Feasibility Study for Team TerraUser

The Web-based User Management Project

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1. INTRODUCTION

This document is a feasibility study of the TerraUser web-based user management software. The purpose of this feasibility study is to identify if there are any “make or break” issues that would prevent this project form being successful. We want to determine weather the business issues make sense and find the roadblocks. By completing the feasibility study of the project we hope to figure out if the project has value from a business perspective, and is technically feasible.

The Business

USGS is not a company “per say”, however it creates many important products and solutions. USGS is a national science agency that collects, monitors, analyzes, and provides scientific understanding about natural resource conditions, issues, and problems. USGS produces a vast variety of products ranging from geologic maps to assessments of the vulnerability of large metropolitan areas to natural hazards. Over 10,000 scientists work for and with the USGS in nearly 400 offices across the nation.

The USGS Terrestrial Remote Sensing Team at the Flagstaff Field Center consists of a four-member group: Pat Chavez *(Remote Sensing Scientist and Group Leader),* Stuart Sides *(Computer Scientist),* Deborah Lee Soltesz *(Web Mistress), and* Miguel Velasco *(Image Processing Specialist)*. They work with satellite multispectral, airborne photos, shipborne sidescan sonar, and DEM digital images. This team does such things as digital mosaicking, extraction and mapping of earth science information, geometric and radiometric calibration and corrections, and multitemporal change detection. The team has set up TerraWeb as a way for people to access this information along with a way to organize and manage some of their data.

The Problem & Objective

Currently USGS TerraWeb applications have minimal security. Users are not required to log on to access these web applications. No current user management system is in place. Data management and data analysis/manipulation is the main function of many of these applications, and it is imperative that if work is going to be done using these systems that there be some sort of security standards. These TerraWeb applications are fairly new, therefore application uses and functions are evolving to the groups needs.

In this project we are to design and implement a system that will:

- Create a secure interface to currently existing web applications
- Centralized user management system
- Be a way for different users to have different access levels
- Set user priority levels
- Have an application to manage all the users
- And allow for basic user customizations

The objective of the project is to design and implement an efficient, secure interface to other USGS TerraWeb applications, along with a stand-alone application used to administer the user management system. The software will allow users to securely and easily access other interactive TerraWeb applications.

Review of what Feasibility study covers

This document provides the business perspective, technical and economical feasibilities, and the timelines of the project. In this document we will discuss:

- Business value of the project
- Technical feasibility of the project
- Resources available to complete project

2. FEASIBILITY ISSUES

The clients need for web application security is currently not being met, by completing this project we will have added value to the existing system. The technology is available for our team to use to complete the task. We have designed the system to meet organizational and business objectives. The system will be both cost effective and can be operational within the scheduled time. The system will be an addition to the current system and scalable for future needs.

2.1 Business Value

USGS collects huge amount of data for scientific research purpose. Our client work to find ways to manage, present, and analyze the data through the design and implementation of web pages and web applications. The client has set up TerraWeb as a way for people to access this information along with a way to organize and manage some of their data. The people who use the data and products produced by USGS consist of a variety of people ranging from scientists, to government officials to the general public. This project would facilitate/support a way for users to securely and easily have access TerraWeb applications. The client would have a generic interface to all of the current and future web applications.

Since the technologies that the project is being developed on are cutting edge, there are always going to be changes to the solution. Since this project is designed as an interface to applications that deal with scientific data management and analysis the market is pretty diverse. User expectations are

always high when it comes to security and user management. There is a demand for our product in many areas within user market and beyond.

2.2 Economics

Our client has stated that her group does not have the money to buy costly software to solve this problem. Additionally, she doesn't need overly complex and difficult software to deal with the situation. It is a very desirable and viable situation for the client to sponsor a NAU capstone project to get some of her software needs met. Another big bonus of this situation is that the client will have all the code and be able to easily modify and customize it in the future. The client is also flexible enough to wait for the software to be completed delivered at the end of April 2002.

2.3 Technical Feasibility

The cost and the availability of technology is one of the critically important things that need to be looked at to determine if a project is feasible. The required technology exists to build this project, however, much learning and research is needed to keep up with the incredible pace of all the changes in these modern technologies. A development server is needed with all the technologies as stated in the following section. The development server will need to be connected to the USGS network and be accessible to all group members.

