



**HAL**  
open science

# Modified UTAUT2 to Determine Intention and Use of E-Commerce Technology Among Micro & Small Women Entrepreneurs in Jharkhand, India

Sraboni Dutta, Shradha Shivani

► **To cite this version:**

Sraboni Dutta, Shradha Shivani. Modified UTAUT2 to Determine Intention and Use of E-Commerce Technology Among Micro & Small Women Entrepreneurs in Jharkhand, India. International Working Conference on Transfer and Diffusion of IT (TDIT), Dec 2020, Tiruchirappalli, India. pp.688-701, 10.1007/978-3-030-64861-9\_60 . hal-03744806

**HAL Id: hal-03744806**

<https://inria.hal.science/hal-03744806v1>

Submitted on 3 Aug 2022

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

# Modified UTAUT2 to determine Intention and Use of E-Commerce Technology among Micro & Small Women Entrepreneurs in Jharkhand, India

Dr. Sraboni Dutta<sup>1</sup> and Dr. Shradha Shivani<sup>2</sup>

<sup>1</sup> Birla Institute of Technology, Mesra , Ranchi-835215

<sup>2</sup> Birla Institute of Technology, Mesra , Ranchi-835215  
sdutta@bitmesra.ac.in, shraddhashivani@bitmesra.ac.in

**Abstract.** E-commerce revolution is creating enormous growth opportunities for Indian SMEs. Yet, reports suggest that adoption of e-commerce remains low among women entrepreneurs in the micro and small sector. This research applies a technology acceptance perspective to examine the determinants which induce the behavioral intention to accept and use e-commerce among the women entrepreneurs of Jharkhand, a developing state of eastern India. The UTAUT2 model of technology acceptance was modified to measure the relative impact of performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation , price value , individual innovativeness and achievement motivation on their intention to adopt and use e-commerce under the influence of age and experience as moderators. Structural Equation Modeling was employed and the findings confirm the positive influence of all the core determinants except for hedonic motivation. This implies that in order to improve the weak penetration of e-commerce in the population, campaigns have to be designed and implemented to make the women entrepreneurs perceive that investment in ICT for e-commerce will be valuable for them and that they can easily use the technology .

**Keywords:** E-commerce, Modified UTAUT2, Women Micro & Small Entrepreneurs, Structural Equation Modelling.

## 1 Introduction

One of the ICT applications which have gained immense usage is e-commerce (electronic commerce). India has been a witness to an e-commerce boom. With exponential growth in internet penetration in last few decades, the e-commerce sector in India is particularly lucrative for all. It is projected that by 2020 approximately 330 million people in India will be buying goods and services online. It is projected that between 2016 and 2021, retail e-commerce will grow from around 16 billion USD to over 45 billion USD and the CAGR for the sector is projected to reach 23 percent [32].

Given this scenario, it has become imperative for SMEs to embrace digitization and adopt e-commerce to accelerate their business growth. Moreover, with the onslaught of the Covid-19 pandemic, this is fast becoming a necessity for sustenance. Numerous reports like the KPMG Snapdeal Report [36] highlighted the various benefits Indian SMEs using e-commerce have been reaping. Yet only 43% of SMEs are involved in online sales [65].

In India, where the economic contribution of women is approximately 17% of the GDP, the growth of women-run businesses could translate into a huge boost to the economy. Indian women entrepreneurs in the SME sector are increasingly coming to the forefront and are now confident and optimistic about the growth of their businesses [16].

