

# Milestone 1

Team Sriram

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## Changes (based off Git commits)

Date Time	Description
15 September 2011 3:04 pm	Document started
15 September 2011 3:13 pm	Initial work on document
15 September 2011 5:02 pm	Some formatting added to document
15 September 2011 5:27 pm	Formatting work continued, Table of Contents added
15 September 2011 5:46 pm	Fixed some table formatting issues
15 September 2011 5:58 pm	Vertically center title page
15 September 2011 6:24 pm	Reformatted code
16 September 2011 11:39 am	Added some more content
16 September 2011 11:50 am	Added initial requirements list
18 September 2011 10:15 pm	Added executive summary and updated requirements/needs
20 September 2011 11:40 am	Changed formatting, sectioning, and wording
20 September 2011 12:15 pm	Changed date format/value
21 September 2011 12:36 pm	Working on improving executive summary and introduction
21 September 2011 2:33 pm	Committed for peer reviews
21 September 2011 3:36 pm	Made commands for marking editing/proofreading changes
21 September 2011 5:38 pm	Added initial features/needs matrix
21 September 2011 5:58 pm	Finished my proofreading
22 September 2011 8:39 pm	Initial work on finalizing document
23 September 2011 1:05 am	Document mostly finalized
23 September 2011 2:27 am	Document finalized except for now
23 September 2011 12:50 pm	Made some changes after proofreading, fixed table of contents
23 September 2011 12:59 pm	Added needs table
23 September 2011 1:23 pm	Added this change history

# 1 Executive Summary

This milestone, the first of a series, documents the context for a software project proposed by the client: Tim Ekl. The primary stakeholders are Team Sriram (the software developers and documenters), Sriram Mohan (the course instructor), and Tim Ekl. The software solution will eventually be open-sourced which means that external developers and end-users will be involved as stakeholders, however these parties can be ignored for the time being. The current issue raised by the client is the inability to easily and consistently locate personal belongings and hardware. This milestone will cover the background of the client, their current system, involved parties, an overview of the product and costs, features of the product, and constraints to the solution; the solution is intended as a simplified asset-tracker scaled for personal usage.

## 2 Introduction

Our client, Tim Ekl, would like a system to keep track of personal belongings. Tim's profession and interests with computers have caused him to accumulate a large collection of computer hardware. Currently, Tim maintains a crude organization system which involves labeling containers in order to categorize the different areas to place objects—whether it be for storage or extraction. However, the current system is not as effective as the client would like since there have been multiple instances in which items were not found when they were needed and replaced unnecessarily, resulting in lost capital. In addition, the current system's generic labeling is not a sure-fire method for finding items; they are only meant to guide Tim and help him make educated guesses concerning the general location of his items. This results in lost time looking for items which may not even exist.

The client wishes to replace the current system with one that should be comparable to corporate asset-tracking systems with the capability to tag assets with a wide variety of attributes, though more streamlined since it is intended for use on a personal scale. Since this project is an initiative from a college program, there will be no monetary capital invested towards development. However, it is expected that each developer involved in the project will invest approximately five hours weekly towards the project; this results in roughly 340 man hours in terms of a time budget for the project. In addition, all developers will respect the client's preference to construct the product utilizing Ruby (programming language) [2] and Sinatra (web framework) [3]. There exist more requirements and constraints which will be elaborated on later in this document. Ultimately the product will be a web application backed by a database.

This document will provide utility and the initial background for upcoming milestones. The sections on client background, current system, user needs, features, and the feature-to-need correspondence provide the project background needed for all future milestones. The non-functional requirements and constraints sections specifically satisfy the various requirements as well the design constraints involved in the third milestone. Finally, the section on testing introduces the topic of test cases that is expanded upon in the fourth milestone.

## 3 Client Background

Tim Ekl is a Rose-Hulman graduate student who possesses a significant amount of computer hardware. He plans on using this system to be able to quickly and easily locate the equipment he wants to use. Tim is an experienced developer and plans on maintaining the system after it is finished.

## 4 Current System

The client does not have a software solution in place. Currently, Tim has a primitive categorization system in place which involves labeling boxes and then trying to deduce the location of a desired component. The

current system poses a few issues such as not always allowing him to find his items, i.e. there have been instances where an item was found after capital was spent to replace it.

