Software Plan

Requested by:  Dr. Scott Hunter  
Professor of Computer Science  
Computer Science Department of Siena College

Ms. Jami Cotler  
Professor of Computer Science  
Computer Science Department of Siena College

The Electronic Spreadsheet  
Automated Teaching Assistant

Pear Software

Prepared by:  Matt Restivo – Team Leader  
Colin Cubinski  
Daniel Nakhla  
James Rocco  
Justin Valentini

September 19, 2006
# Table of Contents

## System Definition:

- Section 1.1: Problem Definition........................................................................................................1
- Section 1.2: System Justification........................................................................................................1
- Section 1.3: Goals for the System and on the Project........................................................................1
- Section 1.4: Constraints on the System and on the Project...............................................................1
- Section 1.5: Functions to be Provided................................................................................................2
- Section 1.6: User Characteristics.......................................................................................................2
- Section 1.7: Development / Operating / Maintenance Environments..............................................2
- Section 1.8: Solution Strategy............................................................................................................2
- Section 1.9: Priorities of System Feature..........................................................................................3
- Section 1.10: System Acceptance Criteria.......................................................................................3
- Section 1.11: Sources of Information...............................................................................................3

## Project Plan:

- Section 2.1: Life-Cycle Model (Terminology / Milestones / Products)...............................................4
- Section 2.2: Org Structure (Management Structure / Team Structure / Work Breakdown Structure / Statements of Work).................................................................4
- Section 2.3: Prelim Staffing and Resource Requirements (Staffing and Resource Schedule)........5
- Section 2.4: Prelim Development Schedule (PERT & Gantt Charts).................................................5
- Section 2.5: Project Monitoring and Control Mechanisms...............................................................5
- Section 2.6: Tools and Techniques to be Used...............................................................................5
- Section 2.7: Programming Languages..............................................................................................6
- Section 2.8: Testing Requirements..................................................................................................6
- Section 2.9: Supporting Documents Required..................................................................................6
- Section 2.10: Manner of Demonstration and Delivery.................................................................6

## Appendices:

- Section 3.1: Gantt Chart..................................................................................................................7
- Section 3.2: Resumes for Team Personnel.....................................................................................8
- Section 3.3: Glossary of Terms.......................................................................................................16
Section 1.1: Problem Definition

The use of computers in modern times is almost mandatory no matter where one goes or what one does. Computers tend to make everyday tasks faster, more efficient and more organized. A computer automated teaching assistant for example, could really take a major burden off of busy college professors that do not have time to grade the massive amount of assignments that they hand out and must mark over the length of a semester. Our clients, Dr. Scott Hunter and Ms. Jami Cotler have exactly that problem, too many papers to grade and not enough time to do it. Pear Software can offer them a solution, one which will cut down on the tedium of grading Microsoft Excel Spreadsheet assignments for the Computer Science 010 class at Siena College, which a large amount of students are required to take.

Section 1.2: System Justification

Our software will serve a multitude of purposes for not only our two clients, but for the students enrolled in the course. For the clients, the software will offer a variety of features, including the automated grading of Microsoft Excel Spreadsheets. The software will grade Computer Science 010 pre-labs, and be able to determine whether or not font sizes, font types, background colors, formatting, and formulae are correct and in the correct places. The software will also keep track of how much of the actual assignments were completed by the student, and keep a log of their grade. In addition, the software will also provide statistical information, including which questions were repeatedly incorrect, and which material seemed to be causing the most problems or confusion among the students. On the student’s side, the software will provide an interface in which the students can electronically submit their assignment and receive a grade and feedback for the assignment.

Section 1.3: Goals for the System and on the Project

The goal for the system is to provide a user-friendly and efficient piece of software that can truly aid and assist our clients, as well as make the pre-labs more meaningful to the students. Our clients received software from last years Software Engineering class, but they have informed Pear Software that the software did not have all of the specific features that they required. We hope to build on what was submitted last year and make sure that every fine detail is included into the software, giving them the complete package.

