High Quality Omni

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For BCS-301
Capstone Final Project

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Executive Summary

User Interface (UI) has become increasingly important year in and year out since the beginning of the 21st century. User interface describes how users interact with a computer system with features that affect two-way communications between the user and the computer. These features include usability, user satisfaction, support for business functions, and system effectiveness. This relationship includes everything from smartphones to global networks. The use of UI is to enhance user experience and create an atmosphere that is transparent, simple, easy-to-learn, and valuable.

Recently brought up in an HQO executive meeting, the HQO mobile application's interface needs to be updated, as there will be new features implemented into the application. HQO executives asked the IT departmentment to invest in and implement ideas for a new UI that will improve quality-of-life for the HQO application.

The IT department has developed an interface that breaks the mold for current apps in the field with a faster, easier, and more secure interface. This interface offers users options of who, what, and how much they want to see of others' content. They already have the ability to post their content to a personal wall or a public wall, but now they are able to post content to both at the same time. Users are now able to choose whether they want their account to be private or public. Furthermore, they are able to save other people photos or videos for inspiration or replication.

The interface developed meets the criteria of the very important "honeycomb" of UI. *Exhibit 7A* below shows the honeycomb and what UI should strive to meet. The reason this

criteria is so important to meet for HQO is that the company needs an innovative interface to further advance it in this increasingly competitive field. With this new interface, HQO feels it will be taking charge of the field and its competitors.

This report will give a glimpse of what is to come. The company can't share all the secrets, so this report will show the basics and how easy-to-learn the interface is.

Problem	Solution
The HQO application's interface is outdated and must be updated in order to further enhance user experience.	HQO will implement an interface that allows easy access to personal content, as well as a new timeline that allows users to connect to other users faster, easier, and with more security. Furthermore, new features will be added making the interface more useful and valuable.

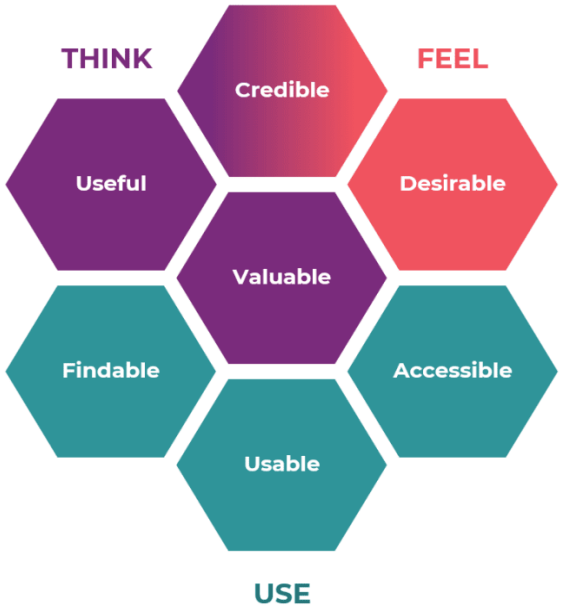

Exhibit 7A

Proposal with Business Case

Proposal for Initiating AWS Cloud Computing

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Current Situation:

The customers are having many issues staying connected to the servers, as well as having their information and data stored properly when finally logging back in. For example, user James Smith said, “Everytime I’m on the app it frequently logs me out of my account and the application won’t let me back on. However, the times that I am able to log back on I see that some of my pictures are not visible anymore on my account.” HQO needs better servers to maintain and further our company’s success.

With the current system, the servers are getting overloaded and it cannot handle too many people on the platform at once. When this happens, some of the servers reboot causing customers to get disconnected, potentially losing what data they had recently stored into the application.

This project is mainly for the Information Technology department, but towards the latter of the implementation stage, the Marketing department will be involved to push HQO’s new system towards current and future customers.

Proposed Project:

The proposed project is to convert the server system to Amazon Web Service system, which is cloud-based. This shift in systems should take a maximum of eight weeks to complete, and throughout these eight weeks the IT department will be responsible for the following: converting all HQO systems to AWS, updating and maintaining such servers, and making sure each department is aware and proficient with this new change. The use of cloud-based servers will create more reliability in the application’s capabilities, and it will prevent overloads and reduce risk of data loss.

This project will be less costly to HQO than constantly changing servers and losing customers due to lack of reliability and frustration while using the app. According to the research, HQO would benefit greatly from the shift to cloud-computing.

HQO (High Quality Omni) Business Case

I. Executive Summary

Project Overview:
With the current system HQO has in place, the servers are getting overloaded and it cannot handle too many users on the platform at once. The goal is to convert the server system to Amazon Web Service system, which is cloud-based.

Impact Statement:
With the use of Cloud Computing, HQO is able to reduce costs, improve team performance, prevent future security breaches, eliminate the backup storage that Server's need, add additional storage space whenever needed, and monitor the operations of HQO effectively without having to rely on outdated updates and statuses.

II. Reason To Change

1. The use of cloud-based servers will create an effective reliability in the application's capabilities, it will prevent overloads and reduce risk of data loss. The use of cloud-based servers will enhance productivity for HQO due to the fact that users will no longer experience outdated crashes while using the app. There's an estimated 950k profit increase by 2022 and enhanced productivity on HQO's application.

2. Go to *Box V Option 2* located below to indicate specific cost and time estimate

III. Risks

1. Go to *Box V Options 1 & 2* located below to indicate specific risks maintaining the current servers and switching to a cloud based server.

IV. Options

HQO servers are very unreliable so the following options to improve the reliability of the service is available.

1. Buy new equipment to upgrade the servers
2. Use a cloud computing service such as AWS, Google Cloud or Microsoft Azure.

V. Option Comparison

Option 1: If HQO upgrade's its own server equipment it will cost around 1 million dollars. Then it will take at least 2 months to complete the upgrade and when HQO gains more users it will have to spend more money to buy more servers. The company will also have to hire more IT People to maintain it and for the power consumption which will cost another $500k per year.

Option 2 : If HQO uses a cloud computing service it will cost around $30k a month and take around one month. It would be much easier to rent more server space if HQO gains more users. The company would also not have to hire any IT professionals to maintain the servers. If the company sells the existing servers it will be easier to recoup the losses. The one downside to using cloud computing is that if the servers go down (which very rarely happens) the company would have no way to fix it.

VI. Recommendation

These are recommendations that should be greatly considered, in no special order:

1. Convert to cloud computing within 2-3 months and then sell out old equipment to recoup some of the company's losses.

2. If the decision is made to convert to cloud computing, Amazon Web Services (AWS) should be used.

3. The IT department should focus on the server conversions while other departments focus on how to use cloud computing efficiently.

4. The use of cloud computing may be a foriegn idea to some HQO employees, so a mandatory training session should be enforced.

5. When the new system is implemented, HQO's success will be measured in the rate of users logging on, how much data will be stored in the new servers, and of course, how many new customers are gained through HQO's innovative new platform.

VII. Approval Request

Go to *Request for Information Services* on pg. 1.4.

System Planning Phase: Preliminary Investigation Report

Executive Summary

HQO's servers are very unreliable and it's causing users to quit the service. The servers that the company is using are about 15 years old. The cost to replace the servers would cost around $1.6 million and even more to maintain, in addition the company will also have to upgrade the servers again in a few years. If the company was to switch to a cloud based computing service it would cost less than half a million a year. If the company does not fix their faulty servers users will continue to leave the platform which will equate to a loss in revenue for the company.

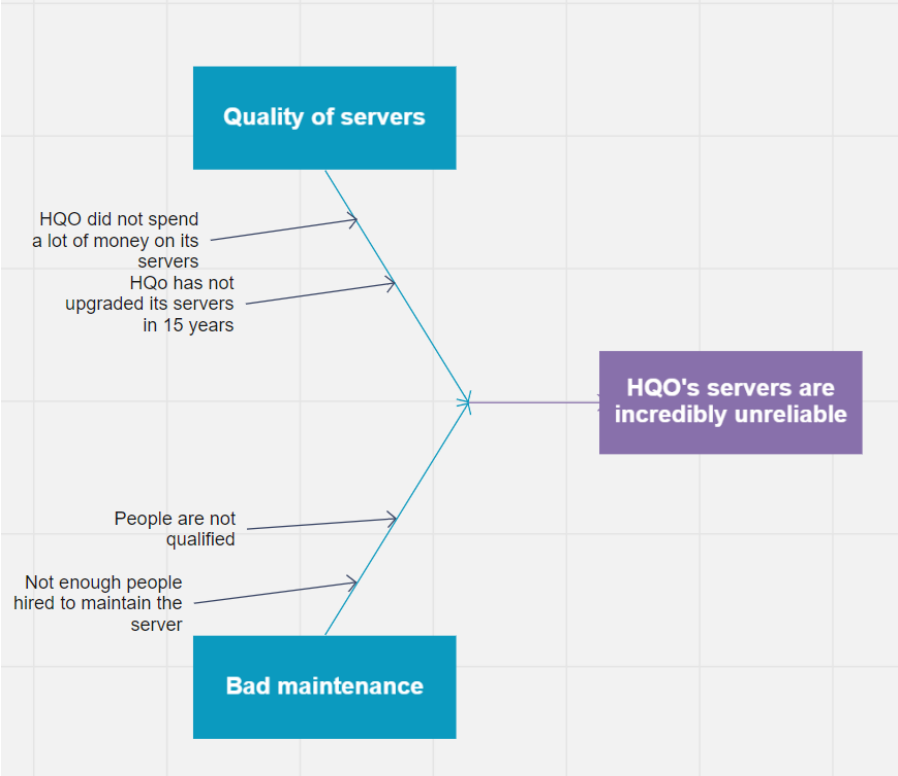
With the use of Cloud Computing, HQO is able to reduce costs, improve team performance, prevent future security breaches, eliminate the backup storage that Server's need, add additional storage space whenever needed, and monitor the operations of HQO effectively without having to rely on outdated updates and statuses. The use of Amazon Web Services will create an effective reliability in the application's capabilities, it will prevent overloads and reduce risk of data loss.

