Introduction

The Supermarket Management System is a project that deals with supermarket automation and it includes both purchasing a selling of items. This project is designed with a goal to making the existing system more informative, reliable, fast and easier. There are many reasons for the starting of the project because in the selling of items through the manual system of salesperson faces a lot of inefficiencies. It requires handling of large record books that consist of both irrelevant and important information's thus making it difficult to find out the required information as per necessity.

This is also a clumsy and untidy process that disturbs the smooth flow of work. But this system introduced by us will reduce the huge number of paper works while on the other side there are many more problems that persist in the manual system. They reduce efficiency as well as the productivity level of human. Administrative module, purchase module, employee module, sales module and billing module are some of the various modules that make up our project.

The administrators consist of a unique password and names of the employees. It helps the employees to make secure login. The ids and passwords are kept secret from others. The modules of sales and

purchase include all the details of selling and purchasing. In the billing module the details of payments are clearly shown.

This is one of the best systems that can be introduced in the supermarket for efficient management.

It will also reduce the cumber some job of finding the most accurate data from the huge log books. It also helps the management to keep efficient records of all the purchases and sales. The introduction of ID and password will further reduce the manipulation and thus providing the accurate and transparent data. This system will increase the productivity and reduce the need of manual system to a large extent.

A **supermarket** is self-service shop offering a wide variety of food, beverages and household products, organized into sections. It is larger and has a wider selection than earlier supermarket stores, but is smaller and more limited in the range of merchandise than a hypermarket or big-box market.

The supermarket typically has aisles for meat, fresh produce, dairy, and baked goods. Shelf space is also reserved for canned and packaged goods and for various non-food items such as kitchenware, household cleaners, pharmacy products and pet supplies. Some supermarkets also sell other household products that are consumed regularly, such as alcohol (where permitted), medicine, and clothes, and some sell a much wider range of non-food products: DVDs, sporting equipment, board games, and seasonal items (e.g., Christmas wrapping paper in December).

A larger full-service supermarket combined with a department store is sometimes known as a hypermarket. Other services may include those of banks, cafés, childcare centres/creches, insurance (and other financial services), Mobile Phone services, photo processing, video rentals, pharmacies or petrol stations. If the eatery in a supermarket is

substantial enough, the facility may be called a "grocerant", a blend of "grocery" and "restaurant".

The traditional supermarket occupies a large amount of floor space, usually on a single level. It is usually situated near a residential area in order to be convenient to consumers. The basic appeal is the availability of a broad selection of goods under a single roof, at relatively low prices. Other advantages include ease of parking and frequently the convenience of shopping hours that extend into the evening or even 24 hours of the day. Supermarkets usually allocate large budgets to advertising, typically through newspapers. They also present elaborate in-shop displays of products.

Supermarkets typically are chain stores, supplied by the distribution centres of their parent companies thus increasing opportunities for economies of scale. Supermarkets usually offer products at relatively low prices by using their buying power to buy goods from manufacturers at lower prices than smaller stores can. They also minimise financing costs by paying for goods at least 30 days after receipt and some extract credit terms of 90 days or more from vendors. Certain products (typically staple foods such as bread, milk and sugar) are very occasionally sold as loss leaders so as to attract shoppers to their store. Supermarkets make up for their low margins by a high volume of sales, and with of higher-margin items bought by the attracted

shoppers. Self-service with shopping carts (trolleys) or baskets reduces labor cost, and many supermarket chains are attempting further reduction by shifting to self-service check-out.

In the early days of retailing, products generally were fetched by an assistant from shelves behind the merchant's counter while customers waited in front of the counter and indicated the items they wanted. Most foods and merchandise did not come in individually wrapped consumer-sized packages, so an assistant had to measure out and wrap the precise amount desired by the consumer. This offered opportunities for social interaction: many regarded this style of shopping as "a social occasion" and would often "pause for conversations with the staff or other customers". These practices were by nature slow and labour-intensive and therefore also quite expensive. The number of customers who could be attended to at one time was limited by the number of staff employed in the store. Shopping for groceries also often involved trips to multiple specialty shops, such as a greengrocer, butcher, bakery, fishmonger and dry goods store; in addition to a general store. Milk and other items of short shelf life were delivered by a milkman.