Our group’s goal is to make a name for ourselves, and to put all of ourselves up to the challenge that is before us. Our clients have provided a near exact outline of what they require, and we fully intend to give them exactly what they asked for, and hopefully more.

Section 1.4: Constraints on the System and on the Project

Our constraints on the system do not seem too demanding. The software must be usable on a Windows based system, as all of the computers are personal computers (PCs). Another possible constraint would be the actual coding of last year’s software. If we find that is too inefficient or something that we cannot work with, we may start from scratch.
Project restraints include the breakdown and time limits that currently exist. There will be a decent amount of coding required for this to be a quality piece of software, and we only have the second semester to do it. The official project is yet to be determined but will be sometime near the end of the spring semester.

Section 1.5: Functions to be Provided

- Allow the student to electronically submit a pre-lab to our software.
- Allow the student to get feedback:
- Report/log the grades for the teachers.
- Generate a correlation of answers, i.e. how many students got a question wrong/right, with breakdown percentages.
- Further break this information down into class/sections.
- Focus on marking the more tedious aspects of the pre-labs, including font-sizes, colors, formatting, etc. Specifically things which are hard to grade by eye.
- Recognize most formulas on Excel spreadsheets. Since there are so many possibilities to solve most problems, it would be improbable to store every solution for a question that generates a formula. Instructors would double check this by hand, if such an abstract formula was used that the software marked incorrect, when it actually was correct.

Section 1.6: User Characteristics

The main users of our software will be the clients, Dr. Scott Hunter and Ms. Jami Cotler of the Siena College Computer Science Department. The students of these courses will also have access to the software, but their actual use will be limited compared to that of the clients. Our software may also be used by other professors of the Computer Applications Course at Siena College.

Section 1.7: Development / Operating / Maintenance Environments

The greater part of our development will take place in the facilities provided for our use by Dr. Lederman, which is the Software Engineering Lab in Roger Bacon at Siena College. The operating of our software will take place in the various Computer Science labs around Roger Bacon, on a PC platform since none currently have any other platforms available. Maintenance environments are undetermined at this stage.

Section 1.8: Solution Strategy

In order to develop the requested product for our clients, we will use the classic Waterfall model. The classic Waterfall model is a design with the following steps;

1. Project Definition – Pear Software will meet with the clients and decide what the problem is that needs to be solved.
2. Analysis and Requirements – The team will analyze the notes of the meeting and decided how and using what tools we will use in order to complete the project.
3. Design of the Solution – The project team will change the basic ideas into a software.
4. Code and Test the Solution – The project team will encode the software primarily using a programming language that has yet to be determined. The product will be tested throughout the process. Coding and testing will occur in the Spring of 2007.

5. Install and Maintain – This step involves the actual installation of the software product. Documentation will be provided client in order to assist them in using the final software product.

**Section 1.9: Priorities of System Feature**

The system features are the ability to greatly reduce the time taken to grade pre-lab exercises, as well as providing another way to convey feedback to the students. Also, students will be able to receive faster, hopefully allowing them to quickly correct mistakes and learn from them.

**Section 1.10: System Acceptance Criteria**

- Allow students to electronically submit pre-labs
- Mark the percent complete/attempt at the work. Report this to the instructor.
- Give the student feedback on their incorrect answers.
- Automatically grade almost all aspects of a spreadsheet pre-lab, including font sizes, colors, and formulas.
- Allow the instructors to keep a grade log.
- Allow the instructors to know which responses were consistently wrong, and produce these statistics in a break down by class and/or section.

**Section 1.11: Sources of Information**

Our largest source of information for the project so far has been provided by our two clients, Dr. Scott Hunter and Ms. Jami Cotler. Dr. Lederman has also been very helpful in providing information on the overall structure of our task as well as providing us with ideas and tactics to use. The textbook used for our class, Software Engineering: A Practitioner’s Approach Sixth Edition, by Roger S. Pressman has also been an invaluable resource.
Section 2.1: Life-Cycle Model (Terminology / Milestones / Products)
Pear Software will be using the Classic Waterfall Model. Please revert to section 1.8 on page 3 for the Solution Strategy where the waterfall model is explained.