The use of cloud-based servers will enhance productivity for HQO due to the fact that users will no longer experience outdated crashes while using the app. There's an estimated 950k profit increase by 2022 and enhanced productivity on HQO's application. There are also scheduling and time benefits to the upgrade that cloud-based servers have in place at HQO.

Problem/Opportunity Statement:

The company's servers are incredibly unreliable and customers are complaining that they can't get into their account and that their photos are being deleted. This gives the company the opportunity to switch to a cloud based computing network.

Fishbone Diagram:



Five Whys?

Why are people not using HQO after they make accounts:

Because they are having trouble using the service.

Why are the users having trouble using HQO:

Because the servers are unreliable.

Why are the servers unreliable:

Because They are outdated.

Why are they outdated:

Because the company does not have enough money to upgrade them.

Why does the company not have enough money to upgrade them:

Because people are not using the service after they create an account.

Project Scope

Business Objective(s) :

- Increase new business by 10% in Q3
- Reduce customer latency by 5%

Project Objective(s) :

- Implement a cloud-based server system to HQO by May 2020
- Have all staff proficient with the new server system
- Increase reliability and productivity

Description

A list of the included deliverables and the boundaries of the project.

In Scope:

•Implement a cloud-based server to increase reliability and productivity

•Create new ways to store and maintain data securely

•Enforce efficiency with new server system

Out of Scope:

•This will not include marketing

•It will not include new *HQO* application interface

Constraints

The limitations and risks that can affect the project.

- Time constraints:
    - On a very strict timeline so the margin for error in processes of any kind are very small.
    - Beta testing will be released three weeks before release, giving IT two weeks max to fix any bugs or issues.

- Scope constraints:
    - Marketing/advertising is not a part of the scope
    - New application design is not a part of the scope

- Cost constraints:
    - $30,000 a month to rent server space
    - Possible increase in employees working overtime while operating on this new project
    - Possible loss in customers due to impatience and frustration with current situation

Fact Finding:

Documentation:

1. Email from customer:

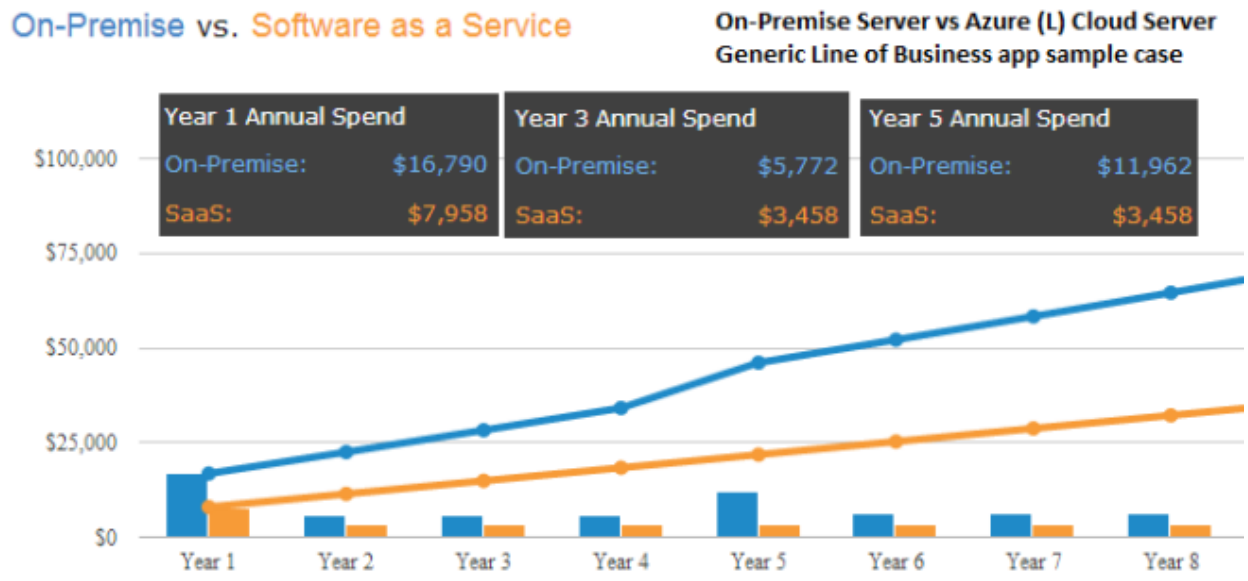
Hello HQO,

I've been a user of HQO for around three months now and it seems that your servers are incredibly unreliable. Everytime I'm on the app it frequently logs me out of my account and the application won't let me back on. However, the times that I am able to log back on I see that some of my pictures are not visible anymore on my account. It's super frustrating because this is the only place that I keep them. I also have the issue where I can't see any comments that I wrote on posts. Please find a way to fix this, I like your application but if need be I'll move onto the next platform with similar features.

Sincerely,

User James Smith

Chart(s):

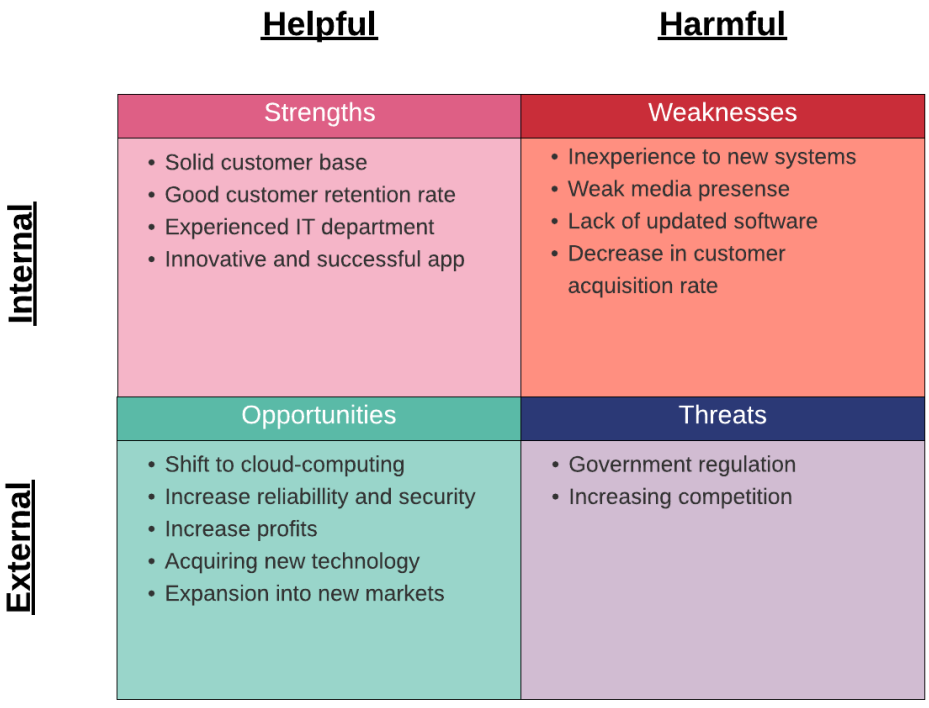


- Chart above shows the difference in money spent on on-premise servers and software-as-a-service (a part of the cloud). (Source: betanews.com)

Survey(s):

1. 2018 IDG Cloud Computing Survey
    - Seventy-three percent of organizations have at least one application, or a portion of their computing infrastructure already in the cloud – 17% plan to do so within the next 12 months.
    - The average cloud budget is up from $1.62 million in 2016 to $2.2 million today. This does change by company size with enterprise organizations investing $3.5 million and SMBs investing $889,000 (which is up from $286K in 2016).
    - More than one third of respondents (38%) shared that the IT department feels pressure to migrate 100% to the cloud.
    - Organizations are utilizing a mix of cloud delivery models. Currently the average environment is 53% non-cloud, 23% SaaS, 16% IaaS and 9% PaaS; however, will evolve to only 31% non-cloud within 18 months.
    - Forty-two percent of organizations are using multi cloud. The top two benefits of a multi cloud strategy are increased cloud options (59%) and easier and faster disaster recovery (40%).

SWOT Analysis



Feasibility Study:

Operational -

With Amazon Web Services, HQO also gets an estimate as to how many desktops or systems need to be in place by determining the configurations of each system. This desktop deployment is also global if HQO would like to expand in the future. Through the WorkSpaces environment HQO is able to select which productivity applications they would like for accurate services.

Economic -

With Amazon Web Services, HQO saves 39% of their estimated server costs, this includes maintenance and equipment. This economic save will allow HQO to allocate their resources and possibly upgrade other outdated problems in their IT department to provide for an efficient application.

Technical -

Without Amazon Web Services, if there were a problem with the servers that were upgraded instead of having cloud-based servers there would be no Desktop as a Service (DaaS) solution. All the memory and storage resources are met to HQO's performance needs through AWS. All data stored through AWS is also secure through outlets such as Amazon Virtual Private Network this allows access to encrypted storage volumes in the cloud while also maintaining a Key Management Service which does not allow user data to be stored in a local device this allows accurate and secure data.

Schedule -

With Amazon Web Services, HQO saves an entire month of their estimated server costs, this includes set-up. This also does not include the time or scheduling that would take place if an entire group of IT employees were hired for a time period that doesn't support the two month time frame it would go past the estimated half million dollar project cost.

Cost-Benefit Analysis:

Option 1: Buy new equipment to upgrade the servers.

Option 2: Use a cloud computing service such as AWS, Google Cloud or Microsoft Azure.