System Analysis

This system is mainly used in small and medium-sized supermarkets and the function of the system mainly realize the login, procurement management, inventory management, sales management, staff management and membership management.

Procurement management can query the information of incoming goods, and maintain the good information. Refund management and stock management are two departments, but considering the management situation of small and medium-sized supermarkets, system put it in stock management to operate together.

Inventory management can query the information of existing goods, record the warehouse's basic information which includes number, name, size, type, contact information, etc., and maintain this information.

Sales management can query the sales record in any time. Supermarket can judge goods according to the sales record and determine the amount of goods in next time stock.

Existing System:

The existing system is very paper based in small as well as medium supermarkets. Even though the paper work and manpower requirement is less, the existing system is not very economical for these markets. Relevant and irrelevant information are entered and stored in the same place, which is very clumsy and untidy process.

In case of big supermarkets, the existing system is computerized to some extent, but it is not fully automated to cover all the aspects of the supermarket. The data entry, storing, and retrieval procedure is very inefficient. Further, there are chances of data misplacement and wrong data entry. The system is still very insecure and inflexible to adapt to user requirements.

Proposed System:

The proposed supermarket management system aims at full automation of big, medium, and mini supermarkets by making the system reliable, fast, user-friendly, and informative. It reduces paperwork, manpower requirement, and increases the productivity of the supermarket. Using this application, one can add, modify, update, save, delete, and print details. There's also a search feature to find products available in the supermarket.

Modules Overview:

The main modules in supermarket management system are:

- **Login module:** Performs all the operations of the login functionality.

- **Customer module:** Customer module performs the operations of customer to purchase a product.

- **Product module:** Product module performs the below operations:

    a. **Add product:** Add new records for the product.

    b. **Edit product:** Edit any of the existing records of product.

    c. **Delete product:** Delete the existing records of product.

    d. **Listing product:** Generates the lists of all the existing products.

- **Purchase module:** This module stores all the purchase details of the supermarket.

- **Sales module:** This module stores all the sales details of the supermarket.

- **Billing module:** With the help of this module, all the payment details based on purchases and sales can be shown.

Software Requirements

1.	Front-end	HTML5, Bootstrap, PHP,AJAX
2.	Back-end	PHP
3.	Database	MySQL and Apache

Data Collection

During weekly store visits, information was collected on individual prices, the origin of production, eco-labelling, fruit sizes, display sizes, pointof-purchase material sizes, weekly advertisements, in-store specials, and quality-scale measures for different varieties of fresh fruit. Information on quantity sold was taken from weekly movement reports provided by the produce managers or other qualified personnel1 at the time of the weekly store visit. The weekly movement reports listed fruit varieties by PLU numbers, the codes used by almost all stores to track produce sales. At times, data were being collected from as many as nine different retail grocery stores within the same chain. The stores had different management styles and were located in different demographic areas in the Portland, Oregon metropolitan area.

Tools and Strategies Useful for Data Collection:

To ensure that all relevant variables were tracked on a weekly basis and to minimize data collection error and collector bias, tools and methods were developed for the data-collection process. The tools developed were an inventory sheet, maps of the produce area, a weekly log, and use of pictures. The methods used include management of the collected data, reconciling of conflicting prices, interactions with managers and consumers, and selecting and training new data collectors.

There were a few tools that made collecting data at the retail level easier. One of the most important tools developed and used for the study was an inventory sheet. The inventory sheet is a table listing the fresh fruit varieties on the left-hand side and the different variables that were being tracked across the top. This sheet provides a quick and accurate way to record individual prices, the origin of production, eco-labelling, fruit sizes, display sizes, point-of-purchase material sizes, weekly advertisements, in-store specials, and quality-scale measures for different varieties of fresh fruit.

