Software Requirements Specification (SRS)

Group Mahler

SELF TEACHING ELEMENTARY PROGRAMMING SYSTEM (STEPS)

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Revision History

Date	Primary Author	Reason For Changes	Version
16/10/2003	Thomas Byrne	Initial Draft for team review	0.1
17/10/2003	Thomas Byrne	Change slight errors	0.2
24/10/2003	Thomas Byrne	Add a non-registered user	0.3
28/10/2003	Thomas Byrne	Incorporate changes post a meeting with the client 27/10/2003	0.4

1. Introduction

1.1 Purpose.

The purpose of this document is to describe the Self Teaching Elementary Programming System (STEPS). This document defines and describes the interfaces, functions, performance, security and quality assurance requirements for STEPS.

This document is intended for all STEPS stakeholders including, but not limited to, developers, project managers, users, testers, and documentation writers for STEPS. This SRS will be used as a common basis for their understanding of the capability to be provided by the beta release for STEPS.

Except for those requirements marked "Phase 2", the Contractor shall implement all requirements herein during the SE315 Semester 1, 2003. Further, the Contractor shall abide by all Contractor deliverable requirements defined in the STEPS Software Project Management Plan. STEPS is envisioned to be a client/server application.

1.2 Scope.

STEPS will provide capability for a user to perform the following:

- register an account,
- login to the system,
- view graphical tutorials,
- view working programs through Java applets,
- download example code,
- take an exam on current levels tutorial,
- re-sit an exam in the event of failing,
- receive a forgotten password, and
- choose a language setting [Phase 2]

The SRS is developed consistent with and in conjunction with the full set of software development activities identified in this project's STEPS Software Project Management Plan(SPMP). This SRS is the originating requirements source for STEPS.

1.3 Definitions, Acronyms, and Abbreviations.

This section provides the definitions of all terms, acronyms, and abbreviations required to interpret this SRS.

1.3.1 Definitions.

None.

1.3.2 Acronyms.

IEEE	Institute of Electrical and Electronic Engineers
IP	Internet Protocol
STEPS	Self Teaching Elementary Programming System
GUI	Graphical User Interface
SPMP	Software Project Management Plan
SRS	Software Requirements Specification
TCP	Transmission Control Protocol

1.3.3 Abbreviations.

None.

1.4 References.

This section provides a complete list of all documents referenced in the SRS. When a specific version of the document is not identified, the current base-lined version shall apply.

1.4.1 Standards.

[2]IEEE Std 830 IEEE Recommended Practice for Software Requirements Specifications

1.4.2 Project Documents.

2003-STEPS-0.1 STEPS Software Project Management Plan (SPPMP)

1.5 Overview.

The remainder of the SRS includes the following:

- An overall description that includes general factors that affect STEPS and its requirements. This does not state specific functional requirements. Instead it provides a background for those requirements.
- Specific STEPS functional requirements to a level of detail sufficient to enable designers to design a system and testers to test that the system satisfy those requirements. Topics addressed include topics such as software and hardware interfaces, functions, performance, standards compliance and security requirements.

IEEE Std. 830 is used as guidance for the content and organization of this SRS.

2. Overall Description.

2.1 Product Perspective.

STEPS is intended to provide a service to users to facilitate the learning of Elementary Java programming and examine user on tutorials taken at each level as they progress. Each tutorial is designed to give a graphical step by step introduction to all essential elements of Java.

STEPS provides services including registration, login system, tutorials, help and support center, sample Java code downloads, Java Applet sample code, automated examination system, unique re-sit tests, Multilingual provisions.

A context diagram that depicts that major external interfaces and user types is shown in

Figure 1.

