The university of Hong Kong
Department of electronical and electronic engineering

Mid-term Review

Mobile Web Application – Electronic Payment System

Final Year Project 2017-2018

Supervisor: Dr. W. H. Lam

Name: ZHU Zicong

UID: 3035142132

Curriculum: BEng(Computer Engineering)

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2. System Design
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1. INTRODUCTION - BACKGROUND

- **Definition of Electronic Payment**

  Users send payment orders to bank systems directly or indirectly via electronic devices, to achieve currency payment and fund transfer.

1. INTRODUCTION - BACKGROUND

- **Categories of Electronic Payment**
  - Internet
  - Telephone
  - Point of Sale (POS)
  - **Mobile Device**

1. INTRODUCTION - BACKGROUND

- **Products of Electronic Payment**
  - PayPal
  - AliPay
  - WechatPay

1. INTRODUCTION - OBJECTIVES

- **To build an electronic payment system with features:**
  - **Multi-functional**
  - **Safety & Stable**
  - **Convenient & User-friendly**

- **Project is named as "*Free Yeah Payment*"**

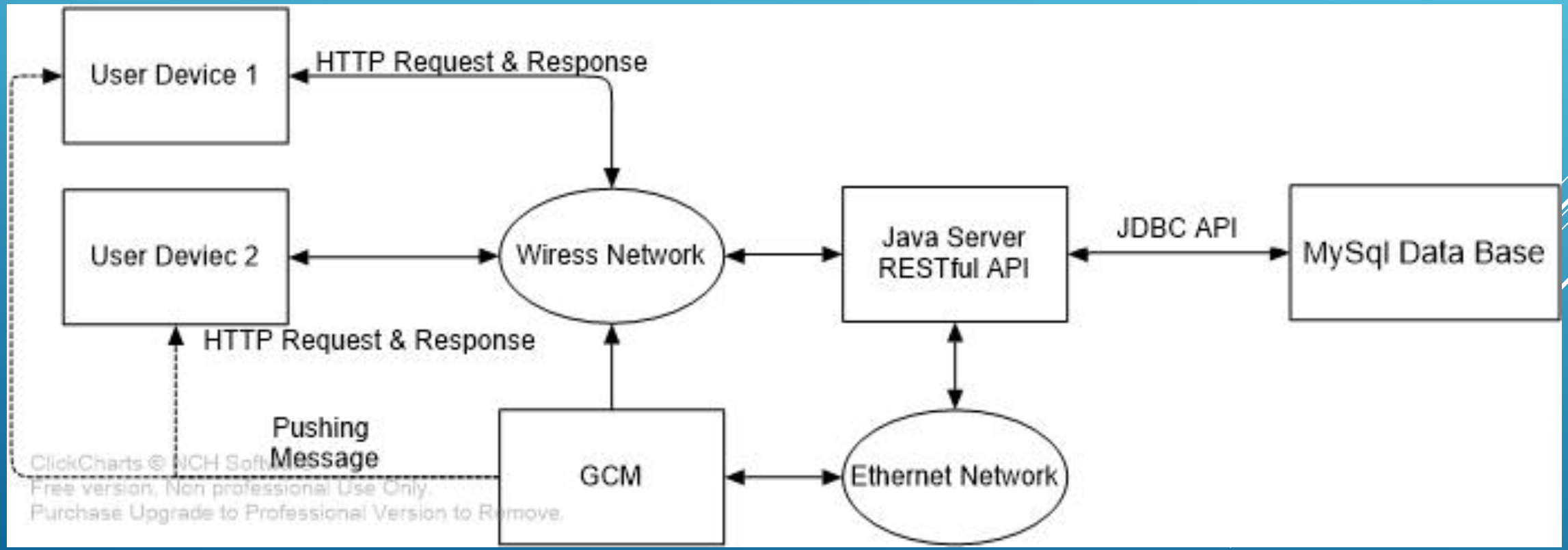
2. SYSTEM DESIGN - OVERVIEW

- **Android front-end application**
- **Java server with RESTful API**
- **MySQL database**
- **GCM**