ICT and e-commerce can help women entrepreneurs to reduce time and mobility constraints, increase market reach, upgrade skills and enable wider participation in business network [41]. Women entrepreneurs are increasingly prompted to use ICTs like mobile phones, SMS, e-mail, social network and internet based telephony (such as Skype) to reach their existing and potential customers and business partners, thereby increasing their confidence in conducting economic activities [3, 45]. Big marketplaces like Amazon Mahila-e-Haat, e-Bay, Alibaba.com amongst others are continuously inspiring and encouraging Indian women entrepreneurs to adopt ecommerce [36, 46, 56]. The 'Digital India' campaign of the Government of India is also aimed at enabling wider section of businesses to adopt ICT. Despite this, the small and micro women entrepreneurs continue to encounter barriers in incorporating ICT for ecommerce into their business firms. It has been reported that only 20 per cent of these women entrepreneurs in India use online platforms to sell [64]. This reflects the lack of infrastructure or awareness about the benefits of e-commerce platforms. Fear of security of payments and privacy of online transactions are issues plaguing women entrepreneurs. For women entrepreneurs, particularly at the bottom of the pyramid to make the most out of India's e-commerce boom, there is definitely need for mentorship, technical handholding and business advice [57].

An inherent reason for the above observations could be the gender digital divide, a characteristic of majority of the developing nations [26,49, 50, 51]. It is stated that women in South Asia (including India) are 26% less likely to own a mobile phone than men and 70% less likely to use mobile internet [57]. The "Towards Gender Equity Online" study [22] and the India Internet 2019 report [28], also states that the female internet user population in India is only half of the 258 million male internet users, and 'the bias is more evident in rural India'. This digital divide possibly inhibits internet and ecommerce usage among women entrepreneurs as well.

In the above context arises the need for conducting a holistic study aimed at identifying and analyzing the determinants of ecommerce adoption by Indian small and micro women entrepreneurs. This research employs the extended Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) Model [68] for empirical analysis to identify the key determinants affecting the behavioral intent and ensuing usage of ecommerce by these women entrepreneurs. This model is considered to have better explanatory power than the TAM (Technology Acceptance Model) and UTAUT models that have been used to explain users' behavioral intentions toward various information technologies [68]. Findings of this study may aid governments, international organizations, research institutions, NGOs, development banks and other stakeholders of women and entrepreneurial development in reviewing, designing and implementing gender-responsive trade and economic policies and programmes. This would also help in ensuring the success of the "Digital India" campaign of the Government of India and simultaneously enhance empowerment of women in the country.

## 2 Literature Review

E-commerce is an ICT application which has emerged as a catalyst for business growth. It is described as the “use of electronic means to conduct an organization’s business internally and/or externally” [29]. It has the potential to reduce costs, augment profitability, productivity and strengthen B2B/B2C relationships, facilitate better management of information, reposition business offerings, ensure enhanced visibility and sustain competitive advantage [6, 48, 55].

A brief discussion of some studies that have been conducted during the last few years to investigate the determinants of e-commerce adoption by SMEs is presented here. Barrosso et al., [10] developed a fuzzy cognitive map to show that *entrepreneur profile, market, operational management, marketing and promotions, website and digital platform, and products* are the most important determinants of SME e-commerce adoption. Kartiwi et al. [31] examined how the external factors such as customers and competitors drive Malaysian SMEs to adopt ecommerce and outlined the resultant benefits gained by them. Rahayu and Day [54] used the Technology, Organization, Environment (TOE) Framework to highlight that perceived benefits, technology readiness, owners’ innovativeness, owners’ IT ability and IT experience significantly influence Indonesian SMEs in adopting e-commerce. Other researchers in different nations like Garg and Choue [21], Yeh et al. [70], Klaiber et al. [35], Kenneth et al. [33], Hinson and Sorensen [27] and MacGregor [39] too have arrived at a list of different determining factors which in many cases are overlapping in nature. The level of adoption of e-commerce technologies by SMEs bears some correlation with the level of development of the nation [23, 30] and its “E-readiness”[11].

Literature reveals a range of e-business adoption and usage challenges that women managed businesses specifically in the context of developing countries are confronted with [34, 53]. These include lack of human, social, financial and physical capital culminating in diminished entrepreneurial abilities. Moreover, institutional impediments that are manifested as socio-cultural expectations regarding their commitments to family and home, alongwith existence of gender-based discrimination within the business/organizational sphere also plagues these women entrepreneurs. In addition there are individual attitudinal issues and women centric perceptions towards adoption of technology [26,40, 66]. However, limited number of studies focuses on the drivers inducing behavioral intention to adopt and use ecommerce from the technology adoption perspective, specifically amongst women entrepreneurs of developing nations and studies in India are scant. Thus, arises the rationale of this research.

