

Digital E-Commerce as a Lifeline for Independent Ageing: A Study of Older Adults Living Alone in Nuclear Families in New Town, Kolkata

Mr. Mofikul Islam

Assistant Professor, Department of Business Administration Aligarh Muslim University Centre
Murshidabad, West Bengal, India

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ABSTRACT

Population ageing, rapid urbanisation, changing family structures, and the increasing geographical separation of adult children are reshaping the way older people experience later life in contemporary India. Although the traditional joint-family system has historically played an important role in providing day-to-day support to older family members, the growing prevalence of nuclear families has created new challenges for older adults who may not have regular physical assistance from their children or other relatives. At the same time, the expansion of digital technologies and e-commerce services has created new possibilities for supporting independent living.

Against this background, online platforms offering food, groceries, medicines, and other essential commodities may provide practical support to older adults who live alone or have limited mobility. This study examines how such e-commerce services contribute to independent ageing among older adults living alone in nuclear-family settings in New Town, Kolkata. The study draws primarily on the Technology Acceptance Model (TAM), while also incorporating perspectives related to digital inclusion, independent living, and ageing in place.

A structured questionnaire-based survey design is proposed for the study. To demonstrate the proposed analytical framework, an illustrative dataset comprising 250 respondents aged 60 years and above is used in this draft. The analysis includes descriptive statistics, reliability testing, correlation analysis, and multiple regression. The illustrative results suggest that factors such as perceived usefulness, digital literacy, trust, perceived ease of use, delivery reliability, and confidence in making digital payments are positively related to the adoption of e-commerce services. Greater adoption of these services is also associated with higher levels of perceived digital self-reliance and quality of life.

However, the findings also highlight several difficulties faced by older users. Health and mobility limitations, concerns about online fraud, complicated digital interfaces, and dependence on family members or others for completing digital payments can restrict their effective use of e-commerce platforms. These challenges suggest that access to technology alone is not sufficient; older adults also need appropriate support, confidence, and user-friendly digital environments.

The study therefore argues that e-commerce should not be viewed as a substitute for family relationships, emotional support, or social interaction. Instead, it can serve as a practical means of reducing older adults' dependence on family members for routine purchasing and household requirements. The study recommends the development of age-friendly interfaces, simpler payment systems, assisted digital services, dedicated customer support for senior citizens, dependable delivery mechanisms, and targeted digital-literacy programmes.

Overall, the research contributes to the growing literature on ageing, e-commerce, consumer behaviour, digital inclusion, and independent living by highlighting **e-commerce-enabled self-reliance as an emerging dimension of ageing in place**.

Keywords: ageing in place, older adults, elderly consumers, e-commerce, online grocery shopping, digital literacy, digital self-reliance, nuclear family, independent living, New Town Kolkata, technology acceptance.

INTRODUCTION

Population ageing has become one of the major demographic and socioeconomic changes of the twenty-first century. Increasing life expectancy, declining fertility rates, rapid urbanisation, migration, and changing household structures are gradually reshaping the traditional systems through which older people receive care and everyday assistance. This issue is particularly relevant in urban India, where younger family members often move to other cities or countries for education, employment, and professional opportunities, while their ageing parents continue to live in their established homes.

Traditionally, the Indian joint-family system provided older adults with considerable practical support in meeting everyday needs. Family members commonly assisted with purchasing food and groceries, obtaining medicines, managing household goods, and carrying out other routine activities. However, the increasing prevalence of nuclear families and the physical distance between generations have altered this pattern of support. As a result, some older adults may have to manage their daily household requirements with limited or no regular physical assistance from their children or other family members.

At the same time, independent living can be an important and desirable aspect of ageing. For many older adults, the ability to remain in a familiar home and neighbourhood provides a sense of dignity, autonomy, privacy, and personal control. Independence, however, should not be interpreted as complete isolation or the absence of assistance. Rather, it involves having sufficient control over everyday decisions and activities while being able to obtain appropriate support whenever required.

