

To: CSUSB Digital Marketplace Working Group

From: Vince Enriquez  
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Re: Development of use cases to ensure user centered design of the Digital Marketplace

Date: September 3, 2008

**Background:**

This memo was originally authored by Regan Caruthers. The Digital Marketplace project is at the point where it needs to begin designing the services with input from faculty and staff. This CSUSB pilot is the initial step.

To do so effectively and collaboratively, we need your voice and involvement. The Digital Marketplace development team is following user-centered design principles. One of the first steps is to have current and prospective users of the technologies to describe their needs and desires in the form of a “use case”. Use cases are stories about how people successfully and/or unsuccessfully accomplish their goals with technology. Use cases enable many different people participating in the planning, design, development, testing of technologies to communicate and collaborate successfully.

**Task:**

The initial deliverable is to write a use case. The use case must describe using the current Federated search in searching for content in preparation of a course.

These will be contributed to a collection of use cases that the Digital Marketplace development team will use to guide its efforts. These contributed use cases will be placed on the web to enable people to see what stories have already been written, to capture importance services the Digital Marketplace could provide and to identify the gaps in services that still need to be developed. Contributing use cases is a critical process for our community of future users of the Digital Marketplace to shape its design.

These results will go directly into the development of a set of Digital Marketplace services. The current application is only the start. It was important to get these initial services out to the faculty and staff. All User interface issues are open for comment. We need to understand how you will use this in your work, what other services would be required, will this make work more efficient, can you use in another manner instead of standard web access and its value to you.

The project team also is working on accessibility requirements for these services.

### **Goals and Definitions:**

The goal of a use case model is to capture and/or structure user requirements of a new system, whether it is being developed from scratch or based on an existing system, by identifying all the big functional blocks (use cases) and by detailing all the scenario's that users will be performing (within these functional blocks) [Rosenberg & Scott 99]. The use case model helps the users and developers agree on how to use the system [Jacobson et al 99]. Here are a number of additional use case definitions:

- "A use case is a narrative document that describes the sequence of events of an **actor** (an external agent) using a system to complete a process." [Jacobson92]
  
- "They are stories or cases of using a system. Use cases are not exactly requirements or functional specifications, but they illustrate and imply requirements in the stories they tell." [Larman98]
  
- "...domain processes can be expressed in use cases – narrative descriptions of domain processes in a structure prose format." [Larman98]
  
- "A description of set of sequences of actions, including variants, that a system performs that yield an observable result of value to an actor." [Booch99]
  
- "You apply use cases to capture the intended behavior of the system you are developing, without having to specify how that behavior is implemented. Use cases provide a way for your developers to come to a common understanding with your system's end users and domain experts. In addition, use cases serve to help validate your architecture and to verify your system as it evolves during development." [Booch99]

A use case answers a question, for example, "How do I search for digital resources for my biology class in the Digital Marketplace (DM)? The user has a goal, to search, which is critical function of the DM. There are a number of situations that the user could find himself or herself. The use case breaks down the goal into sub goals, eventually individual actions, plus the interactions between various actors as they try to reach that goal, or fail to reach it. Scenarios and use cases conclude with goal success or abandonment. The user could play different roles and have multiple goals.

### **Framework to Guide Use Case Authoring:**

For use cases to provide powerful guidance in the design, development, and testing processes, the stories need to follow a framework. Below are the aspects of a use case framework to serve as your guide; each use case may not require all aspects to be fully defined.

**1) User Characteristics:** Describe the features of the existing user population(s) that will engage the products and services to function. There are 5 categories of features:

- Technical and Information Competencies: What are the knowledge, skills, and attitudes of users that are engaged in using the products and services?
- Content Competencies: What are the knowledge domains, disciplinary content areas that the user must know?
- Organizational Role: What role does the individual play in the organization which effects user performance? (e.g. faculty, student, dean, librarian, academic technology staff, etc.)
- Cognitive and Affective States of Users: What are the “personal” aspects of the users that will influence the users abilities to perform? (e.g. level of comfort with technology, level of anxiety about college level learning, etc.)

**2) User’s Technology Infrastructure:** Describe the features of the users technical infrastructure that the targeted products and services require. There are 5 categories of features for technical infrastructure:

- Hardware: Computer and peripherals, servers, etc,
- Software: Loadset on or available to computer
- Network: What is the capacity and reliability of network
- Training: Types and availability of training to users
- Support: Types and availability of support to “help” successful delivery of current implementations as well as plan, develop, implement, and evaluate upgrades.

**3) Use Case Goals:** Describe the set of goals that the user wants to achieve. There are 4 features of the goals:

- Description of the desired situation (what the user must be able to do, what are the features of the users’ environment (physical, data, social) that are features of the goal state?
- Frequency of need to produce desired situation
- Criticality of goal (how required is the goal to user’s “broader goals”)
- Timeframe of achieving goal (short term vs. long term)

**4) User Scenario:** Describe the sequence and parallel steps that users proceed through to achieve their goals.

- Describe the information the user has available at each point in the sequence of the scenario
- Describe the actions that the users need to perform at a point in the sequence of the scenario.
- Describe the consequence of the action on the next steps in the scenario.
- Include descriptions of likely sources of confusion in the information, actions, and consequences in the scenario.

