

Bandavya Virtual Assistant

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Abstract

Bandavya Welfare Society (BWS) is a non-profit organization that finds overseas sponsors for less-fortunate children in India to assist their educational needs. Over the years, the number of sponsors and children managed by the BWS has increased and the manual work has become tedious and labor intensive. Bandavya Virtual Assistant (BVA) is an application created for BWS organization to aid them in their endeavors. BVA collects the information on sponsors and children in one application with reporting and search capabilities. It aids them in monitoring the payments and correspondence between each child and the sponsor. BWS can now manage the organization more efficiently allowing more money to be funneled to the children rather than paying for additional staff.

1.0 Introduction

There are many poor, less-fortunate children in India who are unable to meet their educational needs due to lack of funds. Bandavya Welfare Society (BWS) is a non-profit organization that aids poor children in obtaining financial support to meet their educational needs. The name 'Bandavya' means a bond or a relationship, which is exactly what BWS does; create links between the children and the sponsors. BWS links a child with an overseas sponsor who can pay for their education. During the sponsorship children are required to keep the sponsors up to date on their progress in education and write various mandatory letters. The letters are received at the BWS and translated and approved before passing them on to the sponsor. Sponsors make several types of donations through out their subscription period to the BWS, which are collected and routed to the appropriate children. BWS acts as a communication and cash flow link between the children and their sponsors. Currently all work for managing the sponsors, children, payments and correspondences are done manually by filing information in binders and shuffling papers between the coordinator, staff and any volunteers at the organization. Over the years the pool of children and sponsors managed by the BWS has increased and the manual management has become tedious and labor-intensive.

Bandavya Virtual Assistant (BVA) is an application created to aid BWS in their endeavors. BVA is a web-based application which allows the traveling BWS coordinator to access the BVA system from anywhere in the world. Its database backend stores valuable information on sponsors, children, their families, correspondences between child and sponsor, payments made to children and donations received by the sponsors. BVA

has reporting and search capabilities to easily and quickly retrieve important information. BVA will save time and money for the organization through its easy to use interfaces and feature set. BWS can reduce its operational costs by using BVA since they will no longer need to bring in additional staff to run the organization. By reducing the operational costs more money can be directed to the children. BVA can also reduce communication gap between the traveling coordinator and the staff in India since the system is remotely accessible with easy lookup capabilities.

2.0 Approach

BVA was developed using an iterative development approach known as the rational unified process (RUP). Iterative development is one of the software engineering best practices and it allows development to be done in a series of iterations. Each iteration has its own requirements, analysis, design, implementation and testing activities as depicted in Figure 1. The iterative approach incorporates feedback and adaptation into each iteration. It is a better model for incorporating change compared to some of the traditional approaches such as the waterfall model where requirements have to be completed and frozen before moving on to design and analysis.

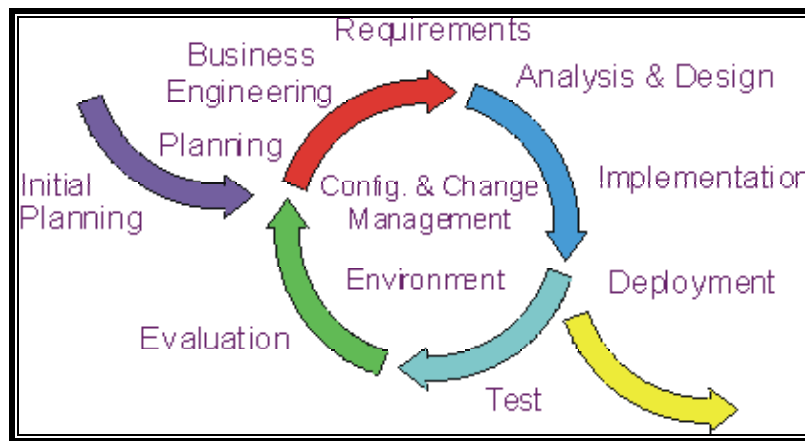


Figure 1: Iterative Development
 (From <http://medlem.spray.se/perlin27/rup.htm>)

The Rational Unified Process (RUP) is an iterative approach that was used in creating BVA. RUP consists of four phases: Inception, Elaboration, Construction and Transition. During inception the feasibility, vision and scope of the project are assessed and lifecycle objectives are defined. The goal of elaboration phase is to create a sound architectural foundation, create the development plan and define most of the requirements. Implementation takes place incrementally during the construction phase. The transition phase completes the software development by deploying the product to the user along with user documentation. Each phase can have one or more iterations. During each iteration, varying amounts of workflows such as business modeling, requirements, analysis and design, implementation, testing and deployment are performed as shown in Figure 2.

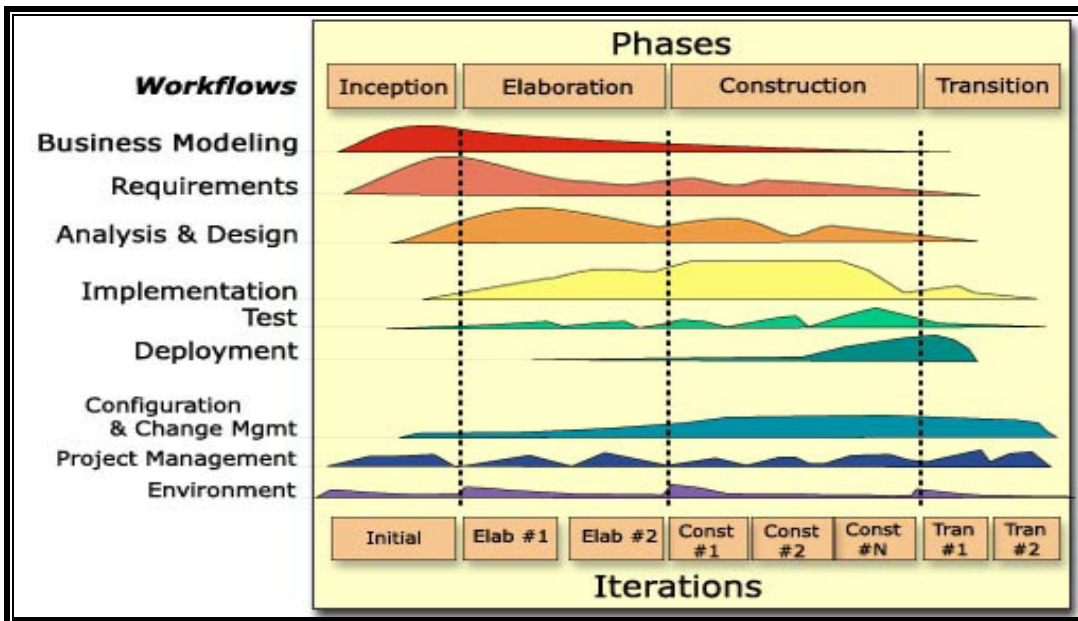


Figure 2: Rational Unified Process
 (From http://ref.web.cern.ch/ref/CERN/CNL/2002/001/SDT_RUP/)

RUP was chosen for developing BVA due to the flexibility of incorporating changes. Changes were anticipated during development due to the limited availability of client. The following sections detail how the rational unified process was used in the development of BVA. BVA was developed in four iterations. The following sections contain details on each iteration, categorized percentages of workflow activities performed per iteration and list of artifacts produced during each iteration.

2.1 Iteration I - Inception

During the first iteration the inception phase of the RUP was completed. The major activities during this phase of development included the following: assessing feasibility, eliciting requirements and identifying resources. The feasibility of project and the timeline were assessed and documented in the BVA Vision and Scope Document

[Appendix II] and the BVA Software Project Management Plan [Appendix I]. Several meetings with the client were set up to understand their business need for the application and to elicit requirements for the application. The elicited requirements were documented in the BVA Software Requirements Specification document. The BVA SRS was not fully completed during this iteration. There were several additions and modifications made during the following iterations. One of the benefits of RUP is the ability to easily incorporate the changes in requirements into the project. The BVA Software Project Management Plan and Vision and Scope documents were reviewed by the client to verify the business case and requirements.

The table below summarizes the amount of workflow activities that took place and the artifacts created by the end of this iteration.

Activities	Estimated Work Completed
Business Modeling	98%
Requirements Analysis	80%
Database Design	80%
System Set up (development environment)	90%
Artifacts Created	Reference
BVA Software Project Management Plan	Appendix I
BVA Vision and Scope Document	Appendix II
BVA Software Requirements Specification	Appendix III

Table 1: Activities during Iteration I

2.2 Iteration II – Elaboration

During this iteration the system was set up and the development environment was completed and implementation of features began. The system set up included the Apache Tomcat 4.0 Server, MySQL database server, and a FTP server for remote development.

The BVA front-end web page layout was designed and the BVA Database was created during this iteration. The web interface implementation was done using Javascript, JSP and HTML. Features were prioritized and high priority features were implemented to retrieve and add data using the BVA database through the BVA web interface. Some of the implemented features are as follows:

- Login User
- Add Child Information
- Add Child Family Information
- Get Child Details
- Add Sponsor Information
- Add Sponsor Family Information
- Get Sponsor Details
- Logout User

Documentation from previous iteration, especially BVA SRS was updated with additional requirements and changes. The implemented features were tested using actual data. The table below summarizes the amount of workflow activities that took place and the artifacts created by the end of this iteration.

Activities	Estimated Work Completed
Business Modeling	100%
Requirements Analysis	95%
Database Design	100%
System Set up (development environment)	100%
Design	80%
Implementation	20%

Testing	20%
Artifacts Created	Reference
Data Model	Appendix IV
Use Case Model	

Table 2: Activities during Iteration II

2.3 Iteration III - Construction Phase

This iteration focused on implementation of features. During this iteration all high priority and major features were implemented and tested. Features that were not completed during this phase were those that were less important and ‘good to have’ features.

Some of the implemented features during this iteration are as follows:

- Add Child Payment Details
- Add Sponsor Donation Details
- Add Child Letter Details
- Add Sponsor Letter Details
- Edit Child Details
- Edit Child Family Information
- Edit Child Payment Details
- Edit Child Letter Details
- Edit Sponsor Details
- Edit Sponsor Family Information
- Edit Sponsor Donation Details

- Edit Sponsor Letter Details
- Search
- Generate Following Reports:
 - List of pending reply letters
 - List of pending yearly letters
 - List of latest letters by children
 - List of recent sponsor annual subscriptions

Again all artifacts from previous iterations were updated with changes implemented during this iteration. The implemented features were tested using actual data. The table below summarizes the work completed by the end of this iteration.. No artifacts were created during this iteration other than BVA Code.