Section 2.2: Org Structure (Management Structure / Team Structure / Work Breakdown Structure / Statements of Work)

Pear Software is compromised of the following:

<table>
<thead>
<tr>
<th>Name</th>
<th>Contact Information</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colin Cubinski</td>
<td><a href="mailto:colin.cubinski@siena.edu">colin.cubinski@siena.edu</a></td>
<td>(516) 695-2530</td>
</tr>
<tr>
<td>Daniel Nakhla</td>
<td><a href="mailto:daniel.nakhla@siena.edu">daniel.nakhla@siena.edu</a></td>
<td>(518) 542-4738</td>
</tr>
<tr>
<td>Matthew Restivo</td>
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<td>(631) 241-3142</td>
</tr>
<tr>
<td>James Rocco</td>
<td><a href="mailto:james.rocco@siena.edu">james.rocco@siena.edu</a></td>
<td>(845) 642-9396</td>
</tr>
<tr>
<td>Justin Valentini</td>
<td><a href="mailto:justin.valentini@siena.edu">justin.valentini@siena.edu</a></td>
<td>(518) 929-4295</td>
</tr>
</tbody>
</table>

Pear Software is organized as follows for the e-SATA project:

- Colin Cubinski – Team Librarian/Record Keeper
- Daniel Nakhla – Systems Administrator
- Matthew Restivo – Team Leader
- James Rocco – Team Project Manager
- Justin Valentini – Website Developer

Pear Software is using a structure of organization called controlled decentralized. Matthew Restivo is our team leader, but anything that requires decisions is done as a group. Every group member has an equal say in all of our business.

The descriptions of each position in the group are as follows:

*Team Leader:* Organize and setup all team meetings. The team leader will also have an itinerary of what needs to be discussed at each meeting, and will distribute the work required accordingly. Also, the team leader will keep Dr. Lederman apprised of the teams progress.

*Team Librarian/Record Keeper:* The team librarian will attend every meeting that the group has, and keep a detailed and accurate record of all matters discussed. The librarian will also be present at every client meeting as well, to take notes while other members converse with the clients.

*Systems Administrator:* The systems administrator will be responsible for maintaining the group’s computers in the Software Engineering lab, as well as heading up the actual software development.

*Project Manager:* The project manager will assist any other team member that needs help with their requirements, as well as help lead discussions and keep group activities organized.

*Website Developer:* The website developer will create the team webpage and maintain it appropriately.
Section 2.3: Prelim Staffing and Resource Requirements (Staffing and Resource Schedule)

The staffing that the group requires is detailed in Section 2.2

The software that the group requires is detailed in Section 2.6 and 2.7

The hardware that is required for our teams use is as follows:
- Computer terminals
- Printers

Resources for our project include:
- The clients, Dr. Hunter and Ms. Cotler
- Our professor, Dr. Lederman
- Our class textbook

Section 2.4: Prelim Development Schedule (PERT & Gantt Charts)

All charts are located in Section 3.1 of our Software Plan.

Section 2.5: Project Monitoring and Control Mechanisms

To successfully monitor the group’s progression and make sure that things are running smoothly, we will continue to meet with the clients at least once a week. These meetings will help to not only keep us on track, but make sure that the clients are satisfied with our work and can raise any issues that they may have.

Section 2.6: Tools and Techniques to be Used

Computers with Blue J, Dreamweaver, Fireworks, Microsoft Office, and Microsoft Project will be used. We will be using both Macintosh and PCs with Tiger OS X for the Mac and XP Professional for the PC. We will use Internet Explorer, Firefox, and Safari for browsers and ensure compatibility of our software with all three browsers. Our web server will be Apache and our database management system (DBMS) will be Oracle.
Section 2.7: Programming Languages

In order to develop the Electronic Spreadsheet Automated Teaching Assistant we will use languages such as PHP (PHP Hypertext Preprocessor), Java, Javascript, HTML (HyperText Markup Language), and SQL (Structured Query Language).

