Will Mobile Application Technology Help Retail Merchandising ? Breakthrough Innovation by FMCG Companies

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Abstract

For the retail business to run successfully and to improve sales, the critical component is to display its products and services in a visually appealing manner. Retail merchandising assists the retailers to attract shoppers and influence their purchase. Often, the merchandising updates are not escalated up the hierarchy ladder as they are much dynamic and spontaneous in nature. Top manufacturing FMCG companies like HUL, ITC, etc. took up this challenge of modern trade merchandising by maintaining manpower in organized retail stores to tap the cutting edge of competitive advantage. The key challenges of these merchandisers include – maintaining overall shelf health, frequency and consistency of restocking, tracking the competition actions in the store, eliminating the conflicting signages, remove broken displays, and display compliances. These FMCG companies have adopted a breakthrough innovation of mobile applications to overcome these challenges. This study is novel and investigated the sales performance improvement through mobile application technology. The research was conducted in two parts. Part 1 included structural interviews (one-on-one) with retail store managers and FMCG sales representatives. The results disclosed eight major attributes as store trend, competition update, personnel management, stock availability, demand creation, in-store visibility, new products launch and promo packs, and share of shelf to improve sales performance. Part 2 examined the significance of these eight factors through quantitative study by considering FMCG merchandisers as respondents. The study identified that competition update, stock availability, personnel management, in-store visibility, and share of shelf were significant factors that impacted sales performance in retail merchandising by utilizing mobile technology applications.

Keywords : **retail merchandising, mobile technology application, merchandisers, FMCG companies**

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Merchandising is the set of activities, procedures, and policies, which aim in selling goods directly to the consumers. Merchandising is important to brick-and-mortar firms and also online retail stores (Tiwari, Dubey, Chopra, & Jain, 2015). Merchandising gained importance as it can shape the store image and consumer buying behavior (Ravi & Bhagat, 2017). Effective merchandising is always based on the end consumer's needs and desires (Aguirre, Mahr, Grewal, De Ruyter, & Wetzels, 2015).

Sensible presentation of the products in stores for sale is attained through merchandising (Tang & Lim, 2012). To lure the consumers and convert them into brand loyal consumers is the aim of effective merchandising

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(Choudhary & Sharma, 2009). The presentation of goods on the shelves, category arrangements, and displays will influence the purchase behavior of the consumers (Deloitte, 2012).

Retail merchandising is very simple at the surface, but companies confront numerous hurdles to establish their brands in a determined fashion at retail outlets (Fernie, Fernie, & Moore, 2015). It is significant that sellers should also focus on the type of brands they offer to consumers (Kumar, 2019). Every retail store is unique and dissimilar in nature ; thus, the merchandising has to be organized in a much customized fashion (Reynolds & Sundström, 2014). It is the responsibility of the retailers in pitching strategies to attract consumers (Bhagat & Ravi, 2018). People have become so much techno-savvy that they recognize all the information available on the web, which increases their knowledge about the products they need (Bhagat, 2016b). This is the ground level task to be performed with maximum manpower intervention. Wansink (2017) highlighted that retail merchandising directly influences consumer purchases in retail stores. Merchandising challenges are also critical and hinder the sale of products in retail stores (Ravi & Prasad, 2020b). Often, merchandising updates are not escalated up the hierarchy ladder as they are much dynamic and spontaneous in nature. FMCG companies identified this as a major flaw hindering the promotional executions, consumer feedback flow, and merchandising execution updates. The major reason backing the FMCG sales growth include lifestyle changes of middle class and rise in disposable income (Ravi & Prasad, 2020a). These companies have expectations about their product displays in the stores. Companies create guides and planograms category wise to achieve in-store merchandising plans to be executed in retail stores, respectively.

Few merchandising drawbacks can be in broken signages, wrong signboards, missing shelf takers, etc. These drawbacks impact the overall sales of every store. An arduous training and understanding is required by the merchandisers to handle merchandising situations at a store (Beck & Rygl, 2015). Merchandising can be managed only with great exertion on a day to day basis. The major challenges include – Overall shelf health, frequency and consistency of restocking, competitive or conflicting signages, broken displays, and display compliances.