When a new data collector needed to be hired, one of the important characteristics sought was a personable nature. The data-collection process involves interaction with retail managers, other store staff members, and consumers; thus, the data collector should be personable to maintain good relationships with managers, their staff, and their customers.
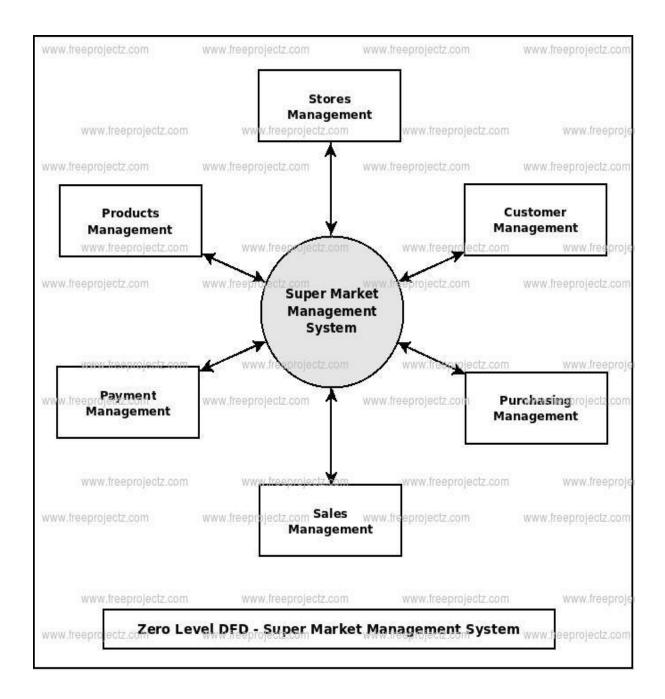
<u>Hardware Requirements</u>

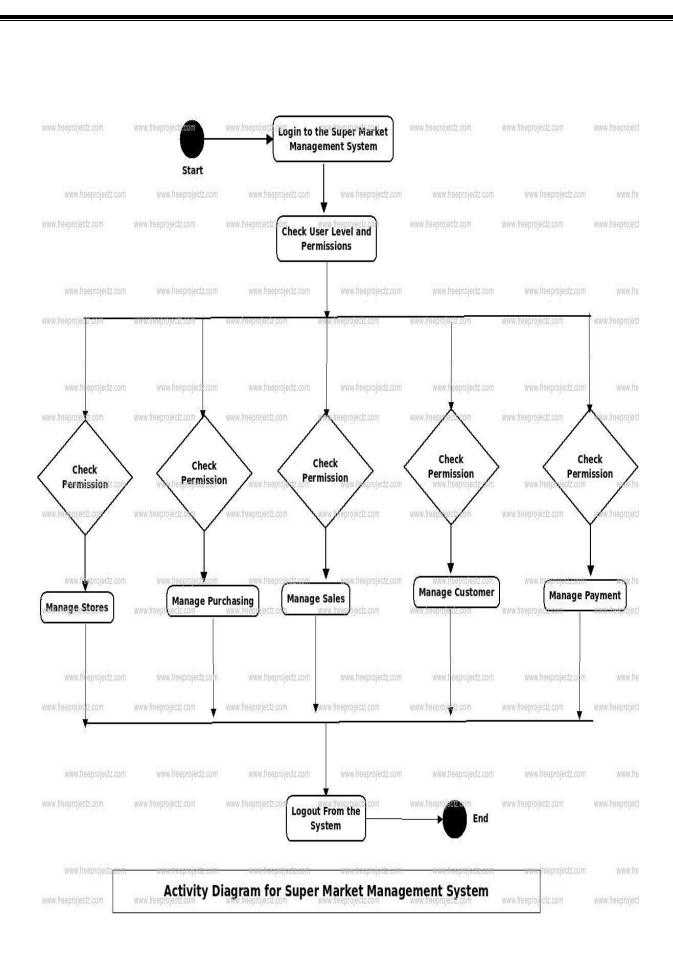|		
1.	OS	Windows 10
2.	RAM	2 GB
3.	ROM	32 GB
4.	Browser	Google Chrome
5.	CORE	15

Environment Specifications

In this section we will describe the development, design and capabilities of the Supermarket Management System. The Supermarket Management System is a software application with which study participants can shop in a manner comparable to a real supermarket. The application was developed in Personal Home Page (PHP). The Supermarket Management System contains a front-end which can be seen by the participants and a back-end that enables researchers to easily manipulate research conditions. The application can be obtained via an URL and the installation consists of unpacking a compressed file at the desired location. The application is available only on MS Windows (Windows 2000+) and is built to accommodate a wide range of computer arrangements, by allowing the user to choose different screen sizes.