Section 2.8: Testing Requirements

As Pear Software continues to work on the task at hand, we will thoroughly and rigorously test our product, while conferring with Dr. Lederman and other sources for assistance.

Section 2.9: Supporting Documents Required

The following documents are to be handed in and provided to our clients during semester at the following times:

- Software Plan: September 19th, 2006
- Software Specification: October 23rd, 2006
- Preliminary Design: November 27th, 2006

Section 2.10: Manner of Demonstration and Delivery

Throughout the semester, numerous presentations will occur so that the clients can get an official and well versed response to Pear Software’s progress with their problem. These presentations will include Power Point offerings, as well as handouts and brief speeches. Supporting documents will also be provided to the clients.

- Software Plan Document: September 19th, 2006
- Software Plan Presentation: September 20th and 22nd, 2006
- Software Specification Presentation: October 25th and 27th, 2006
- Preliminary Design Document: November 27th, 2006
- Preliminary Design Presentation: November 29th and December 1st, 2006
Section 3.2: Resumes

James J. Rocco
Phone Number: (845) 638-1209
james.rocco@siena.edu

Present Address:
SPOB 4088
515 Loudon Rd.
Loudonville, NY 12211
Cell: (845)-642-9396

Permanent Address:
20 Farm Court
New City, NY, 10956

OBJECTIVE
To obtain a challenging position in the field of Computer Science that will allow growth and utilization of my education.

EDUCATION

Siena College, Loudonville, NY
B.S. in Computer Science, May, 2007
GPA: 1.95

COURSE WORK

<table>
<thead>
<tr>
<th>Introduction to Computer Science</th>
<th>Management Information Systems</th>
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<tbody>
<tr>
<td>Data Structures</td>
<td>Object-Oriented Design &amp; Programming</td>
</tr>
<tr>
<td>Computer Architecture &amp; Assembly Language</td>
<td>Database Design and App for Bus</td>
</tr>
<tr>
<td>Software Engineering I</td>
<td>Introductory to Java</td>
</tr>
<tr>
<td>Introductory Electronics</td>
<td>Web Design</td>
</tr>
<tr>
<td>Digital Electronics</td>
<td>Intro to Computer Applications</td>
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</table>

COMPUTER EXPERIENCE

Software Programming: Java, Visual Basic, C++
Assembly Language
Software Packages: Microsoft Office, BlueJ, Lotus Notes, Support Works, Citrix

RELATED EXPERIENCE

IT Support Analyst, Stolt Nielsen Transportation Company, Norwalk, CT, Summer 2006
- Provided quality service to employees located all over the world
- Mentored and improve the efficiency of computer users in the organization
- Wrote a manual on how to use Support Works for future IT support analysts.

Project Manager, Pear Software, Siena College, Fall 2006-present
- Prepare and present PowerPoint programs about Software Plan, Software Requirements Specification, Preliminary and Detailed Design, Acceptance Test and Test Plan & Results.
• Assisting others when they are in need: gathering documents for the librarian, help coding our web page or assisting our systems administrator.

ACTIVITIES
Participated in intramural basketball, roller hockey, volleyball, soccer and softball

CLUBS
• Radio Station 2003

COMMUNITY SERVICE/ACTIVITIES
• Little League Baseball Umpire present 1998 to present
• Participated in fund raising and sport activities for the Rockland ARC (Association for Retarded Citizens) and Jawonio 1999 to present
COLIN C. CUBINSKI  
37 Surrey Lane  
Massapequa Park, NY 11762  
516 – 695 – 2530  
E-Mail: Colin.Cubinski@siena.edu

OBJECTIVE:  
To obtain a job in the Computer Science field that is not only challenging but reflects my interests and abilities.

EDUCATION:  
Siena College  
515 Loudon Road  
Loudonville, NY 12211  
B.S. in Computer Science, B.S. in Mathematics, May 2007  
Presidential Scholar

RELEVANT COURSE WORK:  

WORK EXPERIENCE  
Librarian, Pear Software, Siena College, Fall 2006 – present.  
- Keep logs of all meetings with the group and clients.  
- Manage all of the group’s paperwork and schedules.