(i) Overall Shelf Health : Empty shelves due to out of stock situations or low inventory levels will lead to unattractive presentation to the consumers (Herring, Wachinger, & Wigley, 2014). Over stacking may also lead to spillover of the shelves. So, the overall shelf health has to be maintained to have an attractive category and improvement in sales performance.

(ii) Frequency and Consistency of Restocking : How often the stocks need to be restocked from the backroom is a vital question. The tricky choice of restocking should be based on the sales per day. Arranging replenishment plans will be based on the products and stores. Store demand item by item has to be mooted for a good merchandising plan.

(iii) Competitive or Conflicting Signages : Competitor brand's action in the store cannot be controlled, but moderating one's own signages and displays to compete with the competition can be dealt through efficient merchandising plans (Kang, Mun, & Johnson, 2015). In-store placement battle can be handled by ensuring adequate signage and enough products to be displayed. Signages should not deter consumers to pick up the products for purchase.

(iv) Broken Displays : As fixtures will not last for long, they need to be replaced at regular intervals. Utmost care needs to be taken that the displays should not obstruct the aisle traffic. Trolley hits are a major cause for broken displays. The other reason may be over load of stock beyond the capacity of the display. LED strips and light board displays should be checked on regular intervals as bulbs burnout quickly (Zott & Amit, 2010). Broken displays may miss the opportunity of drawing new purchases. Ripped displays also cause stocking issues and create

negative brand image to the shoppers. Torn displays on logo, name, discounts, and offers will dissuade consumers from purchase (Yuan, 2014).

(v) Display Compliances : Displays sometimes are found with missing parts and missing signs. The products may be displayed at an incorrect bay or a different category. The offer displayed for few products may not be valid. These may confuse the consumers and hinder the brand perception (McGrath, 2010). Display compliances will also result in reduction of sale as the display or promotion is not effectively communicated to the consumer.

It is hard to envisage any aspect of modern business without the influence of technology in one kind or another, and merchandising is not immune to the same (Labrecque, vor dem Esche, Mathwick, Novak, & Hofacker, 2013). This trend will emerge more strongly by providing opportunities to local players to widen their product portfolios (Bhagat, 2016a). Indian FMCG companies are now embracing android technology (Fuentes-Blasco, Moliner-Velázquez, Servera-Francés, & Gil-Saura, 2017) rapidly to improve efficiencies of merchandising and enhance the sales performance by collecting updates on closing stock, personnel management, space allocation of in-store visibility elements, POP (point of purchase elements) maintenance, share of shelf adherence, category planogram, promo stock availability, competition updates, and new launches from their retail clients (Smith, 2012). This technology is serving the FMCGs in successfully executing merchandising plans and to avoid detrimental effects in the stores (Deloitte, 2016).

Research Gap

Many studies have been carried out to aid the retailers for influencing and pulling shoppers for product purchase by top FMCG companies (Basu, 2013). Several previous academic contributions also moved up to see the effect of retail merchandising initiatives on consumer behaviour and market response (Shankar, Inman, Mantrala, Kelley, & Rizley, 2011). The studies also identified the challenges of merchandising, but there is hardly any study on solutions to challenges of merchandising, especially using technology. There is a need for a better understanding of how Indian FMCG companies embrace android mobile technology given to the merchandisers or their retail clients who work in different retail outlets by collecting information like closing stock, in - store visibility details, new product launches, etc., which have brought a paradigm shift in successfully accomplishing merchandising plans and improving sales performance. The scope of most of the existing studies was limited to increase the visibility of the retail stores and attraction of their brands at the point of sale. However, there are no or very few studies on the improvement in sales performance using mobile application by merchandisers of different FMCG companies in the retail industry.

