Consumer Perception of Purchasing Fruits and Vegetables through E-Commerce in Hyderabad

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Abstract
The present study aimed to understand consumer purchasing patterns, preferences for specific types of fruits and vegetables, and future expectations of consumers while purchasing them online. The E-commerce industry is experiencing rapid growth, particularly in the quick commerce sector, which has gained significant momentum in metropolitan cities. Various platforms such as Big Basket, Zepto, Country Delight, Blinkit, Swiggy Instamart, and Reliance Fresh have been instrumental in meeting the growing demand for online fruits and vegetables.
For the purpose of this study, a representative sample of 100 individuals from Hyderabad city was selected using purposive sampling techniques. Both qualitative and quantitative methods were employed to gather and analyze data effectively. The collected data were systematically tabulated and analyzed using statistical tools like percentage analysis and Garret's Ranking method, among others.
The findings of the study revealed key insights into consumer behavior and expectations. A significant observation was that online stores need to prioritize better quality control measures to ensure customer satisfaction. Additionally, there is a demand for a wider variety of fruits and vegetables, including organic options. Consumers expressed their willingness to pay a premium for high-quality products and services, highlighting the importance of maintaining high standards in online offerings. The study further indicates that the E-commerce sector is expected to witness substantial growth in the coming years as consumers increasingly rely on online platforms for their daily needs. By addressing these concerns and expectations, E-commerce companies can enhance their service offerings and build long-term customer loyalty.

Keywords: Consumer purchasing patterns, Online fruit and vegetable shopping, E-commerce growth, Quick commerce sector, Consumer preferences, Consumer satisfaction, Digital grocery shopping trends.

Introduction

India's internet user base has grown significantly, from 251.59 million in March 2014 to 954.40 million by March 2024 (Statista, 2024). The Indian e-commerce market is projected to grow at a compound annual growth rate (CAGR) of 18.7%, increasing from $147.3 billion in 2024 to $292.3 billion by 2028 (IBEF, 2024). Experts predict a 23.8% rise in the e-commerce market in 2024 alone, driven by increased online retail consumption and improved internet accessibility. One of the key drivers behind this rapid expansion is the rise of quick commerce (Bhatnagar, 2024).

Quick commerce has redefined the e-commerce sector, transforming what initially seemed like a marketing gimmick—such as 10-minute delivery—into a fiercely competitive business model. Platforms like Dunzo, Zepto, Swiggy, and Zomato have embraced this trend, meeting consumer demand for speed and convenience. Similarly, online grocery platforms such as Big Basket, Country Delight, and Reliance Fresh have gained traction by offering varied products tailored to customer needs.

The e-commerce industry can be categorized into three primary elements: catalog, cost, and convenience (Bhatnagar, 2024). Companies typically excel in one area, often compromising the other two. For instance, Big Basket is known for its extensive catalog, Swiggy Instamart focuses on convenience, and Meesho emphasizes competitive pricing. Quick commerce businesses, however, have adopted the Dark Store model to deliver goods at unprecedented speeds. These mini warehouses are strategically placed within 1.5 to 4 kilometers of customers, enabling delivery within 10-20 minutes (ET Retail, 2024).

The logistics systems of these businesses are meticulously designed. As soon as a customer place an order, warehouse operations and delivery personnel are synchronized to achieve the fastest delivery times. In today's fast-paced world, consumers with busy schedules increasingly prefer e-commerce grocery shopping. Contributing factors include quick delivery, attractive pricing, discounts, better packaging, and access to a broader range of products (Statista, 2024).

Literature Review

Srividya N. (2016) conducted a comparative analysis of mean values for various variables using t-tests and one-way ANOVA tests. The study revealed that internet prices for most products are significantly lower than those at local stores, even when consumers negotiate prices. Many online shoppers fall within the age group of 20-30 years, showing high sensitivity to convenience and discounts. Women were observed to prefer online grocery shopping due to the ease of home delivery services. The research also found a statistically significant association between gender and preference for home delivery. Moreover, quality perception was identified as a key determinant in consumers' decisions to purchase groceries and vegetables.