The procedure for starting to shop in the Supermarket Management System will be explained below. The Supermarket Management System was designed in the image of a real supermarket. Photographs of real products were used to compose products for the Supermarket Management System and prices were made available through shelf labelling. Food prices were based on the prices of the present market.
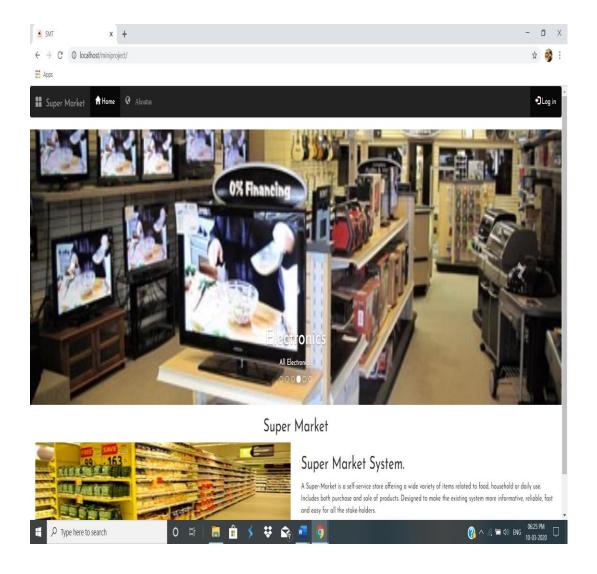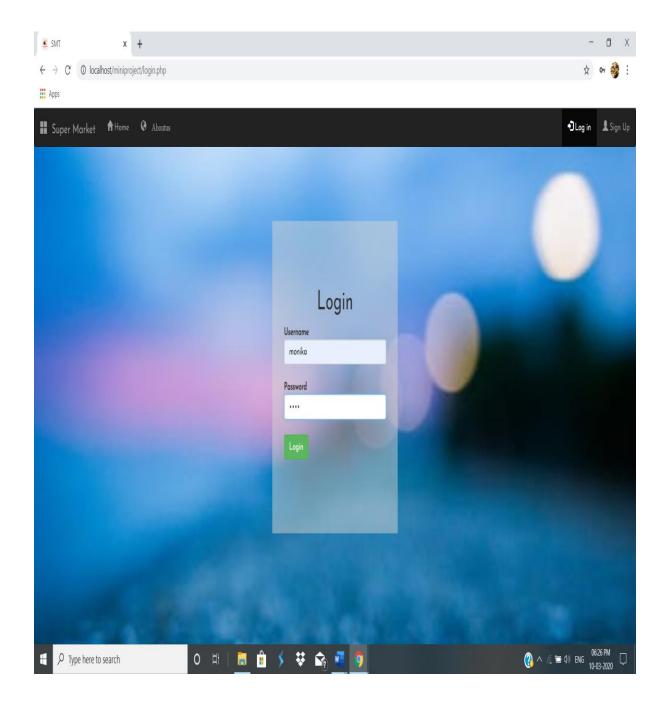
E R Diagrams

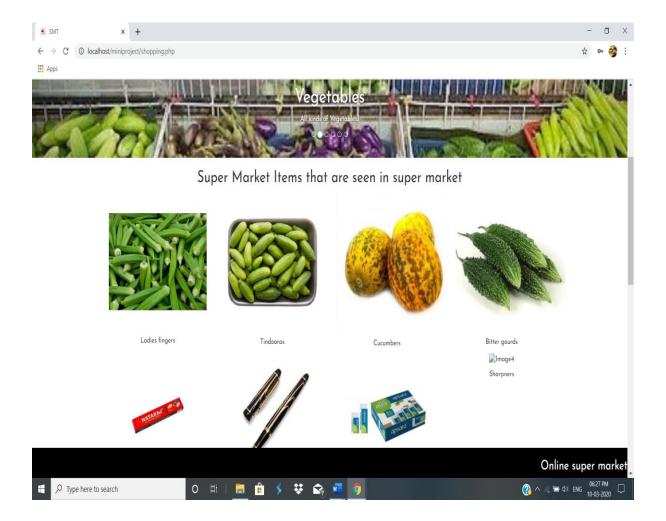Zero Level DFD - Super Market Management System

