

HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

School of Information and communications technology

PERSONAL REPORT

EcoBike Rental

Subject: ITSS Software Development

Group Number: 6

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Table of contents

Table of contents	1
1 Introduction	2
2 Overall Description	3
3 Contribution Detail	6

1 Introduction

This report demonstrates my contributions to project 'EcoBikeRental'.

2 Overall Description

In the EcoBikeRental project, I am assigned use case "Payment".

I'm also responsible for these tasks:

- Develop payment method when user returns bike.
- Develop the User Interface for payment phase.
- Design and maintain the database.

2.1 Use case specification:

Use case ID	UC001	Use case name	Payment
Actors	User, System		
Pre-Condition(s)	- User account must be on the system - User has used bike-renting service.		
Basic Path (Success)	No	Proceeded by	Actions
	1.	User	choose 'Payment'
	2.	System	calculate the fee user needs to pay
	3.	System	displays 'Payment' interface
	4.	User	checks payment information
	5.	User	proceeds payment
	6.	System	debits and refund deposit to user's bank account
	7.	System	Saves transaction information and sends to user's registered email
Alternative Paths	No	Proceeded by	Actions
	6a.	System	Error prompt: Account does not have enough balance to proceed payment.
	7.	System	Error prompt: Error when connecting to database.

Post-Condition(s)	<ul style="list-style-type: none"> - User proceeds payment successfully. - System save the current transaction and sends to user's registered email.
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2.2 Input data

Table 1: Input data

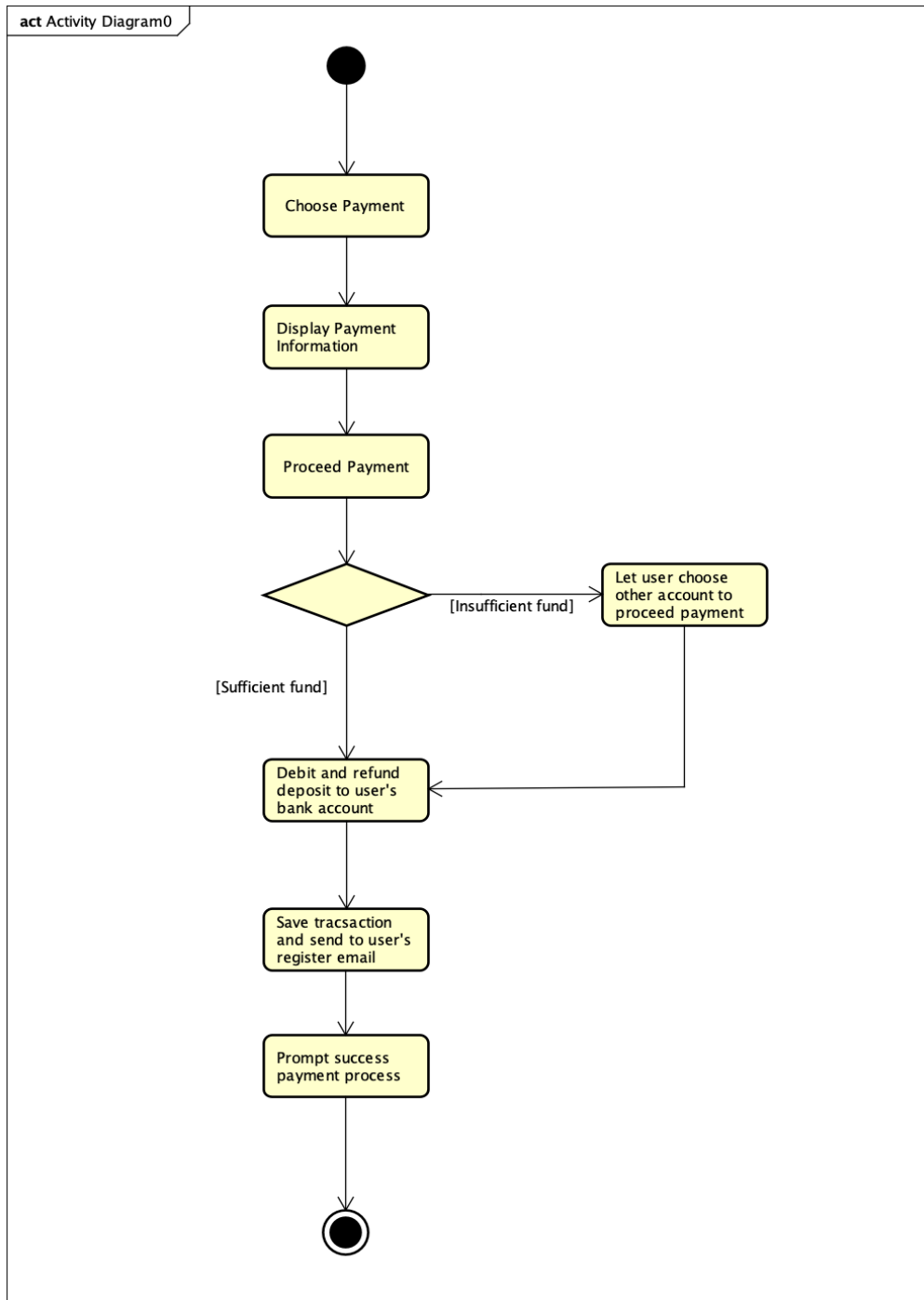
ID	Data field	Description	Mandatory	Valid condition	Example
1	Credit card information	User's credit card information	Yes	Must be present in database.	h.anh@gmail.com
2	Username	Name of the current user	Yes	Must be present in the database	Tran Quy Duong
3	Bike name	Name of the current bike	Yes	Must be present in the database	EcoBike-12
4	Total use time	Time from when the user rents to when the user returns bike.	Yes	Must be calculated correctly.	1 hour 14 minutes
5	Money to pay	The fee user must to pay	Yes	Must be correct based on use time.	500.000 (VNĐ)

