SOFTWARE PROJECT MANAGEMENT PLAN

for

The Project Team

Valley Data Programming Group

and

The Sponsoring Group

Angus-Hamer, Inc.

November 1, 2000
Table of Contents

1. INTRODUCTION ......................................................................................................... 1
   1.1. Purpose ..................................................................................................................... 1
   1.2. Scope ...................................................................................................................... 1
   1.3. Definitions, Acronyms and Abbreviations ............................................................. 1
   1.4. References ............................................................................................................. 2
   1.5. Overview of Contents of Document ....................................................................... 3

2. PROJECT OVERVIEW .............................................................................................. 3
   2.1. Project Summary .................................................................................................... 4
   2.2. Project Deliverables .............................................................................................. 4
   2.3. Evolution of the SPMP ......................................................................................... 5

3. PROJECT ORGANIZATION ..................................................................................... 5
   3.1. Process Model ....................................................................................................... 5
   3.2. Organizational Structure and Interfaces ............................................................... 6
   3.3. Project Responsibilities ......................................................................................... 7

4. PROJECT MANAGEMENT AND CONTROL ........................................................ 7
   4.1. General Project Management ................................................................................ 8
       4.1.1. How the plan is kept current ......................................................................... 8
       4.1.2. How the Project is managed ...................................................................... 8
       4.1.3. How progress is measured ...................................................................... 9
       4.1.4. How schedules are tracked ...................................................................... 9
       4.1.5. What specific methodology is used for software development .................. 9
       4.1.6. How verification and validation is conducted .......................................... 10
       4.1.7. Delivery Plan: ......................................................................................... 10
   4.2. Project Management Objectives and Priorities .................................................... 11
   4.3. Assumptions, Dependencies, and Constraints ..................................................... 11
   4.4. Risk Management ............................................................................................... 13
   4.5. Change Management .......................................................................................... 13
   4.6. Schedule Control .............................................................................................. 14
4.7. Issue Resolution..................................................................................................... 14

5. TECHNICAL PROCESS........................................................................................... 15

5.1. Methods, Tools, and Techniques ........................................................................... 15
  5.1.1. Formal Project documents .............................................................................. 15
  5.1.2. Software package configuration files .............................................................. 16
  5.1.3. Web based help files ....................................................................................... 17
  5.1.4. Web template files ........................................................................................ 17
  5.1.5. HRII Software including cgi and cron driven scripts ..................................... 17
  5.1.6. HRII Tables .................................................................................................... 17

5.2. Software Documentation ....................................................................................... 17

5.3. Documents .......................................................................................................... 18

6. ACTIVITIES, SCHEDULE, AND BUDGET .......................................................... 18

  6.1. Activities and Tasks ........................................................................................... 19
  6.2. Resource Requirements ..................................................................................... 20
  6.3. Budget ................................................................................................................ 20
  6.4. Schedule ........................................................................................................... 20

APPENDIX A ................................................................................................................. 21

APPENDIX B ................................................................................................................. 22

APPENDIX C ................................................................................................................. 23

APPENDIX D ................................................................................................................. 24

APPENDIX E ................................................................................................................. 25
1. INTRODUCTION
This document defines the working relationship between the students that comprise ValleyData Programming Group (VDPG), and the Sponsor Angus-Hamer, Inc. (AHN). The software product being offered by ValleyData is entitled “Human Resource Internet Integration” (HRII) and serves as the Computer Science Senior Project requirement for the California State University of Sacramento. All details regarding the layout and management of this Project are found in this document.

1.1. Purpose
This document clearly captures the internal processes used within ValleyData to accomplish Project goals. The layout and management of the entire Project to be developed by ValleyData is also discussed. The reader of this Software Project Management Plan (SPMP) will know how ValleyData intends to control and manage the development of the proposed software system to be delivered to Angus Hamer, Inc. and what the Product is supposed to do.

1.2. Scope
Details concerning the management process, standards, and procedures are given in this document. Also details concerning Team structure, individual roles and responsibilities, Project planning and tracking mechanisms, and risk management are included where appropriate.