Activities	Estimated Work Completed
Business Modeling	100%
Requirements Analysis	100%
Database Design	100%
System Set up (development environment)	100%
Design	100%
Implementation	80%
Testing	70%
Artifacts Created	Reference
BVA implementation code	

Table 3: Activities during Iteration III

2.4 Iteration IV - Construction Phase

This iteration was the second iteration during construction phase. The goal of this phase to was to complete implementation. Development was completed and testing was heavy

during this phase. All previous documentation was updated and new user documentation was created. Some of the features implemented during this iteration are as follows:

- Generate following Reports:
 - List all children
 - List all Sponsors
 - List all Children and their sponsors
 - List Sponsors without children
- Delete Child
- Delete Child Family Information
- Delete Child Payment
- Delete Child Letter
- Delete Sponsor
- Delete Sponsor Family Information
- Delete Sponsor Donation
- Delete Sponsor Letter
- Add Staff access
- Delete Staff access
- Help

The sponsor and staff interfaces were also completed during this iteration. The sponsor and staff interfaces reused the implementation models for administrator interface. All previous artifacts were updated with changes made during this iteration. All

implemented features were tested using actual data. The table below summarizes the workflow activities and work completed by the end of this iteration.

Activities	Estimated Work Completed
Business Modeling	100%
Requirements Analysis	100%
Database Design	100%
System Set up (development environment)	100%
Design	100%
Implementation	100%
Testing	100%
Artifacts Created	Reference
BVA User Manual	

Table 4: Activities during Iteration IV

The above iterations completed all the phases of RUP except the transition phase. For this project, the transition phase where deployment takes place was not performed since the client is in a remote location and physical deployment is not possible. Instead the code, documentation and user manual will be sent to the client for deployment on their own. The below table summarizes all the activities and artifacts produced for iteration/phases of development.

Activities	Iteration I Inception	Iteration II Elaboration	Iteration III Construction	Iteration IV Construction
Business Modeling	98%	0%	0%	0%
Requirements Analysis	80%	15%	5%	0%
Database Design	80%	20%	0%	0%
System Set up (development environment)	90%	10%	0%	0%
Design	98%	2%	0%	0%
Implementation	0%	20%	60%	20%
Testing	0%	20%	50%	30%
Artifacts Created				
	BVA SPMP	Data Model	Implementation Code	User Manual

	BVA VS	Use Case Model		
	BVA SRS			

Table 5: Summary of activities of each iteration

3.0 System Architecture

The BVA system architecture is a three-tier architecture with client/presentation tier, business logic tier and data tier. The user communicates through the client tier using the web browser. The information from the client tier is sent to the business logic tier and processed. The results are then presented back to the user through the client tier. The business logic layer communicates with the data tier to process data requests. The BVA system uses a web browser, HTML, and JavaScript. The business logic tier processing the client requests uses JSP files and the Apache Tomcat Web server. The data tier consists of the MySQL database server. The BVA architecture is shown in figure 3.

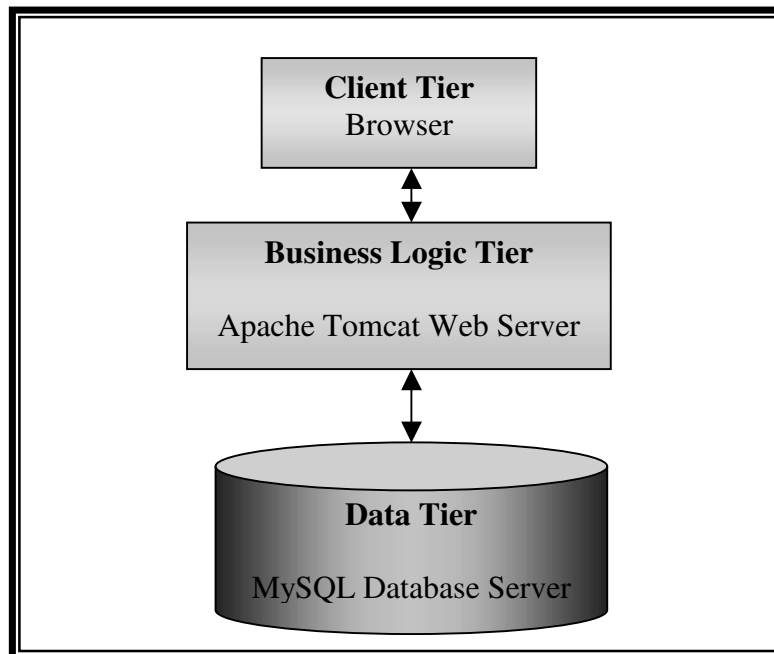


Figure 3: BVA three-tier architecture

The BVA architecture was implemented using the model view controller (MVC) design pattern. Using MVC paradigm the user input, the modeling of the external world and the visual feedback to the user are explicitly separated and handled by model, view and controller objects. The controller interprets the user inputs and maps them into commands to the model and/or view to necessitate the appropriate change. The model manages the behavior and data of the application domain by responding to queries about state information and change state requests. It captures the state of the process or system and how the system works. The view displays the graphical/text output of the results from the model to user.

In BVA all user input is handled by controller objects using html forms. The controller passes the requested function information to the models where processing takes place. The model object ensures correctness of the data and either redirect to controller for further information or process the data and passes the output to the view objects. The view object displays the output from the request processed by the model. The BVA model view controller interactions are shown in figure 3. The naming convention used in BVA for each function allow for easy identification of each model view controller objects as depicted in figure 3.

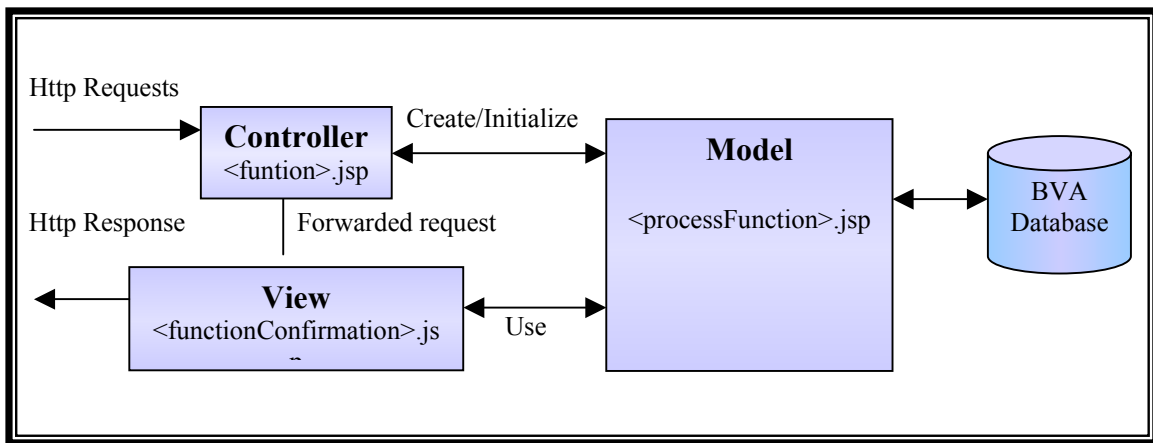


Figure 4: BVA Model View Controller Pattern Usage

4.0 Principles of Operation

The BVA application consists of three different interfaces: the admin interface, sponsor interface and staff interface. When a user logs in to the BVA system from the BVA main page, BVA determines the type of user and directs them to the appropriate interface. If the user is an administrator, BVA directs them to the administrator interface, staff to staff interface and sponsors to the sponsor interface. The following sections details the functionality for each user interfaces.

4.1 Administrator Interface

The administrator is the super user of the BVA system and will have full access to the BVA functionalities. The administrator interface consists of menu options for sponsors, children, staff, search and reports. The sponsor menu consists of options to add information on new sponsor, get sponsor details, add sponsor family information, sponsor donation information and letter details. The staff menu allows administrator to create

new staff accounts and remove staff accounts. The children menu consists of options to add new child, get child profile information, add child family member information, payment details and letter details. The search option provides easy way for administrator to locate appropriate child and sponsor information. Reports menu provides a variety of reports for the administrator to monitor and manage the BWS activities.

4.2 Sponsor Interface

Sponsors are members of BVA who donate money to particular children they sponsor and to the organization. The sponsor interface consists of options to view child information of their child/children and to view and edit their own profile information.

4.3 Staff interface

Staff members have same access as the administrator, except for account management. They can add, edit and view children and sponsor information, child and sponsor family details, correspondence and payment details between child and sponsor. They can also view all the reports as the administrator in order to assist the administrator in managing the BWS activities.

5.0 Presentation and validation of results

The BVA system was tested against the requirements using sample data provided by the BWS coordinator. The BWS administrator was also presented with a demo of the system

in order to validate and verify that BVA meets the requirements. Below are several screenshots from the BVA system.