Salini R. (2023) analyzed consumer intentions in Coimbatore city using statistical tools such as the arithmetic mean, percentage method, Henry Garrett's ranking, and total weighted score methods. The study highlighted that age and income were the primary demographic variables influencing the frequency of online grocery shopping. Among online purchases, bananas and onions were the most frequently bought fruits and vegetables. All respondents were aware of online shopping for fresh produce, and a significant majority reported being influenced by social

media. Big Basket and Jiomart emerged as the most preferred platforms, with the study concluding that the Covid-19 pandemic increased the preference for online grocery shopping.

Lavanya N. et al. (2022) examined consumer preferences and purchasing patterns using percentage analysis and the Likert scale method. Their findings showed that 85% of customers had more than five years of internet experience. A substantial portion, 68.75%, reported checking retail stores before making online purchases of fruits and vegetables. Seasonal availability was identified as a common issue. Additionally, 46.85% of customers preferred delivery timings between 9:00 AM and 10:00 AM. The study concluded that convenience in order placement and quick deliveries were primary motivators for purchasing fruits and vegetables online.

Faseha Batool (2024) analyzed customer opinions on e-grocery stores through descriptive and inferential statistics, regression analysis, thematic analysis, and comparative analysis. The findings revealed that the Covid-19 pandemic significantly boosted online grocery delivery services, and many customers continued using these services even after the pandemic. Factors such as product availability, discounts, offers, and time savings were major motivators. However, barriers like the inability to physically inspect products and a lack of guaranteed quality were notable concerns.

Yogesh A. et al. (2018) utilized multiple regression analysis and Garrett's ranking method to study consumer behavior in online grocery shopping. Their research revealed a negative correlation between price and the quantity of vegetables purchased. Quality and freshness were found to be the most important factors influencing customer satisfaction, and all respondents reported being satisfied with their online purchases.

Febri Arifatul Fadhila et al. (2023) investigated factors influencing online purchases of fruits and vegetables in Indonesia using multiple linear regression analysis, including validity, reliability, and classic assumption tests. The study identified timely delivery as a key driver of consumer purchasing decisions. Competitive pricing and promotional offers also encouraged repeat purchases. Additionally, hygienic packaging and well-maintained product quality fostered consumer loyalty on platforms like Kitabeli e-commerce.

Afreen Nishat A.N. et al. (2022) analyzed consumer buying behavior trends in Indian e-commerce using SWOC analysis. The authors emphasized the importance of delivering quality products while providing value through discounts, gifts, and transparent product information. Building consumer trust and confidence was identified as a crucial factor for success in the e-commerce industry.

Objectives of the Study:
1. To understand Consumer purchasing patterns of fruits and vegetables in the E-commerce sector.
2. To analyze consumer preferences for specific types of fruits and vegetables (Organic, exotic, seasonal, packaged) and the significance of organic options.
3. To understand consumers' future expectations in purchasing fruits and vegetables through e-commerce platforms.

Methodology
Study Area: The study focused on Hyderabad City to examine consumer purchasing behavior, preferred e-commerce platforms, and expectations when buying fruits and vegetables online. A

combination of targeted selection and random sampling methods was used to select participants. Individuals from various socio-economic backgrounds, residing in different parts of Hyderabad, including Maisammaguda, Hi-tech City, Pragathi Nagar, Kukatpally, and Gachibowli, were included in the sample. Participants were selected randomly without predefined criteria.

Data Collection: To ensure diversity in the sample, data were collected from individuals of different ages, income levels, and genders. A total of 100 participants, with 20 respondents from each of the five areas, were interviewed. Data collection focused on demographic information such as age, gender, educational qualifications, and income levels, along with shopping preferences, e-commerce usage habits, and expectations regarding purchasing fruits and vegetables online. Structured interviews were conducted, and Google Forms were shared via email to gather reliable responses. The research objectives were clearly explained to respondents to ensure accuracy in the data.

Tools and Techniques:

1. **Likert scale rating**
   Likert Score=∑(Response Value×Weight)
       Where:
- Response Value = Numerical value of the selected response.
- Weight = The weight assigned to the statement

2. **Percentage analysis**
   Percent = (Value of interest / Total) * 100

3. **Garett's Ranking Technique:**
   For each rank given by respondents, calculate the percent position using:
   Percent Position= Rank – 0.5 / Total no.of ranks * 100
   Where:
- **Rank** is the rank assigned to a factor by a respondent.
- **Total Number of Ranks** is the number of ranks the respondent assigns.

