

Omni Channel Inventory Planning in Retail

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Abstract- Omni-channel retailing entails ensuring that businesses provide a consistent customer experience across all channels by employing more intuitive commitment channels that allow a customer to design his own living space. A 360-degree view of incoming and on-shelf activity is made possible by an Omni-channel strategy, which can also aid in enhancing advertising effectiveness. The Omni-channel perspective enhances system complexity by expanding client options, stock-keeping units, and product selection. However, it also assists with catering to the needs and expectations of particular customers. This research demonstrates that customer loyalty to their preferred Omni-channel e-retailers may be mostly based on their trust in the brand. In addition, consumers value personalisation, and an increasing number of visitors to web-based entertainment sites offer different reasons, while the majority of customers use mobile coupons to make purchases at home, on the move, or online (Mercier et al., 2014). Omnichannel e-retailers can provide customised experiences for customers if they collect data about them; yet, such data is difficult to collect due to consumers' reluctance to disclose personal information. Direct delivery to the purchaser is likely the most crucial factor in achieving a pleasant beginning-to-end client experience. The traditional mindset of purchasing an item in a store and bringing it home is still prevalent, but it is losing way to more modern fulfilment strategies. This study examines the application of Omni-channel to four internet business processes with the purpose of enhancing the customer experience via personalization, instalment, designated development, and enhanced customer service.

Keywords - Uncertain Demand, Omnichannel, Inventory Strategy, Inventory Planning and Shipping.

I. INTRODUCTION

The growth of new web-based business channels has increased competition and price pressures, but the greatest barrier is the expansion of retailing as a faster and more convenient method of shopping. Changes in socioeconomics, lifestyles, technology, clients' information, monetary behaviours, and the proliferation of mobile phones need that e-rears employ more effective business strategies than in the past.

For brands, the ability to provide an Omni-channel retailing customer experience has become a key point of differentiation. Effective Omni-channel procedures can unambiguously and successfully integrate offline, online, and mobile sales channels to provide a uniform purchasing experience. In addition to revenue growth and investment returns, variables such as enhanced customer loyalty and brand perception are deemed crucial for attracting new prospects and retaining a large customer base.

Investing in innovation and organizing the legal cycle are essential for offering a comprehensive Omnichannel client experience (Bayram et al., 2021). For Omni-channel arrangements, significant technological investments are required to provide item and stock visibility, adapt the customer experience, and equip retail locations and neighbourhood fulfilment centres with pick and convey or pack and ship capacities. However, in order to reap the full

benefits of Omnichannel exercises, retailers must assess their capacities and the obstacles of integrating CRM, POS, order management (OMS), and online business platforms across all channels. Omni-channel retailing is one of the most important components of India's thriving and dynamic online commercial industry, which has risen substantially. According to all accounts, the number for customer loyalty and attitude toward Omni-channel retailing appears to be optimistic, but those that place a premium on innovation and client conduct could anticipate to focus on considerable innovation and client experience.

This would result in the organisation of generally profitable frameworks. Therefore, multichannel e-retailers should have a comprehensive understanding of their clients' shopping and purchasing preferences. Numerous studies have been conducted on Omni-direct retailing in nations such as the United States, the United Kingdom, Europe, Korea, Malaysia, and Singapore.

However, there is a significant gap between omni-channel purchasing innovation and customer satisfaction and behaviour. This hole should be filled by considering them from the client's perspective in order to evolve the situation in the future. Consequently, the purpose of this study is to examine the purchase choice behaviour and level of satisfaction with the quality of Omni-channel e-services provided by Omni-channel e-retailers for products acquired through Omni-channel retailing.

II. LITERATURE REVIEW

Different channel retailers can segment consumers based on channels (Saha et al., 2021; De Keyser et al., 2015). For instance, retailers with both online and offline locations can divide their customers into online and offline customers. In addition, client interest can be distinguished into online interest and disconnected request. Gao and Su (2017) investigated the effect of online and offline self-administration seeking advancements (communication between online and offline channels) on client interest and corporation revenues. Gallino and Moreno (2014) conducted an experimental study of the influence of BOPS on the online and unconnected channel sales of shops and discovered that the implementation of BOPS will result in a decline in internet-based sales and an increase in in-store sales and foot traffic.

Further research by Hübner et al. (2016) found that the BOPS model's ability to decrease online sales, increase offline sales, and increase the frequency of customer visits is due to the following variables: extra store sales brought about by the purchase of other items in the store while buyers utilising BOPS go to the store to get the products, and the movement of some BOPS purchasers from online to offline actual stores and from non-clients to BOPS customers. Gallino et al. (2017) analysed data from US retailers using the "buy online, transport to store" (BOSS) approach and discovered that BOSS will widen the price disparity between distinct commodities at physical locations.

