

PROJECT ANALYSIS ON BICYCLE SHARING SYSTEM

Course name: Object Oriented Analysis and Design

Group Members

- 1. Hossain, Farhana Anwar – 17-34666-2**
- 2. Haiat, Md. Asif – 17-34664-2**
- 3. Sumanta Kurmar – 17-34348-1**
- 4. Jahidul Islam – 17-35223-1**

BICYCLE SHARING SYSTEM

Problem: Traffic Jam is one of the biggest problem in our country. Now it becomes the main problem of our country in the last few years. Over the last few years the transportation problem of Dhaka City has visibly been deteriorating steadily. Citizens constantly complain about the unbearable twin problems of traffic jam and air pollution. Democracy watch decided to address this problem through an opinion poll covering around eight hundred households randomly selected from several purposively selected neighbourhoods of the city, representatives of middle and lower income areas.

The questions asked focused mainly on three issues:

- (a) the nature of the problem as perceived by the surveyed residents,
- (b) their understanding about the causes of these problems and
- (c) their recommendations on solutions to these perceived problems.

In today's world, the success of a city depends on its economy, which in turn is dependant on the infrastructure, among other things. The importance of the infrastructure can be particularly felt by the citizens of Dhaka in its traffic system, as its congestion reminds us of how important it is to have a good transport system.

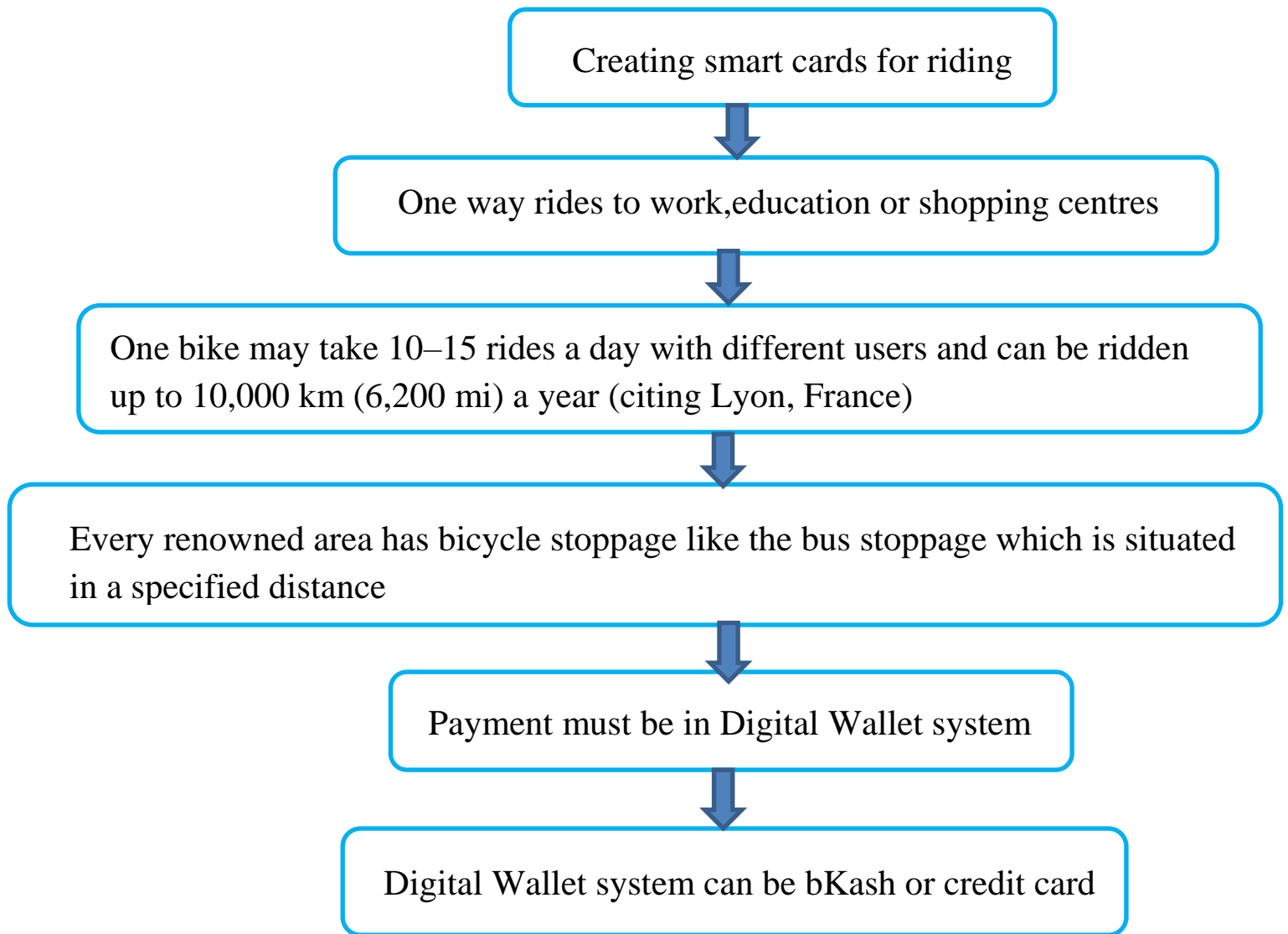
- **Traffic systems** : We the citizens of Dhaka are suffering because our traffic system is failing us, as it is resulting in less efficiency in various fields, such as business.
- **Traffic congestion** : Due to traffic congestion, our valuable times and energy are being wasted.
- **Vehicle emission** : The problem of traffic congestion and uncontrolled vehicle emission make life miserable in Dhaka city causing threat to health.
- **Traffic jam** : Everyday work-hours are unnecessarily wasted due to traffic jam. It has a great economic impact on production and thus on our economy.
- Traffic congestions intensify sufferings of commuters keeping people motionless as well as creating suffocating condition in the streets.

