

ASA-Mall Management System

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Abstract— Extensively accepted problem from major shopping mall owners is to win the customers for their venture. Customers have become more informed with internet and mobile technologies. They prefer to achieve convenient and many times online shopping experience. With an online management site, it becomes easy for mall administrators to manage the mall from remote locations. And also, for shop owners to manage their shop's inventory and check their employee details. Today shopping centers are becoming more complex in terms of its size, type and characteristics and this depicts the challenging role the management team faces. It is important for the owner/developer to establish excellent management teams in order to face the challenges.^[1]

I. INTRODUCTION

Shopping malls are characteristic of large floorage, extensive range of product categories, a variety of specialty stores as well as recreational offerings. After enjoying prosperity for quite a long time, shopping malls began to face serious challenges and bottlenecks in the late 1990s, when sales per square foot of mall space kept dropping. Today, more and more mall managers localize vexation about how difficult it is to boost patronage and profitability. According to retail researchers, including Coalman (2002), Ibrahim and Ng (2003) and Biba, Des Rosiers, Theraully and Villeneuve (2006), massive overdevelopment leads to mutual cannibalization among shopping malls. Consequently, their performances may weaken. Moreover, the rise of big boxes and discounters as well as other types of purchase outlets, which gradually popularize as alternate venues for shopping, probably poses one of the immediate threats to lure away traditional shoppers. Some mall management scholars such as Wakefield and Baker (1998), Wilhelm and Mottner (2005), Biba et al. (2006) and Backstrom (2006), in view of the tightening business environment in which shopping malls operate, theorize that the creation of entertainment experience may play an essential role in enhancing the shopping mall's competitive edge. As entertainment paradigm researchers contend, successful management of a shopping mall involves the management of the entertainment experience.^[2]

II. LITERATURE SURVEY

During the development of shopping centres, the owners have to plan on how to market the space and manage the building later on. Today shopping centres are becoming more complex in terms of its size, type and characteristics and this depicts the challenging role the management team face. It is important for the owner/developer to establish excellent management teams in order to face the challenges.^[3]

III. SCOPE OF THE PROJECT

The scope defines two roles of users of the project, the administrator and the shop owners at the mall.

The administrator is the manager of the mall. The mall management system aims at assisting the manager at performing managerial tasks.

These tasks include accepting or rejecting requests made for leasing a shop at the mall. Manage the lease of existing shops (Grant or deny extensions). Manage the employees of the mall. Manage the events that happen in the mall. Check the revenue of the mall. Manage the data of the mall owners.

The shop owner may own more than one shop at the mall. The shop owner can login only after his request is granted by the mall administrator. A mail request scheme is implemented for the same. The shop owner can manage the inventory of his/her shop; the inventory can be updated by him/her. The shop owner can see the transactions from and to particular dates. The shop owner can view and update the details of the employees working at the shop. The shop owner can also see the sales trends from the previous transactions. The shop owner can request for a lease extension. The shop owner may also close the shop if he wishes to.

The system can be extended by adding the ability to shop for products available at the mall electronically. A payment system can be made through secured online transactions.

IV. PROBLEM DEFINITION

In this project, we will be designing a simple shopping mall management system. The mall will provide a soothing shopping experience for customers, provide mall management functions to mall administrators and inventory/staff management to shop owners at the mall.

- Mall Administrator:

The Mall Administrator is the super user and has complete control over all the activities that can be performed. The application notifies the administrator of all shop creation requests, and the administrator can then approve or reject them. The administrator can check the floor plan to see all the shops in the mall. The administrator can also get details about the mall employees.

- Shop Owner:

Any user can submit a shop creation request through the site. When the request is approved by the Mall Administrator, the requester is notified, and from there on is given the role of Shop Owner. The Shop Owner is responsible for setting up the shop and maintaining it. The job involves managing the inventory in the shop. Also, the shop owner can add or remove items from his shop. The Shop Owner can also decide to close shop and remove it from the mall.

- Mall Customer:

A Mall Customer can browse through the shops and choose products to place in a virtual shopping cart. The shopping cart details can be viewed and items can be removed from the cart. Also, the customer can modify personal profile information (such as phone number and shipping address) stored by the application.