1.3. Definitions, Acronyms and Abbreviations
All acronyms, abbreviations, and technical terms used in this document are arranged in alphabetical order.
<table>
<thead>
<tr>
<th>AHN</th>
<th>Angus-Hamer, Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSDI</td>
<td>Berkeley Software Design, Inc. Operating System</td>
</tr>
<tr>
<td>CVS</td>
<td>Concurrent Versions System</td>
</tr>
<tr>
<td>HR</td>
<td>Human Resource(s)</td>
</tr>
<tr>
<td>HRII</td>
<td>Human Resource Internet Integration (the proposed system)</td>
</tr>
<tr>
<td>LDAP</td>
<td>Lightweight Directory Access Protocol</td>
</tr>
<tr>
<td>PHP</td>
<td>Pre-Hypertext Processing Language</td>
</tr>
<tr>
<td>SDD</td>
<td>Software Design Document</td>
</tr>
<tr>
<td>SMM</td>
<td>Software Maintenance Manual</td>
</tr>
<tr>
<td>SMTP</td>
<td>Simple Mail Transfer Protocol</td>
</tr>
<tr>
<td>SPMP</td>
<td>Software Project Management Plan (this document)</td>
</tr>
<tr>
<td>SRS</td>
<td>Software Requirements Specification</td>
</tr>
<tr>
<td>SSP</td>
<td>Software System Proposal</td>
</tr>
<tr>
<td>STD</td>
<td>System Test Document</td>
</tr>
<tr>
<td>STR</td>
<td>System Test Report</td>
</tr>
<tr>
<td>UM</td>
<td>User Manual</td>
</tr>
<tr>
<td>VDPG</td>
<td>ValleyData Programming Group</td>
</tr>
<tr>
<td>WBS</td>
<td>Work Breakdown Schedule</td>
</tr>
<tr>
<td>Baseline</td>
<td>A baseline is a work product that has been formally reviewed and accepted by the involved parties. A baseline is changed only through formal configuration management procedures.</td>
</tr>
<tr>
<td>Milestone</td>
<td>A scheduled event used to measure progress.</td>
</tr>
<tr>
<td>Project Deliverable</td>
<td>A work product that is delivered to the Project Sponsor. Software Project Management Plan 2.</td>
</tr>
<tr>
<td>Task</td>
<td>The smallest unit of work subject to management accountability.</td>
</tr>
</tbody>
</table>

1.3 - Definitions, Acronyms and Abbreviations

1.4. References

Any sources used in the preparation for this document are sited. A reference to the specific bibliographic entry is made at the location in the document where information from that specific source is used.


1.5. Overview of Contents of Document
This subsection briefly describes each of the remaining sections in the document as well as the contents of each appendix. The rest of the document is organized as follows:

The PROJECT OVERVIEW section identifies AHN as the Project Sponsor and why AHN needs an automated Human Resource (HR) system like HRII. Additionally it describes the context in which the HRII system is used. A PROJECT ORGANIZATION section that describes the modeling approach and organizational structures used to develop the Project. A PROJECT MANAGEMENT AND CONTROL section which gives a detailed breakdown of risk and change management, as well as scheduling and issue control. A TECHNICAL PROCESS section which documents the methods, tools, and techniques which VDPG uses throughout the Project lifecycle and the formalities which must occur throughout the paper process. An ACTIVITIES, SCHEDULE, AND BUDGET section which gives additional information regarding time and financial constraints on the Project. APPENDIX A. pictorially represents the Project Management Plan, APPENDIX B. defines the form which VDPG uses in all document change requests. APPENDIX C. offers a risk management table of VDPG members and our CSUS Faculty Advisor to show backup leadership and task positions. APPENDIX E. depicts the Project lifecycle schedule along with expected start and competition dates. Finally, APPENDIX D. depicts VDPG’s approach to the methodology of the Project lifecycle through the use of the Modified Waterfall Model for software engineering.

2. PROJECT OVERVIEW
Contains information about the Project, required deliverables, and this document itself.
2.1. Project Summary
The Project ValleyData is creating for Angus-Hamer, Inc. (AHN) is composed of multiple parts which are divided into phases. Each phase is accompanied by a major document which must be created, reviewed, and approved by the Project Sponsor. The purpose of each document is to narrow the approach and design ValleyData uses to manage, create, and implement the Project throughout its lifecycle. The Project being offered by ValleyData is a Human Resource online database. So that AHN may fully take advantage of the product being offered, reviews between the Project Group (VDPG) and the Project Sponsor (AHN) take place bi-monthly. The purpose of these meetings is to synchronize all expectations and constraints between the two parties. The first phase of the Project lifecycle is the Software Project Proposal (SPP), which defines the need AHN has for the Product and the proposed solution ValleyData makes in their behalf. The next phase of the Project lifecycle is entitled the Software Project Management Plan (SPMP) document. Its purpose is to clearly capture the internal processes used within ValleyData to accomplish Project goals. After the SPMP is presented and approved, the next phase entitled the Software Requirement Specification (SRS) is created. The purpose of the SRS is to determine the development requirements for the intended solution. The next phase is entitled the Software Design Document (SDD) and it describes the layout of the solution ValleyData intends to use for the problem at hand. Upon completion of this phase comes the software coding, which is produced concurrently with the last three phases. The System Tests and Results phase documents the test runs and results before the product is accepted to ensure it meets the requirements. Afterwards the User Manual phase describes the operational instructions for the delivered product. Finally the Service Maintenance Manual phase will contain maintenance information to troubleshoot and information necessary to incorporate future upgrades to the product.

