations to use SIS and can register for the courses, get information about courses, and get registration information and confirmation of registration. Having the Student Information System available on a mobile platform will allow greater flexibility for the users of SIS. Currently SIS is only available to users with a computer and an Internet connection. Once SIS is on a mobile platform students will be able to register for their courses easily during the registration time. The mobile platform will share some of the load with the web based SIS during registration time allowing more users to connect to SIS without degraded performance.

#### Stakeholder Groups

- 1) **Students** – Students from different colleges of RIT are currently the major stakeholders. Their goal is to use SIS through mobile PDA-type devices for registration of courses and to keep track of their basic academic information.
- 2) **Faculty** – Faculty members from different colleges of RIT are another major category of stakeholders. Their goal is to keep track of the number of students enrolled in the course and the information about the course through a portable hand held device.
- 3) **Staff** – Staff members of RIT help students to register for their courses. Throughout the school year students turn to the staff for help with SIS.
- 4) **Administrators** – They perform daily administration including user account management, responding to web related questions from visitors, and maintaining the web site when many students are logged during the registration time.

**Assumptions** – All the stakeholders use a PDA-type device.

All the stakeholders have used the web based Student Information System (SIS) at some point and understand some of its functionality.

Designers and implementers are the IT team at RIT.

### 2. CURRENT ANALYSIS

This new application, if implemented, will be very useful for users. Thus, I believe to analyze the current situation, we can conduct interviews with the stakeholders. Our goal is to understand how

to extend the SIS to a mobile platform. We want to understand how students currently use the SIS and how they will use the mobile version. Some of the question interviews could be as follows:

Which college of RIT do you belong to?

How frequently do you use Internet?

Which web browsers do you use?

What tasks do you use the Student Information System for?

Are there any technical issues you had ever faced with SIS?

How often do you access the Internet with your PDA?

Can you imagine accessing SIS from your PDA? What would it be like?

And many more questions could be included in the formal interview questionnaire. With these questions, we could interpret the background, expectations and preferences of the stakeholders.

### **3. STAKEHOLDER PROFILE**

The main stakeholder group using Student Information System is the students of RIT. Age group of the students is usually from 17-23 years. They could be categorized as digital natives (they have grown with the technology). They have experience and are comfortable with technology even though many of them may not understand it. Email, IM, and cell phones are primary forms of communication. Spending a significant amount of time on Internet for studies, entertainment and games, students are well versed on how to navigate through the variety of systems used for these types of activities, whether leisure, academic or otherwise. Laptop, iPod, PDA and wireless Bluetooth headsets are ever-present parts of many students lifestyle. Many students prefer an environment with multiple forms of simultaneous sensory input (for example, music playing while reading).

#### **Stakeholder Profile (Student)**

Kelly is a 18-year-old international student at Rochester Institute of Technology (RIT) working towards a degree in Human Computer Interaction. She is not very strong in the English language yet. Kelly has been around computers and similar technology since she was very young. Kelly uses her Laptop computer and PDA on a daily basis to check email, surf the Internet, as well as connect to her online learning environment. The rest of her time is spent working in lab where she sits at a desk top computer all day and enters data electronically using a software system such as Microsoft Excel to organize the data. The lab also has the internet available but is has constraints on where she can go and for what purpose she can visit sites. She gets e-mail from her superiors. She is very good at her job. She also enjoys literature and relaxes with video games. She has joined RIT this fall quarter and is experiencing trouble with interpreting some words and registration is taking longer for her because it's all in the word format. There are a lot of different majors and words that look the same to her.

### **Stakeholder Profile (Faculty)**

Professor Gnarl has been teaching at RIT for 15 years. He is part of the department of Networking, Security, and Systems Administration (NSSA). He teaches at both the undergraduate and graduate levels. Some of his interests lie in autonomous systems, artificial intelligence, web services, and network security. Professor Gnarl is a very connected person, using his Blackberry and laptop everywhere he goes. The Internet is a major part of his life and he spends most of his time in front of a computer. Professor Gnarl is a major proponent of web services and believes they are beneficial in a variety of ways.