Methodology

The main objective of the study is to identify the improvement in sales performance using mobile technology applications by FMCG companies in the retail industry. The research was conducted during April – September 2019. This research was conducted in two parts. Part one was a qualitative study of structured interviews. Structured personal interviews were conducted with 18 hyper store managers across Bangalore south and nine sales representatives of diverse FMCG companies in Bangalore. The results of the qualitative study of one to one interviews for store managers and sales representatives highlighted eight major attributes like store trend (Factor 1), competition update (Factor 2), personnel management (Factor 3), stock availability (Factor 4), demand creation (Factor 5), in-store visibility (Factor 6), new product launch and promo pack (Factor 7), and share of shelf (Factor 8) as rewards of mobile technology which are adding value to the FMCG companies in the retail industry.

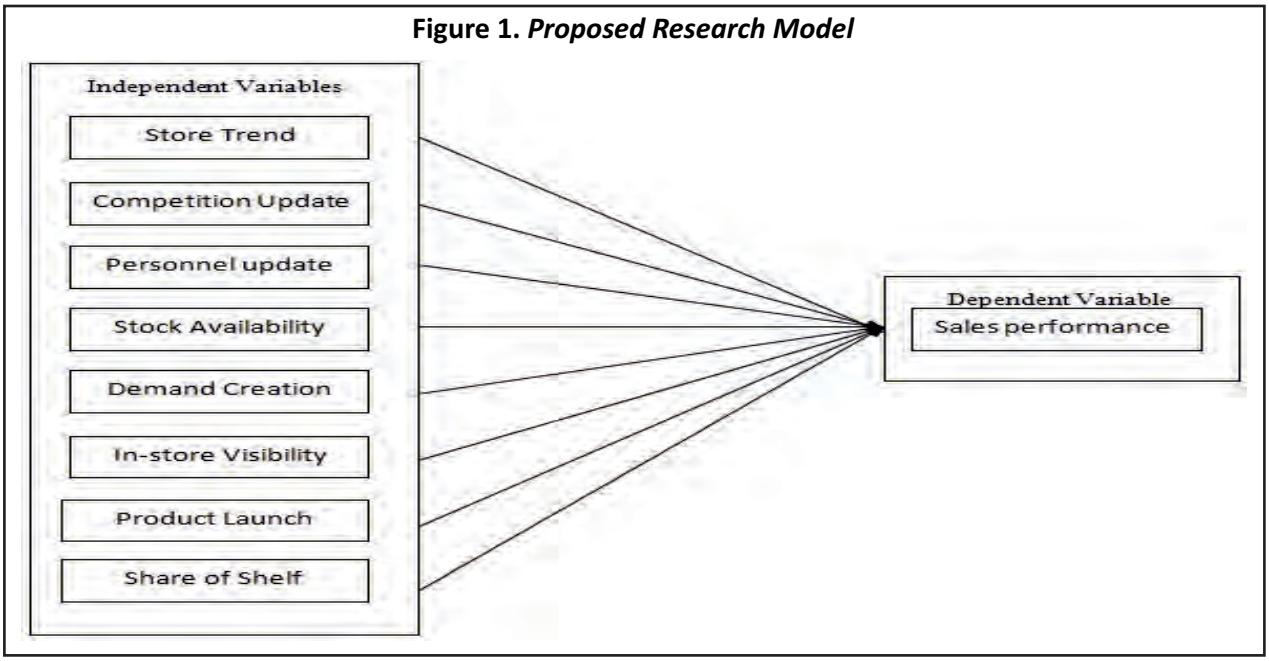
Part two investigated the effectiveness of this technology by analyzing the eight factors and their significance with sales performance. The respondents were the merchandisers of various FMCG companies who work in retail outlets using mobile technology applications. The questionnaire was prepared by considering the factors identified in Part one of the study. The data were collected from 166 merchandisers in Bangalore city by using the convenience sampling technique. The respondents were asked to provide the data on a 7 - point Likert scale, where 1 stands for *strong disagreement* and 7 stands for *strong agreement*. Ordinal regression was applied on the factors identified based on the qualitative study conducted.