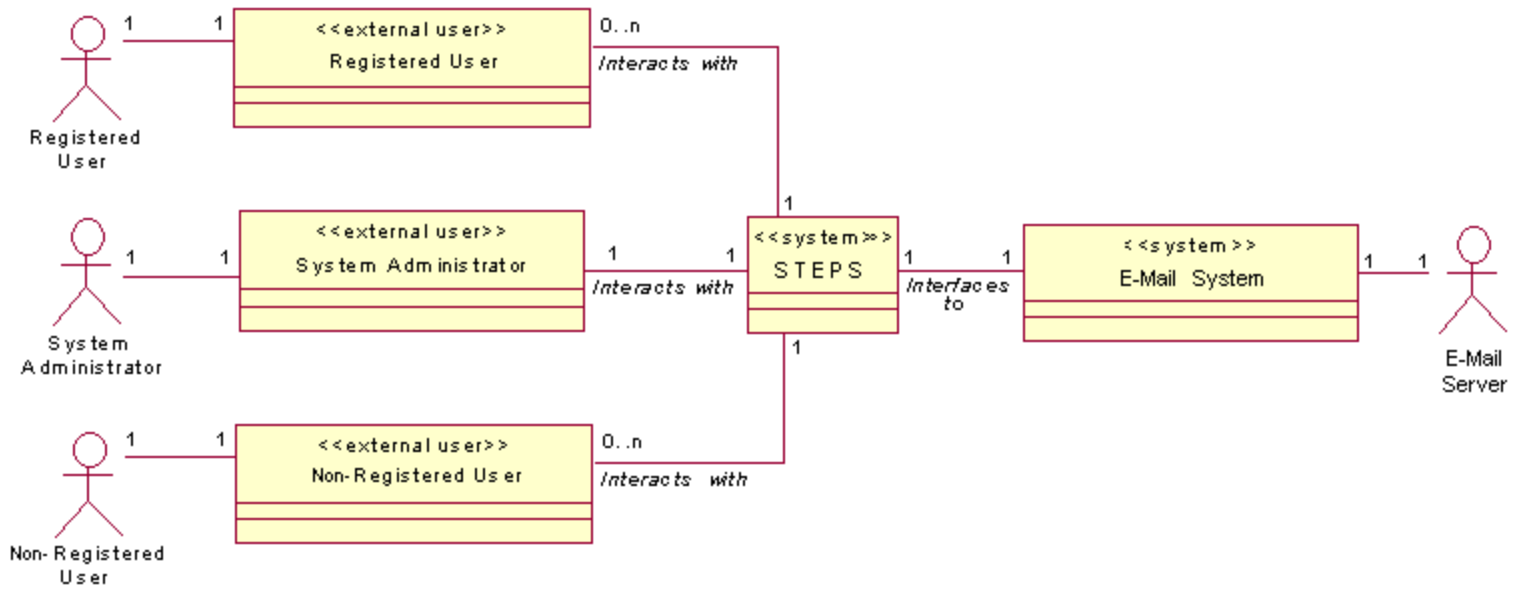

Figure 1. STEPS Context Diagram.

2.1.1 System Interfaces.

This section describes each system interface.

1. STEPS shall have interfaces with the following external system services:

   a. Maintains a data store of user information. STEPS is required to interface with the data store to populate it and to obtain user details including login information and tutorial records while ultimately ensuring that all relevant data is recorded by this service.

   b. The STEPS GUI to provide exact user details for the data store should be a primary focus of the user interface development. The GUI should accommodate the ability to be expanded of gathering of further data and expansion of the system. A GUI similar to commonly used members only online systems is envisioned as one possibility.

2. STEPS shall have an interface with the following external systems:

   a. E-mail Server – STEPS integrates with the E-mail Server to send e-mail messages associated with user registration and password management.

2.1.2 User Interfaces.

STEPS shall interface to the following classes of users:

1. **System Administrator:** This class of user has special privileges with respect to control of user accounts and system initialisation.

2. **Registered User:** This class of user is able to access non-administrative features of STEPS. As a result of registration with STEPS, the registered user can access all the standard user functions.

3. **Non-Registered User:** This class of user is able to access non-administrative and non-Registered Users features of STEPS. As a result of non-registration with STEPS, the non-registered user can only access overview and introduction pages.

2.1.3 Hardware and Software Operating Environment.

1. STEPS client software shall operate on any Windows 95/98/ME/2000/NT/XP, OS2 and Unix based operating systems, 64Mbytes memory, 300MHz processor, and 30Mbytes free disk space.

2.1.4 Communications Interfaces.

1. STEPS client and server software online based approach shall operate over a Transmission Control Protocol/Internet Protocol (TCP/IP) based network.
2. STEPS client and server software for CD-ROM based approach shall operate on an installed Local host/web server.

2.1.5 Operations.

1. After start-up and initialisation, STEPS server software shall normally operate in an unattended mode without a need for administrative user interaction.

2.1.6 Site Adaptation Requirements.

1. STEPS shall have no initialization sequences.
2. STEPS shall have no features that must be modified to adapt STEPS to a particular installation.

2.2 User Characteristics.

STEPS users and administrators are not expected or required to have significant technical expertise to operate STEPS. STEPS must accommodate English language users as a minimum with clear method to expansion to multilingual options on future releases.

3. Specific Requirements.

3.1 External interface requirements.

3.1.1 User interfaces.

1. A registered user with basic computer knowledge shall be able to perform all available STEPS tasks after 15 minutes of experience.
2. A System administrator user with basic computer knowledge shall be able to perform all available STEPS tasks after 15 minutes of experience.
3. STEPS shall accommodate users who are colorblind.
4. STEPS shall not accommodate users with sight impairment.
5. STEPS shall operate in the English language, as a minimum.
6. All error messages generated by STEPS shall indicate the specific cause of the error and action that can be taken by the user to resolve the error.

3.1.2 System interfaces

1. STEPS shall not currently provide an interface with any external system.

3.2 System features.

This section provides the detailed requirements for STEPS, organized by primary system features. A feature is an externally desired service provided by STEPS that requires a sequence of inputs to affect the desired result.

3.2.1 System Access.

System Access provides capability for the user to create an account (i.e. register), login to that account.

