# CIS610 Project 01 - iVending Incorporated Initiative Business Requirements Definition

# Introduction

iVending Incorporated is a startup company in Colorado. It is the mastermind of a group of Colorado State University College of Business graduates. The company is targeting a growing trend toward self-servicing customers and autonomous business solutions. The market and product concept is a “smart’ vending machine that offers ease of access to customers, especially clustered apartments amd campus locations where large number of customers reside. For example, the company plans to place iVending machines in apartment complexes so that students can purchase quality food, snack, and drink products reducing the need to go to a local business for similar products. Another potential site for installation is an airport with its high-density traffic. The company is researching the legal requirements of offering beer in its vending machines. However, this item offering is likely in the far future as regulatory requirements are constraints.

# iVending Incorporated Operations

iVending operates out of its company headquarters and operations center. At this location, staff conduct company financial, marketing, accounting, supply chain, information technology, and operations. The Operations Department manages iVending machines. It installs, maintains, and retires machines as needed. It also manages physical inventory activities such as restocking machines and removing nonperishable and perishable items as needed. This department managed the contracts and oversees the alliances between iVending and iVending’s distribution partners. The Operations Department works closely with the Accounting Department to implement the program for loyal customers.

# Business Vision

## Machines

The iVending business model is a self-contained vending machine that dispenses food, snack, and drink products. iVending machines are cashless for customer ease of use, security, and safety. While there is a default configuration, the vending machine is configurable so that its content can be targeted to customer purchasing patterns. Thus, if customer in one apartment complex or customers in one section of an apartment complex tend to purchase more drinks than food, a larger portion of the machine can be configured to hold more drinks. A machine will be engineered to utilize the standard electrical power of a country so that the machine can be operated internationally. The machine is self-maintenance engineered. If a machine malfunctions, it will automatically trigger an alert to the iVending operation center. A machine has a real time feature that utilizes machine learning to monitor machine operation. This monitoring feature will alert the operation center as machine power operation degrades so that maintenance can be conducted before a failure. Of course, if there is a failure, a failure alert will be issued so that an immediate, high-priority maintenance task is conducted. Similar monitoring and alert functionality are designed for warming and cooling features. A novel engineering concept associated with iVending machine is its use of an architecture that provides redundancy. If the warming unit fails, fail over falls to the cooling unit which will be operate bimodally in both cooling and warming modes (similarly if there is a cooling failure). It is not the goal of this exercise to “engineer” the machine’s technical physical, mechanical, or electrical components. Assumptions can be made to facilitate an understanding of the physical vending machine.

## Items

iVending items are food, drinks, and snacks. Food items include offerings that span breakfast, lunch, and dinner. This offering range gives the company broader latitude to stock a vending machine with items associated with targeted local customer preferences. The vending machine supports both chilled and warmed products. Item pricing is dynamic, and pricing is implemented at a site or machine level.

## Inventory Management

Inventory management is a unique business function for iVending. With a smart vending machine, real time inventory management is achieved by implementing economic order quantity (EOQ) concepts. At every point in time, iVending will know what products are in what machine and how many of each item is in each machine. Reordering is automatically triggered. The company will also know about item aging to manage freshness and spoilage. Inventory management is achieved by aggregating items at a machine, site location, and geographic location level. This inventory analytics promotes buying power and pricing advantages.

A machine item is based upon a catalog item and is part of a master catalog managed by the company. A catalog item is sometimes stocked in machine. When a catalog item is stocked in machine, it is a machine catalog item. Whether a particular item is stocked in a machine depends upon the preferences of the customers. However, each machine is stocked with the inventory that best suits its customer base.

## Distributors

Third party distributors offer food, snack, and drink items for purchase. Distributors offer catalog items for purchase to iVending. The company retains information about which distributors supply which item. A distributor may discontinue offering an item, an item may not be selected, or the distributor may go out of business. It is important for iVending to keep up with the information. Sooner or later, iVending will place a purchase order to add to existing inventory or to replenish spoiled items. The purchasing manager selects the distributor that offers the required items based on EOQ at the best price. Purchase orders satisfy the requirements of one or more machines. The purchase order consists of attributes such as an issue date, scheduled delivery date, shipping address, items, and the total amount of the order. iVending needs to know about purchaser order shipments including their schedules. When shipped items of a purchase order are received from a distributor, items are allocated to perpetual inventory.

The company selects the distributor that offers the item required at the best price. All purchase orders must be placed by the iVending purchasing department, and each order is to satisfy the requirements of an inventory requirement. Each machine has its own inventory.

## Customers

iVending customers are either known or unknown. A customer is known if one signs up to be a valued customer through the company’s loyalty program. Loyal customers are provided special promotions as well as a discount on every purchase based upon the amount a customer spends during the previous calendar month. A loyal customer may optionally fund an account. This account can be used to purchase items even if the customer has no credit, debit, or electronic wallet account. A customer can purchase multiple items at a time.

iVending seeks to implement an MYiVendingRewards program using an iVending app. The app will provide its members with the opportunity to earn points, make easy payments, and redeem awards.

## Customer Interface

A customer purchases food, snacks, and drink through a customer interface. There are a machine and mobile versions of the customer interface. This interface navigates the customer through functionality such as:

* Loyalty signup
* Item selection
* Purchase payment (there is no currency purchases – debit card, credit card or digital wallet)
* Account replenishment
* Nearest location of items
* Inquiries
  + Machine location
  + Machine catalog items
  + Item pricing
  + Account balance
  + Purchase summary and history

## Public Health

As a result of the COVID pandemic, iVending formulated a disinfectant program. With this program, machines are disinfected. A customer departure triggers a disinfecting feature. The disinfecting unit senses when it is safe to disinfect (no customer around) and enables a caution warning for customers. Then, the disinfecting feature ejects a gas chemical disinfectant (nontoxic to humans) on the machine front to eliminate or reduce the risk of airborne viral droplets. The disinfecting unit is self-monitoring, monitors disinfecting chemical levels, and signals when disinfecting chemical levels are too low.

## Artificial Intelligence (AI)

Management is excited to jump on the artificial intelligence bandwagon. Can AI and machine learning contribute to a more dynamic business model? Can AI help produce an improved customer purchasing experience or vending operation? If so, how?

Your assignment is straight forward. Complete innovative business requirements that will bring iVending management vision into reality by implementing a smart vending machine and integrated operation. iVending management wants to utilize IT infrastructure, applications, and data to transform a customer’s vending experience. In your formulated solution, budgetary consideration is not a limitation.

The following summarizes key iVending business vision:

* Vending machines: configurable for items, self-maintenance, cooling, warming, cashless, fail over, self-monitoring operation.
* Items: food, drink, and perishable items, dynamic pricing.
* Inventory management: machine inventory management, company inventory management, local stock targeted for local customers, automated stock level calculation, automated reorder points, automated perishable thresholds, master catalog driven.
* Distributors: catalog item providers.
* Customers: loyal customers, non loyal customers
* Accounts: loyal customers
* Public health; automated disinfecting, self-monitoring disinfecting