The following is a Preliminary Investigation Report written as part of a Systems Analysis and Design course.

The goal of the project was to create a fictional company and design a plan for the implementation of the technical side of the company. We were tasked with creating various deliverables beyond this report, such as a PowerPoint presentation and spreadsheets. While this was a group project, I wrote 100% of the technical documentation. The information contained in this report is not intended to be fully accurate (or truly feasible!). It was intended to be an exercise that would allow us to work through the process. Any information gathered from another source is cited directly in the report. The audience for this assignment was intended to be management and executive level staff members.

The text of this document remains the same as it was when the report was originally written, but I have edited it to remove 20+ pages of tables containing outdated demographic and financial figures. I have retained some of these tables as an example of research performed at the time, but I have kept what remains focused on what I actually wrote as part of the final report.

PRELIMINARY INVESTIGATION REPORT

Introduction

At the request of management, the IT department has been tasked with implementing a new Information System incorporating both a web and mobile presence. This preliminary investigation aims to define the company's current and future workflow needs. Upon completion of the study, the IT department will provide management with a detailed analysis of all company activities and recommendations for consideration.

Project summary

Name of the enterprise

The name “Orion” is well-known and easily remembered. It has many strong historical and cultural associations that often bring to mind the idea of a robust and reliable warrior and its existence as a guiding constellation. The business logo consists of simple star shapes overlaid atop the other in slightly different shades of orange. It is bright and attention-grabbing.

Location

The company headquarters is located in the Hampton Roads region. Future growth will expand the business beginning with other regional metropolitan areas such as Richmond and Washington, D.C., before branching out more widely across the East Coast.

The company requires only enough physical space to accommodate in-house corporate and administrative staff and the hardware on which the IT department will implement the system. No extra space is necessary as Orion does not employ its own fleet of vehicles but relies on independent contractors and their own vehicles.

Description of the project

- The company currently focuses on the Hampton Roads region and intends to serve the community's residents as a customer base and a pool of prospective employees.
- The company benefits the local community as it will offer new job opportunities.
- The target market of the company is customers who fall between the ages of 18-45, regardless of gender.
- The target market would include large groups such as college students and business people. A portion of the company's business is devoted to providing transportation options for corporate use, so the company must give the impression of being suitable and professional for that purpose.

Long-range objectives

- Expand the company to service areas along the East Coast with an eventual nationwide rollout.
- Reach out to local advocacy agencies to best accommodate riders with special needs and disabilities.
- Establish a strong brand image and gain brand loyalty. An emphasis on customer satisfaction will be key.

Systems request summary

The needs of the company require full development of the Orion website, mobile applications, and back-end infrastructure that will comprise all day-to-day business operations. The system is critical and must provide sound and efficient functionality for end-users and employees. The system must provide scalability for future company expansion.

Investigation findings

- The project's scope will require the construction of both back-end infrastructure and front-end design to allow the business to function on a day-to-day basis.
- Orion offers the option of private car service as well as rideshare options. Their “fleet” comprises independent contractors and individuals who own their own vehicles.
- Through the usage of the website and the mobile application, customers will be able to create member accounts. They will also be able to select their pickup and destination locations and agree to a prearranged fee before a driver dispatches to their location. All transactions require using a credit card, debit card, or PayPal and customers are not billed until they reach their final destination.
- All drivers are provided with a mobile application with GPS capabilities that track their location at all times, ensuring passengers' safety and employee accountability.

- Considering the nature of the company, the focus will need to be placed on organized and efficient database management and creating a system that can handle the demands of both the web and mobile traffic while remaining within budget and hardware constraints.

