**Abstract:**  
The goal of this project is to design and introduce an automatic cycle rental system.

**Working mechanism:**

The system is installed at designated stops in the institution. Each stop has an automatic key dispensing machine and a camera installed.

Every user has an account registered with WHEELS ON ROLL. When the user scans the QR code using the WORCraft app in the phone, the automatic key dispensing machine is activated and user identity is sent to the server< through an application>. This prompts the key dispensing mechanism to eject a key. Every key is attached to a key chain with RFID tag. The RFID (radio frequency identification) tag uniquely identifies the key which in turn, is linked to the cycle. Then, the information of the user stored in the server is clubbed with that of the key and the cycle. This encapsulated information is then stored in the database.

The keys are stacked one on top of the other inside the key dispensing machine. The incoming key is pushed on top the stack and the key to be ejected out of the machine comes out from the bottom of the stack. The RFID tag of each incoming key is read by the RFID reader when the key is dropped into the machine. This mechanism checks for the validity of the key. In case it is valid, it’s information is sent to the server. In case of invalid key (which includes a wrong key or a key with a damaged RFID), it is directed to the outlet. Furthermore, the machine has a screen which displays error messages in case of an invalid key and relevant messages.

The unique cycle number, also mentioned on each key helps the user to identify the cycle. The user can then take the cycle anywhere and drop it at any of the stops in the institution. The QR code should again be read in order to return the cycle. The scanning action feeds the key information linked with the user into the machine.

The returning of the key will be a two-step process. The user needs to drop the key into the machine which leads the key to the RFID reader. The key is validated as mentioned above. The second step will be done by the camera installed in each stop. The camera identifies the cycle by the unique cycle number displayed on the cycle. Once the corresponding cycle is identified, the timer for the ride stops and a notification message is displayed on the machine. The database is updated with the information and thus the app shows the updated ride data. In case of damaged cycle numbers or invalid key, the user is prompted to report the problem and will be solved accordingly.

Working of the

//The scanning of the QR code reads the user information and sends it to the server. The activation of the machine dispenses a key to the user based on the information given by the server. //

The server acts as an interface between the user and the key dispensing machine.