Analysis and Results

To create a remarkable experience for the consumers, the role of merchandising in retail was focused upon and it became the priority of the FMCG companies to exhibit their brands as appealing to customers (Grewal, Levy, & Kumar, 2009). Smart MNCs in the FMCG industry like HUL, Colgate, Nestle, Dabur, GSK, and ITC introduced the mobile applications as a means to understand the dynamic market situations and improve the shopper experience and portray their brands to improve sales (Nielsen, 2013 ; Rigby, Miller, Chernoff, & Tager, 2012). All the FMCG market leaders who invested in mobile technology are enjoying the yields. The FMCG companies aligned with software cloud computing companies in development of android and IOS applications with server based technology to secure the confidentiality of the data (GroB, 2015; Ng, 2016).

FMCG companies have given their respective merchandising teams a smart phone device and 4G speed data connection. The task of every merchandiser is to update the data directly in the app, instead of filling the report books on a daily basis. The merchandiser uploads the merchandising data once after every store visit and immediately the detailed information is flown up the hierarchy. This has improved the system hygiene and transparency. The data collected in the mobile app by merchandisers include time of visit, store name, store latest picture to upload, category name, category picture, SKU wise stocking details, planogram picture, share of shelf updates, in-store visibility details, focus brand updates, new launches, monthly offer details, signage display requirements, competition special offers, and new launches.

Figure 1. ***Proposed Research Model***



Structured interviews were conducted with the store managers of hypermarkets and FMCG company sales representatives to identify and analyze the rewards of using mobile technologies. This study revealed eight major attributes like store trend (Factor 1), competition update (Factor 2), personnel management (Factor 3), stock availability (Factor 4), demand creation (Factor 5), in-store visibility (Factor 6), new product launch and promo pack (Factor 7), and share of shelf (Factor 8) through the mobile technologies which are adding value to the MNC companies in retail industry as shown in Figure 1. Information is periodically collected through the mobile technology applications by the merchandisers in the respective retail stores. This facilitates the companies with cutting - edge information regarding the retail industry along with the details of their own performance.

Information Collected by the Mobile Application

Sales in FMCGs are very dynamic. In no time, new similar products may emerge, competition share fluctuates, demand varies, and most of the time, even before identification of this, the share races to the bottom. The merchandiser updates about every SKU's (stock keeping unit) closing stock available on the shelf in his/her every visit. On an average, if a single store is visited by a merchandiser every three days, the information captured by the company from the above input will be represented on account of the below discussed eight factors, which are also represented in Table 1.

Table 1. ***Attributes in Mobile Technology***

S. No.	Attributes	Description
Factor 1	Store Trend	Consumer behavior of a particular store and the products opted, sales rate, demand trends can be identified.
Factor 2	Competition Update	Detailed competition information such as new launches, competitors' offers discounts, and visibility updates.
Factor 3	Personnel Management	To verify merchandisers' and promoters' administrative functions and analyze their capabilities at work.
Factor 4	Stock Availability	Detailed quantified reports of products across the product line and depth can be gathered.
Factor 5	Demand Creation	By using marketing techniques like visibility elements, category branding etc. can increase the demand of the products.
Factor 6	In-Store Visibility	To track the implementation of visibilities as per the TOT (terms of trade agreement) assigned to a store.
Factor 7	New Product Launch and Promo Packs	To track the new product acceptance in the consumer base, feedback collection, and implementation of introductory offers and ensure smooth sale.
Factor 8	Share of Shelf	To track the execution of agreed share of shelf per store according to the terms of trade between company and retailer.

↳ Factor 1 - Store Trend

Based on particular geography, target groups, and social aspects, the sale of different SKUs can be identified at the outlet level. This is more helpful in formulating and customizing the strategies and promotional activities (Sachdeva & Goel, 2015). If a new SKU is introduced in a particular month, the customer acceptance and also the trend can be identified in no time using technology of the android apps. This is also used in comparison of SKU level growth from time to time and also to ascertain the growth outlet wise and geography wise. This information

accumulation improves sales performance, reduces cost of selling, and ensures survival of the FMCGs in perfect market competition (McGrath, 2010).

Factor 2 - Competition Update

Understanding and evaluating the competition strategy is fundamental in FMCGs as the competition is intense and also the products are very similar. Competition offers, discounts, new launches, bundle packs, share of shelf, in-store visibilities, and point of sale system are recorded in the application-store wise by the merchandisers. This is key for the leadership teams of FMCGs to interpret competition and execute their plan of action (Benson-Armer, Noble, & Thiel, 2015).