Project Costs	Option 1	Option 2
Equipment	$83,333.33 (per month)	$30,000 (per month)
Time Costs & Projections	2 months (minimum)	1 month
Maintenance (IT employees & electricity costs)	$500,000	$0
Emergency Costs	$100,000	$50,000
TOTAL (yearly cost)	$1,600,000 & 2 months	$410,000 & 1 month

Recommendation:

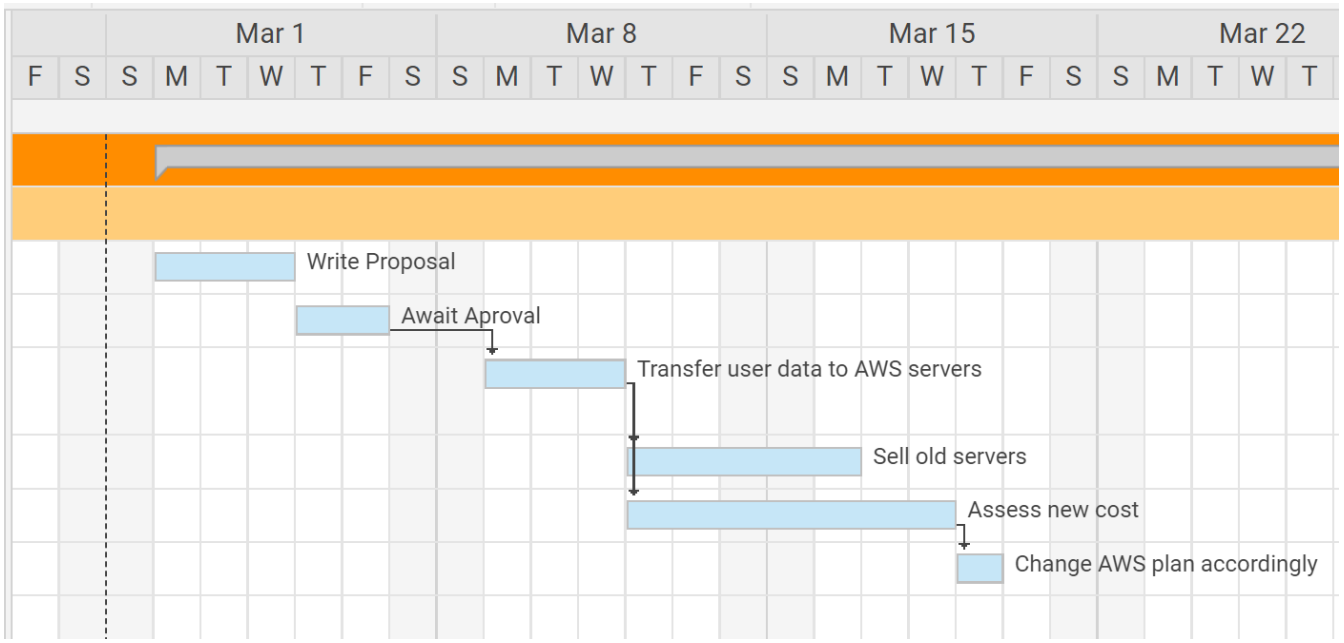
Between both Option 1 & Option 2, Option 2 which is AWS cloud-based server, Option 2 is the most cost-effective and time-effective.

Decision Process:

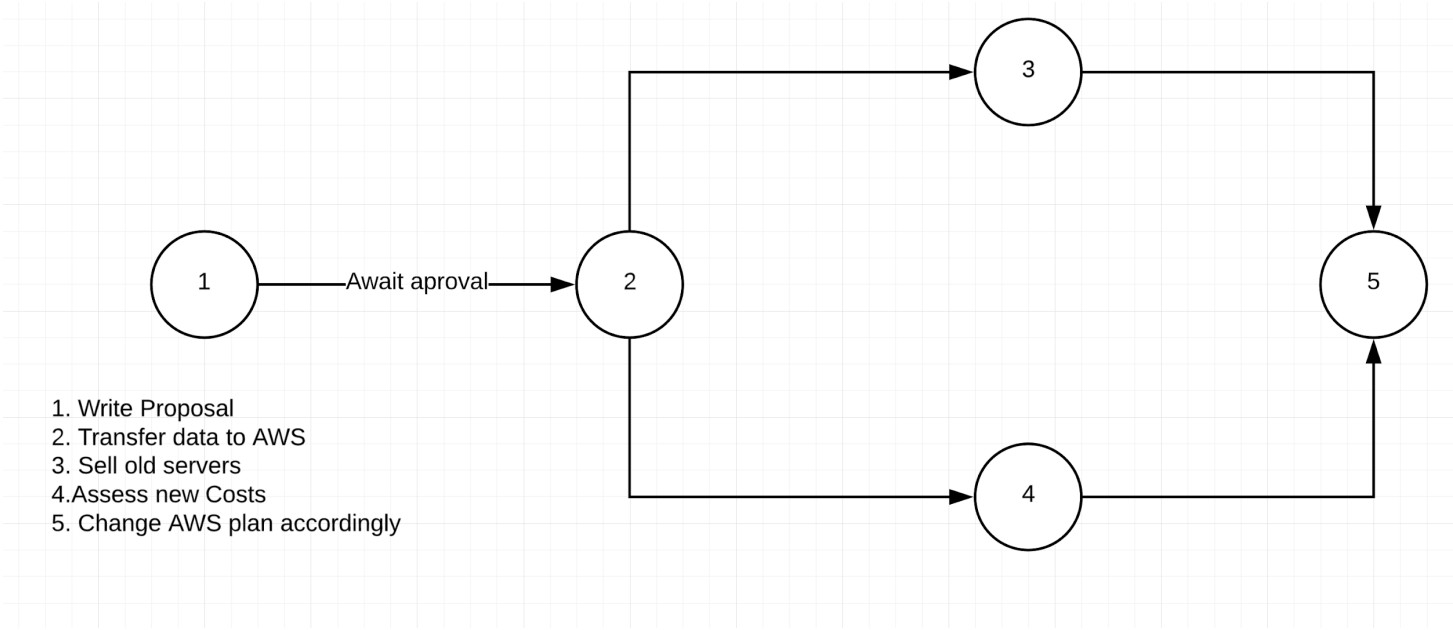
The use of Amazon Web Services cloud-based servers will create more reliability in the application's capabilities, and it will prevent overloads and reduce risk of data loss. This AWS project will be less costly to HQO than constantly changing servers and losing customers due to lack of reliability while using the app. According to the information above, HQO would benefit greatly from the shift to cloud-computing, therefore switching over to AWS beginning May 2020.

Project Management

Gantt Chart :



Pert/CPM Chart



System Analysis Phase: System Requirement Document

Executive Summary

HQO provides customers with an application that allows photo and video storage as a social media platform to be broadcasted among friends and other subscribers. HQO stores all application data without invading personal information such as payment method in a server. Over time HQO's goals are to be able to provide the same service if not better and more effective to it's number one stakeholders, it's customers.

With the current system HQO has in place, the servers are getting overloaded and it cannot handle too many users on the platform at once. The goal is to convert the server system to Amazon Web Service system, which is cloud-based.

A strong recommendation to management is that to persuade operations and such to be run with Amazon Web Services. Their cloud-based servers are impeccable and would benefit HQO greatly. With the use of Cloud Computing, HQO is able to reduce costs, improve team performance, prevent future security breaches, eliminate the backup storage that Server's need, add additional storage space whenever needed, and monitor the operations of HQO effectively without having to rely on outdated updates and statuses.

Problem	Solution
HQO's servers are very unreliable and it's causing users to quit the service. The servers that HQO is using are super outdated.	Amazon Web Services cloud-based servers will allow HQO the appropriate amount of storage and performance needed for the application.

The requirements for such a system to take place are operated and helped out by an AWS operator collaborating with an HQO operations manager to ensure that all operations and maintenance team members understand the structure that the AWS cloud-based servers offer to HQO. The conversion to cloud computing will take place between 2-3 months. In order for the more cost-efficient system HQO will then sell out old equipment to recoup some of the company's losses.

Data will be stored in our servers and then users will query that data based on who they are following.

The use of cloud-based servers will enhance productivity for HQO due to the fact that users will no longer experience outdated crashes while using the app. Growth highlights would include that there's a projected $950,000 profit increase by 2022 and enhanced productivity on HQO's application.

System Design Phase: System Design Specification

Risk Management Plan

Name of Business	**Date of Plan**	**Date to be Reviewed**
HQO (High Quality Omni)	**29 February 2020**	**2 March 2020**

Potential Risks/Hazard	***Likelihood of Risk***	***Action to be taken to reduce and prepare for risk***	***When***	***Who***	***Proof of Action***
Amazon Web Services servers go down	LOW RISK	- Contact of AWS customer service - Contact customers via email regarding the temporary unuse of HQO application	During Risk	Manager & Maintenance	- AWS contact through customer service - Go to Customer Client spreadsheet
Unauthorized access to customer and business data	HIGH RISK	- Maintenance schedules to be kept to ensure authorized access to customer and business data - Prepare statement to customers regarding data breach - Emergency procedures to be followed, incident report to be completed, temporary application shut down	Ongoing During Risk During Risk	Manager & Operations & Maintenance Manager & Operations Operations & Maintenance	- Operations is to be in charge of maintenance scheduling - Manager to approve statements regarding data breach - Maintenance to initiate temporary application shut down
Customer credentials are stolen	MEDIUM RISK	- Maintenance to contact customer(s) - Legal team to be contacted if customer wants to bring up legal action - Shut down customer(s) application and create new upgraded & secured account	During Risk After Risk During Risk	Maintenance Legal Team & Manager Operations & Maintenance	- Manager to approve statements regarding legal action & customer information - Maintenance to perform new account alongside Operations

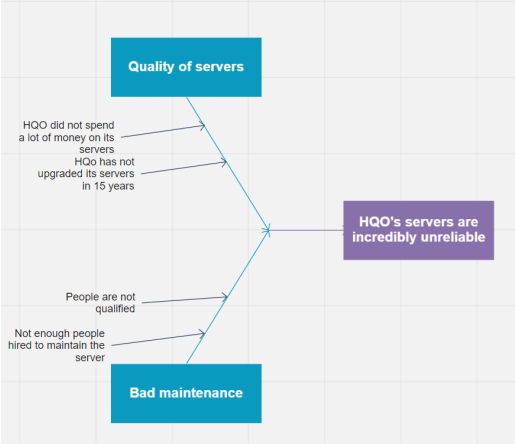
Preliminary Investigation Report

I. Introduction

Problem/Opportunity Statement: The companies servers are incredibly unreliable and customers are complaining that they can't get into their account and that their photos are being deleted. This gives the company the opportunity to switch to a cloud based computing network.

