Final Report - Grading Criteria

Team Members: Glitter Pigs (William Hurley, Alison Roy, Nichol Suchy, Alice Uhl)

The following are the sections required for the Final Report. Attach a copy of this grading sheet to front of your report.

Points Earned	Points Possible	Category	Grading Notes
	5	**Organization** Follows same guidelines as the feasibility report	
	10	**Spelling & Grammar** Document is free of spelling and grammatical errors.	
	15	**Management Summary**	
	20	**Current System**	
		Proposed System	
	20	• **Functional Requirements**	
	10	• **Diagrams**	
	50	• **Solution**	
	15	**Recommendations**	
	5	**Appendix**	
	15	**Extra Credit**	
	150	**TOTAL (excluding extra credit) COMMENTS**	

Edmonds Community College
CIS 233

Research Project #2 – System Requirements Document

Prepared March 3, 2016

Team Glitter Pigs: William Hurley, Alison Roy, Nichol Suchy, Alice Uhl

Bank of Xanadu

Invoice Processing System
System Requirements Document

March 3, 2016

Glitter Pigs: Will Hurley, Alison Roy, Nichol Suchy, and Alice Uhl

Table of Contents

Research Project #2 – System Requirements Document 1
Cover Page 2
MANAGEMENT SUMMARY 5
CURRENT SYSTEM 6
Introduction 6
Project Stakeholders 6
System Scope 7
Project Scope 7
Current Procedures 7
Contract Workflow 7
Invoice and Timesheet Workflow 7
Invoice-to-Contract Verification 7
Vendor Inquiries 8
New System Requested Features 8
Project Constraints 8
PROPOSED SYSTEM 9
Functional Requirements 9
Use Case Scenarios 9
RECEIVE CONTRACT 9
CONTRACT EXCEPTION 10
UPDATE CONTRACT 12
RECEIVE INVOICE 13
INVOICE EXCEPTION 15
UPDATE INVOICE 16
PAY INVOICE 18
VENDOR INQUIRY 19
INVOICE ACCRUAL 20
Proposed Solution 22
Use Case Diagram 23
Functional Decomposition Diagram 24
Data Flow Diagram 24
Users 25
Reports 25

Variants 26
RECOMMENDATION 27
APPENDIX 29
Correspondence 29
Source Documents 30
Assumptions 39
Issues 39

MANAGEMENT SUMMARY

The Glitter Pigs team (William Hurley, Alison Roy, Nichol Suchy, and Alice Uhl) has completed a System Requirements Document for the Bank of Xanadu Bellevue Banking Center. This report is the result of a systems request submitted by Patrick Jay, Vice President/Manager of the Bellevue Banking Center, and is a follow-up to the Feasibility Study submitted on February 4, 2016.

The Bank of Xanadu has come a long way from Swellvue Savings and Loan. With the most recent acquisition of Utopia National Bank, they have decided to restructure their organization and outsource all in-house programming to contracted programmers. Without an established system to manage this new process, the Bellevue Accounting Group, led by Dave Spencer, put together a spreadsheet system to collect the necessary data from the contracts and invoices submitted by contracted programmers.

The spreadsheet system works, but is very time consuming, as it requires all documents to be verified manually. By automating the verification of all contract and invoice data, it will expedite the current system processes, which are currently performed by the Accounting Group.

This is why the Glitter Pigs team has been tasked with creating a new system that will more efficiently enter, process, and validate these documents. Patrick Jay has explained there are three important functionalities this system must perform:

- Verify whether each billable invoice is within their perspective contract start-end dates.
- Confirm that the hourly rates billed on each invoice match the hourly rates on the corresponding contract.
- Calculate if there is enough funding on the contract to pay the contracted programmer.

The invoice processing system performs ten primary functions currently, not including the automated verification that has been requested. These primary functions were analyzed to provide insight towards the system functionality and data processes.

Our solution is an automated invoice processing system that will store contract and invoice data that is manually entered by the Accounting group. The proposed system will maintain the current manual data entry process to ensure quality and accuracy of inputted data. Additionally, manual data entry will keep training to a minimum because accountants are accustomed to this process.

The system will automatically verify entered invoice information against corresponding contracts. Automatically flagging errors in data entry will improve the workflow of the

current procedures. After acknowledging the error, the accountants can create and send exception memos directly from the system.

The system will automatically generate reports and send via email to the appropriate parties, requiring only the Accounting group to have access to this new system. The accountants can modify the reporting function as needed, allowing them to edit report information, reporting frequency, report recipients, and generate on-demand reports.

CURRENT SYSTEM

Introduction

Below you will find an analysis of your existing invoice processing system. This section incorporates, and elaborates upon, items that are found in your first deliverable: Feasibility Study, Preliminary Investigations Report. We have outlined the scope of the project, stakeholders affected, and the existing steps required of the Bank of Xanadu Accountants to process an invoice. A thorough understanding of current processes, what specifically is included and requested in the project, constraints, and the knowledge of who it affects has allowed the Glitter Pigs team to conceptualize a satisfactory solution for your organization.

Project Stakeholders

- **Dave Spencer, Head Accountant** - Mr. Spencer spends the majority of his workflow interacting with the current system. Mr. Spencer is vested in the new system because it will affect his day-to-day operation at the Bank of Xanadu. Successful implementation of this new system will allow Mr. Spencer to focus on other priorities and duties held at the organization.
- **Kyle Watts, Tamisha Spencer, and Misty Barber, Accountants** - The Accounting Group will be using the new system. This will streamline their day-to-day processes.
- **Lyle Newhart, Payables Group Manager** - Mr. Newhart and his payables team will be receiving payment information in a more efficient way, thus allowing quicker turn-around time on payables.
- **Anne Kasey, Sr. Vice President** - The new system improves the efficiency at her office. As this is a pilot program, reports of high productivity to the corporate offices will be advantageous to her.

System Scope

This system will include creating an automated invoice processing system that will contain all future manually entered contracts and invoices for outsourced vendors and their programmers. The system will store, process, validate, and accrue contract and invoice data for the Bellevue banking center and their satellite branches only. No other banking centers, branches, or bank data are included.

Project Scope

The Accounting Group will receive training and be the only employees who have access to this system. As the legacy system is not integrated into any existing systems, no Xanadu systems will be integrated as part of the proposed system. System security, applicable labor/contract laws, and legacy data (including contracts and invoices) will not be considered in this project.

Current Procedures

Contract Workflow

- Accounting receives a contract from the Buyer.
- Accounting verifies contract is well-formed.
  - If there are errors in the contract, an Exception Memo is written.
  - Contract is sent back to the Buyer.
  - After resolving issues, the Vendor returns the contract to Accounting.
  - Cycle repeats until contract is well-formed.
- Accountant enters information on contract into an Excel spreadsheet.
- Contract is stored in the filing cabinet.

Invoice and Timesheet Workflow

- Accounting receives invoice and timesheet.
- Accounting verifies documents are well-formed.
  - If there are errors on either document, an Exception Memo is written and documents are sent back to the Buyer.
  - After resolving issues, the Vendor returns the documents to Accounting.
  - Cycle repeats until documents are well-formed.
- Accountant enters information on invoice into an Excel spreadsheet.

Invoice-to-Contract Verification

- Accounting compares the well-formed invoice to the appropriate well-formed contract. Accounting makes sure that:
  a) The dates on the invoice are within the contract limitations.
  b) The hourly rate on the contract matches the hourly rate on the invoice.
  c) The contract has money left over to pay the invoice.

  - If documents are outside of the contractual agreement, an Exception Memo is written and documents are sent back to the Contract Group.
  - After resolving issues, the Contract Group returns documents to Accounting.
  - Cycle repeats until the documents fit the contract.
- The Accountant fills out a data entry sheet and attaches the invoice to it.
- Accounting packages the invoice and data entry sheet, marks it as “OK to Pay”, and sends it to Accounts Payable.

