Online Taxi Sharing System

System Request and Feasibility Study / Planning Phase   
(Homework No.1B)

Project team: Team 01

Instructor: Dr. Araz Yusubov

Submitted in partial fulfillment of the requirements of the INFT 2303: Systems Analysis and Design course project

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| Team member | Contribution to this homework (NOT the project) | Estimated % |
| Senan Mardanli | Gave constructive introduction and summarized references | 25% |
| Nargiz Bayramova | Contributed to define technical, economic and organizational feasibility analysis | 25% |
| Nigar Salayeva | Pointed out overall description, product perspectives, and product functions in detail | 25% |
| Anar Bayramov | Identified user characteristics, constraints, assumptions and dependencies | 25% |

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# Introduction

This is part of the System Proposal for a hypothetical project Schedule for Taxi submitted for partial fulfillment of the requirements of the Systems Analysis and Design course in the School of Information Technologies and Engineering at ADA University, Baku, Azerbaijan.

First of all, we would like to start listing our individual System requests here and describe which factors we have examined to choose the main project for our team.

* Online search for craftsmen (UstaTap.az)
* Alert system for incoming earthquake (QuickAlert)
* Online taxi sharing system (TravelBuddy)
* Finding suitable professor system (MyProfessor)

Let's start with the online method for finding craftsmen. The idea was abandoned for a number of reasons, the first of which is that it had previously been published in Azerbaijan. Additional concerns were the unclear aspect of the project's scope and the high risks associated with its achievement given it is already existing in Baku.

On the other hand, the earthquake alert system was outpacing our understanding of technology and other related topics. That is why we also dropped this project.

Lastly, Finding a suitable professor system. We got rid of this system because we believed it would be immoral to use it with our professors at our institution, and because a comparable system, called Blackboard, is already in use.

Eventually, the online taxi-sharing system proved to be the best option for our project. Indeed, the cause is rather straightforward. It had a very obvious issue that we were able to concentrate on, creating a mechanism to address in Azerbaijan. With the use of this technology, we will be able to lessen traffic and crowding in Baku's busiest areas and assist passengers in finding cabs much more quickly and affordably. Furthermore, everyone who signs up for the service will have access to it as both a driver and a passenger. The user will let other users know where he is and where he's going, as well as that he's seeking a travel companion.

## Definitions

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| --- | --- |
| Term | Definition |
| ROI | stands for Return on Investment, typically measured as %, calculated by dividing the net profit by the cost of investment |
| BEP | stands for Break-Even Point, a concept in financial analysis, that defines the level of gains required for business |

# Overall Description

* System name:

**Online Taxi Sharing System**

* Business need[[1]](#footnote-1)

People who live far from the city center use taxis with a fee of 1 manat to get to the city faster and more easily. These operative taxis can be found in many regions of the city. But these taxis cause a number of problems because they work without a schedule and arbitrarily. More than necessary, taxis are waiting there, occupying the second and third lines and it causes congestion. Or the complete opposite happens; passengers are

waiting for a taxi for a long time. Also, they become an obstacle to the smooth movement of buses because the taxis all stand together at the bus stops. And the most ridiculous thing is the conflict between them over the passenger.

* Explain what the system will, and, if necessary, will NOT do/ Business Requirements

A system should be created for both passengers and drivers. Passengers and drivers must register to use the system. Everyone who uses the system must have their own personal account to identify and show their location in the system.

Anyone who registers with the system can use the system both as a driver and as a passenger. The user reports where he is and where he will go in the application and informs other users that he is looking for a travel buddy.

Let's give an example: I go from Bina to Koroglu subway and open the application and report this, so people going to Koroglu can go with me at a more affordable price (1 AZN). (I want to inform you that the normal taxi price is 7-8 AZN) In the system, taxi drivers will be able to see where other drivers are and where passengers are. Passengers will also be able to see the nearest drivers.. As a result, there will be no need to wait for a driver or a passenger. Also, the system will automatically queue registered drivers to avoid congestion. There will be no conflict between taxi drivers due to a certain row, nor will they obstruct other drivers.

* Describe the application of the system being specified, including relevant benefits, objectives, and goals / Business value

Goals:

* congestion on the roads will be reduced
* taxis will not be an obstacle to buses at the bus stop
* time saver: both drivers and passengers will not wait as much as before
* there will be a certain order, so conflicts between drivers will end
* Special issues or constraints:
* If the system is created, the work will be official and the drivers must pay taxes, there is a possibility of tax evasion.
* Also, elderly people may find it difficult to use the system because they are not very familiar with the new technology.

