D284 Software Engineering

MJ Logistics Gaming Company

Customer Relationship Management Solution

Software Solution

Akari Bowens

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A. INTRODUCTION

A1. INTRODUCTION AND PURPOSE STATEMENT

We are grateful to be in consideration for the proposal of a software solution for MJ Logistics Gaming Company. We have reviewed the listed requirements and have created this document to provide a scalable, reliable, and modern solution. Our proposed solution implements a web-based customer relationship management system that fits the needs of MJ Logistics. It also provides design and test plans to aid in the development process.

A2. OVERVIEW OF THE PROBLEMS

MJ Logistic Gaming Company is becoming more profitable and demand for their services has increased. They have outgrown their current system for customer relationship management and have been using disconnected tools and processes, with teams spread across multiple offices.

Our proposed solution uses a hybrid cloud model to incorporate their current infrastructure with a cloud environment. This allows them to utilize computing resources and scale without increasing capital expenses or losing access to existing data. The hybrid cloud model also allows control over the region data is stored in and gives users access to the system across all locations.

A3. GOALS AND OBJECTIVES

The primary goal is to provide MJ Logistics Gaming Company with an easy-to-use and intuitive CRM that manages disconnected processes and scales with their growing business and product lines. The solution should consolidate the company's existing tools, so information and resources are accessible from all company locations.

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The main objectives of this project and solution are to deliver a scalable and secure CRM that stores and condenses all contact and business information. The solution should log company activities and interactions with contacts while limiting user access to role-based privileges for its users. Our proposed solution also tracks sales and manages activities using safe data management practices that comply with relevant data privacy laws.

A4. PREREQUISITES

Number	Prerequisite	Description	Completion Date
1	Azure	Sign up for Microsoft Azure and add existing servers	12/30/2023
2	Workstation	All PCs using this system must be running Windows 10 or Windows 11	12/30/2023
3	Server	Active Microsoft Active Directory	12/30/2023

A5. SCOPE

These requirements are in scope for this system:

- Data reporting with filtering, formatting, querying, and exporting capabilities

- High performance while handling 500 active users during peak times and 2000 users accessing the system in total

- Provide a ticketing system that tracks all contact interaction. Relevant ticket data tracking such as who called, the reason, the date and time, etc. A database that supports the fluid workflow procedures and keep an audit trail

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- Accurately control data access, workflow, and editorial permissions based on the users' role in the company
- Integrates with the company's current Active Directory Server

The system will not manage:

- Updating systems to most recent releases
- Configuring network firewalls
- Anything else listed not listed in this scope statement

A6. ENVIRONMENT

The proposed system is a hybrid cloud model using Microsoft Azure intended to work along with MJ Logistics' current infrastructure. This allows for the solution to be compatible with any device with internet access. The system will use the company's existing servers to manage regular network traffic. The system will then utilize the backup servers in the cloud when traffic is at a high and as the company grows. The system uses storage capabilities from the cloud to manage datasets when they get too complex.

The solution will be compatible with the following:

- Cloud-based storage and servers
- Latest Chrome and Chromium
- Latest Firefox
- Latest Microsoft Edge
- Latest Safari
- Mobile device application stores
- Latest iOS systems
- Windows 10 & Windows 11
- Latest Android systems

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B. REQUIREMENTS

BUSINESS REQUIREMENTS

Our proposed solution will provide predefined and custom data reports. Available data can be changed into different formats, filtered, and exported. Our solution also allows data querying for very specific datasets.

USER REQUIREMENTS

Our proposed solution allows for the scaling of computing resources whether network traffic is average or at a high, using cloud capabilities. This system also grows as demand grows without increasing capital expenses.

FUNCTIONAL REQUIREMENTS

Our proposed solution provides a ticketing system that allows for users to enter and track all communication for contacts. The system tracks all relevant contact data like the contact who called, the purpose of their call, when the call was, and any follow-up interactions; this also included email interactions. The system database will keep logs of all occurrences. Any PII provided will be encrypted in transit and at rest; and managed according to the relevant regulations.

NON-FUNCTIONAL REQUIREMENTS

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Our solution addresses control access data, workflow and editorial controls using the principle of least privilege. The principle of least privilege promotes only giving users access to permissions that are absolutely necessary in order to complete their jobs.

C. Software Development Methodology

The company is proposing utilization of the Agile methodology for the development process. This is an iterative methodology that uses "sprints" to break down development into phases. Each phase is followed by a review that allows the team to communicate and make improvements for the next sprint. This methodology also allows time for frequent user feedback.