Chime et al. (2018) investigated the effect of display spaces on web-based shippers. According to their observational findings, not only did the display area increase online and overall sales, but it also improved operational effectiveness. According to study by Jing (2018), the expansion of online channels by conventional dealers will increase their interest. By using the omnichannel strategy, retailers can support either total interest or single-channel interest (on the web or disconnected).

Concurrently, there are the idiosyncrasies of buyer channel shift, which might result in competition between channels, hence influencing merchants' stock decisions. Over the course of examining the pertinent writing, the following gaps are revealed: No research has been conducted on an important aspect of Omni-channel retailing that may be a precursor to purchase choice behaviour, consumer loyalty, and the perception of fulfilling service. There was no review material for the Indian retail environment that addressed web-based phases and payment plans.

III. OBJECTIVES OF THE STUDY

The following are the aims of the current study on Omni channel inventory management:

1. Examine the effects of demographic and individual characteristics on Omnichannel commerce.
2. Determine the elements that influence the buying choice of Omni-channel retailing in Bangalore
3. Analyse the amount of consumer satisfaction and its impact on Bangalore's Omni-channel retailing.

IV. SOURCE OF DATA

The review is descriptive and analytical, and both primary and secondary sources were employed. To achieve the objectives of the study, Omni-channel customers and IT professionals in Bangalore are surveyed using a well-structured questionnaire to collect pertinent data. All responders have diligently completed the survey, which is notable. The optional review material is compiled from notable diaries, websites, and journals. The directory of notable optional information sources can be located in the bibliography.

V. SAMPLING TECHNIQUE

To increase the number of respondents, "Convenient sampling" is conducted through personal contacts with IT companies in Bangalore. In the primary round, the expert selected eight IT companies in Bangalore based on their presentation using a transparent evaluation process. The research population includes programmers employed by IT companies. Similar to WIPRO, TCS, and HCL in Bangalore, with a sample size of 150 (Xu et al., 2019).

VI. HYPOTHESIS

The hypothesis of the current study is mentioned below:

H₀₁: There is no significant relationship between demographic variables influencing the experience on Omni-Channel Inventory Management.

H₀₂: There is no significant impact of purchase behaviour and the Satisfaction level of Omni-channel retailing

VII. CONCEPTUAL FRAMEWORK

The Figure 1 depicts the conceptual framework for Omni-Channel Retailing based on the purchase decision and consumer satisfaction.

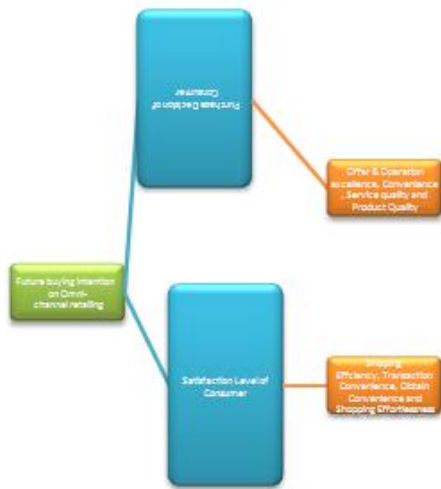


Fig.1. Conceptual Framework of Omni Channel Inventory Management.

VIII. STATISTICAL TOOL USED FOR THE STUDY

The tool MS-EXCEL was used for the quantitative portion of the continuing assessment. Achieve works with information section and the management of lines and segments in preparation for factual investigation. MS Excel is one of the most often employed data analysis tools. The majority of data specialists favour Excel's for quantitative data analysis due to its affordability and convenience. Eventually, applying Excel for measured evaluation involves mental clarity, information science skills, and excellent reasoning abilities.

IX. EXPERIMENTAL ANALYSIS

This section focuses on the analysis and interpretation of segment and individual attributes, client purchasing decisions, and Consumer Satisfaction Level in relation to the influence of Omni-channel retailing. The data was acquired from 150 respondents in Bangalore IT companies. In accordance with the review's points, responses were gathered from respondents using a structured survey that was collected and analysed using the following measurable instruments:

1. ANOVA Analysis
2. Multiple Regression Analysis

9.1 Influence of Demographic and Personal Factors On Omni-Channel Retailing

Fundamentally, Demographic profiling is the activity of formulating hypotheses about groups. This section attempts to discuss the primary segment factors, including Gender, Age, Educational Qualification, Income, Purchase Frequency, Product Category, and Influencing Factor. The

consequence of examining the data pertaining to the Demographic profile of the sample respondents follows. The demographic analysis of the variable Gender is presented in table 1.