The rapid development of digital technologies has opened up new possibilities for facilitating such independence. Smartphones, internet services, online banking, digital payment systems, food-delivery applications, online grocery platforms, e-commerce marketplaces, and rapid-delivery services have made it possible to obtain many everyday necessities without visiting physical markets. For an older person experiencing mobility difficulties, health-related limitations, transportation problems, or the absence of an immediately available family member, ordering essential goods through a smartphone may be considerably more convenient than travelling to several shops.

Previous research on online grocery shopping among older adults has identified health conditions, mobility limitations, and the distance from physical retail outlets as important factors affecting the adoption of online shopping. Studies combining the Technology Acceptance Model (TAM) with the Capability Approach have further suggested that online grocery services may, in certain circumstances, reduce the need for physical grocery trips and thereby support independent living among older people.

The Indian context deserves particular attention in this regard. Research involving 282 elderly online grocery shoppers in India has indicated that factors such as website design, responsiveness of customer service, availability of product information, product variety, and competitive pricing can shape the online grocery experience of senior consumers. More recent research focusing on older adults in Kolkata has similarly suggested that digital technologies can provide practical support to people living alone, although concerns about online fraud, technological complexity, and inadequate assistance continue to limit their effective use.

These developments raise an important question:

Can e-commerce serve as a practical support mechanism that enables older adults living alone to manage their routine food and essential-commodity requirements without regularly depending on physically present family members?

The present study addresses this question within the proposed empirical setting of New Town, Kolkata. The area provides a relevant urban context because of its modern residential infrastructure, relatively high levels of digital connectivity, growing service economy, apartment-based residential communities, and the presence of both working-age households and older residents.

Importantly, this study does not suggest that digital commerce can replace family relationships or human care. Emotional companionship, social interaction, healthcare assistance, emergency support, and other forms of family involvement cannot simply be substituted by online shopping. Instead, the study focuses on a narrower but practically important dimension of ageing: whether e-commerce can reduce **older adults' dependence on physically present family members for routine consumption-related activities**. In this sense, digital commerce may represent not a replacement for family support, but an additional mechanism through which older adults can maintain greater autonomy in their everyday lives.

Background and Research Problem

Changing family Structures

The gradual shift from joint and extended family arrangements towards nuclear households has significant implications for the everyday lives of older adults. In many nuclear-family settings, older parents may continue to live in their familiar homes while their adult children reside in a different neighbourhood, city, state, or even another country. As a result, physical proximity, which traditionally served as an important source of routine assistance, may no longer be consistently available.

This change should not necessarily be interpreted as a decline in family responsibility. Adult children may continue to provide financial support, emotional care, and assistance through digital communication and other remote means. Nevertheless, a practical difficulty remains: who will purchase vegetables, rice, milk, toiletries, cleaning materials, packaged food, and other household necessities when an older person has difficulty travelling to the market or carrying essential items?

For many older adults, e-commerce may offer a practical solution to this everyday problem. By allowing essential goods to be ordered and delivered directly to the home, online commerce can potentially reduce the need for physical assistance while enabling older people to remain in their familiar surroundings.

E-Commerce and Older Consumers

The Technology Acceptance Model (TAM), proposed by Davis (1989), identifies perceived usefulness and perceived ease of use as two fundamental factors influencing an individual's acceptance of technology. In the case of older consumers, however, the decision to adopt digital services may depend on a wider range of considerations, including trust, digital literacy, technology-related anxiety, physical capability, security concerns, and access to assistance.

The Unified Theory of Acceptance and Use of Technology (UTAUT) similarly emphasises factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions in explaining technology adoption and use.

For older adults, the usefulness of e-commerce can be particularly practical and immediate. Online shopping is not simply a means of saving time or obtaining lower prices. It may allow an older person to purchase essential goods without walking long distances, carrying heavy bags, dealing with traffic, arranging transportation, or depending on another person to accompany them to the market. Thus, the value of e-commerce for older consumers may extend beyond convenience to include greater autonomy in managing everyday household needs.

Digital Self-Reliance

Against this background, the present study introduces the concept of **Digital E-Commerce Self-Reliance (DESR)**. DESR refers to an older person's perceived ability to use digital commerce platforms to independently obtain routine food, grocery, household, and other essential commodities without requiring regular physical assistance from family members or caregivers.

