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A TAM-Based Analysis of Consumer Attitude towards OGS in Tier 2&3 Indian Cities: Examining Key Determinants

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ABSTRACT

This study aims to examine customer purchasing behaviour in the online grocery sector inside India's Tier 2 and Tier 3 cities, utilizing the Technology Acceptance Model (TAM). The study seeks to evaluate the impact of multiple factors—including Perceived Usefulness (PU), Perceived Ease of Use (PEOU)—on consumers' intention to engage in online grocery shopping. This study aims to elucidate the primary facilitators and obstacles influencing digital grocery uptake in less urbanized areas by including these dimensions into the TAM framework. The results will be crucial for e-grocery platforms, policy makers and marketers in formulating strategies that enhance customer trust, mitigate perceived dangers, increase usability, and utilize promotional and regulatory assistance to increase adoption rates. This research enhances the scholarly discussion on online customer behaviour and provides practical insights for optimizing digital grocery services in emerging markets.

Keywords: Attitude, Adoption, TAM Model, online grocery shopping.

INTRODUCTION

E-commerce is a growing phenomenon in today's world, and any company that doesn't offer its products online misses out on the opportunity to be proactive and is compelled to act in a reactive way. Due to this, businesses understand the critical role that internet technology plays in day-to-day operations and see the adoption and use of internet as increasingly important and necessary to improve their competitiveness. (Ghauri, 2010). The majority of studies on Internet grocery concentrate on grocery retailers and the difficulties they encounter when going online for business, so there have been few empirical studies into consumers' plans to choose and use online grocery channels. (Huang & Oppewal, 2006). In some countries (like Great Britain), ordering groceries online and having them delivered to homes or picked up from a handy store is commonplace, but online grocery shopping is still relatively new in Sweden (Emmanuel Cimana & NakkarinPhoosangthong, 2013).

As the internet's liberation matures, it is crucial to determine consumer awareness of the online grocery market and the major variables influencing their choice to purchase food online. From an operational perspective, online grocery shopping presents a compelling research area. The efficient prediction, planning, and distribution of purchased goods constitute major logistical challenges for supermarkets engaged in e-commerce. Second, since food is the most common item purchased, there is rude competition in the grocery market (Emmanuel Cimana & NakkarinPhoosangthong, 2013). Therefore, increasing and sustaining both the level of customer gratification and business’s profitability becomes a

great concern (Rafiq & Fulford, 2005). For the purpose of the research, we will also study consumer meaning, types of consumers and models for consumer buying behavior.

Technology Acceptance Model (TAM) (Davis, 1989)

The original intent of the Technology Acceptance Model (TAM) was to investigate and analyze the variables that influence computer use. Two concepts are fundamental to TAM: A user's behavioral intention and subsequent usage of a computer system are fundamentally determined by Perceived Ease of usage (PEOU) and Perceived Usefulness (PU), according to the TAM. Figure 1 shows the model that describes the relationships between factors such as PU, PEOU, attitude, behavioral intention, and actual use.

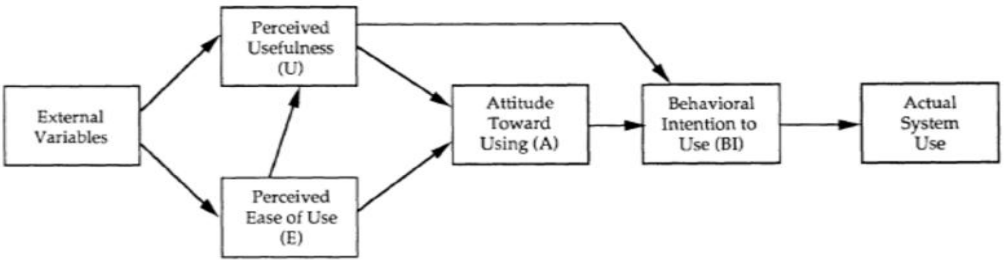

Figure 1: Technology Adoption Model (Source: David, 1989)

It was defined as "the degree to which a person believes that using a particular system would be free of effort" and "the degree to which a person believes that using a particular system would enhance his or her job performance" in the explanation of PU and PEOU, respectively. Furthermore, according to TAM, compared to PEOU, Perceived Usefulness (PU) has a far larger impact on usage behavior. The model's placement of PEOU as a prelude to PU implies that, rather than having an immediate impact on usage, its effect on PU mediates its influence on usage indirectly.

