**Design Prototype**

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| American Video Game Company |
| Software Project Proposal |
| Customer Relationship Management Solution |

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| Nyssa Robinson  5-25-2022  [Version 1.0] |

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# Introduction

The American Video Game Company is seeking bids for a new customer relationship management (CRM) system that will help the company meet its existing and anticipated growth objectives. This approach will deem highly profitable, improve client connections, and increase system effectiveness. Our organization is proposing AVGC this CRM system, which will be discussed in depth in the parts that follow, covering requirements, methodology, design, and testing.

# A.1. PUrpose Statement

The purpose of this document is to propose a solution for AVGC’s critical business requirements and needs to maintain current and future growth that is defined in our company’s CRM proposal.

# A.2. Overview of THE PROBLEM

In the previous two years, AVGC has witnessed a 42% rise in sales and cannot meet client demand. Such conditions have resulted in challenges such as outdated and disconnected systems, including the inability to monitor or control contracts, sales, and activities. Avoiding the existing problems will lead to a loss of clients and, eventually, American Video Game Company.

# A.3. Goals and Objectives

There will be a new CRM that will greatly improve the current business procedures to continue AVGC upward trajectory well into the future.

The goals and objectives are as follows:

Create accessibility and scalable longevity to meet existing/future customer demand

Develop and maintain strong security by assigning users to their appropriate roles and permissions

Uncompromising ideal performance throughout development

Define a specified timeframe

# A.4. Prerequisites

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| Number | Prerequisite | Description | Completion Date |
| 1 | None | Reinforce and resolve critical business needs. | 10/13/2021 |
| 2 | 1 | Obtain permission for consented timeframe. | 12/25/2021 |
| 3 | 1 | Acquire the project sponsor's consent after formulating a budget. | 2/10/2022 |
| 4 | None | Address customer resource management policy, program development, security needs. | 3/29/2022 |

# A.5. Scope

The items that are in scope are as follows:

* Versions of records maintenance
* Soft deletion of data
* Hosting
* Users: Scalability and Performance
* Product sold order management

The items that are not in scope are as follows:

* Expandability
* Setup
* Networking
* Server maintenance
* OS and browser systems that are not listed in the environment section below

Our cloud host, Amazon Elastic Beanstalk, will offer limitless scalability along with setup, networking, and server maintenance.

# A.6. Environment

*OS and Browser Support*

* Android 4.0 Chrome
* iOS7 Safari
* iOS7 Third Party Browsers (Chrome and Firefox)
* Latest Chrome and Chromium
* Latest Firefox
* I.E 9 and above
* Mobile and tablet
* Safari 6.0

*Cloud Hosting Environment*

* AWS Elastic Beanstalk- Platform as a service (PAAS) a cloud server for designing, executing, and administering applications.
  + The programming language is C#
  + .NET Framework (IIS and ASP.NET)
  + The database used is Amazon Relational Database Service

# Requirements

In the previous two years, AVGC has witnessed a 42% rise in sales and cannot meet client demand. Such conditions have resulted in challenges such as outdated and disconnected systems, including the inability to monitor or control contracts, sales, and activities. Avoiding the existing problems will lead to a loss of clients and, eventually, American Video Game Company. To combat these issues, AVGC as set requirements to have a CRM that is cost-effective while keeping as much of the current business method as possible. This CRM needs to manage both soft and hard deletions, inventory administration, cost estimation, and scalability to name a few. The requirements that will be discussed in detailed are as follows.

* Versions of records maintenance
* Soft deletion of data
* Hosting
* Users: Scalability and Performance
* Product sold order management

# Business Requirements

***Versions of Records Maintenance***

AVGC's CRM must comply with guidelines for version control and change management. Maintaining versions of records allows the execution of audits that improves security, track software changes, and conduct roll-backs when necessary. Every project employee must adhere to the change management procedures by logging all changes to our company's confidential "bucket" available through our cloud hosting environment, Amazon Elastic Beanstalk.

# user Requirements

***Hosting***

AVGC's CRM must be compatible with the listed operating systems and browsers mentioned in the environment section of this proposal. Our solution is to test those listed OS and browser systems. For example, a popup screen listing AVGC's required OS and browsers will appear only when the environment used is incompatible.