Demographic Analysis for the Hampton Roads Region†

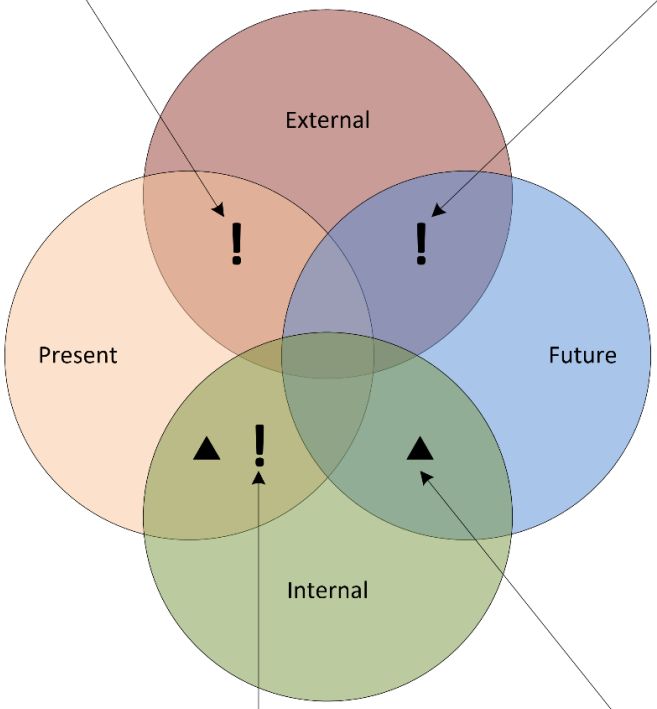
- Racial/Ethnic Background
    - 67% Caucasian
    - 20% African-American
    - 13% Other
        - Hispanic or Latino
        - Asian
        - Pacific Islander
- Sex
    - 51% Female
    - 49% Male
- Military Presence
    - 61,000+ veterans in the region.
    - Active Military or those in some way connected to a service member comprise 50% or more of the local population.
- Tourism
    - Tourist season falls within the summer months.
- Age
    - The median age is 35 years.
    - 23% fall within 20-34 years.
    - 13% fall within 35-44 years.
    - 14% fall within 45-54 years.
    - 10% 65+ years.
- Income and Education
    - Average Household Income: $74,867
    - 8% fall below the poverty line.
    - 94% are High School graduates or higher.
    - 33% completed a Bachelor's degree or higher.

†source: http://www.yesvirginiabeach.com/Business-Environment/Documents/2014%20Community%20Profile.pdf
†source: http://quickfacts.census.gov/qfd/states/51/5182000.html

Project Constraints

- New Affordable Care Act laws must be used in the payroll system.

- Driver car safety inspections and insurance must be checked annually to ensure they are up to date and pass standards.
- Driver's license must be checked regularly to make sure they are still valid.
- Company standing with the military and the individual drivers' military ID must be kept valid and up to date for on-base pickups and dropoffs.



- System needs to be able to scale with company growth to new geographic locations.

- Management needs the system to be completed immediately.
- The system must be up and running at all times.
- Both the website and the app must be able to accept input from many users at once.

Feasibility analysis

Economic feasibility

Economic rates findings

- The Hampton Roads area is surrounded by water and has varying factors that will make traveling to various destinations more costly than others. Some of the outer regions fall within a lower income bracket and spending allowance than those within inner areas of the Hampton Roads District. Military income is a fixed rate, with people commuting between North Carolina and the military bases daily. These individuals are likely to have less disposable income than others in the area. Tourist season will increase prices within the area, from gas prices to tolls, and also increase opportunity as people look for alternative means of transportation within the region.
- Pricing of services will have to consider gas, tolls, and competition. All vehicles must be commercially insured when “on duty” by State law. That is roughly $50,000 more than personal vehicle insurance. Workers' compensation for these fares must be accounted for. EzPass for each driver is recommended to keep prices down and for ease of use, as not all crossings have toll booths for cash. However, EzPass has its own costs with a $0.50 monthly fee for a standard transponder or $1.00 for a Flex transponder and a $35.00 minimum balance on the transponder.
- For the service to operate there are two main options: hosting it in-house or using a cloud service. Each presents its own financial impact on the company, which can be costly.
    - With an in-house approach, the upfront cost of the hardware ranges from $4,115.98 to $4,287.98, depending on the setup.
    - There are the yearly averages of the licenses for the database, the internet connection, and security software, ranging from $1,917.85 to $19,338.91.
    - This in-house setup has ten different setup options, which provide a wide range of needed support.
    - These figures are applicable for two years only, as lock-in with an ISP offers a two-year contract before renegotiating rates.
    - Hosting with Amazon Web Services has three options that have no upfront costs. These options range from $9,490.86 to $26,024.40 for the first year and $9,866.40 to $26,372.88 after the first year. These options also present the need for less support staff.
    - Over three years, the company will likely spend $153,493.00 for an on-premises system, but going with an AWS solution, the average cost could be $4,772.00.
    - There would be a -45% Return on Investment with a Cost of $3,397.00 to the benefit of $1,853.00.
    - While using a hosted solution, there would be a 233% ROI with a cost of $503.00 to the benefit of $1,676.00.