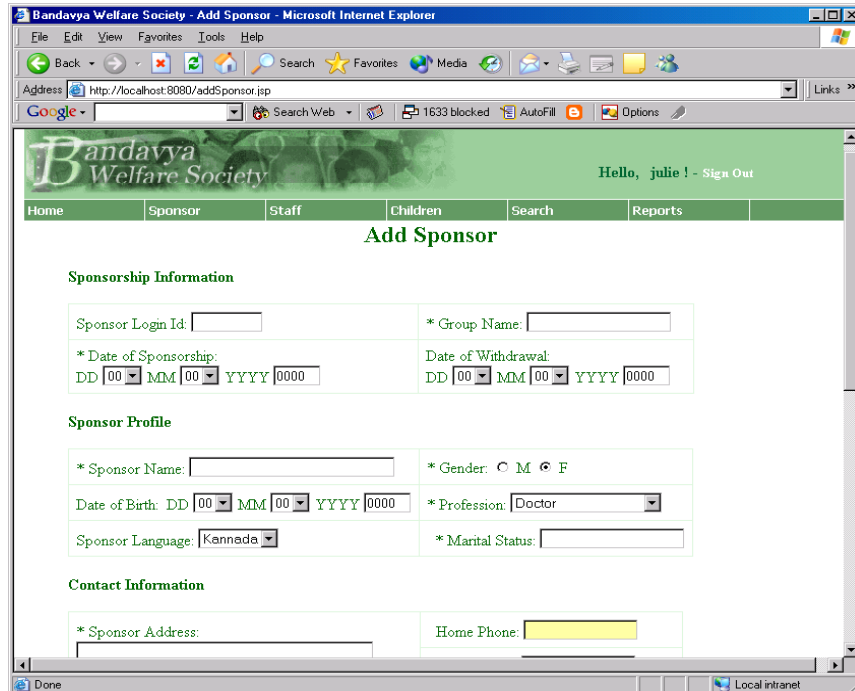


Figure 4: BVA Add Sponsor page

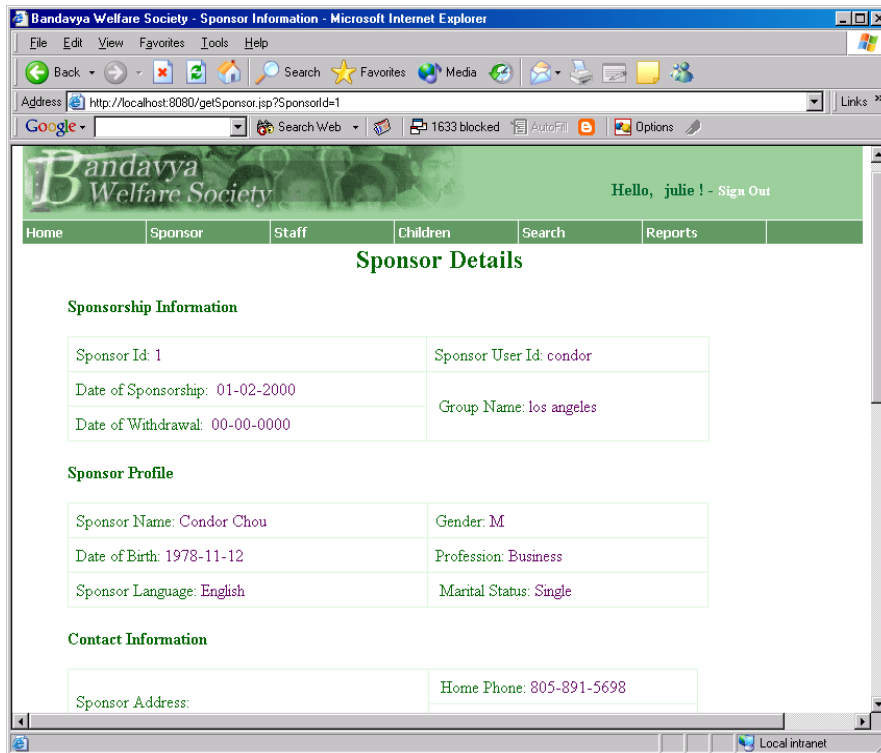


Figure 5: BVA Sponsor Information Page



Figure 6: BVA List of all sponsors and children page

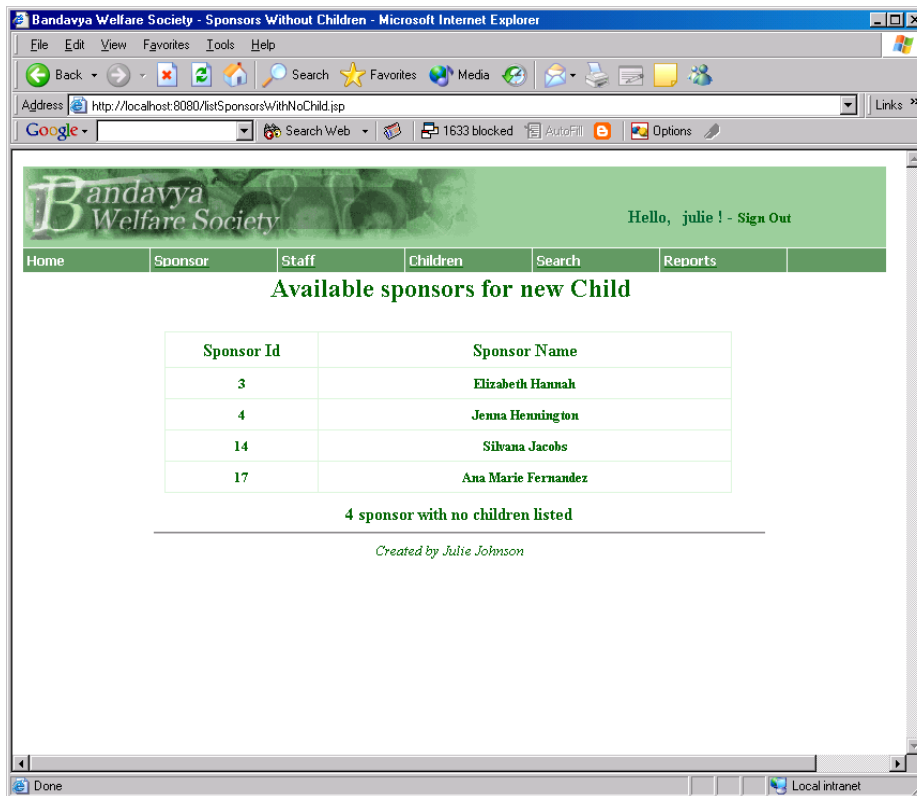


Figure 7: BVA List of sponsors with no child assigned page

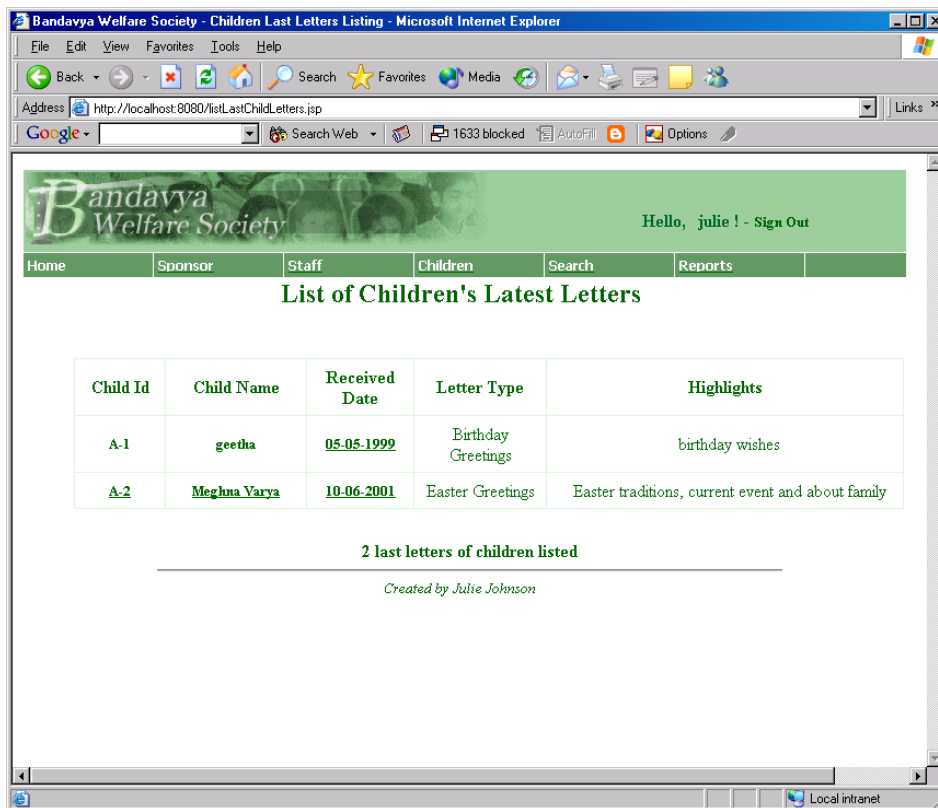


Figure 8: BVA List of children' latest letters page

6.0 Conclusion

6.1 Lessons Learned

There were several lessons learned from creating BVA. As BVA was created for international usage there were several different adaptations that needed to be made including the fields to enter date in DD-MM-YYYY format. Other differences include the name fields not being separated as first and last name due to the naming system used in different countries. Another important lesson learned was the need to keep documentation up-to-date. When there was a big gap of time not spent in development between iterations, it was hard to remember and obtain information without up to date documentation. Also the selection of meaningful terminology in the design of the

application was important in order to later comprehend sections that were updated after some time. The lack of a team environment made it easy to keep the design consistent and saved time for design decision making but it took more time to finish the project.

6.2 Limitations

BVA application does not allow sorting by different fields in a report. It also does not allow the user to select fields they would like displayed in a report. Customized report capabilities can be incorporated into the future versions of BVA. Another useful feature to be added is possibility of generating automated letters with pre-populated fields given a letter template. The BWS coordinator writes several newsletters to children and sponsors throughout the year and a automated letter generation feature could be very useful.

6.3 Future Work

In the future the BVA application can be reused to include additional features such as capability to make credit card payments directly through the BVA application. This would reduce the time it takes for the children to obtain the funds and would make it easier to monitor payments for the staff. Another possible feature would be to allow the administrator to automatically generate letters addressing each sponsor or children from inputting a letter template that BWS needs to send to all sponsors or children. BWS could also use the BVA application as a way of obtaining more sponsors. Features can be implemented to allow anyone on the Internet to perform a search through the list of un-

sponsored children given their preferences. Once they find a child they wish to sponsor, they could fill out a sponsorship form with their information for BWS staff to review whether to accept or decline.

7.0 References

- [1] E. Gamma, R. Helm, R. Johnson, and J. Vlissides, Design Patterns: Elements of Reusable Object-Oriented Software, Reading, MA: Addison-Wesley, 1995.
- [2] C. Larman, Applying UML and Patterns: An introduction to Object Oriented Analysis and Design and the Unified Process, Upper Saddle River, NJ: Prentice-Hall, 2002.
- [3] P. Kruchten, The Rational Unified Process: An Introduction, Boston, MA: Addison-Wesley, 2000
- [4] D. Lane and H. Williams, Web Database Applications with PHP and MySQL: MySQL, O'Reilly, 2002
- [5] G. Reese, Managing and Using MySQL, Beijing: O'Reilly, 2002
- [6] MySQL Reference: www.mysql.com
- [7] HTML and Javascript Tutorials: www.echoecho.com
- [8] Java Reference: www.java.sun.com
- [9] Apache set up Reference: www.apache.com
- [10] K. Wiegers, Software Requirements, Redmond, WA: Microsoft Press, 1999.
- [11] D. Leffingwell and D. Widrig, Managing Software Requirements: A Unified Approach, Indianapolis, IN: Addison-Wesley, 2000.
- [11] G. Reese, Database Programming with JDBC and JAVA, Sebastopol, CA: O'Reilly, 1997
- [12] R. Colburn. Special Edition Using SQL, Indianapolis, IN: QUE, 2000
- [13] D. Kroeneke. Database Processing: Fundamentals, Design & Implementation, Upper Saddle River, NJ: Prentice Hall 2001

8.0 Glossary

RUP – Rational Unified Process

BVA – Bandavya Virtual Assistant

BWS – Bandavya Welfare Society

JSP – Java Servlet Pages

SQL – Structured Query Language

MVC – Model View Controller

SRS – Software Requirements Specification

SPMP – Software Project Management Plan

VS – Vision and Scope Document

Appendix I
BVA Software Project Management Plan

Software Project Management Plan

for

Bandavya Virtual Assistant

Version 1.0

Prepared by Julie Johnson

Master of Science in Computer Science Project

January 15, 2003

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Revision History

Name	Date	Reason For Changes	Version
Julie Johnson	1/15/2003	Initial Draft	0.1
Julie Johnson	6/3/2003	Made formatting changes	0.2

Bandavya Virtual Assistant Software Project Management Plan

1 Introduction

1.1 Bandavya Virtual Assistant (BVA) Overview

Bandavya Welfare society (BWS) is a non-profit organization working to benefit the poor and less fortunate children of India to obtain education. The program finds overseas families willing to aid the children by providing financial support and assigns them as sponsors to a particular child or children. Once a sponsor family has been found for a child, there are different types of correspondence that takes place between the child and the family. Correspondence includes different types of letters, such as thank you letters, Christmas letters, grade report letters, yearly photographs, etc. The BWS monitors and manages the correspondence between each sponsor and the sponsored child. BWS also monitors and manages the payments from the families to the children through the organization.

