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A STUDY ON THE ROLE OF DIGITAL TWIN TECHNOLOGY IN SHAPING CONSUMER LIFESTYLES THROUGH GROCERY-BASED APPLICATIONS

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ABSTRACT

This paper, "A Role of Digital Twin Technology in Shaping Consumer Lifestyles through Grocery-Based Applications," explores how Digital Twin (DT) technology uses real-time data, simulation, and personalization to shape consumer lifestyles. Responses of 253 respondents in Coimbatore City were obtained to study awareness, adoption drivers, and lifestyle effects of DT-based grocery websites like Zepto, Blinkit, BigBasket, and Instamart. With the use of SPSS software, percentage analysis, Chi-square, ANOVA, Friedman Ranking Test, and t-test were used. The results indicate that DT-integrated grocery apps increase personalization, convenience, and sustainability, as well as smarter consumption behavior. The research provides valuable insights for consumers, retailers, and developers alike to enhance consumer trust and engagement through next-generation digital solutions

Keywords

Digital Twin Technology, Grocery Applications, Consumer Lifestyle, Smart Retail, Personalization, Data Analytics, Predictive Insights, Consumer Behavior, Digital Transformation, Real-Time Simulation

Introduction

Digital Twin (DT) technology is revolutionizing the digital realm at a very fast rate by closing the gap between the physical and virtual domains. Under grocery-based applications, DT

technology provides real-time data analysis, virtual simulation, and tailored user experiences that increase convenience and efficiency in everyday shopping. With grocery apps like Zepto, Blinkit, BigBasket, and Instamart remodeling contemporary retail experiences, the embrace of DT technology helps give consumers smarter, data-driven solutions for maintaining their lifestyle demands. This research delves into the serious impact Digital Twin technology has on influencing consumer lifestyles through their buying behavior, enhanced decision-making, and promoting sustainable and personalized shopping experiences using grocery-based platforms.

OBJECTIVE

- To identify the key factors that influence consumer adoption of digital twin technology in the context of glossary-based apps.
- To examine the common challenges consumers, face while engaging with digital twin based solutions in glossary-based applications.

METHODOLOGY

Primary data for this research have been gathered from consumers in Coimbatore who frequently use grocery-based apps like Zepto, Blinkit, BigBasket, and Instamart. Secondary data have been gathered from research journals, books, and online sources pertinent to Digital Twin (DT) technology, consumer behavior, and lifestyle research.

Tools Used

A basic table has been prepared by compiling and organizing the collected primary data. The primary data for this study were gathered through a structured questionnaire designed to assess consumer awareness, perception, and adoption of Digital Twin (DT) technology in grocery-based applications. The data presented in the tables have been carefully analyzed using appropriate statistical techniques. The following tools have been used to interpret the data and achieve the objectives of the study:

- Percentage Analysis
- Friedman Ranking

Sample Size

For the study, a total of 253 respondents have been selected.

REVIEW OF LITERATURE

1 Kaur, S. & Sharma, R. (2022) conducted a study on the integration of Digital Twin (DT) technology in retail platforms and found that DT enables real-time data synchronization,

personalized recommendations, and efficient inventory management. Their findings revealed that DT-driven grocery applications significantly enhance consumer convenience and satisfaction by predicting purchasing patterns and optimizing product availability

2 Patel, M. (2023) explored the influence of digital transformation on consumer lifestyles within online grocery platforms. The study highlighted that technologies such as Digital Twins improve decision-making and engagement by providing virtual simulations of product usage and nutritional value. This personalized approach encourages healthier and more sustainable shopping habits among consumers.

3 Lee, J. & Thomas, D. (2021) examined the role of emerging technologies in shaping consumer behaviour across e-commerce platforms. Their research emphasized that the application of DT technology allows for better visualization of consumer preferences, leading to enhanced personalization and trust in digital grocery services. The study concluded that DT contributes to creating a more immersive and user-centric shopping experience.