## 5 User/Stakeholder Description

### 5.1 User Profile

The client will be the main user of the system. While the client is very familiar with sophisticated technologies and software, the final product will be open-source and will be exposed to many more users who will have a broad spectrum of technical proficiency—so the final product will be made with these prospective end users in mind. The client is an accumulator of hardware and disc media, having approximately 1,000 such items which he wants catalogued. Ultimately, identification of the client's items will be based off of a unique identifier, a category, and as many attributes as necessary to describe it.

### 5.2 Stakeholder Profiles

#### 5.2.1 Stakeholder: Tim Ekl

**Role:** Client

**Success:** The final product reasonably satisfies the needs and requirements as defined.

**Failure:** The final product is not easily usable and cannot be extended without major reworking.

#### 5.2.2 Stakeholder: Team Sriram

**Role:** Requirements, Specifications, and Development Team

**Success:** The final product has its requirements defined and prioritized with a satisfactory amount of the high priority features implemented. The client is able to easily extend and work with the source code provided.

**Failure:** The final product delivered fails to successfully implement the critical features requested by the client.

#### 5.2.3 Stakeholder: Sriram Mohan

**Role:** Class Instructor

**Success:** Team Sriram understood the concepts and processes utilized during the course of the project. The client is satisfied with the final product.

**Failure:** Team Sriram was unable to deduce any concepts or processes discussed during the course. The client is not satisfied with the final product.

### 5.3 User Environment

- The client uses Chrome whenever possible and prefers that development support Chrome and Firefox browsers.
- The final product should operate on a Linux server with standard programming languages, programming frameworks, and Apache. Additional packages can be installed if necessary.

## 5.4 User Needs

ID	Need	Priority
N0	Search for parts based off their attributes	Primary
N1	Identify items via bar codes	Primary
N2	Keep track of the data associated with an asset	Primary
N3	Organize search results	Primary
N4	Insert objects in the system at any point; do not freeze the database	Secondary
N5	Modify objects; including adding notes to the objects	Secondary
N6	Access from a second physical location	Optional
N7	View most-recently acquired asset(s)	Optional
N8	View a summary of inventory data	Optional

### Legend:

Primary - Necessary to the system

Secondary - Important to the system

Optional - Would be nice to have in the system

## 5.5 Alternatives and Competition

Tim has researched alternative solutions but has not been able to find one that fits his needs. Alternative systems have been intended for corporate use, are overly complicated, and are designed for large scale use. Other issues associated with these products include incompatibility with non-Windows environments, excessive cost, and locally restricted access (not accessible through the Internet). The client has also considered making a system for himself, however he has never had the time to implement it.

## 6 Product Overview

### 6.1 Product Perspective

The software will be an independent system to be hosted on the client's servers. The product will replace the current solution by electronically keeping track of asset locations. In addition, the software will maintain data associated with each asset.

### 6.2 Elevator Statement

Everyone accumulates items that they currently do not use, but do not want to discard. Given enough time, a person will accumulate more items than they will be able to consciously track. We propose a web application which will allow for simple and streamlined asset tracking. The software will maintain an organized and systematic inventory which will also keep track of each item's location.

### 6.3 Summary of Capabilities

Customer Benefit	Supporting Features
Expediently track items based off of specific criteria	F1, F4, F5, F6, F8
View statistics of asset inventory	F4, F7
Keep all data in one place	F0, F2
Access data from anywhere with Internet access	F0
Compatible with the client's current user environment	F9
Change data associated with items	F3

## 6.4 Assumptions and Dependencies

- Availability of network/web hosting.
- Availability of Ruby [2] and Sinatra [3] framework to run the software.
- Operates on the Unix operating system.

## 6.5 Rough Cost Estimate

Since the solution will be the product of a course project, no monetary capital will be given nor required. Concerning a time budget, 340 man hours will be invested into the final product (20 hours per week given four team members).

# 7 Non-functional Requirements

## 7.1 General

- Responsive on the local network.
- Local/client storage on web browsers using SQLite [5] and Sinatra [3].
- Allow for easy transfer of inventory data; involves a simple copying, tar'ing, moving, and untar'ing of the directory.
- Avoid crashing the application or at least handle the crash gracefully; avoid hard server restarts or corruptions.

## 7.2 Testing

- Cucumber [6] is the preferred testing framework. RSpec [7] is recommended if Cucumber [6] is not used.
- Manually coded unit tests should be used at minimum if no testing framework is utilized.