Digital E-Commerce Self-Reliance should not, however, be understood as complete technological independence. An older person may occasionally require assistance from an adult child, caregiver, friend, or other person—for example, when installing an application, resolving a payment-related difficulty, changing a password, or understanding a newly introduced feature. Such occasional assistance does not necessarily undermine the person's overall independence in routine purchasing activities.

The concept therefore focuses on **functional independence in everyday consumption**, rather than complete independence from all forms of technological or social support.

Research Gap

Previous research has examined several aspects of digital technology use among older adults, including online shopping adoption, digital literacy, online grocery experiences, technology acceptance, and barriers to digital participation. However, comparatively less attention has been given to the question of whether **e-commerce can function as an everyday support infrastructure for independent ageing among older adults who do not have regular physical assistance from family members**.

The context of Kolkata is particularly relevant to this issue. Recent research involving older adults living by themselves in Kolkata suggests that digital engagement can be influenced by factors such as digital confidence, availability of support, gender, concerns about online fraud, and difficulties associated with digital devices and applications. These findings indicate that access to technology alone does not guarantee effective digital participation among older people.

The present study seeks to extend this emerging line of research by focusing specifically on the procurement of **food, groceries, and essential household commodities through e-commerce platforms**. It further examines whether the ability to use such services independently is associated with older adults' perceptions of self-reliance and quality of life.

In doing so, the study shifts the focus from e-commerce adoption merely as a consumer-behaviour outcome towards a broader question of **whether digital commerce can contribute to independent ageing and ageing in place**. The study consequently treats e-commerce not simply as a retail channel, but as a potential component of the everyday support infrastructure available to older adults living independently.

The study addresses the following research questions:

RQ1: What is the level of e-commerce adoption among older adults living independently in New Town?

RQ2: What factors influence their adoption of online food and essential-commodity services?

RQ3: Does digital literacy influence e-commerce-enabled self-reliance?

RQ4: Does e-commerce reduce dependence on family members for routine household purchases?

RQ5: Does e-commerce-enabled self-reliance contribute to perceived quality of life?

RQ6: What technological, financial, psychological, and operational barriers restrict independent e-commerce usage?

Objectives of the Study

The study has the following objectives:

1. To examine the extent of e-commerce adoption among older adults living alone in nuclear-family settings in New Town, Kolkata.
2. To identify the major categories of food and essential commodities purchased online by older adults.

3. To examine the influence of digital literacy on e-commerce adoption.

4. To assess the influence of perceived usefulness and perceived ease of use on e-commerce adoption.

Conceptual Framework

The conceptual framework is primarily based on the Technology Acceptance Model (Davis, 1989), with additional variables relevant to ageing.

The proposed model is:

Digital Literacy



Perceived Ease of Use



Perceived Usefulness



E-Commerce Adoption



Digital E-Commerce Self-Reliance



Independent Ageing / Quality of Life

Additional antecedents include:

- Trust
- Digital-payment confidence
- Delivery reliability
- Product availability
- Mobility limitations
- Technology anxiety
- Family/digital support

The framework assumes that when older adults perceive online shopping as useful, easy, trustworthy, secure, and reliable, they are more likely to adopt it. Greater adoption may increase their ability to obtain everyday necessities independently, thereby supporting ageing in place.

Hypotheses

Based on the conceptual framework, the following hypotheses are proposed.

H1: Digital literacy has a significant positive relationship with e-commerce adoption among older adults.

H2: Perceived usefulness has a significant positive relationship with e-commerce adoption.

H3: Perceived ease of use has a significant positive relationship with e-commerce adoption.

H4: Trust in e-commerce platforms has a significant positive relationship with e-commerce adoption.

H5: Digital-payment confidence has a significant positive relationship with e-commerce adoption.

H6: Delivery reliability has a significant positive relationship with continued e-commerce usage.

H7: E-commerce adoption has a significant positive relationship with digital e-commerce self-reliance.

H8: Digital e-commerce self-reliance has a significant positive relationship with perceived quality of life.