Computer Sales, Best Buy, Huntington Station, June 2006 – present.  
- General Computer Sales, software, hardware, tech support.  
- Additional training to become a Customer Specialist.

Sales, Arlo Pharmacy, Massapequa Park, July 2001 – present.  
- General sales, customer service, account management.  
- Additional work with maintaining store computers, managing pertinent customer information regarding house charge accounts.

Tutor, Math and HEOP, Siena College, Fall 2004 – present.  
- Calculus I and II tutor for all students for the math department, group setting.  
- Calculus I tutor for the HEOP program, work with students on an individual basis.

ACTIVITIES  
Intramural Basketball, Siena College, 2003-present  
COMPUTER EXPERIENCE

- Extensive programming experience with Java and C++.
- Skilled with hardware, proficient in assembling custom computers and some repairs.
- Very proficient with diagnosing software problems, operating system maintenance and upkeep.
- High proficiency in Excel, PowerPoint, Access.
- Basic knowledge of Basic, Visual Basic, Assembly Language, HTML, Linux.
- Advanced knowledge of Windows 95-XP.
Daniel Nakhla
10 Cypress Drive Loudonville NY 12211
518-542-4738
dnakhla@hotmail.com

Objective
An opportunity to use my computer and business skills in a real world environment.

Education
Bachelor of Science, Computer Science

Siena College, NY
- Major: Computer Science (3.7 GPA)
- Minor: Business


Skills/Abilities

Computer Science
- Worked solely and as part of a team on several different projects at The New York State Department of Tax and Finance's Computer Architecture unit.
- Developed an entire Java-based software package for use by the New York State Department of Tax and Finance in conjunction with The United States Postal Services for information retrieval.
- Developed and implemented a small computer application for engineers at MW-Zander to increase efficiency with mundane tasks.

International Studies:
- Fluent in English and Egyptian (Arabic Dialect) with a good speaking knowledge of Spanish.
- Studied aboard in Argentina for 5 month with an indigenous family and acquired a strong knowledge of the Spanish Language and culture.
- Possess a studied knowledge of French and Francophone culture
Experience

Student Intern, The New York State Department of Tax and Finance, Albany (June 2006- current)

- Involved in several different projects mainly utilizing my knowledge of Java programming using IBM’s Rational Application Development IDE.
- Worked solely to create a Java-based software package for use in conjunction with The United States Postal Service for information retrieval.
- Used Dreamweaver as part of the User Interface Team to develop and maintain CSS based web pages in NYS Department of Tax and Finance’s largest project E-mpire.

Technology Assistant, MW-Zander, Watervliet (November 2005 - February 2006)

- Computer intensive position mainly facilitating day to day operations using office software, hardware and software troubleshooting, and dealing with different ranks of employees from vendors to executives.

Nighttime Manager, Planet Fitness, Loudonville (May 2005 - July 2005)

- Worked nightly with cash flows and club memberships. Responsible for opening club, handling cash and credit cards, confidentiality, sales and daily business maintenance.
OBJECTIVE
A challenging position in the field of computer science that will allow growth and utilize my education and experience. Special interest in programming and/or web design.

EDUCATION
Siena College, Loudonville, NY.
B.S. in Computer Science, Mathematics Minor, May 2007

COMPUTER COURSES / TECHNICAL SKILLS

Courses:
- Intro to Computer Applications
- Intro to Computer Science
- Intro to Programming
- Data Structures
- Assembly Language
- Object Oriented Design and Programming
- Analysis of Algorithms
- Database Management
- Advanced Database Management
- Network and Data Communications
- Web Design

Computer Skills:
- Programming in Java, VB, HTML, XML, PHP, CGI, JavaScript, CSS, and SQL.
- Proficient in Windows 3.1/9x/NT/2000/XP.
- Proficient in Word, Excel, Access, PowerPoint, Dreamweaver, Fireworks, Internet, and Oracle.

RELEVANT EXPERIENCE
- Used software to financial plan a start-up business.
- Developed a financial growth model.
- Created reports of data for potential investors.