ANALYSIS AND INTERPRETATION

Simple Percentage Analysis

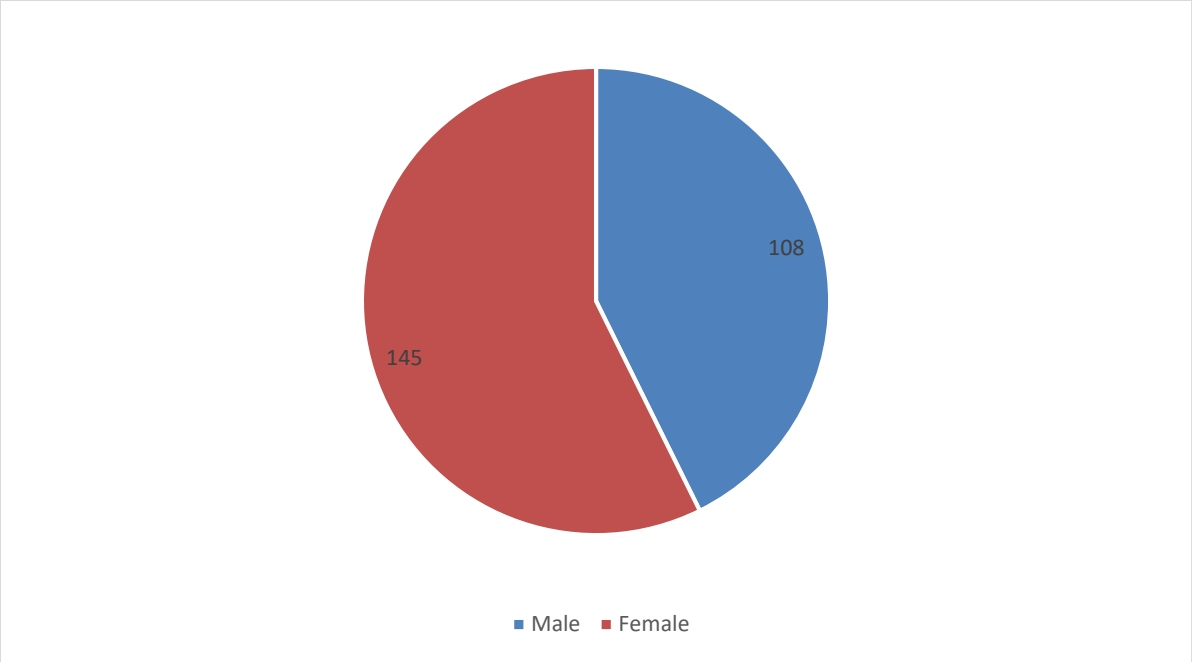
Straight percentage calculation means dividing a given value by the sum of all responses and then multiplying the obtained value by 100 to get a percentage. It is a technique employed to express information in an understandable and comparable way, reflecting the proportion or distribution of the respondents in different categories. Simple percentage analysis is employed to analyze consumer awareness, attitudes, and opinions towards the contribution of Digital Twin technology in determining consumer lifestyles with grocery-based services like Zepto, Blinkit, BigBasket, and Instamart. Through this analysis, patterns and trends in consumer perception towards personalization, convenience, and lifestyle improvements offered by digital twin capabilities are determined.

TABLE 1.1 : GENDER

Gender	**No. Of Respondents**	**Present**
Male	108	42.7
Female	145	57.3
TOTAL	**253**	**100.0**

Interpretation

The gender of the respondents who participated in the study on the role of Digital Twin technology in transforming consumer lifestyles through grocery apps shows that 57.3 percent of the respondents are female, followed by 42.7 percent male respondents. Hence, it can be inferred that the majority of respondents are female, indicating that women are more active in using grocery-based applications integrated with Digital Twin technology.