2.2. Project Deliverables
The sequence of products delivered over the life of the Project are identified below, along with the phase in which the product is delivered.
<table>
<thead>
<tr>
<th>Phase</th>
<th>Deliverable</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Requirement Analysis</td>
<td>Software System Proposal</td>
</tr>
<tr>
<td>Project Management Plan</td>
<td>Software Project Management Plan</td>
</tr>
<tr>
<td>Software Requirement Generation</td>
<td>Software Requirements Specification</td>
</tr>
<tr>
<td>Software Design</td>
<td>Software Design Document</td>
</tr>
<tr>
<td>Implementation</td>
<td>Code</td>
</tr>
<tr>
<td>System Testing</td>
<td>System Test Document, Results</td>
</tr>
<tr>
<td>Acceptance Testing</td>
<td>Software Test</td>
</tr>
</tbody>
</table>

Table 2.2– Project Deliverables

2.3. Evolution of the SPMP

This document is designed to easily allow changes to be incorporated. ValleyData realizes the SPMP needs continual updating due to changes within both the Sponsor’s organization and our own. The document owner, Matt Palmerlee, must approve changes to the SPMP. The Team is notified when changes to the document are made. Changes to the SPMP after it is baselined are dealt with using the Change Request Form in Appendix B.

3. PROJECT ORGANIZATION

Provides the reader with information on how the Project is organized, including the software process model that is used. It also gives specific information on what individual VDPG members are responsible for.

3.1. Process Model

A modified waterfall model is followed throughout the development life cycle. This model is ideal for the development of the system because it provides the ability to go back to the previous phase and rework mistakes or problems. See Appendix D for a visual representation of the modified waterfall model. This Software Project Management Plan (SPMP) gives information on the Project for the rest of the development of the system. The concept of the Project is explored in the Software System Proposal (SSP), while requirements for the system are gathered into the Software
Requirements Specification (SRS). The SRS is referred back to frequently during design and testing to ensure that the system adheres to the requirements. The Software Design Document (SDD) is the primary source of information for the system code and user’s manual.

3.2. Organizational Structure and Interfaces

ValleyData Programming Group is made up of five members who have varying degrees of programming and technical writing experience. Team members have been assigned a role according to their personal strengths. Currently acting as the Team’s Project Manager is Ryan Mahoney in lieu of his relationship with the Project Sponsor. Ryan’s roles include organizing tasks, delegating parts to the Team members who can best accommodate the workload, and holding Team members accountable for the work they promise to perform. Acting as Executive Secretary for VDPG is Aaron McBride. The roles that Aaron is responsible for include taking notes in Peer review meetings, Faculty Advisor meetings, and Sponsor meetings. These notes are posted to a website accessible to VDPG staff members so that follow-up can be performed to any task delegated out or discussed in previous meetings. ValleyData has made it a high priority to be on time with all documents and Project phases, and thus the role assumed by Jaspreet Singh as Scheduling Manager is crucial. It is Jaspreet’s role to analyze the time required for each Project phase and outline an allotted time with which the group must begin and end Project phases. In Peer review meetings, this Project Schedule is often referred to measure progress and offer suggestions to further benefit the efficiency with which the group performs. It is Jaspreet’s role to also assimilate Team member’s individual hours worked each week and present them to the Senior Project Professor, Dr. Buckley. These hours are used to measure overall work performed on the Project thus far. Within the VDPG organization are two document specialists. Matt Palmerlee currently acts as the Design Document Engineer and Charles Smothers as the Technical Document Engineer. Each position is important in its own right. Matt is responsible for the overall look, feel, and readability of all documents presented by ValleyData to our Project Sponsor. As technical content supervisor, Charles Smothers is responsible for the feasibly of all Project design structures and implementation schemes. Charles is also responsible for
implementing open source packages and linking them to each other in our testing environment. Appendix C. displays the roles each Team member plays, along with backup roles that are assumed in the case of Team member absence. A Document Change Coordinator, or owner is assigned for each document and must approve any changes that Team members perform on a draft.

3.3. Project Responsibilities
Document Change Coordinators have been assigned the responsibility of ensuring that their document meets or exceeds the standards set by the Project Advisor. It should not be assumed that holders of this task are responsible for a larger portion of work for the document they oversee, but that they are the “last say” in how things are presented and organized within the document. The Change Coordinator also accepts all changes and revisions posted by Team members through the use of Microsoft Word 2000’s Change Management feature. By rotating the Change Coordinator assignment, each Team member is given the opportunity to experience a leadership position.

