**Introduction**

A vending machine is defined as “a machine that provides a desired good or service when money (coins or bills) or debit/credit cards are inserted” [1]. Due to low-cost hardware and high cost of human staff, vending machines now-a-days process a great variety of different products and services. Amongst the principal categories of vending machines (e.g. beverage vending machines, tobacco vending machines, ticket vending machines etc.), a transport Ticket Vending Machine’s (TVM) primary tasks involve recharging transit fares through smart cards and dispensing paper tickets/ transit passes after accepting variety of user inputs (e.g. type of ticket, quantity of tickets etc.) and appropriate payments. Additionally, TVMs are utilized for assisting in management of queue & prioritization of services. For our project, we have chosen the TVMs used by Societe de transport de Montreal (STM), which are widely distributed in all the metro stations of the greater Montreal area. We selected this particular TVM, as its user interface and functionality are very much familiar to the members of the project.

The chosen TVM has the following characteristics:

1. **Easy and intuitive user interface:** The TVM user interface is mostly self-explanatory and can be accessed without prior training. Furthermore, few assumptions are made about the skill level and knowledge of the users. Users may suffer from cognitive interference due to stress and the UI supports the user task and minimizes the probability of error. The UI consists of physical buttons for selecting user choices, a physical keyboard and a simple color display.

Using this design as reference, we propose to include a touch sensitive color display. This is done because touch sensitive displays can be programmed and used to build tangible user interfaces. The needs of seniors as well as, users with physical and cognitive constraints such as limited vision, difficulties with physical movement will also catered for in our design. For these reasons, the height of the keypad is kept at 50cm and the angle of inclination is almost diagonal (45 degree) for people on wheelchairs. Tactile marking indented keypads are used for blind people with voice assistance.

1. **Type and Quantity of tickets:** The selected TVM can dispense tickets/transit passes to end users and recharge their transit smart cards. The passes can vary in time range, such as daily, weekly and monthly, or on a per usage basis such as five passes, ten passes etc.
2. **Language:** The machine UI has multilingual support, namely for English and French so that it can be legally operated in Canada.
3. **Payment methods:** Prices are displayed only in Canadian dollar (CAD). The machine accepts CAD bills of five, ten and twenty dollars denominations, as well as coins worth one dollar, two dollar and twenty five cents. Users can also pay using their credit/debit cards if necessary.
4. **Receipt:** The
5. **Location:** At the moment, the TVM is strategically placed either in the middle of the metro station or close to an ingress/ egress points with signs pointing at it for better visualization. Our proposed TVMs will also be paced near vital bus stoppages.

References:

[1] Higuchi, Yoshihiro. "History of the Development of Beverage: Vending Machine Technology in Japan." *National Museum of Nature and Science: Survey Reports on the Systemization of Technologies* 7 (2007).

[2] Sandnes, Frode Eika, et al. "User interface design for public kiosks: an evaluation of the Taiwan high speed rail ticket vending machine." *Journal of information science and engineering* 26.1 (2010): 307-321.