Toll Rates

Elizabeth River tunnels			
Monday – Friday	EzPass	Pay-by-Plate	Unregistered
00:00 – 05:30	$1.00	$2.00	$3.00
05:30 – 09:00 (peak)	$1.25	$2.25	$3.25
09:00 – 14:30	$1.00	$2.00	$3.00
14:30 – 19:00 (peak)	$1.25	$2.25	$3.25
19:00 – 00:00	$1.00	$2.00	$3.00

South Norfolk Jordan Bridge			
	EzPass	Pay-by-Plate	Unregistered
Standard Rate	$1.75	$3.25	$4.25

Chesapeake Expressway		
	EzPass	Cash
Standard Rate	$3.00	$6.00
Peak Weekends	$3.00	$6.00

*Peak weekends are defined as 00:01 Saturday morning to 00:00 Sunday – Memorial Day through Labor Day

Chesapeake Bay Bridge Tunnel		
Off-Peak	EzPass	Cash
One-Way Trip	$13.00	$13.00
Return Trip within 24 Hours*	$5.00	$13.00
Peak		
One-Way Trip	$15.00	$15.00
Return Trip within 24 Hours*	$3.00	$15.00

*Peak is defined as Friday through Sunday – 15 May through 15 September

Current E-ZPass customers with open accounts as of July 9, 2012, will not be charged a monthly fee until they replace their existing transponder or add a new one to their account. They will then be charged a 50-cent monthly fee per new standard transponder or a $1 monthly fee per new Flex transponder. The fee applies to new transponders obtained after July 9, 2012.

New E-ZPass customers opening accounts after July 9, 2012, will be charged a 50-cent monthly fee per standard transponder or a $1 monthly fee per Flex transponder.
The current $25 deposit will no longer be required for new transponders. Customers who have previously paid a deposit will have it converted to prepaid tolls on their accounts when replacing a transponder or will receive a refund if they return a transponder and close their account. New customers will still be required to pay $35 in prepaid tolls when opening an E-ZPass account.
†source: http://www.ezpassva.com/

Gas Prices

Current		
Grade	Low	High
Regular	$1.97	$2.85
Premium	$2.19	$2.80
Diesel	$2.47	$2.79
Forecasted		
	$2.30	$2.50

†source:
http://www.virginiabeachgasprices.com/index.aspx?area=Virginia%20Beach%20-%20Central&area=Virginia%20Beach%20-%20East&area=Virginia%20Beach%20-%20North&area=Virginia%20Beach%20-%20NW&area=Virginia%20Beach%20-%20SE&area=Virginia%20Beach%20-%20West

†source:
http://ttp.aaa.com/TripTik/?subCommand=mapLoc&geoName=%7CTidewater%7C+%7C+%7C&geoState=%7CVirginia%7C&geoType=city&poiKey=256&zl=13#

†source: http://hamptonroads.com/2015/02/hampton-roads-gas-prices-are-creeping-back#

Technical Feasibility

- The company will acquire the necessary hardware, software, and network resources.
- The company has the needed expertise to operate at its current level. In the future, the company may require other staff to continue operating at the same level of efficiency.
- The proposed platform has sufficient capacity for its current needs and will be sufficient for future expansion on the timetable the company is planning.
- As the business grows and expands into a larger coverage area, the company will need to make adjustments to ensure the system can accommodate the increased traffic and influx of users.
- A full mock-up is recommended to ensure that the system runs smoothly and is free of errors before an official launch.
- Based on the options available for the business needs, the hardware and software environment will be very reliable. Reliability is the main focus as it is a necessary business requirement to maintain day-to-day operations.

- The system will connect to external systems such as PayPal, Google Wallet, and most major credit card carriers.
- As uptime is a major necessity for the business to function daily and retain its customer base, the hardware and software must supply adequate performance.
- Daily system back-ups will occur during hours in which the system is under the least amount of stress.
    - The IT department can plan backups during overnight hours (such as between 0300-0500 EST) as the current system is needed only for the Hampton Roads area.
    - The company can adjust the time frame accordingly with the expansion to accommodate local time differences.

Operational Feasibility

- The information system is a mandatory requirement for business operations. The purpose of this investigation was to determine the most efficient system for the company and implement it based on the findings.
- The system design will allow for maintenance with a minimal amount of staff. Training will be required to ensure that those maintaining it will be able to maintain it properly.
- The website and the mobile application are designed to be easy and intuitive.