II. Methods

Fishbone Diagram:



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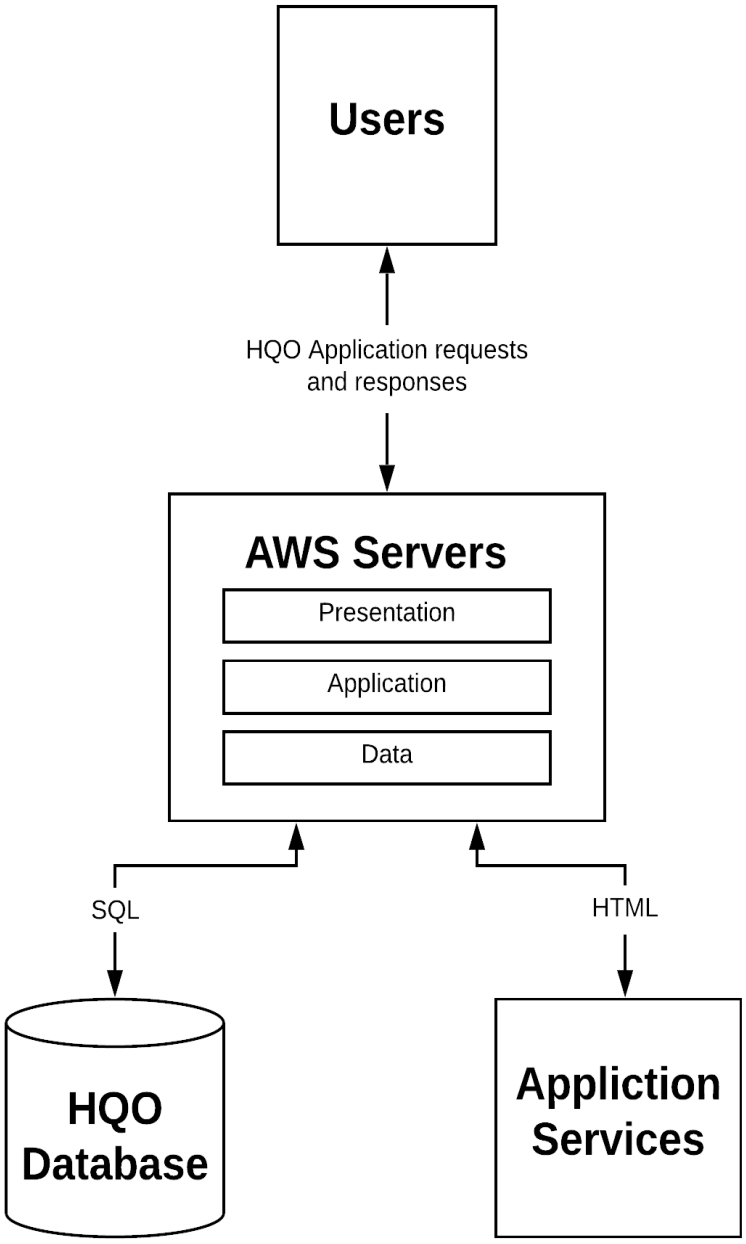
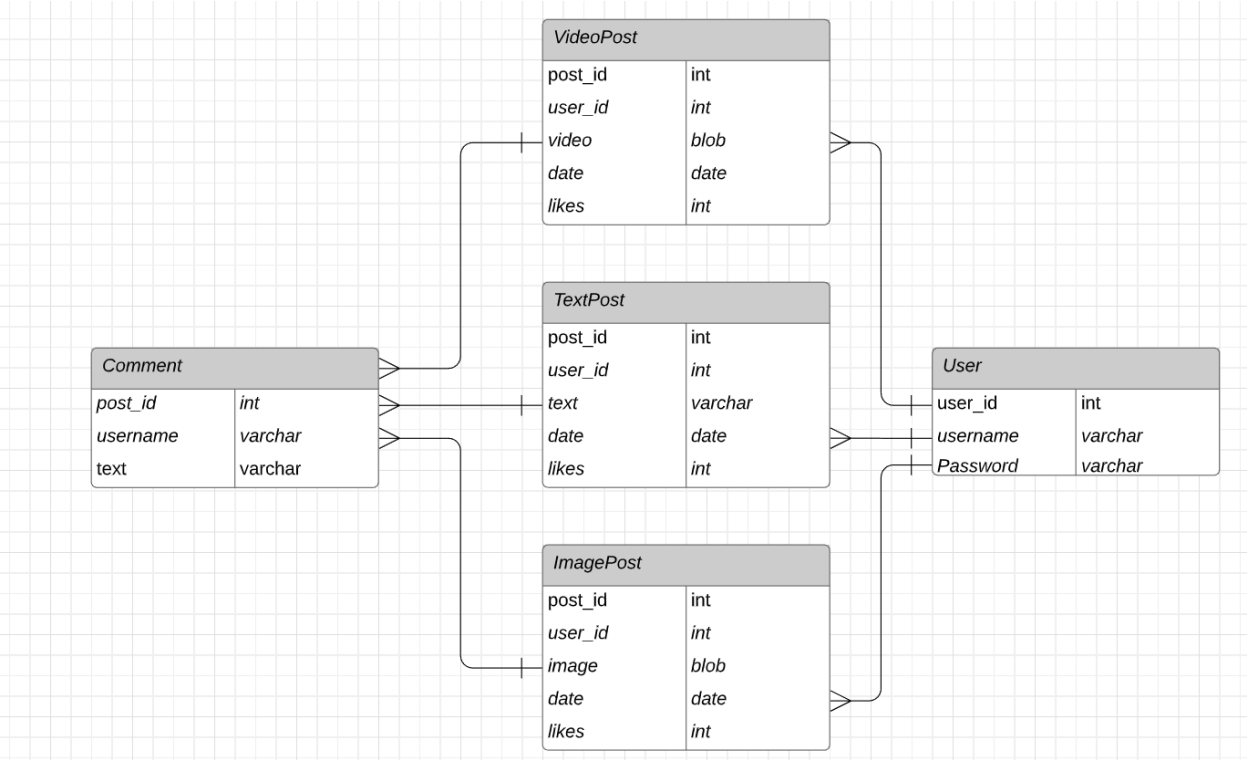
System Architecture Design

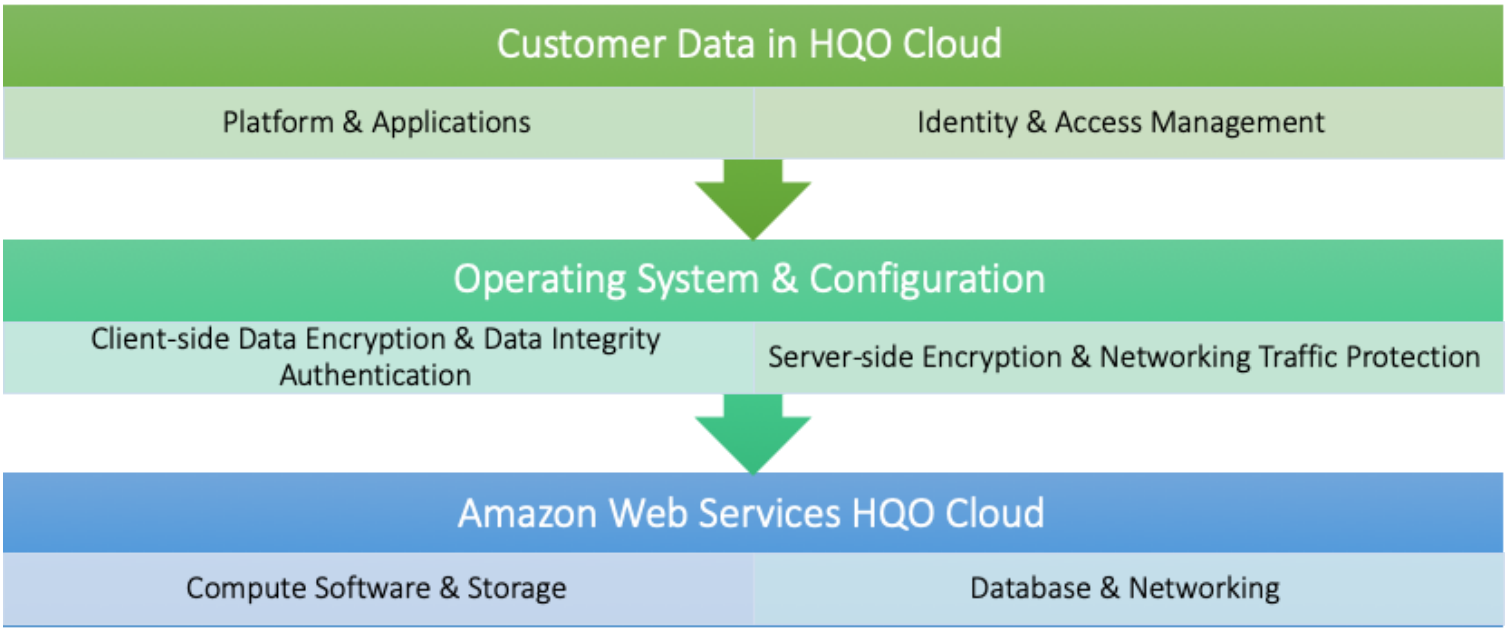


1. **Users**: Make requests to the servers by using the HQO application and receive responses.
2. **AWS Servers**: Hosts the application's various layers, sends and returns application data to and from the HQO database, sends user requests to the application services, and retrieves services to the users.
    - **Presentation**: Users interact with the application via cloud computation.
    - **Application**: Manages the flow of the application, implements business logic and collaborates with the data to process requests from the users and their responses.
    - **Data**: Handles domain data and provides persistence and retrieval services for the HQO database.
3. **HQO Database**: Where HQO data is persisted and retrieved.
4. **Application Services**: Interaction with users and other applications.