<table>
<thead>
<tr>
<th>Major Activities</th>
<th>Owner / Change Coordinator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software System Proposal</td>
<td>Ryan Mahoney</td>
</tr>
<tr>
<td>Software Project Management Plan</td>
<td>Matt Palmerlee</td>
</tr>
<tr>
<td>Software Requirements Specification</td>
<td>Jaspreet Singh</td>
</tr>
<tr>
<td>Software Design Document</td>
<td>Charles Smothers</td>
</tr>
<tr>
<td>Code</td>
<td>Aaron McBride</td>
</tr>
<tr>
<td>System Test Document, Results</td>
<td>Ryan Mahoney</td>
</tr>
<tr>
<td>Software Test</td>
<td>Jaspreet Singh</td>
</tr>
</tbody>
</table>

Table 3.1 – Change Coordinator Assignments

4. PROJECT MANAGEMENT AND CONTROL
Describes in detail how the plan is kept current, how the Project is managed, how progress is measured, how schedules are tracked, what specific methodology is used for software development, and how verification and validation is conducted. Also discusses the method ValleyData intends to deliver the system.
4.1. General Project Management

This section gives the reader a detailed overview of how the Project is managed, how progress is measured, and how schedules is tracked. It also describes the methodology that is used for software development.

4.1.1. How the plan is kept current

If the need arises to update the Management Plan, or any other document, a Change Request is given to the ValleyData member who owns the document. The owner of the document makes the necessary changes, and appends information about the change to the end of the document. For a sample Change Request Form see Appendix B.

4.1.2. How the Project is managed

ValleyData members rely on daily communication to ensure that the Project is being well managed. At least once a week the Schedule Manager keeps other ValleyData members up to date on our current progress and upcoming deadlines. The Project Manager delegates tasks to appropriate ValleyData members based on the schedule, these members are then held accountable for completing these tasks on time.

Appendix A depicts the Project Management cycle that is used within the VDPG organization. Ryan Mahoney currently assumes the VDPG Project Management role and tasks are delegated to the appropriate members according to job title and emphasis strengths. As these tasks are completed, a peer review between group members occurs where suggestions and special details are given. When all tasks are completed, the document is synchronized for grammar usage and reading flow. Once the document is in its first draft form, it is presented to the Faculty Advisor and returned with further suggestions for revision. The group members resynchronize the document after the revisions are completed and a second draft is presented. The Faculty Advisor may return minor revisions and the document is presented to the Project Sponsor after these revisions have been addressed. A document is considered to be in the baseline stage once it has been signed by the Project Sponsor. Once a document has reached the baseline stage, the group starts working on the next document.
4.1.3. How progress is measured

A critical aspect of the SPMP concerns the completion of work products. Progress is measured as a function of parts completed for the deliverable in question. These elements are delegated by the Project Manager and are reviewed, refined, and revised in group meetings. The Project Schedule tracks where start and deadline dates have been suggested for each document and is used to ensure VDPG completes tasks before they are to be delivered. The date on which a work product is deemed complete is termed a milestone. In order to determine whether a work product has indeed reached a milestone, it must first pass a series of reviews performed by VDPG Team members, the Faculty Advisor, and the Project Sponsor. A typical milestone is the date on which the design is completed and passes review. Once a work product has been reviewed and agreed upon, it becomes a baseline and can be changed only through formal procedures. After the documents are signed by the Project Sponsor for baseline validation, the group moves into the next required stage of the process cycle.

4.1.4. How schedules are tracked

To ensure that deadlines are being met, the Schedule Manager will keep schedules current and up to date by recording ValleyData’s progress in each phase.

4.1.5. What specific methodology is used for software development

The following is a collection of techniques adopted by ValleyData throughout the complete life cycle of HRII:

- Discover the customer’s needs and desires
- Define flexible functions to accommodate these needs
- Propose these solutions to the customer through formal communication documents and contracts
- Remain open for customer feedback, comments, and revisions
- Design the functions that fall within the scope of the Project to be integrated inside HRII
- Present a beta version to be tested by the customer for functionality and approval
- Revise any components that need additional attention
• Present the finished product with all required documentation

4.1.6. How verification and validation is conducted
As seen in Appendix A, verification and validation occurs as a series of step involving peer reviews, Faculty Advisor reviews, and eventually Project Sponsor acceptance. Each phase may occur multiple times before the final version is created and all parties have come to a mutual agreement.

4.1.6.1. Verifying that the product designed conforms to the requirement specifications
Verification of Project conformance to Sponsor requirements is a high priority in Sponsor reviews. Each need is reevaluated to assure that features and functionality of the system cover the Sponsor’s requirements. Amendments to this SSP are made if any additional functions or features are needed, after which they are then agreed upon by the Sponsor and VDPG.

4.1.6.2. Validating that the requirements satisfy the Sponsor’s need
The Sponsor is responsible to assure that the proposed methods described in the Software System Proposal will satisfy their current needs. ValleyData is responsible for holding the Sponsor accountable to suggest whether these needs are covered or whether additional functions must be implemented to cover any special cases the Sponsor may have.

