MET CS 632 - IT PROJECT MANAGEMENT

Paperless Statements

Nicholas Scala
Final Project

Objective

This project lays the infrastructure and software needed to allow customers to receive their monthly statements electronically. As a result of this project, customers will be able to use the current online portal to opt-in and opt-out of this new feature. Should they choose to opt-in, customers will receive their monthly bank statement via email immediately after it is ready for their consumption.

The purpose of implementing paperless statements is to provide our customers with a quicker and easier-to-access monthly bank statement, while simultaneously improving the company's environmental impact and decreasing costs.

TABLE OF CONTENTS

1. Project Charter

This document formally authorizes the project. This charter defines the reason for the project and assigns a project manager's authority level for the project.

Project Title:	**PAPERLESS STATEMENTS**
Organization	Ridgewood Savings Bank
Start Date	September 1, 2015
End Date	January 1, 2016
Project Champion	Rachel Alt-Simmons, CIO
Purpose	The purpose of implementing paperless statements is to provide our customers with a quicker and easier-to-access monthly bank statement, while simultaneously improving the company's environmental impact and decreasing costs.
Description	This project lays the infrastructure and software needed to allow customers to receive their monthly statements electronically. As a result of this project, customers will be able to use the current online portal to opt-in and opt-out of this new feature. Should they choose to opt-in, customers will receive their monthly bank statement via email immediately after it is ready for their consumption.
Goals	• Decrease costs associated with mailing statements by 50% within 1 year • Achieve 25% customer participation in paperless statements by Q3 2016
Success Criteria	Success will be measured two-fold. We will bring in a third-party consulting firm to provide us with quantitative figures on the improvements of our environmental impact. We will also conduct surveys with our customers to measure brand perception and customer response to this new initiative.
Project Budget	$50,000
Milestones	• Establish necessary hardware infrastructure (10/15/2015) • Enhance current online portal to support enrollment of paperless statements (11/15/2015) • Communicate to customers the new initiative (01/01/2016)
Signatures	*Dr. Vijay Kanabar, 09/03/2015* (CEO) *Rachel Alt-Simmons, 09/03/2015* (CIO and Project Champion) *Nicholas Scala, 09/03/2015* (Project Manager) *Karana Samat-Hinoch, 09/03/2015* (IT Director)

2. Scope Statement

The Scope Statement is the document that describes all aspects of the project, both the managerial process and the desired content to be delivered.

Project Title:	**Paperless Statements**	**Date:**	September 1, 2015

Prepared by:

Nicholas Scala, Project Manager, (818) 555-8236, n.scala@ridgewoodsavings.com

Project Description:

This project lays the infrastructure and software needed to allow customers to receive their monthly statements electronically. As a result of this project, customers will be able to use the current online portal to opt-in and opt-out of this new feature. Should they choose to opt-in, customers will receive a link to their monthly bank statement via email immediately after it is ready for their consumption and be able to view historical bank statements.

Project Justification:

Rachel Alt-Simmons, CIO of Ridgewood Savings Bank has prioritized this project for 2015-2016 as part of the bank's new environmental friendly initiatives. By allowing our customers to view current and historical statements electronically, the bank is pathing the way to a greener tomorrow, both environmentally and financially. This initiative significantly reduces the resources needed to mail statements to our customers including, but not limited to, paper, ink, and transportation necessities proving its positive environmental impact. This initiative will also reduce the bank's expenses incurred through printing and mailing costs proving its positive financial impact. The estimated cost for this project is $50,000, but will save the company a projected $2,500 per month in printing expenses, thus achieving a payback period of less than two years.

Product Characteristics and Requirements:

- Opt-In/Opt-Out Options: Customers should be able to opt-in and opt-out of this service at will via the account settings in the current online portal.
- Email Notifications: Emails containing standard text with a one-click link to access the most recent statement shall be sent to customers enrolled in the paperless statements service immediately after the statement period's end date.
- Links: Hyperlinks sent to the customer for accessing their monthly statements must be masked/encrypted to not display any sensitive information.
- Statement Format: Statements shall be available in a PDF and HTML format for viewing within a browser and downloading a local copy.
- Website Updates: The current online portal must be enhanced with a new section for accessing historical statements.
- Historical Retrieval: Customers must be able to retrieve monthly statements dating back at a maximum of seven years.
- Database Modifications: Our database must be modified to track which customers have opted-in and opted-out of paperless statements. Queries tied to the database must also be added to support access to historical statements.

- Hardware: The technical infrastructure must be enhancements to support the anticipated increase in online traffic and email notifications.
- Security: Sensitive customer information must be protected from all possible malicious threats, both internal and external.
- Month End Process Update: Going forward, the system must only send PDF statements for customers opted out of paperless statements to our printing vendor.
- Reporting Capability: We will create the necessary reporting software to capture customer participation rates in the paperless service.
- The functionality must be accessible using a standard Internet browser on Windows, Mac, and mobile operating systems.
- The functionality must be available 24 hours a day, 7 days a week, with one hour per year downtime for system maintenance, as appropriate.

Summary of Project Deliverables:

Project management-related deliverables:

business case, charter, team contract, scope statement, WBS, schedule, cost baseline, status reports, final project presentation, final project report, lessons-learned report, and any other documents required to manage the project.

Product-related deliverables:

- Hardware Upgrades: To support an increase in traffic and email notifications our hardware will need to be upgraded
- Database Updates: To capture whether or not our customers have enrolled in this new service, and to provide access to historical statements, our database will be updated.
- Site content: The site will be updated to allow the customer to opt-in and opt-out of the paperless service and access historical statements.
- Content: The emails will contain general text that needs to be finalized before email notifications are sent.
- Middleware Solution: A solution will be created between the online portal and the statements storage location so that customers can pull their statements in a secure and effective method.
- Test plan: The test plan will document how the new service will be tested, who will do the testing, and how bugs will be reported.
- Promotion: A plan for promoting the new paperless service will document the timing and methods of communicating to our customers.
- Project benefit measurement plan: A project benefit plan will measure the financial value of the site.

Project Exclusions:

- The system will not attach statements in the email notifications to customers, but rather provide a link to the statement for security reasons
- The project will not include the ability for the customers to pay for statements online
- The project will not make any changes to the content or design of current statements
- The project will not make any design changes to the current online portal other than the

necessary additions to support the new functionality
Project Constraints: • The system must continue compliance with Federal Law to keep the past seven years of statements for all customers • The system must continue compliance with all security considerations in accordance with Security and Exchange Commission laws • The bank will utilize only internal resources for the project
Project Assumptions: • The bank's current system already supports the monthly generation of PDF statements. • The bank's current online portal already interfaces with our database to store, retrieve, and display customer transaction and account information. • The bank currently has sufficient internal IT resources and these resources possess the necessary skills to successfully complete this project.
Project Success Criteria: This project will be deemed successful if the project does not exceed the approved budget of $50,000 and its six month projected duration. Success of this project will also be measured by customer participation in paperless statements with a 30% goal within one year from the release with a positive trend. This goal of 30% customer participation will lead to our projected savings of $2,500 per month in printing costs. The project will also provide the necessary reporting capabilities to measure customer participation and a third party vendor will be brought in to measure the change in environmental impact before and after this service is released. Finally, we will leverage our current customer survey platform to measure customer satisfaction changes as a result of this new service.

3. Stakeholder Documentation

The stakeholder register is used to identify those people and organizations impacted by the project and document the relevant information about each stakeholder.

3.1 Stakeholder Identification

The following table is a summary of the main stakeholders, their position, and their interest in the project.

Stakeholder Name	Position / Title	Interest
Dr. Vijay Kanabar	CEO	To comply with the IT Green Initiatives set by the board of directors and keep customers of the bank satisfied
Rachel S Alt-Simmons	CIO / Project Sponsor	To report progress to the board of directors and CEO and fund this initiative
Karuna Samat-Hinoch	IT Director	To report to the CIO the advances and risks of the project
Nicholas Scala	Project Manager	To manage risks and see through the successful completion of the project
Joe McCarthy	Operation Manager	To ensure hardware is fully functional and internal team is productive
Joe Davis	Software Development Manager	To oversee code is stable and produced cleanly without breaking other functionality
Nichole Phillips	Marketing Manager	To make sure any changes made to the website remain consistent with the bank's brand and marketing
Richard Duffet	Legal and Compliance Manager	To make sure the bank continues to comply with regulations
Customers	External	To consume and utilize changes brought about by this enhancement
International Regulatory Bodies	External	To conduct audits to make sure banks are complying with international regulations

3.2 Stakeholder Register

The following table demonstrates how to meet each stakeholder's expectations for the project.

Stakeholder Name	Position / Title	Goal	Expectations
Dr. Vijay Kanabar	CEO	Have at least 30% of the costumers in paperless by the end of the year	Save at least $2,500 a month in the printing and mailing of paper statements
Rachel S Alt-Simmons	CIO / Sponsor	Execute the project on time and within budget	Completion of the project to further the IT Green Initiatives
Karuna Samat-Hinoch	IT Director	Finish the project on time and without issues	To help project the manager resolve potential issues through the execution of the project plan
Nicholas Scala	Project Manager	Deliver the product on time and within budget	Completion of the project via the standards and goals set forth in the Scope Document
Joe McCarthy	Operation Manager	Finish the project and release resources for internal projects	Provide estimates for the effort and hardware needed for the project
Joe Davis	Software Development Manager	Create the software on time and defect free	Provide estimates for the effort and hardware needed for the project
Nichole Phillips	Marketing Manager	Check costumers are receiving quick and quality statements in the online portal	To review and approve the online portal content
Richard Duffet	Legal and Compliance Manager	Review that the bank is in compliance by providing the monthly statements with the paperless option	To keep track of the users receiving paperless statements for legal compliance
Customers	External	Utilize the features brought out by this project	The service will be user friendly and keep information secure
International Regulatory Bodies	External	Ensure the bank continues to comply with international regulations	The bank will continue to comply with international regulations

3.3 Stakeholder Ranking

The Stakeholder Analysis table below was used to determine the ranking of each stakeholder's interest and influence.

Stakeholder Name	Position / Title	Interest*	Influence*	Total*
Dr. Vijay Kanabar	CEO	9	10	**19**
Rachel S Alt-Simmons	CIO / Sponsor	8	10	**18**
Karuna Samat-Hinoch	IT Director	8	10	**18**
Nicholas Scala	Project Manager	7	7	**14**
Joe McCarthy	Operation Manager	6	5	**11**
Joe Davis	Software Development Manager	6	5	**11**
Nichole Phillips	Marketing Manager	6	5	**11**
Richard Duffet	Legal and Compliance Manager	6	5	**11**
Customers	External	10	1	**11**
International Regulatory Bodies	External	2	5	**7**

* Guide

1	2	3	4	5	6	7	8	9	10
Zero	**Extremely Low**	**Low**	**Medium Low**	**Medium**	**Medium High**	**High**	**Very High**	**Extremely High**	**Vital**

4. Communication Management Plan

This section describes various one time and ongoing meetings that will be scheduled as part of this project.