### **Stakeholder Profile (Staff)**

Background: Familiar with Web, email, and standard office applications, especially Microsoft Word, Microsoft Excel. They are comfortable using Mac and PC. Staff members of RIT are responsible for updating the student and faculty records. They are often responsible for responding to the student's unmet needs. They are not much tech savvy people.

Expectations: Will make their job easier; they don't have to stick to their chairs to do the work; could also print through their PDA device (if they have Bluetooth enabled printers).

Preferences: The design of SIS on web connected PDA should be same as the web based SIS.

Linda Richardson is the Sr. Staff Assistant at the Department of Information Technology at RIT. She has been serving RIT for 15 years. She is a digital immigrant i.e. who has adopted many aspects of new technology at some later point in their life. She has moderate experience and is comfortable using technology (usually specific to her job tasks). She uses a PC (desktop computer) at work. Phone, email, and written documents are her primary forms of communication. She spends a significant amount of time in the academic administration environment. She is responsible for updating student's details and responding to their general queries. She is not usually concerned with the research aspects of the institute.

## **PROBLEM SCENARIO WITH ACTIVITY DESIGN, INFORMATION AND INTERACTIVE DESIGN SCENARIO**

It's registering time and Kelly has a lot of decisions to make about what classes to take. Navigating through the SIS system is a pain for her. She opens the Student Information System website. She tries to login to the SIS and realizes that she doesn't remember her University ID. And without UID she cannot move further. Suddenly she remembers that she has saved her UID in her PDA. She is able to successfully login to the SIS. Kelly likes the icons on other sites and wonders about them being implemented on the SIS system. After playing around with the SIS for almost 15 minutes, she looks for the 'Help' icon, but couldn't find any. She decides to take help from somebody about how to actually use SIS and starts looking for the 'Logout' button. She looks at the top left and right corner of the screen but can't locate it where she normally thinks it

to be. After few minutes, she is able to figure the log-out button as the ‘Log-off’ button at the bottom right corner of the screen. She logs out of the SIS and wish all these improvements could be implemented in the PDA based SIS.

**Claim: Words on the SIS system**

- + For English speakers it’s easy
- For non English speakers it can be difficult

**Claim: Icons on the SIS or a virtual map of the campus to organize the majors and classes associated with a given college**

- + Gives the students a recognizable map of the campus to aid in decision making
- + Returning students have a schema already in use for the map and can quickly check out their courses
- + May help incoming students learn the campus
- Incoming students may take more time learning the campus
- Smaller buildings or colleges may get less attention/less space on the map which may lead to fewer enrollments

**Claim: Implementation with another system such as a PDA**

- + Can be easier to manipulate rather than scrolling, looking for the right numbers
- + Faster recognition of the colleges and easy retrieval
- Might be harder for older PDA’s to display

**Activity Scenario:**

Kelly is an international student and although she isn’t exactly proficient in English she is able to use the SIS system well enough to get her schedule made. On the course description page there are little icons which are helpful. When she goes to the SIS page she finds that there is a map instead of the usual words used to represent the different colleges and the courses within. She finds that this is a much more natural system and although some of the smaller buildings are harder to see, there is a legend and she can find what she needs if it’s necessary.

Kelly cannot finish registering for her classes online at home so she continues to do so by accessing the SIS system on her PDA while she is at work. Her model of PDA is not the most recent, but is also not the oldest model and therefore it is easy for her to see the icons clearly. She navigates through the system without issue and is able to complete registration on time. The icons that are used in the new system are natural, and instead of fumbling around for the logout button Kelly is able to see that there is an “exit door” and makes the connection that this is where she should go to exit the system when she is finished. The new SIS is easier to use on her PDA than it used to be the regular way.