V. METHODOLOGY

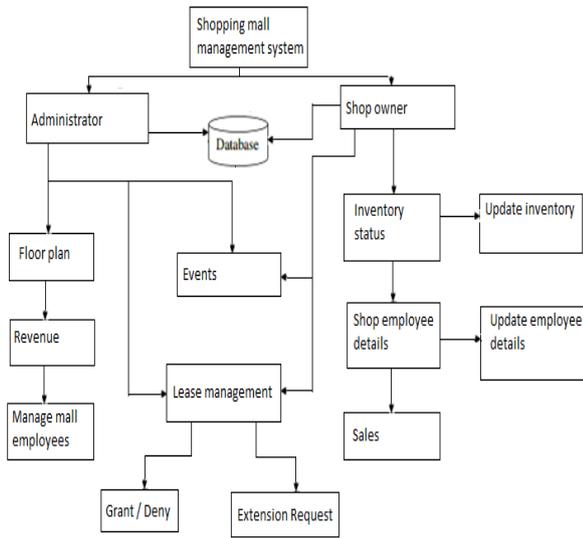


Fig 5.1: System representation

The diagram represents the methodology in which the system will provide functionality to the respective clients who use the system. The system depicts the software to provide an integrated solution for the mall personnel to access various types of information through the database and make changes to it wherever necessary. Various personnel include the mall administrator and the shop owners.

The mall administrator gets to access the database for information regarding the mall employees. The administrator has access to the entire floor plan of the mall to see the present status of each shop and access information regarding the same. This can be done by clicking on any desirable shop on the floor plan and selecting the kind of information that he requires to see. The administrator also has the facility to see the sales and revenue status of the mall. For this, the past records are displayed in a graphical manner and for the future sales, the predictions are made using the linear regression algorithm.

The shop owner has the functionality of accessing the inventory status of his/her shop and make changes to it accordingly. He/she can also access the employee details of the people who work in their shop and edit them whenever required or even remove them, thus revoking their rights to the shop. The shop owner gets to see the information regarding the sales of the shop from the previous times and the predicted sales as well.

The mall administrator and the shop owner have some common and overlapping functionality as well which includes access to the events functionality and the lease management. Events show the present and future events that are lined up in the mall for the purpose of publicity, entertainment for customers and revenue generation. New events can be added according to the availability on that particular day and the events lined up can be seen. Lease management allows the shop owners to check the end date on their lease of their respective shop and also apply for the extension of the same. The same can either be granted or denied by mall administrator accordingly. The mall administrator can access the lease information for all the stores in the mall.

VI. ALGORITHM

Simple linear regression is used to model a relationship between a dependent variable ‘y’ and an explanatory variable ‘x’.

Suppose there are *n* data points {*y_i*, *x_i*}, where *i* = 1, 2, ..., *n*. The goal is to find the equation of the straight line

$$y = \alpha + \beta x,$$

This would provide a “best” fit for the data points.

Where

$$\hat{\beta} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sum_{i=1}^n (x_i - \bar{x})^2}$$

$$= \frac{\bar{xy} - \bar{x}\bar{y}}{\bar{x}^2 - \bar{x}^2} = \frac{\text{Cov}[x, y]}{\text{Var}[x]}$$

$$\hat{\alpha} = \bar{y} - \hat{\beta} \bar{x},$$

This equation can be used to predict sales for future months by finding the sales pattern from sales data collected from previous months. A relation between sales and months can thus be found. This will help the shop owners to keep stock of inventory accordingly.

VII. CHALLENGES IN MANAGING SHOPPING CENTRES

Generally, it must be remembered that the shopping centre industry has moved fast since the early 1950s, as mentioned earlier. In fact, in the past 58 years of growth, shopping centers have created important roles and challenges for shopping centre management. Since the nineteenth century, one of the most consistent challenges in shopping centre management has been to identify, understand and meet the ongoing needs of consumers, retailers and owners. These key parties are fundamental to any shopping centre in the world. It is important for the owner/developer to establish excellent management teams in order to face the challenges. The British Council of Shopping Centers has taken the step of funding diploma courses in shopping centre management to provide

managers with the appropriate education and skills (Kaye, 1989a). In the United States, the *University of Shopping Centers* has been established to offer all shopping centre professionals continuing education training in specialized fields relating to the shopping centre industry. The quality of management in a shopping centre is identified as the third most important factor that can affect the success or failure of shopping centre Morgan and Walker, 1988).^[4]

VIII. DIAGRAMS

Mall administrator:

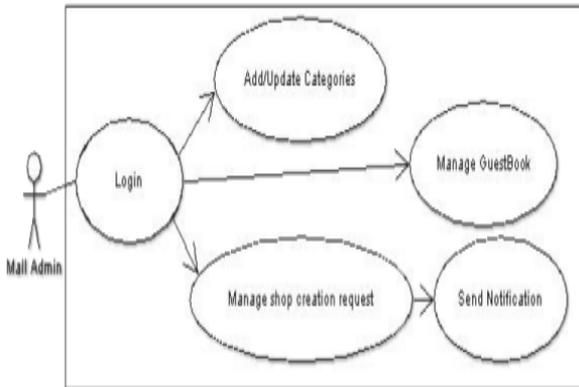


Fig 8.1: Use case diagram for mall admin

Shop owner:

