# Database Modelling and Design

**This project aims to get the proper skills to design and model the Database using the given specifications.**

## 1. Project Domain

This project concerns a liquor shop chain in Sydney, called *The Magic Ale* (MA). The objective of this project is to develop a database system that will be used to centrally store and manage all relevant information for the branches of MA.

The information to be stored include information on different branches of MA (Bankstown, Hornsby, etc.), types of drinks they sell (beers, wines, cedars, etc.), staff they employ (Retail Assistants, Shelving Assistants, etc.), Magic Members (MA Loyalty Card holders), and Sales Campaigns (discounts on specific products over a limited period). The basic requirements gathered from the stake holders is presented in the following five points. As typically the case, these requirements are often underspecified. Use your judgment in interpreting them when required, and keep a note of the assumptions you made.

1. **Branch Information: The MA System shall keep information on each branch including its name and address, and the number of employees who work there. The system shall also contain information on which days (Mon-Sun) the branch is open, and opening hours. It will also keep information on opening hours (e.g., Mon-Fri 10:00AM-5:30PM; Sat 9:00AM-9:00PM; Sun Closed).**
2. **Product Information: The system shall contain relevant information on products of different types at the "item level", such as: type (wine/beer/spirit/...), packaging info (can/bottle/...), volume (e.g., 375ml X 6 pack), price, and brand (e.g. Tooheys Old Dark Ale), as well as current stock level.**
3. **Staff Information: The system shall record information on staff members who work at different branches of MA. This will include their roles, type of employment (e.g. permanent, casual), salary (annual or hourly depending on permanent or casual), as well as who they report to.**
4. **Membership Information: The system shall record information on magic members, including type of membership (Platinum/Gold/Silver), and when the membership will expire.**
5. **Sales Campaign Information. The system shall keep information on sales campaign. Assume that these campaigns are global (same across all branches of MA). It will have information of the form: campaign start date and campaign end date, what items are on sale, and the discount for customers based on their membership (e.g., nonmembers 10%, Silver 15%, and Platinum/Gold 20%).**

# 2. Task Specifications

**Task 1**

Construct a conceptual data model in the form of an enhanced ER (EER) model for the above project domain (see the Appendix for a sample). Identify and justify the use of, if any, *generalization /specialisation*, *weak entity types*, and *attributes on relationships*. This model should include entities, attributes, primary keys, the relationships among entities with cardinality and participation constraints. You can make any reasonable assumptions if there is a lack of information on particular aspects and/or you think there is ambiguity. If necessary, you may also introduce additional entities to ensure that every data requirement is captured. Note that you should not show the foreign keys in the EER model.

**Task 2**

Construct a logical data model (a relational data model) by transforming the conceptual data model of Task 1, showing the relations, their attributes, and foreign and primary keys. The relational data model can be presented either as a relation diagram or a relational schema.