RESEARCH METHODOLOGY

Research Design

The study follows a quantitative, cross-sectional survey design. A structured questionnaire is proposed for collecting primary data from older adults living in New Town, Kolkata.

A mixed-method extension is also recommended for the final empirical study because quantitative data can identify statistical relationships while interviews can explain the lived experiences behind those relationships.

Study population

The target population comprises individuals aged **60 years or above** who:

- live in New Town, Kolkata;
- live alone or primarily without co-resident adult family members;
- belong to nuclear-family arrangements;
- have adult children or close family members who do not provide regular physical assistance; and
- have access to a smartphone, internet connection, or e-commerce-enabled digital device.

The study focuses particularly on routine food and essential-commodity procurement.

Sampling

For the model study presented in this manuscript, a hypothetical/illustrative sample of **250 respondents** is used.

A future actual field study may employ purposive sampling followed by snowball sampling because older adults living alone constitute a relatively specific population that may not be easily identified through conventional random sampling.

Potential recruitment locations may include residential complexes, senior citizens' associations,

data Collection instrument

The questionnaire consists of five sections:

Section A: Demographic characteristics

Section B: Digital access and literacy

Section C: E-commerce usage behaviour

Section D: Technology acceptance and trust

Section E: Digital self-reliance and quality of life

Most attitudinal questions use a five-point Likert scale:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

Variables

Independent Variables

- Digital literacy
- Perceived usefulness
- Perceived ease of use
- Trust
- Digital-payment confidence
- Delivery reliability

Mediating / Behavioural Variable

- E-commerce adoption

Outcome variables

- Digital e-commerce self-reliance
- Perceived quality of life

Illustrative Data Analysis and results

Demographic profile

Table 1 Illustrative Demographic Profile of Respondents (N = 250)

Variable	Category	Frequency	Percentage
Age	60–64	78	31.2
	65–69	69	27.6
	70–74	57	22.8
	75–79	31	12.4

	80+	15	6.0
Gender	Male	139	55.6
	Female	111	44.4
Living arrangement	Completely alone	142	56.8
	With elderly spouse	108	43.2
Education	Secondary or below	42	16.8
	Graduate	97	38.8
	Postgraduate	88	35.2
	Other professional education	23	9.2
Previous occupation	Government	81	32.4
	Private sector	64	25.6
	Business/self-employed	38	15.2
	Professional/academic	42	16.8
	Other	25	10.0

The illustrative demographic profile indicates that the largest age category is 60–64 years. More than half of the respondents live completely alone, while the remainder live with an elderly spouse without regular co-resident assistance from adult children.

Digital Access

Table 2 Illustrative Digital Access and E-Commerce Usage

Indicator	Frequency	Percentage
Own smartphone	236	94.4
Regular internet access	229	91.6
Use digital payments	218	87.2
Use WhatsApp	232	92.8
Use online grocery services	181	72.4
Use online food delivery	164	65.6
Purchase household essentials online	173	69.2
Purchase medicines/health-related items online	118	47.2
Independently place online orders	156	62.4

Require occasional assistance	76	30.4
Completely dependent on others for online purchases	18	7.2

The illustrative results suggest relatively high smartphone and internet penetration among respondents. However, ownership of a device does not automatically imply independent digital competence.

Approximately 62.4% of respondents are assumed to place online orders independently, while 30.4% occasionally require assistance. This distinction is important because digital inclusion should not be measured merely by device ownership.

Major categories purchased online

Table 3 Illustrative Categories of Online Purchases

Product category	Respondents using service	Percentage
Groceries	181	72.4
Fresh food/vegetables	137	54.8
Cooked food	164	65.6
Milk/dairy products	121	48.4
Household cleaning products	173	69.2
Personal-care products	149	59.6
Medicines/health products	118	47.2
Packaged food	156	62.4
Clothing/other goods	92	36.8

The highest usage is assumed to occur for groceries and household cleaning products. Food delivery is also relatively common. Medicines represent an important but more sensitive category because some respondents may prefer physical pharmacies or require professional advice.

Descriptive Statistics

The constructs were measured using five-point Likert scales.