Schedule Feasibility

- The IT department controls most factors that affect the schedule.
    - Without the implementation of the system, the business cannot operate. Because of this, the system must be completed on time and as quickly as possible.
    - The IT department conducted a thorough investigation, and IT established a careful plan so that would be possible.
    - Management has established a firm timetable for the project.
- The project should have all of its steps completed on time to avoid the risk of a time crunch toward the end.
- The schedule was determined to devote appropriate attention to each part of the project, resulting in the best possible outcome.
- The schedule has allowed for an ample testing phase after implementation. With a brand new system and a new company, it is important that the initial release goes as smoothly as possible and the users find the product satisfactory and delivered as promised.

SWOT Analysis

Strengths

- Offers better pricing than most taxi services.
- More convenient than public bus routes.
- Luxury vehicle options available.
- No need to tip or pay the driver in cash.
- Safety and proper service guaranteed.
- Drivers pre-screened and background checked before hiring.
- Payments are not deducted until the customer arrives at their final destination.
- RideShare available.
- Convenient and easy-to-use website and mobile application.
- User accounts allow a “reward” system for frequent usage.
- Telephone-based customer service option.
- Fewer limitations on hiring as there is no need to maintain a “fleet” given that employed drivers use their own vehicles.

Weaknesses

- Limitations of availability in smaller towns and cities.
- Reliance on the website and mobile application mean that any service interruption means a loss of business.
- New branding; people cannot use it if they don’t know about it.
- Limited availability to accommodate individuals with disabilities.

Opportunities

- Rapid growth; expanding services to new locations only requires hiring drivers in those locations.
- Beneficial to the local communities due to a new area in the market for more jobs.
- Possibility to reach out to local advocacy agencies to accommodate all riders.