4.1.7. Delivery Plan:
1. Deliver and install module on Sponsor’s systems.
2. Test module by itself.
3. Test module after integration with rest of system.
4. Have Sponsor verify that the module adheres to its requirements.
5. Go back to step #1 until the entire system has been integrated, tested, and accepted.
4.2. Project Management Objectives and Priorities.
VDPG’s goals are to learn as much as possible about the technology used in our Project and about software engineering in general. In order to do this VDPG works hard to plan ahead by scheduling meetings that are an effective use of Team members’ time. VDPG also intends to ensure smooth Team dynamics by looking out for each other whenever a Team member is overwhelmed.

Meetings are seen as a high priority. They are scheduled in the following manner:

- Regularly scheduled meetings on Mondays and Wednesdays.
- Online Teleconferencing meetings as needed.
- Phone bridge meetings at the onset of any new document, and as needed thereafter.
- Late night school meetings before the final draft of any document is due
- VDPG meets with Professor Buckley every Monday between 2:00pm and 3:15pm to learn about Software Engineering, and to be briefed on details of the work we are doing.
- The Project Manager will meet with our Faculty Advisor at least once a week to go over the progress of VDPG’s Project, and to get tips on improving the documents.
- The agenda for the meetings are set at the preceding meeting when possible, but time is always set aside to work on any new issues that may arise. The agenda is posted in the ‘minutes’ section of the VDPG web site.
- ValleyData members will each keep track of the hours they spend on the Project, then at the end of the week hours are sent to the Schedule Manager who compiles the hours and sends them to Professor Buckley.

4.3. Assumptions, Dependencies, and Constraints
It is assumed by ValleyData that the need for a Human Resource Project really exists, and that because of this need Angus-Hamer, Inc. will work in a cooperative effort to help VDPG complete all aspects of the requirements. ValleyData also assumes that AHN will exist for the remainder of the Spring 2001 semester, and that our Sponsor Contact, Corie
Hamer, and our Project Advisor, Ted Ryon, are available at least bi-monthly for meetings on the progress and requirements of the Project. Additionally, ValleyData is assuming that LDAP is suited as an authentication mechanism for the Project, and that MySQL is a viable option for a database. ValleyData also assumes that employees at AHN use common web browsers, such as Netscape Navigator and Microsoft Internet Explorer. Also, that employees at AHN have an existing email system that VDPG can use to send Simple Mail Transfer Protocol (SMTP) mail. Finally, ValleyData assumes the product is intended for a staff of 100 employees or less.

ValleyData uses open source code when deemed valuable to extend the functionality of the product. VDPG is required to create original code and configuration parameters in order to make the HRII system unique and to meet the customer’s specific needs. Although using open source packages does not require the writing of code, it may require substantial time to learn and install these packages. If ValleyData produced custom products to perform these auxiliary functions, there would be greater limitations to the complexity of the features included in the HRII System. AHN expects VDPG to utilize open source products whenever feasible and develop and integrate the HRII product into their existing systems.

It is also critical that the HRII system not be dependent on a product where there could be problems integrating and using the software. It is critical that certain problems don't occur over the life of the Project including serious illness, or prolonged absence of a VDPG Team member.

Neither ValleyData nor Angus-Hamer, Inc. is assuming that the purchase of software is required. The Team will acquire a server for use during the development of the product. At the time of delivery, AHN will provide a server environment where the product and any other required software are installed.

ValleyData will provide detailed documentation to show how database schemas can be easily created inside the delivered source code, and how each portion of the system is
used. Once ValleyData completes the primary deliverables, we will also include documentation to describe how to extend the capabilities of the product.

### 4.4. Risk Management

<table>
<thead>
<tr>
<th>Risk:</th>
<th>Solution:</th>
<th>Severity:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of ValleyData Member</td>
<td>Role Switching</td>
<td>Serious</td>
</tr>
<tr>
<td>Loss of Data/Work</td>
<td>Backup Plan (3 Redundant Versions)</td>
<td>Minor</td>
</tr>
<tr>
<td>Sponsor not available</td>
<td>Continue the Project using current assumptions</td>
<td>Moderate</td>
</tr>
<tr>
<td>Deficiency in one or more of the other programs that we require (i.e. WebMin)</td>
<td>Seek an alternate software solution, if this fails, negotiate a change in the requirements with the Sponsor</td>
<td>Serious</td>
</tr>
<tr>
<td>Loss of Sponsor</td>
<td>Seek an alternative Sponsor that can use as much of the work that we have already done on a new Project</td>
<td>Serious</td>
</tr>
<tr>
<td>Hardware failure with the BSDI box</td>
<td>Set up a new box running Linux if we need to</td>
<td>Moderate</td>
</tr>
<tr>
<td>Missing requirements after the SRS has been baselined</td>
<td>Consult with the Sponsor, and update the SRS with a change form.</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Table 4.3 – Risk Management