As the organization has been in its beginning stages all work had been done manually. Now the amount of children and sponsors have grown over the years and there is a great need for a system to keep track and aid the BWS staff and coordinator with their efforts. In order to coordinate work between BWS groups overseas, they need an Internet based application that can be accessed from anywhere in the world. The application should capture the sponsor and child information and should automate or aid in monitoring and managing the payments, and correspondence between the sponsor and children. Also the application should automate particular letters that BWS sends to all sponsors throughout the year. Bandavya virtual assistant (BVA) application implements such features.

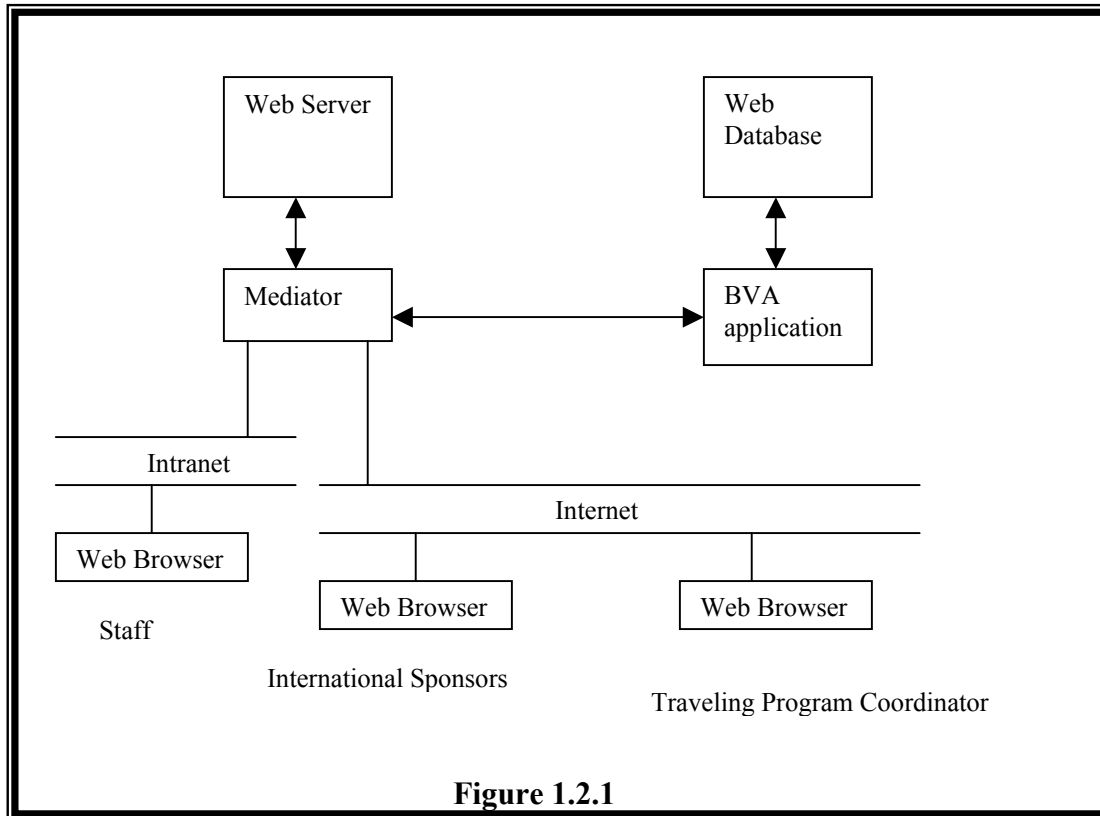
1.2 Problem Description

The goals of the BVA Project are:

- Decrease coordination efforts between staff in India and overseas volunteers
- Track correspondences between sponsors and children and log its highlights
- Manage the payments made by the sponsors
- Automate letters to be sent to the sponsors.
- Manage information regarding each child and sponsor
- Reduce communication delay and effort between child and sponsor
- Allow the information to be viewed online by the participants of the program
- Automate information retrieval.

The BVA application is centered around a web database, containing information of sponsors and children. BVA application will interface the database and process the information and sends it to the viewer's browser through a mediator and Internet. The

traveling BWS Program Coordinator will perform as the system administrator and will define the access privileges for all other users.



1.3 Functional Overview

BVA application consists of three main user groups: sponsors, BWS coordinator who will perform as the application administrator and the rest of the BWS staff who has different access privileges as defined by the coordinator. All user groups will use web clients to access the BVA application database over the Internet.

The scope of the project encompasses the following components:

- Web Database
- Web Server Software and Web Server setup
- BVA Application
- Documentation
- Mediator Software

1.4 Customer Project Deliverables

The BVA application items to be delivered to the customer include:

- *BVA Software Project management Plan*

- *BVA Software Requirements Specification*
- *BVA Software Integration and Test Plan*
- *BVA Software User Manual*
- *BVA software*

Other items, like the BVA Software Design document can be reviewed by the customer but are not delivered to the customer. The developer will also provide additional consultation to help set up software.

1.5 Reference Materials

[IEEE 1058] *IEEE Standard for Software Project Management* ANSI/IEEEStd.1058.1-1987

[Pilafian] *Smart Front Desk Software Project Management Plan* Dem T. Pilafian
<http://www.cs.Colorado.edu/~pilafian/>

1.6 Acronyms

BWS	Bandavya Welfare Society
BVA	Bandavya Virtual Assistant
RUP	Rational Unified Process
EECS	Electrical Engineering and Computer Science
KU	University of Kansas
HTML	Hyper Text Markup Language
OO	Object Oriented
WWW	World Wide Web
SQL	Structured Query Language
JSP	Java Server Pages

2 Project Organization

2.1 Process Model

The Rational Unified Process (RUP) model will be used for this project. It will consist of 4 phases: inception, elaboration, construction and transition. Each phase will be completed in multiple iterations. The milestone for inception phase completion is the lifecycle objectives. Elaboration phase will be completed with a stable well-defined architecture. Construction phase will focus on building the software and transition will deploy the software to the client's environment. Each phase will be completed in multiple iterations. Below table features the contents of each version of software created iteratively.

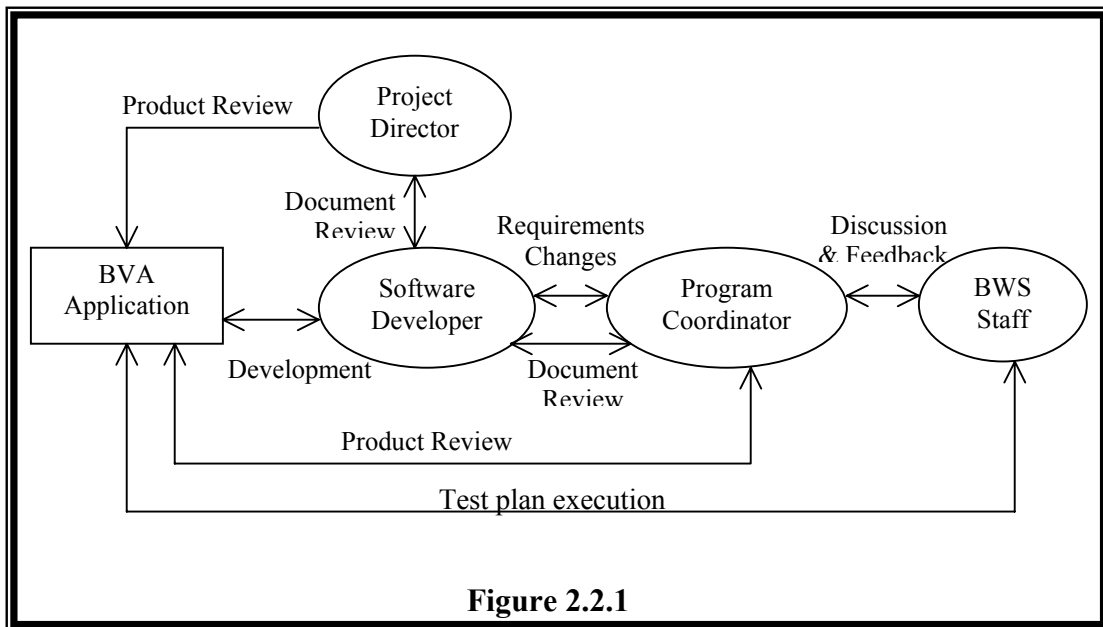
Version	Contents
0.1	Requirements Analysis Documentation
0.2	Set up Web Server Set up Web site
0.3	Set up Web Database application (MySQL) Create Database Shell
0.4	Develop Data Entry Prototype Interface
0.5	Password protection for administrator Password protection for staff & sponsors
0.6	Develop Simple Queries & Reports
1.0	First Prototype for Review
1.1	Implement search features
1.2	Implement reporting features
1.3	Implement correspondence tracking features
2.0	Second Release
2.1	Deploy and provide consulting for BWS

Table 2.1.1

2.2 Organizational Structure

The software developer will be in charge of writing all code and documentation. The developer will meet with the BWS coordinator to establish the requirements, and to verify and validate the product. The developer will also report the project status to the EECS department faculty member directing the project. The faculty member will review documents and will indicate satisfactory or unsatisfactory completion of the final project presentation.

The faculty member directing the project will be Dr. Arvin Agah.



3 Managerial Process

3.1 Assumptions, Dependencies and Constraints

Resources for software development will be freeware software such as MySQL, and JSP as there is no funding. Implementation of features will be limited to the capabilities provided by these tools. The KU web server will be used during development. Also, there will not be an interface for sponsored children as they are assumed to not have access to the Internet.

3.1 Risk Management

Potential risks will be assessed during each iteration of the project. Risk factors will be identified and classified as high, medium and low risk. High risk potential refers to a risk factor that could possibly render the system unusable and prevent the developer from completing the project and graduating. Medium risk potential refers to risk factors that would reduce some functionality significantly but the system may still be usable. Low risk potential indicates that a nonessential function will be eliminated or a work around will be implemented.

Risk assessment will include the description of the risk factor, the potential damage, mitigation plan, status change and the risk exposure.

3.2 Monitoring and Controlling Mechanisms

Biweekly, status reports will be created and reviewed by the Faculty member directing the project. The status reports will contain the goals achieved and pending for each 2 weeks.

3.3 Staffing Plan

There will only be one software developer working on the project. She will play the role of the analyst, developer, tester, and document writer.

