Software Solution

American Video Game Company

CRM Integration

A Data Management Solution for a Growing Business

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A. INTRODUCTION

The American Video Game company has urged its desire to create a new Customer Relationship Model (CRM) system. A Customer Relationship Model is a business strategy that establishes how the relationship between a business and its distinct customers should be dealt with and managed in order to improve customer satisfaction. Most companies employ a form of CRM since it aids in the attraction of new customers and the retention of current customers, which in turn leads to maximizing the business's profits. Hence, it is beneficial for the American Video Game company to have a strong CRM system in order to thrive. The following sections will establish the company's overall state, list the requirements for an exemplary CRM system, establish the best software development strategy, implement the best software developmental cycle design, and establish distinct testing methods to achieve functionality.

A.1. PURPOSE STATEMENT

The purpose of this report is to provide a suitable Customer Relationship Model (CRM) system that sets to replace the current obsolete CRM system.

A.2. OVERVIEW OF THE PROBLEM

The American Video Game Company has met with a system management obstacle caused by the enormous financial growth it incurred through its presence in the video game industry. During its past two years, sales went up an extraordinary 42% and its continuous flourishment has forced the company to abandon its current CRM system in exchange for an improved and more scalable CRM model. As more customers interact with the company, the system will eventually reach a bottleneck that will negatively affect business by decreasing response time as well as throughput.

A.3. GOALS AND OBJECTIVES

Goals and objectives of the new CRM system:

- The system must unite all business and contact information.
- The system manages and tracks different activities such as sales and keeps records.
- The system is capable of being improved and scaled.
- The system must have an easy-to-use and user-friendly UI.
- The system can manage data including manipulation, extraction, deletion, and accesses based on user privileges.

A.4. PREREQUISITES

Number	Prerequisite	Description	Completion Date
1	N/A	Receive a document establishing the specific Customer Relationship Management requirements for the American Video Game company.	05/01/2022

2	Receive CRM requirements Document	Review the document to ensure all the provided requirements are easily understandable. Either accept the document, or reject it and contact American Video Game company to gain further information on anything vague.	05/07/2022
3	Accept the provided CRM requirements document	Estimate a budget from the start to finish of the project given the proposed CRM requirements and the environment of the business.	05/07/2022
4	Previous steps	Provide a document comparing the current CRM system and its better replacement.	05/14/2022

A.5. SCOPE

The project begins with a discussion of two business requirements, two user requirements, and a functional requirement. Given that the main objective of this report is to implement a new CRM system, solutions presented to solve these requirements relate to areas of customer management. Additionally, the company's proposed software methodology, the waterfall method, will be compared to the agile methodology which is expected to be more suitable based on the scope of the project. Finally, this document lays out areas of the design and presents a guideline for testing different aspects of the project.

This project is a proposal for the replacement of a current CRM system that has become obsolete. It does not go beyond the area of business-to-customer relationships and is therefore not a solution to other problematic systems within the business. For example, the project will not solve problems regarding supply chain management.

A.6. ENVIRONMENT

The software system is hosted in a cloud-based model and must be compatible with computers, tablets, and both iOS and Android mobile devices. Additionally, this software system must be compatible with the latest operating systems and browsers which include:

- Chrome
- Firefox
- Linux
- Internet Explorer
- Opera
- Safari

B. REQUIREMENTS

The CRM requirements report provided by the American Video Game company has a diverse number of needs the system should address. These requirements can be broken down into three main parts: business requirements, user requirements, and functional requirements. Listed below are solutions involving two business requirements, two user requirements, and a functional requirement.

B.1. BUSINESS REQUIREMENTS

The newly established system requires serving a total of 2,000 end users with an estimate that at most 500 users will be using the system at a given time. These numbers will grow as the company itself becomes bigger. Also, the tools set out by this system are to be distributed throughout several offices and employees working remotely. Our CRM system addresses this problem by being a fully scalable cloud-based system that can adapt to a dynamic environment. It tracks both the number of current users and the number of users accessing the resource at a single point in time. It uses both measures to adapt and grow as business users increase.

Another specified business requirement claims that users' data must remain safe, secure, and within the boundaries of the United States at all times. The new system implements high-security restrictions that prevent modified, extracted, and appended data from leaving the United States. Since this regards a legal matter, sharing data with sources outside the country is limited to only employees with the highest authority. Authorized employees are prompted with two pop-up messages warning them of the action they're about to perform. After this, two other high-level employees need to confirm and sign the data-sharing process. Finally, a request is sent to the user with the highest level of privilege who either approves or denies the request.

B.2. USER REQUIREMENTS

The system solves the requirement that the software product should be clean and user-friendly by providing an easy-to-use user interface. The software displays a very neat, clean format that contains buttons and labels for the user to interact with. Furthermore, the software has updates installed automatically via the cloud for employees working inside the offices or headquarters. Those working remotely are prompted to install updates via a pop-up before the beginning of their shift.

