Since the in-door navigation is the area that has not been completely developed, our capstone project team has met so many technical and knowledge-based issues that are out of our learning experience. Challenges are:

* Creating a mobile app under an unfamiliar structure (MS Xamarin) and language (XAML).
* Implementing the whole mapping system based on the PDF version of maps. Our team was totally confused when only the graphical maps were given for a navigation system, and none of us have experience with computer vision to analyze or transfer the visual picture to actual usable data.
* Using an engineering software AutoCAD to transfer the visual information to a precise grid system. Although we have a workable solution to generate the map data, it is still time-consuming to learn a new professional tool.
* Identifying all required items’ location. This work must be done manually based on our source of the library’s information, and all items must be relatively accurate. For instance, the place of every shelf and books stored on the shelf is not given, we have to record the position one by one, and transfer them into the map.
* Creating a modified version of A\* algorithm. We chose A\* as our fundamental algorithm for mapping (finding the shortest path), while under this condition, it must have some special features to fit in an actual working scenario. For example, the original A\* cannot generate the shortest path for multiple floors.
* Displaying the graphical pathline on the mobile screen for the user during the navigating is quite complicated.