The review of literature indicated that this research required a holistic and structured model that assumes an individual-level approach of technology acceptance to examine the determinants that influence behavioral intention of women entrepreneurs to adopt and use e-commerce technology in the Indian SME context. The theoretical framework for the study is presented in the next section.

### 2.1 Theoretical Framework

The Unified Theory of Acceptance and Use of Technology Model-2 (UTAUT2) originated in the theories of Technology Acceptance Model (TAM) and thereafter

UTAUT developed by Venkatesh et al., in 2003 [67] to study the behavioral intention of people to accept and use technology. However Venkatesh et al. [68] extended the model to propose UTAUT2 in 2012, to study acceptance and use of technology in a consumer context. By introducing psychological and cognitive factors such as Hedonic Motivation (HM), Price Value (PV), and Habit (HT) in addition to the four core determinants, Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI) and Facilitating Conditions (FC) which directly influence the user's behavioral intention to use new technologies. The Behavioral Intention (BI) then affects the Usage Behavior (UB). Three moderators of key relationships are Gender, Age and Experience which either amplify or constrain the influence of the core determinants, on Behavioral Intention and Usage Behavior.

It has been used by researchers to explain technology adoption in case of B2B/C2C e -marketplaces [4], mobile apps for restaurants [60], E-commerce payment systems [2, 14], food delivery apps [38], online shopping [8, 62], mobile marketing [18], mobile wallet adoption [42], social recommender systems [52], music e-commerce [69], cloud computing in organizations [7], social commerce [5] etc. Dwivedi et al. [17] through their study using Meta-analysis methodology, proposed that attitude, partially mediated the effects of exogenous constructs on behavioral intentions, and had a direct influence on usage behaviors. Few studies employing UTAUT 2 and UTAUT have been conducted with entrepreneurs as the subjects of study. Abushakra & Nikbin [1] extended the UTAUT2 Model to empirically examine the factors guiding Acceptance and Adoption of the Internet of Things (IoT) by entrepreneurs in Oman. They posited that in addition to all the key constructs of the UTAUT 2 model, knowledge of information technology was an additional driver. Erumi-Esin and Heeks [19] used the UTAUT model to examine e-business adoption and use among African women owned SMEs and came to the conclusion that perceived usefulness (PE) had a greater influence than ease of use (EE) and facilitating conditions play a greater role than social influence in the adoption decision. Based on studies conducted on SMEs, few other researchers also concluded that performance expectancy is the strongest predictor of behavioral intention to use technology [47, 58].

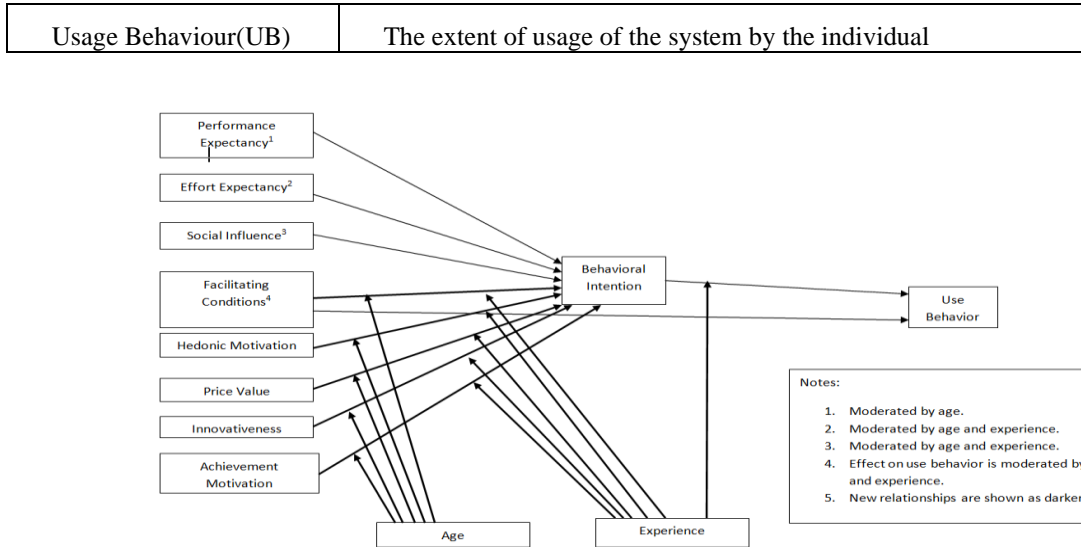
It was concluded from the above review of literature explaining technology adoption that UTAUT 2 is a widely applicable theoretical model for an empirical study of intention and use of technology. Therefore, this was the model chosen for this research to analyze the drivers for adoption of ecommerce technology by Women Entrepreneurs in the state of Jharkhand. However, in this study an attempt has been made to modify the UTAUT 2 model to make it more relevant for the subject under consideration.