Vendor Inquiries

- Accounting receives a Vendor inquiry.
- Accounting locates the related invoice.
  - If there is no invoice, Accounting must try to locate one.
  - If an invoice cannot be found, Accountant refers Vendor to Buyer and it falls out of scope.
- Accountant finds copy of invoice in filing cabinet, which indicates original was sent to Accounts Payable.
- Accountant refers Vendor to Accounts Payable and it falls out of scope.

New System Requested Features

The automated invoice processing system will collect data from contracts and invoices manually entered by the Accounting Group. New invoice entries will be automatically validated against the database as they are entered to ensure accuracy. If there is any error, such as the invoice does not correspond to an existing contract, the invoice date is outside of the contract date range, the hourly rate is incorrect, or there are not enough funds left on the contract, the system will alert the user immediately preventing data entry errors and increasing efficiency. In addition, accruals are automatically calculated and reports can be generated in real time, reflecting the most up-to-date information.

Project Constraints

- The project must be completed within the forecasted budget.
- The System Requirements Document must be complete by March 17, 2016.
- The invoice processing system must run independent of David Spencer.
- The Accounting Group must be able to learn and utilize the new system.

PROPOSED SYSTEM

Functional Requirements

Use Case Scenarios

USE CASE NAME:	**RECEIVE CONTRACT**	**ID: UC001**
Primary Actor:	Accountant	
Brief Description:	This use case describes the steps from the time the accountant receives a new contract until the contract is validated, entered into the system, and filed.	
Trigger:	The accountant receives a new contract.	
Main flow	This use case begins when the accountant receives a new contract from the buyer. 1. Accountant visually verifies that the contract has all required information. 2. Accountant logs onto the system and navigates to the screen where new contract information is entered. 3. Accountant assigns a contract number used by the accounting department. 4. Accountant selects correct vendor, project manager, charge unit (cost center), and bank division. 5. Accountant enters contract info, programmer name, project start/end dates, hourly pay rate, fee maximum amount, and project description. 6. Accountant saves new contract record into system. 7. Accountant files original contract for future reference.	
Alternate flows	4. If the vendor does not exist in the system, the accountant will navigate to the vendor entry screen and create a new vendor record. This also applies to non-existent project managers, charge units, and divisions. 5. If any of the required information is missing, a default value is selected.	
Exception flows	1. If the contract is missing any information, the accountant will flag it as invalid, send it back to the buyer, and an exception memo is generated.	
Preconditions	A new contract has been received and is ready to be entered into the system.	
Post-conditions	A new contract has been successfully entered into the system.	
Information Requirements	Programmer Name Vendor Name Project Manager Charge Unit (cost center)	

	Bank Division Contract Start Date Contract End Date Programmer Hourly Rate Fee Maximum (contract budget) Project Description Contract Number (accounting dept.)
Assumptions	1. The buyer will deliver a valid and complete contract. 2. The contract is executed before any programming work is done.
Business Rules	1. The buyer must submit a complete and valid contract to the accounting department. 2. Contracts are to be executed prior to the start of any programming work. 3. Only one programmer is allowed to be on a single contract. 4. Every project must have a separate contract issued. 5. Each contract must have a unique number issued by the accounting department.

USE CASE NAME:	**CONTRACT EXCEPTION**	**ID: UC002**
Primary Actor:	Accountant	
Brief Description:	This use case describes the steps taken when the accounting group deems a contract mal-formed and notifies the buyer.	
Trigger:	A mal-formed contract has been identified.	
Main flow	This use case begins when the accountant identifies a contract as being mal-formed, either during visual inspection or when the system returns an error message. 1. Accountant visually confirms the error message received by the system is indeed incorrect on the paper contract and not caused by data entry error. 2. Accountant saves the contract as “Pending Exception”, saving all data entered to this point. 3. Accountant navigates from the contract entry screen to the Exception Memo entry screen. 4. Accountant enters the unique contract number, which pulls up the correct buyer for the contract. 5. Accountant chooses the appropriate reason for rejecting the contract from the drop-down menu. 6. Accountant enters any additional comments to explain the reason for rejection. 7. Accountant completes the Exception Memo and the system sends as an email to the buyer.	
Alternate flows	1a. Accountant visually determines the contract to be mal-formed before logging into the system.	

	1b. Accountant logs into the system and navigates to the Exception Memo entry screen. 4a. The unique contract number does not yet exist in the system, so the accountant chooses the correct buyer from the drop-down list of existing buyers in the system. 4b. If a buyer record cannot be found, the accountant navigates to the buyer entry screen to enter a new buyer record. 4c. Accountant returns to the Exception Memo entry screen to choose buyer, reason for rejection, and enter any additional comments before submitting the Exception Memo.
Exception flows	N/A
Preconditions	A contract is determined to be mal-formed, either by visual inspection or by system-generated error message.
Post-conditions	An Exception Memo has been sent to the buyer with information regarding the reason for rejection.
Information Requirements	Buyer Name Exception Date Exception Reason Exception Comments Response Date Programmer Name Vendor Name Invoice Number (if applicable) Invoice Total (if applicable) Invoice/Contract Start Date Invoice/Contract End Date Contract (Master Agreement) Number
Assumptions	1. Buyer will respond and resolve exception issues in a timely manner. 2. Exception will be resolved before any additional invoices are submitted for the corresponding contract.
Business Rules	1. A separate Exception Memo must be generated for each mal-formed contract. 2. Once an updated contract has been received by accounting, the response date for the applicable Exception Memo will be updated in the system. 3. All exceptions must be corrected before the buyer resubmits mal-formed contract.

USE CASE NAME:	UPDATE CONTRACT	ID: UC003
Primary Actor:	Accountant	
Brief Description:	This use case describes the steps taken when an accountant receives an updated contract including validation, system entry, and filing.	
Trigger:	The accountant receives an updated contract.	
Main flow	The use case begins when an accountant receives an updated contract from the buyer. 1. Accountant visually verifies that the contract has all required information. 2. Accountant logs onto the system and navigates to the Exception Memo screen. 3. Accountant pulls up the corresponding Exception Memo to verify that original errors have been resolved. 4. Accountant returns to the contract entry screen and locates the partially entered information by contract number. 5. Accountant then selects the correct vendor, project manager, charge unit (cost center), and bank division if not already chosen previously. 6. Accountant then finishes entering contract info including programmer name, project start and end dates, hourly pay rate, fee maximum amount, and project description. 7. Accountant saves the updated contract record into the system. 8. Accountant then files the paper contract for record keeping.	
Alternate flows	4a. If the contract was rejected during visual verification, no information was entered into the contract entry screen and a contract number was never created. 4b. Accountant locates the partially entered contract by either vendor, programmer, or project manager name. 5. If the vendor does not exist in the system, the accountant will navigate to the appropriate screen and create a new vendor record. This also applies to non-existent project managers, charge units, and divisions.	
Exception flows	1. Accountant visually confirms there is still missing information on the contract, so the contract is rejected and a new Exception Memo is generated. 6. System returns an error message because required information is missing. The contract is rejected and a new Exception Memo is generated.	
Preconditions	An updated contract has been received and is ready to be entered into the system.	
Post-conditions	The updated contract has been successfully entered into the system.	

Information Requirements	Programmer Name Vendor Name Project Manager Charge Unit (cost center) Bank Division Contract Start Date Contract End Date Programmer Hourly Rate Fee Maximum (contract budget) Project Description Contract Number (accounting dept.)
Assumptions	1. The buyer will deliver a valid and complete updated contract. 2. The updated contract is entered into the system before any programming work is done.
Business Rules	1. The buyer must submit a complete and valid contract with all errors corrected to the accounting group. 2. Contracts are to be completed and entered into the system prior to the start of any programming work. 3. Only one programmer is allowed to be on a single contract. 4. Every project must have a separate contract issued. 5. Each contract must have a unique number issued by the accounting group.