## **Information Design Scenario:**

In navigating through the virtual map of the SIS system Kelly is struck by how well put together the new system is while using her PDA. With the new virtual map of the system Kelly is able to see that she can begin at the Library, a central starting point and has directional awareness through a relative compass. The compass is not in the traditional sense a four way compass of North, South, East and West but one designed with many tiers that guides her toward the different Colleges. Using these tiers Kelly is able to follow the map where she wants to go easily and on her PDA there are magnification elements so that she can zoom in and out of the screen.

Once “inside” the buildings she is given another subdivision of choices represented by hallways. Once again she is given the choice which to follow and finds that there are classrooms representing the courses where inside is a blackboard of the description of the course, what the objectives are and also a list of other courses which it compliments or completes in a sequence. These are represented with words rather than more icons as it is typical to see words on a blackboard.

When Kelly has decided which courses she would like to enroll in there is a link to each of the classes embedded within its name and a little diploma that pops up when confirmation is complete. After this is done Kelly is automatically placed back in the classroom and is able to exit through a virtual door back into the hallway. Using a system like this is more Kelly’s speed; she does play a lot of video games and can navigate through a virtual system as if she were in it quite naturally.

She finds that the new mapping system is great and very intuitive to use, as well as easier on the eyes and gives her less trouble when attempting to organize in her head the classes she needs to take. It is very PDA friendly and gives her little headache due to the ease with which the information zooms in and out of focus.

She is excited about the new SIS. And she decides to explore more of it. She tries to see what courses will be offered next quarter but realizes that this feature is not available. PDA based SIS is designed to hold the information regarding current quarter. Bright blue and orange color is used for text, which she finds attractive. The font size is big enough to facilitate readings. She discovers that icons are used to represent larger information structures, instead of text. Thus, information is basically conveyed with the help of icons. She clicks on the course, Usability Engineering, but found that very nominal information is available as compared to website SIS.

She is running late for class and decides to quit SIS. And she looks for the log-off button on the course information page. But to her surprise, there is no log-off button on that page. She didn’t like this, and wonders about it. She goes back to the registration page and looks for the log-off button. She is amazed to see that log-off button has been changed to a much common terminology of ‘Exit’. Also the position of logout button has been changed from bottom right to top right. She really likes this change. She quickly logs out from SIS and head for her class thinking about the new PDA based SIS.

## **Problem Scenario 2:**

Kelly is a student at RIT that has had some good experience on campus but decided last year that she would like to move in with some of her friends to a house located in downtown Rochester. Unfortunately none of her roommates were around for the summer, leaving Kelly all on her own to take care of the bills. This left her no extra money for an internet provider in her house and being without internet coming up on registration time can be a hassle.

Kelly would like to check out her options for classes but it isn't practical that she spend a lot of time on campus because she has to work. She decides to get a cheap internet service but the connection is slow and it takes longer than she would like to get her information. Having the open/closed course list and course descriptions on a different page than the actual registration is problematic. Not only that, but because students are beginning to come back from school the demand for the sites are overwhelming and manage to take even longer.

### **Claims:**

A list of course descriptions online

+ Would be a single place for information

+ Roll overs of a course to check the availability and a brief description of the course would save time

- Lots of work for programmers

- Depending on the updates may not be the most reliable source of information on courses

## **Supplementary Problem and Activity Scenarios for the different Stakeholder Profiles**

### **Problem Scenario 1: (Professor)**

Professor Gnarl has been approached last minute by Jim Denarzio the Department head of the NSSA department about adding a class to his schedule for the fall semester. Jim explains that about 15 seniors in various graduate programs approached him about wanting to take an elective to fulfill their curriculum requirements. Prof. Gnarl is already scheduled to teach a full course load. He would love to tell Jim that his schedule can accommodate the class but is not certain he really can teach it.

Before Prof. Gnarl can answer, Prof. Denarzio begins to talk about what class Prof. Gnarl would be teaching. The class is a Web Services course and can include whatever Prof. Gnarl thinks is necessary. In order for Prof. Gnarl to teach this course he would have to drop a course from his current schedule. He tells Jim that he will check the enrollment of the courses he is scheduled to teach and see if he can drop one and get back to him through email. Teaching

this course would mean a lot to Prof. Gnarl's and he hopes that one of his courses has low enrollment so he can drop it.