Factor 3 - Personnel Management

Personnel management translates the merchandising plan into merchandising performance. Actually, merchandising management is the serving muscle (Tripathi, Gautam, & Lal, 2017). Merchandiser control helps a company to ensure that the off-take goals are properly aligned with the other goals of the firm. The merchandising team management is as important as any other sales force management team (Bustillo, 2010). The aspects that can be controlled by using the android application to improve the effectiveness of manpower is to check on :

(i) Merchandiser's timely market visits,

(ii) Merchandiser's travel itinerary,

(iii) Merchandiser's time spent per store,

(iv) Merchandiser's effectiveness in maintenance of in-store.

Factor 4 - Stock Availability

It is defined as the absolute quantity of SKUs that a retail outlet still holds in the reporting period at a retail outlet.

(i) Lesser Investment in Materials : With the boon of merchandising stock tracking systems through mobile technology, the closing stock quantities will be updated in regular intervals. It greatly facilitates the retail outlets purchase order rising at the right time outlet wise (Moorthy, Behera, & Verma, 2015). This will be cost effective for the retail stores and also avoids the 'no stock' situations at any point of time for any single SKU. FMCG companies will completely have a hold on the stock situations and fluctuations department wise and store wise. This information is used in formulating purchase policies and standardizing minimum base quantities (MBQ) per store (Spielmaker, 2012).

(ii) Detection of Theft and Leakages Expiry : With the help of mobile technology, FMCG companies are effectively planning inventory control, wastage, leakages, and thefts of the products. In an illustration shared by a store manager, an FMCG company moved the near expiry stock of almost six cartons to a fast moving store (high sales store) and replaced them with latest stock. This activity prevented the company from loss of expiry. Thus, the situations of theft, leakages, wastages, and other discrepancies were handled without delay. This also helps in maintenance of quality relationship with the retailers, which, in turn, acts as a more sustainable competitive advantage (Harrison, 2013).

Factor 5 - Demand Creation

Demand creation is the strategy to create excitement in the minds of the consumers by generating a sense of urgency or opportunity. Fuentes - Blasco et al. (2017) proposed a framework which highlighted that fashion and innovation are essentially focused in demand creation. An interview discussion with the store manager revealed that floor displays of the products and placement of products in vantage locations create an enthusiasm in the consumer to purchase. FMCGs can keep a track on floor displays promotional events in the store through the mobile technology application.

Factor 6 - In-Store Visibility

The retail outlets sell their space in the store as 'assets' to the companies for their products to be displayed through various 'point of purchase' elements. A retail store manager revealed that these point of sale (POS) elements include – end caps, gondolas, parasites, floor stacking units, wobblers, danglers, category dressings, pillar stackers, pillar branding, chiller branding, cash-tills etc. Companies strategically choose assets (point of purchase elements) in various stores based on brand image, footfalls, promo slots to outperform the competition products in a store (Bell, Corsten, & Knox, 2011 ; Hui, Inman, Huang, & Suher, 2013). In an interview, a sales manager highlighted that the snacks and gum brands always trade for the checkout counter visibilities at the hypermarkets to promote impulse purchase by the consumers as described by a store manager.

Leading FMCG companies introduced this system of mobile application technology to ensure their brands were unfailingly activated in the store as intended. Merchandisers upload the photographs of the visibility displays agreed as per the retailers and the company in the terms of trade agreement (TOT). The terms of trade agreements will specify the count of point of purchase elements to be present per outlet. Let it be floor stocking unit, category dressing elements, header cards, category arches, shelf stickers, fins, wobblers, posters, pillar branding, and parasites, etc. These visibility elements maintained in the store at vantage locations can be reconfirmed and examined through the pictures uploaded by the merchandisers through their mobile phones in their visit to the retail chains in regular intervals. This activity helps the companies in appropriate investment and maintenance of assets in the hypermarkets (Inman & Nikolova, 2017).