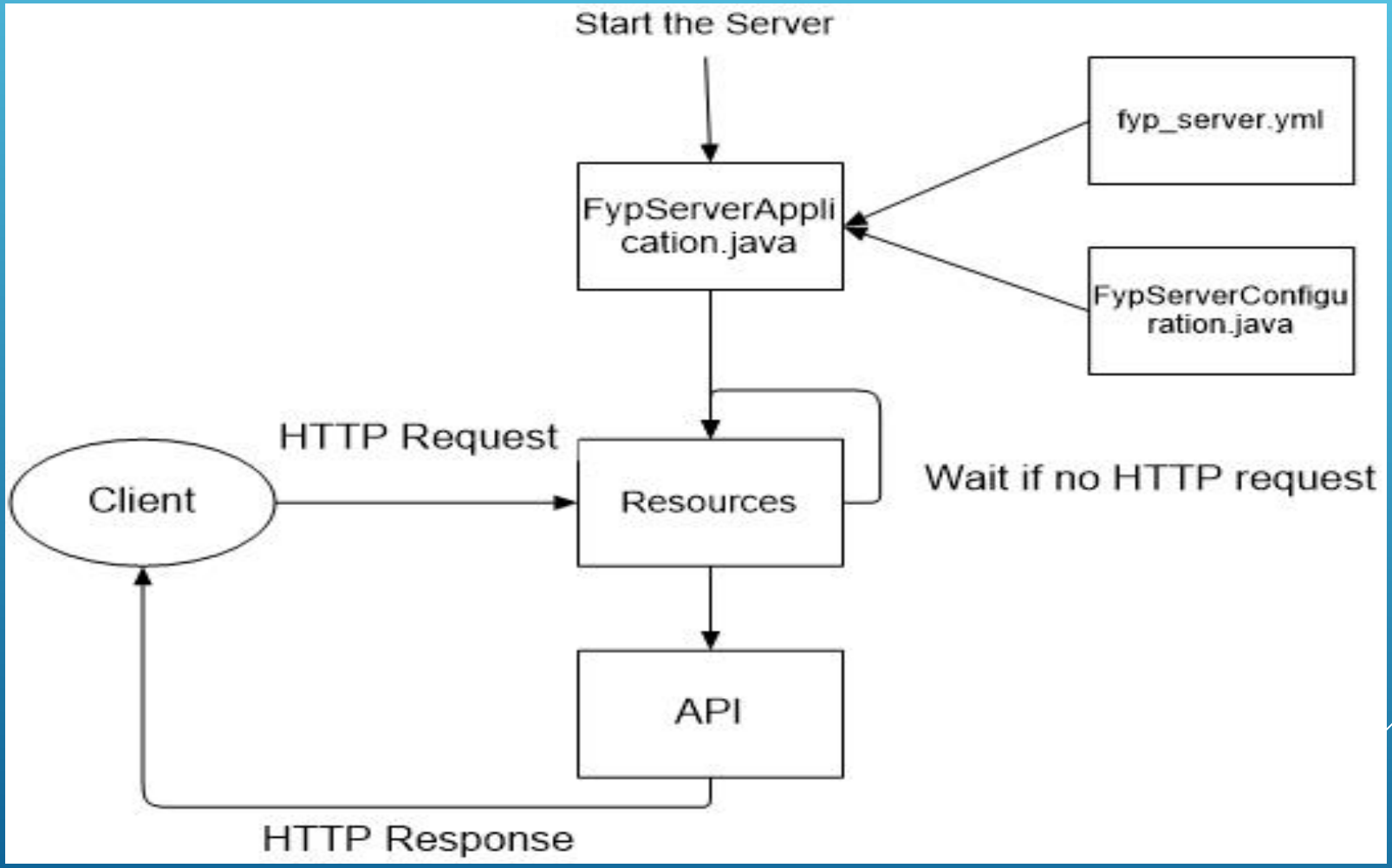
Uses URL for locating resources and HTTP actions for behaviors