When Prof. Gnarl's gets back to his office, he uses Internet Explorer on his Laptop to login to SIS. He looks at his current course load and checks the enrollment in each course. According to the SIS website, the enterprise security class that he is teaching has no students enrolled. Prof. Gnarl's sends an email to Jim Denarzio telling him that he can add the Web Services course to his schedule, but he will have to drop the enterprise security class. Before Prof. Gnarl's can call the registrar and have them officially take the enterprise security course off of the available classes offered, he must wait to hear back from Jim.

### **Claims**

Having course information available on SIS

Pro – ability to view course information online instead of a course booklet

Pro – course availability and information can be updated frequently

Con – if connection to SIS was unavailable registrar would have to be ready to register students

Con – students are familiar with registering for classes through the registrar

### **Activity Design Scenario 1:**

Professor Gnarl's has been approached last minute by Jim Denarzio the Department head of the NSSA department about adding a class to his schedule for the fall semester. Jim explains that about 15 seniors in various graduate programs approached him about wanting to take an elective to fulfill their curriculum requirements.

Professor Gnarl's takes his PDA out and logs onto SIS. He clicks on "Get registration information" and types in the course number for the Enterprise Security course in the following format (#####.###.##). The next page displays the course name, number, date/time it occurs, and number of students registered. Professor Gnarl's notices that no one has registered for the course yet, making his decision to drop the course from his schedule and easy one. Professor Gnarl's tells Jim that since no one is registered for his Enterprise Security class he will drop it and add the Web Services class to his schedule. Jim seems excited with the decision and tells Prof. Gnarl's that he will go to the registrars right now and remove Enterprise Security from this semester's course offering and add the Web Services class.

### **Problem Scenario 2:**

Professor Gnarl's is the student advisor for Amanda Graves. Amanda has her first meeting with Prof. Gnarl's and is concerned with making the right course choices for the semester. When she meets with Prof. Gnarl's he seems frustrated with his laptop computer. He tells Amanda that the IT department decided to push much-needed updates to his computer, and he cannot connect to the Internet. Amanda starts to think she might have to reschedule this meeting because she only has an hour and without Internet connectivity it will be hard to look up course information. After repeated attempts, Prof. Gnarl's cannot connect to SIS and decides to use the RIT course catalog

to have his meeting with Amanda. After a long discussion and numerous page flipping Prof. Gnarl and Amanda come to an agreement and it is decided that Amanda will drop two courses she is currently enrolled in and register for two other courses. Even though Amanda and the professor had been in their meeting for approximately an hour, Prof. Gnarl still could not connect to SIS. Amanda explains to the professor that she is familiar with using SIS and could handle dropping and adding the courses they have discussed.

### **Claims:**

Relying on SIS for adding and dropping classes

- + Ability to be at any location and drop or register courses
- + No paperwork to fill out
- When connection to SIS is not available, students cannot register or drop classes
- Maintenance of SIS may be harder to schedule because of users wanting to connect all the time

Needing computer to use SIS

- + Access to SIS is truly available around the clock
- + Good backup capability because you can use any computer
- If you are without a computer you cannot lookup, drop, or register for courses
- If SIS is down for repairs it may cause trouble for students and overwhelm the system when it is back online from all the "back orders" so to speak of the students

### **Activity Design Scenario 2:**

Professor Gnarl is Amanda's advisor for her curriculum. Amanda has her first meeting with Prof. Gnarl and is concerned with making the right course choices for the semester. After Amanda and Prof. Gnarl finish their small talk Amanda notices that the Prof. Gnarl's computer is turned off. Prof. Gnarl points out that his computer is currently being updated and he will not be able to use it. Prof. Gnarl then takes out his PDA and logs into SIS. At this point Amanda is unsure how she is going to get help with deciding which courses she should be enrolled in.