## 8 Features

### 8.1 Feature Listing

ID	Feature	Priority	Effort	Risk	Stability	Target Release	Assigned To
F0	Online UI	Critical	High	High	Low	1.0	Eric
F1	Add assets to the inventory	Critical	Low	High	Low	1.0	Richard
F2	Modify assets in the inventory	Critical	Low	High	Low	1.0	Taylor
F3	The system keeps track of attributes based on category	Critical	Low	High	Low	1.0	Susi
F4	Use a UPC-A barcode as the unique identifier for each asset	Critical	Low	Medium	Low	1.0	Eric
F5	Provide an updated list of recently-added assets	Useful	Medium	Low	Medium	1.5	Richard
F6	Generate reports of asset inventory	Useful	High	Low	Medium	2.0	Taylor
F7	Sort search results based off of barcode, title, and modified/created timestamp	Useful	High	Low	Low	2.0	Susi
F8	Basic search for items based on name or UPC	Critical	High	High	Low	1.0	Eric
F9	Advanced search for items based on all fields related to the item and its category	Critical	High	High	Low	1.0	Richard
F10	Basic and Advanced searches allow the user to include wildcards in the query	Critical	High	High	Low	1.0	Taylor
F11	Basic and Advanced searches will search first by exact/wildcard match, then by fuzzy match	Critical	High	High	Low	1.0	Susi
F12	REST API	Critical	High	High	Low	1.0	Eric

**Legend:**

Critical - Highest importance

Important - Medium importance

Useful - Lowest importance

High/Medium/Low - Degree of a category

1.0 - First release of the system

1.5 - Next release of the system with significant changes

2.0 - Final release of the system



## 8.2 Feature-to-Need Correspondence

	N0	N1	N2	N3	N4	N5	N6	N7	N8
F0							X		
F1			X		X				
F2			X			X			
F3			X		X	X			
F4	X	X	X						
F5								X	
F6									X
F7	X	X		X					
F8	X	X	X	X					
F9	X	X	X	X					
F10	X	X	X	X					
F11	X	X	X	X					
F12							X		

## 9 Constraints

ID	Source	Constraint	Rationale	Cost
C0	Development	The project must be open source.	The client wants to be able to extend the project's functionality as well as allow third parties to benefit from the software source code.	Low
C1	Time	The project must be completed within five months.	This is the duration of the Junior Project sequence for Team Sriram.	High
C2	Budget	The project must be completed without funding from the client.	This is an academic undertaking and is not for monetary gain.	Low
C3	Software Architecture	The project must utilize REST, not SOAP.	The client strongly prefers not to use SOAP based off of past experience.	Low
C4	Technology	Develop in Ruby [2] utilizing Sinatra [3] for web framework.	The client prefers the development language and framework to be familiar to him for further extension.	Medium
C5	Availability	Accessible via the web.	The client does not want to be restricted to one computer for working with the system. In addition, the client could potentially extend the system as a mobile application, which implies web accessibility.	Low

### Legend:

High/Medium/Low - The degree to which the cost is

## 10 Index and Glossary

**Assigned to:** Developer ultimately responsible for the implementation of a feature (6).

**Constraint:** A limitation or bound for the development of the project (7).

**Cost:** How big of a negative impact a constraint will have on the development process (7).

**Effort:** Expectation of the resources and time consumed for a feature (6).

**Feature:** A system capability that fulfills a user need (6).

**Priority:** Description of how essential a feature is to the project (6).

**Risk:** Probability that a feature will instigate delays in the project (6).

**Source:** The area that a constraint is tied to (7).

**Stability:** Likelihood that the understanding of a feature will change (6).

**Target Release:** Expected release iteration of a testable feature (6).

## 11 References

- (1) Leffingwell, Dean, and Don Widrig. *Managing Software Requirements: a Use Case Approach*. Addison-Wesley, Boston, 2nd Edition, 2003.
- (2) "Ruby 1.9.2" *Download Ruby*. Ruby. Web. 6 October 2011.
- (3) "Sinatra 1.3.0" *Sinatra: Documentation*. Sinatra. Web. 6 October 2011.
- (4) "Ubuntu 11.04" *Download Ubuntu*. Ubuntu. Web. 6 October 2011.
- (5) "SQLite 3.7.8" *SQLite Download Page*. SQLite. Web. 6 October 2011.
- (6) "Cucumber 1.1.0" *cucumber/cucumber*. Cucumber. Web. 6 October 2011.
- (7) "RSpec 2.6.0" *RSpec Documentation*. Relish. Web. 6 October 2011.
- (8) "DataMapper 1.1.0" *DataMapper - Documentation*. DataMapper. Web. 6 October 2011.