Message	**Introductory Meeting**
Description	This meeting will introduce the project to all stakeholders. Every stakeholder will be getting to know the goals and expectation of paperless statements.
Attendees (Required)	Sponsors, Project Manager, Banking Compliance team, Marketing, Quality Management team, Product Managers, Product Engineers, Software Quality team, IT Team
Attendees (Optional)	n/a
Method	In person meeting/WebEx
Frequency	One time
Host	Project Manager

Message	**Kickoff Meeting**
Description	This meeting will officially kickoff paperless statements. Teams working on this project will be formed from product management, engineering and software quality teams. Scrum master will be selected for the project.
Attendees (Required)	Project Manager, Product Managers, Product Engineering, Software Quality teams, IT Team
Attendees (Optional)	Sponsors
Method	In person meeting/WebEx
Frequency	One time
Host	Project Manager

Message	**User Stories Grooming Meeting**
Description	As part of Scrum methodology, Product Managers will explain requirements to the team working of development and testing of this project to reprioritize and estimate the backlog of user stories.
Attendees (Required)	Product Manager, Product Engineering team, Software Quality Team
Attendees (Optional)	Banking Compliance Team
Method	In person/WebEx
Frequency	Weekly
Host	Scrum Master

Message	**Daily Standup meeting**
Description	This meeting will allow each team member working on the project to update their daily tasks with other team members.
Attendees (Required)	Product Manager, Product Engineering team, Software Quality Team
Attendees (Optional)	n/a
Method	In person/WebEx
Frequency	Daily
Host	Scrum Master

Message	**Sprint Demo Meeting**
Description	At the end of each sprint, team will demo the product changes to all stakeholders with the progress made.
Attendees (Required)	Product Manager, Product Engineering team, Software Quality Team, Project Manager, Banking Compliance team, Marketing Team
Attendees (Optional)	Sponsors
Method	In person/WebEx
Frequency	Bi-weekly
Host	Scrum Master

Message	**Status Update Meeting**
Description	Project Manager will update sponsors with the latest progress of the product, specifically about project risks such as cost overruns and project delivery date.
Attendees (Required)	Sponsors, Project Management
Attendees (Optional)	n/a
Method	In person
Frequency	Monthly
Host	Project Manager

Message	**Hardware Readiness Status Meeting**
Description	IT Team will give updates about new hardware needed to test and support this project.
Attendees (Required)	Sponsors, Project Management, IT Team, Product Engineering, Software Quality
Attendees (Optional)	n/a
Method	In person
Frequency	Monthly
Host	Project Manager

Message	**Lessons Learned**
Description	This meeting will be held upon complete of the project to discuss and capture positive and negative aspects of the project to improve future initiatives at the bank.
Attendees (Required)	Sponsors, Project Management, Product Managers, IT Team, Product Engineering, Software Quality
Attendees (Optional)	CIO, IT Director
Method	In person/WebEx
Frequency	One time
Host	Project Manager

5. Requirements Documentation

This document provides documentation of requirements.

Requirements are grouped by the following:

- Project Requirements
- Functional Requirements
- Non-Functional Requirements
- Hardware Requirements

5.1 Project Requirements

Requirement	Stakeholder	Acceptance Criteria
Close the projects within 3 months.	CIO	Achieve at least 90% of Milestones within the allotted time
Complete project within allotted budget of $50,000 and save $2,500 per month in printing and mailing of paper statements by Q3 2016	CIO, CEO	Stay within ±10% of the project Budget
Increase Customer participation rate in paperless statements	CEO	Achieve 25% customer participation by Q3 2016

5.2 Functional Requirements

Requirement	Stakeholder	Acceptance Criteria
Allow bank customers to opt in/opt out feature to receive bank statement electronically	CIO, Bank Customers	As part of green initiative, customers will get option to receive monthly bank statement online only. Customer can also stop receiving online statement and switch to paper statement
Email Notification	Bank Customers, Compliance , Product Engineering	Customers to receive email notifications when monthly statements are ready to view online
Increased online storage for monthly statements	Compliance, Bank Customers	Customer can view online statements dating back seven years from current date
Print and mail only opt out customer's statements.	CIO, Bank Customers	Printing module to print only those monthly statements for customers who are opted out of paperless statements

5.3 Non-Functional Requirements

Requirement	Stakeholder	Acceptance Criteria
Statements need to remain secure	CEO, CIO, Bank Customers	Sensitive customer information must be protected from all possible malicious threats, both internal and external
Database upgraded to support new functionality	CIO, IT	Database must be modified to track which customers have opted-in and opted-out of paperless statements. Queries tied to the database must also be added to support access to historical statements
Cross-browser/Cross-operating system compatibility	CIO, IT, Bank Customers	The new functionality needs to work on all major browsers (Internet Explorer, Chrome, Edge, Safari, Opera, Firefox) and on all major operating systems (Windows, Linux, Mac OS X, Apple iOS, Android)
24/7/365 uptime	CIO, IT, Bank Customers	The functionality must be available 24 hours a day, 7 days a week, with one hour per year downtime for system maintenance, as appropriate.

5.4 Hardware Requirements

Requirement	Stakeholder	Acceptance Criteria
Upgrade email server and webserver performance to support increased usage.	IT, Product Engineering, Software Quality	Upgraded hardware to support 40% more traffic to email and online portal
Upgrade Content Manager server to support more historical data of monthly statements.	IT, Product Engineering, Software Quality	Customer is able to retrieve past seven years of data from online portal

6. Human Resource Management

The human resource plan describes how all aspects of resources should be addressed. It is composed of roles and responsibilities, project organizational chart, and staffing management plan.

6.1 Human Resources Plan

Project Title:	Paperless Statements	**Version:**	1.0	**Date:**	09/19/2015

Roles and Responsibilities

CEO:
The CEO is responsible for managing the bank. The CEO has granted the funding for the project to the CIO.

CIO:
The CIO's responsibility is to ensure that the project is meeting the needs. The CIO maintains a close relationship with the IT Director and CEO throughout the duration of the project.

IT Director:
The IT Director is in charge of ensuring paperless statements are fully functional and meets all customer needs.

Project Manager:
The project manager will oversee the project, complete all documentation, and ensure that all deliverables are on track to meet the quality metrics.

Product Manager:
The product manager represents the customer by providing and approving requirements and their priority.

Operation Manager:
The Operations Manager will provide and manage the resources needed from his team to set up all the hardware to support the new paperless initiative.

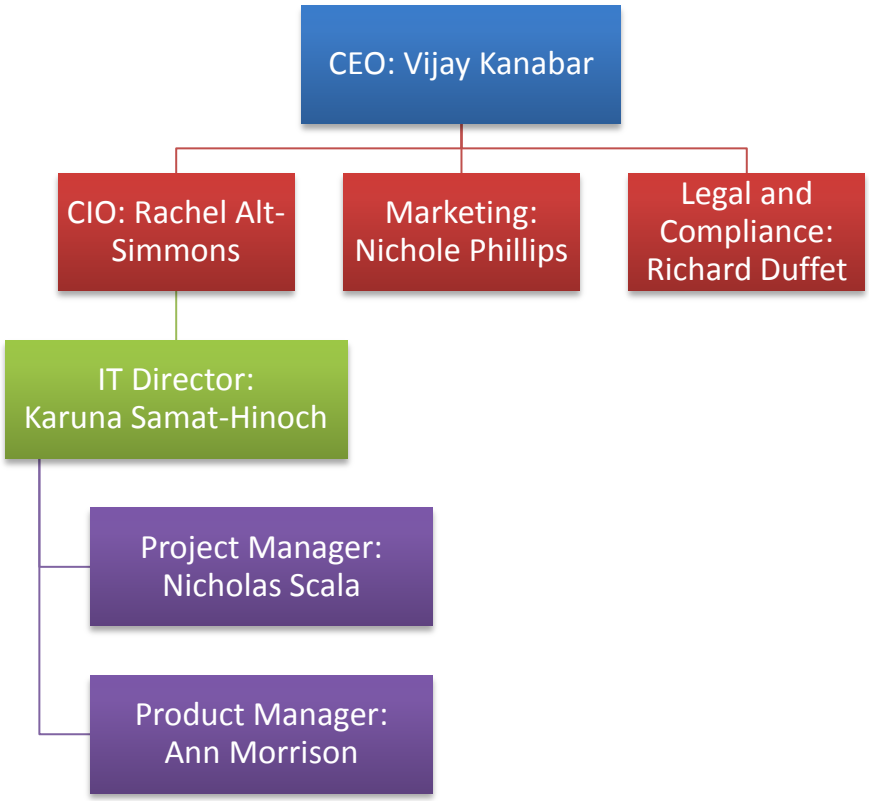
Software Development Manager:
The Software Development Manager will provide and manage the resources needed from his team to develop the software to support the new paperless initiative.

Quality Assurance Manager:
The Quality Assurance Manager will ensure the code is defect free and stable through managing a series of software testing methodologies.

Marketing Manager:
Will review and provide feedback for the content of the statements and text in the online portal.

Legal and Compliance Manager:
Will keep track of the reports for the daily paperless statements to keep legal compliance.

Executive Structure (abbreviated):



Staff Acquisition:
All the resources needed for this project and thus acquisition of staff is not necessary for this project.

Staff Release:
All the resources needed for this project are internal and thus release of staff is not necessary for this project.

Training:
The process to show the statements in the online portal will be automated. Documentation on how the system works will be provided by the software development team for future reference and troubleshooting.

Performance Reviews:
Performance reviews will be conducted annually on the individual level as per current HR policies.

Regulation and Policy Compliance:
All regulations and policies will be strictly adhered to. If there are any questions or concerns regarding policy or regulation, contact the Project Manager.

6.2 Core Team

Name	Role	Location: City/State	Email	Phone
Nicholas Scala	Project Manager	Boston, MA	n.scala@ridgewoodsavings.com	555-555-5555
Ann Morrison	Product Manager	Boston, MA	a.morrison@ridgewoodsavings.com	555-555-5555
John Davis	Senior Software Developer	Boston, MA	j.davis@ridgewoodsavings.com	555-555-5555
Joe Bucks	Senior Software Developer	Boston, MA	j.bucks@ridgewoodsavings.com	555-555-5555
Jeff Stills	Senior Network Administrator	Boston, MA	j.stills@ridgewoodsavings.com	555-555-5555
Stephen Doe	Senior Network Administrator	Boston, MA	s.doe@ridgewoodsavings.com	555-555-5555
Vishal Jain	Senior Quality Assurance Analyst	Boston, MA	v.metha@ridgewoodsavings.com	555-555-5555
Rachel Cohen	Senior Linux Administrator	Boston, MA	r.cohen@ridgewoodsavings.com	555-555-5555

