



Factors Influencing the Mobile app Adoption for Online Milk Purchase in Surat City

Urja Kotadia^{1*} and Gautam Parmar²

¹MBA, ASPEE Agribusiness Management Institute,

Navsari Agricultural University, Navsari (Gujarat), India.

²Associate Professor, ASPEE Agribusiness Management Institute,

Navsari Agricultural University, Navsari (Gujarat), India.

(Corresponding author: Urja Kotadia*)

(Received 12 August 2025, Revised 28 September 2025, Accepted 08 October 2025)

(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: India is the world's largest producer and consumer of milk where milk and milk products are used in Indian kitchens almost every day. Milk purchase behaviour is a routine purchasing behaviour where convenience is crucial since milk is perishable in nature. As smart phones and internet connectivity become more widely used, e-commerce has grown dramatically and is now a normal aspect of daily living, including grocery shopping. Smartphone became handy tool for shopping. In this regard, the present study was carried out to understand factors affecting adoption of mobile app for online milk purchase. The descriptive research design was adopted and data were collected using structured questionnaire. The primary data from 150 respondents were collected and analyzed with descriptive statistics and multivariate data analysis techniques. The exploratory factor analysis has awarded 4 factors which explained 77.916 percent of total variance. The factors were Attitude towards mobile app usage, subjective norms, perceived ease of use and perceived usefulness. In literature very less study was observed for the milk delivery apps. The present study tried to investigate that consumer preference for home delivery of milk and factors affecting on adoption of milk app for the online milk purchase. The study outcome may be helpful to the stakeholders in developing and increasing adoption of mobile app for milk purchase.

Keywords: Mobile Apps, E-Commerce, Online Milk purchase, online grocery purchase, Online consumer behaviour.

INTRODUCTION

The Indian dairy industry accounts 23 percent of global milk production and contribute 5 percent to national economy (IBEF, 2022). The Indian milk production was 230.58 million tonnes and per capita availability was 459 grams per day per person in the year 2022-23 (PIB, 2025). Milk is complete food due to its nutrient content and had a wide range of consumers (Elango *et al.*, 2023). Milk and milk products are used daily in the Indian kitchens. They are consumed directly or ingredients in various dishes. The most preferred place for purchasing packed milk is Kirana store (Pai *et al.*, 2018).

Artificial Intelligence (AI) is one of the most powerful technologies of today, helping to improve innovation, efficiency, and growth in many fields (Lal *et al.*, 2025). The rise in internet usage, higher Smartphone adoption and evolving consumer preferences in favour of convenient and time-efficient shopping option are providing strong growth of online grocery adoption (Business wire, 2025). However, the ease of order and convenience played important role in online shopping

adoption. The discounts, trust and brand loyalty play significant role in online grocery purchase (Kaur, 2022). E-grocery allows customers to fulfil their daily needs without sacrificing time and routine activities (Wijayanto, 2024). In the present era of information centricity, mobile phones (ICT tools) might be pretty helpful for farmers to fetch real-time need-based information (Shukla *et al.*, 2022). Sensors, drones, and precision farming software especially artificial intelligence and machine learning are rapidly being used in agriculture to increase efficiency, production, and sustainability (Lingireddy *et al.*, 2023; Saikia and Saikia 2023). Technologies highlighting smart farming tools such as sensors, drones, robots, IoT, UAVs, GPS and GIS offer the potential for increased productivity and sustainable practices, their field implementation poses significant challenges (Rakhi and Radhakrishnan 2024). The integration of Artificial Intelligence (AI) in farm mechanization represents a transformative shift in modern agriculture, offering unprecedented opportunities for enhancing productivity, efficiency, and sustainability (Kailashkumar and Vijayakumar 2024).