ERD


VideoPost
post_id int
user_id int
video blob
date date
likes int
TextPost
post_id int
user_id int
text varchar
date date
likes int
ImagePost
post_id int
user_id int
image blob
date date
likes int
Comment
post_id int
username varchar
text varchar
User
user_id int
username varchar
Password varchar

Systems Requirements Model



Systems Requirements Checklist

Inputs:

- Users enter data into the system.
- User must be able to create accounts

Outputs:

- The system must be able to deliver posts to users that follow a specific account.

Processes:

- Users must be able to post text, videos and images to HQO.
- Users must be able to view posts from their followers.

Performance:

- System must be capable of taking large amounts of data from multiple users at once and sending that data back to the appropriate users.

Security:

- Users must be able to safely store their posts without people who they don't want seeing it.

Online Documentation

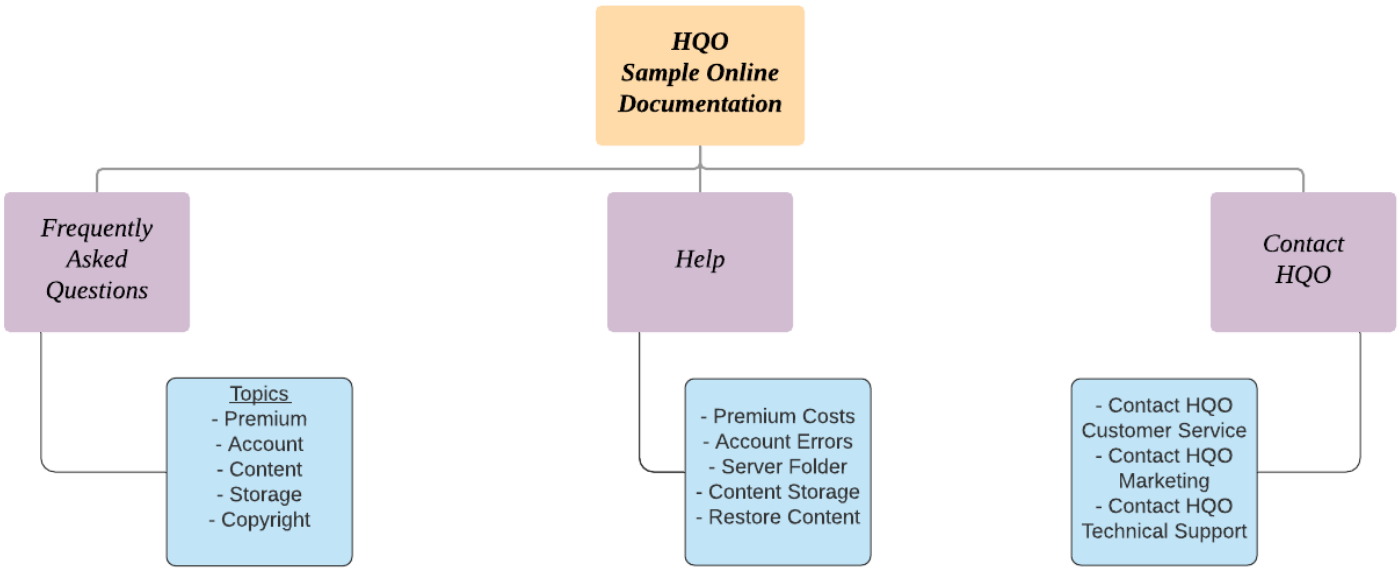
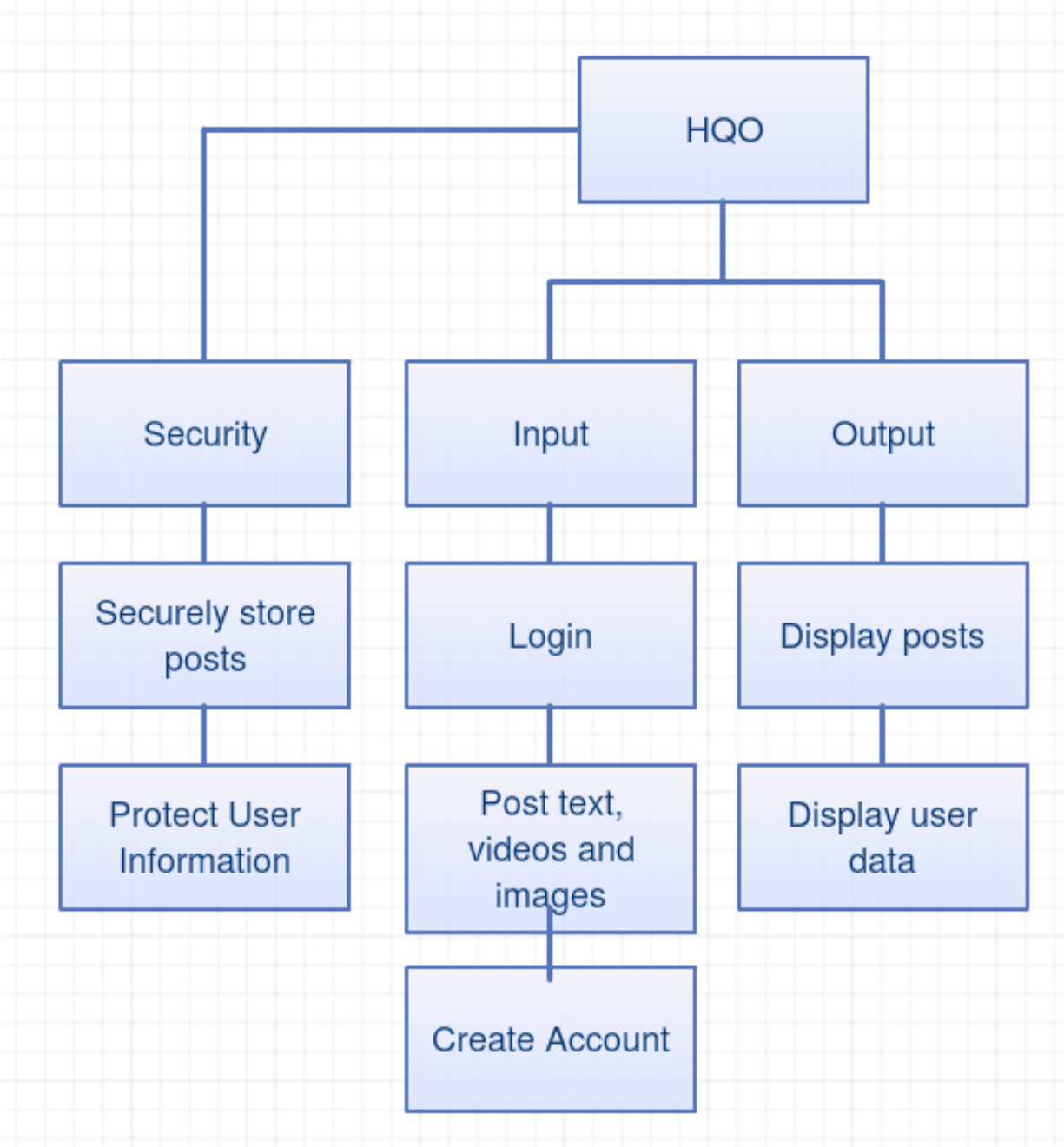


