Project Parkeergarage

Problem definition.
In this chapter you will describe the problem that you are trying to solve with this application. Try to formulate your problem in a generic and realistic way. Expand on the use of simulations in business problems.

- The parking garage contains 500 parking spaces.
- The company has 15 employees (see organizational structure) and the parking garage is open 24-7.
- Next to the parking garage "Cityparking Groningen" the famous theatre "Groningen Opera House" is located. This theatre has 1000 seats.
- Visitors of the theatre park their cars in the parking garage "Cityparking Groningen". Each weekend the "Groningen Opera House" organizes shows that are always sold out.
- **It is not yet possible to reserve a part of the garage for reservations or for clients with a parking pass.**

What is the problem we want to solve?

We think the problem regarding the 'Project Parking Garage' is that at the moment there are very few parking spaces when there are a lot of cars using the parking garage. We have to either expand the number of parking spaces, or integrate a well-organized system to keep track of reservations or normal visitors.

There is also the problem that it is not yet possible to make a reservations for reserving a part of the garage for companies who want to have parking spaces for their employees. It would also be very useful if it is possible for clients with a parking pass to reserve parking spaces. So to make this possible we have to divide the parking garage in spaces for reservations and people without reservations.

Another problem is that it is very busy in the weekends when there is a show at the "Groningen Opera House" that is located next to the parking garage. The shows are almost always sold out and there is always alot of clients who want to make use of the parking garage at that time. Because of this, the parking garage is almost instantly full during the weekend. Maybe it would be smart for the parking garage "Citypark Groningen" to have a conversation about this problem with "Gronigen Opera House" to resolve this problem.

At the moment the program is designed in the way that all cars who arrive at the car park take the first spot they see. So there is not one single car who drives on and search for an empty place a couple of spaces further. This pattern is always the same. If we look at the parking garage, we see that the garage is devided in parking places, which are then devided in rows, which are devided over three floors. When the car enters the parking garage, he/she takes the first free parking spot he/she sees.

In this project the following functionality was already implemented:
- A simulator for arrival and departure of customers.
- Queues
- Incoming and outgoing traffic per hour
- Payment at the gate on departure.
- Regular payment
- Parking Pass usage
- A graphical representation of the occupation of the garage

As the project is the delivered (the as-is) the simulation is not really easy to expand or maintain. This is why we are working on this simulation to make it easier to add cars, to maintain the amount of cars are entering the car park and to have a control over the parking spaces, rows, floors and cars.