## Product Perspective

There are many taxi companies such as Bolt, Uber, etc. These taxi companies have their own systems, in which the location of both the driver and the passenger can be easily seen in their system. Both systems show how far the driver is and how long it will take. Both card and cash payments are valid in both systems. The difference is that in the system we will create, both drivers will be able to use it as passengers, and passengers will be able to use it as a driver, and at the same time, the driver will be able to take not only one person, but several people, as a result, the prices will be more reasonable. There is one more difference: the drivers themselves choose and mark the destination, and the passengers find the drivers according to their destination.

## Product Functions

* **Registration form:**  Passengers and drivers must register to use the system. The system needs the user's full name and contact information(email address, phone number especially to keep in touch with each other).
* **Guideline:** When the user registers to the system, the system should automatically provide guidelines and instructions should be clear to the user. It should consist of how the system works and what is required to use the system.
* **Search:** In the search, option passengers enter the destination where they want to go in order to find the nearest driver.
* **Location:** Users should permit sharing their location in order to find the nearest driver or passenger. In the system, there should be a location board in which users can add, edit or delete their location.
* **Payment:** Both card and cash payments should be valid in the system.
* **New Ride Panel:** Ride details should be automatically added to the system when the drivers select their destination and should be easily found by passengers.
* **Help Center:** If the user has difficulties while using the system, he will be able to contact the administrator and he will be helped to solve the problem.
* **Feedback:** After the first use, a feedback panel will be activated for the user to mention their feedback and suggestions to improve our system.

## User Characteristics

In order for our users to be able to use the platform, they are required to have certain characteristics, such as:

Expertise in the technical area: Our platform is intended to be used by people with varying levels of technical expertise. It is recommended that our users be comfortable with the use of mobile applications and online services.

Basic income level: the intended users may come from a different financial backgrounds, but it is projected that the system will be used most frequently by users who are looking for an affordable transportation option. This may include students, people with lower incomes, or generally people who are commuting on a daily basis.

Age range: The intended user base of our system may come from a wide range of age groups, but we are expecting a moderate number of younger people who are comfortable with technology and are more likely to use ride-sharing services.

Sharing personal information: the system requires users to share personal information, including their location, contact information, and in particular cases their home address.

Mobility: the intended users may have different levels of mobility. Some percentage of our users will heavily rely on the system as their primary mode of transportation. This will impact our view on the design of the system, particularly in terms of accessibility features.

These were the main characteristics that we need to take into consideration when designing the system. As an example, the user interface should be designed to be intuitive and easy to use for users with limited technical expertise. At the same time, the system should be designed to protect user privacy and ensure the security of personal information.

## Constraints

The Taxi Sharing system has some constraints that should be kept in mind when designing and implementing the system. They include

Technical constraints: the system must be compatible with a range of devices and mobile operating systems to ensure that it can be used by as many people as possible. The architecture of the system should be chosen to handle a high volume of users and data traffic.

Security constraints: the system should be designed to ensure the privacy and security of user information. Appropriate security measures should be implemented to prevent unauthorized access.

Legal constraints: the system must follow all relevant regulations and laws, related to transportation and data privacy.

Cost constraints: the system should be designed to be efficient and cost-effective, during development and production.

Performance constraints: the system should be designed to provide fast and reliable service, starting with minimizing the time for matching drivers and passengers and ending with ensuring that the system runs without disruptions.

These constraints require the developers to come up with creative solutions to reduce development time and issues, for example by using cross-platform technologies when developing a mobile application.

## Assumptions and Dependencies

The Taxi Sharing system relies on multiple instances, such as:

Internet connectivity: the user should have a stable and reliable internet connection for the system to function correctly.

Availability of drivers: one of the critical factors for our system is the availability of drivers. It is assumed that there will be a sufficient number of drivers available to meet the demand for the service.

User interest: one of the main factors for the success of the system is user adoption. We are expecting a sufficient demand for the service to support the sustainable development of the system.

Payment processing: the system is dependent on reliable payment processing to ensure that drivers are paid and that the transaction is successfully completed.

User data accuracy: the system relies on accurate information provided by the users, in cases when location services are not being used. Users must provide the correct location and destination addresses.