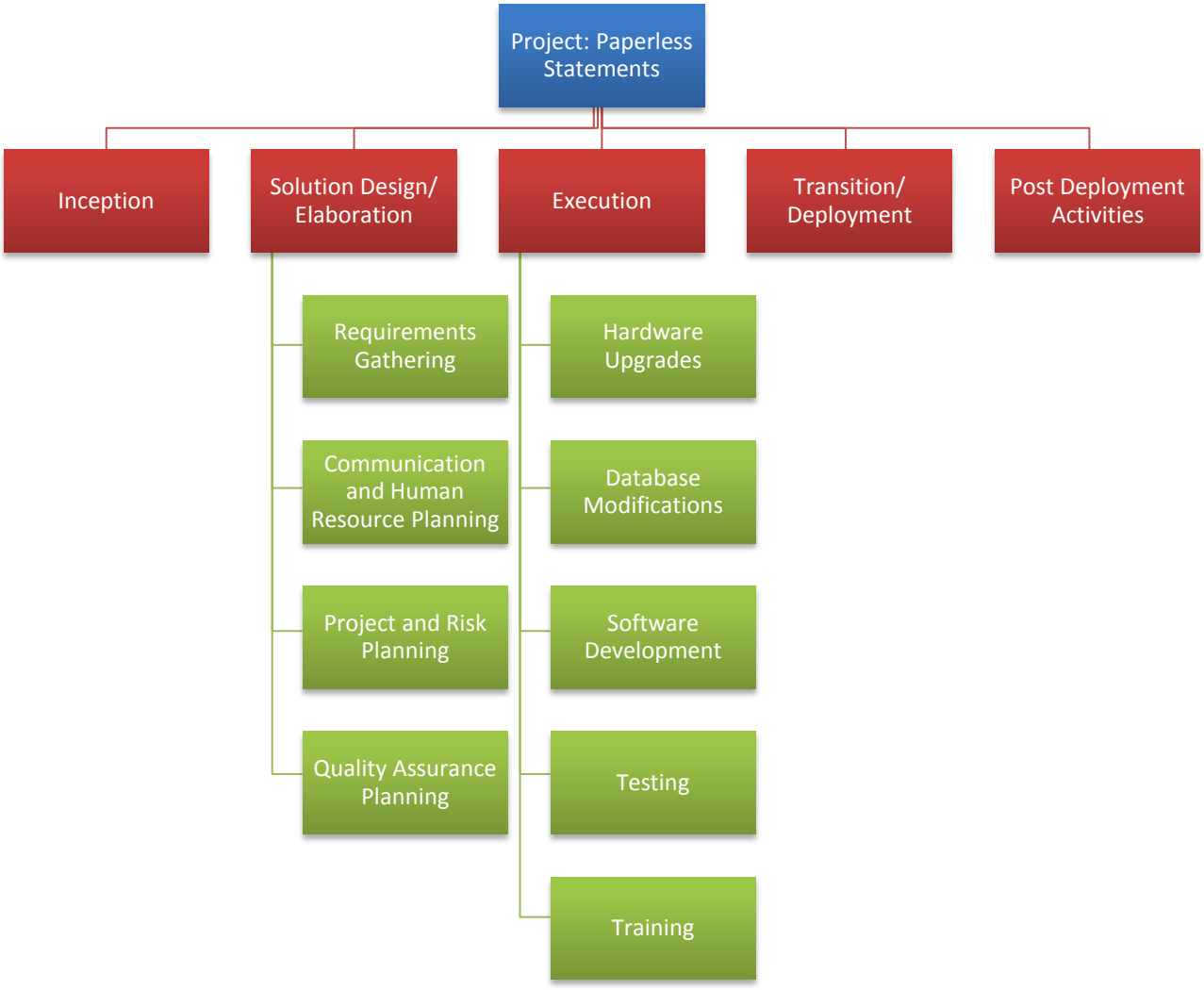
6.3 Stakeholders and Partners

Name	Area Represented	Location: City/State	Email	Phone
Vijay Kanabar	CEO	Boston, MA	v.kanabar@ridgewoodsavings.com	555-555-5555
Rachel Alt-Simmons	CIO	Boston, MA	r.alt-simmons@ridgewoodsavings.com	555-555-5555

7. Work Breakdown Structure Reports

7.1 Work Breakdown Structure Summary

Below is a high-level Work Breakdown Structure (WBS):



7.2 Activity List

Below is a list of activities as part of the Work Breakdown Structure. This list does not include milestones or recurring project team meetings.

WBS ID	Task Name
1.1	**Inception**
1.1.1	Develop Business Case
1.1.2	Create Project Charter
1.1.4	Identify Stakeholders
1.1.5	Produce Stakeholder Identification Documents
1.1.6	Develop Scope Statement
1.1.7	Review Scope Statement with Team
1.1.9	Hold Kick-Off meeting
1.3	**Solution Design / Elaboration**
1.3.1	**Requirements Gathering, Analysis and Specifications**
1.3.1.1	Identify and Document Inputs
1.3.1.2	Identify and Document Functional Requirements
1.3.1.3	Identify and document Non-Functional Requirements
1.3.1.4	Compile Requirements in Requirements Document
1.3.2	**Communication and Human Resource Planning**
1.3.2.1	Draft Communication Management Plan
1.3.2.3	Identify Roles and Responsibilities
1.3.2.4	Draft Human Resource Plan
1.3.3	**Project and Risk Planning**
1.3.3.1	Develop Project Plan
1.3.3.2	Identify Risks
1.3.3.3	Draft Risk Identification and Response Document
1.3.3.4	Draft Risk Contingency Plan
1.3.3.5	Review Project Plan and Key Risks with Team
1.3.4	**Quality Assurance Planning**
1.3.4.1	Define Project Quality
1.3.4.2	Develop Metrics for Measuring Project Quality
1.3.4.3	Identify Quality Control Actions
1.3.4.4	Draft Quality Management Plan
1.5	**Execution**
1.5.1	**Hardware Upgrades**
1.5.1.1	Acquire Necessary Hardware
1.5.1.2	Install Hardware
1.5.1.3	Test Hardware
1.5.2	**Database Modifications**
1.5.2.1	Update Database Models and Documentation
1.5.2.2	Complete SQL Updates to Database
1.5.2.3	Ensure Database Integrity Post Modifications via Testing
1.5.3	**Software Development**
1.5.3.1	Develop Middleware Solution
1.5.3.2	Unit Test Middleware Solution
1.5.3.3	Develop Modifications to Website

1.5.3.4	Unit Test Modifications to Website
1.5.3.5	Develop New Email Notifications
1.5.3.6	Unit Test Email Notifications
1.5.3.7	Develop Security Measures
1.5.3.8	Test Security Strength of System
1.5.4	**Testing**
1.5.4.1	Test Prep
1.5.4.1.1	Create Test Plan
1.5.4.1.2	Create Test Traceability
1.5.4.1.3	Create Test Cases
1.5.4.2	Test Execution
1.5.4.2.1	Conduct System Testing
1.5.4.2.2	Complete Integration Development
1.5.4.2.3	Complete Integration Testing
1.5.4.3	User Acceptance Testing
1.5.4.3.1	Prepare UAT Plan
1.5.4.3.2	Identify Users & Kick-off session
1.5.4.3.3	Create User Guide / Test Scenarios
1.5.4.3.4	Complete UAT Testing
1.5.4.3.5	Perform Testing and Report issues
1.5.4.3.6	Fix issues reported by UAT
1.5.4.3.7	Review System Readiness
1.5.4.3.8	Deploy changes to production
1.5.5	**Training**
1.5.5.1	Develop Quick Reference Guide
1.5.5.2	Prepare Release Notes
1.7	**Transition / Deployment**
1.7.1	Release Code / Changes to Production
1.8	**Post Deployment Activities**
1.8.1	Establish Post Deployment Support for Critical Issues
1.8.2	Conduct Lessons Learned

7.3 Milestone List

Below is a list of milestones as part of the Work Breakdown Structure. An “internal” milestone type denotes a milestone that bares importance to the internal IT Project Team, whereas an “external” milestone type denotes a milestone that bares importance to anyone outside of the IT Project Team, including but not limited to, bank executives and bank customers.

WBS ID	Milestone Name	Date	Type
1.1.3	Get Business Case and Project Charter Approved and Signed	T 9/3/15	Internal/External
1.1.8	Get Scope Statement Approved and Signed	F 9/11/15	Internal/External
1.2	Complete Inception	M 9/14/15	Internal
1.3.1.5	Review Requirements Document with Team	T 9/17/15	Internal/External
1.3.2.2	Review Communication Management Plan with Team	T 9/15/15	Internal/External
1.3.2.5	Review Human Resource Plan with Team	T 9/17/15	Internal
1.3.3.6	Baseline Project Plan	W 9/23/15	Internal
1.3.4.5	Review Quality Management Plan with Team	W 9/30/15	Internal
1.4	Complete Solution Design / Elaboration	W 9/30/15	Internal
1.5.1.4	Hardware Upgrades Complete	T 10/13/15	Internal
1.5.2.4	Database Modifications Complete	T 10/8/15	Internal
1.5.3.9	Software Development Complete	W 11/11/15	Internal
1.5.4.1.4	Review Test Plan and Test Cases with Team	W 11/18/15	Internal
1.5.4.2.4	Achieve QA Team Signoff	M 11/23/15	Internal
1.5.4.3.9	Achieve UAT Sign off	T 12/15/15	Internal
1.5.5.3	Training Complete	T 11/26/15	Internal/External
1.6	Complete Execution	T 12/15/15	Internal
1.7.2	Production Sign-Off (live)	W 12/16/15	Internal/External

7.4 Activity Resource Requirements

Below is a list of activity groups as part of the Work Breakdown Structure along with the amount of resources needed to successfully complete the underlying activates on time.

WBS ID	Task Name	Resource Type	Qty.
1.1.1	Develop Business Case	Project Management	3
1.1.2	Create Project Charter	Project Management	3
1.1.4	Identify Stakeholders	Project Management	3
1.1.5	Produce Stakeholder Identification Doc	Project Management/Business Analysis	3
1.1.6	Develop Scope Statement	Project Management/Business Analysis	3
1.1.7	Review Scope Statement with Team	Project Management	3
1.1.9	Hold Kick-Off meeting	Project Management	3
1.3.1	Requirements Gathering, Analysis and Specs	Project Management/Business Analysis	3
1.3.2	Communication and Human Resource Planning	Project Management	3
1.3.3	Project and Risk Planning	Project Management	3
1.3.3.1	Develop Project Plan	Project Management	3
1.3.3.3	Draft Risk Identification and Response Doc	Project Management	3
1.3.3.4	Draft Risk Contingency Plan	Project Management	3
1.3.4	Quality Assurance Planning	Quality Assurance	1
1.5.1	Hardware Upgrades	Hardware Administration	1
1.5.2	Database Modifications	Software Development	2
1.5.3	Software Development	Software Development	2
1.5.4	Testing	Quality Assurance	1
1.5.4.1	Test Prep	Quality Assurance	1
1.5.4.2	Test Execution	Quality Assurance	1
1.5.4.3	User Acceptance Testing	Quality Assurance/Product Management	2
1.5.5	Training	Project Management/Product Management	3
1.7.1	Release Code / Changes to Production	Software Development	2
1.8.1	Establish Post Deployment Support	Project Management/Software Development	3
1.8.2	Conduct Lessons Learned	Entire Project Team	10

7.5 Activity Duration Estimates

Below is a list of activities as part of the Work Breakdown Structure along with their planned durations, start dates, and end dates. For tasks ending October 5th or earlier, the duration period is actual and not estimated. For tasks ending October 6th or later, the duration period is estimated and not actual.

