Bikeshare 2.0

Bike sharing has been rapidly gaining popularity around the world during the last few years. According to a recent MTI Funded Cycling Report**,**As of May 2012, there were approximately 184 bikesharing programs operating in an estimated 204 cities around the world, with about 368,600 bicycles at more than 13,600 stations on 5 continents and 36 countries.

The growth of bikesharing has been mainly due to urbanization and immigration of especially younger professionals to cities; those who want to experience the city life and its convenience. Another contributing factor is the maturity and lowering cost of the bikesharing infrastructure including information technology, credit-card payment, online reservation systems as well as GPS tracking.

Public bikesharing makes it easier for some people to use public transit more by solving the  "first" and "last" mile problems, while it also facilitates making quicker trips, which enables some users to reach their destinations sooner than they would with bus or rail.

A new breed of bikeshare is unveiled on Kickstarter that uses a patent-pending Bluetooth smart U-lock named BitLocck. BitLock replaces the bike key with your smart phone. Through the app on the smart phone users checkout bikes and geo-locate the bikes around them.

The current bikeshare systems in place in large cities such as Capital BikeShare of New York City, BIXI of Montreal, Velib of Paris depend on docking stations where users swipe their credit cards to check out bikes. The major downside of station-based systems is the enormous cost of dock and kiosk installation. Currently it costs upwards of $6000 per bicycle to implement a station-based bike share system in addition to the on-going maintenance costs. Due to such high implementation cost, these systems must be funded by the cities or external sponsors and are rarely profitable. Besides, station-based systems lack flexibility because of the limited number of pick-up and drop-off locations and pose the possibility of users encountering full docks during the peak hours thus requiring an ongoing load balancing operation.

Two newer bikesharing systems, SOBI and ViaCycle, have developed a station-less bikeshare system. The bikes have integrated GPS tracking, a perpetual data connection, a built-in locking mechanism, as well as a solar panel to power the system on each bike. The locking system is designed so that bikes can be locked to generic bike racks. The station-less bike share system offers a relatively lower implementation cost compared to the station-based bikeshare systems. The bikes cost around $1000 plus a monthly data subscription fee.

Another bike sharing model that is geared toward smaller communities such as hotels, apartments, colleges, and businesses use regular locks with mechanical keys. The keys can be checked out at the front desk or from special boxes. Zagster and OnBikeShare, two companies in this domain, mainly provide the bikes and the IT infrastructure for bookkeeping key check-in/outs. The bikes are typically not GPS tracked.

The new bikeshare system enabled by BitLock has multiple advantages over the state-of-the-art. First of all, the new bikeshare system is very affordable. BitLock is priced at $99 on Kickstarter. The cost of the lock and a rugged bicycle together is in the order of a few hundred dollars compared to $1000 of SOBI station-less model and $5000 of station-based systems. Plus there is no data subscription fee since the lock uses the user’s smart phone data connection instead.

Since bikes can be locked to any bike rack, the exiting infrastructure can be used. This also means users can flexibly pick-up and drop-off bikes virtually anywhere. There’s also not GPS on the bikes, and instead the user’s smartphone GPS is used for tracking. Also, since the lock is not attached to the bike, the system can adopt different types of bikes based on the user preferences. For example, mountain bike sharing can be created for recreational use. The system is extremely lightweight. The lock weighs 2.5 pounds and can be easily carried around. BitLock is very user-friendly. No punching in code or swiping credit card will be necessary. The user will just walk up to the target bike and presses the button the lock to unlock. Everything else is managed under the hood.