Thus, nowadays the consumers preferred online shopping over offline shopping (Pal & Kumari 2023). According to IMARC report, the Indian online grocery market size reached USD 11.4 billion in 2024 and will reach to 96.3 billion by 2033 with 25.38 percent CAGR. Mobile app has emerged as most promising tool for the marketers and the study of consumer behaviour towards this technology advancement is essential (Malik *et al.*, 2017) and smartphone applications are referred to as marketing vehicles because they fundamentally alter the customer firm relationships (Abbas *et al.*, 2022). Nguyen *et al.* (2023) found the Technology Acceptance Model factors (perceived usefulness and perceived ease of use), perceived value and perceived enjoyment had significant effects on attitude towards online purchase. Nonis *et al.* (2024) found that Perceived ease of use positively affects to attitude whereas perceived useful does not. Further, the Attitude, Subjective norms and perceived behavioural control positively affects purchase intention. The good number of studies related to grocery purchase were found in literature but there were a smaller number of studies which address milk specifically. Since, milk is everyday used product in Indian household the gap was identified to study factors affecting mobile app adoption for online milk purchase. The present study tries to investigate factors influencing mobile app adoption for online milk purchase.

RESEARCH METHODOLOGY

The present study was conducted with the objectives to study factors influencing mobile app adoption for online milk purchase. To fulfill the objectives descriptive research design was adopted. The primary data were collected structured questionnaire. The questionnaire was prepared after surveying available literature and transfer to online data collection platform. The questionnaire was contained research questions and demographic profile of respondents. The respondents were exposed to 11 statements related to mobile app usage for milk purchase on five-point Likert type scale where 5- Strongly Agree, 4- Agree, 3- Neutral, 2- Disagree and 1- Strongly Disagree. The link for the data collection was share to contacts using social media. Further, the respondents were also told to share link with their contact. Thus, the snowball sampling was applied. The sample size was kept 150. The collected data were analyzed with the help of computer software. The exploratory factor analysis (EFA) was carried out for the perception towards milk app.

RESULTS AND DISCUSSION

Demographic profile and Milk purchase Behaviour

The demographic profile such as gender, occupation, education, family size, monthly income and milk

purchase details like expenditure on milk and milk purchase frequency, the frequency of the profile is displayed below in Table 1.

For the present study responses from 150 respondents were collected and the profile of 150 respondents shown in Table 1. Out of 150 respondents 58.7 percent respondents stay in joint family whereas 41.3 percent stay in nuclear family. The average age of the respondents was found 36.52 years (Minimum 18 years and maximum 72 years). In case of monthly family income, it was found that 47.3 percent respondents have above Rs. 50000 monthly family income followed by 34.7 percent have Rs. 30000-50000 monthly family income, and 18 percent respondents have below Rs.30000 monthly family income. Out of 150 respondents 114 respondents (76 percent) were purchasing packed milk whereas 36 respondents (24 percent) were purchasing loose milk.

The preferred time for purchase of milk was investigated and found that 64.7 percent respondents prefer morning time followed by 29.3 percent and 6 percent anytime for milk purchase. The respondents were also asked for preferred place for the purchase of milk and found that the 60.7 percent respondents prefer milk parlour followed by 26.7 percent kirana store and 12.7 percent other option, the findings are in line with (Kalaivani *et al.*, 2023). Out of 150 respondents 82 percent prefer home delivery. Out of 150 respondents 68 percent respondents do not get home delivery. The 57.3 percent respondents prefer online mode for the purchase of grocery items whereas 42.7 percent prefer offline mode, the findings are in line with Chettiar (2024) who found that respondents prefer online grocery shopping, and also with the findings of Scaria *et al.* (2021) that online shopping is increasing. Further it also supports findings of Wijayanto (2024) who found that for Time saving, effectiveness and ease of use and learning of applications are several factors that influence consumers so that they form a positive attitude towards shopping through e-grocery applications. Perceived usefulness and attitude are able to encourage consumers' behavioural intentions to use e-grocery applications to shop for daily necessities. The benefits and positive attitude felt by consumers influence consumer intention to use e-grocery applications.