After logging in, Professor Gnarl selects the option 'Get information about the courses'. A well defined list appears vertically sorted by their course numbers in ascending order. The Professor and Amanda look at the PDA together and Amanda points out which courses she has planned to take. Professor Gnarl selects a specific course number and the information along with a small campus map is being displayed. Professor Gnarl begins to read the small synopsis of the course and discusses Amanda's possible strengths and weaknesses associated with the specific course. The professor and Amanda do this for each class she is enrolled in.

Professor Gnarl and Amanda finally come to an agreement that she will drop two courses and add another two in their place. Professor Gnarl then explains to Amanda that if she would like to, she can use his PDA to drop and register for the courses. Amanda takes Professor Gnarl's PDA and logs into SIS with her username and password. She selects drop courses and types in both course numbers in the following format (#####.###.##) and clicks on the drop

button. The next page displays a confirmation page that reads, "Course number #####.###.## and #####.###.## have been removed from your schedule". From that page, Amanda clicks on the Register for courses button. She then types in the two courses in the following format (#####.###.##) and clicks register for courses. The next page displays a confirmation message that reads, "You are registered for course number #####.###.## and #####.###.##". Amanda hands the PDA back to Professor Gnarl and thanks him.

### **Problem Scenario 1 (Staff):**

It's the first week of fall quarter. Linda Richardson arrives to the office at 8:30 a.m. after a week of absence. She is informed that IT Department Chair had to go to a meeting at 9:30 a.m. to discuss about the new courses introduced and their response among the students. So, he wants the print documents of all those new courses introduced this quarter and the number of students enrolled in the courses.

She gets settled quickly to do the job. She starts the computer but it looks that something is wrong with her computer. The computer seems to be affected by some viruses. It's already 8:45 and she starts feeling helpless. She always wants her work to be done on time. She feels awful that she is completely dependent on the computer for each and every part of her job. She calls Paul, the technician, to fix her computer. Meanwhile, she borrows the computer of a student worker to do the job.

Linda opens the web based SIS. She is able to login to the SIS successfully. But when she tries to pull down the list of courses, SIS shows an error that, 'Too many users are logged in. Please try later.' Linda starts to panic, she tries to get the list again but it shows the same message. It's already 9 a.m. and she has no clue about how to proceed further. After several tries, Linda is able to pull out the list of courses. Without wasting even a single minute, she extracts all the information and assembles it together in a document. Within fifteen minutes of work, she is ready to give the print. She takes the prints, arranges them into a folder and hands it to the IT Chair on time. Linda takes a sigh of relief and wish that she has some other modes to access SIS rather than just web based SIS.

### **Claims:**

Uses computer for job

- + Manual work is reduced
- + Easy to use
- Feels helpless without a computer
- Too dependent on just one device.

Web based SIS website

- + Easy to use
- + Most important features of registration could be done online
- Cannot bear the load of too many users at once.
- No icons
- Help not provided for new students

### **Activity Design Scenario 1:**

Linda arrives at 8:30 a.m. to the IT department office after a week of absence. She is being informed about the meeting which is to be held at 9:30 a.m. She is being asked to pull out the information of new courses introduced this quarter, and the number of students enrolled in these new courses. She knows that this is the first week of quarter and SIS website usually gives problem during this time of the year. She takes her PDA and logs in the SIS. She is happy that the web connected PDA is fast to access and she is not solely dependent on computers now. Also many users can access SIS at once. She sees that the interface of SIS is easy to understand. It has the basic functionalities of registering for the courses, get information about the courses and confirm the registration.

She selects the option 'Get information about the courses'. A well defined list appears vertically sorted by their course numbers in ascending order. She selects the required course number and the information along with a small campus map is being displayed. Without showing any interest in the campus maps, she moves further with her job of finding the number of students enrolled in the course.

She selects the icon of open/closed courses and makes a quick note of the number of students enrolled. Within few minutes, she is done with her job. She tries to log-out but observe that the position of log-out has been changed. It's now located on the upper screen and log-off has been changed to logout. She is happy with this change as more common location and terminology is being used. Linda is impressed and found that PDA based SIS gives her the same flexibility as the web based SIS.