Google Clouding Messaging

2. SYSTEM DESIGN - ARCHITECTURE



2. SYSTEM DESIGN – FLOW OF SERVER



2. SYSTEM DESIGN – DATABASE

Table of user

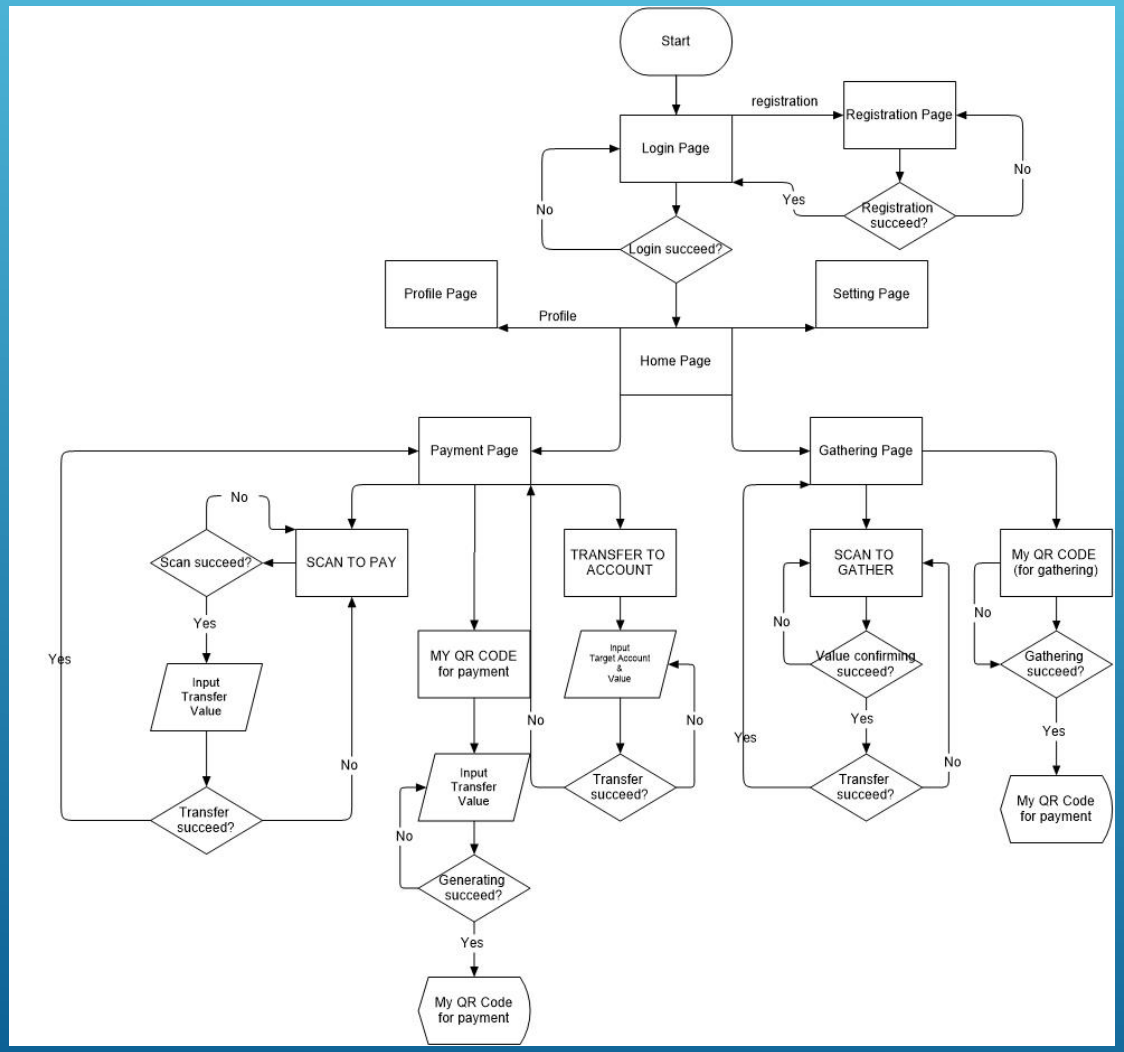
Field/Attribute	Data Type	Description
user_id	int, not null	Primary key, auto increment
user_name	varchar(10), not null	Set to be unique
user_password	varchar(20), not null	
user_emailAddr	varchar(20)	user's email address
user_balance	int	user's current balance
user_createTime	timestamp, not null	this account's created time
user_lastModifiedTime	timestamp, not null	
user_valid	char, not null	1 for valid, 0 for invalid
user_bankAccount	varchar(20)	user's bank account
user_ip	varchar(16)	user's last login IP address
user_qrValidNum	varchar(6)	6-bit random string for current QR Code generated by this user
user_qrValue	int	value information shall be contained be the current QR Code generated by this user

2. SYSTEM DESIGN – DATABASE

Table of transaction

Field/Attribute	Data Type	Description
trans_id	int, not null	Primary key, auto increment
trans_fromID	int, not null	user id of payment side
trans_toID	int, not null	user id of gathering side
trans_fromName	varchar(10), not null	user name of payment side
trans_toName	varchar(10), not null	user name of gathering side
trans_fromBalance	int, not null	user's balance of payment side
trans_toBalance	int, not null	user's balance of gathering side
trans_value	int, not null	value of this transaction
trans_creatTime	timestamp, not null	