ANALYSIS AND DISCUSSION

Table 1 Descriptive Statistics

Variables	N	Mean	Std. Deviation	Minimum	Maximum
Perceived Usefulness	480	3.5425	0.79285	1.00	5.00
Perceived Ease of Use	480	3.6908	0.78954	1.00	5.00
Behavioural Intention	480	3.7117	0.81514	1.00	5.00
Actual usage	480	3.6950	0.69027	1.33	5.00

Perceived Usefulness (PU): The mean score of 3.542 (SD = 0.793) suggests that respondents generally find online grocery shopping useful, but with some variation in their perceptions. The minimum value of 1.00 indicates that some users strongly disagree with its usefulness, while the maximum value of 5.00 represents strong agreement.

Perceived Ease of Use (PEOU): With a mean of 3.691 (SD = 0.790), respondents generally perceive online grocery platforms as easy to use. The relatively low standard deviation indicates moderate consistency in responses, and the full range from 1.00 to 5.00 suggests a diversity of opinions.

Behavioural Intention (BI): A mean score of 3.712 (SD = 0.815) indicates that respondents have a moderately strong intention to adopt online grocery shopping. The minimum and maximum values (1.00 to 5.00) suggest that while some users have a low intention, many express a positive inclination toward adoption.

Actual Usage (AU): The mean of 3.695 (SD = 0.690) indicates that users engage in online grocery shopping at a moderate frequency. The standard deviation is relatively lower, indicating consistent usage patterns

Hypothesis of This Study

H1: Higher the Perceived Usefulness (PU), higher is the Behavioural Intention (BI) towards adoption of online grocery shopping.

Table 2 Regression Weights: (Group number 1 - Default model)

Path			Estimate	S.E.	Standardized Estimates	C.R.	P
Behavioural Intention	<---	Perceived Usefulness	.492	.049	.629	10.013	***
PU1	<---	Perceived Usefulness	1.000		.829		
PU2	<---	Perceived Usefulness	.786	.061	.797	12.966	***
PU3	<---	Perceived Usefulness	.836	.050	.782	16.737	***
PU4	<---	Perceived Usefulness	1.071	.084	1.003	12.737	***
BI1	<---	Behavioural Intention	1.000		.763		
BI2	<---	Behavioural Intention	1.080	.068	.835	15.845	***
BI3	<---	Behavioural Intention	.985	.076	.638	12.974	***

The structural equation model results indicate a significant relationship between Behavioural Intention (BI) and Perceived Usefulness (PU) in technology adoption. Perceived Usefulness is a strong predictor of Behavioural Intention, with a standardized estimate of 0.629 (β = 0.629, C.R. = 10.013, ***p < 0.001). This suggests that as users perceive a technology to be more useful, their intention to use it increases.

The measurement model for Perceived Usefulness shows high standardized estimates (PU1 = 0.829, PU2 = 0.797, PU3 = 0.782, PU4 = 1.003), indicating strong construct reliability. Similarly, the Behavioural Intention indicators also have strong factor loadings (BI1 = 0.763, BI2 = 0.835, BI3 = 0.638), confirming that the construct is well-represented. All relationships in the model exhibit statistically significant critical ratio (C.R.) values, reinforcing the model's robustness. The significant p-values (***p < 0.001) validate the theoretical framework, confirming that Perceived Usefulness significantly influences Behavioural Intention. The strong factor loadings further attest to the reliability of the constructs, supporting the hypothesis that perceived usefulness drives behavioural intention in technology adoption.