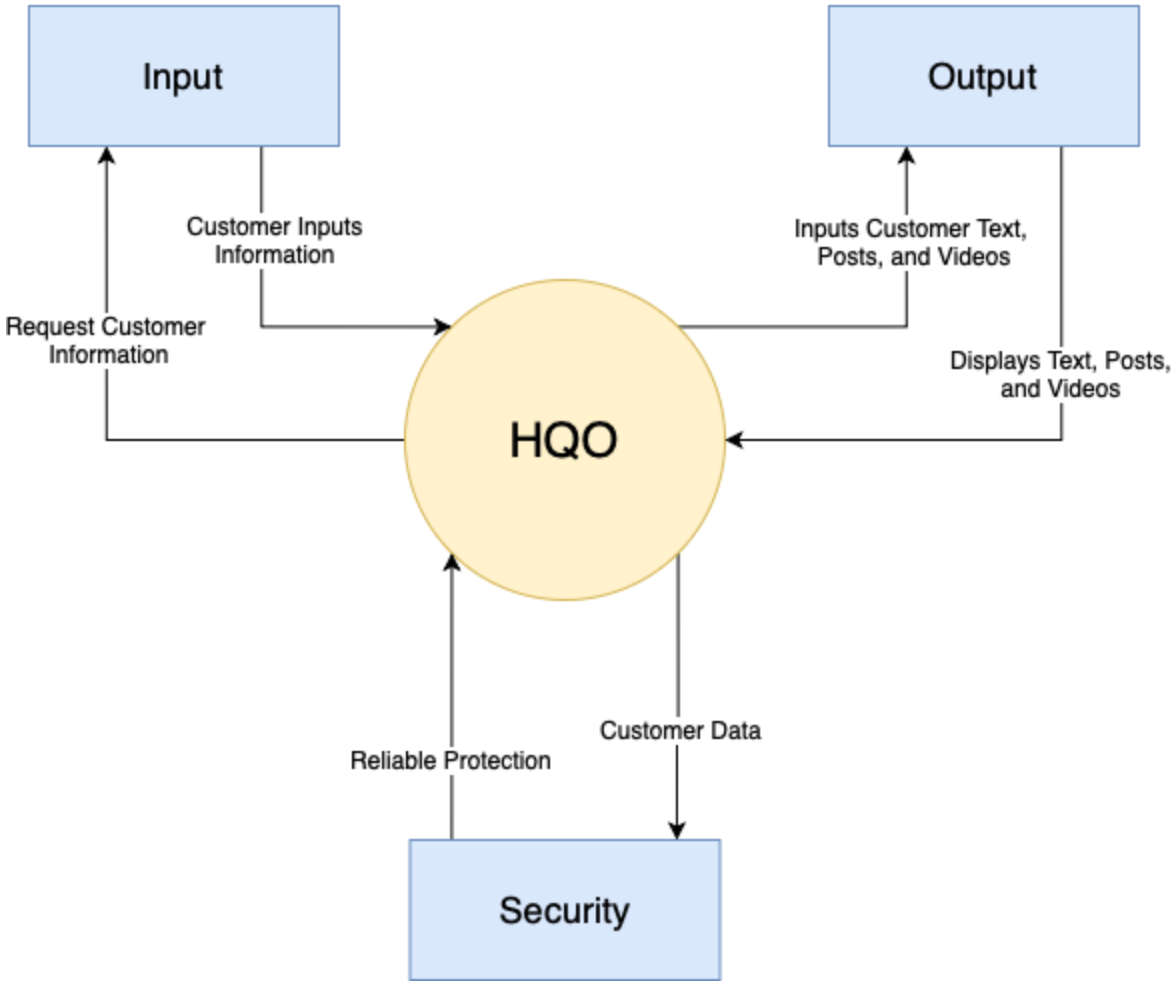
Figure 7.1: Represents a sample of how HQO's FAQ, Help, and Contact Menus with sub-links would look like. Each topic or category has a designated link therefore making it easier for the user to find which category or section they need.

Logical Model

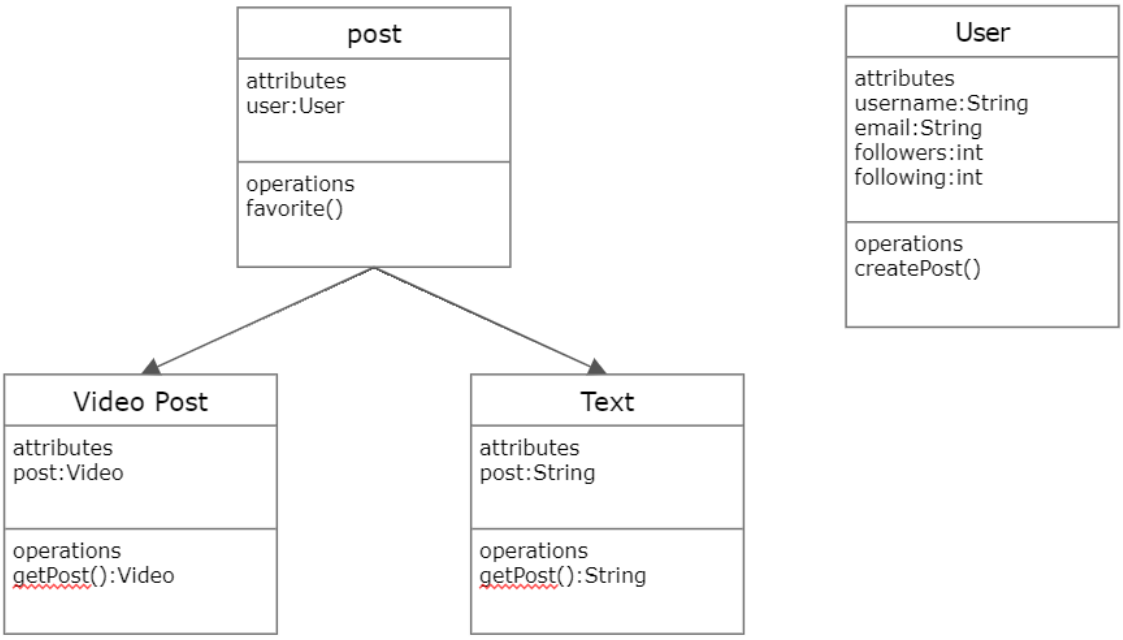
Functional Decomposition Diagram:



Context Diagram

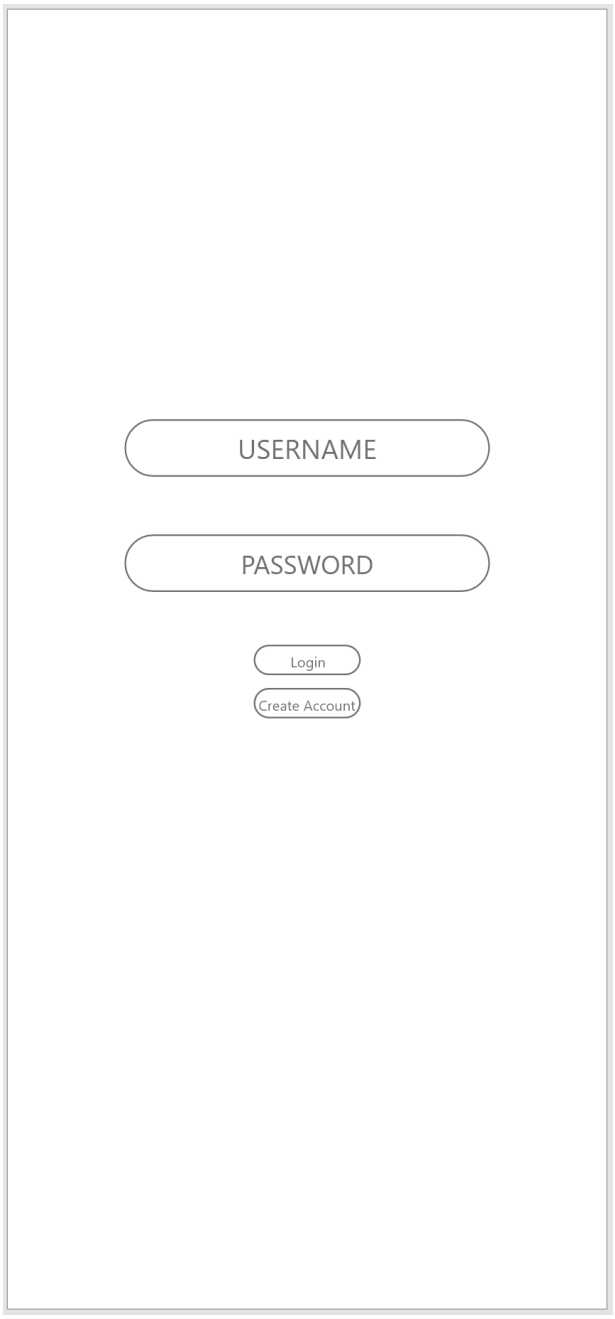


Object Relationship Diagram

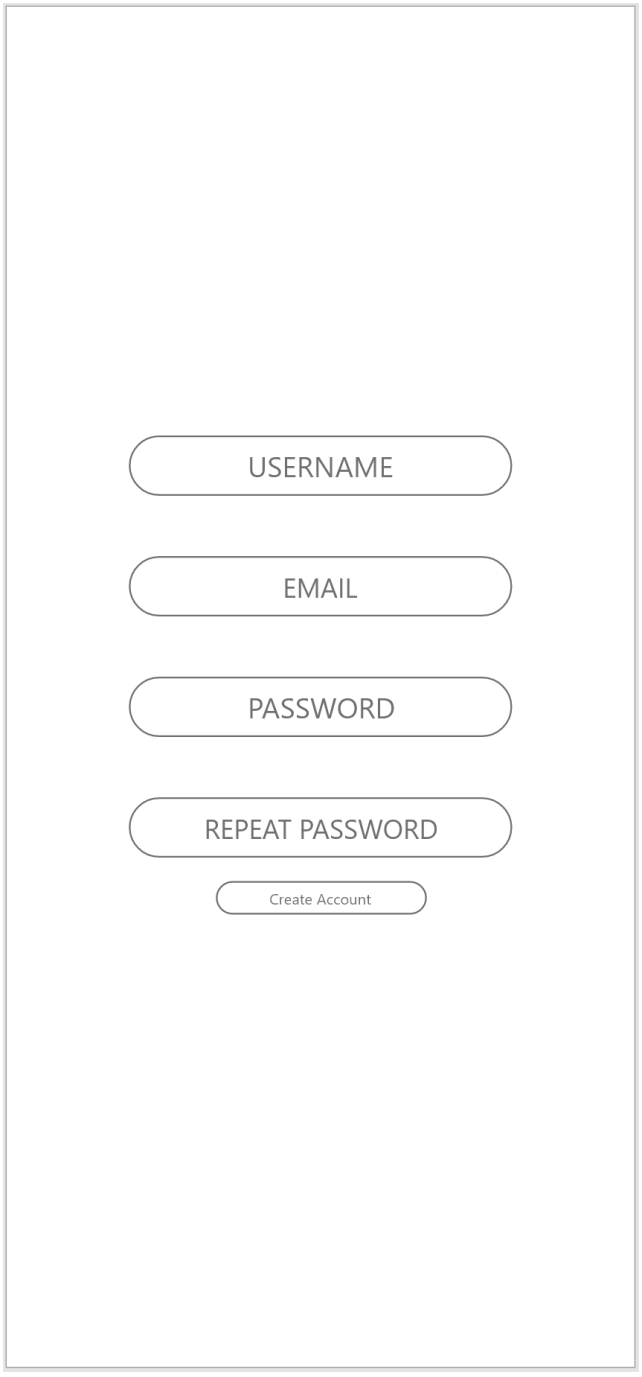


User Interface

Login Screen



Create Account



This Screen is very straightforward. All entry fields and buttons are labeled; anyone would know what to do on this page.