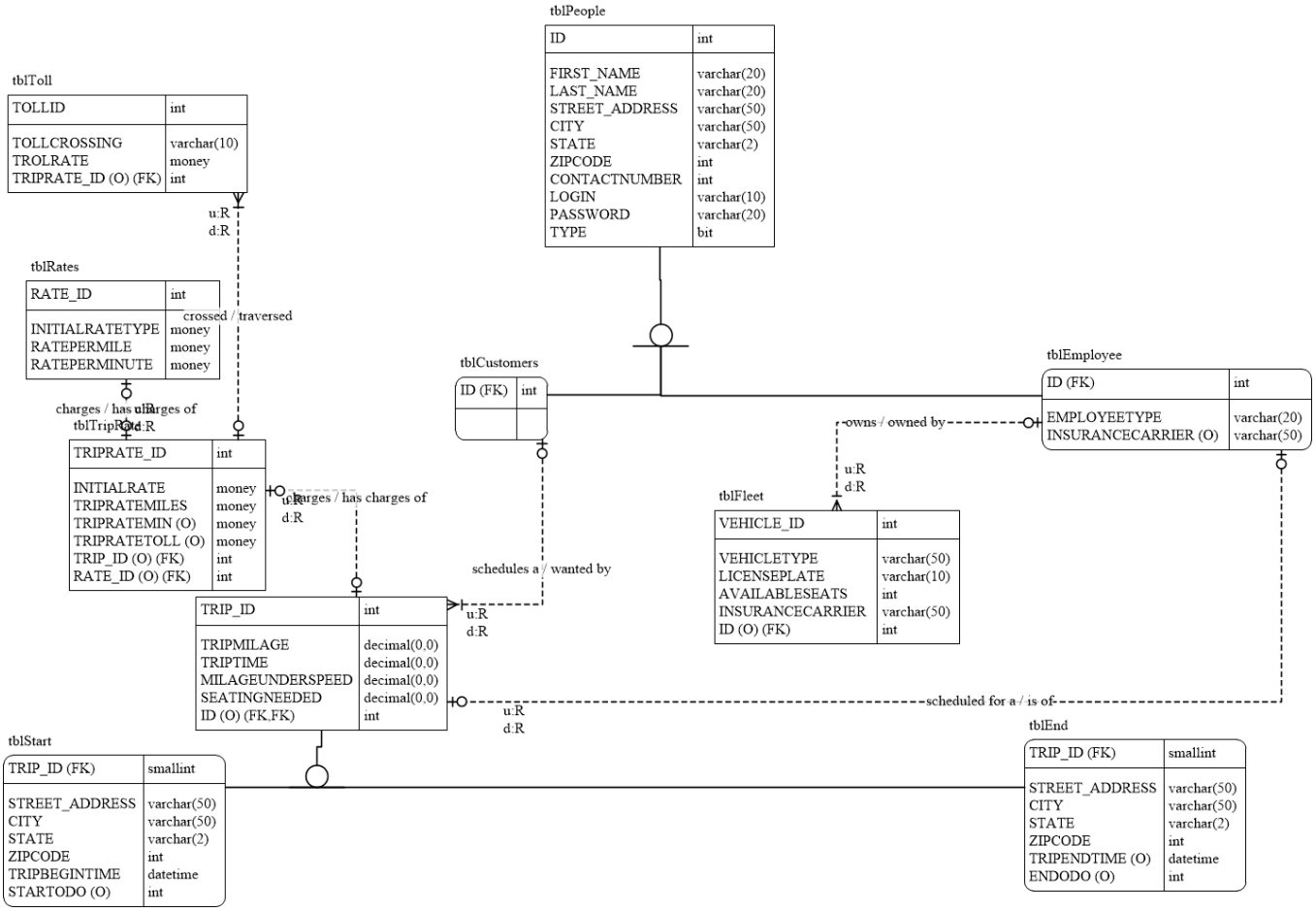
Threats

- Traditional, existing transportation options.
- Weather and climate conditions.
- Similar services appearing in the future.