1. STEPS shall provide capability for a Non-Registered user to create an account.
2. The unique identifier for each account shall be comprised of a user-login name.
3. STEPS shall have a fixed login name for the System Administrator.
4. STEPS shall require that the user login name is a minimum of seven characters.
5. STEPS shall require that the user answers an unusual question on order to obtain a password reminder in the event of forgetting a password.
6. STEPS shall distinguish between capital and non-capital letters in a user login name.
7. STEPS shall require the Non-Registered user to input a valid e-mail address upon creation of an account.
8. During account creation, STEPS shall provide capability for the Non-Registered user to input the user's choice for password.
9. During account creation, STEPS shall require the Non-Registered user to input a confirmation of their chosen password.
10. During account creation, STEPS shall provide capability for the Non-Registered user to input a country of residence for eventual expansion to a multilingual system, Phase 2.
11. Each login name shall be unique within STEPS and data store.
12. Upon Non-Registered user request for an existing login name, STEPS shall reject the duplicate login name request and provide the appropriate error message to the user.
13. The username and password for a STEPS Registered User's account shall be e-mailed to the user's e-mail address.
14. STEPS shall provide capability for any user to modify their current password after successful login.
15. STEPS shall provide capability for the administrator user to modify registered users accounts after successful login.
16. STEPS shall provide capability for any user to request a password reminder to be displayed with submission of their STEPS login name and correct answering of a question answered at registration, without logging on to STEPS.
17. STEPS shall provide capability for an administrator user to view all registered users details.

3.2.2 Level Storage.

Level storage provides the current level a registered user has reached on STEPS for use to assess the tutorial and examination the use should be displayed.

1. STEPS shall provide capability for the level to be incremented each time a user receives a grade equal or greater than but not less than 40% on an examination.
2. STEPS shall not permit the level number to exceed the number of tutorials required for successful completion of STEPS.

3.2.3 Course Examinations.

STEPS provides capability for only registered users to complete an Examination on STEPS course material.

1. STEPS shall provide capability to display Examinations after completion of each respective Tutorial.
2. STEPS shall provide course Examinations comprising of ten multiple-choice questions.

3. STEPS shall provide Automated Computation of Examinations where all questions carry equal mark of 10% of the overall Examination.
4. STEPS shall provide a Negative marking system, in cases where users omit an answer no penalty is incurred otherwise incorrect answers receive a negative mark of 10%.
5. STEPS shall provide capability for a user to retake an Examination upon failure to receive a mark greater or equal to 40%.
6. STEPS shall provide capability to generate a unique Examination every time it is required for a user to repeat an Examination.
7. STEPS shall provide capability to accumulate user's marks for printing attained grade on the certificate for successful completion of STEPS.

3.2.4 System Administration and Management..

System Management provides capability for the system administer to manager registered user accounts and system details.

1. STEPS shall provide a system administrator account with system administration capabilities.
2. The system administrator shall be able to manage user accounts including the following:
    a. STEPS shall allow the system administrator to search for and find a particular user account.
    b. Initiate deletion of a user account including deletion of all related details stored on that user account.

3.2.5 Initialisation and Shutdown.

Initialisation starts STEPS for either the first time, initial load, or subsequent to a previous shutdown.

1. Where deemed appropriate, STEPS shall install required software including preconfigured configuration files to prepare the system for an Initial Load.
2. STEPS shall automatically run upon installation of the required software or on any subsequent insertion of the CD-ROM on the same system.

3.3 Software System Attributes

3.3.1 Reliability

1. STEPS shall go through rigorous Testing phases to ensure premium reliability
2. STEPS will continue to provide a reliable service only impeded by such external devices unreliability.

3.3.2 Availability

1. STEPS remains available continuously during all tasks.
2. STEPS shall accommodate multiple users on the system at a given time frame.

3.3.3 Security

1. STEPS shall use a login-logout system which requires user information

2. STEPS shall not provide any secure socket layer (SSL) type technologies as STEPS does not deal with security critical information (i.e. Credit Card)

3.3.4 Maintainability

1. STEPS software shall normally operate in an unattended mode without a need for administrative user interaction.
2. Coding of STEPS shall have description headers and code body shall be clearly commented.

3.3.5 Portability

1. STEPS shall operate on any Windows 95/98/ME/2000/NT/XP, OS2 and Unix based operating systems.
2. STEPS shall require a web browser, flash player and a JAVA virtual machine
3. STEPS shall provide links to all relevant locations for download of necessary components.

3.4 Data Store Requirements.

This section defines the structure and inter-relationship used for persistent data storage.

3.4.1 Data store.

1. STEPS shall provide a persistent data store such as a relation database.
2. Any Datastore provided by STEPS shall be capable of holding all information required by STEPS
3. It is envisaged to us multiple table capable of dividing data into subsets for minimum duplication.

Appendix A: Open Issues.

This section contains a list of the open requirements issues that remain to be resolved, including pending decisions, information that is needed, conflicts awaiting resolution, etc.