USE CASE NAME:	**RECEIVE INVOICE**	**ID: UC004**
Primary Actor:	Accountant	
Brief Description:	This use case describes the process when the accountant receives an invoice, enters its information into the system, and the system validates the invoice.	
Trigger:	The accountant receives a new invoice.	
Main flow	The use case starts when an accountant receives a new invoice. 1. Accountant visually verifies there is a timesheet attached to the invoice and that information matches on both documents. 2. Accountant logs onto the system and navigates to the invoice entry screen. 3. Accountant selects the correct vendor and programmer for the invoice. 4. Accountant then enters the invoice number, date, period worked, hours worked, hourly rate, and invoice total. 5. System confirms invoice total entered is correct based on hourly rate and hours worked. 6. System locates the contract that corresponds to the invoice.	

	7. System verifies the invoice details are within the contract constraints and there are funds available. 8. System changes the invoice's status to "OK to Pay". 9. System saves the new invoice entry. 10. Accountant files the paper copy of the invoice for Accounts Payable.
Alternate flows	3a. Accountant cannot locate an existing vendor and/or programmer record. 3b. Accountant navigates to the vendor entry screen and/or the programmer entry screen to create a new record.
Exception flows	1. Accountant determines there is missing or inaccurate information on the invoice or a timesheet is not attached. The invoice is rejected and an Exception Memo generated. 3. Accountant cannot find a contract in the system that matches the vendor and contracted programmer on the invoice. The invoice is rejected and an Exception Memo generated. 5. System determines the invoice total is incorrect. The invoice is rejected and an Exception Memo generated. 7. System determines the invoice details are outside of contract constraints or there are insufficient funds available. The invoice is rejected and an Exception Memo generated.
Preconditions	A new invoice is received and needs to be entered into the system.
Post-conditions	A new invoice has been correctly saved into the system and the paper copy filed for Accounts Payable.
Information Requirements	Vendor Name Programmer Name Invoice Number Invoice Date Period Worked Hours Worked Hourly Rate Invoice Total Contract (Master Agreement) Number Charge Unit Description of work performed
Assumptions	1. The invoice will include a timesheet and all information will be correct. 2. The invoice will be submitted on time for the corresponding pay period. 3. All work listed on the invoice has been completed satisfactorily.
Business Rules	1. A separate invoice must be submitted for each contracted programmer. Vendors cannot combine multiple programmers on one invoice.

	2. The accountant will notify the buyer via an Exception Memo if the invoice is rejected. 3. All exceptions must be corrected before the invoice is saved in the system and filed for Accounts Payable.

USE CASE NAME:	**INVOICE EXCEPTION**	**ID: UC005**
Primary Actor:	Accountant	
Brief Description:	This use case describes the procedures taken when the accounting group deems an invoice mal-formed and notifies the buyer.	
Trigger:	A mal-formed invoice has been identified.	
Main flow	This use case begins when the accountant identifies an invoice as being mal-formed, either during visual inspection or when the system returns an error message during data entry. 1. Accountant visually confirms the error message received by the system is indeed incorrect on the paper invoice and not caused by data entry error. 2. Accountant saves the invoice as “Pending Exception”, saving all data entered to this point. 3. Accountant navigates from the invoice entry screen to the Exception Memo entry screen. 4. Accountant searches for the correct buyer for the invoice based on invoice number or associated contract. 5. Accountant chooses the appropriate reason for rejecting the invoice from the drop-down menu. 6. Accountant enters any additional comments to explain the reason for rejection. 7. Accountant completes the Exception Memo and the system sends as an email to the buyer.	
Alternate flows	1a. Accountant visually determines the contract to be mal-formed before logging into the system. 1b. Accountant logs into the system and navigates to the Exception Memo entry screen. 4a. If a buyer record cannot be found, the accountant navigates to the buyer entry screen to enter a new buyer record. 4b. Accountant returns to the Exception Memo entry screen to choose buyer, reason for rejection, and enter any additional comments before submitting the Exception Memo.	
Exception flows	N/A	
Preconditions	An invoice is determined to be mal-formed, either by visual inspection or by system-generated error message.	
Post-conditions	An Exception Memo has been sent to the buyer with information regarding the reason for rejection.	
Information Requirements	Buyer Name Exception Date	

	Exception Reason Exception Comments Response Date Programmer Name Vendor Name Invoice Number (if applicable) Invoice Total (if applicable) Invoice/Contract Start Date Invoice/Contract End Date Contract (Master Agreement) Number
Assumptions	1. Buyer will respond and resolve exception issues in a timely manner. 2. Exception will be resolved before any new invoices are submitted for the same contract.
Business Rules	1. A separate Exception Memo must be generated for each mal-formed invoice. 2. Once an updated invoice has been received by accounting, the response date for the applicable Exception Memo will be updated in the system. 3. All exceptions must be corrected before the buyer resubmits mal-formed invoice.

USE CASE NAME:	**UPDATE INVOICE**	**ID: UC006**
Primary Actor:	Accountant	
Brief Description:	This use case describes the steps taken when an accountant receives an updated invoice including validation, system entry, and filing.	
Trigger:	The accountant receives an updated invoice.	
Main flow	The use case begins when an accountant receives an updated invoice from the buyer. 1. Accountant visually verifies there is a timesheet attached to the invoice and that information matches on both documents. 2. Accountant logs onto the system and navigates to the Exception Memo screen. 3. Accountant pulls up the corresponding Exception Memo to verify that original errors have been resolved. 4. Accountant returns to the invoice entry screen and locates the partially completed entry by invoice number. 5. Accountant then enters the updated and missing information including invoice number, date, period worked, hours worked, hourly rate, and invoice total. 6. System confirms invoice total entered is correct based on hourly rate and hours worked. 7. System locates the contract that corresponds to the invoice.	

	8. System verifies the invoice details are within the contract constraints and there are funds available. 9. System changes the invoice's status to "OK to Pay". 10. System saves the updated invoice entry. 11. Accountant files the paper copy of the invoice for Accounts Payable.
Alternate flows	4a. The original invoice was never entered into the system and the accountant cannot locate an existing vendor and/or programmer record. 4b. Accountant navigates to the vendor entry screen and/or the programmer entry screen to create a new record.
Exception flows	1. Accountant determines there is still missing or inaccurate information on the invoice or a timesheet is not attached. The invoice is rejected and an Exception Memo generated. 4. Accountant cannot find a contract in the system that matches the vendor and programmer on the invoice. The invoice is rejected and an Exception Memo generated. 6. System determines the invoice total is incorrect. The invoice is rejected and an Exception Memo generated. 8. System determines the invoice details are outside of contract constraints or there are insufficient funds available. The invoice is rejected and an Exception Memo generated.
Preconditions	An updated invoice is received and needs to be entered into the system.
Post-conditions	An updated invoice has been correctly saved into the system and the paper copy filed for Accounts Payable.
Information Requirements	Vendor Name Programmer Name Invoice Number Invoice Date Period Worked Hours Worked Hourly Rate Invoice Total Contract (Master Agreement) Number Charge Unit Description of work performed
Assumptions	1. The updated invoice will include a timesheet and all missing or incorrect information will be updated and correct. 2. The updated invoice will be submitted on time for the corresponding pay period or as soon as possible. 3. All work listed on the updated invoice has been completed satisfactorily.
Business Rules	1. A separate invoice must be submitted for each contracted programmer. Vendors cannot combine multiple programmers on one invoice.

	2. The accountant will notify the buyer via an Exception Memo if the invoice is rejected again. 3. All exceptions must be corrected and saved in the system before processing new invoices for the same contract.