2. SYSTEM DESIGN – PROGRAM FLOW



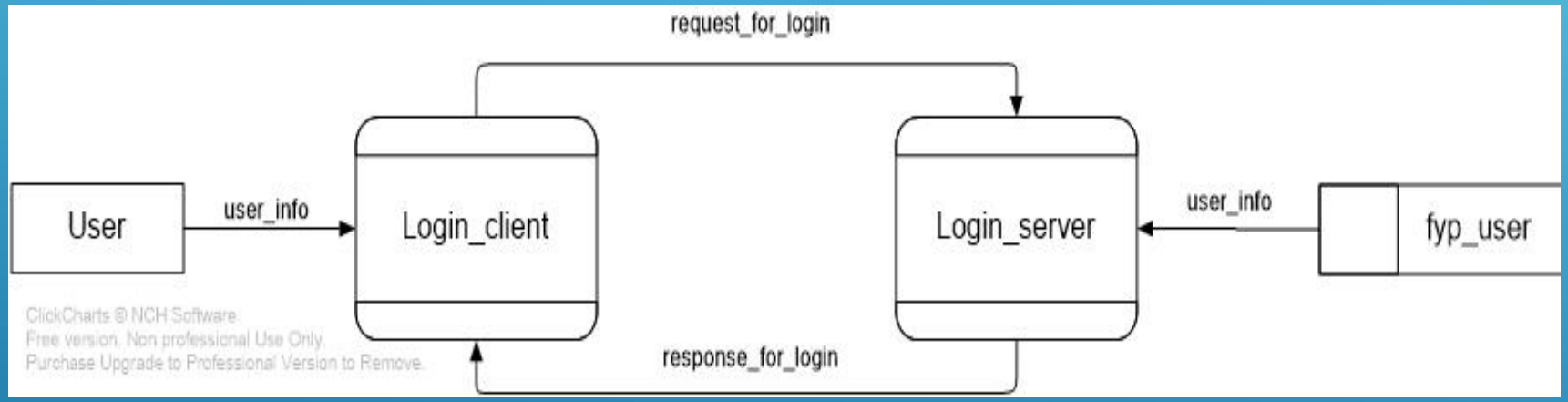
2. SYSTEM DESIGN – FUNCTION LIST

- **Data flow is designed according to function list**

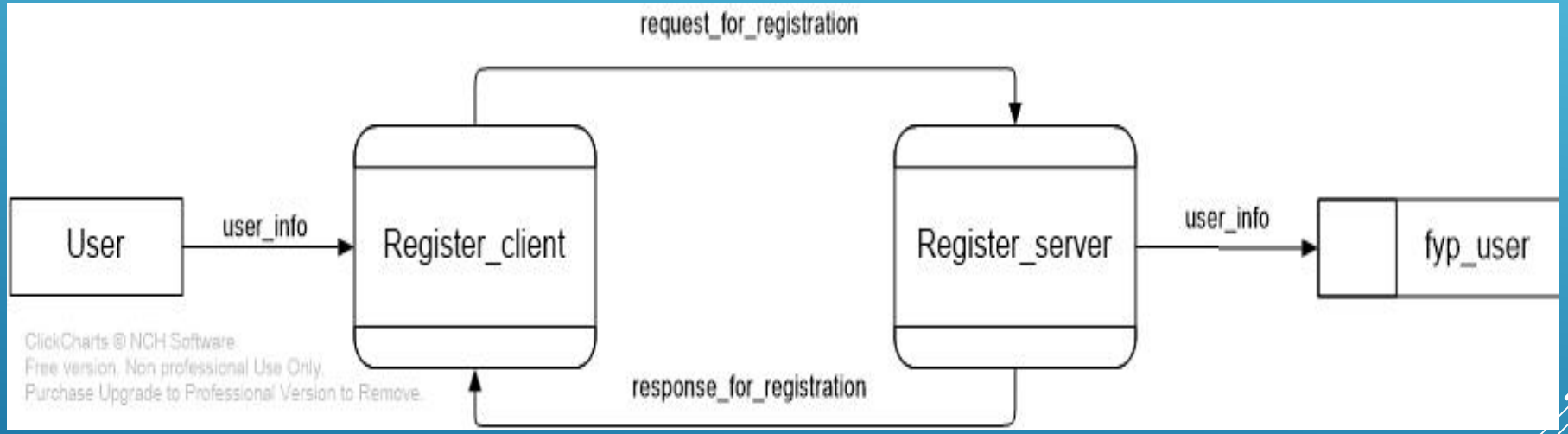
Scenario Name	Description
Login	Users login with necessary information
Registration	Users register with necessary information
Payment_byScan	Users scan a QR Code to pay. Transfer value input is required
Payment_byQRCode	Users generate a QR Code which is able to be scanned by others. Transfer value input is required before generating
Payment_byAccount	Users directly type in target and value to transfer
Gathering_byScan	Users scan a QR Code to gathering. Transfer value is defined in the QR Code
Gathering_byQRCode	Users generate a QR Code which is able to be scanned by others to transfer