Factor 7 - New Product Launches and Promo Packs

In a one on one interview, a FMCG sales representative expressed that new products launches generally encounter issues like article code linkage for billing and placement in the appropriate category at the exact bay in the right store. This application ensures that the new product reaches the target consumer in the right time. Companies have focus packs and focus SKUs for a particular month's sale for which they expend huge amounts on TVCs and other promotional activities (Goworek & McGoldrick, 2015 ; Pole, 2015 ; Tiago & Veríssimo, 2014). The penetration of the SKUs and the acceptance levels of customers is best cognized through the latest sale data of promotional (offer) SKUs. This also strengthens the information regarding the supply of promotional SKUs in the distribution channel, the ease of movement , supply chain issues, and also the veracity of offers passes to the actual consumers. This establishes the hygiene in the market and also controls market infiltration.

Factor 8 - Share of Shelf (SOS)

In traditional trade, the leadership teams of the FMCG companies used to only focus on marketing teams to grow a brand. There occurred a shift when leadership teams put their vim into sales and commercial capabilities. Rigorous competition in the retail industry is creating high importance for store image (Sorescu, Frambach, Singh, Rangaswamy, & Bridges, 2011). Rise in shopper's number in organized retail, change in buying behavior of the

consumers from loyalty to brand attractions in the aisle, increase in impulse purchases, and reconsidering choices from purchase to purchase by the end consumers created the need in share of shelf calculations (Malik, 2012).

For the FMCG industry in organized retail stores, new products and brands are budding to shrink the shelf space in the retail stores. Private label brands are also equally occupying the category space with immense store support activities (Kowitt, 2010). With increased complex decisions of the products and brands to be placed, FMCG sales teams were often ill-equipped to get the right trade agreements on time which transmitted in cluttered shelves, inadequate promotions, and reduction in sales productivity. Appropriate in-store experience for the shoppers is the primary activity of the sales team in retail stores for brand growth (Nielsen, 2013 ; Rigby et al., 2012).

Share of shelf is a calculation to identify various brands and products present in the retail store and distinguish the number of facings for each SKU by identifying the planogram and activating the promotions to attract the consumers for purchase.

Retail outlets are contracted once in a quarter or half yearly or annually by FMCG companies to maintain particular SOS for their brands to come out in the shelf over competition. The SOS is calculated in two styles, one based on facings count and other on inches count. The SOS formula is total brand number of facings of the brand in the category divided by total facings or inches.

$$\text{SOS\%} = \frac{\text{Brand facings}}{\text{Total category facings}} \text{ (or) } \frac{\text{Brand occupied inches}}{\text{Total category occupied inches}}$$

FMCG payments to retail outlets are based on predefined percentages. The percentage should be cross verified before the payment. Previously, companies used to outsource third party agencies in calculation on SOS percentages in regular intervals. With recent development of android applications, the SOS can be identified on every visit of the merchandiser and payments happen based on these recorded data.

Sales Performance

The sales in a retail outlet are calculated by an FMCG based on the goods shipment from the stock point to the retail outlet. This data gives the information only about the primary sale but not the secondary sale (off take data). For an FMCG company, this data collection is the toughest task. The market share is a tool which gives a very broad perspective. Most of the time, companies pay 1 – 1.5% back to the larger retailer chains to get concrete sales data. However, this is again monthly data which cannot distinguish the weekly trends. So, this application gives solid data to analyze and assists the companies in strategic decision making, which improves the sales performance per store. The difference in sales performance per store before mobile application usage and after can be considered as the absolute parameter to judge the efficiency of the mobile application introduced by the FMCG companies. Hence, sales performance is considered as a dependent variable (Chou, Chaung, & Shao, 2016 ; Kaplan, 2012).

Data Analysis

Table 1 depicts how sales performance can be analyzed by implementation of mobile technology implications. The data were collected from the FMCG company merchandisers in organized retail sectors (Table 2). Table 2 furnishes the R, R^2, adjusted R^2, and the standard error of the estimate to identify a regression model accommodating the data. The accommodation of the data in the regression model is determined by R^2 and adjusted R^2 as shown in Table 2.