USE CASE NAME:	**PAY INVOICE**	**ID: UC007**
Primary Actor:	Accountant	
Brief Description:	This use case describes the steps taken to submit an invoice to Accounts Payable for payment.	
Trigger:	The accountant has successfully processed an invoice and the system has assigned a status of “OK to Pay”.	
Main flow	This use case begins after the accountant has successfully processed an invoice and receives an “OK to Pay” status. 1. Accountant creates a data entry sheet that will be sent to Accounts Payable along with the processed invoice. This sheet must include vendor name, vendor number, invoice number, description, invoice date, due date, invoice total, G/L account, P.O. Number, and charge unit. 2. Completed data sheet is attached to invoice and sent to Accounts Payable to issue payment.	
Alternate flows	1. If any information requested on data entry sheet is unknown, field is left blank and process continues as usual.	
Exception flows	N/A	
Preconditions	Invoice has been successfully processed in system and status changed to “OK to Pay”.	
Post-conditions	Invoice and data entry sheet have been successfully submitted to Accounts Payable.	
Information Requirements	Vendor Name Programmer Name Invoice Number Period worked Invoice Date Due Date (date invoice should be paid by) Invoice Total General Ledger Account Number P.O. Number (if different than General Ledger Number) Charge Unit	
Assumptions	1. System successfully processed invoice and there are funds available to pay vendor and/or contracted programmer. 2. Accounts Payable will send out paycheck by due date on data entry sheet. 3. All work listed on invoice has been completed satisfactorily.	
Business Rules	1. Invoice must be submitted with data entry sheet. Missing paperwork will result in Accounts Payable rejecting payment request.	

	2. The invoice entry must be complete and saved in the system before submitting for payment.

USE CASE NAME:	**VENDOR INQUIRY**	**ID: UC008**
Primary Actor:	Accountant	
Brief Description:	This use case describes the process of receiving and responding to an inquiry from a vendor.	
Trigger:	Accounting receives an inquiry from a vendor.	
Main flow	This use case begins when an accountant receives a vendor inquiry. 1. Vendor contacts accounting with a question related to an outstanding invoice. 2. Accountant gathers vendor name, contact information, and relevant invoice number for reference. 3. Accountant logs in to the system and navigates to the invoice screen to investigate invoice in question. 4. Accountant performs a check on status of any related open exceptions to determine reason for delay. 5. Vendor is notified that the issue has been resolved and to expect a payment soon.	
Alternate flows	3a. Invoice has an exception active in the system. The system shows the accountant the status and reason for the exception. 3b. Vendor is notified that the invoice has been rejected and that the buyer should be contacting him to resolve the issue.	
Exception flows	3. If the accountant cannot locate the invoice in question, the vendor is referred to the buyer and scenario falls out of scope. Use case is terminated. 4. If the invoice exists in the system, but there is either no exception or the exception has been closed, the vendor is referred to Accounts Payable and scenario falls out of scope. Use case is terminated.	
Preconditions	Accounting receives an inquiry from a vendor requesting information about outstanding invoices.	
Post-conditions	The accountant has responded to the vendor with a resolution to their inquiry.	
Information Requirements	Vendor Name Programmer Name Invoice Number Vendor Contact Information	
Assumptions	1. There is an existing invoice in the system already. 2. The accountant can log into the system and research the vendor inquiry.	

Business Rules	1. Accounting may receive vendor inquiries via email, phone call, or letter. 2. Missing invoices are referred to the appropriate buyer. 3. Invoices with a status of “OK to Pay” are referred to Accounts Payable.

USE CASE NAME:	**INVOICE ACCRUAL**	**ID: UC009**
Primary Actor:	Accountant	
Brief Description:	This use case outlines the steps taken when an invoice is received outside of the pay period the work was performed.	
Trigger:	The accountant has finished entering a well-formed, approved invoice, but the system notifies the accountant that the invoice needs to be accounted for on a previous pay period for accurate bookkeeping.	
Main flow	This use case begins when the accountant has successfully entered an invoice from a previous pay period into the system. 1. Accountant navigates from the invoice entry screen to the accruals screen 2. Accountant locates the accrual record for the invoice he just entered. 3. Accountant updates the “period accrued” field for the invoice. 4. System verifies that the accrued accounting period is correct for the pay period on the invoice. 5. System saves the updated accrual record. 6. Accountant files the paper copy of the invoice for Accounts Payable.	
Alternate flows	N/A	
Exception flows	1. If the work was performed inside the current pay period, an accrual is not needed. Use Case is terminated.	
Preconditions	An invoice needs to be accrued on the correct accounting period.	
Post-conditions	The invoice is successfully saved in the system with the accurate accrual period and the paper copy is filed for Accounts Payable.	
Information Requirements	Programmer Name Vendor Name Charge Unit Contract (Master Agreement) number Invoice Number Invoice Total Invoice Date Period Worked Period Accrued	

Assumptions	1. Work was performed outside of the current payment period. 2. System accurately determines invoice needs to be accrued on a different pay period.
Business Rules	1. All invoices processed for accrual are correct, well-formed, and already in system. 2. A separate invoice is required for each pay period worked. Vendors cannot combine multiple pay periods on one invoice.

Proposed Solution

The data and flow of data for the proposed automated processing system for the Bank of Xanadu receives inputs from the Vendor and Buyer (Contracts) entities and outputs data to the Vendor, Buyer (Contracts), Payables, Project Manager, and Division Management entities. The Buyer (Contracts) entity provides three incoming (contract, invoice, and timesheet) data flows to the system and receives two outgoing data flows (contract exception and invoice exception). The Vendor entity provides one incoming data flow (vendor inquiry) to the system and receives one outgoing data flow (inquiry response). The Payables entity receives three outgoing data flows (data entry sheet, invoice, and timesheet), project managers receive one outgoing data flow (reports), and division management receives one outgoing data flow (reports) from the system. Refer to Figure 3 for a data flow diagram that visually depicts this information.

The new invoice processing system will automatically verify that all required information is entered, all calculations are correct, the hourly rate on the invoice matches the contract, and that there are funds available on the contract to pay the invoice. These three tasks are our priority and focus.

Contracts and invoices will still be entered into the system manually. The disadvantages and risks of automating data entry for these documents far outweigh the advantages, and scope creep would be inevitable when working to add these new functionalities. In addition, maintaining this manual invoice and contract entry process allows the new system to be much more scalable, as its use will be limited to one department. By not completely overhauling the way the accountant's work is done, training can be kept to a minimum, it will be easier to use, and product support will not have to be outsourced to vendors. If management wants to automate this process in the future, we would be happy to negotiate an addition to the new system.

Timesheets will not be entered into the system and are only used to verify invoice information before being submitted along with the data entry sheet and invoice to Accounts Payable. Errors in invoices or contracts (manually caught by an accountant prior to data entry or automatically by the system) require generating an Exception Memo, which will be created in the system and sent automatically via email to the appropriate buyer.

Reports currently generated manually for the Accounting Group, Project Managers, and Division Management will be automated in the new system and sent out monthly via email to the designated recipients. The Accounting Group will handle any required changes to these reports or requests for new reports, as they are the only employees who will receive access to this new invoice processing system. Vendor inquiries will continue to be received manually by phone, email, or letter and inquiry responses will remain manual.

The Accounting Group has been instrumental in understanding the requirements of the new system. With their intimate knowledge of the existing system, we have conceptualized an invoice processing system that will maximize productivity and minimize changes to their existing procedures. This will ensure that the accountants are able to adapt quickly to the new system, which will reduce impact to invoice and contract processing and those operations that rely on this information. The Accounting Group will continue to work closely with the Glitter Pigs team into the system design phase to ensure that the user interface meets their needs and maintains optimal functionality.