Table 4 Illustrative Descriptive Statistics

Construct	Mean	SD
Digital literacy	3.71	0.82
Perceived usefulness	4.08	0.67
Perceived ease of use	3.73	0.79
Trust	3.51	0.86

Payment confidence	3.69	0.84
Delivery reliability	3.82	0.75
E-commerce adoption	3.79	0.78
Digital self-reliance	3.74	0.80
Quality of life	3.69	0.73

Perceived usefulness records the highest mean score. This suggests that older adults may recognise the practical benefits of e-commerce even when they experience difficulties with digital interfaces.

Trust records a relatively lower mean, suggesting that security and fraud concerns may remain significant obstacles.

Reliable Analysis

Cronbach's alpha is used to assess internal consistency.

Table 5 Illustrative Reliability Statistics

Construct	Number of items	Cronbach's α
Digital literacy	4	.86
Perceived usefulness	4	.89
Perceived ease of use	4	.87
Trust	4	.88
Payment confidence	3	.84
Delivery reliability	3	.82
E-commerce adoption	4	.90
Digital self-reliance	4	.91
Quality of life	5	.88

All illustrative alpha coefficients exceed .80, indicating strong internal consistency.

For the actual study, however, reliability should be calculated from the real respondent-level data rather than assumed.

Correlation Analysis

Table 6 Illustrative Pearson Correlation Matrix

Variable	1	2	3	4	5	6	7
1. Digital literacy	1						

2. Usefulness	.54**	1					
3. Ease of use	.58**	.63**	1				
4. Trust	.41**	.52**	.47**	1			
5. Payment confidence	.61**	.51**	.57**	.48**	1		
6. E-commerce adoption	.55**	.67**	.59**	.54**	.58**	1	
7. Digital self-reliance	.49**	.60**	.54**	.46**	.51**	.71**	1

Note. $p < .01$.

The illustrative correlation results show positive associations among the principal variables. E-commerce adoption has a relatively strong positive relationship with digital self-reliance ($r = .71$), suggesting that greater use of e-commerce may be associated with greater perceived ability to manage everyday purchases independently.

Regression Analysis

A multiple regression model is proposed to examine the determinants of e-commerce adoption.

Table 7 Illustrative Multiple Regression Predicting E-Commerce Adoption

Predictor	β	t	Significance
Digital literacy	.24	4.32	< .001
Perceived usefulness	.29	5.17	< .001
Perceived ease of use	.16	2.86	.005
Trust	.18	3.21	.002
Payment confidence	.09	1.71	.089
Delivery reliability	.13	2.37	.019

Illustrative model statistics: $R^2 = .58$; Adjusted $R^2 = .57$; $F(6, 243) = 55.72$, $p < .001$.

The model suggests that perceived usefulness is the strongest predictor of e-commerce adoption, followed by digital literacy, trust, perceived ease of use, and delivery reliability.

Payment confidence shows a positive coefficient but is assumed not to reach conventional statistical significance in this illustrative model.

These results are theoretically consistent with the Technology Acceptance Model, which places particular importance on perceived usefulness and perceived ease of use in technology adoption (Davis, 1989).

E-Commerce Adoption and Digital Self-reliance

A second regression model examines whether e-commerce adoption predicts digital self-reliance.

Table 8 Illustrative Regression Predicting Digital E-Commerce Self-Reliance

Predictor	β	t	Significance
E-commerce adoption	.71	15.98	< .001
Digital literacy	.13	2.84	.005
Trust	.08	1.77	.078

Illustrative model: $R^2 = .61$; Adjusted $R^2 = .60$; $p < .001$.

The illustrative results suggest that e-commerce adoption is strongly associated with digital self-reliance.

This is the central proposition of the study. An older adult who can independently order groceries, food, cleaning products, toiletries, and other essential goods can reduce the need to ask a family member to physically visit a market or shop.

Digital Self-Reliance and Quality of Life

Table 9 Illustrative Regression Predicting Perceived Quality of Life

Predictor	β	t	Significance
Digital self-reliance	.62	12.31	< .001
E-commerce adoption	.17	3.42	.001
Social connectedness	.19	3.76	< .001

Illustrative model: $R^2 = .49$; Adjusted $R^2 = .48$; $p < .001$.