Super Market Management System

Start

Login to the Super Market Management System

Check User Level and Permissions

Check Permission

Check Permission

Check Permission

Check Permission

Check Permission

Manage Stores

Manage Purchasing

Manage Sales

Manage Customer

Manage Payment

Logout From the System

End

Activity Diagram for Super Market Management System

Output Screens

1. First page

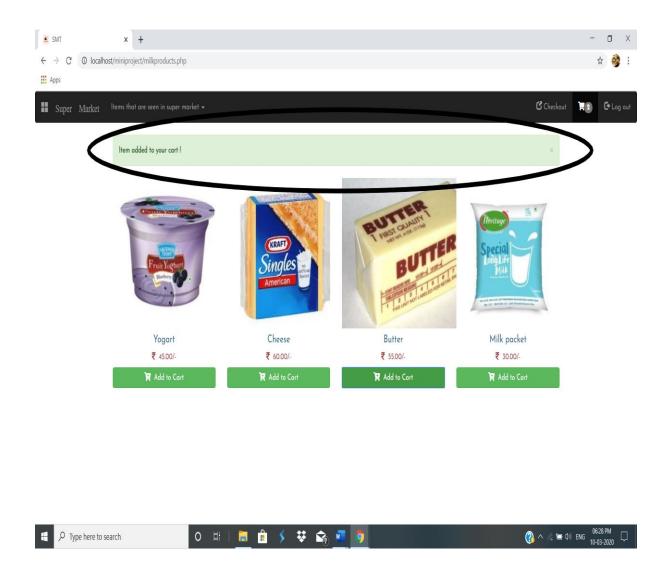## 2. Login Form

3. Shopping page

It contains the number of products in the website.

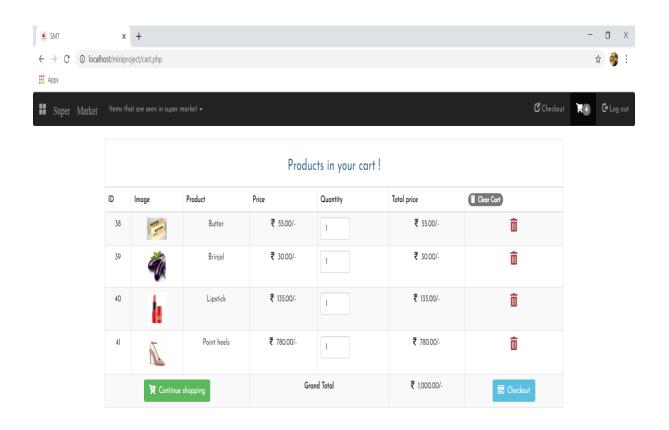4. One of the type of products page in the website (milk products)

5. After opening the page when we will select an item for cart.

We can observe that the item selected message on the top of page.
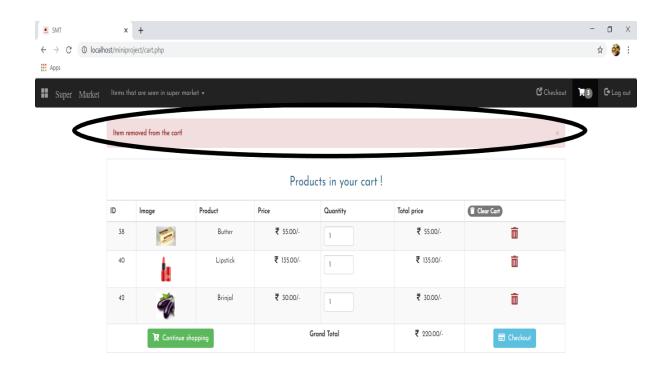
6. Move to **cart** page

