# Singapore Management University

# School of Information Systems 2016/2017

# Semester 2

# IS 421-Enterprise Analytics for Decision Support

# Programming Project (Y3 Technologies)

18 Jan, 2017

1. Description

The objective of this project is to help F&B merchants deepen their customer engagement through personalized digital menu, powered by a recommendation engine. Digital menu is increasingly adopted in F&B outlets today in the form of tablets (e.g. Sakae Sushi) or LCD screens (e.g. MacDonald’s). It is gradually replacing waiting staff as the first point-of-contact for customers and is acting as the bridge between the Offline-and-Online world. However, most digital menu today cannot replace the roles undertaken by waiting staff today, such as providing product recommendations based on customer profile and transaction history. In fact, waiting staff are unable to play this role well today as it is difficult to identify a returning customer and know his/her preferences. In addition, waiting staff are unable to tweak their company’s one-size-fit-all promotions to tailor to individual customer’s needs. Digital menu can overcome these challenges through predictive analytics and optimization, and provide astute recommendation that maximizes customer satisfaction and/or revenue.

1. The problem

Based on the context above, the primary challenge is to develop a machine learning, recommendation engine that can be embedded into a dynamic, digital menu.

The objectives are:

* Maximum customer satisfaction (i.e. adoption of the most probable and desired product)
* Maximum revenue (i.e. adoption of the highest-value product)

The constraints are:

* Maximum quantity that can be consumed
* Maximum spending limit
* Dietary restrictions

The segmentations for consideration are:

* Member vs Non-Member
* Individual vs Group
* Breakfast vs Lunch vs Dinner
* Young vs Middle-Age vs Elderly
* Heartland vs CBD
* Vegetarian vs Non-Vegetarian

1. Deliverables

The key deliverable is an executable multi-objective recommendation engine, written in Python/Java with clear documentation/commentary. The model will be evaluated based on its robustness and scalability. Actual testing of the model on Y3/Ascentis customers is not included in the project scope.

1. X-Factor

The model will be considered as outstanding if it can achieve one or more of the following:

* 1. Consider the potential impact of weather condition on product choices
  2. Promote untried products to make the dining experience more experimental and delightful than norm
  3. Integrating recommendation from social media sites (e.g. HungryGoWhere, Yelp!) to increase likelihood of adoption of the model’s recommendation
  4. Promote slow-moving products

1. Resources

Y3 will provide a set of anonymized CRM data and historical transactions upon start of project.

1. Contacts

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