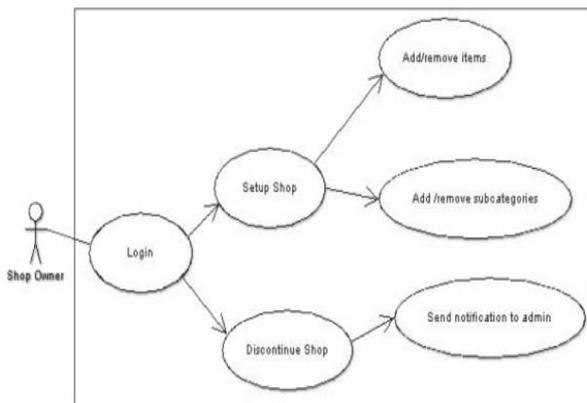


Fig 8.2: Use case diagram for shop owner

Customer:

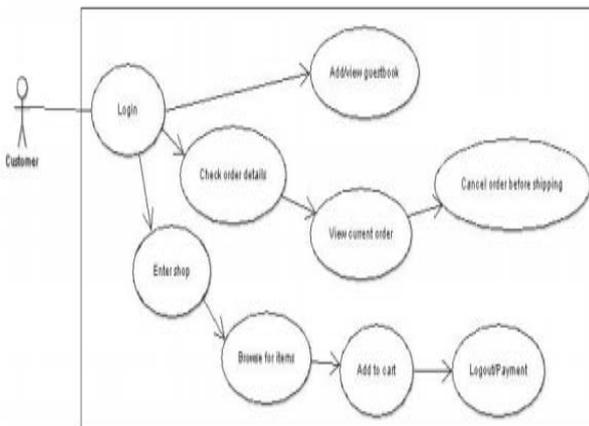


Fig 8.3: Use case diagram for customer

IX. RESULT AND DISCUSSION

The system eliminates the need document the information using pen and paper and provides a unified solution by integrating the different systems that may be used by the mall administrator and the shop owners, thereby increasing convenience.

The prediction algorithm will help the managers and shop owners to prepare accordingly.

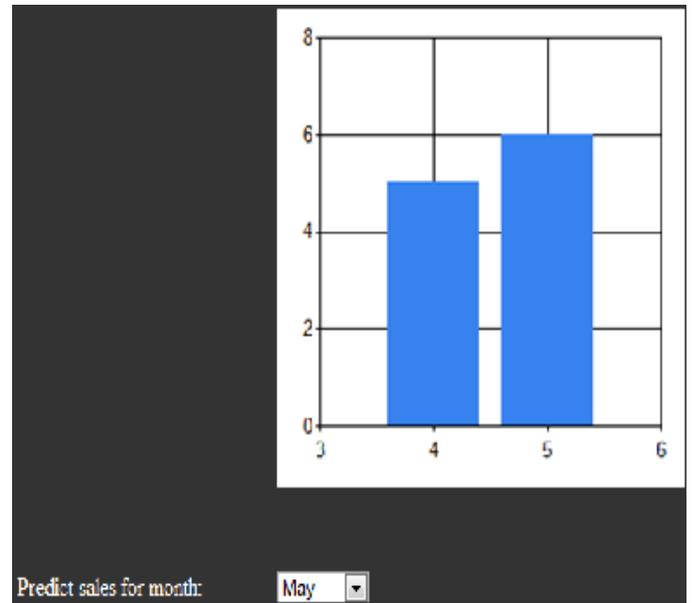


Fig: 9.1: Sales prediction using regression algorithm.

The simple linear regression algorithm helps in finding the relation between a dependent variable 'y' and an explanatory variable 'x'. In case of simple linear regression, the relation is modeled into a linear equation to fit a line.

This equation can be used to predict the value of the dependent variable 'y' with changes in value of the explanatory variable 'x'. Thus, the system can use this algorithm to predict the sales of goods in the upcoming months.

X. CONCLUSION

Shopping centers are unique as a real estate format because they typically evolve more rapidly than other properties. They serve many different people, in addition to consumers, retailers and owners. Traditionally, major retail shopping centers have been managed by different in-house management teams, in a traditional fashion. Many are managed on behalf of investors through a combination of centre management teams and managing agents. They generally provide the primary focal point for managing the building asset and retaining relationships within the community and with retailers, with substantive support from consultants and contractors on a centre-by-centre basis. As a result of all this, a confusing range of relationships exist, ranging from retailers' service contracts to centre IT infrastructure, promotions, mechanical, electrical and fabric maintenance, cleaning, lifts and security, and a host of other arrangements. With the suggested solution, the mall can be managed by mall administrators in a more centralized

fashion rather than distributed functioning of different departments. It also allows the store owners at the mall to manage their stores using the system. It allows them to manage the shop's inventory, its employees and other critical functions. The proposed system is an online system and hence mall administrators and shop owners can work from remote locations. The system is available at any time of the day and does not require the administrators and shop owners to be present at the mall. It provides an integrated solution to managing the mall than the use of a number of individual solutions.

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