WBS ID	Task Name	Duration	Start Date	End Date
1.1	**Inception**	**10 days**	**T 9/1/15**	**M 9/14/15**
1.1.1	Develop Business Case	3 days	T 9/1/15	T 9/3/15
1.1.2	Create Project Charter	1 day	T 9/1/15	T 9/1/15
1.1.4	Identify Stakeholders	1 day	F 9/4/15	F 9/4/15
1.1.5	Produce Stakeholder Identification Documents	2 days	M 9/7/15	T 9/8/15
1.1.6	Develop Scope Statement	2 days	W 9/9/15	T 9/10/15
1.1.7	Review Scope Statement with Team	1 day	F 9/11/15	F 9/11/15
1.1.9	Hold Kick-Off meeting	1 day	M 9/14/15	M 9/14/15
1.3	**Solution Design / Elaboration**	**12 days**	**T 9/15/15**	**W 9/30/15**
1.3.1	**Requirements Gathering, Analysis and Specifications**	**3 days**	**T 9/15/15**	**T 9/17/15**
1.3.1.1	Identify and Document Inputs	1 day	T 9/15/15	T 9/15/15
1.3.1.2	Identify and Document Functional Requirements	1 day	T 9/15/15	T 9/15/15
1.3.1.3	Identify and document Non-Functional Requirements	1 day	T 9/15/15	T 9/15/15
1.3.1.4	Compile Requirements in Requirements Document	2 days	W 9/16/15	T 9/17/15
1.3.2	**Communication and Human Resource Planning**	**3 days**	**T 9/15/15**	**T 9/17/15**
1.3.2.1	Draft Communication Management Plan	1 day	T 9/15/15	T 9/15/15
1.3.2.3	Identify Roles and Responsibilities	1 day	W 9/16/15	W 9/16/15
1.3.2.4	Draft Human Resource Plan	1 day	T 9/17/15	T 9/17/15
1.3.3	**Project and Risk Planning**	**7 days**	**T 9/15/15**	**W 9/23/15**
1.3.3.1	Develop Project Plan	2 days	T 9/15/15	W 9/16/15
1.3.3.2	Identify Risks	2 days	T 9/17/15	F 9/18/15
1.3.3.3	Draft Risk Identification and Response Document	1 day	M 9/21/15	M 9/21/15
1.3.3.4	Draft Risk Contingency Plan	1 day	T 9/22/15	T 9/22/15
1.3.3.5	Review Project Plan and Key Risks with Team	1 day	W 9/23/15	W 9/23/15
1.3.4	**Quality Assurance Planning**	**5 days**	**T 9/24/15**	**W 9/30/15**
1.3.4.1	Define Project Quality	1 day	T 9/24/15	T 9/24/15
1.3.4.2	Develop Metrics for Measuring Project Quality	1 day	F 9/25/15	F 9/25/15
1.3.4.3	Identify Quality Control Actions	1 day	M 9/28/15	M 9/28/15
1.3.4.4	Draft Quality Management Plan	2 days	T 9/29/15	W 9/30/15
1.5	**Execution**	**54 days**	**T 10/1/15**	**T 12/15/15**
1.5.1	**Hardware Upgrades**	**9 days**	**T 10/1/15**	**T 10/13/15**
1.5.1.1	Acquire Necessary Hardware	4 days	T 10/1/15	T 10/6/15
1.5.1.2	Install Hardware	3 days	W 10/7/15	F 10/9/15
1.5.1.3	Test Hardware	2 days	M 10/12/15	T 10/13/15
1.5.2	**Database Modifications**	**6 days**	**T 10/1/15**	**T 10/8/15**
1.5.2.1	Update Database Models and Documentation	2 days	T 10/1/15	F 10/2/15
1.5.2.2	Complete SQL Updates to Database	2 days	M 10/5/15	T 10/6/15
1.5.2.3	Ensure Database Integrity Post Modifications via Testing	*2 days*	W 10/7/15	T 10/8/15
1.5.3	**Software Development**	***24 days***	**F 10/9/15**	**W 11/11/15**
1.5.3.1	Develop Middleware Solution	*4 days*	F 10/9/15	W 10/14/15
1.5.3.2	Unit Test Middleware Solution	*4 days*	T 10/15/15	T 10/20/15

1.5.3.3	Develop Modifications to Website	*3 days*	W 10/21/15	F 10/23/15
1.5.3.4	Unit Test Modifications to Website	*2 days*	M 10/26/15	T 10/27/15
1.5.3.5	Develop New Email Notifications	*2 days*	W 10/28/15	T 10/29/15
1.5.3.6	Unit Test Email Notifications	*2 days*	F 10/30/15	M 11/2/15
1.5.3.7	Develop Security Measures	*3 days*	T 11/3/15	T 11/5/15
1.5.3.8	Test Security Strength of System	*4 days*	F 11/6/15	W 11/11/15
1.5.4	**Testing**	***24 days***	**T 11/12/15**	**T 12/15/15**
1.5.4.1	Test Prep	*5 days*	T 11/12/15	W 11/18/15
1.5.4.1.1	Create Test Plan	*1 day*	T 11/12/15	T 11/12/15
1.5.4.1.2	Create Test Traceability	*1 day*	F 11/13/15	F 11/13/15
1.5.4.1.3	Create Test Cases	*3 days*	M 11/16/15	W 11/18/15
1.5.4.2	Test Execution	*8 days*	T 11/12/15	M 11/23/15
1.5.4.2.1	Conduct System Testing	*3 days*	T 11/12/15	M 11/16/15
1.5.4.2.2	Complete Integration Development	*2 days*	T 11/17/15	W 11/18/15
1.5.4.2.3	Complete Integration Testing	*3 days*	T 11/19/15	M 11/23/15
1.5.4.3	User Acceptance Testing	*16 days*	T 11/24/15	T 12/15/15
1.5.4.3.1	Prepare UAT Plan	*2 days*	T 11/24/15	W 11/25/15
1.5.4.3.2	Identify Users & Kick-off session	*1 day*	T 11/26/15	T 11/26/15
1.5.4.3.3	Create User Guide / Test Scenarios	*1 day*	F 11/27/15	F 11/27/15
1.5.4.3.4	Complete UAT Testing	*5 days*	M 11/30/15	F 12/4/15
1.5.4.3.5	Perform Testing and Report issues	*2 days*	M 12/7/15	T 12/8/15
1.5.4.3.6	Fix issues reported by UAT	*3 days*	W 12/9/15	F 12/11/15
1.5.4.3.7	Review System Readiness	*1 day*	M 12/14/15	M 12/14/15
1.5.4.3.8	Deploy changes to production	*1 day*	T 12/15/15	T 12/15/15
1.5.5	**Training**	***3 days***	**T 11/24/15**	**T 11/26/15**
1.5.5.1	Develop Quick Reference Guide	*2 days*	T 11/24/15	W 11/25/15
1.5.5.2	Prepare Release Notes	*1 day*	T 11/26/15	T 11/26/15
1.7	**Transition / Deployment**	***1 day***	**W 12/16/15**	**W 12/16/15**
1.7.1	Release Code / Changes to Production	*1 day*	W 12/16/15	W 12/16/15
1.8	**Post Deployment Activities**	***6 days***	**T 12/17/15**	**T 12/24/15**
1.8.1	Establish Post Deployment Support for Critical Issues	*5 days*	T 12/17/15	W 12/23/15
1.8.2	Conduct Lessons Learned	*1 day*	T 12/24/15	T 12/24/15

7.6 Detailed Work Breakdown Structure

ID	WBS	% Complete	Task Name	Work	Start	Finish	Predec	Resour Initials	Cost
1	**1**	**20%**	**Project: Paperless Statements**	**1,624 hrs**	**T 9/1/15**	**T 12/24/15**			**$46,520.00**
2	**1.1**	**100%**	**Inception**	**264 hrs**	**T 9/1/15**	**M 9/14/15**			**$7,920.00**
3	1.1.1	100%	Develop Business Case	72 hrs	T 9/1/15	T 9/3/15		J,N,S	$2,160.00
4	1.1.2	100%	Create Project Charter	24 hrs	T 9/1/15	T 9/1/15		J,N,S	$720.00
5	1.1.3	100%	Get Business Case and Project Charter Approved and Signed	0 hrs	T 9/3/15	T 9/3/15	4,3	J,N,S	$0.00
6	1.1.4	100%	Identify Stakeholders	24 hrs	F 9/4/15	F 9/4/15	5	J,N,S	$720.00
7	1.1.5	100%	Produce Stakeholder Identification Documents	48 hrs	M 9/7/15	T 9/8/15	6	J,N,S	$1,440.00
8	1.1.6	100%	Develop Scope Statement	48 hrs	W 9/9/15	T 9/10/15	7	J,N,S	$1,440.00
9	1.1.7	100%	Review Scope Statement with Team	24 hrs	F 9/11/15	F 9/11/15	8	J,N,S	$720.00
10	1.1.8	100%	Get Scope Statement Approved and Signed	0 hrs	F 9/11/15	F 9/11/15	9	J,N,S	$0.00
11	1.1.9	100%	Hold Kick-Off meeting	24 hrs	M 9/14/15	M 9/14/15	10	J,N,S	$720.00
12	1.2	100%	**Complete Inception**	0 hrs	M 9/14/15	M 9/14/15	11		$0.00
13	**1.3**	**53%**	**Solution Design / Elaboration**	**400 hrs**	**T 9/15/15**	**W 9/30/15**			**$11,600.00**
14	**1.3.1**	**100%**	**Requirements Gathering, Analysis and Specifications**	**120 hrs**	**T 9/15/15**	**T 9/17/15**			**$3,600.00**
15	1.3.1.1	100%	Identify and Document Inputs	24 hrs	T 9/15/15	T 9/15/15	12	J,N,S	$720.00
16	1.3.1.2	100%	Identify and Document Functional Requirements	24 hrs	T 9/15/15	T 9/15/15	12	J,N,S	$720.00
17	1.3.1.3	100%	Identify and document Non-Functional Requirements	24 hrs	T 9/15/15	T 9/15/15	12	J,N,S	$720.00
18	1.3.1.4	100%	Compile Requirements in Requirements Document	48 hrs	W 9/16/15	T 9/17/15	15,16,1	J,N,S	$1,440.00
19	1.3.1.5	100%	Review Requirements Document with Team	0 hrs	T 9/17/15	T 9/17/15	18	J,N,S	$0.00
20	**1.3.2**	**100%**	**Communication and Human Resource Planning**	**72 hrs**	**T 9/15/15**	**T 9/17/15**			**$2,160.00**
21	1.3.2.1	100%	Draft Communication Management Plan	24 hrs	T 9/15/15	T 9/15/15	12	J,N,S	$720.00
22	1.3.2.2	100%	Review Communication Management Plan with Team	0 hrs	T 9/15/15	T 9/15/15	21	J,N,S	$0.00
23	1.3.2.3	100%	Identify Roles and Responsibilities	24 hrs	W 9/16/15	W 9/16/15	22	J,N,S	$720.00
24	1.3.2.4	100%	Draft Human Resource Plan	24 hrs	T 9/17/15	T 9/17/15	23	J,N,S	$720.00
25	1.3.2.5	100%	Review Human Resource Plan with Team	0 hrs	T 9/17/15	T 9/17/15	24	J,N,S	$0.00
26	**1.3.3**	**36%**	**Project and Risk Planning**	**168 hrs**	**T 9/15/15**	**W 9/23/15**			**$5,040.00**
27	1.3.3.1	100%	Develop Project Plan	48 hrs	T 9/15/15	W 9/16/15	12	J,N,S	$1,440.00
28	1.3.3.2	25%	Identify Risks	48 hrs	T 9/17/15	F 9/18/15	27	J,N,S	$1,440.00
29	1.3.3.3	0%	Draft Risk Identification and Response Document	24 hrs	M 9/21/15	M 9/21/15	28	J,N,S	$720.00
30	1.3.3.4	0%	Draft Risk Contingency Plan	24 hrs	T 9/22/15	T 9/22/15	29	J,N,S	$720.00
31	1.3.3.5	0%	Review Project Plan and Key Risks with Team	24 hrs	W 9/23/15	W 9/23/15	30	J,N,S	$720.00
32	1.3.3.6	0%	Baseline Project Plan	0 hrs	W 9/23/15	W 9/23/15	31	J,N,S	$0.00
33	**1.3.4**	**0%**	**Quality Assurance Planning**	**40 hrs**	**T 9/24/15**	**W 9/30/15**			**$800.00**
34	1.3.4.1	0%	Define Project Quality	8 hrs	T 9/24/15	T 9/24/15	32	V	$160.00
35	1.3.4.2	0%	Develop Metrics for Measuring Project Quality	8 hrs	F 9/25/15	F 9/25/15	34	V	$160.00
36	1.3.4.3	0%	Identify Quality Control Actions	8 hrs	M 9/28/15	M 9/28/15	35	V	$160.00
37	1.3.4.4	0%	Draft Quality Management Plan	16 hrs	T 9/29/15	W 9/30/15	36	V	$320.00
38	1.3.4.5	0%	Review Quality Management Plan with Team	0 hrs	W 9/30/15	W 9/30/15	37	V	$0.00
39	1.4	0%	**Complete Solution Design / Elaboration**	0 hrs	W 9/30/15	W 9/30/15	38	J,N,S	$0.00