2.3 Output data

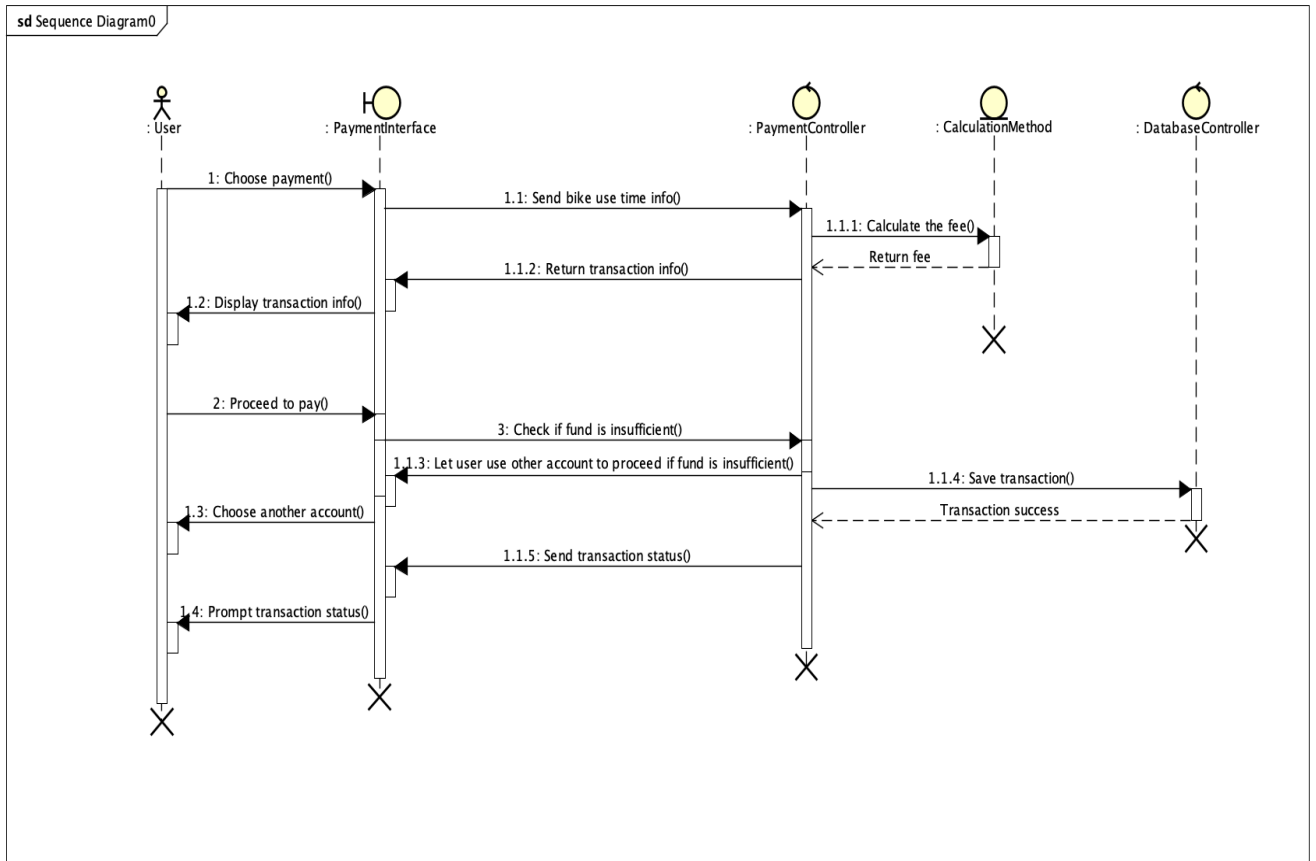
Table 2: Output data

ID	Data field	Description	Mandatory	Valid condition	Example
1	User ID	User ID in the database	Yes	Must be present in database.	12
2	Money to pay	The fee user must pay	Yes	Must be correct based on use time.	500.000 (VNĐ)