4 Technical Process

4.1 Methods, Tools, and techniques

4.1.1 Formats, Languages, and browsers

The BVA application will manage the BWS organization website and will consist of web site files and executable code. The web site files will be composed of html and JSP. The executable code will be written in Java. Apache Tomcat 4.0 will be used for the web server and MySQL will be used to hold the entire child and sponsor information. The web browser used for development of the software will be Internet explorer 6.0 or later from Microsoft.

4.1.2 Development Methodology

The development of the BVA application will utilize the object-oriented technology based on the Rational Unified Process designed by Rational software. The development consists of four phases

- 1) Inception
- 2) Elaboration
- 3) Construction
- 4) Transition

Each phase consists of several workflows such as:

- Business Modeling
- Requirements
- Analysis and Design
- Implementation
- Test
- Deployment
- Configuration and Change Management
- Project management
- Environment

The RUP model incorporates the dynamic nature of development and each phase is completed in multiple iterations.

4.2 Software Documentation

All documentation will be approved by the faculty director and the BWS program coordinator. Possible documentation and artifacts will include:

- *BVA Software Project Management Plan*

- *BVA Software Requirements Specification*
- *BVA Use case Analysis*
- *BVA Software Analysis/Design Document*
- *BVA Implementation Model*
- *BVA Deployment Model*
- *BVA Integration and Test Plan*
- *BVA Users Manual*

5 Schedules and Budget

5.1 Schedule

Tentative schedule milestones are the described by the artifacts produced during the project

Artifact ID	Artifact Title	Milestone Date
BVA-100-SPMP	Software Project Management Plan	02/07/2003
BVA-100-SRS	Software Requirements Specification	2/28/2003
BVA-100-UC	Use Case Model	3/14/2003
BVA-100-SADD	Software Analysis/Design Document	5/31/2003
BVA-100-CODE	Implementation Model and Source Code	10/10/2003
BVA-100-DM	Deployment Model	10/17/2003
BVA-100-STIP	Software Test and Integration Plan	11/14/2003
BVA-100-SUM	Software User's Manual	12/1/2003

Table 5.1.1

5.2 Budget Resource Allocation

There is no budget allocated for this project. The University of Kansas web server will be used during development and all other development resources will be freeware software.

Appendix II
BVA Vision and Scope Document

Vision and Scope Document

for

Bandavya Virtual Assistant

Version 1.0

Prepared by Julie Johnson

Master of Science in Computer Science Project

March 4, 2003

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Revision History

Name	Date	Reason For Changes	Version
Julie Johnson	3/4/2003	Initial Draft	0.1
Julie Johnson	6/3/2003	Made formatting changes	0.2

1. Business Requirements

1.1. Background

Bandavya Welfare Society (BWS) is a non-profit organization working to benefit the poor and less fortunate children of India to obtain education. The program finds overseas families willing to aid the children by providing financial support and assigns them as sponsors to a particular child or children. Once a sponsor family has been found for a child, there are different types of correspondence that takes place between the child and the family. Correspondence includes different types of letters, such as thank you letters, Christmas letters, grade report letters, yearly photographs, etc. The BWS monitors and manages the correspondence between each sponsor and the sponsored child. BWS also monitors and manages the payments from the families to the children through the organization.

As the organization is in its beginning stages all work is being done manually. The number of children and sponsors has grown over the years and there is now a great need for a system to keep track and aid the BWS staff and coordinator with their efforts. In order to coordinate activities between BWS groups overseas, they need a web-based application that can be accessed from anywhere in the world. The application should capture the sponsor and child information and should automate or aid in monitoring and managing the payments, and correspondence between the sponsor and children. In addition, the application should also automate particular letters that BWS sends to all sponsors throughout the year. Bandavya Virtual Assistant (BVA) application implements such features.

1.2. Business Opportunity

More and more less-fortunate children in India need assistance with their education. The amount of children that BWS could assist is limited due to the time it takes to manually process their requests for aid, map them to appropriate sponsors, and monitor each sponsor payments. A computerized application, such as the BVA will help save the time spent on administrative tasks. This would bring greater value to their organization. With the help of BVA, the organization can assist more people in need more efficiently.

1.3. Business Objectives

Most of the administrative tasks at BWS are done by hand by volunteers and staff. BVA will free BWS staff from having to do this manual work. It will save their time and will enable them to concentrate more on social work. Also communication and coordination of activities will be more efficient and less error-prone using the BVA application. The success of BVA can be measured in the amount of time saved in using the application.

1.4. Customer or Market Needs

Many poor children in India depend on welfare societies such as BWS to aid them in meeting their educational needs. As with most organizations that are non-profit organizations, the funding they receive to run the organizations is limited and must be used in the most efficient manner. BVA will reduce the administrative costs so that the amount of money going directly to the children will be more. The less money and time it takes to run the organization and its processes will mean more money that can be spent on the poor children. Thus, the BVA application will

aid them in assisting more needy children. Also the sponsors who are enthusiastic about helping the needy can now see the effects of their donation faster and be able to view information on their children more quickly using the BVA application.

1.5. Business Risks

Since BWS will depend mainly on the BVA application to monitor the children payments, the application must be accurate. Inconsistencies and errors in the system can result in not meeting the goal of assisting the hopeful children.

2. Vision of the Solution

2.1. Vision Statement

Bandavya Virtual Assistant will manage a pool of needy children and possible sponsors overseas who can aid them in their education. It will ensure that all children are receiving the promised amounts and that payments have been made on time by the sponsors. It will also manage the correspondence between the children to the sponsors to make sure the sponsors are kept informed on the status of the children they are assisting. The application will automate the sending of timely letters to the sponsors from the organization. It will also provide faster access to the children's information and their status to the sponsors through the internet. BVA will make BWS more productive by automating time consuming tasks and coordinating their efforts more efficiently through monitoring and tracking activities over the Internet. Also BVA will decrease the time and money spent on administrative tasks by BWS.

2.2. Major Features

The major features of the BVA include the following:

- 2.2.1. Managing a pool of children and sponsors online
- 2.2.2. Monitoring the sponsor payments online
- 2.2.3. Managing correspondences from children to sponsors online
- 2.2.4. Automatically generate common letters to be sent to all sponsors
- 2.2.5. Sponsor access to appropriate children information online
- 2.2.6. Ability to create various reports online
- 2.2.7. Ability to administer access privileges to users on online information
- 2.2.8. Increasing the accuracy of information by validating input data

2.3. Assumptions and Dependencies

The resources for creating BVA will be freeware software as there is no funding for this development. Implementation of features will be limited to the capabilities provided by these tools. The KU web server will be used during development. Also, there will not be an interface for sponsored children as they are assumed to not have access to the Internet.

3. Scope and Limitations

3.1. Scope of Initial Release

The initial release will serve as a prototype and will implement all major features. Its primary purpose will be to establish the requirements. The following features will be implemented in the initial release:

- 3.1.1. Add child information to database
- 3.1.2. Modify child information in database
- 3.1.3. Delete child information from database
- 3.1.4. Search for specific child information
- 3.1.5. Add sponsor information to database
- 3.1.6. Modify sponsor information in database
- 3.1.7. Delete sponsor information from database
- 3.1.8. Search for specific sponsor information
- 3.1.9. Sponsor login
- 3.1.10. Administrator login
- 3.1.11. Staff Login
- 3.1.12. Administrator View
- 3.1.13. Sponsor View
- 3.1.14. Staff View
- 3.1.15. Create Report

3.2. Scope of Subsequent Releases

Subsequent release will incorporate changes and feedback from the initial release. The following table shows the evolution of subsequent releases after the initial release:

Version	Contents
1.0	Initial Release
1.1	Implement search features
1.2	Implement reporting features
1.3	Implement correspondence tracking features
1.4	Implement additional queries and reports
2.0	Second Release
2.1	Deploy and provide consulting for BWS

3.3. Limitations and Exclusions

The functionality of BVA will be limited to the type of activities being done manually today. Any additional information a sponsor may want to know about the children or their background or their culture is not in the scope of the current work. Such information can be added later after the system is put into use. In addition, the stakeholder may anticipate other web server features like a bulletin board or e-mail service to the children; these are not in the scope of this product.

4. Business Context

4.1. Stakeholder Profiles

Stakeholder	Major Value	Attitudes	Major Interests	Constraints
Administrator/BWS Coordinator	Automation of previously manual tasks	Expects high usability and is highly receptive	Managing database of child and sponsor information	No budget
Staff	Increase productivity with more automation	highly receptive, but expect high usability	Monitoring the child payments, correspondences and updating children information	None
Sponsors	View child information	Good and thorough presentation of information	Get status on the child	None

Table 4.1.1

4.2. Project Priorities

Dimension	Driver (state objective)	Constraint (state limits)	Degree of Freedom (state allowable range)
Schedule	release 1.0 to be available by 8/1, release 2.0 by 10/10		
Features			70-80% of high priority features must be included in release 1.1
Quality			90-95% of user acceptance tests must pass for release 1.0, 95-98% for release 1.1
Staff		Will only have one developer	
Cost	Should use freeware software for development	No budget	

Table 4.2.1

4.3. Operating Environment

BVA will be a web application and must be accessible overseas. It must be reliable and accurate. Users in India will be the BWS staff who will update the information on children and sponsors.

They will also monitor the payments and correspondences between children and sponsors. Sponsors overseas will view information and status of their children. The traveling BWS coordinator will perform as the administrator and will provide access privileges to different users and will also create reports and send letters to sponsors.

Appendix III
BVA Software Requirements
Specification

Software Requirements Specification

for

Bandavya Virtual Assistant

Version 1.0

Prepared by Julie Johnson

Master of Science in Computer Science Project

March 25, 2003

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Revision History

Name	Date	Reason For Changes	Version
Julie Johnson	03/25/03	Initial draft	1.0 draft 1

1. Introduction

1.1 Purpose

The Software Requirements Specification (SRS) document describes the functional and non-functional requirements for the Bandavya Virtual Assistant (BVA) application. This document is intended for the members involved in the project to verify the requirements that lead to correct functioning of the system.

1.2 Project Scope

Bandavya Virtual Assistant (BVA) will assist the Bandavya Welfare Society (BWS) in their efforts to provide education for poor children in India. BVA will reduce the amount of administrative work and increase the efficiency of BWS. A detailed project description is available in the *Bandavya Virtual Assistant Vision and Scope Document* [1]. The section titled, “Scope of Initial and Subsequent Releases” lists the features scheduled for full and partial implementation in this release.

1.3 References

1. Johnson, Julie. *Bandavya Virtual Assistant Vision and Scope Document*
2. Johnson, Julie. *Bandavya Virtual Assistant Software Project Management Plan*
3. Wiegers, Karl. *Cafeteria Ordering System Software Requirements Specification*, www.processimpact.com/projects/COS/COS_SRS.doc
4. Wiegers, Karl. *Software Requirements Specification Template*, http://www.processimpact.com/process_assets/srs_template.doc
5. IEEE Std 830-1998 *IEEE Recommended Practice for Software Requirements Specification*

2. Overall Description

2.1 Product Perspective

BVA is a new system that replaces the current manual process to manage the administrative work at BWS. BVA manages pool of needy children and possible sponsors who can aid the children in their education. BVA manages the correspondences between children and sponsors. It also manages the payments made by the sponsors to their children.