2. SYSTEM DESIGN – DATA FLOW

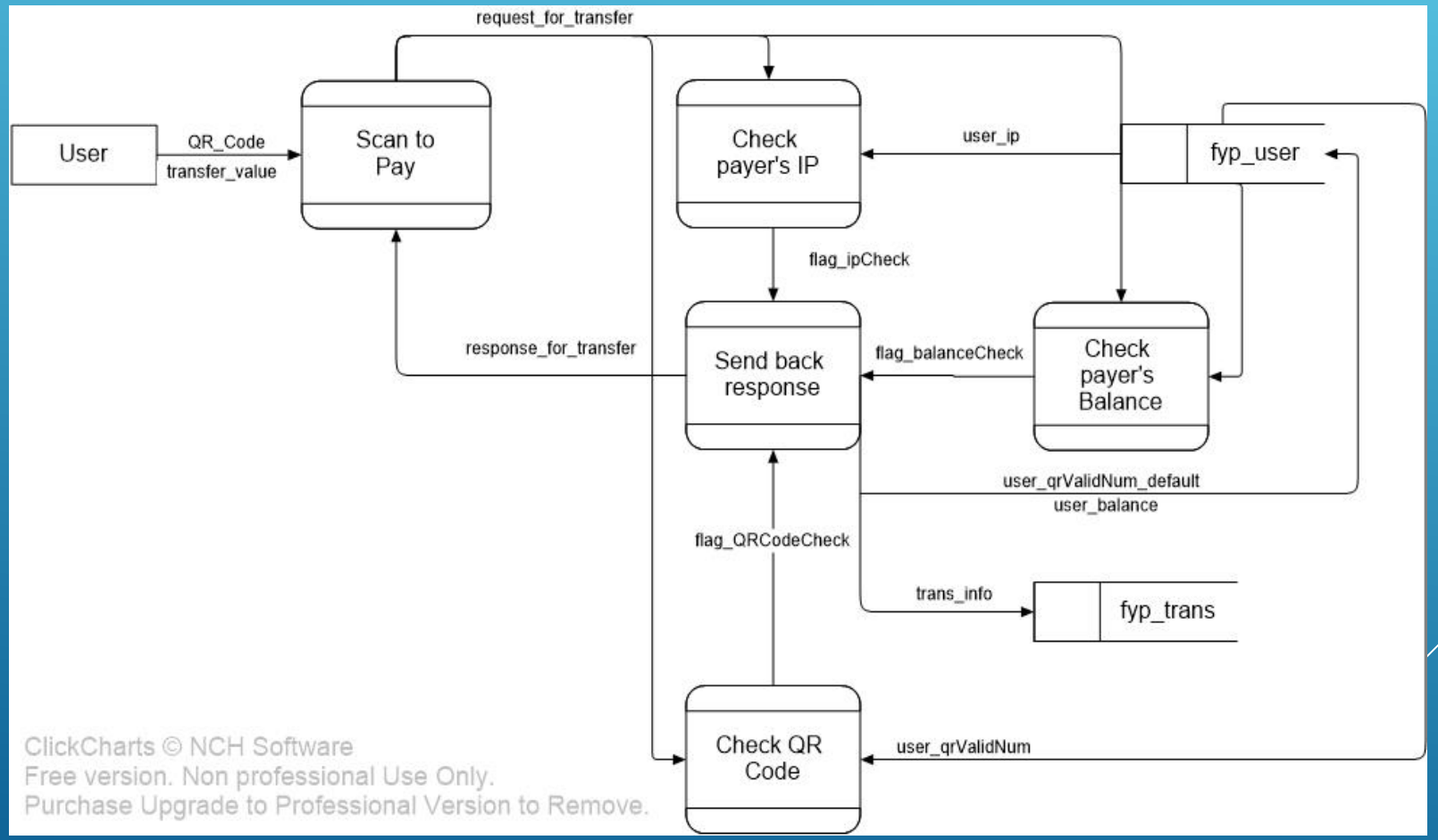
Login



2. SYSTEM DESIGN – DATA FLOW **Registration**

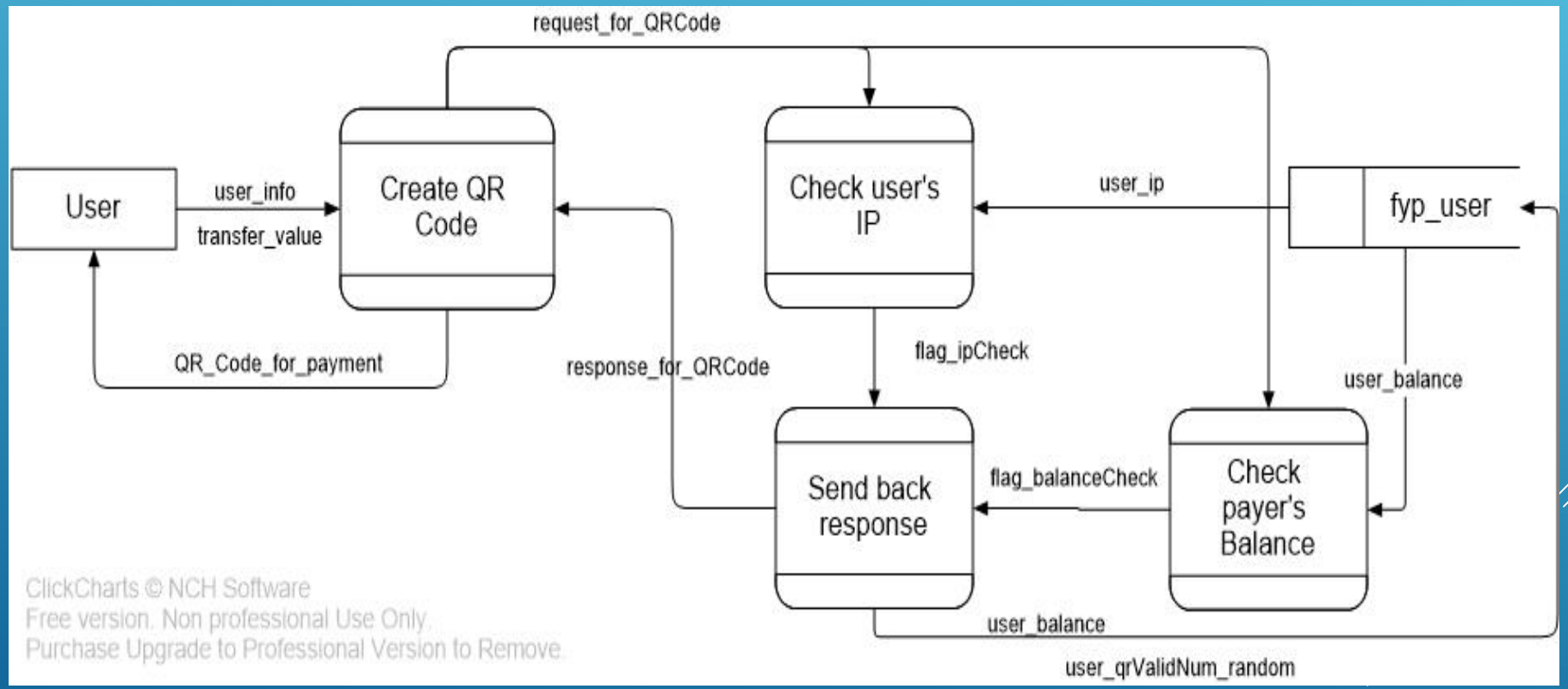


2. SYSTEM DESIGN – DATA FLOW Payment_byScan