2.4 Activity diagram for use case “Payment”



2.5 Sequence diagram for use case “Payment”



2.6 Payment UI

EcoBikeRental App

Payment

User Name:

Lai Tien Duc

Bike Name:

NormalBike-8

Type:

NormalBike

Return to station:

1

Start Time:

2020-12-26 08:45:02

End Time:

2020-12-26 08:45:32

Total Time

0 hour 0 minute

Total Fee

0

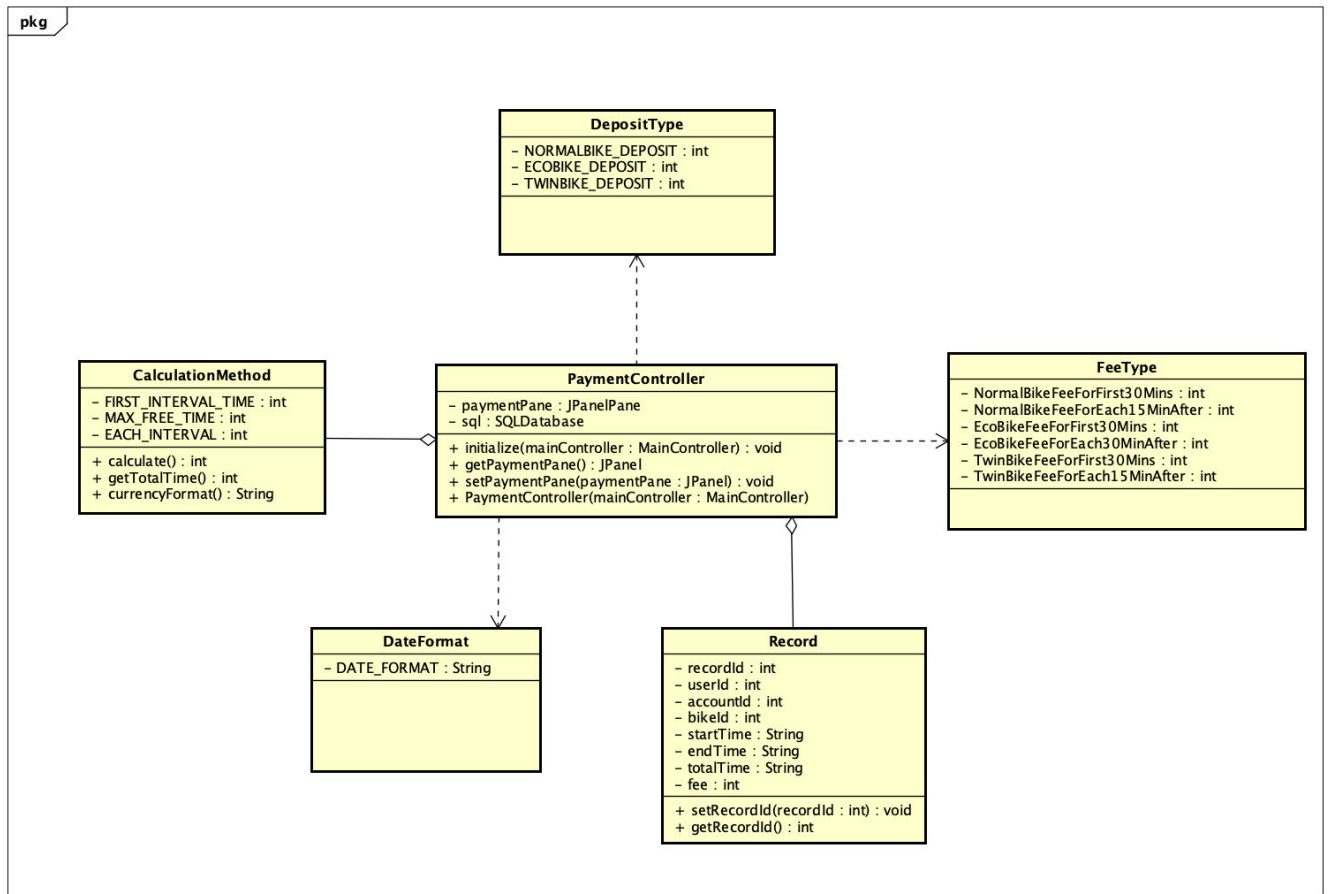
Back

Pay

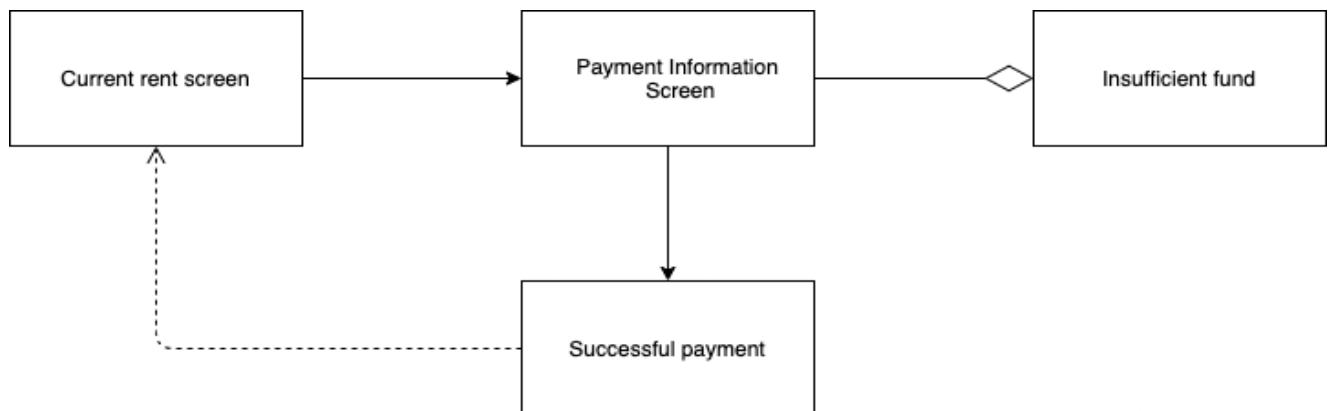
Successful

User ID	1
Name	1
Card Number	44
Balance	2400000

2.7 Class Diagram



2.8 Screen Transition



2.9 Test plan

Test Case Specification for "Payment"			
Test Case ID	TC004	Test Case Description	Test the correctness of fee calculation and

				transaction management			
Created By	Tran Duong	Quy	Reviewed By	Tran Duong Team members	Versi on	1.0	
Tester's Name	Tran Duong	Quy	Date Tested	24/12/2020	Test Case (Pass /Fail/ Not Exec uted)	Pass	
#	Prerequisites:						
1	The program is running.						
2	User decides to return bike at a dock.						
3	Bike use time should be greater than zero						
#	Test Data	Value					
1	User Name	Lai Tien Duc					
2	User ID	4					
3	Bike ID	12					
4	Bike type	NormalBike					
5	Start time	2020-12-24 19:00:27					
6	End time	2020-12-24 20:10:42					
7	Total use time	1 hours 10 minutes					

8	Total fee	19.000 VND			
<u>Test Scenario</u>		Verify on entering different user id,different total time, different bike type and check if any calculation is wrong			
Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended	
1	Use the program, rent bike and choose Payment	Payment Interface should appear	As expected	Pass	
2	Enter user id: 1 Enter bike type: NormalBike Enter start time: 2020-12-24 00:20:34 Enter end time: 2020-12-24 01:30:44	Correct total use time: 1 hours 10 minutes Correct fee: 19.000 VND	As expected	Pass	