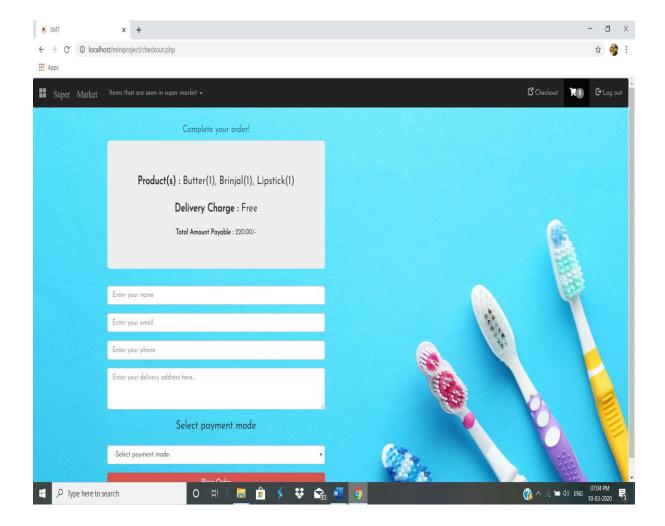The list of items is displayed here in the **cart table**.
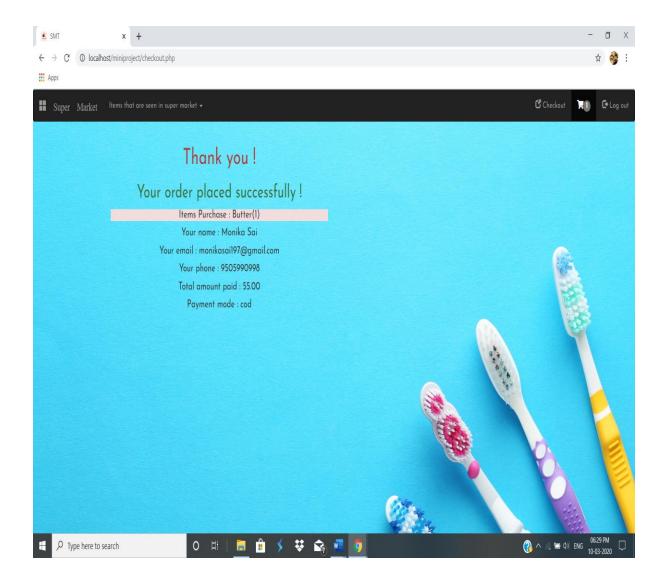
7. Delete a product from the cart

We can observe that the item deleted message on the top of page.

8. Checkout page

To purchase the product, we need fill all the text fields.

9. Transaction completed page

This message will display after filling all the text fields that we mention above.

Report

     This software project is a traditional supermarket management system with some added functionality. This system is built for fast data processing and bill generation for supermarket customers. The system consists of a MySQL database and effective front end designed in PHP. The Supermarket Management System database is a vast collection of product name and price. A product when billed is searched from the database and its price is added to the bill based upon the product quantity. The supermarket management system is built to help supermarkets calculate and display bills and serve the customer in a faster and efficient manner. This software project consists of an effective and easy methods to help the customers in easy bill calculation and providing an efficient customer service.

Advantages:

- The system reduces much of human efforts in calculating bill especially for huge products.
- Saves money and resources of organization and excludes of use of paper or sheets in making bill.
- It can detect the product information and their price instantaneously.
- Saves time.

- It provides accuracy and faultless in billing calculations.

- It is flexible and user-friendly.

<u>Disadvantages</u>:

- Requires large database.

- Cannot track the product information.

Future Enhancements

Other established American grocery chains in the 1930s, such as Kroger and Safeway at first resisted Cullen's idea, but eventually were forced to build their own supermarkets as the economy sank into the Great Depression, while consumers were becoming price-sensitive at a level never experienced before. Kroger took the idea one step further and pioneered the first supermarket surrounded on all four sides by a parking lot.