Another user requirement establishes that the system should be compatible with the provided browsers: chrome, firefox, internet explorer, Linux, opera, safari, mobile devices, and tablets. Users accessing the CRM system with an unauthenticated web browser will be denied access and made aware of the reason. The system redirects the user to a webpage displaying a message that the operating system or browser they are using is not supported. The webpage they're redirected to lists several links containing embedded supported browsers the user can click on and download.

B.3. FUNCTIONAL REQUIREMENTS

Functional requirements specify what a system does. The CRM requirements report mentions that the system should be able to create various reports on all data. The reports should allow for data to be manipulated, extracted, queried, and filtered based on a predefined user interface. Our software solution addresses this by providing an interface where a user can query, manipulate,

extract, and filter data from a selected report. For example, a manager can select from the ‘customer’ table and extract an employee’s information to figure out the salary and bonuses they are currently receiving.

C. SOFTWARE DEVELOPMENT METHODOLOGY

The American Video Game company has proposed to use the waterfall methodology which breaks a project into five steps: requirements, design, implementation, verification, and maintenance. The steps are sequential, one must be fully completed before going into the other. Though the waterfall methodology has its merits, the agile methodology would be a greater benefit for this company. The agile methodology emphasizes collaboration and involves continual growth, iteration, adaptability, and delivery throughout the whole process. Below is a list of advantages and disadvantages that compares both methods and emphasis why the agile methodology is a better choice for this specific project.

C.1. ADVANTAGES OF THE WATERFALL METHOD

- **Straightforward**. The waterfall method contains a very straightforward approach to managing a project which diminishes complexity. It allows everyone involved to know and understand in which stage they are, and which stage(s) have been completed.
- **The end goal is clearly known**. Each stage of the waterfall methodology has a set of risks it must eliminate as well as small accomplishments it must surpass. The final stage has a clear, well-defined primary end goal. All of this information is known before the start of the project with the focus remaining on accomplishing a static end goal.
- **Allows for a nondynamic project**. Expenses and project structure are known and can be accounted for before the project begins. Project developers can remain confident that both won't change.

C.2. DISADVANTAGES OF THE WATERFALL METHOD

- **Lack of flexibility**. The waterfall method does not account for unexpected changes that might surge during the stages of the software development lifecycle. Customer and business demands might change during the development of the software.
- **Doesn't account for unexpected risks**. The method is not adaptable to unexpected risks that might occur during the software development cycle since only well-known and highly probable risks are accounted for. A prominent unexpected risk can unbalance the stages of development causing major chaos.
- **Difficult to estimate project completion time**. Since each stage of the developmental cycle is sequential, each antecedent stage must be completed before moving on to the next descendant stage. It might be difficult to predict how long each predecessor stage might take to complete, therefore, the predicted completion time of the project might be a vague estimate far from the actual completion time.

C.3. ADVANTAGES OF AGILE

- **Delivery of a low erroneous system**. Allowing feedback during the stages of development leads to the delivery of a system with the least number of errors and that best matches customers' demands.
- **Adaptability**. The system can adapt to changes and unexpected risks that might occur during the stages of development.

- **Increase profitability**. The agile methodology is an ever-changing one that doesn't seek to perfect a system, but rather analyzes the current environment and adapts to it. Adapting to the current environment satisfies current customers and attracts new ones. Since customers are the revenue bringers, profitability increases.

C.4. DISADVANTAGES OF AGILE

- **Complex**. Agile methodology is more complex than the waterfall approach which in turn may lead to more time spent trying to establish goals, risks, procedures, and other crucial information to set the blueprint for the software development cycle from start to finish.
- **Dynamic goal(s).** Since agile methodology emphasizes changing its goal(s) based on the demands of a changing environment, many minor goals as well as the end goal can change throughout the different stages forcing the team to adapt and take a new approach to handling the system.
- **Extensive time and commitment**. Interactions between the consumer and the project managers can allow for great feedback but at a cost, more time is allocated to the program due to extensive communication between the two parties.

C.5. BEST SUITED

Given the comparison listed above, the agile methodology proves to be the best software development approach for the American Video Game company. This fits our project since our desired outcome is a CRM system that is user-friendly and exceeds user needs. The agile methodology emphasizes continuous improvement by requesting customer and business feedback throughout the stages of development. This in turn leads to errors being detected and solved early on. Furthermore, this company has 2,000 users and it is estimated that up to 500 users will be using its software systems at one time, therefore agile methodology is the best since it will adapt to an increasing user size. Given the magnitude of this project, the agile approach would be able to deliver a scalable system within the fastest amount of time and with the least number of errors.