Technology needs for project consist of:

Category	Technology Used
Operating System	SuSE Linux
Web Server	Apache
Java Server	Apache Tomcat
Server Side Interfacing	Java, JDBC, JSP, JavaScript
Database	MySQL
Security	SSL

Table 1:Technical Requirements

Equipment needs for project consist of:

- Development server (computer or access to one that meets specified technology needs)
- Network access (Development box needs to be accessible by all group members and from the world wide web)

Will obtain technology and equipment in following ways:

For technology the following online resources will be used:

Resource	Address

SuSE Linux	http://www.suse.com/index_us.html
Apache	http://www.apache.org/
Java	http://java.sun.com/
MySQL	http://www.mysql.org/ http://www.mysql.com/
Section 508	http://www.section508.gov/
Tomcat	http://jakarta.apache.org/tomcat/
USGS TerraWeb	http://terraweb.wr.usgs.gov/

Table 2: Resources

A development server will be pieced together from parts available from USGS along with available parts that group members are willing to provide. The sponsor has also volunteered to help out with finding or purchasing remaining pieces that are needed.

Network access will be provided by USGS.

How project time line is affected by obtaining equipment and technologies:

- Semester schedule is biggest timeline crunch.
- Development server was built and installed with SuSE Linux as of November 11th, 2001.
- Development server will be connected to USGS network no later than December 7th, 2001.

Cost of equipment and technology:

- Costs have been very minimal
- Most all of available technologies used are free

Software Architecture

Our solution will involve use of modules that accomplish desired tasks. There will be a central script that handles all input to the main interface. Another script will handle input to the administrators interface. Each of these scripts will use an individual module that handles database transactions. The modules will be fairly simple in functionality and thus should be easy to implement. The main features of the modules have been reliably implemented many times in the past. The technologies we need to use are available, reliable, and well suited to the needs of the modules we will be creating.

Hardware and Software Environment

Our sponsor has specified the environment our software will run on. The hardware the software is intended to run on is any computer running Linux with Apache, Tomcat, Java, and MySQL running. This environment is already available for use by our team. Additionally, we have our own server with the required software for use.

2.4 Resource Availability

The project is easily viable within the scope of the Capstone project duration. The team members have a wide variety of backgrounds and experiences that will lead to the success of the project. All the team members are dedicated to the success and completion of the project.

Team TerraUser sees this project as being a valuable contribution for USGS TerraWeb applications. The business issues make sense. No major roadblocks are predicted. We have already successfully:

- Identified project objectives
- Looked at most viable solution
- Evaluated alternatives
- Focused on possible obstacles

We agree that the project should be done, can be done, and will be done.

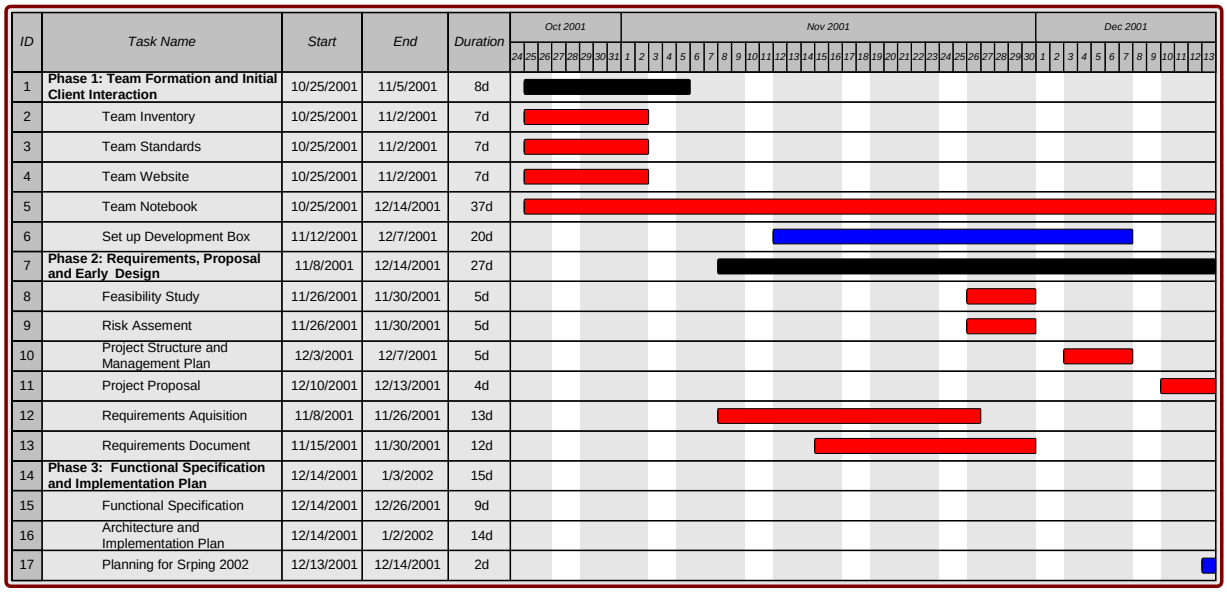
Timelines

Timeline is a significant process for a top-quality product to be created in a given time. Our timeline must follow the college capstone curriculum. Major timelines for the project are shown in Table 3.