ValleyData takes extreme precautionary measure to ensure the safety of all data produced for the Project Sponsor. Through the incorporation of an automated process, redundant versions of all files are created on three physically separated servers. A batch process has been created which has two jobs running off Ryan Mahoney’s computer every night. The first job, which starts at 3:00AM nightly, authenticates automatically into the group’s remote file transfer protocol (FTP) site: ftp://valleydata.homepage.com/staff and fully backs up all data to Ryan’s local computer. At 4:00AM Ryan’s computer synchronizes with the group’s practice implementation environment Berkeley Software Design, Inc. (BSDI) computer so that this third machine becomes aware of any changes made to the ftp://valleydata.homepage.com/staff directories. Through this method, three redundant fail-safe versions of VDPG’s data are created nightly.

### 4.5. Change Management

When a document needs to be changed, a Change Request Form (see Appendix B) must be submitted to the owner of the document. The owner of the document makes the
necessary changes and appends information about the change to the end of the document. The owner of the document will rename and post the new document, and notify the group of the changes. Underscores are used instead of spaces in filenames. Version numbers will have two digits (i.e. ver.01 instead of ver.1). No more than 5 old versions of any document should be kept on the FTP site.

4.6. Schedule Control
The schedule is kept current based upon the Gantt chart provided in Appendix E. Current progress of the task at hand is compared against the baseline in the Gantt chart for that particular task. As development progresses, the Team makes estimates about the time needed to finish the task. As the Team gets closer to the baseline, these estimates will govern the pace needed to meet the baseline. Once a task meets the baseline in the estimated time, the task is marked finished and development moves on to the next task. However, in the event the Team needs more time than the baseline, the rollover will affect the baselines for remaining tasks.

Every document is divided among the Team members based on their strengths and their role in the Team. All sections of the documents are open to every member’s opinion until they are finalized. To ensure the quality of a document every change goes through the following phases:

- The member who makes any change to any section posts a draft to the Team’s web site. The other members are notified of that change via email.
- Every member is responsible for reading that change and providing necessary feedback as to if any further change is required.

The designated document engineers in the Team will finalize the look and feel, and technicality of the document.

4.7. Issue Resolution
One-on-one (personal) issues should be dealt with privately, in the case that problems cannot be solved, the problem is brought to the group’s attention and the group works on solving it. Issues with the Sponsor or with the Project Advisor are dealt with when the
need arises and on a personal or group basis, as appropriate. Technical issues need to be agreed upon by the group and the Sponsor if necessary. The Project Manager holds one-on-one conferences with the members of VDPG to discuss any issues that may come up, and to ensure that everyone is working to their best ability. ValleyData intends to strive towards mutually beneficial decisions for all parties involved in the outcomes.

5. TECHNICAL PROCESS
Defines the general technical issues of the Project, and describes the tools, and techniques VDPG uses to develop the system.

5.1. Methods, Tools, and Techniques
Specifies the development methodologies, programming languages, and identifies what tools and techniques are used to specify, design, build, test, integrate, document and deliver the Project’s work products.

5.1.1. Formal Project documents
All the formal Project documents (SSP, SPMP, etc.) are written in and managed using Microsoft Office 2000. Documents with low complexity are written in Word. More complex documents are written in Word, plus other Microsoft applications and are combined using Microsoft Binder. The Change Control features within Office 2000 are utilized to assist the group members in identifying and tracking changes. However, the security features are not utilized; passwords within documents are not set because the group members feel that this would not enhance productivity.

The Project documents are stored on the group server at ftp://valleydata.homepage.com. A new directory is created to contain each formal document. All files, which are required to build the formal document, are stored in this directory. Filenames are of the form “DOCID_REV.doc”  DOCID is the acronym of the document (eg: SPMP); and an underscore; and a two digit revision number.
All group members are required to contribute to each formal document. This presents a problem with managing change control. If two group members download, modify, and upload a change to a document, there is a chance that one person’s work may be lost. To minimize the chances of this occurring, each group member must follow this process.

1. Inform other group members using both email and ICQ that you intend on working on a document.
2. Download the largest revision number file.
3. Make changes
4. Make certain that someone else has not uploaded a larger numbered file
5. Upload changed file
6. Inform other group members, again, using email and ICQ that a new version has been posted.

5.1.2. Software package configuration files
Configuration files control the behavior of the software modules which make up HRII. For example, the configuration file which controls the Apache server is named httpd.conf. It is managed with the Concurrent Versions System (CVS). The process that group members use with CVS is as follows:

1. Check out a local copy of the file. Either use the \texttt{cvs checkout} \texttt{<directory>} command from a UNIX workstation, or use the Windows WinCVS (http://www.wincvs.org/) to check it out.
2. Make the necessary changes to the local copy using an approved editor.
3. Before checking in the changes, run the \texttt{cvs update} to examine any changes have been committed by other Team members.
4. Commit the changes with the \texttt{cvs commit} command.
5.1.3. Web based help files
The Web based help files are written using Microsoft Front Page. They are managed just like the formal documents with respect to version control. They are kept on the ftp://valleydata.homepage.com server and copied to the BSDI server.

