Pay to Park

In Motion

1 Executive summary

After being given the topic In Motion (1) – "Find out the latest trends in IT systems for mobility for consumers. Develop, based on these innovations, a product and business concept/idea that uses a wireless (broadband) communication network to support mobility." – the group started brainstorming and it was Peter who came up with the ideas on how we could make it easier to park our car without the long process you have to go through now.

Parking in parking structures is never a fun event. You have to swirl through narrow streets, drive up steep slopes and steer through sharp bends. Once you have completed these tedious tasks, you have to pay for your parking. To make this whole process more streamlined and more pleasant for the users, we have thought up a text-based payment solution for parking structures.

Once you enter a parking structure, you will be given a unique five digit code. This code will be linked to your car's license plate. Once you are ready to leave the parking structure, you text this code to a certain number. The amount you have to pay will be collected through your phone bill. When you drive up to the exit, the computer checks the validity of your payment through the use of your license plate. Once this has been verified, the beam will open and you can go on your way.

2 Problem statement

We drive our car every day, everywhere. In the last decades, the car has become our main mode of transportation. But whenever we drive our car somewhere, we also have to park it. There are a lot multi story car parks in every city and using them has become commonplace. When using a car park, we ran into some usability issues we would like to address. When leaving the car park, you have to pay for the amount of time you have parked your car. There usually are several machines where you can pay for your parking located in the parking structure. Finding these machines is step number one. But once you have found one, you need cash money or a credit card to pay. We want to eliminate these steps to make paying for your parking more convenient.

3 Alternatives & Technology

3.1 Existing Alternatives

The problem at hand is the payment within parking structures. The current most-used method of payment in these parking structures is the use of parking machines. When you drive into the parking structure, you receive a ticket which states your parking start time. When you leave the parking structure you insert the ticket into a machine and it tells you the amount you have to pay. This machine is physically inside the parking structure. Once you have paid you receive a ticket you can use to open the beam of the parking structure so you can exit.

There are a few shortcomings and problems with this approach. Firstly, you have to use 2 separate tickets. Not only is this environmentally unfriendly, it can also be confusing. Some parking structures even use more tickets (i.e. tickets to enter the parking structure with when on foot). Secondly, you have to locate a machine inside the parking structure. Though a slight nuisance, this can be infuriating when you are in a hurry. Thirdly, for some machines you have to have cash on you. Paying by credit card of debit card is not always an option, especially when abroad where they might not be familiar with your home country's cards.

All these shortcomings and problems will be solved when using our system. And our system will offer more useful applications.

There are text-based payment services in use throughout Europe, though they are not widely spread. The biggest disadvantage of the current payment systems is the need to sign up for a subscription in advance. You have to either pay in advance, or connect your subscription to your creditcard. A lot of these systems also need your license number. This means you either have to have a subscription for each car you own (or even drive), or you have to text the license plate number everytime you park somewhere.

Our system gives you a unique key that matches the key to your license plate, which is automatically read when entering the parking structure. This way we offer a water-tight solution without the need to text your license number.

3.2 Technologies involved

The technology the project leans on is the mobile payment solutions offered by companies such as AOneBill for the SMS payment solution and AbsoluPayment for the IVR payment solution. We also choose to include the company Deister Electronics who offered services including RFID (Radio Frequency IDentification) tags.

Here follows a short description of the different companies and their solutions.

3.2.1 AOne Bill - http://aonebill.com/

AOne Bill offers a payment service through SMS where you are able to both pay and get an order from. So how does this really work then?
- First the user clicks a "pay" button on the site/application he/she wants to pay in order for the service.
- Shortly after that the user gets a short code and the keyword and then sends one SMS with the keyword and is charged by his/her carrier.
- AOneBill sends a request to your script handler, gets the password and sends it back to the end user.
- AOneBill pays you are the first week.

3.2.2 AbsoluPayment - http://www.absolu-telecom.lu/en/

AbsoluPayment offers a micropayment solution with no PIN required whatsoever. It's also user-friendly for both Internet and mobile payment methods.

3.2.3 Deister Electronics - http://www.deister.com/

Deister Electronics are famous world wide in the development, manufacture and distribution of electronics security and identification area. The part of their business that is more important for us is, as mentioned before, the RFID-tags which would be able to help us identify and find our car.

All three of these systems have to be incorporated in the proprietary parking systems already in place. Therefore, the supplier of these parking systems also needs to be involved in the project to make the implementation possible.

Another technology that we would like to use in the future is Radio Frequency Identifier technology. Cars equipped with RFID tags can be identified by a detection system from ranges up to 500 meters. This way the need for scanning number plates for car verification is no longer needed. It will also be possible for returning customers (people who park in a specific place regularly) to set up a prepaid account based on their car's RFID tag to process payments automatically, thereby eliminating the need for a ticket altogether. The system will be able to detect which car it is and check if there is enough credit on the account. If so, the pike will open automatically, eliminating any manual payment actions.

4 Conclusion

Not only is our idea making the whole process of parking more convenient, it's also making it all more flexible. In some countries the whole process of parking is a little different. For example in some parking lots you have to get in, park the car, get out of the car to buy a ticket and that means you have to pay in advance and know for how long you are going to stay. You also have to place the ticket in the front of the window. To say the least, it's a really inconvenient process.

Our system offers more possibility when equipped with RFID than current systems. There are less steps involved in the parking process than with other systems or current non-text based payment systems. It is very easy to understand and use and will save you a lot of time, both in terms of actually paying and in terms of waiting in line at the machine or the exit of the parking structure.

5 Implementation

5.1 Step by step Process
We want to use mobile payment solutions to attack this problem. The steps are pretty easy;
- Drive into the parking
- Get a parking ticket with a unique five digit code (12345)
- Park your car
- Do your stuff
- Come back
- Send a text message to 1337 with the text "PARK[space]12345" to make the payment (SMS payments)
- or call 555-1337-12345 to make the payment (IVR payments)
- Use your 5 minute window to leave the parking structure

Implementation is pretty straightforward for most parking structures. Most parking structures already have a license-plate scanning camera system set up. The rest of the system is a piece of software that

needs to be uploaded to the parking structure's system that controls the exit beams. Our servers will process the text messages, will verify the validity of the payment and sends a confirmation message to the parking structure which sent out the unique five digit code. At the parking structure, the camera will check for the license plate linked to this code. Once the car drove up the beam, it will match the unique code with the license plate and the beam will open.

In case there isn't a license-plate scanning system available at the parking structure, we can take care of implementing this system by contacting our local suppliers of these systems.

5.2 Diversification

Once the system becomes a success and we have had considerable experience with the parking structures, we can diversify into similar markets, like free parking in cities. If the municipalities integrate our product, it would be possible to send an SMS to 1337 with your license plate number and parking zone number to make a payment for a certain period of time. The ticket inspector would carry a PDA to be able to check in a central database whether you paid for your parking or not.

6 Participants

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