The illustrative results suggest that digital self-reliance has a substantial positive association with perceived quality of life.

However, social connectedness remains independently important. This supports the argument that e-commerce can complement family and community support but cannot replace emotional companionship or social relationships.

Hypothesis Testing

Table 10 Illustrative Hypothesis Testing Summary

Hypothesis	Relationship	Result
H1	Digital literacy $\rightarrow$ E-commerce adoption	Supported
H2	Perceived usefulness $\rightarrow$ E-commerce adoption	Supported
H3	Ease of use $\rightarrow$ E-commerce adoption	Supported
H4	Trust $\rightarrow$ E-commerce adoption	Supported
H5	Payment confidence $\rightarrow$ E-commerce adoption	Not supported in illustrative model

H6	Delivery reliability → Continued usage	Supported
H7	E-commerce adoption → Digital self-reliance	Supported
H8	Digital self-reliance → Quality of life	Supported

The illustrative model provides preliminary support for seven of the eight proposed relationships.

Barriers to E-Commerce Adoption

Table 11 Illustrative Major Barriers

Barrier	Respondents identifying barrier	Percentage
Fear of online fraud	148	59.2
Difficulty navigating applications	119	47.6
Payment-related anxiety	106	42.4
Small text/font size	97	38.8
Difficulty comparing products	79	31.6
Delivery problems	76	30.4
Difficulty obtaining refunds	69	27.6
Preference for physical shopping	62	24.8
Lack of digital assistance	58	23.2
Lack of confidence in product quality	55	22.0

Fear of online fraud is the most prominent illustrative barrier.

This finding is consistent with recent research on older adults living alone in Kolkata, which identifies fear of fraud, technological complexity, and inadequate support as important constraints on meaningful digital engagement.

DISCUSSION

The proposed findings have several theoretical and practical implications.

First, the results reinforce the relevance of the Technology Acceptance Model to elderly e-commerce adoption. Perceived usefulness emerges as an important determinant. For older adults, usefulness has a specific meaning: it can mean avoiding physical travel, carrying heavy bags, standing in queues, negotiating traffic, and depending upon others.

Second, digital literacy is important. Smartphone ownership alone does not guarantee digital independence. An older adult may possess a smartphone but still depend on a child or neighbour for installing applications, entering payment information, comparing products, identifying genuine sellers, or resolving failed transactions.

Third, trust is particularly important. Older adults may be more cautious about sharing payment information, clicking links, responding to messages, or accepting unfamiliar digital offers. Therefore, trust should be treated as a central component of elderly e-commerce adoption.

Fourth, delivery reliability matters. For an older person living independently, the delivery process is part of the service rather than a peripheral logistics function. Late delivery, incorrect products, damaged packages, or complicated return procedures can create substantial inconvenience.

Research on online grocery shopping among older adults has similarly shown that health, mobility, and distance from physical stores are important situational factors influencing online shopping decisions.

Fifth, e-commerce can be understood as part of an emerging **digital care infrastructure**. This does not mean that e-commerce companies become caregivers. Rather, digital services can perform certain practical functions that traditionally required another person to be physically present.

For example, an older adult may independently order:

- Rice and flour;
- Vegetables;
- Milk;
- Fruits;
- Packaged food;
- Cleaning materials;
- Toiletries;
- Personal-care products;
- Household supplies; and
- Other essential commodities.

This can transform the meaning of independence.

E-Commerce as a Practical Substitute for Physical Assistance

The phrase “substitute for family assistance” requires careful interpretation.

E-commerce cannot substitute for:

- Emotional companionship;
- Emergency medical support;
- Physical caregiving;
- Transportation during serious illness;
- Social interaction;
- Decision-making assistance;

- Psychological support.

However, it can substitute for a limited class of **routine physical tasks**, particularly purchasing and transporting everyday commodities.

This distinction provides an important conceptual contribution.

The research therefore proposes three levels of support:

Level 1: Physical Family Support

A family member physically purchases and delivers goods.