The respondents were asked for their preference for home delivery of milk and status of actually enjoying home delivery of milk and results were shown in Table 2 As table depicts 82 percent respondents of total respondents prefer the home delivery of milk and 32 percent respondents actually get the home delivery. The 50 percent respondents do not get home delivery of milk that prefer the home delivery of milk.

Table 1: Demographic Profile of respondents.

Particulars	Frequency	Percent
Family type		
Nuclear Family	62	41.3
Joint Family	88	58.7
Total	150	100.0
Age of the Respondents (in years)		
Average Age of Respondents	36.52 Years	Min- 18, Max= 72
Family monthly income (in Rs.)		
Up to Rs. 30000	27	18.0
Rs.30000- Rs. 50000	52	34.7
More than Rs.50000	71	47.3
Total	150	100.0
Type of Milk Purchase		
Loose Milk	36	24.0
Packed Milk	114	76.0
Total	150	100.0
Preferred time to purchase the milk		
Morning	97	64.7
Evening	44	29.3
Anytime	9	6.0
Total	150	100.0
Place of milk Purchase		
Kirana Store	40	26.7
Milk Parlor	91	60.7
Others	19	12.7
Total	150	100.0
Do you prefer home delivery of milk?		
Yes	123	82.0
No	27	18.0
Total	150	100.0
Do you get home delivery of milk?		
Yes	48	32.0
No	102	68.0
Total	150	100.0
Which method of purchase do you find most convenient for Grocery items?		
Offline	64	42.7
Online	86	57.3
Total	150	100.0

Table 2: Cross tabulation for actual home delivery of milk and Preference for home delivery of milk.

Home delivery of milk * Preference for home delivery of milk					
			Do you prefer home delivery of milk?		Total
			Yes	No	
Do you get home delivery of milk?	Yes	Count	48	0	48
		% of Total	32.0%	0.0%	32.0%
	No	Count	75	27	102
		% of Total	50.0%	18.0%	68.0%
Total		Count	123	27	150
		% of Total	82.0%	18.0%	100.0%

Reliability Test

In order to check the check reliability of the scale used to understand factors influencing mobile app adoption for online milk purchase, Cronbach's Alpha was applied. The Cronbach's Alpha for 11 items was found

0.942. The Cronbach's Alpha used to check reliability of scale, the value ranges from 0 to 1. As per rule of thumb, the value of alpha greater than 0.7 is consider as good and acceptable for further analysis (Tavakol & Dennick 2011).

Exploratory Factor Analysis

The Exploratory factor analysis is a multivariate data analysis technique which is used for data reduction (Malhotra and Dash 2007).

It is method to identify the factors underling the variables by means of clubbing related variables in the same factor (Verma and Abdel-Salam 2019). To check the appropriateness of data two tests were conducted. i. Bartlett's test of sphericity and ii. Kaiser- Meyer- Olkin (KMO) measures of sampling adequacy. The outcome is presented in below Table 4. The value of KMO measures of sampling adequacy falls between 0.5 to 1.0, which indicates factor analysis is appropriate and value below 0.5 indicates inappropriateness of the analysis (Malhotra and Dash 2007). For the present study the Kaiser- Meyer- Olkin measures of Sampling Adequacy value obtained is 0.873.

So, it can be inferred that present data are appropriate for factor analysis. Further the approximate chi-square value was found 1437.552 at 55 degree of freedom for Bartlett's test of Sphericity which is significant at the 0.05 level (value= 0.00). So, it can be inferred that the variables in population are correlated.

To carryout factor analysis 6 to 7 methods are available out of them principal axis factoring analysis was adopted in the present study. The Equamax with Kaiser Normalization was adopted as rotation method. The rotated component matrix was presented using sorted by size and the coefficients were suppressed having value below 0.4 and four factors were extracted. The four explained 77.916 percent of total variance (Table 5).

Table 3: Reliability Test.