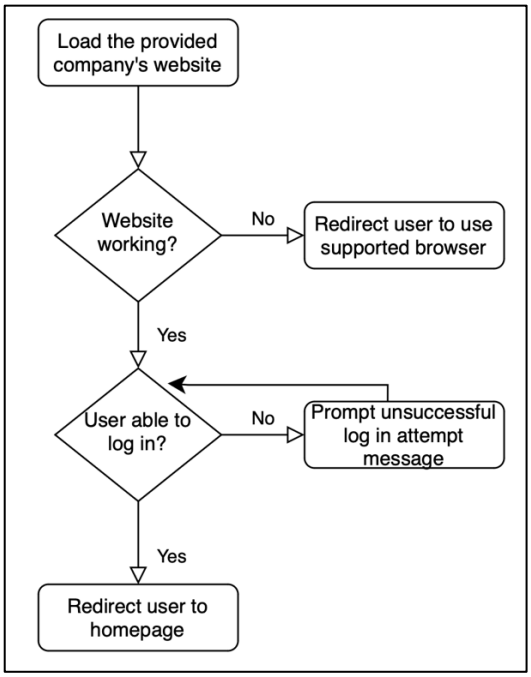
D. DESIGN

The design of the new CRM system is minimalistic with a very clean user interface. Also, any sensitive information, such as a password being typed, is blurred out to meet security standards. Below I have provided two designs that meet and exceed business requirements for the CRM system: a flowchart showcasing the steps a user takes to log in and a GUI mock of a login screen.

D.1. FLOWCHART IDENTIFYING LOG-IN STEPS

The following flowchart identifies the steps a user takes to log into their account. The user begins by loading the website. If the website loads, the user will be prompted to log in. If it doesn't load, a message displays information regarding why the website didn't load properly. Most of the time the user isn't running a supported browser, so they are redirected to a webpage letting them know their browser isn't supported. Also, the webpage they are redirected to provides a list of links containing supported browsers they can download. After downloading and installing a supported browser, the user can now load the website and attempt to log into the system. An unsuccessful login attempt provides a nonintrusive popup letting them know the username and password combination wasn't found and to please try again. If the username and password combination is found, they are redirected to the homepage where they can manage their account and data they have been given access to.

Figure 1: Sample Flowchart

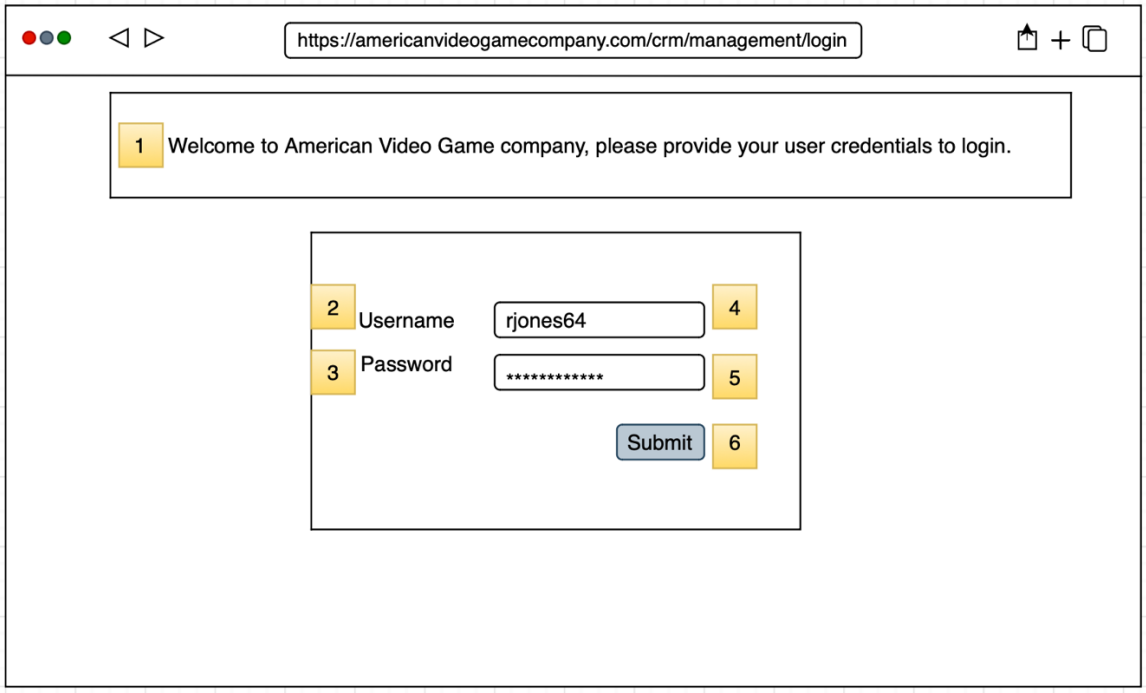


D.2. GUI FOR MANAGEMENT LOGIN SCREEN

The design below presents the display of a laptop screen a user sees when attempting to log into the website where the CRM system is hosted. The user is prompted to enter both their username and password to log in. A failed password attempt triggers a pop-up that tells the user to try again.