BVA will have three interfaces: administrator interface, BWS staff interface and a sponsor interface. Administrator interface will allow the BWS program coordinator to login as the super user with access to all functions. BWS staff will access BVA through the staff interface for data entry. The sponsors will access BVA through the sponsor interface to view information on their sponsored children and BWS.

2.2 Product Features

The major features of the BVA application include the following:

- Authenticate users
- Manage children information
- Manage sponsor information
- Manage staff access
- Manage child letters
- Manage sponsor letters
- Manage sponsor donations
- Manage child payments
- Generate Reports
- Search for children and sponsors
- Help

2.3 User Classes and Characteristics

BWS Coordinator	BWS Coordinator is the person in charge of the BWS and will be the super user on the BVA system. The BWS Coordinator often travels overseas and find sponsors. The BWS coordinator is the head of the BWS organization. The coordinator will be the administrator on the BVA application. He/She will use the BVA application to view different types of reports to manage the BWS activities.
BWS Staff	BWS staff are personnel that work in India. They ensure that the children receive the payments and letters from their sponsors and notify the coordinator. They will use BVA application to enter information on children, payments and correspondences.
Sponsors	Sponsors are members of BWS who sponsor one or more children in India and pay for their education. Sponsors access the BVA application from all over the world to view information about BWS and their sponsored children.

2.4 Operating Environment

- 2.4.1 BVA shall operate with the following Web browsers: Microsoft Internet Explorer versions 5.0 and 6.0.
- 2.4.2 BVA shall operate on a server running Windows XP, MySQL Database Server and Apache Web Server.

2.5 Design and Implementation Constraints

- 2.5.1 Sponsors can only view information of the children they have sponsored.
- 2.5.2 There will be no interface for children to access the BVA.
- 2.5.3 All user interfaces will be programmed using JSP, HTML and Javascript.
- 2.5.4 The system shall use the MySQL 4.0 database engine.

2.6 User Documentation

- 2.6.1 The system shall provide online hierarchical cross-linked online help system in HTML, describing the features and functionalities.
- 2.6.2 Users will be provided with user installation guide with instructions for system setup, containing information on setting up database server, web server etc.

2.7 Assumptions and Dependencies

TBD

3. System Features

3.1 Login

3.1.1 Description and Priority

Login provides a secure interface for BWS sponsors, staff and administrator to access the BVA system. Priority is high.

3.1.2 Stimulus/Response Sequences

Stimulus: User enters the login id and password in the fields provided in the BWS web page and clicks the login button.

Response: System authenticates the password and user name. If inaccurate, system prints out appropriate error message else it determines the type of user and redirect the user to appropriate interface.

3.1.3 Functional Requirements

3.1.3.1 The login id shall be up to 16 characters long. It cannot be over 16 characters.

3.1.3.2 The password shall be up to 16 characters long. Passwords cannot be over 16 characters long.

3.1.3.3 The system shall direct user to appropriate interface upon successful authentication.

3.1.3.4 The system shall provide appropriate error messages when:

- Login Id is not provided
- Password is not provided
- Neither /login id or password is provided
- Login id or password is incorrect

3.2 Logout

3.2.1 Description and Priority

Logout provides a secure means for user to exit the BVA system. Priority is high.

3.2.2 Stimulus/Response Sequences

User: User clicks the sign out button.

System: System ends the current session and redirects user to BWS home page.

3.2.3 Functional Requirements

3.2.3.1 The system shall prevent users from accessing the BVA application without logging in again once logged out.

3.3 Create new Child

3.3.1 Description and Priority

Creating a new child allows BVA to store child information in the database. Priority is high.

3.3.2 Stimulus/Response Sequences

User: User selects the option to create new child from the children drop down in the menu bar.

System: System provides user with a form to fill out child information indicating the required fields.

User: User clicks on submit button to submit the completed information or click the clear button to clear the form in order to re-enter the information.

System: If user chose to clear the form a blank form is provided for the user to refill. If user submits the application the system checks if all required fields are completed appropriately. If not error message is provided else the system stores the child information and displays successful completion message to the user.

3.3.3 Functional Requirements

3.3.3.1 The system shall ensure that all required information is provided by the user

3.3.3.2 The system shall store the child information if all information is provided and verified.

3.3.3.3 The system shall provide appropriate error messages if any of the following fields are not completed:

- Child Id
- Sponsor Id
- Date of Sponsorship
- Child Name
- Gender
- Address (at least first 2 lines should be provided)
- Date of birth
- Health

3.4 View/Edit Child Information

3.4.1 Description and Priority

This feature allows administrator, staff to view and or edit the child information. It also allows sponsors to view the information of their child. Priority is high.

3.4.2 Stimulus/Response Sequences

- User: User selects child profile option from the children drop down in the menu bar.
- System: System prompts for the child id.
- User: User submits the child id of the child they are interested in viewing.
- System: If child id was incorrect or not provided system provides error message else it displays the child information along with the option to edit the information.
- User: If user chooses to edit the information user clicks on the edit button below child information. If user is a sponsor, he/she will not have this option.
- System: Provides user with the form with current information for update.
- User: User fills out appropriate updated information and click submits.
- System: System ensures that all required information is provided. If not system will prompt the user with error message else store the updated information and displays successful completion message to the user.

3.4.3 Functional Requirements

- 3.4.3.1 The system shall provide child information when accurate child id is provided.
- 3.4.3.2 When entering child id system shall not require the id to be case-sensitive.
- 3.4.3.3 When shall provide appropriate error messages on the following conditions when getting the child id from the user:
- Child Id is not provided
 - Child id is inaccurate
- 3.4.3.4 When editing child information system shall ensure that all required information is provided by the user
- 3.4.3.5 When editing child information system shall store the child information if all information is provided and verified.
- 3.4.3.6 The system shall provide appropriate error messages if any of the following fields are not completed when editing child information:
- Child Id
 - Sponsor Id
 - Date of Sponsorship
 - Child Name
 - Gender
 - Address (at least first 2 lines should be provided)
 - Date of birth
 - Health

3.5 Remove Child Information

3.5.1 Description and Priority

This feature removes all information pertaining to the child from the system. Once the information is removed it is non-recoverable. Priority is high.

3.5.2 Stimulus/Response Sequences

- User: User clicks the delete button on the child information page of the child they want to delete.
- System: System prompts user to confirm deletion and notifies user that all related information of the child will be deleted.
- User: User chooses to confirm deletion by clicking the delete button or cancel the request by clicking the cancel button.
- System: If user cancels deletion system does not delete any information and re-directs user to the page containing child information. If user chooses to delete the system deletes all information of the child, including the child's family member information, letters and payments.

3.5.3 Functional Requirements

- 3.5.3.1 System shall ask user to confirm deletion before deleting all child information
- 3.5.3.2 System shall re-direct user to child information view page if user chooses to cancel deletion.
- 3.5.3.3 System shall delete all information related to the child the user wish to delete.

3.6 Create New Child Family Member

3.6.1 Description and Priority

This feature allows user to enter and store the information of each family member of a child. Priority is high.

3.6.2 Stimulus/Response Sequences

- User: User selects the option to add family member from the children drop down in the menu bar.
- System: System provides user with a form to fill out child family member information indicating the required fields.
- User: User clicks on submit button to submit the completed information or click the clear button to clear the form in order to re-enter the information.
- System: If user chose to clear the form a blank form is provided for the user to refill. If user submits the application the system checks if all required fields are completed appropriately. If not error message is provided else the system stores the child information and displays successful completion message to the user.

3.6.3 Functional Requirements

- 3.6.3.1 The system shall ensure that all required information is provided by the user
- 3.6.3.2 The system shall store the child family member information if all information is provided and verified.
- 3.6.3.3 The system shall provide appropriate error messages if any of the following fields are not completed:
- Child Id

- Relationship
- Family Member's Name
- Profession
- Addiction
- Health

3.7 View/Edit Child Family Member

3.7.1 Description and Priority

This feature allows administrator, staff to view and/or edit the child's family member information. It also allows sponsors to view information on the family members of their child. Priority is high.

3.7.2 Stimulus/Response Sequences

- User: User selects child profile option from the children drop down in the menu bar.
- System: System prompts for the child id.
- User: User submits the child id of the child they are interested in viewing.
- System: If child id was incorrect or not provided system provides error message else it displays the child information along with the option to edit the information.
- User: If user chooses to edit the family member information user clicks on the edit button for the family member they wish to edit. If user is a sponsor, he/she will not have this option.
- System: Provides user with the form with current information for update.
- User: User fills out appropriate updated information and clicks submit.
- System: System ensures that all required information is provided. If not system will prompt the user with error message else store the updated information and displays successful completion message to the user.

3.7.3 Functional Requirements

- 3.7.3.1 The system shall provide child family member information when accurate child id is provided.
- 3.7.3.2 When entering child id system shall not require the id to be case-sensitive.
- 3.7.3.3 When shall provide appropriate error messages on the following conditions when getting the child id from the user:
- Child Id is not provided
 - Child id is inaccurate
- 3.7.3.4 When editing child's family member information system shall ensure that all required information is provided by the user
- 3.7.3.5 When editing child's family member information system shall store the child family information if all information is provided and verified.
- 3.7.3.6 The system shall provide appropriate error messages if any of the following fields are not completed when editing child information:
- Child Id
 - Relationship
 - Family Member's Name
 - Profession
 - Addiction

- Health

3.8 Delete Child Family Member

3.8.1 Description and Priority

This feature removes the child's family member information from the system. Once the information is removed it is non-recoverable. Priority is high.

3.8.2 Stimulus/Response Sequences

User: User clicks the delete button on the child information page for the child family member they want to delete.

System: System prompts user to confirm deletion.

User: User chooses to confirm deletion by clicking the delete button or cancel the request by clicking the cancel button.

System: If user cancels deletion system does not delete any information and re-directs user to the page containing child information. If user chooses to delete the system deletes the information of the chosen family member.

3.8.3 Functional Requirements

3.8.3.1 System shall ask user to confirm deletion before deleting the family member information.

3.8.3.2 System shall re-direct user to child information view page if user chooses to cancel deletion.

3.8.3.3 System shall delete the child's family member information of the family member the user wish to delete.

3.9 Create New Child Letter

3.9.1 Description and Priority

This feature allows user create and store record of the letter written by the child to the sponsor. Priority is high.

3.9.2 Stimulus/Response Sequences

User: User selects the correspondence option from the children drop down in the menu bar.

System: System provides user with a form to fill out child letter details indicating the required fields.

User: User clicks on submit button to submit the completed information.