3	Enter user id: 4 Enter bike type: EcoBike Enter start time: 2020-12-9 10:34:30 Enter end time: 2020-12-9 10:42:44	Correct total use time: 0 hours 8 minutes Correct fee: 0 VND	As expected	Pass	

4	Click Payment	Correct debit and refund to user the deposit 400.000 VND	As expected	Pass

3 Contribution Detail

3.1 Method to calculate the renting fee

Requirement:

- ❖ Free for use time under 10 minutes.
- ❖ Each type of bike has a different fee.
 - Deposit (will be refunded to user's bank account after user finishes renting and pays the fee.):
 - Normal Bike: 400.000 VND
 - Eco Bike: 700.000 VND
 - Twin Bike: 550.000 VND
 - For the first 30 minutes:
 - Normal Bike: 10.000 VND
 - Eco Bike: 15.000 VND
 - Twin Bike: 15.000 VND
 - For each 15-minute after:
 - Normal Bike: 3.000 VND
 - Eco Bike: 4.500 VND
 - Twin Bike: 4.500 VND

Calculation method:

- Convert total use time to minutes.
- After subtracting 30 from this number, find out the number of 15-minutes intervals in the remaining.
- The fee will be calculated by the formula:

$\text{Fee} = \text{FeeForFirst30Minutes} + \text{NumberOf15MinInterval} * \text{FeeForEach15MinInterval}.$

3.2 Database design

Requirement:

- Must have a table to persist user transaction history.
- Must have a table to persist current transaction (user ID, bike ID, account ID, start time, end time).

Solution:

- Design tables and relationships between tables based on group discussion.

3.3 Payment User Interface

Requirement:

- Should be integrated seamlessly into the system.
- UI must display enough and correct information.

Solution

- Discuss with team members and design based on general template.