4. **Cross Tabulation:**
   The formulas used for percentage distributions within the table are:
   Row percentage:
       R.P = Cell Count / Row Total*100
   Column percentage:
       C.P = Cell Count / Column Total*100
   Grand Total percentage:
       G.T.P = Cell Count / Grand Total* 100
   5. Chi-square Test formula:
   $\chi 2=\sum Ei(Oi-Ei)2$

Selected Areas in Hyderabad: The study included participants from five key areas of Hyderabad,

S.no	Consumer Response	Frequency	Percentage	Cumulative frequency
1	Daily	7	7	7
2	2-3 Times a week	19	19	26
3	Weekly	30	30	56
4	Monthly	29	29	85
5	Never	15	15	100

ensuring a balanced representation of consumers. Each area contributed 20 respondents to the total sample of 100 participants.

1. **Gachibowli**: A highly urbanized and rapidly developing area, home to a significant population of tech professionals and students, with 20 consumers participating in the study.
2. **Hi-tech City**: Known for its IT and business hubs, this area also contributed 20 respondents, reflecting its population's familiarity with e-commerce platforms.
3. **Kukatpally**: A densely populated residential area, popular for its diverse demographic, provided 20 participants for the study.
4. **Maisammaguda**: A suburban locality with a mix of urban and rural characteristics, where 20 consumers were interviewed.
5. **Pragathi Nagar**: A developing residential area that also contributed 20 participants, highlighting its residents' growing use of online services. This distribution ensured diversity in the data collection, covering a range of socio-economic backgrounds and consumer behaviors.

1.To understand Consumer purchasing patterns of fruits and vegetables in the E-commerce.
Table 1: Consumer frequency of using E-commerce (n=100)

Table-1 presents an analysis of consumer responses regarding the frequency of purchasing fruits and vegetables online. Of the total sample, only 7% of respondents indicated that they shop daily, suggesting that daily online grocery shopping is relatively uncommon. A larger group, 19% of respondents, purchase 2-3 times per week, reflecting a moderate level of online shopping activity. This is followed by the largest group, with 30% of respondents reporting weekly purchases, highlighting that weekly shopping is the most popular frequency. Together, the daily, 2-3 times a week, and weekly shoppers make up 56% of the sample, indicating a strong preference for more frequent online shopping.
Another 29% of participants reported shopping for fruits and vegetables online on a monthly basis, bringing the total to 85% of respondents who shop at least once a month. However, there remains a group of 15% of respondents who have never made online purchases for fruits and vegetables. This segment represents 15% of the sample, suggesting a segment of consumers who either face barriers to online shopping or prefer traditional grocery shopping methods.

Overall, the data reveals that the majority of consumers shop online for fruits and vegetables either weekly or monthly, with daily shoppers being a minority. The presence of non-users indicates the need for businesses to address concerns such as trust, access, or convenience to increase the adoption of online grocery shopping.

Table 2: Relationship between Education Level and Consumer frequency in using E-commerce

S.no	Education level/ consumer frequency	High school	Undergraduate	Postgraduate	Doctorate	Total	Chi Square (X2 value)
1	Daily	1 / 1.48	5 / 5	3 / 3.19	0 / 0	9	
2	2-3 times a week	1 / 1.48	21 / 20.57	13 / 13.1	2 / 1.89	37	
3	Weekly	2 / 1.72	24 / 23.9	15 / 15.22	2 / 2.19	43	1.82
4	Monthly	0 / 0.44	6 / 6.12	4 / 3.89	1 / 0.56	11	
	Total	4	56	35	5	100	
P- Value				0.994(>0.005)			

Table 2 presents the relationship between **education level** and **frequency of online grocery shopping** among consumers. It categorizes consumers into four education levels: **High school**, **Undergraduate**, **Postgraduate**, and **Doctorate**, and their frequency of shopping online is divided into four categories: **Daily**, **2-3 times a week**, **Weekly**, and **Monthly**. The table includes both observed and expected frequencies in parentheses, with the total sample consisting of 100 respondents.

- **Daily Purchases**: The data shows that no high school or doctoral respondents shop online daily. There are 5 undergraduates and 3 postgraduates who report shopping daily. The observed frequency for undergraduates (5) closely matches the expected frequency (5.00), and similarly, postgraduates (3) align with their expected frequency (3.19). The total number of daily shoppers is 9.