ID	WBS	% Complete	Task Name	Work	Start	Finish	Predece	Resour Initials	Cost
40	**1.5**	**0%**	**Execution**	**744 hrs**	**T 10/1/15**	**T 12/15/15**			**$21,040.00**
41	**1.5.1**	**0%**	**Hardware Upgrades**	**72 hrs**	**T 10/1/15**	**T 10/13/15**			**$6,800.00**
42	1.5.1.1	0%	Acquire Necessary Hardware	32 hrs	T 10/1/15	T 10/6/15	39	R	$5,800.00
43	1.5.1.2	0%	Install Hardware	24 hrs	W 10/7/15	F 10/9/15	42	R	$600.00
44	1.5.1.3	0%	Test Hardware	16 hrs	M 10/12/15	T 10/13/15	43	R	$400.00
45	1.5.1.4	0%	Hardware Upgrades Complete	0 hrs	T 10/13/15	T 10/13/15	44	R	$0.00
46	**1.5.2**	**0%**	**Database Modifications**	**96 hrs**	**T 10/1/15**	**T 10/8/15**			**$1,920.00**
47	1.5.2.1	0%	Update Database Models and Documentation	32 hrs	T 10/1/15	F 10/2/15	38	J,J	$640.00
48	1.5.2.2	0%	Complete SQL Updates to Database	32 hrs	M 10/5/15	T 10/6/15	47	J,J	$640.00
49	1.5.2.3	0%	Ensure Database Integrity Post Modifications via Testing	32 hrs	W 10/7/15	T 10/8/15	48	J,J	$640.00
50	1.5.2.4	0%	Database Modifications Complete	0 hrs	T 10/8/15	T 10/8/15	49	J,J	$0.00
51	**1.5.3**	**0%**	**Software Development**	**288 hrs**	**F 10/9/15**	**W 11/11/15**			**$5,760.00**
52	1.5.3.1	0%	Develop Middleware Solution	64 hrs	F 10/9/15	W 10/14/15	50	J,J	$1,280.00
53	1.5.3.2	0%	Unit Test Middleware Solution	32 hrs	T 10/15/15	T 10/20/15	52	V	$640.00
54	1.5.3.3	0%	Develop Modifications to Website	48 hrs	W 10/21/15	F 10/23/15	53	J,J	$960.00
55	1.5.3.4	0%	Unit Test Modifications to Website	16 hrs	M 10/26/15	T 10/27/15	54	V	$320.00
56	1.5.3.5	0%	Develop New Email Notifications	32 hrs	W 10/28/15	T 10/29/15	55	J,J	$640.00
57	1.5.3.6	0%	Unit Test Email Notifications	16 hrs	F 10/30/15	M 11/2/15	56	V	$320.00
58	1.5.3.7	0%	Develop Security Measures	48 hrs	T 11/3/15	T 11/5/15	57	J,J	$960.00
59	1.5.3.8	0%	Test Security Strength of System	32 hrs	F 11/6/15	W 11/11/15	58	V	$640.00
60	1.5.3.9	0%	Software Development Complete	0 hrs	W 11/11/15	W 11/11/15	59		$0.00
61	**1.5.4**	**0%**	**Testing**	**264 hrs**	**T 11/12/15**	**T 12/15/15**			**$5,600.00**
62	**1.5.4.1**	**0%**	**Test Prep**	**40 hrs**	**T 11/12/15**	**W 11/18/15**			**$800.00**
63	1.5.4.1.1	0%	Create Test Plan	8 hrs	T 11/12/15	T 11/12/15	60	V	$160.00
64	1.5.4.1.2	0%	Create Test Traceability	8 hrs	F 11/13/15	F 11/13/15	63	V	$160.00
65	1.5.4.1.3	0%	Create Test Cases	24 hrs	M 11/16/15	W 11/18/15	64	V	$480.00
66	1.5.4.1.4	0%	Review Test Plan and Test Cases with Team	0 hrs	W 11/18/15	W 11/18/15	65	V	$0.00
67	**1.5.4.2**	**0%**	**Test Execution**	**64 hrs**	**T 11/12/15**	**M 11/23/15**			**$1,280.00**
68	1.5.4.2.1	0%	Conduct System Testing	24 hrs	T 11/12/15	M 11/16/15	59	V	$480.00
69	1.5.4.2.2	0%	Complete Integration Development	16 hrs	T 11/17/15	W 11/18/15	68	V	$320.00
70	1.5.4.2.3	0%	Complete Integration Testing	24 hrs	T 11/19/15	M 11/23/15	69	V	$480.00
71	1.5.4.2.4	0%	Achieve QA Team Signoff	0 hrs	M 11/23/15	M 11/23/15	70	V	$0.00
72	**1.5.4.3**	**0%**	**User Acceptance Testing**	**160 hrs**	**T 11/24/15**	**T 12/15/15**			**$3,520.00**
73	1.5.4.3.1	0%	Prepare UAT Plan	16 hrs	T 11/24/15	W 11/25/15	71	V	$320.00
74	1.5.4.3.2	0%	Identify Users & Kick-off session	8 hrs	T 11/26/15	T 11/26/15	73	A	$320.00
75	1.5.4.3.3	0%	Create User Guide / Test Scenarios	8 hrs	F 11/27/15	F 11/27/15	74	A	$320.00
76	1.5.4.3.4	0%	Complete UAT Testing	40 hrs	M 11/30/15	F 12/4/15	75	V	$800.00
77	1.5.4.3.5	0%	Perform Testing and Report issues	16 hrs	M 12/7/15	T 12/8/15	76	V	$320.00
78	1.5.4.3.6	0%	Fix issues reported by UAT	48 hrs	W 12/9/15	F 12/11/15	77	J,J	$960.00
79	1.5.4.3.7	0%	Review System Readiness	8 hrs	M 12/14/15	M 12/14/15	78	V	$160.00
80	1.5.4.3.8	0%	Deploy changes to production	16 hrs	T 12/15/15	T 12/15/15	79	J,J	$320.00
81	1.5.4.3.9	0%	Achieve UAT Sign off	0 hrs	T 12/15/15	T 12/15/15	80	J,N,S	$0.00
82	**1.5.5**	**0%**	**Training**	**24 hrs**	**T 11/24/15**	**T 11/26/15**			**$960.00**
83	1.5.5.1	0%	Develop Quick Reference Guide	16 hrs	T 11/24/15	W 11/25/15	71	A	$640.00
84	1.5.5.2	0%	Prepare Release Notes	8 hrs	T 11/26/15	T 11/26/15	83	A	$320.00
85	1.5.5.3	0%	Training Complete	0 hrs	T 11/26/15	T 11/26/15	84	J,N,S	$0.00
86	1.6	0%	**Complete Execution**	0 hrs	T 12/15/15	T 12/15/15	81	J,N,S	$0.00
87	**1.7**	**0%**	**Transition / Deployment**	**16 hrs**	**W 12/16/15**	**W 12/16/15**			**$320.00**
88	1.7.1	0%	Release Code / Changes to Production	16 hrs	W 12/16/15	W 12/16/15	86	J,J	$320.00
89	1.7.2	0%	**Production Sign-Off (live)**	0 hrs	W 12/16/15	W 12/16/15	88	J,N,S	$0.00
90	**1.8**	**0%**	**Post Deployment Activities**	**200 hrs**	**T 12/17/15**	**T 12/24/15**			**$5,640.00**
91	1.8.1	0%	Establish Post Deployment Support for Critical Issues	120 hrs	T 12/17/15	W 12/23/15	89	J,N,S	$3,600.00
92	1.8.2	0%	Conduct Lessons Learned	80 hrs	T 12/24/15	T 12/24/15	91	A,J,J,J,.	$2,040.00

8. Project Cost Estimation

After conducting a series of cost estimation analyses including (1) Planning Poker, (2) Parametric Estimating, (3) Three Point Estimating, and (4) utilizing the Work Breakdown Structure, the team has decided to combine the estimations received from Planning Poker and the Work Breakdown Structure to arrive at a total cost estimate for the Ridgewood Savings Bank's Paperless Statements project of **$48,960**.

The team has decided not to use the formal *Analogous cost estimation method* because the company does not have any similar projects that we can derive analogous activities from, as this is a unique project for the company. The team extensively researched similar projects executed by similar companies to derive like activities to employ the Analogous method, but that research was inconclusive.

Because this project blends hardware acquisition and software development, with software development dominating the majority of the work effort, the team has decided not to use the estimate received from the *Parametric method*. Similar to the Analogous method, in order for the team to derive accurate constants, the company would need sufficient history of similar projects. For our company, this worked well in determining the hardware costs, but falls short in determining more flexible costs such as the software costs.

Our estimates derived from the *Three Point Method* were wide in range due to the confidence interval premise. The Three Point Method also only included effort and not fixed costs, like hardware acquisition. For these reasons, the team decided not to report the estimate derived from the Three Point Method.

The team found the software development estimates from *Planning Poker* to be very accurate. This is because this software development team has worked together previously and have built up experience to make accurate estimates. Due to the group consensus nature of Planning Poker, both the estimates and the requirements became more accurate through the detailed estimation discussions. Planning Poker is strong at estimating software development costs. When it comes to hardware and more of the planning and designing activities however, this method is not sufficient.

For the planning, designing, hardware, and deployment activities, the team turned to the estimates derived from the *Work Breakdown Structure*. Instead of providing guess-based estimations on high-level tasks, the detailed broken-down nature of this bottom up micro approach derived stronger estimates that the team felt comfortable reporting.

8.1 Planning Poker Estimate

Planning Poker is an Agile Software Development estimation technique that uses consensus based "rounds of poker" to arrive at a final estimate for software development work [5]. Planning Poker cannot accurately be used to estimate other activities such as planning and design and thus were left out of scope for this planning method.

Procedure:

1) The team delineated those who should vote and those who should observe. Based upon the project team composition the following members were required to vote:
    - John Davis, Senior Software Developer
    - Joe Bucks, Senior Software Developer
    - Vishal Jain, Senior Quality Assurance Analyst
2) The team scheduled a series of meetings to conduct Planning Poker.
3) In each session, the Product Manager, Ann Morrison, read each software requirement with acceptance criteria aloud to the voting team.
4) The voting members asked for further clarifications to arrive at a better estimate and Ann provided more details when asked.
5) For each requirement, Ann had asked the team to use their Planning Poker cards (numbered 0, 1, 2, 3, 5, 8, 13, 20, 40 and 100) to simultaneous estimate the effort required.
6) If there were differing estimates, the voters with the highest and lowest estimate would voice their opinions as to why they provided that estimate.
7) After discussion, the team re-voted continuously until a consensus was reached.
8) When the team reached a point estimate consensus, Ann noted down the estimate and moved onto the next requirement.

Estimates:

Below are the final point estimates reached by the voting team for each software requirement along with the estimated cost. Because this team has worked together previously, there was sufficient historical information to determine that each story point is approximately equivalent to $200.

Functional Requirements:

Requirement	Point Estimate	Cost
Allow bank customers to opt in/opt out feature to receive bank statement electronically	8	8 x $200 = $1,600
Email Notifications	5	5 x $200 = $1,000
Increased online storage for monthly statements	5	5 x $200 = $1,000
Print and mail only opt out customer's statements.	3	3 x $200 = $600
Total Functional Cost:		**$4,200**

Non-Functional Requirements:

Requirement	Point Estimate	Cost
Statements need to remain secure	13	13 x $200 = $2,600
Database upgraded to support new functionality	8	8 x $200 = $1,600
Cross-browser/Cross-operating system compatibility	8	8 x $200 = $1,600
24/7/365 uptime	3	3 x $200 = $600
Total Non-Functional Cost:		**$6,400**

Functional Cost + Non-Functional Cost = Total Cost

$4,200 + $6,400 = **$10,600 for software development**

8.2 Parametric Method Estimate

A parametric estimate is a mathematical relationship between the cost, or schedule of an element of the project and the project's parameters. Constants, equations, and parameters derived from historical data combine to deliver a top-down cost estimate [2].

Below figures are based upon historical estimations. Due to the limited historical data and the top-down nature of this approach, the estimate produced below is a *rough order of magnitude* estimate.