Level 2: Assisted Digital Support

The older person selects the products but requires a child, neighbour, caregiver, or friend to complete the digital transaction.

Level 3: Independent Digital Support

The older person independently selects, orders, pays for, receives, and manages the purchase.

The transition from Level 1 to Level 3 represents increasing **digital self-reliance**.

Findings of the Study

Based on the illustrative model, the principal findings are as follows:

1. Smartphone and internet access are relatively widespread among digitally engaged older adults.
2. Online grocery shopping represents one of the most important e-commerce applications for independent ageing.
3. Perceived usefulness is a major determinant of e-commerce adoption.
4. Digital literacy positively influences adoption.
5. Perceived ease of use is important because complicated interfaces can discourage older users.
6. Trust is a major factor affecting adoption.
7. Delivery reliability contributes to continued usage.
8. E-commerce adoption is strongly associated with digital self-reliance.
9. Digital self-reliance is positively associated with perceived quality of life.
10. Fear of online fraud is a major barrier.
11. Payment anxiety remains an obstacle for a substantial proportion of older adults.
12. Some older adults still prefer physical markets because of familiarity and social interaction.
13. E-commerce can reduce dependence on family members for routine household purchases.
14. E-commerce cannot replace emotional, social, or healthcare support.

15. Age-friendly digital design is therefore essential for meaningful digital inclusion.

Theoretical Implications

The study contributes to the Technology Acceptance Model by extending its application from general technology usage to the specific context of independent ageing.

Traditional technology-adoption research frequently treats usefulness in terms of productivity, efficiency, convenience, or performance. In the context of ageing, usefulness may additionally mean:

- Maintaining autonomy;
- Reducing physical effort;
- Maintaining food access;
- Reducing dependence;
- Remaining in one's own home;
- Preserving dignity; and
- Managing daily life despite declining mobility.

The study therefore proposes that **independent ageing utility** should be considered an important dimension of perceived usefulness in future research on older consumers.

The concept of **Digital E-Commerce Self-Reliance** may also provide a useful construct for future empirical studies.

Managerial Implications

E-commerce companies should redesign their platforms for older consumers.

Senior-friendly interface

Platforms should provide:

- Larger fonts;
- High-contrast displays;
- Simplified menus;
- Fewer steps;
- Clear product descriptions;
- Prominent customer-support options;
- Voice-based assistance; and
- Simple reorder functions.

Senior-specific payment mechanisms

Companies should consider:

- Simplified payment workflows;
- Transaction confirmation screens;
- Clear payment status;
- Fraud warnings;
- Easy refund procedures;
- Secure saved-payment options; and
- Optional assistance from verified customer-support personnel.

Reliable Delivery

Delivery personnel should be trained to communicate respectfully with older customers and assist with basic delivery-related difficulties without compromising safety or privacy.

Easy repeat ordering

A “Buy Again” or “My Regular Essentials” function could be particularly useful for older adults.

For example, the customer could create a weekly household basket containing:

- Milk;
- Bread;
- Rice;
- Vegetables;
- Fruits;
- Toiletries;
- Cleaning materials.

This would reduce cognitive and navigational burden.

Social and Policy Implications

The findings also have implications for policymakers.

Digital literacy programmes

Senior citizen digital-literacy programmes should not focus exclusively on social media. They should teach practical life skills such as:

- Online grocery ordering;
- Digital payments;
- Checking delivery status;
- Identifying fraudulent links;

- Requesting refunds;
- Verifying sellers;
- Using customer support.

Community digital assistance centres

Residential complexes and senior citizen associations could establish trained digital volunteers who assist older adults without taking control of their passwords, bank accounts, or financial credentials.

Cyber-Safety education

Cybersecurity awareness should be incorporated into elderly digital-literacy programmes.

Age-friendly digital standards

Government and industry bodies could develop accessibility standards for e-commerce platforms targeting older consumers.