There were three modifications proposed in the UTAUT2 model. Habit as a determinant of behavioural intention was excluded and two psychological characteristics i.e. Innovativeness and Achievement Motivation were included. Finding from depth interviews conducted with few women entrepreneurs from the population of the study and with experts during the exploratory study suggested that majority of these women entrepreneurs are not habituated to use ecommerce repeatedly. Hence habit as

a driver would be redundant for the study. The psychological traits of Innovativeness and achievement orientation included in the model have long been considered as drivers of entrepreneurial success. Many recent studies have also focused on these psychological traits as related with entrepreneurship [20, 44, 61, 63]. Since the population of this research consisted of women entrepreneurs and the focus of the research was adoption of new technology (ecommerce) of conducting business for achieving enterprise success, therefore these two entrepreneurial traits were included as drivers of BI. In line with the moderating impact of Age and Experience on the influence of the drivers of intention to use technology as depicted in UTAUT2 model, it is proposed in this study that these variables will moderate the influence of individual innovativeness and achievement motivation on behavioural intention of the entrepreneurs to use ecommerce. Table 1 provides a summary of each of the modified UTAUT2 determinants, (core constructs) and dependent variables alongwith its description. Figure 1 depicts the conceptual model of this study.

**Table 1.** Modified UTAUT2 (Venkatesh et al., 2012 ) variables

<b>Core Determinants</b>	
Construct	Definition
Performance Expectancy (PE)	The degree to which an individual believes that using ecommerce will help him/her to attain gains in job performance
Effort Expectancy (EE)	The degree of ease associated with the use of ecommerce
Social Influence (SI)	The degree to which an individual perceives that important others believe that he/she should use ecommerce
Facilitating Conditions (FC)	The degree to which an individual believes that an organizational and technical infrastructure exists to support the use of ecommerce
Hedonic Motivation (HM)	The fun, pleasure (in context of status) derived from using ecommerce
Price Value (PV)	Entrepreneurs' cognitive tradeoff between the perceived benefits of ecommerce and the monetary cost involved
Individual Innovativeness (IN)	Extent to which entrepreneur is open to experiencing, and experimenting with, new technologies involved in ecommerce
Achievement Motivation (AM)	Degree to which the entrepreneur rates the positive or negative affect towards an achievement activity
<b>Dependent Variables</b>	
Construct	Definition
Behavioural Intention (BI)	The intention of the individual to use the system



**Fig. 1.** Modified UTAUT2 Model, (Venkatesh et al., 2012)

## 2.2 Research Hypotheses

Based on the modified UTAUT2 Model which forms the theoretical framework presented in the previous section the following hypothesis were formulated for the study:

