

Bicycle Sharing System

Client Background

The customer designs, customizes, deploys, trains and manages bicycle share systems, giving people the benefits of owning a bicycle without all the hassle.

The Bicycle sharing programs are the new modern way of getting around. Designed to move cities, universities and corporate campuses quicker and more efficiently than ever before, bicycle sharing systems are quickly changing how millions of people around the globe go about their day. Whether it's commuting to work, running errands or simply enjoying a nice bicycle ride for exercise, automated bicycle sharing programs fulfill all those needs in a very efficient manner. It's convenient, easy to use and it's 'green' transportation at its best.

From large city-wide systems to the small corporate programs, bicycle sharing programs accomplish the goal of improving the quality of life for communities while easing traffic and parking congestion with reliable and sustainable transportation.

Client's Challenge

The customer was having a running system which is 3 fold, Backoffice administration application, Frontoffice for members to monitor their transactions and on field Kiosk setup where actual end users go and rent a bicycle.

Following were the main challenges customer faced with this system:

- Since the major operation of the system was on field where Kiosk machine are kept in open space due to which it was having impact on its working due to environmental factors like heat, storms etc
- Also since it was in open area where installing cables for network connection is not possible and required to run with internet connection using SIM based modem connection which could not ensure continuous network connection.
- Current Backoffice application has below issues:
 - Application has tab based interface

- Switching from members tab to reports to look for information regarding a members transaction takes too of much time
- Moving from tab to tab for different tasks is very cumbersome
- Back office running too slow
- In short – web interface is not user friendly
- One of the parts of whole system is mechanical lock infrastructure installed at every kiosk from where bicycles are taken out or parked. This particular infrastructure has lot of grey areas
 - Bicycles not registering in locks properly
 - People are stealing the Bicycles from mechanical locks
 - There are no alert going out to administrators of various departments

in following scenarios:

- o for late fees for members
- o Bicycle checked out but not checked in after configured duration
- o Bicycle taken out by service staff but is not reached to warehouse for maintenance etc
- If there is no connection with Backoffice server, transactions are not maintained in offline mode, resulting in lots of customer complaints
- Most important, timely maintenance and support of all these 3 systems is always matter of concern

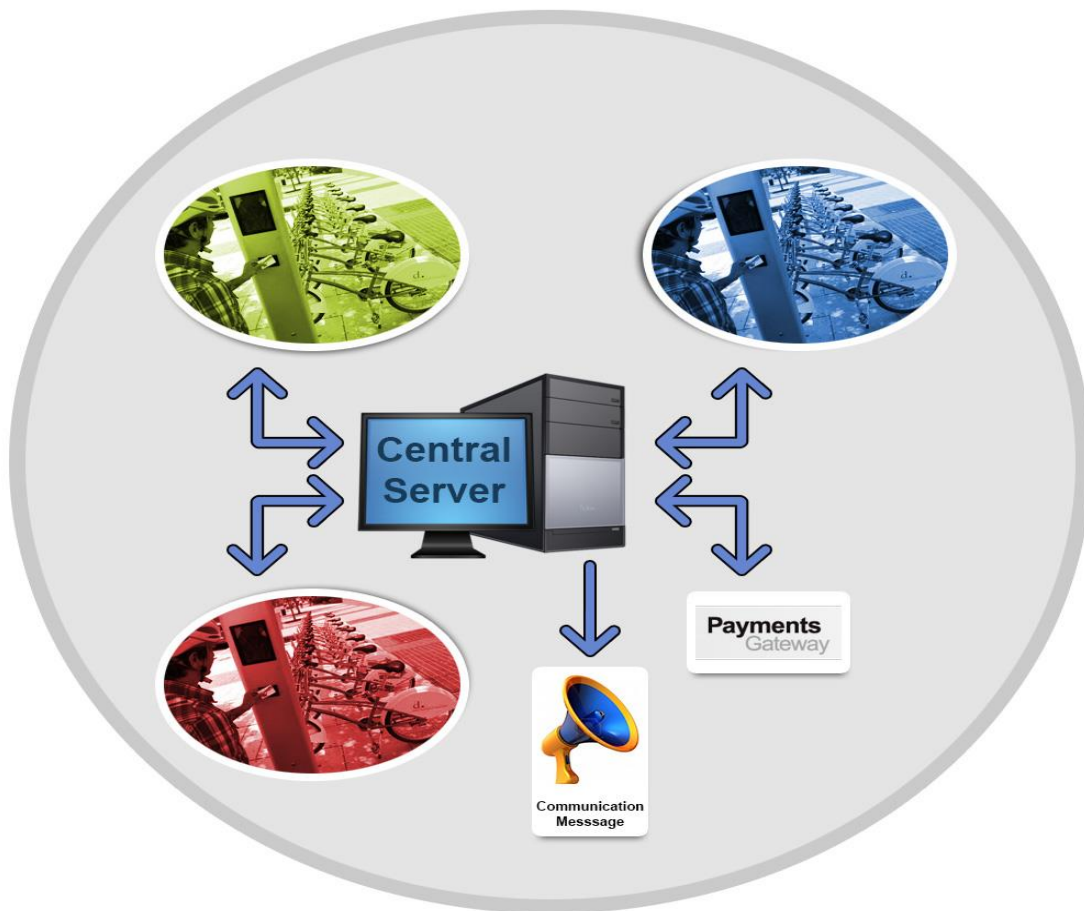
The Our Approach

New Bicycle sharing system involves following entities:

- Kiosk machine

- Will have Computer or motherboard (very low power consumption)
- Touch screen – daylight visible (again very low power consumption)
- Wireless modem
- Card reader (credit or membership or service card)
- OR Key fobs would be provided for members or service users
- Solar panel and controller
- Speaker
- Reads information from RFID reader at Bicycle locks
- Send information of Bicycle in locks to server
- Send credit card information to server (third party gateway process transactions)
- Send voltage information of kiosk to server (once in a hour)
- Bicycle locks with RFID reader
 - Locks will also have LED's indicating various status of Bicycles e.g. locked, released, damaged
 - Rider can use Membership card directly on lock to check-out a Bicycle
- Bicycles
 - Bicycle only gets read by RFID once Bicycle is secure in lock.
- Backoffice system
 - To manage administrative activities at back office
 - Configuration
 - Reporting
- Front office system

- Riders can register for membership and track their transactions



Successful outcomes and results

Following are the benefits of our solution:

- All systems mentioned above are robust
- Role based access to different modules
- Well built Kiosk and lock setup
- With new system user can take out bicycle directly from lock instead of going to Kiosk and following 3-4 step process to get the bicycle
- Money transaction tracking becomes easy resulting in less turn around time
- Bicycle maintenance is happening on time as alerts are sent for bicycle needing maintenance

- CRM process has become very flexible and easy as all the required information is available from single screen
- Tickets are generated automatically on behalf of customers when certain customer care events happened (e.g. cancel membership)
- RFID based solution for locks makes sure the secure and trusted transactions by users
- All the data is maintained at centralized location, which helps faster consolidation of data
- Offline data capture and synchronization brings customer trust by not losing any transactions happening at kiosk/dock
- Our team is always available for any technical support

Technology used

- ASP.NET 4.0 with C#
- Microsoft SQL Server 2008R2
- C++
- Payment gateway integration (Payeezy Gateway)
- AWS hosting