Timeline	Objective	Document / presentation
1st week of November	Initial sponsor contact Team forming stage	Team Inventory Team Bylaws Team Website
2nd week of November	Problem definitions / statements	
Mid. November	Initial requirements/specification acquisition, requirements document	Requirement document Introduction presentation
	Project analysis	Feasibility study document Risk assessment document
End of November	Draft proposal	
Early December	Complete specification	Proposal document Proposal presentation
During winter break	Learn and master technology that need on the project	N/A
Jan. – Feb., 2002	Development architecture Implementation	(not specified)
March, 2002	Testing / Integration	(not specified)
April 26, 2002	Capstone Project Conference	As-built report / presentation

Table 3: Project Timelines

We will use Visio software to create Gantt chart to keep track of our tasks for this project. The chart will be updated weekly. As an example, Gantt chart for Fall 2001 is shown in Figure 1.



ID	Task Name	Start	End	Duration
1	**Phase 1: Team Formation and Initial Client Interaction**	10/25/2001	11/5/2001	8d
2	Team Inventory	10/25/2001	11/2/2001	7d
3	Team Standards	10/25/2001	11/2/2001	7d
4	Team Website	10/25/2001	11/2/2001	7d
5	Team Notebook	10/25/2001	12/14/2001	37d
6	Set up Development Box	11/12/2001	12/7/2001	20d
7	**Phase 2: Requirements, Proposal and Early Design**	11/8/2001	12/14/2001	27d
8	Feasibility Study	11/26/2001	11/30/2001	5d
9	Risk Assement	11/26/2001	11/30/2001	5d
10	Project Structure and Management Plan	12/3/2001	12/7/2001	5d
11	Project Proposal	12/10/2001	12/13/2001	4d
12	Requirements Aquisition	11/8/2001	11/26/2001	13d
13	Requirements Document	11/15/2001	11/30/2001	12d
14	**Phase 3: Functional Specification and Implementation Plan**	12/14/2001	1/3/2002	15d
15	Functional Specification	12/14/2001	12/26/2001	9d
16	Architecture and Implementation Plan	12/14/2001	1/2/2002	14d
17	Planning for Srping 2002	12/13/2001	12/14/2001	2d

Figure 1: Gantt Chart for Fall 2001

We are confident that our timelines are sufficient for our project to develop a useful, good-quality product. We allow us to have some learning curve between the semesters to gain knowledge of technology that need on the project. Implementation should start as soon as the spring semester starts to allow enough time for testing and integration. Our timeline also follows the college capstone curriculum. The project will be completed by the April 26, 2002, for the Capstone Project Conference.

Budget

Our cost estimate is very minimal since:

- Most all of available technologies used are free
- Hardware was provided by the team leader
- Development server (SuSE Linux) has been provided by the client
- Connection to USGS network will be provided by the client
- No labor costs since the project is a college curriculum

3. RECOMMENDATIONS AND CONCLUSION

The technologies are available to accomplish the tasks required by the project. The project is economically viable. The resources are available to complete the project.

Team TerraUser sees this project as being a valuable contribution for USGS TerraWeb applications. The business issues make sense. No major roadblocks are predicted. We have successfully:

- Identified project objectives
- Looked at most viable solution
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Estimate of project value:

A very approximate estimate of the true value of the product in dollars would be cost of labor. However, since this project is part of NAU's Senior Capstone Design Course no labor costs are incurred. The following table is a very rough estimate of the hours spent working on the project:

Project stage	**Hours worked on Task**	**Cost**
Concept Development	~10	$200
Requirements	~20	$400
Set up and configure Development server	~5	$100
Proposal	~30	$600
Design and Implementation	~200	$4,000
Testing and Integration	~25	$500
Acceptance (complete software & Documentation)	~30	$600
Total:	**~320**	**$6,400**

Table 3: Rough Cost Estimate (Estimates are based on a $20/hr pay rate)

By completing this feasibility study we have improved confidence that the recommended action is the most viable solution to the problem. We feel that this project can be done, will be done, and should be done. Team TerraUser (Michelle, Harr, Daniel Wallace, and Naoko Tsunekawa) are confident that if we proceed with the project it will be a success.