- H<sub>1</sub>: Performance expectancy positively influences intention to use e-commerce
- H<sub>2</sub>: Effort expectancy positively influences intention to use e-commerce
- H<sub>3</sub>: Social influence positively influences intention to use e-commerce
- H<sub>4</sub>: Facilitating conditions positively influences intention to use e-commerce
- H<sub>5</sub> : Hedonic motivation positively influences individual intention to use e-commerce
- H<sub>6</sub>: Price value positively influences individual intention to use e-commerce.
- H<sub>7</sub>: Individual's innovativeness positively influences intention to use e-commerce
- H<sub>8</sub>: Individual's achievement motivation positively influences intention to use e-commerce
- H<sub>9</sub> : Facilitating conditions positively influence the individual's e-commerce usage behavior
- H<sub>10</sub>: Intention to use ecommerce positively influences the individual e-commerce usage behaviour
- H<sub>11</sub>: The influence of performance expectancy on behavioral intention is moderated by age.

- H<sub>12</sub>: The influence of effort expectancy on behavioral intention is moderated by age.
- H<sub>13</sub>: The influence of effort expectancy on behavioral intention is moderated by experience.
- H<sub>14</sub>: The influence of social influence on behavioral intention is moderated by age.
- H<sub>15</sub>: The influence of social influence on behavioral intention is moderated by experience.
- H<sub>16</sub>: The influence of facilitating conditions on behavioral intention is moderated by age.
- H<sub>17</sub>: The influence of facilitating conditions on behavioral intention is moderated by experience.
- H<sub>18</sub>: The influence of hedonic motivation on behavioral intention is moderated by age.
- H<sub>19</sub>: The influence of hedonic motivation on behavioral intention is moderated by experience.
- H<sub>20</sub>: The influence of price value on behavioral intention is moderated by age.
- H<sub>21</sub>: The influence of price value on behavioral intention is moderated by experience
- H<sub>22</sub>: The influence of individual's innovativeness on behavioral intention is moderated by age.
- H<sub>23</sub>: The influence of individual's innovativeness on behavioral intention is moderated by experience.
- H<sub>24</sub>: The influence of individual's achievement motivation on behavioral intention is moderated by age.
- H<sub>25</sub>: The influence of individual's achievement motivation on behavioral intention is moderated by experience
- H<sub>26</sub>: The influence of facilitating conditions on use behavior is moderated by age.
- H<sub>27</sub>: The influence of facilitating conditions on use behavior is moderated by experience.
- H<sub>28</sub>: The influence of behavioural intention on use behavior is moderated by experience.

### 3. Research Methodology

The study is conducted amongst the small and micro women entrepreneurs in the state of Jharkhand in eastern India. The study has modified the UTAUT2 model of Venkatesh et al.[68], and theorizes that performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC) hedonic motivation (HM), price value(PV) , individual innovativeness (IN) and achievement motivation (AM) are the core determinants of women entrepreneurs' intention to adopt and use e-commerce moderators in the model being age and experience The purpose of this study was to determine the strength of these determinants (PE, EE, FC and SI, HM, PV, IN, AM) on behavioral intention to use ecommerce (BI) and usage behavior (UB)



in light of the moderating effects of age and experience in using technology. The moderator, gender has been excluded in this study.

### **3.1 Data collection and Data analysis**

The database on women entrepreneurs were collected from the District Industry Centres (DIC) of Bokaro, Ranchi and Jhamshepur. A structured questionnaire was administered among a sample of 300 micro and small women entrepreneurs. Valid responses were received from 258 women- response rate of 86%. The first section of questionnaire captured the demographic profile of the respondents, their usage of various ICT tools and their extent of ecommerce adoption as per “hierarchical phases of e-commerce adoption” as indicated by Molla and Licker [43]. The second section captured their perceptions regarding the adoption of e-commerce on the basis of the modified UTAUT2 Model, using a 5-point Likert Scale (1-Strongly Disagree; 5-Strongly Agree). The items used by Venkatesh et al. [68] were replicated. For soliciting responses on individual innovativeness, a 3 item scale was adopted from Slade et al [59] to assess the willingness of the women entrepreneur to try out e-commerce technologies. Responses on achievement motivation were collected via the 10 item Revised Achievement motivation Scale (AMS-R) designed by Lang & Fries [37] to gauge how these women rate their positive or negative affect towards an achievement activity like adopting ecommerce for business sustenance and growth. SPSS 22.0 and AMOS were the statistical packages used to analyze the data.