5.1.4. Web template files
The web template files are used to create a consistent look-and-feel to all the HRII web pages and forms. The template files are treated similar to source code with respect to version control. They are edited with a text editor and managed with CVS.

5.1.5. HRII Software including cgi and cron driven scripts
As users access the HRII system, they activate the cgi or pre-hypertext processing scripts, which are to be written in Perl or PHP. Additionally, there are some regularly scheduled reports the system will create which are activated by cron. These reports are written in Perl as .cgi scripts. Both the cgi scripts and the cron driven scripts are managed using CVS as described in the “Software Package” section above.

5.1.6. HRII Tables
The HRII tables are treated as though they were application configuration files and are managed similarly.

5.2. Software Documentation
The software documentation is kept in the same servers and directories as the source code itself. It is managed using the same tools as the source code. In fact, the software documentation will become the code. The perldoc feature of perl is utilized to embed the software documentation within the perl source files. The HTML template files contain comments, which are the software documentation. The Technical Document Manager provides several template files that include examples. The templates are specialized for specific types of tasks. For example template-cgi.pl is a template for building perl based cgi programs. Another example would be: template-ldap.pl which is a template for a perl module which communicates with the LDAP server. Included in the template are
sections and examples for documentation, including `perldoc`. Each template contains instructions regarding how to re-name the template, check it into CVS, and how to make changes. The dates which the design was reviewed, who reviewed it, and when it was baseline approved appear within each file. Any changes beyond the baseline must also be reviewed and approved.

5.3. Documents

The following is a table of all documents to be produced over the development life cycle. Delivery dates are based on the Team’s intentional schedule described in the Gantt chart in Appendix E.

<table>
<thead>
<tr>
<th>Document Type</th>
<th>Description</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSP</td>
<td>Software System Proposal defines the general overview of the product that ValleyData Programming Group is committed to produce for Angus-Hamer, Inc.</td>
<td>10/10/00</td>
</tr>
<tr>
<td>SPMP</td>
<td>Software Project Management Plan clearly captures the internal processes used within ValleyData to accomplish Project goals.</td>
<td>11/01/00</td>
</tr>
<tr>
<td>SRS</td>
<td>Software Requirement Specification determines the development requirements for the intended solution.</td>
<td>11/30/00</td>
</tr>
<tr>
<td>SDD</td>
<td>Software Design Document describes the layout of the solution, ValleyData Team intends to use for the problem at hand.</td>
<td>03/02/01</td>
</tr>
<tr>
<td>System Tests and Results</td>
<td>It documents the test runs and results before the product is accepted to ensure it meets the requirements.</td>
<td>05/14/01</td>
</tr>
<tr>
<td>User Manual</td>
<td>Describes the operational instructions for the delivered product.</td>
<td>05/21/01</td>
</tr>
<tr>
<td>Service Maintenance Manual</td>
<td>It contains maintenance information to troubleshoot and information necessary to incorporate future upgrades to the product.</td>
<td>05/21/01</td>
</tr>
</tbody>
</table>

Table 5.3 – Document Descriptions and Due Dates

6. ACTIVITIES, SCHEDULE, AND BUDGET

Outlines the tasks that need to be performed throughout the Project, and how ValleyData manages the budget and schedule of the Project.
6.1. Activities and Tasks
The sequence of work activities to be performed over the life of the Project is identified below. Each phase contains a set of tasks that lead to the completion and approval of a baseline product for that phase. For a graphical representation of the Project Schedule see Appendix E.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Task</th>
<th>Deliverable</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Requirement Analysis</td>
<td>Identify Project</td>
<td>Software</td>
</tr>
<tr>
<td></td>
<td>Prepare Project proposal</td>
<td>System Project Proposal</td>
</tr>
<tr>
<td>Project Management Plan</td>
<td>Prepare WBS</td>
<td>Software Project Management Plan</td>
</tr>
<tr>
<td></td>
<td>Prepare Schedule</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prepare SPMP</td>
<td></td>
</tr>
<tr>
<td>Software Requirement Generation</td>
<td>Complete requirement analysis</td>
<td>Software Requirements Specification</td>
</tr>
<tr>
<td></td>
<td>Prepare technical specification</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prepare SRS</td>
<td></td>
</tr>
<tr>
<td>Software Design</td>
<td>Prepare architectural design</td>
<td>Software Design Document</td>
</tr>
<tr>
<td></td>
<td>Prepare detailed design</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prepare SDD</td>
<td></td>
</tr>
<tr>
<td>Implementation</td>
<td>Write Code</td>
<td>Code</td>
</tr>
<tr>
<td></td>
<td>Perform unit testing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perform integration testing</td>
<td></td>
</tr>
<tr>
<td>System Testing</td>
<td>Prepare system tests</td>
<td>System Test Document Results</td>
</tr>
<tr>
<td></td>
<td>Perform system testing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prepare STD and STR</td>
<td></td>
</tr>
<tr>
<td>Acceptance Testing</td>
<td>Perform Sponsor acceptance testing</td>
<td>Software Test</td>
</tr>
</tbody>
</table>
6.2. Resource Requirements