C1. Advantages and Disadvantages

Advantages of the Agile Method

Three advantages of the Agile methodology:

1. Increased flexibility

2. Cross-functional teams

3. Frequent customer communication/user feedback

Disadvantages of the Agile Method

Three disadvantages of the Agile methodology:

1. Scope creep
2. Less documentation

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3. Difficulty measuring progress

ADVANTAGES OF WATERFALL

Three advantages of the Waterfall methodology:

1. Early timeline and budget determination due to strict scope
2. Uses a clear structure with a defined set of steps
3. Easy transfer of information as documentation is maintained throughout the process

DISADVANTAGES OF WATERFALL

Three disadvantages of the Waterfall methodology:

1. Limited customer feedback
2. Testing isn't done until the product is already built
3. Sudden changes can make previous work obsolete

C2. BEST SUITED

The Agile methodology is the best for this project because it allows for improvements at each iteration and gives customers a lot of chances for input. This project is complex and since there is no strict time or budget, the project can be worked on for a while. Agile gives equal focus to UI/UX and functionality, so all the moving parts should be well tested.

D. CREATE TWO REPRESENTATIONS OF THE SOFTWARE SOLUTION

USE CASE DIAGRAM
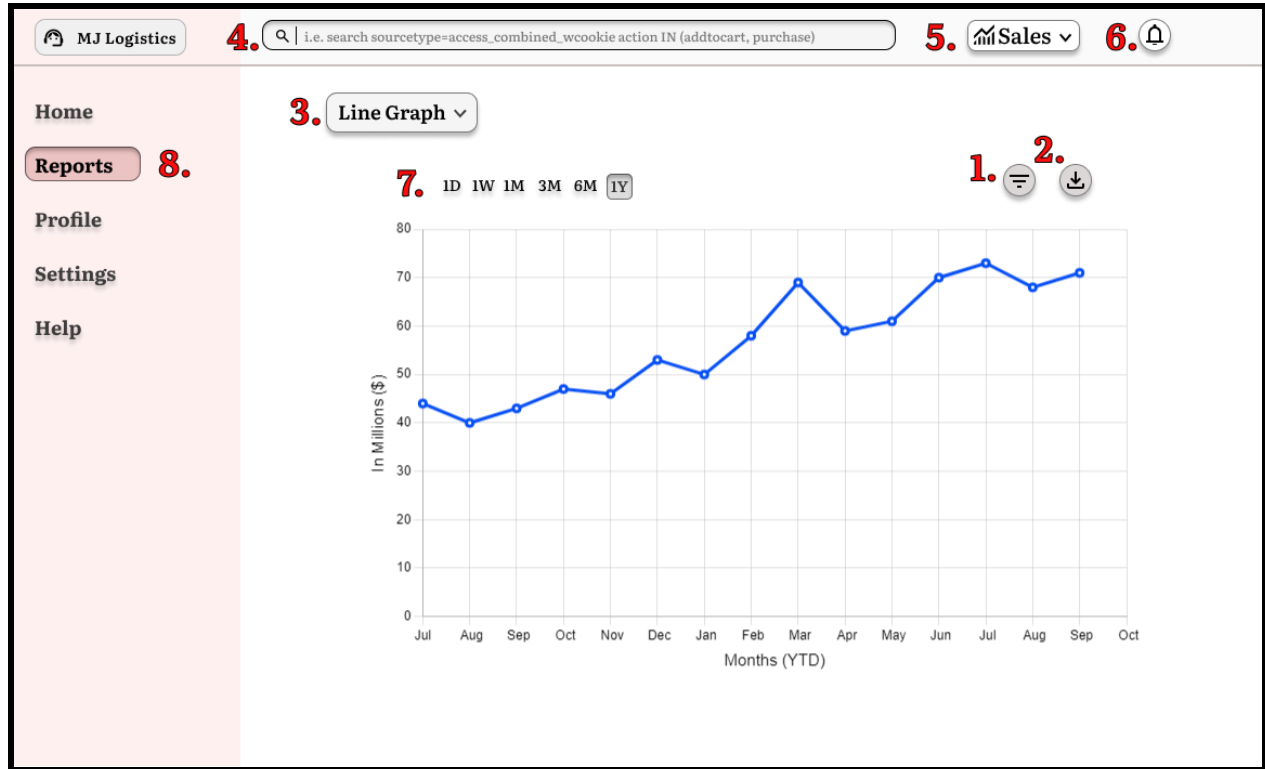
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This is a high level view of the proposed solution for the ticketing system requirement that allows for user ticket creation and support ticket management.
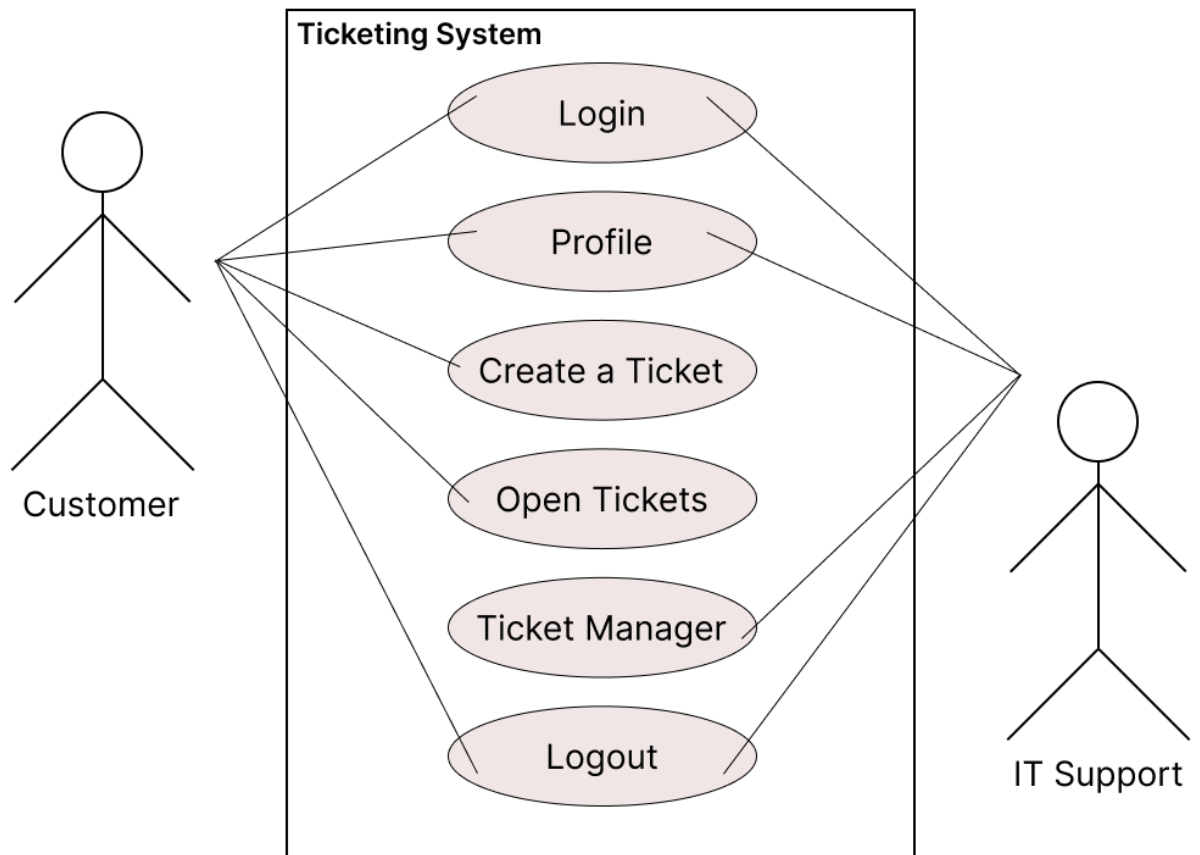
GRAPHICAL USER INTERFACE