Main Screen

This is the screen all users will see when they login to the app. POST can be text, video or an image. It is designed similarly to other social media homepages so the user would know what to do.

Intention and Logic of UI

Intention and Logic of the UI:

The intention of the UI is to create an easier and more transparent interface for users to use. This UI was developed to enhance user experience in ways that the previous UI was unable to do. Prior to the new interface, users were unable to see media immediately. They had to tap a few icons to get to the public page. This new UI opens the app on the public page, and lets you choose to stay there or go to the user's personal page.

The logic of the new UI is very simple; in order to create a better experience for users, the interface must live up to and exceed that of the competitors. HQO believes that with an improved interface, there will be improvements at the bottom line.

Important Guidelines:

Guideline 1

The first guideline is to "create an interface that is easy to learn and use." This guideline is important to HQO because although it is the most vague and blatantly obvious guideline, it is important to understand and meet that criteria. To develop an interface that is hard to pick up creates a learning curve that many first time users will not want to go through. Therefore, the company's first goal was to meet this guideline.

Guideline 2

The second guideline HQO wanted to meet is to "select familiar images that users understand." Familiarity in a new setting creates a feeling of safety and comfort within a person. HQO wants that same feeling for a user, new or old. The login screen, creating a new account, and the buttons to click are all items that users should have seen prior to this app. If not, the interface is very easy to understand and comprehension should not be difficult under any circumstance. Using familiar images and screen displays will increase user experience and decrease frustration users were having previously.

Guideline 3

The third guideline HQO wanted to meet and exceed was to "enhance the interface." This goal was set because the previous interface was not enough for all the ideas and new features being added to HQO during this time. To enhance user experience, which is one of the company's main goals, the UI needed to be enhanced as well. After the next update, users will be more inclined to use HQO and tell friends about it.

Use Case Descriptions

Model 1:

To upload photos:

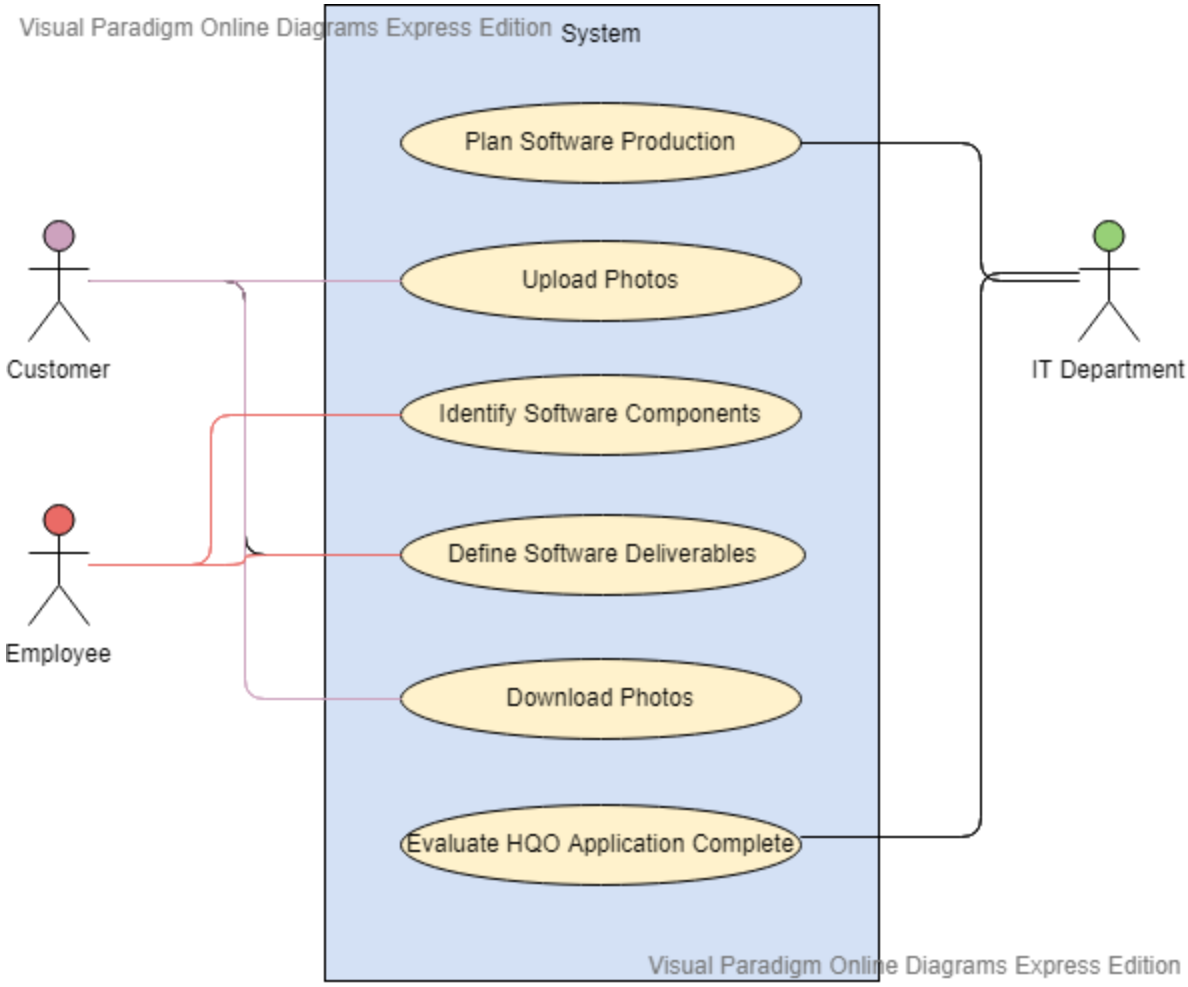
Name:	Upload Photos
Actor:	Customer
Description:	Describes the process used to upload photos to the HQO app
Successful Completion:	1. HQO app verifies the user 2. The HQO app makes sure user is connected to internet 3. The HQO app checks for any content issues 4. The photo is uploaded
Alternative:	1. HQO app verifies the user 2. The HQO app makes sure user is connected to internet 3. The HQO app checks for any content issues 4. The photo is not uploaded due to content issues
Precondition:	User requests to upload photo
Postcondition:	Photo is uploaded to the HQO app
Assumptions:	User has account

Model 2:

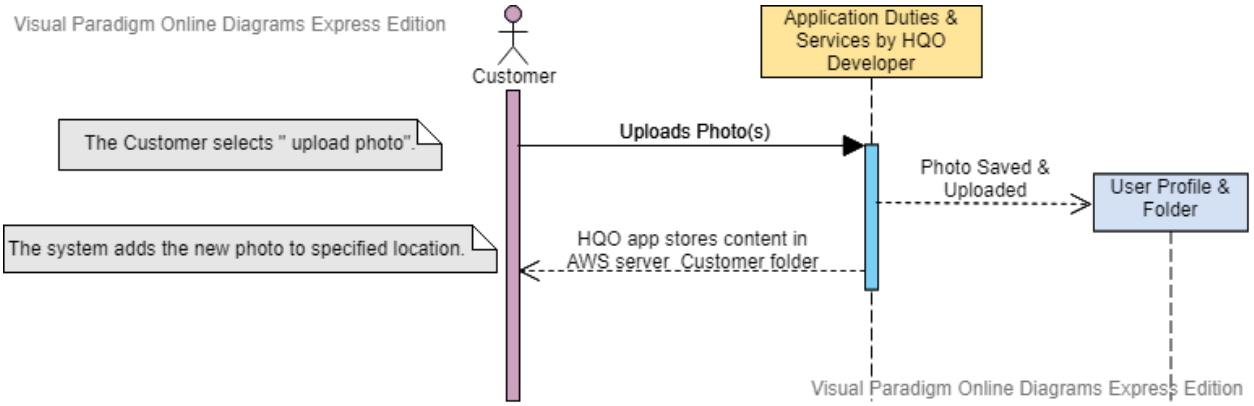
To Store Photos:

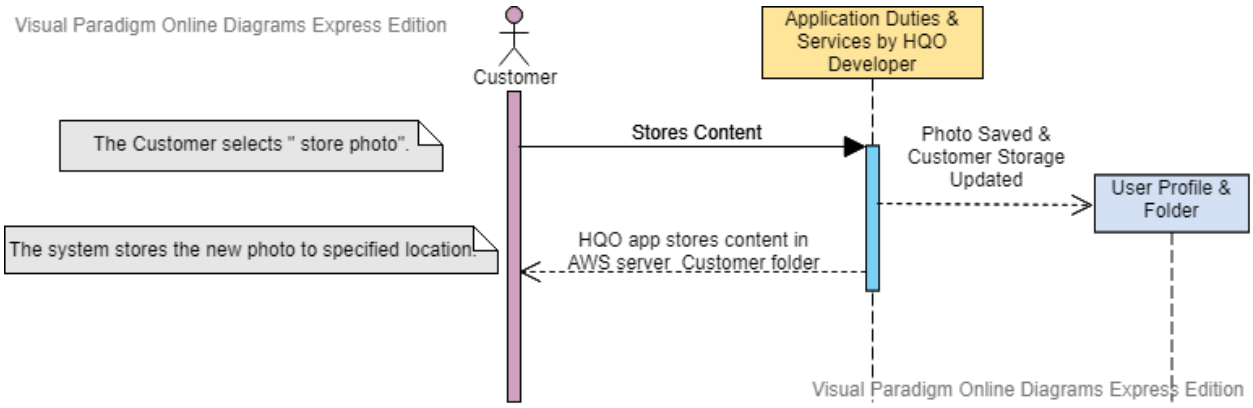
Name:	Store Photos
Actor:	Customer
Description:	Describes the process used to store photos in the HQO cloud
Successful Completion:	1. HQO app checks if user has a file/space reserved in the cloud 2. The HQO app checks to see how much content is being stored 3. The HQO app stores content in user's file
Alternative:	1. HQO app checks if user has a file/space reserved in the cloud 2. The user does not have a file/space created for them 3. The HQO app checks to see if there is space for a new file in cloud 4. HQO requests password for authentication and name for new file 5. HQO creates new file and content is stored in user's file
Precondition:	User requests to store photo in cloud
Postcondition:	Photo(s) are stored in personal file in HQO cloud
Assumptions:	User has account