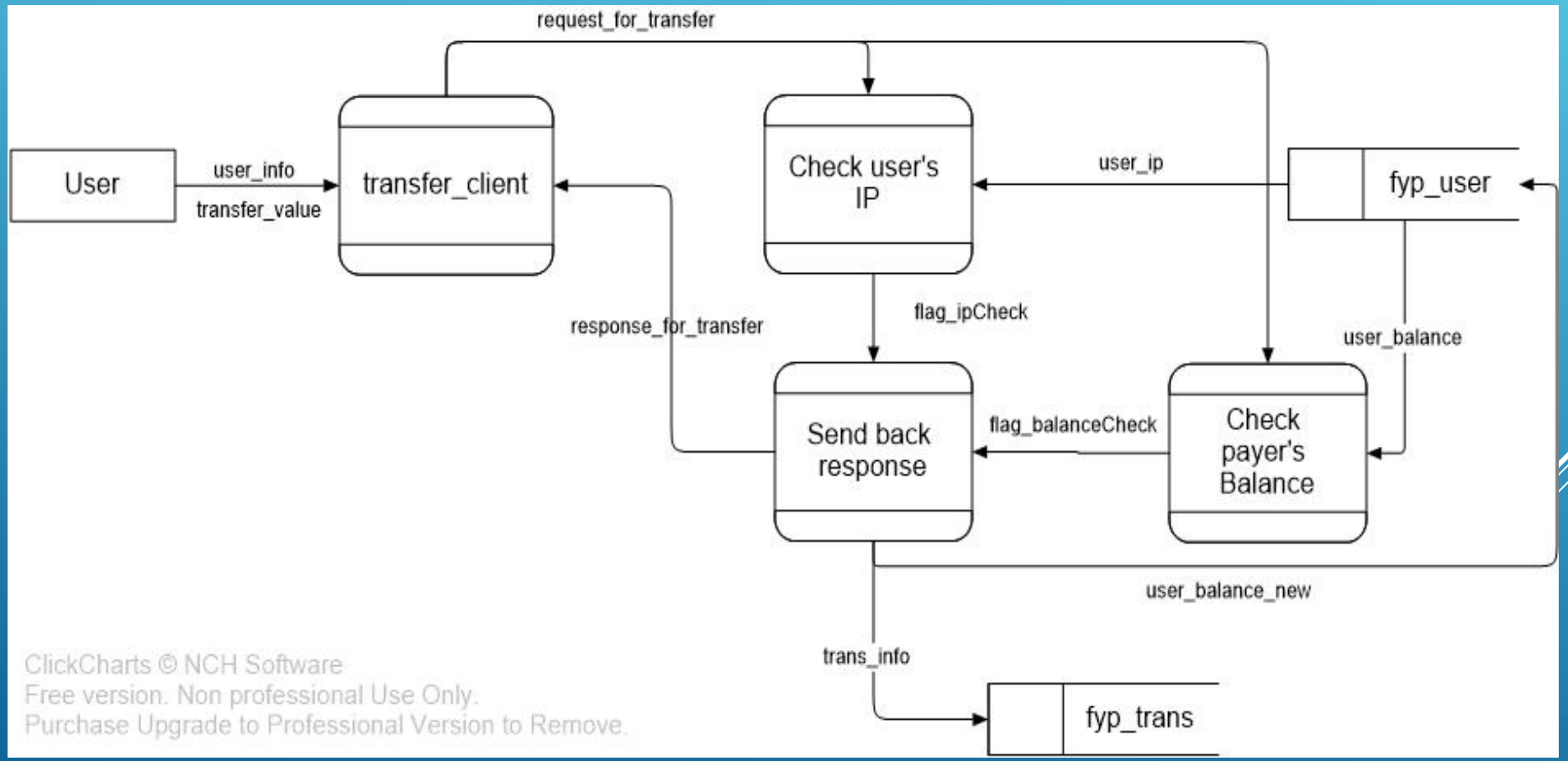
2. SYSTEM DESIGN – DATA FLOW

Payment_byQRCode

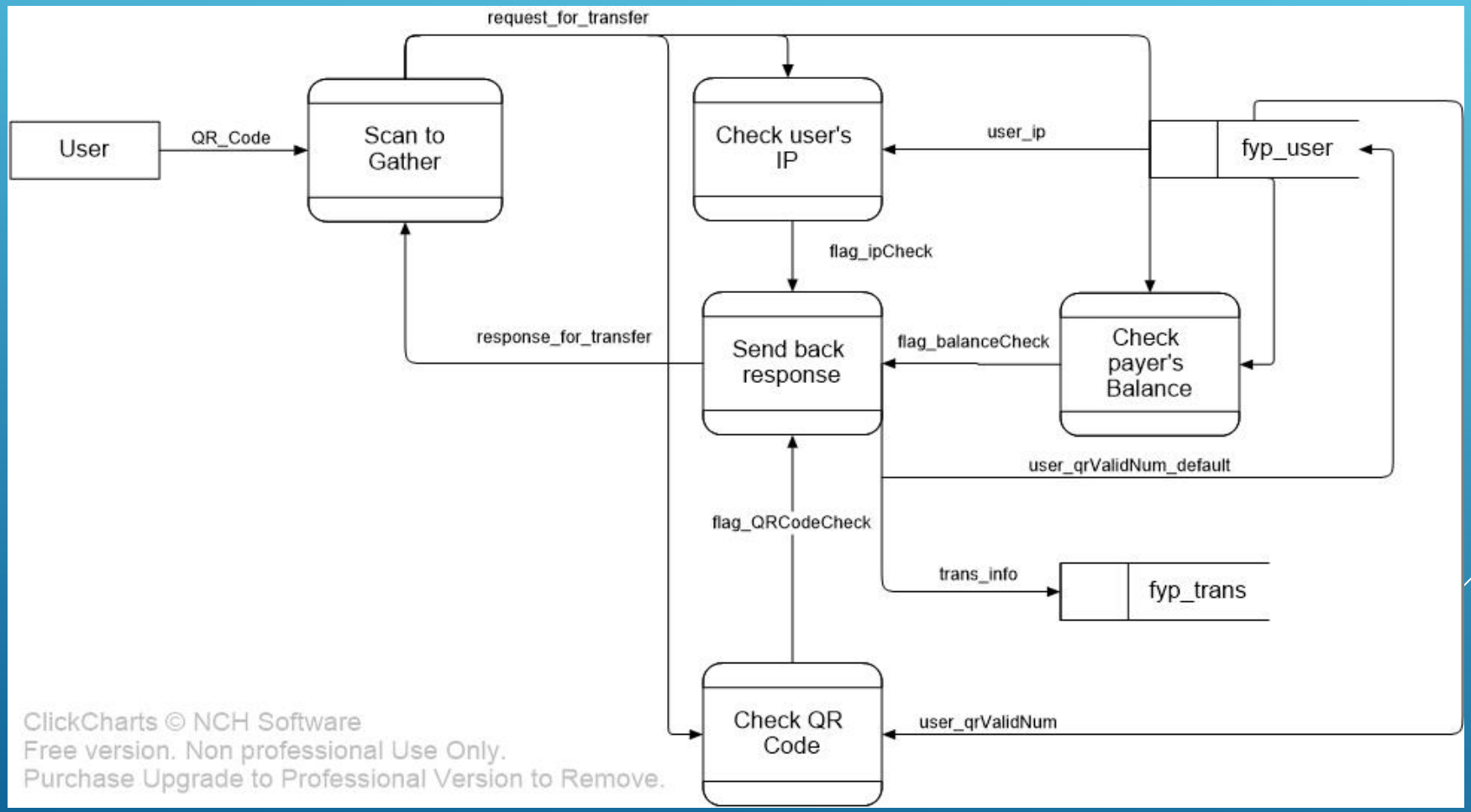


2. SYSTEM DESIGN – DATA FLOW

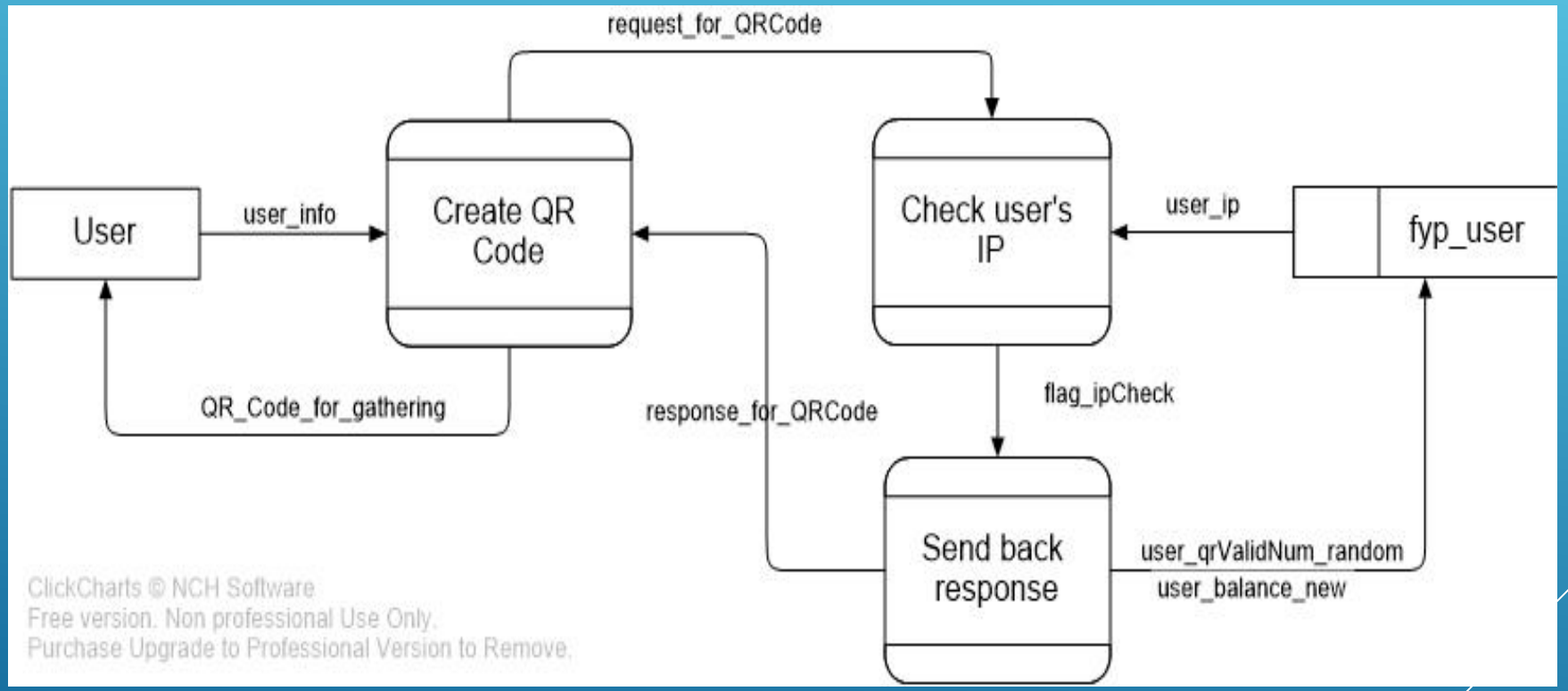
Payment_byTransfer



2. SYSTEM DESIGN – DATA FLOW Gathering_byScan



2. SYSTEM DESIGN – DATA FLOW Gathering_byQRCode



3. DEMONSTRATION

4. FURTHER IMPROVEMENT

- UI Design
- Function of scanning items
- Implementation of GCM
- Implementation of Geolocation by WIFI
- Database Issue
- Security Issue

5. CONCLUSIONS

- Scenarios with payments are already implemented
- Design may be kind of changed while modification
- Still many works to do later

Q & A