***Users: Scalability and Performance***

AVGC employs 2000 people who will use the program daily. Any moment, at the same time, 500 personnel might be using the CRM. This level of traffic must be regulated at a reasonable pace and scale to handle AVGC's growth. Our solution is to focus on database architecture and code optimization using relevant methodologies. As AVGC's economic output increases, Amazon Elastic Beanstalk cloud environment enables scalability.

# functional Requirements

***Soft Deletion of Data***

AVGC’s CRM must be capable of executing soft deletions, which is to remove data from the user interface but not from the database. Our method is to add a column named deleted with a boolean data type set as "false" to any requiring table. That field will then be set as "true" when a user clicks on delete.

***Product Sold Order Management***

The AVGC requires a system that provides a self-service site where users may manage order tracking, returning, placing, and replacing. This new system must also convert cost estimates into orders. Our company's strategy is to start from scratch due to the solution needing a tailored approach by our developers and designers working collaboratively. Furthermore, payments will be through the choice of AmazonPay, mobile payment (Apple Pay, Google Pay, Samsung Pay), or Automated Clearing House (ACH).

# Non-functional Requirements

AVGC's new CRM requires an interface that follows policies and is user-friendly to be intuitive and perform at the optimal level. Our company's strategy is for 200 participants to execute a usability test on the new interface and then collect the data from the user's experience. A legal team will be essential to ensure the continued growth of AVGC. Legal affairs cover employee rights, customer rights, laws, and regulations, to name a few. This asset provides insurance to the company and improves time management.

# SOFTWARE DEVELOPMENT METHODOLOGY

The waterfall method is the preferred software development technique of the American Video Game Company. The waterfall model sequentially addresses project management, with each stage having a start and a finish. The "finish to start" relationship is most suitable for AVGC, proven through extensive analysis. This logical relationship means that the successor activity of the project management cannot begin until the completion of the predecessor activity.

# Advantages of the waterfall method

The waterfall method divides the project development process into multiple stages. This method's strict design flow allows the company to properly manage significant decisions and clarify the final aim of the project for the engineers and team members. They may assess the level of dedication needed and plan the necessary resources for fulfillment. This procedure will be straightforward because there will be no unclear criteria.

# disAdvantages of the waterfall method

Although the waterfall technique is traditional in the software development life cycle, it is not without flaws. The method's commitment to its strictly organized approach would be inconvenient if AVGC sought to introduce new needs and services for the project. The idea phase must be executed properly. If not, it will prove challenging to undo or alter an element once testing begins. What also to note is the expenditure of time is another disadvantage.

# Advantages of Agile method

The Agile method differs from the waterfall methodology by not having a strict structure and making the software development process continuous. The planning and decisions are performed from the beginning to the end of the project. This method allows for ideas and solutions to potentially improve because of the discovery of new ones. Members will not have to commit to an unfavorable approach as they'll be able to pause and reconsider their options.

# disAdvantages of Agile method

The Agile method's advantages can potentially be its disadvantages. For example, this methodology enables software updates to occur in real-time, which deems challenging to gauge the project's development over time. Furthermore, because an outcome is not defined and changes might occur, the project runs the risk of needing additional time and resources. Consequently, this would be potential grounds for scope creep and an upsurge in the project's technical debt.

# best SUITED

American Video Game Company has a clear set of criteria and milestones to meet, which deem the waterfall method the best fit for the project. AVGC is rapidly expanding and will readily require the goods to accommodate this growth. It is imperative to execute the project's tasks consecutively within a specified timeframe for the project to be completed. The scope of the proposed work is straightforward, and the project's success hinges on the fulfillment of the deliverables as soon as possible. For these reasons, we determined that the waterfall approach is the most effective for project success.

# Design

What is the focus of AVGC? Because of the rapid expansion of their business, American Video Games Company necessitates a CRM that can accommodate their growth. Therefore, user experience, scalability, and performance are vital considerations that should take topmost precedence. Our company's proposal will enable monitoring, control, and generate reports and contracts of AVGC. Moreover, an established user-friendly dashboard for the product and customer governance is essential.

# Flowchart

The flowchart below is a high-level overview of placing an order by directing several actions for an order to be executed.