Table 1 Demographic Analysis On Gender.

Gender	Count
Male	83
Female	67
Others	0
Grand Total	150

According to Table 1, of the 150 respondents, 83 are male and 67 are female. As a result, male respondents predominate in this study. Regarding the development, expansion, and evaluation of the delivery system, it is advantageous to categorise Omni-channel retail customers by age group. Thus, the sample responder data on age are collected and presented in Table 2.

Table 1 Demographic Analysis On Age

Age Group	Count
20-25 years	30
26-30 years	60
30-40 years	37
Above 40 years	23
Grand Total	150

From the Table 2, it reveals that 30 respondents fall within the age range of 20 to 25 years, 60 respondents fall within the age range of 26 to 30 years, and 37 and 23 respondents fall within the age ranges of 30 to 40 years and beyond 40 years old, respectively. Thus, the bulk of 60 responders are between the ages of 26 and 30. Education is a significant factor in the respondents' purchasing decisions. The demographic analysis of the variable educational level is shown in Table 3.

Table 2 Demographic Analysis on Educational Level

Educational Level	Count
Graduate	39
Post-Graduate	66
Ph.D	45
Grand Total	150

It is obvious from Table 3 that there are 39 graduates, 66 postgraduates, and 45 Ph.D.'s among the respondents, with the proportion of postgraduates being greater in the IT industry. The demographic analysis on the variable income is analysed and represented in Table 4.

Table 3 Demographic Analysis on Income.

Income Groups	Count
Rs.10,000 – Rs.20,000	56
Rs. 21,000 – Rs. 30,000	63
Rs. 30,000 – Rs. 40,000	23
Above Rs. 41,000	8
Grand Total	150

From the table 4, it is highlighted that the respondents those who earn between Rs.10,000 to 20,000 are 56, Rs. 21000 to Rs.30000 are 63, Rs. 30,000 – Rs. 40,000 are 23 and above Rs. 41,000 are 8. From the analysis it is clear that the respondents of Rs.21,000 to Rs.30,000 are higher. The demographic analysis on the Purchasing frequency variable is analysed and represented in table 5.

Table 4 Demographic Analysis On Purchasing Frequency

Purchasing Frequency	Count
Weekly	44
Occasionally	69
Monthly	25
Rarely	12
Grand Total	150

From the table 5, it is clear that the respondents those who buy apparel from omni-channel retailing are analysed. It is evident that respondents those who buy the products weekly are 44, occasionally are 69, monthly are 25 and rarely are 12. Hence, it is clear that the respondents purchase on Omni channel management frequency is occasionally. The demographic analysis on the product category variable is analysed and represented in table 6.

Table 6 Demographic Analysis On Product Category

Product Category	Count
Apparel, footwear and sports equipment	1
Housewares and home furnishing	3
Personal accessories & eyewear /Beauty and Personal care	53
Grocery	93
Grand Total	150

From the table 6, it is evident that the product purchase category are analysed where Apparel, footwear and sports equipment is only 1 respondent, Housewares and home furnishing is 3 respondent, Personal accessories & eyewear /Beauty and Personal care are 53 respondent and Grocery is 93. Hence, after COVID-19, the grocery purchase through online mode is increased. The demographic analysis on the sources of influencing factors variable is analysed and represented in table 7.

Table 5 Demographic Analysis On Source Influencing Factor

Sources of Awareness	Count
TV/Internet	1
Newsletter/E-mailers/Books/Whitepapers	3
Social groups/ Seminars etc.	53
Friends and relatives	93
Grand Total	150

Grand Total	150
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From the table 7, it is evident that the sources which influence the respondents on the Omni channel inventory management are analysed where the information through Internet/ TV influenced only one person, Newsletter/E-mailers/Books/Whitepapers influenced 3 persons, Social groups/ Seminars etc. influenced 53 persons and Friends and relatives influenced 93 persons. Hence, it is clear that the “word of mouth” marketing through known persons have higher impact.

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9.2 Influencing Factors Of Consumer Purchase Decision

This factor is analysed using the analysis ANOVA- Single factor where there are four variables. Each variables are dependent over the income of the respondents.