- **2-3 Times a Week**: This category sees a higher frequency of purchases, especially among undergraduates (21) and postgraduates (13). The observed values for undergraduates (21) and

postgraduates (13) are close to the expected frequencies of 20.57 and 13.10, respectively. In contrast, the number of high school (1) and doctoral (2) respondents is much lower, reflecting less frequent online grocery shopping among these groups. The total number of shoppers in this category is 37.

- **Weekly Purchases**: Undergraduates (24) and postgraduates (15) again make up the majority of weekly shoppers. The observed and expected frequencies for these groups are in close alignment, with the total number of weekly shoppers at 43.

- **Monthly Purchases**: Monthly shoppers are fewer in number, with only 6 undergraduates, 4 postgraduates, and 1 doctoral respondent. The observed frequencies (6 for undergraduates, 4 for postgraduates) are close to the expected frequencies (6.12 for undergraduates and 3.89 for postgraduates).

The **Chi-square value (X^2)** for the entire table is **1.82**, and the **p-value** is **0.994**, which is much higher than the conventional threshold of 0.05. This suggests that there is no statistically significant relationship between education level and frequency of online grocery shopping. Despite the apparent trend that undergraduates and postgraduates engage in online shopping more frequently, the Chi-square test confirms that these differences are not statistically meaningful. Therefore, the frequency of online grocery shopping does not appear to be significantly influenced by the respondent's education level.

2. To analyze consumer preferences for specific types of fruits and vegetables (Organic, exotic, seasonal, packaged) and the significance of organic options

Table 3: Consumer preference for purchasing fruits and vegetables online based on type

S.no	Consumer preference	frequency	Percentage	Cumulative percentage
1	Organic	69	48.59	48.59
2	Exotic	17	11.97	60.56
3	Seasonal	48	33.8	94.36
4	Packaged	8	5.64	100
	Total	142	100	

The table-3 provides insights into consumer preferences for different types of fruits and vegetables. Among the options, **Organic** produce emerges as the most preferred choice, with 69 respondents, accounting for 48.59% of the total responses. This indicates a strong preference for organic fruits and vegetables. Following organic produce, **Exotic** fruits and vegetables are preferred by 17 respondents, or 11.97%. When combined with the organic preference, this brings the cumulative percentage of respondents to 60.56%, showing that over half of the respondents favor either organic or exotic options. The third most popular preference is for **Seasonal** fruits and vegetables, with 48 respondents (33.80%) selecting this choice. After accounting for seasonal produce, the

cumulative percentage rises to 94.36%, meaning that the majority of respondents lean towards organic, exotic, or seasonal options. Lastly, **Packaged** produce is the least favored, with only 8 respondents (5.64%) choosing this option, bringing the cumulative percentage to 100%. Overall, the data reveals that the highest preference is for organic, followed by seasonal and exotic produce, while packaged produce is the least preferred category.

3.Consumer opinion on recommending the purchase of fruits and vegetables through e-commerce

Table 4: Consumer opinion recommending purchasing through E-commerce (n=100)

S.no	Consumer opinion	frequency	Percentage	Cumulative percentage
1	Yes	35	35	35
2	No	19	19	54
3	Maybe	46	46	100

Table 4 provides insights into consumer opinions regarding a particular question, categorizing responses into "Yes," "No," and "Maybe." Among the total respondents, **35** individuals (35.00%) answered "Yes," reflecting a positive response to the question. Following this, **19** respondents (19.00%) answered "No," indicating a negative response. When combined with the "Yes" responses, the cumulative percentage reaches **54.00%**, meaning that over half of the respondents expressed either a positive or negative opinion. The largest group of respondents, **46** individuals (46.00%), selected "Maybe," indicating uncertainty or indecision. This brings the cumulative percentage to **100.00%**, accounting for all the responses. In conclusion, the majority of respondents were unsure, as reflected by the "Maybe" responses, while a smaller proportion were firmly positive or negative in their answers.

4. To know consumers' future expectations in purchasing fruits and vegetables through e-commerce platforms.

Table 5: Consumers' future expectations in purchasing fruits and vegetables through e-commerce platforms.