## **4 Analysis**

The demographic profile of the respondents indicate that majority of these entrepreneurs is in the age group of 30-45 years and has graduated from college (55.7%). The predominant form of activity is manufacturing (70%) and sole proprietorship is the main form of ownership (81%) in these firms.

The study revealed that usage of ICT was prevalent amongst all the sampled women entrepreneurs in some form or the other. It varied from usage of smart phones, SMS, emails, social media and skype to employing financial accounting packages or hosting a website. With respect to adoption of ecommerce, approximately 28% utilized the Connected E-commerce phase in which the firms were using e-mail to support information and transactional processes with existing and potential trading partners, suppliers and customers. Merely 14% of them were hosting their own website for information sharing and even lesser percentage (10%) had adopted the phase of Interactive Ecommerce, thereby facilitating online interactions and queries between the firm and its customers. A very small fraction of these women entrepreneurs (5%) had adopted Transactive Ecommerce, allowing customers to purchase online, track orders, and manage their account information. None of these entrepreneurs had ventured into the scheme of Integrated Ecommerce in which the firm’s website is integrated with suppliers, customers, and other back-office systems allowing most business transactions and processes to be conducted electronically. The descriptive statistics for the constructs used in this study reveal that except for Usage Behaviour, the mean values of all constructs exceed 3, indicating that most of the respondents agreed or strongly agreed with the statements in the questionnaire.

#### 4.1 Analysis of measurement model

Structural equation modeling was undertaken to analyze the data. Hair et al. [24] suggests that factor loadings must be at least 0.5 and preferably greater than .7 for an acceptable measurement indicator. The construct reliability (CR) must be greater than 0.7 and average variance extracted (AVE) for each construct should be greater or equal to 0.5. There is evidence that the measurement model has adequate reliability and convergent validity because all factor loadings were greater than 0.7, the CRs exceeded acceptable criteria of 0.7, and the AVEs were greater than the threshold value of 0.5 in all cases

Table 2 provides a list of different indices for structural model fit, recommended threshold values, alongwith corresponding literature and the results obtained. It is evident that the results satisfy the threshold levels and hence it implies that measurement model fits the data collected.

**Table 2.** Criteria for Model Fit

Test	Recommended value	Authors	Results
Root mean square error of approximation (RMSEA)	<.08	Browne and Cudeck [12]	<.0394
Goodness-of-fit statistic (GFI)	>=.90	Hair et al. [25]	.93
Adjusted goodness-of-fit statistic (AGFI)	>.80	Chau and Hu [13]	.90
Normed-fit index (NFI)	>= .9	Chin and Todd, [15]; Hair et al. [25]	.95
CFI (Comparative fit index)	>= .9	Bagozzi and Yi, [9]	.94

**Table 3.** Relationship between the Core Determinants and the Dependent Variables.

Path			Beta	t value	p	Decision
BI	←	PE	0.789	10.066 ***	0.000	supported H1
BI	←	EE	0.696	10.266 ***	0.000	supported H2
BI	←	SI	0.134	2.417 *	0.016	supported H3
BI	←	FC	0.229	2.994 **	0.003	supported H4
BI	←	HM	0.096	0.766	0.443	rejected H5
BI	←	PV	0.25	3.45**	0.003	supported H6

BI	←	IN	0.24	2.56*	0.031	Supported H7
BI	←	AM	0.530	9.788 ***	0.000	supported H8
UB	←	FC	0.462	4.593***	0.000	Supported H9
UB	←	BI	0.212	2.136*	0.033	Supported H10

Note: \*p < 0.05; \*\*p < 0.01; \*\*\*p < 0.001

## 5. Findings & Discussion

The results of this study are consistent with the original postulations of Venkatesh et al. [67] regarding influence of the four core determinants of intention and usage but they do not fully support the postulations regarding the effect of moderators.