Reliability Statistics	
Cronbach's Alpha	N of Items
0.942	11

Table 4: KMO and Bartlett's Test.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.873
Bartlett's Test of Sphericity	Approx. Chi-Square	1437.552
	df	55
	Sig.	0.000

Table 5: Total Variance Explained.

Total Variance Explained									
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1.	6.983	63.482	63.482	6.774	61.586	61.586	2.251	20.463	20.463
2.	1.091	9.916	73.397	0.829	7.540	69.126	2.199	19.993	40.456
3.	0.778	7.074	80.472	0.619	5.623	74.749	2.151	19.558	60.014
4.	0.524	4.761	85.232	0.348	3.167	77.916	1.969	17.902	77.916
5.	0.475	4.320	89.552						
6.	0.311	2.825	92.377						
7.	0.236	2.147	94.524						
8.	0.195	1.772	96.296						
9.	0.170	1.545	97.842						
10.	0.146	1.331	99.172						
11.	0.091	0.828	100.000						

Extraction Method: Principal Axis Factoring.

The factor analysis extracted 4 factors shown in Table 6, out of four factors the first factor termed as "Attitude towards mobile app usage" due to the high loading to the statements like, "Ordering milk through mobile app is Convenient (0.766), Ordering milk through mobile app is good idea (0.723) and Ordering milk through mobile app is pleasant (0.699)". The second factor termed as "subjective norms" due to the high loading to the statements like, "People whose opinions my

family/I value would prefer to Order milk through mobile app (0.820), My friends think technology of Ordering milk through mobile app is useful (0.711), Most people who are important to me and my family think that we should incorporate Ordering milk through (0.620)". The third factor termed as "perceived ease of use" due to loading to the statements like "Overall, Ordering milk through mobile app will be useful (0.819), Ordering milk through mobile app will be easy

(0.596), Ordering milk through mobile app will save times (0.573)” and forth factor termed as “perceived usefulness” due to statements like, “It will be easy for me to learn how to order milk online (0.885), and It is easy for me to remember how to order online (0.610)”. The study findings are in line with the outcome of Carfora *et al.*, (2019) who found that the attitude, subjective norms, perceived ease of use and perceived usefulness influence to milk purchase intention. Further, it also supports findings of Primaroni *et al.* (2024) found that behavioural intension was significantly influenced by attitude, subjective norms and perceived behaviour of control. The perceived ease of use and perceived usefulness (both) have notable

impact on attitude. The findings of the present study are partially in line with Jasti and Syed (2019) that perceived ease of use has positive impact on perceived usefulness and the perceived usefulness has positive impact on purchase intention by mediating attitude. Further, Arora *et al.* (2022) identified intention and attitude are highly correlated followed by offers and attitude for grocery apps in India and the present study partially in line with it. Bauerová and Klepek (2018) found the perceived ease of use has a positive effect on Perceived Usefulness and Perceived Usefulness consequently affects the Behavioural intention to buy groceries online, the outcome of the present study also support it.

Table 6: Rotated Factor Matrix.

Rotated Factor Matrix ^a					Variance Explained by factors
	Factor				
		2	3	4	
Ordering milk through mobile app is Convenient.	0.766				20.463
Ordering milk through mobile app is good idea.	0.723				
Ordering milk through mobile app is pleasant.	0.699				
People whose opinions my family/I value would prefer to Order milk through mobile app.		0.820			19.993
My friends think technology of Ordering milk through mobile app is useful.		0.711			
Most people who are important to me and my family think that we should incorporate Ordering milk through		0.620			
Overall, Ordering milk through mobile app will be useful			0.819		19.558
Ordering milk through mobile app will be easy			0.596		
Ordering milk through mobile app will save times			0.573		
It will be easy for me to learn how to order milk online				0.885	17.902
It is easy for me to remember how to order online				0.610	
Extraction Method: Principal Axis Factoring. Rotation Method: Equamax with Kaiser Normalization.					
a. Rotation converged in 15 iterations.					