Use Case Diagram

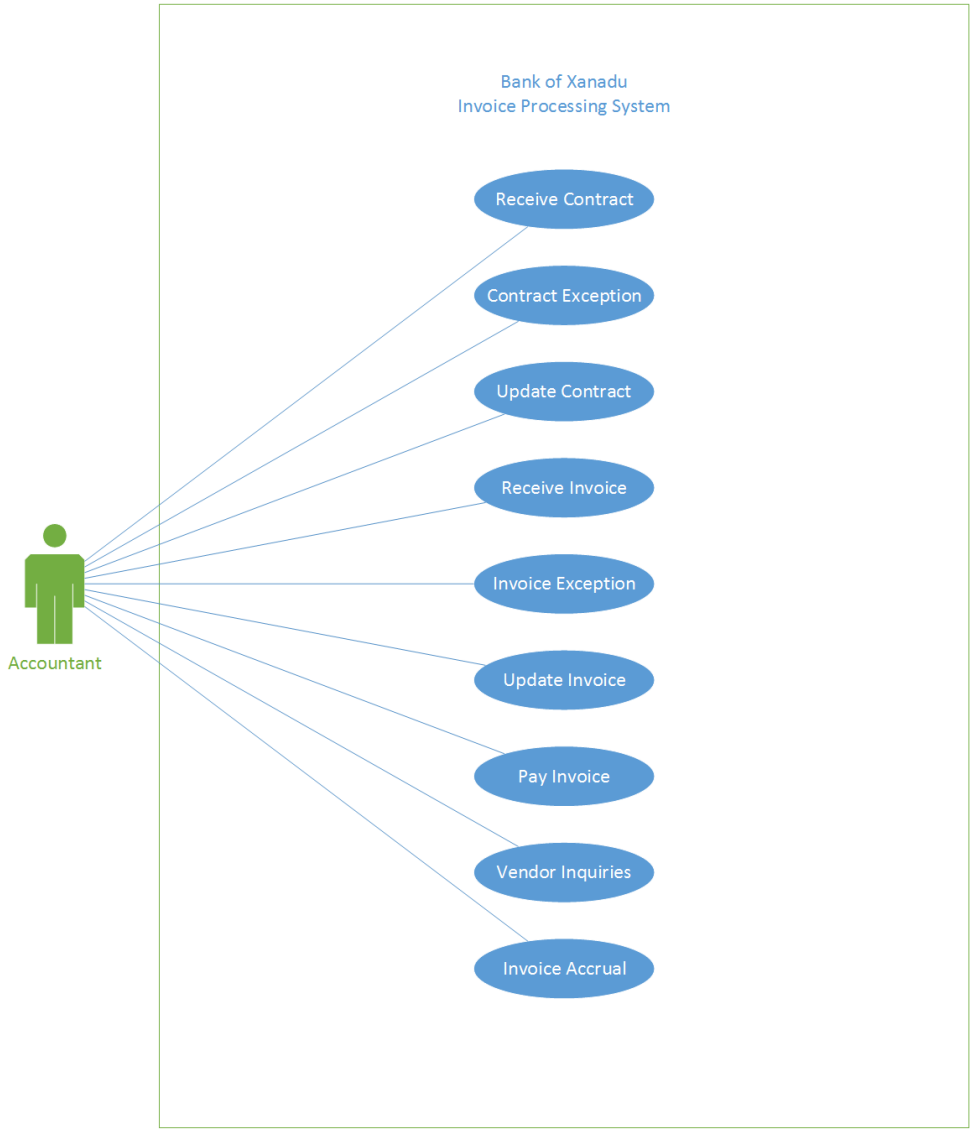

Figure 1

Functional Decomposition Diagram

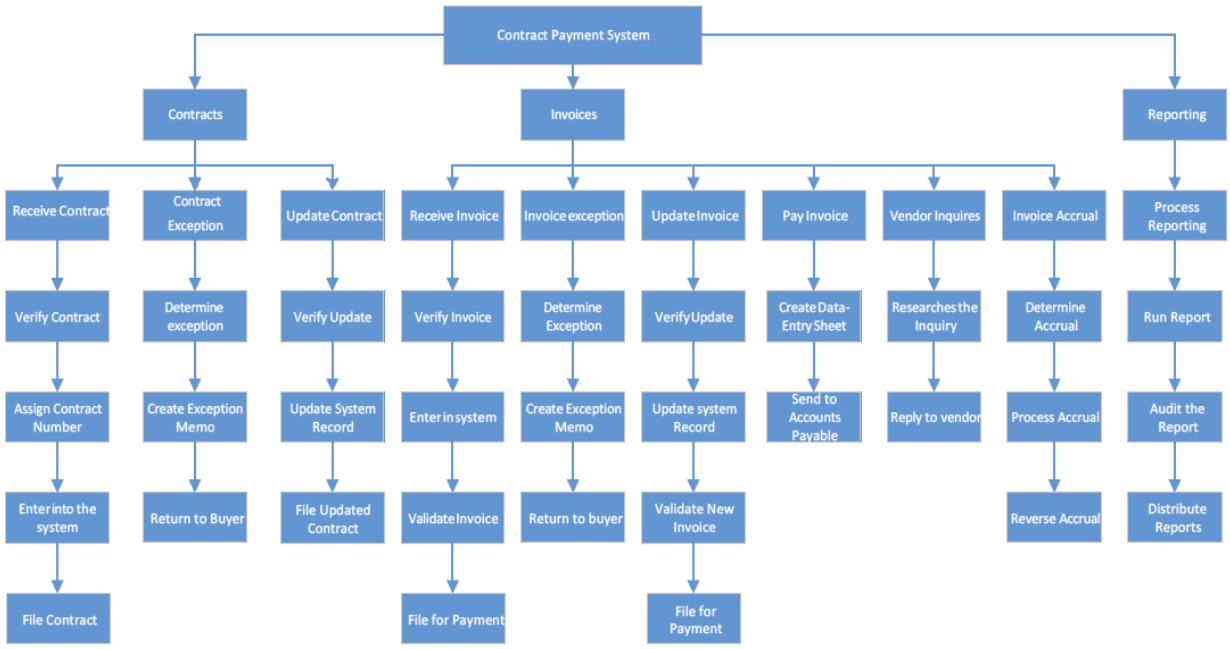

Figure 2

Data Flow Diagram

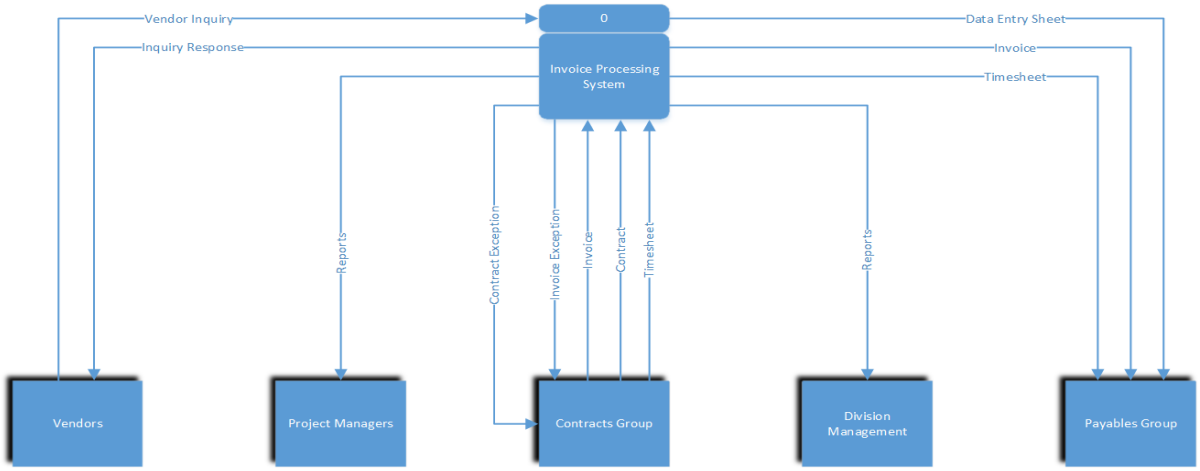

Figure 3

Users

The primary actor for the proposed automated invoice processing system is the accountant. The Accounting group is the primary actor because they will have direct interaction with the automated system. Additionally, they are the only employees at the Bank of Xanadu that will have access to the system during the pilot study of this new system, resulting in all inputted information and outputs running directly through Accounting.