Each ValleyData member spends an average of 20 hours a week on the Project making a total of 3200 man-hours by Project completion time. ValleyData also needs access to a high quality printer and paper to print the deliverables required throughout the Project. On the days ValleyData convenes with our AHN Sponsor Corie Hamer, meetings generate unseen costs incurred through Corie Hamer’s loss of effective productivity time. Potential miscellaneous unseen costs may also occur due to meeting room occupation and scheduling.

6.3. Budget

This chart defines potential real costs to ValleyData through the development of the software for AHN.

<table>
<thead>
<tr>
<th>Direct Costs</th>
<th>Labor Costs: 32 weeks * 20 hours/week * $100/hour * 5 Software Engineers</th>
<th>$320,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect Costs</td>
<td>Transportation Cost: 30 miles * 2 ways * 2 cars * twice a month * .30/mile * 8 months</td>
<td>$288</td>
</tr>
<tr>
<td>Equipment Costs</td>
<td>Tape Backup Device/Media:</td>
<td>$300</td>
</tr>
<tr>
<td></td>
<td>Software: Open source code</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td>Hardware: BSDI server lease $30/mo. * 8mo.</td>
<td>$240</td>
</tr>
<tr>
<td></td>
<td>Printed Documents at Kinko’s:</td>
<td>$100</td>
</tr>
<tr>
<td></td>
<td>16 user BSDI Licensing fee for one year:</td>
<td>$700</td>
</tr>
<tr>
<td></td>
<td>Tutorial Books:</td>
<td>$200</td>
</tr>
</tbody>
</table>

**Table 6.3 – Costs**

**Total Potential Incurred Costs** = $321,828.00

6.4. Schedule

See Appendix E for the Project Gantt Chart, which shows the schedule breakdown of the Project in a graphical format.
Appendix A.

Project Management Plan

1. New Task
2. Verify Time Allotted Using Project Schedule
3. Ryan Delegates Tasks
4. Members Perform Work
5. Ryan Takes Accountability Record
6. Suggestions Given
7. Group Resynchronizes
8. Draft #1 Presented to Ted Ryon
9. Suggestions Given
10. Group Resynchronizes
11. Draft #2 Presented to Ted Ryon
12. Suggestions Given
13. Group Resynchronizes
14. Baseline Presented to Corio Homer

Planning

Implementation

Verification and Validation

Delivery
Appendix B.
ValleyData Change Request Form

Date:_______________

Name of person requesting change:_________________________________
Name of person responsible for making change:_______________________
Document name and version number:_______________________________
Affected Sections:______________________________________________

Details of change:_____________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

Signed:_______________________________________________________

The Rest of this form is for the person responsible for the change

Date completed or sent back to requestor: _______________

Describe changes made (if any):___________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

If no changes were made, explain why:______________________________
________________________________________________________________
________________________________________________________________

Signed:_______________________________________________________
# Appendix C.

<table>
<thead>
<tr>
<th>Member Name</th>
<th>Member Position</th>
<th>Alternate Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryan Mahoney</td>
<td>Project Manager</td>
<td>Schedule Manager</td>
</tr>
<tr>
<td>Aaron McBride</td>
<td>Executive Secretary</td>
<td>Documents (Technical)</td>
</tr>
<tr>
<td>Matt Palmerlee</td>
<td>Document Engineer (Design)</td>
<td>Project Manager</td>
</tr>
<tr>
<td>Jaspreet Singh</td>
<td>Schedule Manager</td>
<td>Executive Secretary</td>
</tr>
<tr>
<td>Charles Smothers</td>
<td>Document Engineer (Technical)</td>
<td>Documents (Design)</td>
</tr>
<tr>
<td>Ted Ryon</td>
<td>Faculty Advisor</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Table 3.2 – ValleyData Staff
Appendix D.

Modified Waterfall Model

1. Requirements Phase
   - Requirements Analysis
2. Specification Phase
3. Design Phase
   - SRS
4. Implementation Phase
   - SDD
5. Integration Phase
   - CODE
6. Testing
7. Delivery and Acceptance
Appendix E.
Gantt chart (*see attached*)