- Photographed art pieces to be posted online.
- Designed a website to showcase JFK art.
- Procured multiple domain names for website.
- Set up appropriate firewall and antivirus software.

ADDITIONAL EXPERIENCE
Assistant Manager, Eckerd Drug, Chatham, NY, July 2004 – Present.
Matthew Restivo
matthew.restivo@gmail.com

Present Address:
SPOB 4066, 515 Loudon Rd.
Loudonville, NY 12211
Cell (631) 241-3142

Permanent Address:
18 Coconut Drive
Commack, NY 11725
Home (631) 486-1220

OBJECTIVE
To use my leadership ability to help aid our team reach our goal set by our clients.

EDUCATION
Siena College, Loudonville, NY
Bachelor of Science, May 2007
GPA 3.26 / 4.0
Major: Computer Science GPA 3.52 / 4.0
Dean’s List: Spring 2005, Spring 2006

EXPERIENCE
Manager, Super Sound Communications, East Northport, NY (Mar 2003 – Aug 2006)
• Created and managed an eBay program that significantly increased the store's overall sales and profit margin
• Supervised store personnel, set weekly schedules, and trained new employees
• Coordinated sales commissions with national cellular companies (ie. Cingular Wireless, T-Mobile, Nextel)
• Managed a computer based inventory and ordering system

Musician, The Lift (Band), (Jan 2005 - Present)
• Created a Flash website for the band (www.theliftband.com)
• Maintained a mailing list utilizing a database
• Produced and sold CDs that raised over $2,100 for Capital Region Action Against Breast Cancer
• Organized a 15 show summer tour in 2006 in order to promote the debut album

Study Abroad Student, Belgrano, Buenos Aires, Argentina (Jun 2005 – Nov 2005)
• Completed sixteen credits of study at the University of Belgrano (GPA 3.79)
• Studied Spanish in an 20 hour per week intensive course
• Resided with an Argentine family in order to assimilate the culture and language

ACTIVITIES
Anchor, Siena College Television, Loudonville, NY (Sept 2003 – March 2005)
• Worked as an on-air talent for sports and news in and around the Capital Region
• Operated professional cameras on the floor of the Pepsi Arena
• Edited footage for the bi-weekly on campus news program

Producer, 88.3 WVCR Radio, Loudonville, NY (Sept 2003 – Present)
• Participated in the Charity Basketball team, traveling to local high schools to play their faculties
• Worked in the studio for live broadcasts of football and basketball games

COMPUTER SKILLS
Java, Flash 8, PHP, MS Excel, Dreamweaver 8, HTML, MS FrontPage, C++, C, Adobe Illustrator, Visual Basic, MS Access, Adobe Premier 6.5
Section 3.3: Glossary of Terms

**Code** - The symbolic arrangement of data or instructions in a computer program or the set of such instructions.

**Database** - A collection of data arranged for ease and speed of search and retrieval.

**DBMS (Database Management System)** - Software that controls the organization, storage, retrieval, security and integrity of data in a database.

**Gantt Chart** - A chart that depicts progress in relation to time, often used in planning and tracking a project.

**HTML (Hyper Text Markup Language)** – A markup language used to structure text and multimedia documents and to set up hypertext links between documents, used extensively on the World Wide Web.

**Internet** - An interconnected system of networks that connects computers around the world via the TCP/IP protocol.

**Linear Sequential Model / Classic Waterfall Model** – A systematic, sequential approach to software development that begins at the system level and progresses through analysis, design, coding, testing, and support.

**PC (Personal Computer)** - Another name for a microcomputer designed for use by a single user.

**PHP (PHP Hypertext Preprocessor)** – A server-side, cross-platform, HTML-embedded scripting language used to create dynamic web pages. PHP is open source software.

**Software** - Written programs or procedures or rules and associated documentation pertaining to the operation of a computer system and that are stored in read/write memory.

**SQL (Structured Query Language)** - Pronounced "sequel", it is a language that provides an interface to relational database systems.