CONCLUSIONS

The present study attempts to understand factors influencing the mobile app adoption for online milk purchase and the study found that the preferred time for purchase of milk was morning time and preferred place for the purchase of milk was milk parlour followed Kirana store. The 57.3 percent respondents prefer online mode for the purchase of grocery items. The 82 percent respondents of total respondents prefer the home delivery of milk and 32 percent respondents actually get the home delivery. The 50 percent respondents do not get home delivery of milk who prefer the home delivery of milk. Attitude towards mobile app usage, subjective norms, perceived ease of use and perceived usefulness are the major factors influencing mobile app adoption for online milk purchase. The study outcome may helpful to the stakeholders in developing and increasing adoption of mobile app for milk purchase.

FUTURE SCOPE OF THE RESEARCH

The future research can be carried out on the aspects of need of various features expected in mobile apps for milk. Further constraints faced for mobile app can also be studied. The service quality of mobile app can be studies.

REFERENCES

- Abbas, S. K., Kő, A. & Szabó, Z. (2022). Shopping using mobile applications and the role of the technology acceptance model: Purchase intention and social factors. *Hungarian Statistical Review*, 5(2), 54–81.
- Arora, M., Agarwal, S. & Kaushik, M. (2023b). Determinants of intentions to use grocery apps in India: The role of attitude and offers. *Proceedings of the International Conference on Application of AI and Statistical Decision Making for the Business World (ICASDMBW 2022)*, 16–17 December 2022, Rukmini Devi Institute of Advanced Studies, Delhi, India.
- Bauerová, R. & Klepek, M. (2018b). Technology acceptance as a determinant of online grocery shopping adoption. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 66(3), 737–746.