System: If user submits the application the system checks if all required fields are completed appropriately. If not error message is provided else the system stores the child information and displays successful completion message to the user.

3.9.3 Functional Requirements

- 3.9.3.1 The system shall ensure that all required information is provided by the user
- 3.9.3.2 The system shall store the child letter details if all information is provided and verified.
- 3.9.3.3 The system shall provide appropriate error messages if any of the following fields are not completed:
 - Child Id
 - Letter Type
 - Date Letter was received

3.10 View/Edit Child Letter

3.10.1 Description and Priority

This feature allows administrator, staff to view and/or edit the child's letter details. Priority is high.

3.10.2 Stimulus/Response Sequences

- User: User clicks on view child letter link while viewing child information or clicks on the date of the letter while viewing a report to view the letter details.
- System: System displays the letter details along with option to edit the letter.
- User: User chooses to edit the letter by clicking the edit button.
- System: System provides the child letter details form pre-populated with previous information.
- User: User may choose to edit and submit the update or cancel update by clicking on submit or cancel button
- System: If user chooses to cancel update, system returns to the viewing letter details page. If user chooses to submit the update, system verifies if all required information is provided and if it is then updates the information else it displays appropriate error message.

3.10.3 Functional Requirements

- 3.10.3.1 The system shall display appropriate letter details when link to the letter is clicked.
- 3.10.3.2 System shall pre-populate the child letter details form with current information.
- 3.10.3.3 System shall not update the information if cancel button is clicked.
- 3.10.3.4 System shall update the letter details if submit button is clicked and all required information is provided.
- 3.10.3.5 The system shall provide appropriate error messages if any of the following fields are not completed when editing child letter details:
 - Child Id
 - Letter Type
 - Date Received

3.11 Delete Child Letter

3.11.1 Description and Priority

This feature removes the appropriate letter written by the child from the system. Once the information is removed it is non-recoverable. Priority is high.

3.11.2 Stimulus/Response Sequences

- User: User clicks the delete button on the child letter details page for the letter they want to delete.
- System: System prompts user to confirm deletion.
- User: User chooses to confirm deletion by clicking the delete button or cancel the request by clicking the cancel button.
- System: If user cancels deletion system does not delete any information and re-directs user to the page displaying the letter details. If user chooses to delete the system deletes the particular letter.

3.11.3 Functional Requirements

3.11.3.1 System shall ask user to confirm deletion before deleting the letter details

3.11.3.2 System shall re-direct user to letter details page if user chooses to cancel deletion.

3.11.3.3 System shall delete all letter details pertaining to the letter the user wish to delete.

3.12 Create New Child Payment

3.12.1 Description and Priority

This feature allows user create and store record of the payment to the child from the BWS organization. Priority is high.

3.12.2 Stimulus/Response Sequences

- User: User selects the new payment option from the children drop down in the menu bar.
- System: System provides user with a form to fill out child payment details indicating the required fields.
- User: User clicks on submit button to submit the completed information or click the clear button to clear the form in order to re-enter the information.
- System: If user chose to clear the form a blank form is provided for the user to refill. If user submits the application the system checks if all required fields are completed appropriately. If not error message is provided else the system stores the child payment details and displays successful completion message to the user.

3.12.3 Functional Requirements

3.12.3.1 The system shall ensure that all required information is provided by the user

3.12.3.2 The system shall store the child payment details if all required information is provided and verified.

3.12.3.3 The system shall provide appropriate error messages if any of the following fields are not completed:

- Child Id

- Payment Date
- Payment Type
- Payment Source
- Payment Method

3.13 View/Edit Child Payment

3.13.1 Description and Priority

This feature allows administrator, staff to view and or edit the information on payment made by BWS to the child. Priority is high.

3.13.2 Stimulus/Response Sequences

- User: User clicks on view child payments link while viewing child information or clicks on the date of the letter while viewing a report to view the payment details.
- System: System displays the payment details along with option to edit.
- User: User chooses to edit the payment information by clicking the edit button.
- System: System provides the child payment details form pre-populated with previous information.
- User: User may choose to edit and submit the update or cancel update by clicking on submit or cancel button
- System: If user chooses to cancel update, system returns to the viewing payment details page. If user chooses to submit the update, system verifies if all required information is provided and if it is then updates the information else it displays appropriate error message.

3.13.3 Functional Requirements

- 3.13.3.1 The system shall display appropriate payment details when link to the payment is clicked.
- 3.13.3.2 System shall pre-populate the child payment details form with current information.
- 3.13.3.3 System shall not update the information if cancel button is clicked.
- 3.13.3.4 System shall update the payment details if submit button is clicked and all required information is provided.
- 3.13.3.5 The system shall provide appropriate error messages if any of the following fields are not completed:
- Child Id
 - Payment Date
 - Payment Type
 - Payment Source
 - Payment Method

3.14 Delete Child Payment

3.14.1 Description and Priority

This feature removes the details on appropriate payment made to the child by BWS. Once the information is removed it is non-recoverable. Priority is high.

3.14.2 Stimulus/Response Sequences

- User: User clicks the delete button on the child payment details page for the payment they wish to delete.
- System: System prompts user to confirm deletion.
- User: User chooses to confirm deletion by clicking the delete button or cancel the request by clicking the cancel button.
- System: If user cancels deletion system does not delete any information and re-directs user to the page displaying the payment details. If user chooses to delete the system deletes the particular payment information.

3.14.3 Functional Requirements

- 3.14.3.1 System shall ask user to confirm deletion before deleting the payment details
- 3.14.3.2 System shall re-direct user to payment details page if user chooses to cancel deletion.
- 3.14.3.3 System shall delete all payment details pertaining to the payment the user wish to delete.

3.15 Create new Sponsor

3.15.1 Description and Priority

Creating a new sponsor allows BVA to store information on a sponsor. Priority is high.

3.15.2 Stimulus/Response Sequences

- User: User selects the option to create new sponsor from the sponsor drop down in the menu bar.
- System: System provides user with a form to fill out sponsor information indicating the required fields.
- User: User clicks on submit button to submit the completed information or click the clear button to clear the form in order to re-enter the information.
- System: If user chose to clear the form a blank form is provided for the user to refill. If user submits the application the system checks if all required fields are completed appropriately. If not error message is provided else the system stores the sponsor information and displays successful completion message to the user.

3.15.3 Functional Requirements

- 3.15.3.1 The system shall ensure that all required information is provided by the user
- 3.15.3.2 The system shall store the sponsor information if all information is provided and verified.
- 3.15.3.3 The system shall provide appropriate error messages if any of the following fields are not completed:

- Group Name
- Date of Sponsorship
- Sponsor Name
- Gender
- Profession
- Marital status
- Address (at least first 2 lines should be provided)
- Country

3.16 View/Edit Sponsor Information

3.16.1 Description and Priority

This feature allows administrator, staff to view and or edit the sponsor information. Priority is high.

3.16.2 Stimulus/Response Sequences

- User: User selects sponsor profile option from the sponsor drop down in the menu bar.
- System: System prompts for the sponsor id.
- User: User submits the sponsor id of the sponsor they are interested in viewing.
- System: If sponsor id was incorrect or not provided system provides error message else it displays the sponsor information along with the option to edit the information.
- User: If user chooses to edit the information user clicks on the edit button below sponsor information.
- System: Provides user with the form with current information for update.
- User: User fills out appropriate updated information and click submits.
- System: System ensures that all required information is provided. If not system will prompt the user with error message else store the updated information and displays successful completion message to the user.

3.16.3 Functional Requirements

- 3.16.3.1 The system shall provide sponsor information when accurate sponsor id is provided.
- 3.16.3.2 When shall provide appropriate error messages on the following conditions when getting the sponsor id from the user:
- Sponsor Id is not provided
 - Sponsor id is inaccurate
- 3.16.3.3 When editing sponsor information system shall ensure that all required information is provided by the user
- 3.16.3.4 When editing child information system shall store the sponsor information if all information is provided and verified.
- 3.16.3.5 The system shall provide appropriate error messages if any of the following fields are not completed when editing child information:
- Child Id
 - Sponsor Id
 - Date of Sponsorship
 - Child Name

- Gender
- Address (at least first 2 lines should be provided)
- Date of birth
- Health

3.17 Remove Sponsor Information

3.17.1 Description and Priority

This feature removes all information pertaining to the sponsor from the system. Once the information is removed it is non-recoverable. Priority is high.

3.17.2 Stimulus/Response Sequences

User: User clicks the delete button on the sponsor information page of the sponsor they want to delete.

System: System prompts user to confirm deletion and notifies user that all related information of the sponsor will be deleted.

User: User chooses to confirm deletion by clicking the delete button or cancel the request by clicking the cancel button.

System: If user cancels deletion system does not delete any information and re-directs user to the page containing sponsor information. If user chooses to delete the system deletes all information of the sponsor, including the sponsor's family member information, letters and payments.

3.17.3 Functional Requirements

3.17.3.1 System shall ask user to confirm deletion before deleting all sponsor information

3.17.3.2 System shall re-direct user to sponsor information view page if user chooses to cancel deletion.

3.17.3.3 System shall delete all information related to the sponsor the user wish to delete.

3.18 Create New Sponsor Family Member

3.18.1 Description and Priority

This feature allows user to enter and store the information of each family member of a sponsor. Priority is high.

3.18.2 Stimulus/Response Sequences

User: User selects the option to add family member from the sponsor drop down in the menu bar.

System: System provides user with a form to fill out sponsor family member information indicating the required fields.

- User: User clicks on submit button to submit the completed information or click the clear button to clear the form in order to re-enter the information.
- System: If user chose to clear the form a blank form is provided for the user to refill. If user submits the application the system checks if all required fields are completed appropriately. If not error message is provided else the system stores the child information and displays successful completion message to the user.

3.18.3 Functional Requirements

- 3.18.3.1 The system shall ensure that all required information is provided by the user
- 3.18.3.2 The system shall store the child family member information if all information is provided and verified.
- 3.18.3.3 The system shall provide appropriate error messages if any of the following fields are not completed:
- Sponsor Id
 - Relationship
 - Family Member's Name
 - Profession
 - Marital Status
 - Gender

3.19 View/Edit Sponsor Family Member

3.19.1 Description and Priority

This feature allows administrator, staff to view and/or edit the sponsor's family member information. It also allows sponsors to view information on the family members of their sponsor. Priority is high.

3.19.2 Stimulus/Response Sequences

- User: User selects sponsor profile option from the sponsor drop down in the menu bar.
- System: System prompts for the sponsor id.
- User: User submits the sponsor id of the child they are interested in viewing.
- System: If sponsor id was incorrect or not provided system provides error message else it displays the sponsor information along with the option to edit the information.
- User: If user chooses to edit the family member information user clicks on the edit button for the family member they wish to edit.
- System: Provides user with the form with current information for update.
- User: User fills out appropriate updated information and clicks submit.
- System: System ensures that all required information is provided. If not system will prompt the user with error message else store the updated information and displays successful completion message to the user.