Table 6: ANOVA, Single Factor

SUMMARY				
Groups	Count	Sum	Avg.	Var.
Omni-channel e-commerce allows you to find the product of your choice in the colour of your choosing.	150	684	4.56	0.39570
The quality of products purchased through Omni-channel e-commerce is always superior.	150	690	4.6	0.45637
In general, the things purchased via Omni-channel e-commerce are pleasant.	150	601	4.007	1.01337

Omni-channel e-commerce provides a greater variety of products and reward points.	150	632	4.213	1.04143
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ANOVA						
Source of Variation	SS	df	MS	F	P-val	F crit
Between Groups	36.45833	3	12.15278	16.72272	1.92E-10	2.619854
Within Groups	433.1267	596	0.726723			
Total	469.585	599				

It is evident from table 8 is that $n = 150$, The p-value in the ANOVA table is 1.92E-10. We reject the null hypothesis since this result is less than our 0.05 significance level. Our sample data give sufficient information to establish that the means of the four variables do not equalise. Therefore, there is a considerable association between respondents' income and their purchasing decisions.

9.3 Influencing The Factors Of Level Of Satisfaction

This factor is analysed using Multiple regression where the four dependent variables are intercepted with each other and resulted below.

Table 7 Multiple Regression

Regression Statistics	
Multiple R	0.10564
R Square	0.01116
Adjusted R Square	-0.01612
Standard Error	0.892611
Observations	150

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	1.30383	0.32596	0.409109	0.80187
Residual	145	115.5295	0.79675		
Total	149	116.8333			

	Coef f	Std Error	t Stat	P-val	Lower 95 %	Upper 95 %
Intercept	1.707	0.573	2.976	0.034	0.5732	2.8403
It's available 24*7, I can shop whenever I like.	0.072	0.087	0.826	0.4102	-0.0998	0.2431
Order tracking information is accessible till delivery.	0.003	0.089	0.031	0.9757	-0.1735	0.1790
Effectively, on-time product delivery is implemented.	-0.024	0.070	-0.349	0.7277	-0.1629	0.1140
Simple and convenient payment modes are available.	0.036	0.106	0.342	0.7327	-0.1739	0.2468

From the table 9, it is evident that the regression analysis is executed. Multiple R: 0.10564. This represents the unique relationship between the reaction variable and its two indicators.

1. R Square: 0.01116. This is referred to as the confidence coefficient. It tackles the minimal portion of the change in the response variable that can be explained by the logical reasons.
2. Adjusted R Square: 0.01612. This is the R-Square modified for the number of indicator variables. This value will also be less than R Square and penalises models with an excessive number of indicator factors.
3. Standard error: 0.892611. This relates to the average deviation of observed data from the regression line.
4. 150 perceptions Total number of tests utilised to develop the relapse model.
5. F: 0.409109. This is the standard F measurement for the relapse model, which is calculated as relapse MS/remaining MS.
6. Significance F: 0.801867. This is the p-value for the F measurement as a whole. It indicates whether the entire model of relapse is measurably critical.
7. In this instance, the p-value is greater than 0.05, indicating that the logical components of customer satisfaction and buyer behaviour have a statistically significant link.

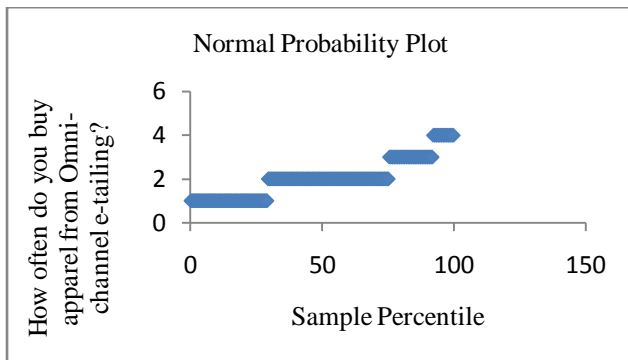


Fig.2. Normal Probability Plot.

Hence there is a significant relationship exists between the factors of level of satisfaction of consumers in purchasing products through omni-channel inventory management.

X.FINDINGS

The findings of this study indicate that the seeming satisfactory support quality and fulfilment on Omni-channel elements may have a major impact on consumers' attitudes regarding Omni-channel shopping. Through the findings of this study, Omni-channel e-posters will be better able to comprehend the assumptions regarding online buyers and the aspects that influence their purchasing decisions. Understanding the primary causes that could make sense of the defection of clients of Omni-channel retailing. Omni-channel e-retailers would have the ability to create and implement their Omni-channel strategies effectively and efficiently, giving them an advantage.