Reports

All reports from the new invoice processing system will be created automatically and sent out electronically via email unless requested otherwise. This will help to limit unnecessary employee access and keep the Accounting Group wholly responsible for the new system. From the provided documentation, it is apparent that the system needs to produce five reports:

- ***Invoice Report*** – used by the Accounting Group and Accounting Manager to verify and balance invoices against contract programmer expense accounts monthly.
- ***Accrual Report*** – used by the Accounting Group and Accounting Manager to identify and process invoice expenses in the proper accounting period, not when funds are paid out.
- ***Contract Programmers Monthly Expense Recap Report*** – used by division management to monitor monthly contract programmer expenses by each bank (charge unit) that reports to that division.
- ***Contract Programmer Report (Fee Maximum vs. Accruals)*** – used by division management to monitor invoices paid for each contract, the maximum fee (total) allowed per contract, and the remaining balance on each contract.
- ***Monthly Contract Recap*** – used by project managers to verify which programmers are working for them, verify which contract the programmers are working on, and confirm the project is within budget.

These are the reports generated from the current system, but more can be added before launching the new system or as needed in the future. Accountants will have the ability to modify existing reports and build new reports to meet the needs of your organization. They will also have the functionality to modify the delivery method (email, fax, or print) and frequency of reporting (monthly, quarterly, or yearly).

Variants

Alternative 1: Invoice Automation

Rather than having the Accountants manually input invoice data, software that is capable of reading electronic and/or scanned paper invoices can be utilized to populate the required user-defined fields. It would then validate the invoice against the correct contract (input by user), and flag the account, letting the Accountant know there is a discrepancy. This has the potential to expedite invoice data entry.

Input automation is an attractive idea. However, many invoices are sent to the Bank of Xanadu on paper, and computer software still does not have a one hundred percent success rate in interpreting human handwriting. Because of this, Accountants will still have to overview the invoice data. Many, if not all, fields will be pre-populated, and it will be easy to overlook the already present data, making it difficult to keep track of what has already been checked. At this point, you are contending with not only human error, but machine error as well. This has the possibility of taking more time than it is worth.

Alternative 2: Buyer Portal

Rather than having the Accountants manually input invoice data, the Invoice Processing System could offer self-service invoice submission. Buyers would have a portal they sign-in to and enter their invoice information. They would not email or mail their invoice to the Bank of Xanadu. Upon receiving the electronic submission, the system would check for discrepancies, and flag both the Accountant and the Buyer if a discrepancy exists.

Offering Buyers an online portal could eliminate invoice input by the Accountant, and possibly reduce phone calls from Buyers. Buyers have some piece of mind because they have automatic confirmation that their invoice was received. On the other hand, Accountants will not have a physical copy of the invoice, Buyers will need to be trained how to input their information, and some could require a large amount of support in using the portal. Buyers might resist using the portal out of dislike for the self-service invoice submission process, and continue to send in their invoices, which defeats the purpose.

RECOMMENDATION

After evaluating the viable alternatives, the Glitter Pigs team has determined that the automated invoice processing system is the best solution.

This new system involves the continuation of manual invoice and contract entry, which is best for the Bank of Xanadu. Maintaining the processes of manual contract entry will make for the smoothest transition. When weighed against alternatives, we have found that it will be more advantageous to the project, and accountants, as a whole.

By having the Glitter Pigs team fully customize the system to automate contract and invoice verification and storage, any issues that may arise can be quickly addressed. Launching the system in other branches will be relatively easy because third party technology need not be used.

This System Requirements Document has aided in a deeper understanding of what the Bank of Xanadu's invoice processing system must achieve. The automated system we are proposing fixes shortcomings of the current system. The next step will be to design the system, which includes a preview of the user interface, application of business rules, and setting up data and system structures.

Page intentionally left blank

APPENDIX

Correspondence

Bank of Xanadu

Corporate Headquarters: George Town, Cayman Islands
Major Banking Centers: Amsterdam • Atlanta • Auckland • Bellevue • Berlin • Dallas • Hong Kong • Johannesburg • Kuala Lumpur • London • Los Angeles • Mumbai • New York • Paris • Toronto • Santiago • Sao Paulo • Shanghai • Singapore • Sydney •Tokyo • Zurich

Information Systems Work Request

Date	1/25/15	Department	Accounting
Contact	Patrick Jay	Location	Bellevue, WA
Title	Vice President, & Manager	Email	pjammer@box.bank

Project Description (in brief):

The strategic direction and growth of the bank has put new emphasis on streamlining our internal procedures. Xanadu Bank is in the business of banking, and to remain profitable and competitive, focus has shifted toward concentration on our core competencies, outsourcing any functions and processes that are not part of these core business operations. Since this process began late last year, we have redeployed all in-house programming positions, resulting in the need to use outside contractors to provide the necessary programming services. This move will save our company over one 1 million dollars annually in employee administrative and benefit costs.

The major problem we face now is finding a suitable way to track these new programming expenses to the scope of service stipulated in their official contracts. While the accounting department has hastily thrown together a stop-gap solution using a spreadsheet application, it is taking an incredibly large amount of time to manually enter all the contractual information, receive and process the incoming programming invoices, prepare accurate accruals, respond to vendor inquiries, and generate accurate monthly financial reports.

The THREE most important functions the new system must perform are to determine whether each billable invoice falls within the contract time limitations (start & end dates), specifically if the work performed and billed on the invoice falls within the valid contract date range. It must also verify the hourly rate billed on the invoice matches the hourly rate stipulated on the contract. Finally, it must calculate whether there is enough funding left on the contract to pay the invoice.

In recent strategic planning sessions, the senior management has determined that there is a desperate need for a new, more automated process for managing contract payables. The *objective* of this project is to investigate and recommend a solution to control payments in accordance to contractual time and fee limitations throughout the company. Once approved, the winning team will design and implement the chosen solution for use within the Bank's various accounting departments.

Submitted by: _____ Date _____

Approved by: _____ Date _____

Bank of Xanadu is a fictitous enterprise, developed for use by CIS 233
Use of materials is solely intended for educational purposes.

Figure 4: Information Systems Work Request

Source Documents

Bank of Xanadu

Corporate Headquarters: **George Town, Cayman Islands**
Major Banking Centers: **Amsterdam • Atlanta • Auckland • Bellevue • Berlin • Dallas • Hong Kong • Johannesburg • Kuala Lumpur • London • Los Angeles • Mumbai • New York • Paris • Toronto • Santiago • Sao Paulo • Shanghai • Singapore • Sydney •Tokyo • Zurich**

CORPORATE HEADQUARTERS: ***George Town, Grand Cayman***

Chief Executive Officer (CEO)
Patrick Dollarene
Chief Financial Officer (CFO)
Sanjay Rupeedaal
Chief Information Officer (CIO)
Isabella Realney
Chief Operations Officer (COO)
Hyacinth Randall

Executive Vice President (EVP)
Carmelita Pesolera
Senior Vice President (SVP)
Richard Poundstone
Vice President (VP)
Dieter Markstein
Assistant Vice President (AVP)
Keiko Yennokai

(Sample)
BRANCH OFFICES

Bellevue, WA
Sr. Vice President
Anne Casey
Executive Secretary:
Beth Rice

Contract Group
Manager: Scott Sorenson
Rob Watt
Sam Esposito
Mark Martin
David Hart
Jagreet Kaur
Anthony Lewis

Accounting Group
Vice President/Manager:
Patrick Jay
Dave Spencer
Kyle Watts
Tamisha Spencer
Misty Barber

Payables Group
Manager: Lyle Newhart
Dawn Hill
Mark Martin
Ho Lee
Bill Loos
Lane Conway
John Wallace