Existing Solution : In Guanzhou, China the privately operated Guanzhou Bus rapid transit system includes public bicycle system. In May 2008, Hangzhou Public Bicycle is a bicycle sharing system serving the city of Hangzhou. As of January 5, 2013, with 66,500 bicycles operating from 2,700 stations, it was the largest bike sharing system in the world, although it has since been overtaken by a number of dockless bike share operators such as Mobike. It is the first bike-sharing system in China. It plans to expand to 175,000 bikes by 2020.

Due to growing motorized traffic congestion and concerns over the environment, the Hangzhou Public Transport Corporation launched bike-sharing on May 1, 2008, initially starting with 2,800 bicycles, 30 fixed stations, and 30 mobile stations (stations which can be moved to meet demand). In March 2011, it had 60,600 bicycles, and 2,416 stations. In The Hangzhou government invested 180 million yuan (\$26.35 million) to launch the program, and 270 million yuan (\$39.53 million) in discounted loans.

Proposed Solution: We want to start it in Bangladesh like China, Australia and other countries. The purpose of the Bangladesh bike-sharing system is to provide a free public bike system network for residents and tourists; the bikes act as a feeder into its public transit network. Bangladesh bike-sharing uses the concept of the last mile (or the last kilometer) to make sure that users can easily get from public transit stops to their destinations through bikes to complete their journey. If this system starts appropriately, it saves our time and money. Though it is a hassled free system. For this system, we don't need license. But in this network system, all bicycles are licensed by an government authorized organization. Decidedly, it's a safe riding system. We can also use it for our daily exercise which is better for health. Bicycle-sharing systems are an economic good, and are generally classified as a private good due to their excludable and rivalrous nature. While some bicycle-sharing systems are free, most require some user fee or subscription, thus excluding the good to paying consumers. Bicycle-sharing systems also provide a discrete and limited number of bikes, whose distribution can vary throughout a city. One person's usage of the good diminishes the ability of others to use the same good. Nonetheless, the hope of many cities is to partner with bike-share companies to provide something close to a public good. Public good status may be achieved if the service is free to consumers and there are a sufficient number of bicycles such that one person's usage does not encroach upon another's use of the good.

Working Process :



Use Case Diagram

➤ **Case :**

In bicycle sharing system, bicycle companies creating smart cards for bicycles. And also makes bicycles. Passengers rides one place to another place using bicycle rides, such as passengers goes for shopping in shopping center same as for education centres and working place. Every passenger can see available bikes for riding at any place using a mobile app. It's a cost free mobile app. Passengers picking bicycles from bicycle stoppage. One bike may take 10–15 rides a day with different users and can be ridden up to 10,000 km. After finishing bicycle rides payment must be confirmed by Digital Wallet system. Digital Wallet can be bkash or Credit card.

Class Diagram

➤ **Case :**

In a bicycle sharing system, a bicycle company makes many bicycles. Every bicycle company have its personal ID and name. Each bicycle has its ID, Name and type. Passengers rides bicycle to go one place to another place. Every passenger has ID, name and account. Passengers goes shopping mall, working place and many places using bicycle rides. There has a bicycle dock in every renowned places. Passengers can borrow bikes from every dock. After finishing riding, passengers can pay their payment through Digital Wallet. In every passengers wallet have person ID, person's name, and person's account info. Digital Wallet can be bKash or Credit Card.

Sequence Diagram

➤ **Case :**

A bicycle company making smart cards for bicycles. Every passenger pick a bicycle from docks. Then the passenger start riding to his/her desired destination. One bike may take 10–15 rides per day. After finishing a ride, a passenger makes his payment through Digital Wallet. If the passengers Digital wallet has enough money for payment, then the payment is cleared. Otherwise the passenger should recharge his Digital Wallet to clear the payment.

Activity Diagram

➤ **Case :**

In a bicycle sharing system, a passenger choose his desired destination. Then the passenger search bikes for riding. If the bicycle is not available search it again. When the bicycle is available, at first select the type of the bicycle which is wanted to ride by the passenger. Then the passenger send a riding request to the system. If the request is accepted, the passenger will start his/her riding. Sometimes the passengers faces many traffic jams. After reached the destination, the passengers ride will be finished. After finishing the ride, passenger will clear his/her payment. This payment can be bKash or credit card. When the passenger clears the payment, the system check the passengers balance availability. If the passengers balance is insufficient, the passengers should recharge his/her account and after that clear the payment. After finishing the payment, passenger will scan the barcode which is attached into the bicycle. When the barcode is scanned, the bicycle will automatically locked. Then the passenger put the bicycle on dock.

State chart Diagram

➤ **Case :**

A bicycle object is created as vacant when the passenger search the availability of the bicycle. When the bicycle is available, the passenger select the bicycle types which he/she wants to ride. After selecting the types of the bicycle, the passenger booked it which is done in the online boking. Then the passenger start riding with his/her hired bicycle. But the bicycle is busy when the passenger stuck into traffic jam. At that moment, the system sent a warning message to the passenger to get warned. After that, the passenger finish his/her rides and the rides will be completed.