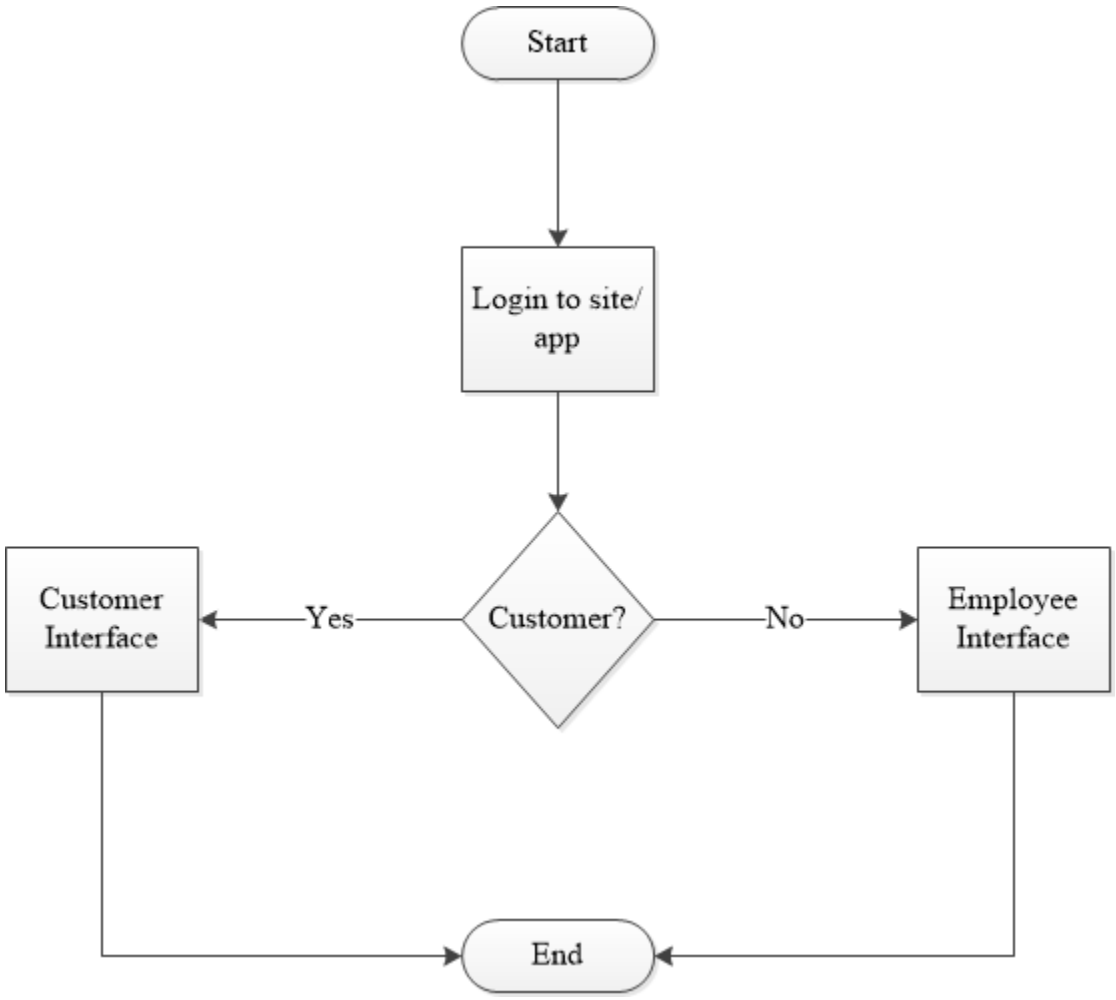
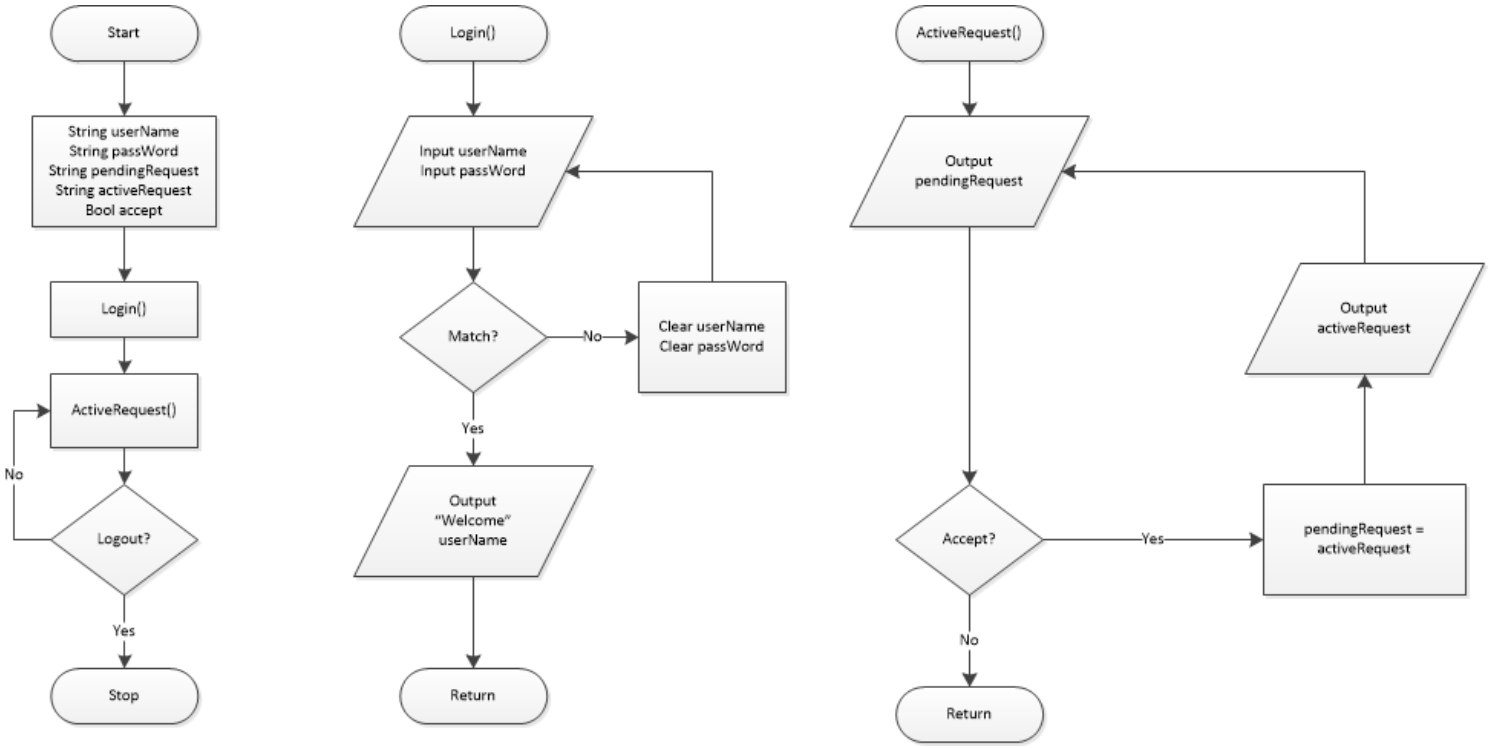
Risk Management Plan

Risk	Probability	Impact	Priority	Actions
Weather impacts the ability for the team to gather together to complete work.	3	2	3	1. Group will communicate via email and instant messenger in lieu of meeting face-to-face.
Deadline missed on parts of the project.	5	5	15	1. If this happens the missed task will be assigned to an additional group member.
Additional time will be needed to complete research.	1	2	3	None
Additional time will be needed converting submitted files.	5	3	9	None

Database Entity Relationship Diagram



Flowcharts


Start
Login to site/ app
Customer?
Yes
No
Customer Interface
Employee Interface
End

Employee Mobile App Flowchart