The value of R is represented by *"R"* column, which is the multiple correlation coefficient. Measure of quality of prediction of the dependent variable, that is, sales performance is considered as R. A value of 0.726 indicates a

Table 2. ***Model Summary***

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics			
					R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change
1	.726[a]	.527	.503	.641	.527	22.030	8	158	.000

Note. [a.] Predictors: (Constant), share of shelf, product launch, demand creation, store level, in-store visibility, competition update, personnel management, stock availability.

good level of prediction. The R^2 value is represented in "*R* square" column, which is also called the coefficient of determination. This is the variance of proportion in the dependent table which can be explained by independent variables (technically, it is the proportion of variation accounted for by the regression model above and beyond the mean model). We can see from our value of 0.527 (as shown in Table 2) that our independent variables explain 52.7% of the variability of our dependent variable, sales performance.

The *F*-ratio tests show whether the overall regression model is a good fit for the data. The output shows that the independent variables statistically significantly predict the dependent variable, $F(8, 158) = 22.030$, $p < .0005$ (i.e., the regression model is a good fit of the data).From the analysis of variance table (Table 3), we observe that the *p*-value is (0.000). This implies that the model estimated by the regression procedure is significant at an α -level of 0.05. Thus, at least one of the regression coefficients is different from zero.

Table 3. ***ANOVA***

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	72.311	8	9.039	22.030	.000[b]
	Residual	64.827	158	.410		
	Total	137.138	166			

Note. [a.] Dependent Variable: Sales performance.

[b.] Predictors: (Constant), share of shelf, product launch, demand creation, store level, in-store visibility, competition update, personnel management, stock availability.

Table 4. ***Coefficients***

Model	Unstandardized Coefficients	Standardized Coefficients		*t*	Sig.	95.0% Confidence Interval for *B*	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	.052	.368		.142	.888	–.674	.778
Competition Update	.129	.054	.146	2.372	.019	.022	.237
Store Trend	.004	.059	.005	.076	.940	–.112	.120
New Product Launch	.039	.072	.034	.538	.591	–.104	.182
Stock Availability	.241	.098	.175	2.449	.015	.047	.435
Personnel Management	.112	.054	.125	2.087	.039	–.219	–.006
In Store Visibility	.361	.060	.383	6.030	.000	.243	.479
Share of shelf	.345	.084	.294	4.118	.000	.179	.510
Demand Creation	.000	.055	.000	.005	.996	–.109	.109

Note. [a.] Dependent Variable: Sales performance.

Estimated model coefficients :

$$\hat{y} = b_0 + b_1 x_1 + b_2 x_2 + \ldots + b_{k-1} x_{k-1} + b_k x_k$$

In the above equation, $\hat{y}$ is the predicted value of the dependent variable. Values of the k independent variables are denoted by $x_1, x_2, x_3, \ldots, x_k$. And finally, we have the b's - $b_0, b_1, b_2, \ldots, b_k$. The b's are constants, called regression coefficients. Values are assigned to the b's based on the principle of least squares.

The general form of the equation to predict sales performance from store trend, competition update, personnel management, stock availability, demand creation, in-store visibility, new product launch & promo packs, share of shelf is :

Predicted Sales Performance = .052 + (0.129 × Completion Update) + (0.004 × Store Level) – (0.039 × Product Launch) + (.241 × Stock Availability) + (0.112 × Personnel Management) + (0.361 × In-Store Visibility) + (0.345 × Product Launch) + (0.000 × Demand Creation).

This is obtained from the coefficients table (Table 4). The dependent variable varies with an independent variable when all other independent variables are held constant indicated by un-standardized coefficients shown in Table 4. The un-standardized coefficient, $B1$, for competition update is equal to 0.129 shown in Table 4. This means if there is a change in competition update, there will also be a change in sales performance for each year.