### **Problem Scenario 2:**

Linda Richardson is very busy during the initial week of the quarter. She has to create record folders for new students who have joined RIT this quarter. She also has to create folders for the new students which will contain their academic information. She also has to arrange welcome party for the new students which is scheduled for the afternoon. Students have decided their courses and are coming to Linda to get them registered for the decided courses. Kelly is a new student and she comes to Linda for help in registering courses. Kelly does not have Laptop and her IT account is also not set yet. She asks Linda that can she register her courses through her PDA. Linda replies that unfortunately, SIS is not PDA based yet.

Linda logs into the SIS and tells Kelly about the number of passwords required to log into the SIS. Linda finds logging into the SIS as a very cumbersome job. Within few minutes, she registers the courses for Kelly and wish Kelly luck for the new quarter.

Linda has to leave early today as her son is coming to visit her. She wishes that she could complete the work before she leaves. But Linda knows that it is difficult to complete the work in such a short time. She wishes that she could do the rest of the job at home. But this also seems impossible as her internet service has not been moved to her new apartment yet. She wishes SIS

was available on PDA's so that she could use her PDA (a gift by her son) to complete the job and could take the prints through her Bluetooth enabled printer.

### **Claims:**

Records for new students:

- + Helps maintain information
- + Easy to look at and make decisions
- Unnecessary work, if information is available
- Storage problem for keeping the documentation of each and every student.

Logging in SIS through by applying number of passwords:

- + Makes the account secured.
- Difficult to memorize different passwords.
- Take longer time to login.

Bluetooth enabled printer

- + Can be used with hand held devices
- + New and improved technology
- + Easy to use
- Expensive

### **Activity Design Scenario 2:**

Linda is busy during the initial week of quarter. She has to create new folders for the incoming students. She also has to take care of the welcome party for new incoming students scheduled in the afternoon. She is moving to and fro to make arrangements for the welcome party.

She leaves early today without attending the welcome party. She had plans to do the rest of the job of extracting information of new students at home using her PDA. After dinner, she sets out to do her pending office work. She takes out her PDA and logs into the SIS. To her surprise, she is being able to log in using just DCE user name and password. She wonders if she could work with the same speed using PDA. She goes to the Academic Advisory Report which has a new icon and the text is written in bright blue color. She notice that the new PDA based SIS has more bright colors than the web based SIS which Linda finds really well. Linda also observes the help icon and remembers how Kelly was not able to register herself. She plays with the help and discovers that it has instructions on how to register for courses, how to see open & closed courses and many other instructions. She also found that there is a print feature on the page which is really helpful. She could directly give the print of the page to her Bluetooth enabled printer. This feature saved her lot of her time.

## **9. APPROPRIATNESS OF SBD METHDOLOGY**

SBD is a diverse area with different types of scenarios involved in it. The most important feature while designing this application was *claim analysis*. Claims involve natural language which

address a variety of situational and interface aspects that affect the compatibility, such as user satisfaction, color and object layout, and strength of affordances. Also the scenarios in the SBD methodology helped us to determine how a novice and an expert user might deal with the same application. It gives us a fair chance to design an application which is easy to use for every user. Scenarios form the foundation for the design, development, and evaluation. Activity design involves what user can and cannot accomplish with the system. Information design deals with how information is shown and how the interface looks. Interaction design focuses on how a user would interact with the system (clicking, typing etc.). Scenario based design includes user participation which could increase the product success through the valuable user insight. We, thus, believe that scenarios form the foundation for the design, development, and evaluation of a system.

Although scenario based design is an excellent interactive method, only a scenario cannot depict the whole picture of user needs. To obtain user requirements from scenarios is the pivot of the design. In this assignment, we had to focus more on the user requirements of the real users rather than user requirement from system point of view.

We believe that Participatory Design methodology would have been better for this project instead of SBD methodology. SIS is a highly used system and having participants give live feedback throughout the course of this transformation would be helpful as well as insightful.