This is a high level view of the proposed solution for the reporting requirement.

ID	Control	Description	Data Source
1	Select	Opens a dropdown of checkboxes to allow data filtering	Internal Variable
2	Button	Exports chart in ".pdf" file format	NA
3	Select	Opens a dropdown of different data formats	Internal Variable
4	Input	Queries available data	User Input
5	Select	Opens a dropdown of available formats for current data type	Internal Variable
6	Button	Changes time frame for line graph data	Internal Variable
7	Select	Notifications/ Alerts	Internal Variable
8	Nav	Navigation menu	Internal Variable

E. TESTING

SCALABILITY TEST

Requirement to be tested:

This will test the system's ability to manage and perform well with 500 concurrent users

Preconditions:

- A testing plan with a clear definition of a pass or fail

- A PC running the necessary testing software

Steps:

1. Set up the test environment to increment users up to 500

2. Create a test scenario

3. Add the test scenario script

4. Start the test

5. Analyze the results

Expected results:

The system should stay in optimal performance without any bottlenecks or disruption at each interval of total users.

Pass/Fail:

Passed: The system experiences optimal performance at each interval up to 500 concurrent users.

UNIT TEST

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Requirement to be tested:

    A ticketing system that tracks all contact interaction. Relevant ticket data tracking such as who called, the reason, the date and time, etc. A database that supports the fluid workflow procedures and keep an audit trail

Preconditions:

- User ready to submit a ticket

- Support associate ready to manage ticket

- Database ready to store interaction

Steps:

1. Log on both user and support associate

2. User submits a ticket

3. Support associate accepts ticket

4. Support manages ticket

5. Support closes or escalates ticket

Expected results:

    The user should submit a ticket and have it managed by the support associate in a seamless process.

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Pass/Fail:

Failed: The ticket management is missing escalation capabilities.

VULNERABILITY TEST
Requirement to be tested: Accurately control data access, workflow, and editorial control based on user permissions
Preconditions: ● Application downloaded ● Active vulnerability scanner
Steps: 1. Open application 2. Login 3. Run vulnerability scanner 4. Analyze results 5. Prioritize most dangerous risks
Expected results:

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Pass/Fail:

Failed: Many active users weren't using Multi-Factor Authentication, so a threat actor could gain access using simple phishing techniques