MSIM 601 - Introduction to Modeling and Simulation Term Project Concept and Idea

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1. Background

Product placement is critical to the successful of any retail industry, especially the fast moving consumer goods (FMCGs) industry. Product placement has the power to influence the buying choices of customers and there is clear scientific evidence behind this mechanism. The location of a product in a store can be the difference between selling 5 units and selling a 1000 units.

There are currently five main placement strategies for different brand categories. Block Placement sees related items placed together, while Vertical Placement has merchandise being placed on more than one shelf level. Commercial Placement involves items with a higher perceived value being more prominently displayed, and Margin Product Placement dictates that the more profit an item generates for the retailer, the better position it will receive. Finally, Market Share Placement is when the highest revenue generators are placed where customers can easily find them.

No matter which placement strategy is selected, there is a common prerequisite that whether there are any shelves naturally attracting more attention from the customers, which means that if there are any better horizontal positions for the shelves? However, there is a lack of empirical evidence to prove with certainty which effects different horizontal product locations have on consumer behavior and product sales. This project is trying to find those better positions by simulating customers' shopping route.

2. Methods

This project will implement an agent-based model using C++. The layout of the supermarket will be abstracted from a real one. The customers' behaviors will follow some assumptions. After the simulation, it will show that which aisles are covered by customers more, which implies that the shelves placed beside these aisles will have more exposure to the customers.
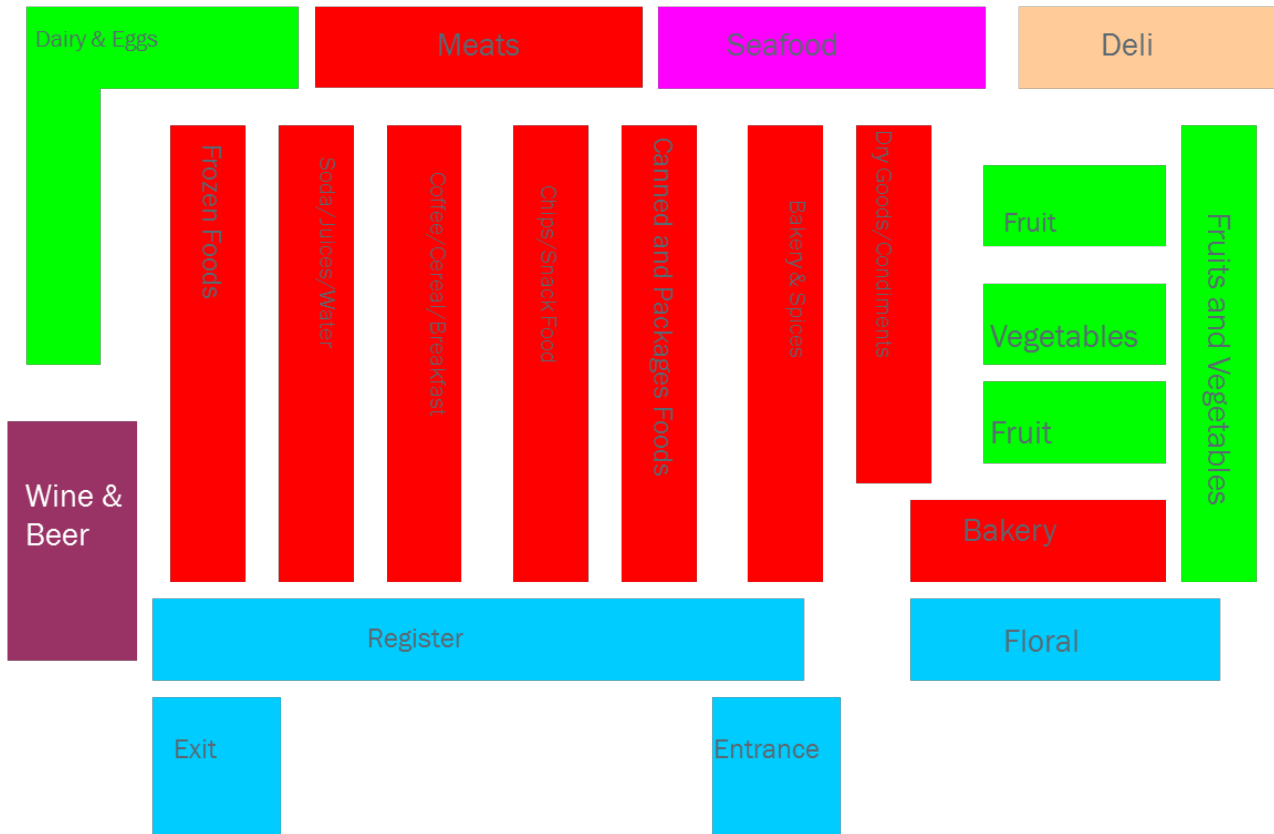
Fig 1: Sample Supermarket Layout

3. Assumptions

According to the purpose of the project, only aimless (no specific products want to buy) customers should be considered. So their behaviors should be generally random.

3.1. Random Customer Appearance

The customers enter the shopping area by randomly choosing among the available entrances.

3.2. Random Shopping Time

The shopping time of all customers is under the same Poisson distribution.

3.3. Constant Movement Speed

All customers walk at the same constant speed in the supermarket.

3.4. Random Turn

Every time a customer arrives at the intersection of aisles, a new direction will be

chosen randomly.

3.5. Never Turn Back

The customers walk along straight line and never visit an aisle twice unless no other choices.

3.6. Checkout Directly

At the end of shopping, the customers will no long look at any other products and checkout directly.

4. References

T. Elbers, "The effects of in-store layout- and shelf designs on consumer behaviour", B.S. thesis, Wageningen University, 2016.

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M. Krishna, "Eye level is buy level: The importance of in-store product placement", *Trax*, 22-Nov-2017. [Online]. Available: https://traxretail.com/2017/11/22/eye-level-buy-level-importance-store-product-placement/. [Accessed: 03-Nov-2018].