Parametric Cost Estimate:

Deliverable/Task	No. in Project	Cost/unit	Cost Estimate
Support Artifacts (Charter, WBS, etc.)	8	$1,000	$8,000
New Servers	2	$2,500	$5,000
Modified SQL Queries	3	$2,000	$6,000
Modified SQL Data Tables	1	$1,000	$1,000
Impacted Web Pages	7	$2,000	$14,000
Impacted Users	500,000	$0.01	$5,000
Total Parametric Estimate:			**$39,000**

8.3 Three Point Method Estimate

The Three Point Method is based the assumption that normal distribution curves do not work for project management estimation because "once projects start to be late, they stay late." Instead, we blend calculations from three different types of estimates [2]:

1. *Pessimistic Estimate*: a worst-case scenario
2. *Most Likely Estimate*: normal activity duration
3. *Optimistic Estimate*: a best-case scenario

Resources and Rates:

Resource Name	Role	Standard Rate
Rachel Cohen	Linux Admin	$25.00/hr
Jeff Stills	Network Admin	$20.00/hr
Stephen Doe	Network Admin	$20.00/hr
Ann Morrison	Product Manager	$40.00/hr
Nicholas Scala	Project Manager	$30.00/hr
Vishal Jain	Quality Assurance Analyst	$20.00/hr
Joe Bucks	Software Developer	$25.00/hr
John Davis	Software Developer	$25.00/hr
Average/blended rate:		**$25.50/hr**

Top-Down Project Estimates:

1. Pessimistic (*p*) = 2,000 hours
2. Most Likely (*m*) = 1,600 hours
3. Optimistic (*o*) = 1,500 hours

PERT Mean:

$$\mu = \frac{o + 4m + p}{6}$$

$$\mu = \frac{1500 + 4(1600) + 2000}{6}$$

$$\mu = 1{,}650\ hours$$

Standard Deviation:

$$\vartheta = \frac{p - o}{6}$$

$$\vartheta = \frac{2000 - 1500}{6}$$

$$\vartheta = 83.33\ hours$$

Estimated Cost:

Confidence Interval	Effort Calculation	Cost (hrs. x $25.50)
66% confidence	1,650 ± (1 x 83.33) = 1,566.67 - 1,733.33 hours	**$39,950 - $44,200**
95% confidence	1,650 ± (2 x 83.33) = 1,483.33 - 1,816.67 hours	**$37,825 - $46,325**
99.5% confidence	1,650 ± (3 x 83.33) = 1,400 - 1,900 hours	**$35,700 - $48,450**

The project schedule cost estimate is **between $37,825 and $46,325 with a 95% confidence level**.

8.4 Work Breakdown Structure Method Estimate

The Work Breakdown Structure Method is a bottom up approach that utilizes task level estimation along with resource allocation and rates to arrive at a total cost estimate for the project.

Resources and Rates:

Resource Name	Role	Standard Rate	Overtime Rate
Rachel Cohen	Linux Admin	$25.00/hr	$37.50/hr
Jeff Stills	Network Admin	$20.00/hr	$30.00/hr
Stephen Doe	Network Admin	$20.00/hr	$30.00/hr
Ann Morrison	Product Manager	$40.00/hr	$60.00/hr
Nicholas Scala	Project Manager	$30.00/hr	$45.00/hr
Vishal Jain	Quality Assurance Analyst	$20.00/hr	$30.00/hr
Joe Bucks	Software Developer	$25.00/hr	$37.50/hr
John Davis	Software Developer	$25.00/hr	$37.50/hr

Work Breakdown Structure:

WBS ID	Task Name	Work	Fixed Cost	Total Cost
1.1.1	Develop Business Case	72 hrs	$0.00	$2,160.00
1.1.2	Create Project Charter	24 hrs	$0.00	$720.00
1.1.4	Identify Stakeholders	24 hrs	$0.00	$720.00
1.1.5	Produce Stakeholder Identification Documents	48 hrs	$0.00	$1,440.00
1.1.6	Develop Scope Statement	48 hrs	$0.00	$1,440.00
1.1.7	Review Scope Statement with Team	24 hrs	$0.00	$720.00
1.1.9	Hold Kick-Off meeting	24 hrs	$0.00	$720.00
1.3.1.1	Identify and Document Inputs	24 hrs	$0.00	$720.00
1.3.1.2	Identify and Document Functional Requirements	24 hrs	$0.00	$720.00
1.3.1.3	Identify and document Non-Functional Requirements	24 hrs	$0.00	$720.00
1.3.1.4	Compile Requirements in Requirements Document	48 hrs	$0.00	$1,440.00
1.3.2.1	Draft Communication Management Plan	24 hrs	$0.00	$720.00
1.3.2.3	Identify Roles and Responsibilities	24 hrs	$0.00	$720.00
1.3.2.4	Draft Human Resource Plan	24 hrs	$0.00	$720.00
1.3.3.1	Develop Project Plan	48 hrs	$0.00	$1,440.00
1.3.3.2	Identify Risks	48 hrs	$0.00	$1,440.00
1.3.3.3	Draft Risk Identification and Response Document	24 hrs	$0.00	$720.00
1.3.3.4	Draft Risk Contingency Plan	24 hrs	$0.00	$720.00
1.3.3.5	Review Project Plan and Key Risks with Team	24 hrs	$0.00	$720.00
1.3.4.1	Define Project Quality	8 hrs	$0.00	$160.00

1.3.4.2	Develop Metrics for Measuring Project Quality	8 hrs	$0.00	$160.00
1.3.4.3	Identify Quality Control Actions	8 hrs	$0.00	$160.00
1.3.4.4	Draft Quality Management Plan	16 hrs	$0.00	$320.00
1.5.1.1	Acquire Necessary Hardware	32 hrs	$5,000.00	$5,800.00
1.5.1.2	Install Hardware	24 hrs	$0.00	$600.00
1.5.1.3	Test Hardware	16 hrs	$0.00	$400.00
1.5.2.1	Update Database Models and Documentation	32 hrs	$0.00	$640.00
1.5.2.2	Complete SQL Updates to Database	32 hrs	$0.00	$640.00
1.5.2.3	Ensure Database Integrity Post Modifications via Testing	32 hrs	$0.00	$640.00
1.5.3.1	Develop Middleware Solution	64 hrs	$0.00	$1,280.00
1.5.3.2	Unit Test Middleware Solution	32 hrs	$0.00	$640.00
1.5.3.3	Develop Modifications to Website	48 hrs	$0.00	$960.00
1.5.3.4	Unit Test Modifications to Website	16 hrs	$0.00	$320.00
1.5.3.5	Develop New Email Notifications	32 hrs	$0.00	$640.00
1.5.3.6	Unit Test Email Notifications	16 hrs	$0.00	$320.00
1.5.3.7	Develop Security Measures	48 hrs	$0.00	$960.00
1.5.3.8	Test Security Strength of System	32 hrs	$0.00	$640.00
1.5.4.1.1	Create Test Plan	8 hrs	$0.00	$160.00
1.5.4.1.2	Create Test Traceability	8 hrs	$0.00	$160.00
1.5.4.1.3	Create Test Cases	24 hrs	$0.00	$480.00
1.5.4.2.1	Conduct System Testing	24 hrs	$0.00	$480.00
1.5.4.2.2	Complete Integration Development	16 hrs	$0.00	$320.00
1.5.4.2.3	Complete Integration Testing	24 hrs	$0.00	$480.00
1.5.4.3.1	Prepare UAT Plan	16 hrs	$0.00	$320.00
1.5.4.3.2	Identify Users & Kick-off session	8 hrs	$0.00	$320.00
1.5.4.3.3	Create User Guide / Test Scenarios	8 hrs	$0.00	$320.00
1.5.4.3.4	Complete UAT Testing	40 hrs	$0.00	$800.00
1.5.4.3.5	Perform Testing and Report issues	16 hrs	$0.00	$320.00
1.5.4.3.6	Fix issues reported by UAT	48 hrs	$0.00	$960.00
1.5.4.3.7	Review System Readiness	8 hrs	$0.00	$160.00
1.5.4.3.8	Deploy changes to production	16 hrs	$0.00	$320.00
1.5.5.1	Develop Quick Reference Guide	16 hrs	$0.00	$640.00
1.5.5.2	Prepare Release Notes	8 hrs	$0.00	$320.00
1.7.1	Release Code / Changes to Production	16 hrs	$0.00	$320.00
1.8.1	Establish Post Deployment Support for Critical Issues	120 hrs	$0.00	$3,600.00
1.8.2	Conduct Lessons Learned	80 hrs	$0.00	$2,040.00
Total Cost:				**$46,520.00**

Total Cost of all non-software related activities: **$38,360**

9. Risk Management Plan

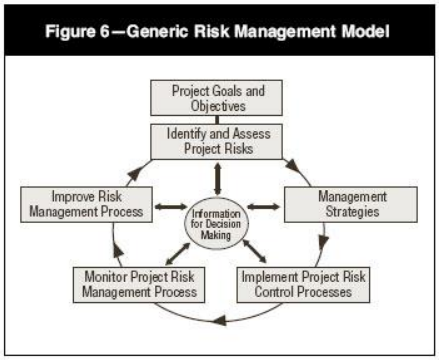
9.1 Roles and Responsibilities

The following roles and responsibilities are documented as it relates to the Risk Management Plan for the Paperless Statements initiative.

Role	Responsibilities
Project Manager	• Develop and maintain the Risk Management Plan • Oversee project process to ensure sufficient and utilized risk escalation paths • Facilitate risk discussions • Identify, document, and escalate project risks as necessary • Determine and document risk mitigation and contingency plans • Keep necessary stakeholders informed of project risks • Prepare reports and communication to the project's Sponsor and the organization's Executive Committee
Sponsor	• Inquire about project risks • Read and respond to risk documentation presented by the project team • Provide support and additional funding as needed to mitigate risks
Executive Committee	• Oversee project risks • Intervene to support risk mitigation as necessary
Project Team	• Identify and escalate risks to Project Manager

9.2 Methods and Approaches

The generic risk management model set forth by the bank's Project Management Office is as follows [1]:



- Identify and Assess Project Risks: Project Management will be held accountable for the accurate identification and assessment of project risks. These decisions should include input from the project team and affected stakeholders. Critical and catastrophic risks will be confronted as soon as possible.

- Management Strategies: Ridgewood Savings Bank's Information Office Management at the executive level have established strategies for mitigating risk in support of all department projects
- Implement Project Risk Control Processes: Project Management will establish the necessary repositories for documenting and assessing project risks. Project Management will also determine actionable mitigation and contingency plans for all identified risks. The Project team should feel empowered and free to voice any potential risks without hesitation.
- Monitor Project Risk Management Process: Project Management will oversee project risks, update the Risk Management Plan, and escalate risks as necessary
- Improve Risk Management Process: The project team will conduct lessons learned at the end of the project and are encouraged to identify ways in which the organization and the team can improve risk management on an ongoing basis

9.3 Tools and Techniques

The project team will employ the following risk management tools and techniques:

- Risk Identification
    - The project team will hold risk brainstorming sessions at the project's onset as prescribed in the Work Breakdown Structure.
    - Project Management will reach out to project team members on a regular basis as a reminder on the methods of identifying project risk.
    - Project Management will utilize the "Risk Management Checklist" as prescribed by the Project Management Office.
    - Project Management will consider the Project Management Office's historical database of common project risks to identify potentially missed risks.
    - Project Management will conduct a SWOT analysis at the end of the project's phases to determine project strengths, weaknesses, opportunities, and threats
    - Raised risks will be stored on a SharePoint site that the project team and necessary stakeholders have access to.
    - Project Risks will be reported in weekly status updates to the Sponsor and Executive Committee
- Risk Mitigation
    - Negative Risks
        - *Avoid*: First choice of risk mitigation if available; This technique eliminates the risk through modifying other aspects of the project that will remove the possibility of said risk. An example of risk avoidance is changing requirements/scope.
        - *Mitigate*: This technique attempts to reduce the likelihood or impact of the risk occurring. An example of risk mitigation is training software developers if they are unfamiliar with a specific technology.