- Business Wire. (2025, January 20). *India Online Grocery Market Outlook 2024-2029: Major players BigBasket, Grofers, and Amazon Pantry are each vying for dominance in the dynamic Indian online grocery market – ResearchAndMarkets.com*. Retrieved from <https://www.businesswire.com/news/home/20250120574723/en/India-Online-Grocery-Market-Outlook-2024-2029-Major-Players-BigBasket-Grofers-and-Amazon-Pantry-are-Each-Vying-for-Dominance-in-the-Dynamic-Indian-Online-Grocery-Market---ResearchAndMarkets.com>
- Carfora, V., Cavallo, C., Caso, D., Del Giudice, T., De Devitiis, B., Viscecchia, R., ... Cicia, G. (2019). Explaining consumer purchase behaviour for organic milk: Including trust and green self-identity within the theory of planned behaviour. *Food Quality and Preference*, 76, 1–9.
- Chettiar., M., T. (2024). A Study on Offline Vs Online Shopping of Groceries Among Women In MMR, *International Journal of Progressive Research In Engineering Management and Science*, 04(11), 895-902.
- Elango, A., Jayalalitha, A. & Pugazhenthii, T. R. (2023). Impact of clean milk production practices on total viable count and coliform count in raw milk. *Biological Forum – An International Journal*, 15(6), 998–1001.
- Lingireddy, H., Bhargava, K., Abhishek, E., Madhusudhan, B., Banu Teja, C. & Guru Sri, B. (2023). An overview of digital technologies in agriculture and their applications. *Biological Forum–An International Journal (Research Trend, Bilaspur Himachal Pradesh, India)*, 15(2), 750-757.
- IMARC Group (2025, February 7). Indian online grocery market to reach USD 96.3 billion by 2033. Retrieved from <https://www.imarcgroup.com/online-grocery-market-india>
- IBEF (India Brand Equity Foundation). (2022, October 21). *Development of India's dairy sector*. Retrieved from <https://www.ibef.org/blogs/development-of-india-s-dairy-sector>
- Jasti, D. & Syed, A. A. (2019). Leveraging the internet for grocery shopping: A study of factors influencing the Indian consumer. *International Journal on Emerging Technologies*, 10(3), 436–443.
- Kaur, A. (2022). Exploring consumer behaviour in online grocery shopping: A comprehensive survey analysis in the Indian context. *IJFANS International Journal of Food and Nutritional Sciences*, 6714–6716.
- Lal, S. P., Kumari, A., Deo, S. and Mallick, B. (2025). Application of Artificial Intelligence and its Detrimental Effect on the Environment. *AgriBio Innovations*, 2(1), 87-91.
- Malik, A., Suresh, S. & Sharma, S. (2017). Factors influencing consumers' attitude towards adoption and continuous use of mobile applications: A conceptual model. *Procedia Computer Science*, 122, 106–113.
- Malhotra, N. K. & Dash, S. (2007). *Marketing research: An applied orientation*. Pearson Education India.
- Nguyen, T. T., Thi Thu Truong, H. & Le-Anh, T. (2023). Online purchase intention under the integration of theory of planned behavior and technology acceptance model. *Sage Open*, 13(4), 21582440231218814.
- Nonis, M. F., Miswanto, M., Horacio, A. & Brito, E. M. (2024). Increasing online purchase intention based on the integration of the technology acceptance model and theory of planned behaviour. *International Journal of Management and Digital Business*, 3(1), 15–31.
- Pal, V., B. & Kumari., P., (2023) Consumer Buying Behaviour towards Online Shopping: An Empirical Study on Patna City, Bihar, India, *Journal of Business Management and Information Systems*, 10(01), pp.4-9.
- Pai, P., Khan, B. & Mukherjee, P. (2018). Factors influencing food & grocery purchase decisions in India. *Journal of International Finance and Economics*, 18(4), 93–114.
- Primaroni, O., Wijayanto, G. & Samsir, S. (2024). The influence of theory of planned behavior and technology acceptance models on behavioral intentions in online grocery shopping in Pekanbaru City. *JAAMTER: Journal Audit Akuntansi Manajemen Terintegrasi*, 2(1), 305–323.
- PIB (Press Information Bureau) (2025). [Title of press release]. Retrieved from <https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2080137>
- Rakhi R. and Geetha Radhakrishnan (2024). Comprehensive Analysis of Precision Farming Technologies and their Impact on Sustainable Crop Management. *Biological Forum – An International Journal, (Research Trend, Bilaspur Himachal Pradesh, India)*, 16(4), 234-242.
- Saikia, S., & Saikia, M. (2023). Smart Sericulture and IoT: A Review. *Biological Forum–An International Journal (Research Trend, Bilaspur Himachal Pradesh, India)*, 15(1), 545-549.
- Scaria, A., Milna Antony, Milana Antony & Anagha P. (2020). A study on the factors affecting online shopping among young professionals. *International Journal on Emerging Technologies, (Research Trend, Bilaspur, Himachal Pradesh, India)*, 11(3), 253–256.
- Shukla, G., Ansari, M. N., Lal, S. P. and Bandhavya, M. (2022). Information Seeking Behaviour of Farmers through Mobile: An Innovative ICT Tool. *Biological Forum – An International Journal*, 14(1), 586-590.
- Tavakol, M. & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53–55.
- Verma, J. & Abdel-Salam, A. (2019). *Testing statistical assumptions in research*. John Wiley & Sons Inc.
- Wijayanto, G. (2024). Analyzing online food shopping behaviour in Pekanbaru City using the technology acceptance model (TAM). *International Journal of Religion*, 5(10), 4677–4687.
- Kailashkumar B. and G. Vijayakumar (2024). Data Driven Farm Mechanization using Artificial Intelligence: A Review. *Biological Forum – An International Journal, (Research Trend, Bilaspur, Himachal Pradesh, India)*, 16(5), 92-97.

How to cite this article: Urja Kotadia and Gautam Parmar (2025). Factors Influencing the Mobile app Adoption for Online Milk Purchase in Surat City. *International Journal on Emerging Technologies*, 16(2): 158–163.