Pine Valley, NY
Sr. Vice President
Leonard Chou
Executive Secretary:
Jan Lawrence

Contract Group
Manager: Cara DeSoto
Annie D'Ogie
Joyce Donahue
Ray Ortiz
John Ackerman
S. Nelson-Leang
Tuan Tran

Accounting Group
Manager: Roy Brown
Shelly Grant
Tom Leman
Pilita Basto
E Osei-Shearman

Payables Group
Manager: Robert Stacy
Amy Hawkins
Leslie Hall
Waylon White
Susan Cooper
Ed Eowpun'
Tereasa Skelly

Berlin, Germany
Sr. Vice President
Louisa Gartner
Executive Secretary:
Darth Weitmeier

Contract Group
Manager: Joachim Mohr
Karl Meister
Steffi Freund
Paula Grossman
Gerhard Arnott
Tobias Stein
D Voigtsberger

Accounting Group
Manager: Franz Neuman
Karin Kratz
Stephan Niebur
Dieter Janssen
Astrid Gutentag

Payables Group
Manager: Astrid Dorftier
Gunther Merckel
Hans Meistersohn
Rudi Schertz
Walter Lehmann
Martin Edelmann
Gert Fromme

Bank of Xanadu is a fictitious enterprise, developed for use by CIS 233
Use of materials is solely intended for educational purposes.

Figure 3: Bank Organization Chart

Bank of Xanadu

Date: February 10, 2016

From: Dave Spencer, Accountant
Financial Controller's Division
Corporate General Accounting #3707

To: Rob Watt, Buyer (Contracts)
Technology Acquisition Management #3411

Classification: Internal

Subject: **CONTRACT OR INVOICE PROBLEMS**

Vendor:

I am unable to process the attached contract or invoice:

()	No Contract on File
()	Contract has errors or is missing information
()	Dollar Amount Exceeds Contract Fee by $
()	Invoice Period Outside of Contract Dates
()	No Time Sheet
()	No Invoice/Time Sheet Approval
()	Time Sheet & Invoice Discrepancy
()	Billed Rate Different from Contract Rate
()	Other Invoice problems
()	Other Contract problems

Please provide the necessary information and return to me in unit #3707. Thanks you for your assistance in resolving these problems. If you have any questions, please call me at XanaduNet 785-1223.

Attachment included.

DATE	ACTION

EXCEPTION_MEMO_2016_v3.docx Rev. 2/10/2016

Figure 4: Exception Memo

APPENDIX A

AGREEMENT TO PROVIDE PERSONNEL BETWEEN
Bank of Xanadu (BANK) and:

DAN VAN RITZ, INC. (CONTRACTOR)

I. All work and/or services provided under this Appendix shall be performed in accordance with the provisions of this Appendix and Master Agreement: #90-3167

Project/Services Number 16358.000 Charge Unit #: 3620

Bank Project Manager/Phone: Peter Townsend 206-675-2696

II. Scope of Services:

A. PROVIDE AN OVERVIEW OF THE PROJECT:
Support product development projects, as well as acquisition preparation for Demand Deposit Systems.

(See attached sheet for continuation of Scope of Services) RITZ0415

III. Fee Schedule: Total fee shall not exceed $ 52,000.00

Name of Individual	Generic Job Level	Hourly Rate	Start Date	End Date
Dan Van Ritz	CSE	$65.00	12/16/14	4/15/15

A NEW APPENDIX A MUST BE EXECUTED TO AUTHORIZE PAYMENT BEYOND THE AMOUNT NOTED ABOVE IN III. FEE SCHEDULE, OR TO AUTHORIZE WORK BEYOND THE COMPLETION DATE NOTED ABOVE

Agreed and Accepted:
DAN VAN RITZ, INC (Contractor)
Signature: Dan Van Ritz
Vendor Officer: DAN VAN RITZ
Title: President
Date: 12/15/14

Agreed and Accepted:
BANK OF XANADU (Bank)
Signature: Maryanne Kerrigan
Name: Maryanne Kerrigan
Title: Vice President
Date: 12/14/14
Countersigned: Charles Skeateas
Name: Charles Skeateas
Title: Vice President
Date: 12/15/14

Bryce Hazen
Bryce Hazen, Senior Vice President

Send Invoices to:
Bank of Xanadu
General Accounting #3707
P.O. Box 37000
Bellevue, WA 98002
Attn: Dave Spencer

Page 1 of 2

Figure 5: Contract Sample, page 1

AGREEMENT TO PROVIDE PERSONNEL BETWEEN
Bank of Xanadu (BANK) and:

DAN VAN RITZ, INC. (CONTRACTOR)

II. Scope of Services Continued:

B. LIST THE SPECIFIC TASKS TO BE PERFORMED:

Complete systems design specification
Analyze and code in C# (C sharp)
Perform unit, system, and integration testing
Provide installation support

C. LIST THE DELIVERABLES EXPECTED TO BE PRODUCED:

Detailed design specifications
Code
Test specifications
Unit testing, system testing
Conversion specifications
Installation specifications

D. LIST THE SPECIFIC TECHNICAL EXPERTISE REQUIRED (HARDWARE, OPERATING SYSTEMS, PROGRAMMING LANGUAGES, ETC.)

IBM 30XX, TSO/ISPF, OS JCL, VSAM
Ability to analyze and code in C# (C sharp)
Design, coding, and testing skills
Accounting systems background required, banking preferred.
Deposit systems/prior acquisition experience a plus
Prior Bank of Xanadu experience a plus
Strong communications and documentation skills
Team player with good interpersonal skills

E. LIST THE PERFORMANCE STANDARDS THAT WILL BE USED TO DETERMINE QUALITY OF WORK (E.G. SDP, DOCUMENTATION STANDARDS, TESTING STANDARDS, ETC.)

Adherence to project standards
Code reviews
SDP
Test plans and test result reviews

Page 2 of 2

Figure 6: Contract Sample, page 2

Dan Van Ritz Consulting, Inc
5820 Stoneridge Road Suite 100
Issaquah, WA 98506
425-555-1212

INVOICE

INVOICE #100154

DATE: JANUARY 16, 2015

TO:
Bank of Xanadu
General Accounting #3707
P.O. Box 37000
Bellevue, WA 98002

FOR:
Master Agreement #90-3167
Charge Unit #3620

PERIOD:	1/1/15 – 1/15/15	TERMS:	ON RECEIPT
HOURS	DESCRIPTION	RATE	AMOUNT
88	Computer Programming/Consulting Services	$65.00	$5,720.00
	RITZ0415		
		TOTAL	$5,720.00

Make all checks payable to Dan Van Ritz Consulting, Inc

Thank you for your business!

Figure 7: Invoice

TIME SHEET

PERIOD OF: 1/1/2015 — 1/15/2015

DAN VAN RITZ CONSULTING, INC.
5820 Stoneridge Road Suite 100
ISSAQUAH, WA 98506
425-555-1212

CONTRACTOR NAME: Dan Van Ritz	**TITLE:** Programmer/Consultant
CLIENT COMPANY: Bank Of Xanadu	**SUPERVISOR:** Peter Townsend

CALENDAR DAY	HOURS WORKED	CALENDAR DAY	HOURS WORKED
1	8	16	
2	8	17	
3		18	
4		19	
5	8	20	
6	8	21	
7	8	22	
8	8	23	
9	8	24	
10		25	
11		26	
12	8	27	
13	8	28	
14	8	29	
15	8	30	
		31	
TOTAL HOURS:	88		

EMPLOYEE SIGNATURE: *Dan Van Ritz*	**DATE:** 1/15/2015
SUPERVISOR SIGNATURE: *Peter Townsend*	**DATE:** 1/16/2015

Figure 8: Time Sheet

Bank of Xanadu
Corporate Headquarters: **George Town, Cayman Islands**
Major Banking Centers: **Amsterdam • Atlanta • Auckland • Bellevue • Berlin • Dallas • Hong Kong • Johannesburg • Kuala Lumpur • London • Los Angeles • Mumbai • New York • Paris • Toronto • Santiago • Sao Paulo • Shanghai • Singapore • Sydney •Tokyo • Zurich**

Date: Friday, 11/30/14
To: Bank of Xanadu Bellevue Employees
From: Anne Casey, Sr. Vice President
Subject: MAJOR ANNOUNCEMENT

This will give you advance notice of a story that will be reported in tomorrow's newspapers. At a press conference today, the Bank of Xanadu board of directors announced that the company would immediately acquire Utopia National Bank, including their corporate headquarters and all 550 of their branch offices, for a sum of $20.1 billion dollars. This acquisition will greatly increase our global influence in Europe, Africa, and the Asian marketplace. This opportunity will expand our operations into eight new international cities, including Madrid, Copenhagen, Rome, Cairo, Bangkok, Taipei, Manila, and Seoul, and add over 400 domestic branches – primarily in America's heartland. We are excited about this acquisition, and welcome Utopia into the Xanadu fold.