FRIEDMAN RANKING TEST

Friedman Ranking Analysis is a parametric statistical technique employed to rank and compare more than two related items or variables based on the views or opinions of respondents. It is most beneficial when the data do not satisfy the assumptions of parametric tests and the process involves assigning ranks to various items and working out the mean ranks to point out the patterns. In the current research, Friedman Ranking Analysis is used to analyze consumer attitudes and opinions towards the application of Digital Twin technology in lifestyle transformation through grocery-based services like Zepto, Blinkit, BigBasket, and Instamart. This report is useful for finding out which of the following attributes—real-time personalization, convenience, predictive recommendations, and sustainability alerts—consumers find most impactful, thus indicating their influence on consumer behavior and lifestyle change due to digital twin-enabled features**.**

TABLE2.1: FRIEDMAN RANKING TEST

Consumer Awareness on Grocery Apps	**Mean rank**	**Rank**
Factors influencing the choice of a grocery app	2.45	Rank1
Challenges faced while using grocery apps	2.78	Rank2
Most valued grocery app features	3.12	Rank3
Expected benefits of Digital Twin technology in grocery apps	3.26	Rank4
Reasons for not using grocery apps	3.39	Rank5

Test Statistics	
N	253
Chi-Square	78.622
Df	4
Asymp. Sig.	.000
a. Friedman Test	

(Source: Calculated data)

Interpretation

The Friedman ranking analysis for the factors influencing the impact of Digital Twin technology on consumer lifestyle through grocery apps reveals that 'Factors influencing the selection of a grocery app' hold the highest priority among consumers, with a mean value of 2.45. This is followed by 'Challenges faced while using grocery apps' with a mean of 2.78, and 'Most valued grocery app features' with a mean of 3.12. The factors 'Expected benefits of Digital Twin

technology in grocery apps' and 'Reasons for not using grocery apps' occupy the fourth and fifth ranks, with mean values of 3.26 and 3.39, respectively. Hence, it can be inferred that the factors influencing the selection of grocery apps have the greatest impact on consumer preferences and decision-making when using grocery applications integrated with Digital Twin technology.

FINDINGS

Simple Percentage Analysis

- A simple percentage analysis shows that the majority of the respondents are female, followed by male respondents. This indicates that women are more active in using grocery-based applications integrated with Digital Twin technology. The findings suggest that female consumers are more engaged in utilizing these platforms for grocery shopping, as they find them convenient, time-saving, and efficient. This further highlights that Digital Twin features such as real-time tracking, personalized recommendations, and interactive shopping experiences have a stronger appeal among female users.

Ranking Analysis

- According to the Friedman ranking analysis, the factors influencing the selection of a grocery app hold the highest priority among consumers, followed by the challenges faced while using grocery apps and the most valued grocery app features. The expected benefits of Digital Twin technology in grocery apps and the reasons for not using grocery apps are ranked lower in comparison. This indicates that the factors influencing the selection of grocery apps have the greatest impact on consumer preferences and decision-making, showing that users give more importance to app usability, features, and performance when engaging with grocery applications integrated with Digital Twin technology.

SUGGESTIONS

- Grocery app developers should focus on expanding the integration of Digital Twin technology to create more immersive and realistic shopping experiences for consumers using grocery-based applications.
- To enhance consumer engagement, companies should prioritize improving real-time interaction, virtual product visualization, and predictive analytics supported by Digital Twin features.

- Grocery platforms should develop user-friendly Digital Twin interfaces and ensure compatibility across different devices to make the technology accessible to a wider range of consumers.
- Regular technological upgrades and user feedback mechanisms should be implemented to refine Digital Twin features, improve personalization, and enhance overall consumer satisfaction.

CONCLUSION

The research evidently shows that Digital Twin (DT) technology significantly influences consumer lifestyles in terms of grocery-based applications. The results of the ANOVA test reveal no significant differences in different demographic groups, implying that consumers of all categories have a positive attitude towards DT-enabling grocery apps. Real-time data tracking, predictive analytics, and personalized suggestions have added convenience, efficiency, and entertainment to grocery shopping. In summary, this research offers significant insights into how Digital Twin technology raises consumer satisfaction, facilitates intelligent buying behavior, and plays a role in today's fast-changing digital commerce lifestyle..

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