Omnichannel e-retailers should place a greater emphasis on implementing outstanding product quality, lower pricing with rebate, prime or free shipping, gifts/coupons, cash back for online purchases, and giving their all to develop, maintain, and enhance their reputation. Omnichannel e-retailers are able to develop their own field-tested strategies to meet customer demand. Using cutting-edge data technology to enhance the capabilities of Omni-channel retail websites, mobile applications, payment components, e-transportation services, and correspondence quality increases customer satisfaction.

The results of the study reveal that the majority of respondents learned about Omnichannel commerce via the Internet, friends, and family, as well as urban test respondents. The notice is the primary source of information from which they learn about web products. This applies to the procurement of products through all channels. Planning web-based advertising takes the utmost consideration and significance. Omnichannel e-retailers must ensure that their advertisements contain accurate product information and attract consumers to their products (Kembro et al., 2018). As time is the most

valuable commodity for all customer classes, the Omni-channel coordinated purchasing strategy should be designed to be so simple that customers would transition from web-based retailing and Omni-channel retailing to Omni-channel retailing. Constantly parched, customers strive to engage in modern purchasing.

Omnichannel e-retailers must attract a growing clientele that is technologically savvy, prioritises convenience, and is willing to pay a premium price for the products they seek. Thus, Omni-channel e-retailers should enhance the comfort and value of their customers and aid them in overcoming their security concerns. Omnichannel commerce has a fundamental impact on the expanding capacity of e-business. Thus, more emphasis should be placed on analyses of Omnichannel purchase behaviour. Customers find the concept of the omni-channel retailing management. Omni-channel e-retailers are expected to build their clients' familiarity with Omni-channel buying and channel combination through an assortment of channels. To get an upper hand on the lookout, Omni-channel retailers should know about the item inclinations and item similarity of Omni-channel insight.

XI.LIMITATIONS OF THE STUDY

- There is consistent doubt that the subjective data- and information-based research is constrained by its own factor, namely one-sided data and information. This survey may unearth one-sided information from respondents. In addition, because this study is limited to Bangalore, it cannot be generalised to other regions due to variations in individuals' lifestyle, way of life, culture, and other factors.
- Only three Information Technology companies in Bangalore were investigated in this review. It is unrealistic to expect a summary of the review's decisions, given they are totally dependent on the opinions of IT specialists from a small group of firms.
- Due to the manner in which the information was obtained through customer reviews, an oversight may have crept into the summary.
- Due to the fact that the current review is limited to Bangalore and the sample size is constrained to 150 respondents, the conclusion may not be truly generalizable.

XII.CONCLUSION

This study focused on the relationship between (Purchase Decision Behaviour and Customer Satisfaction) and customer repurchase intentions. Customers typically anticipate Omni channel e-retailers to adhere to the following four components of buy decision behaviour: (Offer and Operation quality, Convenience, Product quality, and Service quality). Customers' shopping and repurchase goals are impacted by the purchase decision

factors as a whole. This study reaches a similar conclusion, namely that omnichannel retailing influences the client's purchasing decision and purchase objective. The commitment demonstrates comprehension of the components of Omni-channel web-based business client satisfaction. Country customers were dissatisfied with regional options and disinterested in monetary dependability. The research demonstrates that entrance convenience and exchange amenities have a significant impact on customer satisfaction and purchase intent. In an omnichannel retail network, organised back-end satisfaction, coordinated channel allowing flexible stock, shopper item purchase information on delivery, and Logistics administration quality had a significant impact on the purchase plan.

This study concludes that transportation accommodation has a significant impact on consumer loyalty and the Omni-channel trade buy strategy. According to this analysis, the influence of fulfilment remains important. When experience is high, the fulfilment element has an effect on the omnichannel commerce repurchase objective. Omnichannel business is positively impacted by each of the slightly modified limits of customer satisfaction administrations. The subsequent factors, on-time delivery, post-purchase insight, and communication, increase the perception of satisfaction and the propensity to repurchase. Similarly, this study contributes to the academic literature by outlining the components of Omnichannel retailing with a purchase option, consumer loyalty, and saw administration quality relating to customer repurchase expectations in Bangalore.

XIII.SCOPE OF THE FUTURE RESEARCH

Various domestic and international studies have been conducted on retailing, e-business, multichannel retailing, cross channel retailing, and Omnichannel retailing, among others. It is suggested that extra emphasis be placed on Omni Channel Retailing.

- Obtained Omnichannel Supply Chain Connections
- Exposing the causes of Omni-channel dissatisfaction and ways for overcoming them.
- The influence of virtual entertainment on the omnichannel experience • The suitability of omnichannel e-shipping.
- Payment framework administrations for omnichannel shopping

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