

Criterion A: Planning

The client, Mr Amirul Bakri, is the owner of a proposed low capacity middle-end shopping mall in Kuantan, Malaysia. Mr Amirul is a friend of my brother, who introduced me to him upon hearing of my search for a potential project to tackle as my Computer Science Solution. The mall, as proposed, will be separated into quadrants with distinct areas including Retail Shopping, Beauty, Entertainment, and a Food venue. Also according to the proposal, a large outdoor parking area with no fees will surround the mall, alongside an underground parking area in which a fee will be applied for patrons.

Mr Amirul intended to automate the underground parking system in order to eliminate the need for human personnel which, according to his own research, presents additional recurring costs to employ, alongside the possibility of human error. To his detriment, all of the major suppliers of automated parking ticketing solutions in the area present prices which he felt were too exorbitant for a space which only catered to 40 vehicles at maximum capacity.

I offered to design and produce a solution which would automatically track the availability of parking spaces and automatically increment the parking fee for patrons (as opposed to a one-time entrance fee which he felt could be abused by patrons to park for extended periods). The solution would mainly serve as an interface for patrons of the parking space. Mr Amirul also requested that I create the solution to allow patrons to choose parking spots closest to the desired area of the mall they wished to visit, a feature not found in most conventional automated solutions, and one he felt would greatly improve customer satisfaction. Further consultation with the client also spawned the idea of a mobile version of the solution where patrons can check on their accumulated parking fee while spending time in the mall.

Rationale for the Solution

Since the solution caters to additional patrons in the form of parkers alongside the client, it would have to display the layout of the shopping mall, and provide a dropdown to allow patrons to select which area of the mall they would prefer to park in. The layout and presentation of the solution must then be simplified and easily readable while simultaneously providing an unobtrusive yet appealing aesthetic design, as it will be the first interaction the patron has with the shopping mall. To achieve this, I will utilise HTML (Hypertext Markup Language) alongside CSS (Cascading Style Sheets) in order to formulate the design elements of the solution.

PHP will be utilised to create the algorithms used in the implementation of the software, such as computing the duration a patron has parked and the subsequent fee, and the logical processes of filling and freeing up parking spaces. PHP is chosen as it is an easy to manipulate language, and while maintaining PHP on full framework backed websites can be complicated, the nature of my solution is simple enough to warrant its use. Alongside that, PHP is compatible with

almost all if not all web hosts, which is extremely fundamental to the functioning of my solution as a website and its extensibility.

To store values such as the taken/available parking spots, check-in and check-out times, a database in MYSQL will be utilised, which PHP interacts with without much issue.

Starting Success Criteria

- The solution displays the layout of the mall's parking lot in relation to its designated areas (Retail, food, entertainment, beauty).
- Solution will select a parking spot, based on input by patron, closest to the patron's desired destination area.
- Solution will track empty and taken parking spots.
- Solution will state unavailability of parking spots when applicable.
- Solution will increment and track parking fee in real time.
- Solution will allow patrons to input parking spot number to check accumulated fee.
- Solution will allow patrons to check out and open up paid for parking spots.
- Solution will display to client revenue earned from parking spots daily.
- Solution will be presented in an unobtrusive, aesthetically pleasing interface.