Table 3 Model fit summary

Variable	Value
Chi-square value(χ^2)	15.338
Degrees of freedom (df)	9
CMIN/DF	1.704
P value	0.082
GFI	0.991
RFI	0.977
NFI	0.990
IFI	0.996
CFI	0.996
RMR	0.027
RMSEA	0.038

The results indicate a satisfactory model fit based on key fit indices: χ^2 = 15.338, GFI = 0.991, RFI = 0.977, NFI = 0.990, IFI = 0.996, and CFI = 0.996, all exceeding the recommended threshold of 0.90. The root mean square residual (RMR) = 0.027 and the root mean square error of approximation (RMSEA) = 0.038 fall within acceptable limits. The CMIN/DF ratio = 1.704 suggests a good model fit. The p-value (0.082) indicates that the model is not statistically significant at the conventional 0.05 level, but it remains within an acceptable range. Overall, these results support the model's validity and its ability to represent the sample data effectively.

H2: Higher the Perceived Ease of Use (PEOU), higher is the Behavioural Intention (BI) towards adoption of online grocery shopping.

Table 4 Regression Weights: (Group Number 1 - Default Model)

Path			Estimate	S.E.	Standardized Estimates	C.R.	P
Behavioural Intention	<---	Perceived Ease of Use	.859	.054	.955	15.934	***
PEOU4	<---	Perceived Ease of Use	1.000		.784		
PEOU3	<---	Perceived Ease of Use	1.026	.054	.819	18.919	***
PEOU2	<---	Perceived Ease of Use	.977	.056	.760	17.344	***
PEOU1	<---	Perceived Ease of Use	.851	.059	.651	14.467	***
BI1	<---	Behavioural Intention	1.000		.747		
BI2	<---	Behavioural Intention	1.123	.062	.850	18.151	***
BI3	<---	Behavioural Intention	1.005	.074	.637	13.515	***

Structural equation model outcomes evaluate the influence of Perceived Ease of Use (PEOU) on Behavioural Intention (BI) in technology adoption. Behavioural Intention is the dependent variable, whereas Perceived Ease of Use is the independent variable. The results show that there is a high and significant correlation between Perceived Ease of Use and Behavioural Intention ($\beta = 0.955$, C.R. = 15.934, ***$p < 0.001$), indicating that increased perceived ease of use significantly increases behavioral intention to use the technology.

The Perceived Ease of Use measurement model has large standardized factor loadings of between 0.651 and 0.819, showing large construct reliability. In the same manner, the Behavioural Intention has loadings between 0.637 and 0.850, thereby verifying that the observed measures represent the underlying construct. Critical ratio (C.R.) scores are greater than the cut point of 1.96, indicating statistical significance. Since all p-values are less than 0.001, the model relationships are significant. These findings confirm that Perceived Ease of Use has a significant direct impact on Behavioural Intention, validating its key position in technology adoption models.

Table 5 Model fit summary

Variable	Value
Chi-square value(χ^2)	21.939
Degrees of freedom (df)	13
CMIN/DF	1.688
P value	0.056
GFI	0.988
RFI	0.979
NFI	0.987
IFI	0.995
CFI	0.995
RMR	0.018
RMSEA	0.038

The findings indicate that the model demonstrates an acceptable fit with the sample data. The chi-square value is $\chi^2 = 21.939$ with 13 degrees of freedom, resulting in a CMIN/DF of 1.688, which falls within an acceptable range. The goodness-of-fit indices—GFI (0.988), RFI (0.979), NFI (0.987), IFI (0.995), and CFI (0.995)—are all above the recommended threshold of 0.90, suggesting a well-fitting model. Additionally, the RMSEA (0.038) and RMR (0.018) values are below 0.08, indicating a low approximation error. The P-value (0.056) suggests marginal statistical significance. Overall, the results support the validity and reliability of the proposed model.

H3: Higher the Behavioural Intention towards adoption of online grocery shopping (BI), higher is the Actual usage (AU) of online grocery shopping.