Map service integration: the system accurate an accurate and fully functional mapping service that is implemented into the system to locate users and drivers.

# Feasibility Analysis

**Technical Feasibility**

The Taxi Sharing system is technically feasible and offers advanced utility, however, there are also some inevitable technical viability issues to be considered. Following are low potential risks:

**Risk probability** of the population being familiar with taxi-sharing applications is considered comparably low:

* Even though there is no exact same application existing in our country right now, the IT department is well-versed enough and has extensive understanding of the real-time location tracking and online pay-per-use applications.
* Although the technology required to build the system is not yet available, it can potentially be implemented by using existing resources as well.
* Users might have already experienced slightly similar applications (Uber, Bolt, Yango, etc.), but this taxi-sharing system varies in practical use and user-friendly interface, user adoption, and satisfaction.
* Project team requires experts with extensive knowledge from the IT department to build secure and scalable systems and to take advance notice of potential challenges and issues.

**Project size** (relatively lower risk):

* 7-10 people will be assigned to be project moderators.
* Relying on the fact that the taxi-sharing system is primarily considered for urban areas with hectic traffic flow and large coverage of crowd issues, project size depends on how many regions will have this system and the number of passengers that are expected to be adopted.
* Based on geographic coverage scale, expected total number of users, infrastructure facilities, growth strategy, and constraints; the project size is not relying on a critical time frame. Since this project is a newly implemented system in the marketplace, and there’s no predictable competitiveness in the field, there's no sharp deadline to complete the project.

**Compatibility** – To ensure compatibility, our app must be designed to work smoothly on various devices such as smartphones, tablets, and laptops running different operating systems such as Android, iOS, and Windows. However, it may require additional development resources and testing efforts to ensure compatibility with multiple devices and operating systems. Furthermore, there may be limitations imposed by the hardware or software of certain devices that could impact the application's functionality or user experience. To deal with this risk there is a need to use cross-platform development tools(e.g. React Native) which enable developers to create a single codebase that can be deployed to multiple platforms. Hence, from a technical feasibility perspective, building a compatible taxi-sharing application is certainly achievable.

**Economic Feasibility**

The system certainly offers a number of economic upsides, notably lower transport expenses for both drivers and passengers, and enhanced taxi company productivity, utilization, and performance. The viability of such a system, meanwhile, is subject to a variety of parameters. The ease of utilization and scalability of the software will indeed greatly affect user engagement. The approach is implemented to be ***financially feasible*** if enough customers are involved in dividing ride fees.

The development costs – varies widely based on the scope and scale of the project.

The annual operating costs - vary depending on the size and complexity of the system to be implemented, the utility level, and the operating model employed.

The benefits of a taxi-sharing system - are significant and wide-ranging, as well as reduced transportation costs, enhanced efficiency, and scalability for taxi companies, established environmental sustainability, improved access to transportation, safety, and improved user experience.

The intangible benefits and costs – impact the overall social and economic viability of the system.

Intangible benefits:

* Social and environmental impact
* Improved quality of life
* Increased social interaction

Intangible costs:

* Privacy concerns
* Safety concerns
* Behavioral changes
* Legal and regulatory challenges

Necessary Calculations[[2]](#footnote-2):

To ensure the economic viability of this taxi-sharing system, necessary calculations are needed to be considered. Since this is only the primary system request and feasibility analysis plot, we can’t calculate the exact costs right now. However, we will need to determine the ROI and BEP[[3]](#footnote-3) of this investment to follow further steps:

To calculate **ROI** -> (Net profit - Total cost of investment) / Total cost of investment

To calculate **BEP** -> Break-even point = Fixed costs / Contribution margin per ride

**Organizational Feasibility**

Since the project's primary focus is to bring sustainable transportation solutions for urban centers, the main purpose will attract the target market, and yes, it’s directly aligned with the business.

This taxi-sharing system is considered to be effectively affiliated with business; by offering a streamlined income gate, raising consumer involvement and satisfaction, and complementing the company's core purpose and objectives, it can enable a company in accomplishing its goals.

The success of a taxi-sharing system mainly depends on the quality of available technology and the user experience it provides, which impacts user adoption and satisfaction as well. Because of the user-friendly interface, a substantial percentage of people will be adopted the system and businesses will enhance the chances of success for the taxi-sharing system, which also has the power to establish and maintain existing systems.

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