As larger chain supermarkets began to dominate the market in the US, able to supply consumers with the desired lower prices as opposed to the smaller "mom and pop" stands with considerably more overhead costs, the backlash of this infrastructure alteration was seen through numerous anti-chain campaigns. The idea of "monopsony", proposed by Cambridge economist Joan Robinson in 1933, that a single buyer could out-power the market of multiple sellers, became a strong anti-chain rhetorical device. With public backlash came political pressure to even the playing field for smaller vendors without the luxuries of economies of scale. In 1936, the Robinson-Patman Act was implemented as a way of preventing such larger chains from using this buying power to reap advantages over smaller stores, although the act was not well enforced and did not have much impact on the prevention of larger chains overtaking power in the markets

Future researchers can learn from this study in developing a data-collection process for a real-time market-research project in a retail environment. When developing a data collection process, it is important that the research project has a clear objective. Having a clear objective will help determine the primary variables that should be examined. After the primary variables have been selected, other variables need to be looked at to ensure that the project will examine the selected objective. Conducting interviews with other professionals in the area of focus can provide added insight into variables that may be important. For example, interviews conducted with the produce managers or other qualified personnel added new insight into what variables should be tracked for this study. It is also important that the data-collection process be flexible. If slight changes in the objective of the research project occur, the data-collection process should be able to easily and quickly adjust. To keep the data-collection process flexible, new variables should be easy to add to the process, so that a new process does not need to be developed when new variables are added. The slightest change in how things appear at the retail level can have an impact on sales. When collecting data it is better to collect too much information and have the luxury of looking at many different areas than trying to backtrack and create new variables based on previously gathered information.

When training new data collectors it is paramount to convey the importance of accurately collecting and entering the data. New data collectors were instructed to collect and enter data in a timely manner. Previous experience has shown that delaying data entry leads to mistakes during the entry process. These mistakes will lead to incorrect results from the data analysis, and can take weeks to detect and correct. In addition, a process was needed to ensure consistency across data collectors. Project managers allowed sufficient time for the hiring process in order to overlap the outgoing and incoming data collectors by two weeks. This provides for a training process where the new recruit can observe a data collection and entry cycle and can be observed and coached in the second cycle.

Conclusion

Supermarkets proliferated across Canada and the United States with the growth of automobile ownership and suburban development after World War II. Most North American supermarkets are located in suburban strip shopping centres as an anchor store along. They are generally regional rather than national in their company branding. Kroger is perhaps the most nationally oriented supermarket chain in the United States but it has preserved most of its regional brands, including Ralphs, City Market, King Soopers, Fry's, Smith's, and QFC.

In Canada, the largest such company is Loblaw, which operates stores under a variety of banners targeted to different segments and regions, including Fortinos, Zehrs, No Frills, the Real Canadian Superstore, and Loblaws, the foundation of the company. Sobeys is Canada's second largest supermarket with locations across the country, operating under many banners (Sobeys IGA in Quebec).[citation needed] Québec's first supermarket opened in 1934 in Montréal, under the banner Steinberg's.

In the United Kingdom, self-service shopping took longer to become established. Even in 1947, there were just ten self-service shops in the country.[18] In 1951, ex-US Navy sailor Patrick Galvani, son-in-law of Express Dairies chairman, made a pitch to the board to open a chain of supermarkets across the country. The UK's first supermarket under the new Premier Supermarkets brand opened in Streatham, South London,[19] taking ten times as much per week as the average British general store of the time. Other chains caught on, and after Galvani lost out to Tesco's Jack Cohen in 1960 to buy the 212 Irwin's chain, the sector underwent a large amount of consolidation, resulting in 'the big four' dominant UK of today: Tesco, Asda (owned by Wal-Mart), Sainsbury's and Morrisons.

In the 1950s, supermarkets frequently issued trading stamps as incentives to customers. Today, most chains issue store-specific "membership cards", "club cards", or "loyalty cards". These typically enable the cardholder to receive special members-only discounts on certain items when the credit card-like device is scanned at check-out[20]. Sales of selected data generated by club cards is becoming a significant revenue stream for some supermarkets.

The tools and methods developed for this study have proven invaluable. For over 150 weeks, spanning many different supermarket stores, different data collectors have taken weekly observations of

primary data in an efficient and accurate manner. The tools that were found to be most helpful are an inventory list, a weekly log, and the use of pictures. The strategies that were developed and used for this study include management of the collected data, reconciling conflicting prices, interactions with managers and consumers, and selecting and training new data collectors.

Many challenges have been faced and solutions developed for this study to ensure that all relevant information is collected on a weekly basis. Not all of the tools and strategies may directly apply to future studies that expand on the classical demand model, but using the experiences from this study can help ensure that future projects do not face the same problems.