        - *Transfer*: This technique moves the risk to a third party. An example of risk transference would be utilizing third party insurance in which the project forfeits a portion of the budget to push the risk to the insurance company.
        - *Accept*: This technique accepts the reality that the other risk techniques are not able to be used and the team will embrace whatever happens as a result of the risk.
    - Positive Risks
        - *Exploit*: This technique identifies project risks and takes advantage of them. An example of risk exploitation is assigning the most talented resources to the most critical tasks.
        - *Enhance*: This technique attempts to increase the likelihood or impact of the risk occurring. An example of risk enhancement is assigning idle staff to tasks along the critical path to shorten the project schedule
        - *Share*: This technique leverages third party help and assigns them tasks that they will probably perform better. An example of this is assigning database work to a third party contractor with specialty in database engineering.
        - *Accept*: This technique accepts the reality that the other risk techniques are not able to be used and the team will embrace whatever happens as a result of the risk.

9.4 Risk Categories

The following risk categories are inherited from previous projects completed at Ridgewood Savings Bank as established by the standards set forth by the bank's Project Management Office. The potential risks listed in each category are specific to the Paperless Statements software project and have been derived from several project team brainstorming sessions as part of the Risk Management plan.

Risk Category	Potential Risks
Budget (cost)	Aggressive budget, scope creep, increased unplanned costs
Schedule (time)	Aggressive schedule, unplanned project team PTO, deadline changes, inter-department coordination
Resources	Availability, resources stretched between multiple projects
Skills	Lack of technical knowledge skills, training needs
Organizational	Company culture, customer relations
Software	Defects, environment issues, legacy code
Hardware	Defective hardware, increasing costs, increased hardware demand
Requirements	Scope creep/gold plating, ambiguity, dependency of approvals
Regulatory	Regulatory compliance/breeches, external audits

9.5 Stakeholder Risk Tolerance

The following stakeholder risk tolerance assessment is specific to the Paperless Statements software project and have been derived from a project team discussion as part of the Risk Management plan.

Risk Category	Sponsor	Project Manager	Project Team
Budget (cost)	1	1	3
Schedule (time)	1	1	3
Resources	3	1	1
Skills	3	1	1
Organizational	2	2	2
Software	3	2	1
Hardware	3	2	1
Requirements	2	2	1
Regulatory	1	1	1

**Legend: High Tolerance = 3; Medium Tolerance = 2; Low Tolerance = 1*

9.6 Definitions of Probability and Frequency

The following definitions for probability are inherited from previous projects completed at Ridgewood Savings Bank as established by the standards set forth by the bank's Project Management Office.

Rating	Likelihood	Definition	Probability
1	Rare	Occurs only in exceptional circumstances	2%
2	Unlikely	Could occur at some time	20%
3	Possible	Might occur in an average environment	50%
4	Probable	Most likely to occur	75%
5	Imminent	Expected to occur and should be strongly monitored	95%

9.7 Definitions of Severity and Impact

The following definitions for severity are inherited from previous projects completed at Ridgewood Savings Bank as established by the standards set forth by the bank's Project Management Office.

Rating	Impact	Definition	Impact Value
1	Negligible	No cost or schedule impact	Cost: less than 2% of budget Schedule: less than 1 day
3	Minor	Minor cost or schedule impact	Cost: less than 5% of budget Schedule: less than 2 days
5	Moderate	Significant cost or schedule impact	Cost: less than 10% of budget Schedule: less than 5 days
8	Critical	Extensive cost and/or schedule impact	Cost: less than 30% of budget Schedule: less than 10 days
13	Catastrophic	Hugh cost or schedule impact	Cost: greater than 30% of budget Schedule: greater than 10 days

9.8 Risk Levels

Risk Score Matrix

Severity/Impact	Probability/Frequency: Rare (1)	Unlikely (2)	Possible (3)	Probable (4)	Imminent (5)
Negligible (1)	1	2	3	4	5
Minor (3)	3	6	9	12	15
Moderate (5)	5	10	15	20	25
Critical (8)	8	16	24	32	40
Catastrophic (13)	13	26	39	52	65

Risk Level	Risk Score Interval	Response
Low	Risk Score < 10	• Will be tracked/reported on project SharePoint site
Medium	10 ≤ Risk Score < 25	• Will be tracked/reported on project SharePoint site • Will be communicated in weekly status updates
High	25 ≤ Risk Score < 40	• Will be tracked/reported on project SharePoint site • Will be communicated in weekly status updates • Contingency plan will be formalized • Will be escalated to Project Sponsor immediately
Extreme	Risk Score ≥ 40	• Will be tracked/reported on project SharePoint site • Will be communicated in weekly status updates • Contingency plan will be formalized • Will be escalated to Project Sponsor and Executive Committee immediately

9.9 Risk Register

The following list contains the most up-to-date project risks along with their risk level, probability, and severity.

Risk ID	Risk Level	Probability	Severity	Category	Definition
NR-001	Medium	Possible	Moderate	Budget	Project estimates prove to be inaccurate
NR-002	Medium	Unlikely	Critical	Budget	Change in organizational budget reduces funding for project
NR-003	Medium	Possible	Moderate	Schedule	Schedule omits necessary tasks
NR-004	Low	Possible	Minor	Schedule	Schedule pressure reduces productivity
NR-005	Medium	Possible	Critical	Schedule	Stakeholders change project deadline
NR-006	Low	Possible	Minor	Resources	Stakeholders lack necessary participation and become disengaged ignoring communications/ requests
NR-007	Medium	Unlikely	Critical	Resources	Stakeholder turnover causes change in requirements/ expectations
NR-008	Medium	Probable	Moderate	Resources	Stakeholders disagree regarding requirements/ expectations
NR-009	High	Possible	Catastrophic	Resources	Project team turnover causes project disruption and cost overrun
NR-010	Medium	Possible	Moderate	Resources	Project team takes extended paid time off (PTO)
NR-011	Low	Unlikely	Minor	Skills	Project team lacks necessary skills/ knowledge to complete the project
NR-012	Medium	Unlikely	Moderate	Organizational	Project lacks executive support and team lacks the authority to achieve objectives
NR-013	Medium	Unlikely	Critical	Organizational	Executive turnover changes outlook on/ support for project
NR-014	Low	Rare	Critical	Organizational	A merger or acquisition disrupts and restructures the company
NR-015	Medium	Possible	Critical	Software	Defects are found late in development

NR-016	Medium	Possible	Moderate	Software	Legacy code is unreadable/ unmanageable
NR-017	High	Possible	Catastrophic	Software	Product Management refuses to accept implemented functionality
NR-018	Low	Unlikely	Minor	Hardware	Hardware is delayed because it is out of stock
NR-019	Medium	Unlikely	Moderate	Hardware	Hardware arrives defective
NR-020	Medium	Unlikely	Moderate	Hardware	Estimated hardware purchases do not sufficiently support volume increases
NR-021	Medium	Unlikely	Critical	Hardware	Internal infrastructure suffers system outages (i.e. test environments crash)
NR-022	Medium	Possible	Critical	Requirements	Requirements are ambiguous leading to uncertainty by development
NR-023	Medium	Probable	Moderate	Requirements	Scope creep delays timeline and expands budget
NR-024	Medium	Possible	Critical	Requirements	Requirements estimates prove to be inaccurate
NR-025	High	Possible	Catastrophic	Requirements	Changing opinions from Sponsor and Product Management change requirements late in the project
NR-026	High	Unlikely	Catastrophic	Regulatory	Requirements are not regulatory compliant
NR-027	Low	Rare	Minor	Regulatory	Regulatory body conducts audit on project while still in progress

9.10 Risk Response and Contingency Plan

The following list contains the risk assessment, response and contingency plan for the identified risks. Contingency planning has only been conducting for High and Extreme risks.

Risk ID	Assessment	Response	Contingency
NR-001	Project cost and effort estimates were diligently conducted combining a series of different methods with an experienced team. However, inaccurate estimates could change project cost and schedule.	**Mitigate**: Extensive estimation has taken place to reduce the likelihood of this risk occurring.	*n/a (medium risk)*
NR-002	The bank could alter budgets for financial or market driven reasons and thus funding can be minimized for this effort.	**Mitigate**: The Project Manager has received funding approvals/signatures from the necessary parties to reduce the likelihood of this happening.	*n/a (medium risk)*
NR-003	As the project is being developed, there exists the possibility that the WBS could be missing key tasks that the team initially overlooked.	**Accept**: If necessary tasks were omitted, the team must schedule them in and accept the changes to budget/ schedule.	*n/a (medium risk)*
NR-004	Depending on project progress, the schedule deadline could cause pressure for project team members thus decreasing productivity/ quality as the project team rushes.	**Mitigate**: The Project Manager will check in on project team members to reduce stress and boost morale. If necessary, the Project Manager would rather extend the deadline than produce lower quality work.	*n/a (low risk)*
NR-005	There could be a rush to get this new functionality to the market considering the benefits to the brand's perception, customer satisfaction, and environmental impact and thus stakeholders may ask for the project to be delivered sooner.	**Avoid**: The Project Manager has received approvals/ signatures on the current project deadline and will hold stakeholders accountable. If there is an approved executive decision to rush the deadline, Project Manager will explore crashing and fast tracking methods to mitigate the risk.	*n/a (medium risk)*
NR-006	Key project stakeholders are busy executives with day jobs outside of this project. Therefore, key stakeholders could not participate or ignore communications due to their	**Transfer**: If key stakeholders become unresponsive when needed, the Project Manager will shift the accountability on the Project Sponsor and Executive Committee to find	*n/a (low risk)*

	hectic schedules.	replacement, committed stakeholders.	
NR-007	Stakeholders may leave the company and new ones may be hired with differences in opinions on the requirements and budget allocation for this project.	**Accept**: The project team has no influence over stakeholder turnover and must accept the changes in employees.	*n/a (medium risk)*
NR-008	Different stakeholders representing different business functions can disagree on implementation of Paperless Statements.	**Mitigate**: The Project Manager will receive consensus from stakeholders and approvals on requirements will be stringently enforced.	*n/a (medium risk)*
NR-009	Project team members may leave the company and new ones may be hired with different skill sets. This can cause a knowledge loss and delay for the project team.	**Accept**: The project team has no influence over project team members' turnover and must accept the changes in employees.	A portion of the contingency budget will be allocated to mitigate this risk should it come to fruition. This money will be used in training new resources or acquiring resources with the necessary skills.
NR-010	Project team members may take vacation days during the life of the project, which may cause delays in timelines.	**Mitigate**: The Project Manager will ask for the team's scheduled vacation time early in the project to incorporate these days into the project schedule.	*n/a (medium risk)*
NR-011	Project team members may not have sufficient knowledge to implement certain features and thus may need training on new technologies, which can increase costs and schedule delays.	**Mitigate**: The project team will conduct analysis of knowledge gaps early in the project and Project Management will dedicate a portion of the budget for training if needed.	*n/a (low risk)*
NR-012	Due to shifting priorities, executive support can diminish for this project although it is unlikely given the estimated benefits this project brings to the bank.	**Mitigate**: Project Manager has ensured that the assigned stakeholders have the necessary bandwidth to commit to the project.	*n/a (medium risk)*
NR-013	Executives may leave the company and new ones may be hired with different opinions and priorities. This can change the funding or resource dedication on the project.	**Accept**: The project team has no influence over executive turnover and must accept the changes in company structure.	*n/a (medium risk)*