Diagram

Description automatically generated

System Flowchart

# UML Diagrams

The following ULM diagrams demonstrate the order management system in the "Third Normal Form" initially and then the final physical database The User can have multiple Orders, but the Orders can have only one User. The Product Order Line table serves as a bridge between the Order and Product table for information independency and to prevent redundancy. An Order can have many Products, but a Product can only have one Order. An Order has one Tracking ID and vice versa. modelDiagram

Description automatically generated

Diagram

Description automatically generatedULM Diagram in Second Normal Form 1

ULM Diagram in Final Physical Database Model

# Testing

Here, section E outlines the intentions to test the performance of our company's customer relationship management system. The tests will prove that our system is able to manage components and procedures, preserve data integrity, and deliver a prudent user experience. The tested business requirements are as follows.

* Test our proposal CRM query engine
* Test ULM order management product purchasing
* Preforming soft deletes

# Testing Type (functional requirements)

The test that follows will determine if our company's CRM has the capability to delete a user account without the removal of the user information from the database via soft deletes.

# crm query engine

## Test our proposal CRM query engine

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| Requirement to be tested  Querying the Product table to test the CRM's search capability. |
| Preconditions: Conditions that must be present before test case can successfully run   1. Develop a suitably functional system. 2. The fields in the product table are as follows: ID, Name, Description, and Price. 3. Develop a suitably functional GUI interface for product query. 4. Effectively performed SQL command with the appropriate configurations to identify the requested product. |
| Steps: The steps the tester must execute to test the feature.   1. Insert and/or validate that the Product table has the correct information. 2. (GUI) Enter the product's name into the search bar located at the top of the CRM. 3. Check the data log to ensure the proper criteria are being provided via search field. 4. Confirm the SQL command used to find the product is accurate. 5. (GUI) Verify upon product existence, that that product's webpage generates. 6. If product does not appear, confirm that product doesn't exist in the database if the product doesn’t appear during query. |
| Expected results:  If the product exists, we expect the query engine to produce a page containing information about it. |
| (PASS) |

# Product purchase

## Test ULM order management product purchasing

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| Requirement to be tested  In the order management module, ensure the product is available for purchase. |
| Preconditions: Conditions that must be present before test case can successfully run   1. Develop a suitably functional system. 2. Create the following tables with appropriate primary and foreign key entities: Order, OrderProduct, Product, User, and Tracking. 3. The payment function has been deployed and is operational. 4. GUI) Implemented a payment interface to create a sales order. |
| Steps: The steps the tester must execute to test the feature.  1. Generate test data within the database.  2. (GUI) Login account as a test user.  3. (GUI) Query a product to then add to checkout cart.  4. (GUI) Select the button that reads “Proceed to Checkout”.  5. (GUI) Enter in the test payment information then select “Confirm Order”.  6. Verify that AmazonPay has received the test payment.  7. Verify the right amount is updated in the Product table.  8. Verify a new Order, OrderProduct, and Tracking record is generated with the appropriate associations. |
| Expected results:  When a sale is completed, the customer order information is updated accurately. Payment in full has been received. |
| (PASS) |

# soft deletes

## Preforming soft deletes

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| Requirement to be tested  We will put the soft delete criteria to the test for the user. |
| Preconditions: Conditions that must be present before test case can successfully run   1. The database execution and the data flow have to be verified. 2. User table has a field named isDeleted with a Boolean data type. 3. For every user, the isDeleted field is originally set to FALSE. 4. CREATE, READ, UPDATE, AND DELETE (CRUD) capability has been demonstrated to operate on the User table. 5. CRUD tasks associated to the GUI interface are operational. |
| Steps: The steps the tester must execute to test the feature.   1. Indy, a new user, creates an account. 2. Indy login account 3. Indy goes to Settings, then select “Delete Account” 4. The User table isDelete column will be then set to TRUE within the database after Indy accepts the confirmation to delete account. 5. Indy will be automatically redirected to a new webpage that states the account has been deleted. 6. The developer will conduct a query of the User table to verify Indy’s account’s isDeleted value is set to TRUE. 7. The developer validates Indy’s information remains in the User table which indicates the soft delete completion. |
| Expected results:  A deleted account's data remains in the database. The deleted account table entry's isDeleted field to be set to TRUE. |
| (PASS) |