3.19.3 Functional Requirements

- 3.19.3.1 The system shall provide sponsor's family member information when accurate sponsor id is provided.
- 3.19.3.2 When shall provide appropriate error messages on the following conditions when getting the sponsor id from the user:
 - Sponsor Id is not provided
 - Sponsor id is inaccurate
- 3.19.3.3 When editing sponsor's family member information system shall ensure that all required information is provided by the user
- 3.19.3.4 When editing sponsor's family member information system shall store the sponsor family information if all information is provided and verified.
- 3.19.3.5 The system shall provide appropriate error messages if any of the following fields are not completed when editing child information:
 - Sponsor Id
 - Relationship
 - Family Member's Name
 - Profession
 - Marital Status
 - Gender

3.20 Delete Sponsor Family Member

3.20.1 Description and Priority

This feature removes the sponsor's family member information from the system. Once the information is removed it is non-recoverable. Priority is high.

3.20.2 Stimulus/Response Sequences

- | | |
|---------|---|
| User: | User clicks the delete button on the sponsor information page for the sponsor family member they want to delete. |
| System: | System prompts user to confirm deletion. |
| User: | User chooses to confirm deletion by clicking the delete button or cancel the request by clicking the cancel button. |
| System: | If user cancels deletion system does not delete any information and re-directs user to the page containing sponsor information. If user chooses to delete the system deletes the information of the chosen family member. |

3.20.3 Functional Requirements

- 3.20.3.1 System shall ask user to confirm deletion before deleting the family member information.
- 3.20.3.2 System shall re-direct user to sponsor information view page if user chooses to cancel deletion.
- 3.20.3.3 System shall delete the sponsor's family member information of the family member the user wish to delete.

3.21 Create New Sponsor Letter

3.21.1 Description and Priority

This feature allows user create and store record of the letter written by the sponsor to the child. Priority is high.

3.21.2 Stimulus/Response Sequences

- User: User selects the correspondence option from the sponsor drop down in the menu bar.
- System: System provides user with a form to fill out sponsor letter details indicating the required fields.
- User: User clicks on submit button to submit the completed information.
- System: If user submits the application the system checks if all required fields are completed appropriately. If not error message is provided else the system stores the sponsor letter details and displays successful completion message to the user.

3.21.3 Functional Requirements

- 3.21.3.1 The system shall ensure that all required information is provided by the user
- 3.21.3.2 The system shall store the sponsor letter details if all information is provided and verified.
- 3.21.3.3 The system shall provide appropriate error messages if any of the following fields are not completed:
- Sponsor Id
 - Letter Type
 - Date Letter was received

3.22 View/Edit Sponsor Letter

3.22.1 Description and Priority

This feature allows administrator, staff to view and/or edit the sponsor's letter details. Priority is high.

3.22.2 Stimulus/Response Sequences

- User: User clicks on view sponsor letter link while viewing sponsor information or clicks on the date of the letter while viewing a report to view the letter details.
- System: System displays the letter details along with option to edit the letter.
- User: User chooses to edit the letter by clicking the edit button.
- System: System provides the sponsor letter details form pre-populated with previous information.
- User: User may choose to edit and submit the update or cancel update by clicking on submit or cancel button
- System: If user chooses to cancel update, system returns to the viewing letter details page. If user chooses to submit the update, system verifies if all required information is provided and if it is then updates the information else it displays appropriate error message.

3.22.3 Functional Requirements

- 3.22.3.1 The system shall display appropriate letter details when link to the letter is clicked.
- 3.22.3.2 System shall pre-populate the sponsor letter details form with current information.
- 3.22.3.3 System shall not update the information if cancel button is clicked.
- 3.22.3.4 System shall update the letter details if submit button is clicked and all required information is provided.
- 3.22.3.5 The system shall provide appropriate error messages if any of the following fields are not completed when editing sponsor letter details:
 - Sponsor Id
 - Letter Type
 - Date Letter was received

3.23 Delete Sponsor Letter

3.23.1 Description and Priority

This feature removes the appropriate letter written by the sponsor from the system. Once the information is removed it is non-recoverable. Priority is high.

3.23.2 Stimulus/Response Sequences

- User: User clicks the delete button on the sponsor letter details page for the letter they want to delete.
- System: System prompts user to confirm deletion.
- User: User chooses to confirm deletion by clicking the delete button or cancel the request by clicking the cancel button.
- System: If user cancels deletion system does not delete any information and re-directs user to the page displaying the letter details. If user chooses to delete the system deletes the particular letter.

3.23.3 Functional Requirements

- 3.23.3.1 System shall ask user to confirm deletion before deleting the letter details
- 3.23.3.2 System shall re-direct user to letter details page if user chooses to cancel deletion.
- 3.23.3.3 System shall delete all letter details pertaining to the letter the user wish to delete.

3.24 Create New Sponsor Donation

3.24.1 Description and Priority

This feature allows user create and store record of the payment from the sponsor to the BWS organization. Priority is high.

3.24.2 Stimulus/Response Sequences

- User: User selects the new donation option from the sponsor drop down in the menu bar.
- System: System provides user with a form to fill out sponsor donation details indicating the required fields.
- User: User clicks on submit button to submit the completed information or click the clear button to clear the form in order to re-enter the information.
- System: If user chose to clear the form a blank form is provided for the user to refill. If user submits the form the system checks if all required fields are completed appropriately. If not error message is provided else the system stores the sponsor donation details and displays successful completion message to the user.

3.24.3 Functional Requirements

- 3.24.3.1 The system shall ensure that all required information is provided by the user
- 3.24.3.2 The system shall store the sponsor donation details if all required information is provided and verified.
- 3.24.3.3 The system shall provide appropriate error messages if any of the following fields are not completed:
- Sponsor Id
 - Payment Date
 - Payment Year
 - Amount
 - Currency
 - Indian Amount

3.25 View/Edit Sponsor Donation

3.25.1 Description and Priority

This feature allows administrator, staff to view and or edit the information on donation made by sponsor to the BWS. Priority is high.

3.25.2 Stimulus/Response Sequences

- User: User clicks on view sponsor donations link while viewing sponsor information or clicks on the date of the letter while viewing a report to view the payment details.
- System: System displays the donation details along with option to edit.
- User: User chooses to edit the donation information by clicking the edit button.
- System: System provides the sponsor donation details form pre-populated with previous information.
- User: User may choose to edit and submit the update or cancel update by clicking on submit or cancel button
- System: If user chooses to cancel update, system returns to the viewing payment details page. If user chooses to submit the update, system verifies if all required information is provided and if it is then updates the information else it displays appropriate error message.

3.25.3 Functional Requirements

- 3.25.3.1 The system shall display appropriate donation details when link to the donation is clicked.
- 3.25.3.2 System shall pre-populate the sponsor donation details form with current information.
- 3.25.3.3 System shall not update the information if cancel button is clicked.
- 3.25.3.4 System shall update the donation details if submit button is clicked and all required information is provided.
- 3.25.3.5 The system shall provide appropriate error messages if any of the following fields are not completed:
 - Sponsor Id
 - Payment Date
 - Payment Year
 - Amount
 - Currency
 - Indian Amount

3.26 Delete Sponsor Donation

3.26.1 Description and Priority

This feature removes the details on appropriate payment made to the sponsor by BWS. Once the information is removed it is non-recoverable. Priority is high.

3.26.2 Stimulus/Response Sequences

- User: User clicks the delete button on the sponsor donation details page for the payment they wish to delete.
- System: System prompts user to confirm deletion.
- User: User chooses to confirm deletion by clicking the delete button or cancel the request by clicking the cancel button.
- System: If user cancels deletion system does not delete any information and re-directs user to the page displaying the payment details. If user chooses to delete the system deletes the particular payment information.

3.26.3 Functional Requirements

- 3.26.3.1 System shall ask user to confirm deletion before deleting the donation details
- 3.26.3.2 System shall re-direct user to donation details page if user chooses to cancel deletion.
- 3.26.3.3 System shall delete all donation details pertaining to the donation the user wish to delete.

3.27 Generate Reports

3.27.1 Description and Priority

This feature allows system administrator to view various reports to aid the management of BWS activities. Priority is high.

3.27.2 Stimulus/Response Sequences

- User: User selects a report from the reports drop down from the menu bar.
- System: System either displays the report or if the report takes input parameters system prompts the user to fill in required fields.
- User: User fills in the input parameters to view the report and click on submit button.
- System: System ensures that all required information is provided and generates the appropriate report based on the input values.

3.27.3 Functional Requirements

- 3.27.3.1 System shall display the appropriate report when user chooses a report from the menu selection.
- 3.27.3.2 System shall verify if all required parameters are provided if any exists.

3.28 Search for Child and Sponsor Information

3.28.1 Description and Priority

This feature allows system administrator to search for a child or sponsor. Priority is high.

3.28.2 Stimulus/Response Sequences

- User: User clicks on search from the menu bar.
- System: System provides fields to enter the search keyword and drop down search field..
- User: User enters the keyword and chooses which field to search the keyword under.
- System: System ensures that a keyword is provided and displays search results..

3.28.3 Functional Requirements

- 3.28.3.1 System shall display the appropriate child or sponsor search results when user chooses searches by keyword.
- 3.28.3.2 System shall verify if a keyword is provided before searching and display error message if no keyword is provided.

3.29 View Help Information

3.29.1 Description and Priority

This feature provides help to the users on all the functions and capabilities of BVA. Priority is high.

3.29.2 Stimulus/Response Sequences

- User: User clicks on help from the menu bar.
System: System provides a categorized list of help topics.
User: User clicks on the appropriate topic they need more information on.
System: System displays the help on the selected topic.

3.29.3 Functional Requirements

- 3.29.3.1 System shall categorize the help topics and display it to user when requested.
3.29.3.2 System shall display appropriate help section when user selects a topic.

4. External Interface Requirements

4.1 User Interfaces

- 4.1.1 The system shall provide help link on each page providing help for functions that can be performed from that page.
4.1.2 The system shall provide menu bar for easy traversal from page to page.
4.1.3 Depending on the type of user system shall direct the user to appropriate user interface.
4.1.4 System shall use consistent layout between user interfaces.

4.2 Hardware Interfaces

No hardware interfaces have been identified.

4.3 Software Interfaces

- 4.3.1 The system shall send queries and retrieve data from a MySQL database using a JDBC connector.
4.3.2 The system shall retrieve requests from the clients and process them using the Apache web server.

4.4 Communications Interfaces

None

Appendix A: Glossary

BWS	Bandavya Welfare Society
BVA	Bandavya Virtual Assistant
JDBC	Java Database Connectivity
JSP	Java Server Pages
HTML	Hypertext Markup Language

SRS	Software Requirements Specifications
VS	Vision and Scope Document
SPMP	Software Project Management Plan

Appendix IV

BVA Data Model