NR-014	Although highly unlikely given the bank's current standing, a merger or acquisition could occur disrupting funding and/or support for the project.	**Accept**: The project team has no influence over M&A activity and must accept the changes in company structure and employees.	*n/a (low risk)*
NR-015	Defective software can be found in user acceptance testing (later in the project lifecycle) that would need to be fixed with additional development effort.	**Mitigate**: The project team has established a strict and rigorous Quality Management Plan that will reduce the likelihood of defects through continuous testing as prescribed by Agile methodologies.	*n/a (medium risk)*
NR-016	As the software developers begin coding, they may have difficulty in modifying existing code if it has not been commented properly or is difficult to follow. This could delay software development time.	**Avoid**: The Project Manager has assigned software developers to this project that are familiar with legacy code and are experienced in the organization.	*n/a (medium risk)*
NR-017	If the requirements were not captured properly, or Product Management changes their minds, they may refuse to accept implemented functionality, which can cause additional development rework and schedule delays.	**Mitigate**: Thanks to the Agile Methodology selected by the Project Team, changes will be frequently showcased to Product Management early so last minute changes can be accommodated in time without significant schedule impact.	A portion of the contingency budget will be allocated to mitigate this risk should it come to fruition. This money will be used in additional software development efforts to accommodate the change in requirements.
NR-018	When the team goes to procure the hardware, it may be out of stock or shipment can be delayed.	**Transfer**: The project team will look to another supplier of the hardware and software changes have been factored in to be independent of the hardware installations should there be a delay.	*n/a (low risk)*
NR-019	Upon installing the hardware, it may be defective and need to be exchanged for functional hardware. This could delay the schedule for hardware installations.	**Accept**: The project team has no influence over the functionality of ordered software, but the software changes have been factored in to be independent of the hardware installations should there be a delay.	*n/a (medium risk)*

NR-020	Upon conducting end-to-end regression testing, the project team may discover that the originally estimated additional hardware may not be sufficient to support the estimated increase in customer traffic.	**Mitigate**: Architecture will include a clustered server with failover capability and backup (redundant hardware for the application between CMoD and the online portal).	*n/a (medium risk)*
NR-021	Throughout development and testing, the system may suffer unexpected outages due to a variety of unknown reasons. This may hinder team productivity as these issues are fixed.	**Accept**: The project team has no influence over the functionality of IT infrastructure and must accept and modify the schedule to accommodate for this.	*n/a (medium risk)*
NR-022	Requirements can be incorrectly understood by the development teams due to ambiguity and what is implemented might not match what was intended. This can cause rework for the development team.	**Mitigate**: Thanks to the Agile Methodology selected by the Project Team, changes will be frequently showcased to Product Management early so last minute changes can be accommodated in time without significant schedule impact.	*n/a (medium risk)*
NR-023	Product Management may ask for additional features not included on the agreed to and approved scope and requirements documentation. This can cause delays in project schedule and increases in project cost.	**Mitigate**: Thanks to the Agile Methodology selected by the Project Team, additional requests can be accommodated by additions to the backlog. However, these additions along with the current requirements must be reprioritized.	*n/a (medium risk)*
NR-024	Software development cost and effort estimates were diligently achieved via an experienced team's consensus. However, inaccurate estimates could negatively impact project cost and schedule.	**Mitigate**: Extensive estimation has taken place to reduce the likelihood of this risk occurring.	*n/a (medium risk)*
NR-025	Product Management or the Project Sponsor may ask for additional features not included on the agreed to and approved scope and requirements documentation. This can cause delays in project schedule and increases in project cost.	**Mitigate**: Thanks to the Agile Methodology selected by the Project Team, additional requests can be accommodated by additions to the backlog. However, these additions along with the current requirements must be reprioritized.	A portion of the contingency budget will be allocated to mitigate this risk should it come to fruition. This money will be used in additional software development efforts to accommodate the change in requirements.

NR-026	The implementation of certain features may not be compliant with state and federal regulations given the financial impact of this project.	**Transfer**: Legal and Compliance will be asked to overlook requirements before they are developed to ensure project regulatory compliance.	A portion of the contingency budget will be allocated to mitigate this risk should it come to fruition. This money will be used in additional software development efforts to accommodate the compliance changes.
NR-027	Regulatory agencies may ask to oversee project development and implementation while the project is ongoing. This may negatively impact morale or team efficiency.	**Transfer**: Project Management will defer regulatory activates to the Legal and Compliance teams.	*n/a (low risk)*

9.11 Positive Risk Register and Response Plan

The following list contains the positive risk assessment along with risk responses.

Risk ID	Category	Definition	Response
PR-001	Budget	Project ends up costing less money (less effort) than originally planned.	**Exploit**: The Project Team will inquire with the Sponsor and Product Management for additional features that can be included in this release.
PR-002	Schedule	Project is ahead of schedule.	**Exploit:** Project Manager will look into fast tracking and assign idle resources to tasks along the critical path in hopes of finishing the project sooner.
PR-003	Hardware	User response to the marketed new feature is beyond original estimations and servers are overloaded due to unexpected traffic increases.	**Accept**: The Project Team will purchase additional hardware to support increased traffic.

9.12 Risk Management Funding and Contingency

The Sponsor and Executive Committee have agreed to allocate an additional $10,000 from the bank's budget to this project on a contingency basis. The bank values this Green IT initiative greatly and believes it can boost the brand's perception as well as help the bank become a good corporate citizen. Contingency planning has been performed for "high" and "extreme" risks and if the bank must extend more than the $10,000 in contingency funds, the project will be considered a failure for the bank as the return-on-investment (ROI) will not be sufficient.

10. Quality Management Plan

The Quality Management Plan will help to achieve output of the project with the highest quality by minimizing defects and keeping the project within its planned financial and functional boundaries. The plan aims at avoiding gold plating of requirements, assigns specific responsibilities to owners, and defines processes to address conflicts.

10.1 Roles and Responsibilities

Role	Responsibilities
Project Manager	The Project Manager is responsible for delivering the Paperless Statement project with all functional requirements completed within the allocated budget. They will coordinate with the project Sponsor, product management, software engineering, and quality-testing teams to make sure the project is executed as per the intended scope. The Project Manager will facilitate the allocation of best possible resources to complete the project as per the scheduled timeframe.
Sponsor	The project Sponsor is responsible for achieving the planned benefits of the Paperless Statements project, which is to reduce the mailing costs by 50% in one year. Having the ultimate authority and responsibility of the project, the Sponsor will work with the project manager to coordinate smooth execution of the project.
Product Manager	The Product Manager is responsible to work with all stakeholders to draft functional requirements. She is also responsible to validate the engineering analysis document and software quality test plans so that they satisfy the requirements. She will also conduct product demos.
Product Engineering	Product Engineering is responsible for delivering quality software as prescribed in product requirements.
Software Quality	The Software Quality team is responsible for validating software changes by creating test plans and executing test cases. They will log defects if application changes do not align to the requirements.
IT Team	The IT Team is responsible for ordering and configuring new hardware needed to support the project.
Marketing	The Marketing team will ensure that bank customers are informed about this new Paperless Statement feature and will attempt to maximize customer enrollment.

10.2 Quality Assurance Approach

Quality assurance will be provided jointly by product engineering, product management, and the project manager by reviewing project progress periodically. After each sprint, engineering will present the work accomplished to confirm that development is completed in accordance with the requirements. Any shortfalls or gold plating will be promptly addressed to keep the project within scope and quality parameters. The Project Manager will be responsible to allocate resources to promptly find and address defects while continuing development.

10.3 Quality Control Approach

To ensure development is done with minimum defects, engineering team will conduct code reviews before any changes are submitted for testing. Independent code reviewers will be assigned. The software quality team will give higher priority to the requirements. Software quality defects will be first discussed in daily meetings with engineering before entering defects into the Rally project lifecycle management tool to minimize overhead. All defects will be triaged on a weekly basis and will be addressed according to the severity and priority assigned.

10.4 Quality Improvement Approach

The Paperless Statements project is limited to the initially agreed upon system specifications. If any new requirements are needed beyond the scope of the project, these will be reviewed by the change control board, represented by all stakeholders. The Project Manager will conduct a thorough impact analysis on schedule, cost, and quality to assess if such change requests can be accepted.

10.5 Tools, Environment, and Interface

The following set of tools will be used by the various teams:

- Project Management activities: Microsoft Project 2013
- Requirement and defect tracking: Rally
- Development tools: Microsoft Visual Studio 2013, IIS 7.0
- Load Testing: HP LoadRunner
- Website Testing: Internet Explorer, Chrome, Firefox, Safari, Opera
- Collaboration Tools: SharePoint, WebEx Conference calling
- Documentation: Adobe Acrobat, Microsoft Office 2013

10.6 Quality Reporting Plan

In each weekly build, product engineering will inform the software quality team about stories checked in for the build by updating story status in Rally. Any known issues will be reported in the build notes. In daily standup meetings, the software quality team will first discuss the defect with engineering team before creating new defect in Rally.

10.7 Quality Metrics

The following quality metrics chart identifies how to measure project quality:

Metric ID	Requirement	Quality Metric	Measurement Method
QM-001	*Creation of monthly report in PDF files.*	Speed	In monthly bath processing, the PDF file for each customer must be completed within 5 seconds.
QM-002	*Accessing monthly report after log in process is done.*	Response Time	User must be presented with monthly report within 3 seconds once month and year is selected on website.
QM-003	*Browser compatibility*	# of Browsers	User must be able to view monthly

			reports in PDF and HTML format on Internet Explorer, Chrome, Edge, Safari, Opera, and Firefox.
QM-004	*Operating System compatibility*	# of Operating Systems	User must be able to view monthly reports in PDF and HTML format on Windows, Linux, Mac OS X, Apple iOS, and Android.
QM-005	*Email Notifications*	% User Base	Emails server must be able to handle email notifications sent to at least 80% of the customer base each day.
QM-006	*Load Testing due to increased online activities*	# of Users	Online website must support at least 10,000 users connected to online portal accessing monthly PDF files at once.
QM-007	*Service must remain available for customers throughout the year*	Downtime	The functionality must be available 24 hours a day, 7 days a week, with one hour per year downtime for system maintenance, as appropriate.
QM-008	*Database retrieval speed*	Response Time	Query speed to the database must remain unchanged after changes are made to the database
QM-009	*Defects should be kept to a minimum*	# of Defects	The system must be deployed to production with at most 0 critical defects, 0 major defects, 2 medium defects, and 5 minor defects
QM-010	*Sensitive customer information must be protected from all possible malicious threats, both internal and external*	# of Breeches	The system must have 0 breeches of malicious intent on sensitive customer information
QM-011	*All the highest priority requirements must be developed*	# of Requirements	The development team must successfully implement all of the “1-Must Have” prioritized requirements
QM-012	*Customer participation*	% of User Base	Customer enrollment into Paperless Statements should be 30% within one year of software release
QM-013	*Customer satisfaction must increase post deployment*	% of User Base	Using pre-existing customer surveys, customer satisfaction must increase by 10% within one year of software release

11. References

[1] Benvenuto, Nicholas A., and David Brand. "Outsourcing—A Risk Management Perspective." *Information Systems Control Journal* 5 (2005): n. pag. ISACA.org. Web. 4 Oct. 2015. <http://www.isaca.org/Journal/archives/2005/Volume-5/Pages/Outsourcing-A-Risk-Management-Perspective1.aspx>.

[2] Kanabar, V. (2014). *MET CS 632: ArtScience_of_PM_templates.* Retrieved 2015, from Boston University's MET CS 632 online classroom.

[3] Kanabar, V., & Warburton, R. (2013). *The Art and Science of Project Management 2nd Edition.* Newport, Rhode Island, United States: RW Press. Retrieved 2015.

[4] Mar, Anna. "130 Project Risks." *Simplicable*. N.p., 11 Mar. 2013. Web. 05 Oct. 2015. <http://management.simplicable.com/management/new/130-project-risks>.

[5] "Planning Poker." *Mike Cohn's Blog Succeeding With Agile*. Web. 26 Sept. 2015. <https://www.mountaingoatsoftware.com/agile/planning-poker>.

[6] Cover art retrieved from: https://www.bankeasy.com