Use Case Diagrams



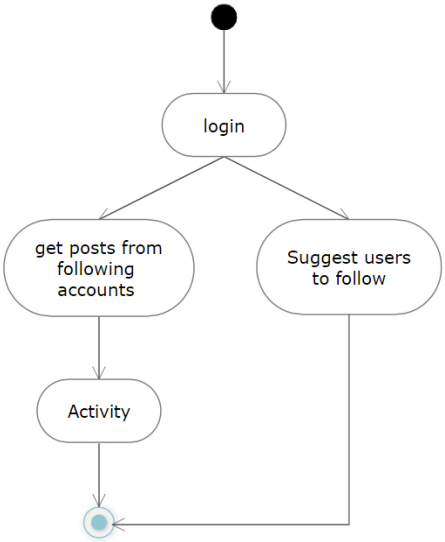
Sequence Diagrams



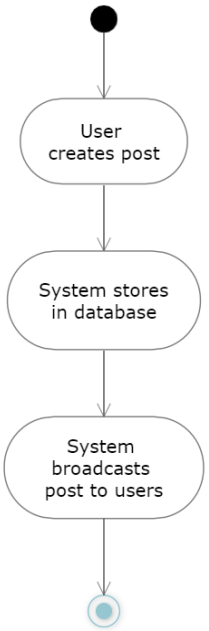


State Transition Diagram

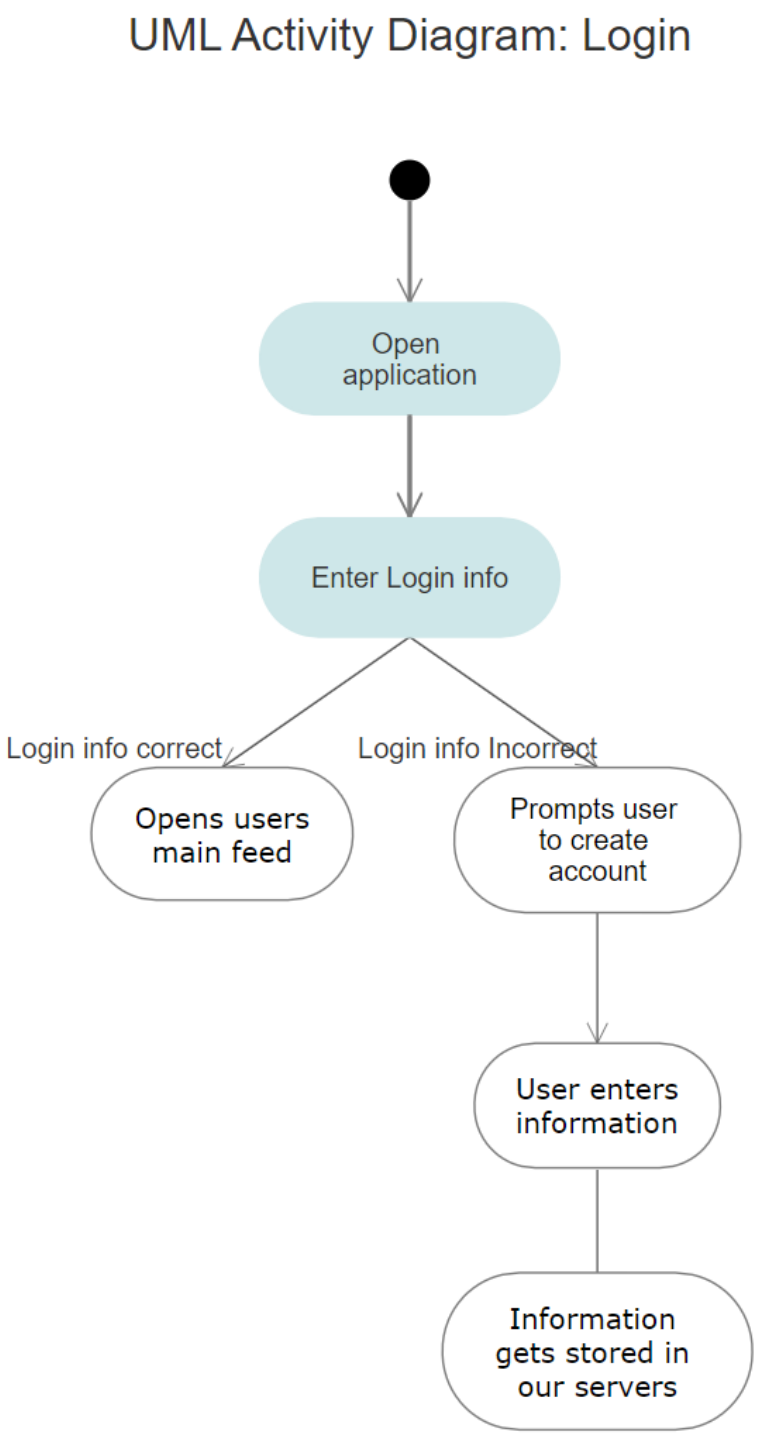
User State Diagram



Post State Diagram



Activity Diagram



Test Plan

Purpose: The purpose of this document is to further define and document the testing that will be completed to ensure that all software created for the project functions as required/designed.

PROJECT IDENTIFICATION		
Project Name	**Project Number**	**Date Created**
High Quality Omni Server Replacement	21081099	1/27/2020
Program Manager	**Project Manager(s)**	
Nick Massaro	Patrick Adams, Brett Hirschberger, Diana Guerrero	
Test Manager	**Test Lead**	
The test manager is responsible for verifying requirements and identifies test approach.	The test lead is responsible for defining test approach, writing test plans, and verifying test requirements with business users and development team.	
Completed by		
Nick Massaro		

OVERVIEW

Objective

The primary purpose of the test plan is to validate that the user requirements as defined in the Software Requirement Specification are being met. Users will verify the operability of the system, and verify all functional areas and output data. System performance will also be evaluated against the performance requirements specified in the Software Requirement Specification. The output data produced will be compared, where feasible, with results obtained from independent calculations.

BACKGROUND– historical information that relates to this project

The use of cloud-based servers will enhance productivity for HQO due to the fact that users will no longer experience outdated crashes while using the app. There's an estimated 950k profit increase by 2022 and enhanced productivity on HQO's application. There are also scheduling and time benefits to the upgrade that cloud-based servers have in place at HQO.

Document	Date
Sprints 1-4	01/27/2020 – 03/13/2020
Sprints 5-8	03/16/2020 – 04/26/2020

TESTING STRATEGY – DESCRIBE THE OVERALL TESTING STRATEGY

RISK ANALYSIS

Identify Components

Data Dictionary Report

External Entities

HQO Data Servers define the sources and destinations of customer input or customer data which then organizes this information from being imported and exported into different HQO data hubs such as the HQO Database, certain information may be posted onto the HQO Application, etc.

Functions/Processes

A function in the following process of customer input includes Reliable Protection through our application and code the system runs the customer input and asks the user themselves if the data they recently updated and provided would like to be stored into their folder under our new servers. Another function is the process in which customer output such as text, posts, videos, and other digital content is displayed onto the HQO Application and further requests customer information to verify that all data and other components that were recently added would also be further introduced into the servers and HQO Database for that said customer.

Data Flows

Data Input through the Customer gets flowed throughout the HQO Data Servers into an output and then also gets stored into the HQO Application itself and is then stored in the HQO Database after it is passed into the Security phase of the data itself.

Data Stores

Data gets stored into the HQO Database which is processed by the Security aspect of the Application through Reliable Protection. The HQO Database holds important customer information which can include emails, pictures/videos, contacts, passwords, etc.

Key Data Elements & Records

Records and Key Data Elements are a huge chunk of what the HQO Data Servers store; these new AWS servers that are used for HQO now provide a better and upgraded plan for what the customer previously had through HQO. These data servers now also help a more manageable and remote control of how the application can improve and expand in its future.

Process Descriptions

Input: The user does not have an account then they will enter their information in a separate screen and it will be stored in our servers. If they do have an account then they will enter their username and password if they match on of the entries on the server then the corresponding information will be load on their device

Output: Once logged the application will run a query on the servers that retrieves the posts from the account that the user follows. If they are not following anyone the system will suggest them people to follow.

Conclusion

The information and data gathered proves for a successful venture into the next step, implementation. In order to properly implement these new systems and updates, a mandatory meeting must be had with the head of each department. This meeting will discuss the forthcoming details as well as who is doing what and when. For example, the Marketing department will be tasked with making sure the media knows of these upcoming changes and finding new ways to gain attention and retention. The IT department will be challenged by making sure each system and update is doing what it needs to do. With many implementation steps given in this report, the next stage is already halfway completed. That being said, what better time to move ahead then now?