Table 6 Regression Weights: (Group number 1 - Default model)

Path			Estimate	S.E.	C.R.	P
Actual usage	<---	Behavioural Intention	.629	.062	9.515	***
BI1	<---	Behavioural Intention	.794			
BI2	<---	Behavioural Intention	.803	.066	15.065	***
BI3	<---	Behavioural Intention	.645	.074	13.005	***
AU1	<---	Actual usage	.755			
AU2	<---	Actual usage	.835	.095	11.356	***
AU3	<---	Actual usage	.010	.098	.199	.842

Table depicts a hypothetical structural equation model that shows cases the interdependence between Two variables, namely the Behavioural Intention and Actual usage. In the present model, the independent variable is the Behavioural Intention, whereas the dependent variable is the Actual usage. The findings of the investigation indicate a positive and statistically significant relationship between Behavioural Intention and Actual usage (β=.629, P<0.05).

The standardized coefficient of 0.629, a positive association between Behavioural Intention and Actual usage, as shown in the route connecting these two variables. The correlation coefficient values (C.R. values) show large magnitudes, suggesting that the observed associations are statistically significant. The fit indices indicate that the model has a good fit, since the factors exhibit statistical significance with p-values over 0.05 (as shown in Table 6). Therefore, the total model fit was evaluated by using seven distinct fit indices, which together demonstrated a statistically significant positive association between Behavioural Intention and Actual usage.

Table 7 Model fit summary

Variable	Value
Chi-square value(χ^2)	3.525
Degrees of freedom (df)	8
CMIN/DF	.441
P value	0.897
GFI	0.998
RFI	0.994
NFI	0.998
IFI	0.998
CFI	0.997
RMR	0.013
RMSEA	0.010

The quality of fit was acceptable representation of the sample data (χ^2 = 3.525), NFI (Normed Fit Index) = 0.998; IFI (Incremental fit index) = 0.998, GFI (Goodness of Fit) = 0.998, RFI (Relative Fit Index) = 0.994 and CFI (Comparative Fit Index) = 0.997 which is much larger than the 0.90. Similarly, RMR (Root Mean Square Residuals) = 0.013 and RMSEA (Root mean square error of approximation) = 0.010 values is lower the 0.080 critical value. Results indicated a good fit for the model presented including RMSEA of 0.010, RMR of 0.013, GFI of 0.998, and CFI of .997.

DISCUSSION & CONCLUSION

The Findings offer interesting insights into the determinants of online grocery shopping adoption and the moderation effect of variables like age, gender, and income. The findings support that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) have a significant positive impact on Behavioural Intention (BI) (H1, H2), supporting the Technology Acceptance Model (TAM) that posits that people will accept technology when they see it as easy to use and useful. Additionally, age, gender, and income play a crucial role in shaping consumer responses, which suggests that tailored marketing strategies and personalized interventions are necessary to increase adoption rates. These results advance the digital retail adoption literature and offer managerial implications for e-commerce companies seeking to increase customer participation and trust towards online grocery store websites.

According to the findings of this research, a number of variables have a substantial impact on the Consumer's Attitude in adoption of online grocery shopping in India. Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are important attributes that have considerable good impact on adoption of online grocery shopping (OGS). From the very

beginning online grocery provides users convenience to stay at home and buy their groceries. Through there strong supply chain, they are able to deliver groceries on their doorstep. Initially these services were available in large metro cities only but gradually they have expanded their benefits to small town and cities of India (Tier 2 & 3 Cities), where customers can enjoy their leisure time indulging into other activities apart from filling their groceries and hassling in traffic for this purpose. Customers from small and remote towns got this convenience to shop their necessaries groceries at the comfort of staying at home anytime or wherever they are. Since, websites provides them all necessary information required by them in order to have smooth and fun shopping. Also, they prefer to buy groceries from the websites which is easy to use, where ordering process is also easy with adequate search options with product assortment and categories. With the time each and every aspect becoming smooth in buying groceries online resulting in more adoption of Online grocery shopping (OGS).

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