S.no	Particulars	Total score	Garret's Mean Score	Rank
1	Better Quality Control	4928	77	1
2	Faster Delivery	2457	63	2
3	More Variety	1650	50	3

4	Easier returns/ refunds	1650	50	3
5	Better packaging	888	37	5
6	Other Improvements	50	25	6

Table-5 presents a ranking of various factors influencing consumer preferences, based on Garret's ranking method. The factor **Better Quality Control** ranks the highest, with a total score of **4928** and a Garret's Mean Score of **77**, highlighting that consumers prioritize quality control above all else when purchasing fruits and vegetables online. Following this, **Faster Delivery** is ranked second, receiving a total score of **2457** and a Garret's Mean Score of **63**, indicating that timely delivery is also a crucial factor for consumers. The third rank is shared by **More Variety** and **Easier Returns/Refunds**, both having a total score of **1650** and a Garret's Mean Score of **50**, suggesting that consumers value both product variety and a smooth returns/refunds process equally. **Better Packaging** is ranked fifth, with a total score of **888** and a Garret's Mean Score of **37**, indicating that while packaging matters, it is less of a priority compared to the other factors. Lastly, **Other Improvements** received the lowest total score of **50** and a Garret's Mean Score of **25**, making it the least important factor. In summary, the table reveals that consumers place the highest value on quality control and fast delivery, with packaging and other improvements being less significant.

Findings: The findings from the analysis of consumer preferences in the paper highlight the key factors that influence online purchasing decisions for fruits and vegetables:

1. **Better Quality Control** emerged as the most significant factor for consumers, with the highest Garret's Mean Score of **77**. This suggests that consumers place the utmost importance on the quality of the products they purchase online, emphasizing the need for e-commerce platforms to ensure consistent and high-quality produce.
2. **Faster Delivery** was the second most important factor, with a Garret's Mean Score of **63**. Timely delivery is a key consideration for consumers, indicating that quick commerce platforms that can deliver fresh produce in a short time frame are likely to attract more customers.
3. **More Variety** and **Easier Returns/Refunds** were equally prioritized, both receiving a Garret's Mean Score of **50**. Consumers appreciate having a wide range of products to choose from, as well as the ability to return or exchange items easily, which enhances the overall shopping experience.
4. **Better Packaging** was ranked fifth with a Garret's Mean Score of **37**. While packaging is important, it was ranked lower than the other factors, implying that it is not a primary concern for consumers compared to quality, speed of delivery, and product variety.
5. **Other Improvements** ranked the lowest, with a Garret's Mean Score of **25**. This indicates that additional improvements beyond quality control, delivery speed, variety, and packaging are not seen as critical factors by consumers.

Conclusion:

In conclusion, this study provides valuable insights into consumer perception, purchasing patterns, and future expectations related to the purchase of fruits and vegetables through the e-commerce sector. By analyzing the data, several key conclusions have been drawn. Firstly, consumers prioritize **quality control** and **fast delivery** when making purchasing decisions, highlighting the importance of maintaining high standards for product quality and offering quick and reliable delivery services. This suggests that e-commerce platforms must focus on these aspects to meet the growing expectations of their customers and build trust.

Secondly, **product variety** and **easy returns/refunds** were identified as essential factors, with consumers valuing the ability to choose from a wide range of products and a hassle-free returns process. These factors contribute significantly to enhancing the overall shopping experience, making it convenient and consumer-friendly.

Furthermore, while **better packaging** remains important, it was ranked lower compared to other factors, indicating that consumers are willing to overlook packaging concerns as long as quality, speed, and variety are prioritized. Additionally, **other improvements** were found to be of minimal significance, suggesting that consumers are mainly focused on the core elements of their online shopping experience, such as product quality, delivery, and selection.

The study also indicates that **future expectations** lean toward a continued growth of the e-commerce sector, with consumers anticipating further improvements in service quality, faster deliveries, and expanded product options. These findings emphasize the need for e-commerce platforms to remain agile and responsive to consumer demands in order to stay competitive in a rapidly growing market.

The analysis underscores the critical role of quality control, delivery speed, product variety, and ease of returns in shaping consumer behavior and expectations in the e-commerce sector. To ensure continued success, businesses must focus on these areas while keeping an eye on emerging consumer trends and expectations for future growth.

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