During our recent strategic planning meetings, we examined external opportunities and internal constraints of our business. We identified several fast-growing areas of banking that might represent new opportunities for Xanadu. We found that bringing Utopia into our business model would present the best opportunity for us to expand not only our global exposure, but also to expand our customer base and increase the available services that we can offer our customers. While Utopia will provide us a wider array of banking opportunities, we will need to streamline both business process models into one seamless operation in order to maintain economic profitability.

As a result, we decided to consolidate operating and networking systems into one global system. We have successfully recovered from the sub-prime mortgage fiasco that resulted in damaging losses for Xanadu, and particularly disastrous losses for Utopia. With losses in the billions of dollars, Utopia has continued to struggle unsuccessfully to operate as a financially profitable organization. This has allowed Xanadu to execute a quick-and-dirty hostile takeover of their organization. With this said, we must now focus on our core competencies in order to maintain financial profitability. After much strategic planning, we have decided to outsource all computer system programming and consulting duties that we once held in-house to outside contractors. We project that this will result in substantial annual cost savings in employee administrative and benefit expenses.

To address this constraint, we have decided to temporarily reorganize our IT resources and assign higher priority to internal projects that will streamline our procedures. As Xanadu employees, you know that our company always has looked ahead to the challenges and opportunities of the future. Our long-term mission is to grow ourselves into the largest and most profitable banking organization in the world – one that is essentially "too-big-to-fail". Our corporate values and the high-quality services we provide are the cornerstone of our success. In a market where many banks and thrifts have failed, we have been able to stave off serious financial distress and with the acquisition of Utopia, believe we have positioned ourselves to sustain our recovery, and continue to grow our product and services worldwide. Our financial analysts and advisors have much work to do to complete the acquisition of Utopia. We will scrutinize all internal procedures and external market opportunities. If all goes as planned, we expect to see increased profits within the next two to three operating quarters. Thank you all for your hard work and dedication.

Bank of Xanadu is a fictitious enterprise, developed for use by CIS 233
Use of materials is solely intended for educational purposes.

Figure 9: Company Memo

Research Project #1 – Background and Problem Information

Company Background

Bank of Xanadu is a large global enterprise that offers a variety of products and services to a customer base of over 10 million people worldwide. They have over 100,000 employees worldwide. Corporate headquarters is located in exotic and tropical George Town, Cayman Islands, although the company originally started in Bellevue, Washington. With 22 major banking centers worldwide, there are currently over 2000 additional branch offices located in both the United States and 15 countries across the globe.

Major banking centers located in the U.S. include Bellevue, Los Angeles, Dallas, Atlanta, and New York. Overseas banking centers are located in The Netherlands, Germany, Australia, South Africa, Singapore, China, Great Britain, India, France, Canada, Chile, Brazil, Switzerland, Japan, and New Zealand. The corporate headquarters employs about 500 people and each of the major banking centers has between 500 and 1000 employees apiece. In addition to the major banking centers, smaller satellite branches employ anywhere from 25 to 50 employees each.

Three young entrepreneurs, who previously worked for large banking conglomerates, founded the original company in 1978. They believed that by combining their successes and their expertise in the banking industry, they could eventually grow their little thrift into an internationally recognized banking enterprise. Originally, there were just three small branches in the Puget Sound area of Washington State. It was one of the first to implement a policy of putting the customer first, no matter what. The company slogan, "No Boundaries", truly describes the personality of the company and its founders.

A tried-and-true methodology that assured quality and exceptional customer service is what made the company successful. What were once three small branches soon grew into a statewide operation. It was not long before they had expanded across the entire Northwest and down into California. After more than a decade and over a dozen merger/acquisitions, what was once called Swellvue Savings & Loan had grown into the Bank of Xanadu and had become a truly global brand. Growth continued at breakneck speed, and by 2007, they had morphed into the gigantic worldwide banking behemoth they continue to be today.

In early 2000, the board of directors decided to move corporate headquarters to George Town Cayman Islands, where the bank could enjoy all the tax benefits of offshore operations. Because of no direct taxation, the islands have become a thriving center for financial operations. More than 68,000 companies have registered in the Cayman Islands including almost 500 banks. Each of the bank's domestic major banking centers is strategically located throughout the United States. Many smaller branch operations have spread out from these larger centers or "hubs". While most

Bank of Xanadu is a fictitious enterprise, developed for use by CIS 233
Use of materials is solely intended for educational purposes.

Figure 10: Background Information, page 1

remain in close proximity to their "parent" center, some may lie as far as 1500 miles away.

In the U.S., each of the smaller local branches reports directly to one of the major banking centers, which in turn reports directly to the corporate office. Worldwide, each of the international banking centers functions as a pseudo-independent entity within its respective country, but still reports directly to the corporate offices as well. Each major banking center has its own administrative, accounting, and human resources functions, which they provide to their respective branches. The corporate office provides a similar structure that reaches out to the U.S. and international banking centers.

Major banking centers employ a wide variety of job descriptions, including contract, accounting, loan, and retail branch personnel. Each banking center also has traditionally had an internal IT staff of 15 to 20, comprised of programmers, analysts, network support staff, and help-desk personnel. The internal IT staff maintains corporate systems and supports database development and programming. Major banking centers process their own expenses, including those for payroll, utilities, real estate, and technology assets, just to name a few. The corporate office usually handles expenses just for its own operations, although it oversees operations for the entire enterprise worldwide.

The Problem

Over the years, as the bank has continued to grow, it has always had a policy of having all its workers hired directly as employees of the company. Recently, having survived the economic downturn and now stronger and bigger than ever, senior management has decided to further streamline operations and focus more closely on the bank's core competencies. Outsourcing all non-essential business functions not directly related to the business functionality of banking would allow them to save millions of dollars annually in terms of human resource overhead.

Because of this shift in corporate vision, the bank redeployed almost 100 of the company's contract programmers and certain business analysts working in the U.S. Outside contractors working under very specific contractual terms will handle all future programming. Currently, the bank does not have an automated system to handle these contractual payments, and has delegated the task of managing such payments to the accounting group at each major U.S. banking center.

Thus, to assess this problem, and in order to recommend appropriate solutions, the bank has assembled a dedicated team of IT professionals to work on this mission. They chose the Bellevue banking center for this pilot project, as it was the original headquarters and senior management is closer to employees at that location. Xanadu has chosen all of you to be on this very special development project. You have already been assigned to teams to work together to plan, investigate, analyze, recommend, design, and implement a solution to Bank of Xanadu's problem.

Bank of Xanadu is a fictitious enterprise, developed for use by CIS 233
Use of materials is solely intended for educational purposes.

Figure 11: Background Information, page 2

Assumptions

- Additional costs and resources are available to train staff and perform administrative duties.

Issues

None at this time.