RECOMMENDATIONS

Based on the proposed findings, the following recommendations are made:

1. E-commerce platforms should introduce dedicated senior-friendly interfaces.
2. Font sizes and navigation should be customisable.
3. Voice-assisted ordering should be expanded.
4. Digital payment processes should be simplified.
5. Older users should receive clear fraud-prevention information.
6. Customer service should provide a dedicated senior-citizen support channel.
7. Delivery services should offer predictable time windows.
8. Repeat-order functions should be made prominent.
9. Return and refund processes should be simplified.
10. Residential complexes should promote digital-literacy workshops.
11. Senior citizen associations should create voluntary digital-support networks.
12. Family members should encourage rather than completely control older adults' digital activities.
13. E-commerce companies should conduct usability testing specifically with consumers aged 60+.
14. Community organisations should combine digital assistance with social interaction.
15. Policymakers should promote affordable and accessible internet connectivity for older adults.
16. Digital inclusion programmes should measure independent usage rather than merely smartphone ownership.

Limitations

Several limitations should be recognised.

First, this paper is designed as a research framework and model empirical paper. The numerical results presented in the analysis section are **illustrative rather than actual field observations**.

Second, the proposed study focuses on New Town, Kolkata. Findings from this relatively urban and digitally connected environment may not generalise to rural or less digitally developed locations.

Third, the cross-sectional design cannot establish definitive causality. Longitudinal research would be more appropriate for examining whether increased e-commerce adoption actually improves independence over time.

Fourth, self-reported quality of life may be influenced by respondents' subjective perceptions.

Fifth, e-commerce users may be more digitally confident than non-users, creating possible selection bias.

Sixth, the study focuses mainly on routine consumer goods. It does not fully examine healthcare, emergency services, transportation, or social interaction.

Scope for Future Research

Future studies can extend the research in several directions.

First, researchers can compare **older adults living alone with older adults living in multigenerational households**.

Second, comparative studies can examine New Town, Salt Lake, Kolkata, and other metropolitan residential areas.

Third, researchers can examine differences between male and female older consumers.

Fourth, longitudinal studies can investigate whether e-commerce adoption increases as mobility decreases.

Fifth, future studies can examine the relationship between e-commerce adoption and loneliness.

Sixth, researchers can investigate voice-commerce and AI-based shopping assistance for older consumers.

Seventh, future research can examine whether family members remotely assist older adults with digital purchases and whether such assistance promotes or inhibits independence.

Eighth, a structural equation modelling approach can be employed to test the complete conceptual framework.

CONCLUSION

The ageing of India's urban population and the transformation of family structures require new approaches to understanding independent living. Older adults who live alone or without regular physical assistance from family members face a practical challenge: managing everyday necessities while maintaining autonomy and dignity.

Digital e-commerce can provide an important part of the solution.

Online grocery services, food-delivery platforms, household-commodity marketplaces, and other digital services can reduce the necessity of physically visiting markets. For older adults with mobility limitations or geographically distant children, this convenience can have implications far beyond ordinary consumer convenience.

The central argument of this paper is that **e-commerce can function as a digital support infrastructure for independent ageing.**

It should not, however, be interpreted as a replacement for family relationships. Human companionship, emotional support, healthcare assistance, emergency support, and social interaction remain essential components of healthy ageing. Rather, e-commerce can reduce dependence on family members for a narrower but important category of activities: routine procurement of food and essential commodities.

The illustrative statistical model presented in this paper suggests that perceived usefulness, digital literacy, ease of use, trust, and delivery reliability can influence e-commerce adoption, while e-commerce adoption can contribute to digital self-reliance. Digital self-reliance, in turn, may contribute to perceived quality of life.

The implications are particularly relevant to urban areas such as New Town, Kolkata, where digital infrastructure and apartment-based living provide favourable conditions for technology-enabled ageing.

The future of ageing should therefore not be viewed simply as a choice between **family care and institutional care**. A third dimension is emerging:

family support + community support + digital self-reliance.

Within this model, e-commerce may become a practical “lifeline” that enables older adults to remain in their homes, manage routine consumption needs, preserve autonomy, and reduce unnecessary dependence on physically present family members.

The next stage of research should validate this proposition through systematic primary data collection from older adults in New Town and other metropolitan areas of India.

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