The password typed is hidden with asterisks replacing each character in order to diminish the security issue. Also, the UI is clean which establishes an easy-to-learn system for employees.

Figure 2: Sample GUI Mock-up



ID	Control	Property
1	Textbox	Textbox welcomes the user letting them know they are on the correct website.
2	Text	Text displaying “username” serves as a guide.
3	Text	Text displaying “password” serves as a guide.
4	User input	User input where user enters their username.
5	User input	User input box where user enters their password.
6	Button	Button to submit user’s input and either allow or deny access.

E. TESTING

E.1. TESTING THE SYSTEM

This section provides the testing needed to bring a fully functional, scalable, and secure system to the market. An outline describing testing procedures for three distinct functional aspects of the system is laid out. Areas to be tested include the system's functionality with different browsers, scalability with a growing user base, and security based on established restrictions.

E.1.1. TESTING THE BROWSER DETECTION PROCEDURE

Requirement to be tested The CRM system must let a user know that an unsupported browser is being used.
Preconditions: Download and install LambdaTest, a cross-browser system emulator used to test different versions of different browsers.
Steps: 1. Load your system into LambdaTest. 2. Select a browser and version not already tested to run the system within the emulator. 3. If the selected browser is supported, play around to test its functionality, and make a note of any discrepancies. 4. If the browser is not supported, the tester should be redirected to a link where they are prompted to download and use a supported browser. 5. Click and download a supported browser from the redirected link. 6. Clear any cache or cookies from the acquired browser. 7. Attempt to load the system into the acquired browser. Make a note of its working conditions. 8. Repeat steps 1-6 for each version of every browser within the emulator.
Expected results: When loading the system into an unsupported browser the tester is redirected to a link that prompts them with an error message and multiple supported browsers they can download. When loading the system into a supported browser, the system should be fully functional.
Pass/Fail: **Pass**. The system behaves as expected when both a supported and an unsupported browser are used to load the system.

E.1.2. TESTING THE SYSTEM IS ABLE TO SUPPORT A LARGE USER BASE

Requirement to be tested
Test that the system can sustain a large user base with at least 2,000 individuals and can adapt to more users joining.
Preconditions:
Create the server used to host multiple users. Also, download and install LoadRunner, a software testing tool used to measure performance under load.
Steps: 1. Using LoadRunner, create a large batch of 2,500 fake customers. 2. Start by loading 2,000 users into your system. 3. Simulate 600 of those users utilizing your system all at the same time. 4. Record any discrepancies, errors, lag, and other issues that might occur with multiple users utilizing the system simultaneously. 5. Increase your user base gradually by 25% from 2,000 users to 2,500. 6. Make note of any faults on the server or user side.
Expected results: Both the servers and fake user accounts should run without any severe lag or errors. For example, a user should be able to run the system without major lag caused by a high number of users utilizing the system within a given time frame.
Pass/Fail: **Pass**. The system is fully functional and scalability works exceptionally. The system adapts to a growing user base and can sustain multiple users on it at the same time.

E.1.3. TESTING THAT SECURITY STANDARDS ARE MET

Requirement to be tested
All data must remain within the United States. In extremely rare circumstances (such as foreign law enforcement asking for specific data), only those users with a very high privilege will be able to share data with other countries.

Preconditions: The user must create one account for each level of privilege designated within a company.
Steps: 1. Load the system. 2. Select a fake account with a specific privilege not previously tested. 3. The tester sorts through data and other relevant sources to make sure it has access to the correct privileges. 4. The tester documents any discrepancies, such as a user being able to access or alter data it shouldn't. 5. Repeat steps 1-3 for all different privilege levels. 6. Using a high privilege account, the tester should attempt to share an irrelevant piece of data to a source located outside the United States. 7. Verify the tester is prompt with a message stating they require another high-level user to accept the data sharing request. 8. Test that after approval by another high-level user, another prompt comes up that requires the approval of the user with the highest privilege. 9. The user with highest authority must sign and submit the form, which in turn should allow the sharing of data to a single source located outside the United States.
Expected results: All users at different privilege levels should be able to view, modify, alter, and manipulate data sources that their level designates. Sharing data to sources outside the United States is restricted to extremely rare scenarios, so it's a very rigorous procedure that requires the approval of two high-level users and the user with the highest-level.
Pass/Fail: **Pass**. The results showcase that all users can view, modify, extract, share and create the correct data given their designated privilege.