Statistical Significance of the Independent Variables

We can also test for the statistical significance of each of the independent variables. This tests whether the un-standardized (or standardized) coefficients are equal to 0 (zero) in the population. If $p < .050$, we can conclude that the coefficients are statistically significantly different to 0 (zero). The t-value and corresponding p-value are located in the *"t"* and " Sig." columns, respectively as mentioned in Table 4. In Table 4, an ordinal regression analysis is run to predict sales performance from competition update, store trend, new product launch & promo packs, stock availability, personnel management, in store visibility, share of shelf, and demand creation. The new product launch and promo packs, store trend, and demand creation variables are not statistically significant as their p-values are >.050.We can see from the "Sig." column (Table 4) that independent variables such as competition update, stock availability, personnel management, in - store visibility, and share of shelf coefficients are statistically significantly different from 0 (zero) and their p-values .019, .015, .039, .000, and .000 are < .050 (less than). Although the intercept, $B0$, is tested for statistical significance, this is rarely an important or interesting finding.

Conclusion

In the fast-growing retail industry, a significant rate is contributed by FMCG sales. This study examines the mobile application technology innovation improving retail sales in the FMCG segment. From this study, it is concluded that the mobile application is helping to improve the retail merchandising and thereby increasing the sales. This finding is also supported by a report which stated that FMCG sales at organized retail stores grew 22% in 2018 (Tandon, 2019). This study confirms that the eight major factors collected from retail stores in regular intervals helped in improvement of FMCG sales. This research also identifies that updates on in-store visibility elements and share of shelf are vital factors influencing the increase in FMCG sales. Further vital factors obtained from the research are recognized as stock availability, competition update, and personnel management. This means that

collecting information regarding the above five factors at regular intervals and confirming the execution at retail stores by FMCG merchandisers improved the sales performance of the respective stores.

Managerial Implications

FMCG is the fourth largest contributor of GDP in the Indian economy. Modern trade in India is expected to grow at a CARG of 20% – 25% per annum to boost the FMCG revenues (India Brand Equity Foundation (IBEF), 2020). This is attracting numerous investments and intensifying the competition in the retail front of FMCGs. Thus, it has become a challenge for the FMCG companies to portray their brands in the market as per their expectations and get grabbed to consumer baskets. The mobile android technology innovation in the form of merchandising apps has become a breakthrough to win in real time markets. This research illustrates various advantages of using mobile applications in a detailed fashion as a merchandising tool to improve the sales performance of the FMCG companies.

This research is essential for the FMCG giants in reorganizing their merchandising teams and get the best out of merchandisers in improving sales ; relatively small FMCGs can analyze the significance and invest in mobile applications for improvement in sales. This study will encourage the FMCG companies to strategize their actions to attain cutting edge in the intense competitive markets. We strongly believe that this study will throw light on shaping critical factors like in-store visibility elements and share of shelf which are dynamic and vary store wise. The only solution to control these merchandising challenges is identified as merchandising apps. By embracing technology to enhance their in-store performance, the FMCG companies can win in the game of market share. This study also supports the hypermarkets and supermarkets to perform in-store merchandising through apps to improve sales in their stores. Lastly, this paper is also useful for the companies other than FMCGs to enhance their in-store merchandising performance by investing in technology.

Limitations of the Study and Scope for Future Research

This study cannot be generalized to the entire retail industry in India because it is specific to the organized sector. This study was conducted only in Bangalore city considering the convenience sampling for merchandisers, store managers, and FMCG sales representatives. This data is limited to FMCG companies and may vary for other industries like electronics, apparels, footwear, etc.

This study is conducted majorly through qualitative approach and the factors identified are through the structured interviews. These factors can be future tested by using a quantitative approach. Similar studies can be conducted in non - FMCG segments. As this study is only conducted on organized retail stores, other unorganized stores can also be explored. Further studies can be conducted in other locations apart from Bangalore. The efficiency of execution of this technology and also the improvement in end results can be the next logical extension to this study.

Authors' Contribution

Shilpa Sarvani Ravi conceived and presented the idea. Shilpa Sarvani Ravi and Dr. Shikha Bhagat developed the theory and performed logical computations. Ms. Shilpa and Dr. Shikha formulated the objectives of the study, identified the sample size, and together developed the questionnaire. Ms. Shilpa worked on introduction and literature review, while Dr. Shikha conducted the data analysis and results. Both the authors together contributed to the conclusions, limitations, scope for future research, and implications.

Conflict of Interest

Both the authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest, or non-financial interest in the subject matter, or materials discussed in this manuscript.

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