## **Digital Marketplace Use Case Example:**

# **Building and Buying Accessible Resources for Instruction and Development**

### **FACULTY ROLE**

#### **DISCOVERY:**

Professor Plum logs into his LMS during the summer to begin to build the collection of resources he will want his students to use in the Biology 101 course he's teaching in the fall. It's been 5 years since he taught the introductory level course so he's interested in reviewing what's available in the field. Within the LMS website, he goes to the page for building his resource list and clicks on "Search for Resources". He types in a key concept he'll be covering in the course and a hit list of materials from 6 different publishers is generated along with free materials from MERLOT. The descriptions of the materials includes title, author, abstract, publisher collateral, type of resource (book, article, multimedia, etc), indication of its ability to be rendered in an accessible (section 508 compliant) format, and the different delivery formats and prices (hard copy text book, custom book, eBook to own, eBook to rent).

While looking for instructional content, Professor Plum also examines some of the professional development resources he can use help him prepare to teach successfully. He finds a number of handbooks on teaching the net-generation and he selects one for his summer reading, which CSUSB gets a discount because of a bulk purchase.

#### **PREVIEW:**

Professor Plum selects 10 different recourses to review in more detail. He clicks on the PREVIEW button and a window pops ups indicating that since he is a faculty in good standing at CSUSB, he will have full electronic access to the eBook for a 72-hour period, starting whenever he wishes. After previewing 10 materials, he selects 5 for his course, a textbook, and a chapter from another book, a tutorial on using EXCEL, and 2 multimedia simulations. He also gets to preview the net-generation handbook as well.

#### **SELECTION:**

Profession Plum saves his selections of materials for his students and writes notes (annotations) about the resources he's selected to use. He notices that the book, chapter, and tutorial can be rendered in an accessible format but the 2 multimedia simulations are only 80% accessible. Professor Plum contacts the campus Center for Students with Disabilities to learn what he needs to do to provide alternative curriculum to the visually impaired student he'll have in his class. Finally Professor Plum examines the "student view" of the resource list and sees that the textbook is offered in an eBook-to-own version for 50% of the hard copy text and the eBook-to-rent is only \$15.99 for the semester. With all these options for access to the materials, he's hoping all his students will use the materials.

#### **BUY:**

Professor Plum puts the net-gen book in his shopping cart and buys it with his credit card.

## **STUDENT ROLE**

### **BUYING INSTRUCTIONAL RESOURCES**

When Jane Student gets access to the LMS for her Biology 101 course, she navigates to the Resource List to check out what she'll need to buy. As a student with a vision disability, she has had a challenge of getting the materials in a format she can use in a timely manner. She reviews the resource list and sees that the textbook and tutorial are in an accessible format and is pleased. She then reviews the different types of style sheets CSUSB has certified has rendering the content in an accessible manner. She likes the choices and decides on the size, contrast, colors, and layout that suit her needs. Jane is considering becoming a biology major so she decides to put the eBook-to-buy in her shopping cart and the tutorial in her shopping cart. She buys the resources online with her credit card and stores the resources in her campus ePortfolio. For the two multimedia resources, there's a note for her stating that the CSUSB Center for Students with Disabilities will provide an aid to work with Jane on the portions of these resource that are not accessible to her.

In the 4<sup>th</sup> week of the semester, Jane realizes she's having trouble with one of the key concepts in biology. She goes to the Digital Marketplace in her LMS and searches for additional materials that might do a better job in helping her learn the concept. She finds a student workbook that has the background information she needs and it can be rendered in the accessible format she prefers. Jane buys it online.

### **BUYING STUDENT DEVELOPMENT RESOURCES**

While Jane was looking for her course materials, she saw that the resource list also include a collection of online materials that could help her learn more about the different jobs you can get with a biology degree, expected salaries, and different types of professional opportunities. She also sees that the State of California provides forgivable student loans for students who go into teaching in California schools. Being a CSUSB student, she can preview the career development material for 3 hours. Jane likes to book and adds it to her shopping cart. She also sees an e-handbook on how to succeed in college without going broke. She also puts this in her shopping cart and buys the materials with her credit card.

## **How to Contribute Your Use Case:**

Write your use case in the following format

- a. Name
  - b. Your position title (Assoc Professor, Librarian, etc)
  - c. CSU Campus or organization affiliation
  - d. Email address
  - e. Use case title
  - f. Use case (following the above framework)
- Email the USE case to the CSUSB project coordinator.

### **Other items to consider**

1. User characteristics
  - o New faculty
  - o Midcareer faculty
  - o Late career faculty
  - o Adjunct faculty
  - o Technology advanced faculty
  - o Technology fearful faculty
  - o Low income students
  - o Students working 40 hrs per week
  - o Students taking online courses
2. User Technologies
  - o Students studying in campus labs
  - o Students studying from home
  - o Students studying at Starbucks
3. User Goals
  - o Faculty doing research papers in Economics
  - o Faculty selecting materials for a course package
  - o Students doing a term paper on XYZ
  - o Students working on a group project

Thank you for your participation. If you have any questions, please contact Vince Enriquez at [venriquez@calstate.edu](mailto:venriquez@calstate.edu).