As is evident from results presented in Table 3 the core determinants i.e. performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), price value (PV), individual innovativeness (IN), achievement motivation (AM) have a significant positive influence on behavioral intention (BI). Among the determinant variables, PE is found to have the strongest influence of BI. The results further suggested that BI and improved facilitating conditions (FC) are significantly influencing usage behavior (UB) for ecommerce adoption by women entrepreneurs in a positive manner. Thus, the results support the H<sub>1</sub>, H<sub>2</sub>, H<sub>3</sub>, H<sub>4</sub>, H<sub>6</sub>, H<sub>7</sub>, H<sub>8</sub>, H<sub>9</sub>, and H<sub>10</sub> hypotheses.

The results from the moderator analysis indicate that the age of the entrepreneur does not moderate the effect of PE, EE, SI, FC, HM, PV, IN and AM on BI. Perception about effect of these core determinants on BI is similar across all age groups. Similarly, experience does not moderate the effect of EE, FC, HM, PV, IN and AM on BI. Experience also does not moderate the effect of FC and BI on UB. Hence H<sub>11</sub>, H<sub>12</sub>, H<sub>13</sub>, H<sub>14</sub>, H<sub>16</sub>, H<sub>17</sub>, H<sub>18</sub>, H<sub>19</sub>, H<sub>20</sub>, H<sub>21</sub>, H<sub>22</sub>, H<sub>23</sub>, H<sub>24</sub>, H<sub>25</sub>, H<sub>26</sub>, H<sub>27</sub> and H<sub>28</sub> are not supported. However, the results indicate that experience significantly moderates the effect of SI on BI, thus, supporting H<sub>15</sub> hypothesis indicating that influence of peer members, associations, friends and business partners on intention to use technology will be stronger on women entrepreneurs who have the experience of using ICT in other walks of life.

Consistent with the results of moderator analysis, with respect to the direct influence of the moderators on the dependent variables it is observed that experience is significantly influencing the usage behavior in a positive manner. The direct effect of moderator age on the two dependent variables is found to be 'not significant'. From the results obtained we posit that age of the women entrepreneurs is no longer a relevant factor impacting technology acceptance by them. Although the overall penetration of ecommerce is low among the women entrepreneurs, the strength of intention to use ecommerce and extent of usage is spread evenly across women entrepreneurs

of all age groups. It may be concluded that the impact of digitization awareness campaigns by various agencies has been uniform across women in all age groups.

## 6. Conclusion

This study takes a technology acceptance perspective towards investigating the drivers of ecommerce adoption among women entrepreneurs in the small and micro sector operating in Jharkhand, India. The theoretical significance of this research is derived from the fact that it presents fresh empirical findings based on application of the widely used UTAUT2 model for predicting technology acceptance and use by individuals. The model was tested on a very specific target group of women entrepreneurs in diverse locations of a developing state in India. The results support the relationships between the core determinants of technology acceptance and the intention to use technology proposed in the model.

The findings of this study have many managerial and policy implications. Despite the thrust of the government and non-government agencies in India towards promotion of women entrepreneurs in the country, they do not seem to have reaped the benefits of the ecommerce boom in India. It has been reported that only 20 per cent of the women entrepreneurs in India use online platforms to sell [65]. Less than 30% of the women owning small and micro enterprises who were interviewed in this study were found to have adopted the rudimentary ecommerce processes. This highlights the need for interventions which can address the technology acceptance issues specific to such women enterprises in a developing nation context. This becomes all the more relevant in this Covid-19 pandemic situation where dependence on the virtual platform is imperative. Based on the empirical findings of this study various policy interventions can be forwarded

PE being the strongest predictor of ecommerce usage intention indicates that if interventions are directed towards inducing women entrepreneurs to perceive that using e-commerce applications would improve the performance of their businesses in terms of growth, efficiency and productivity, the intention to adopt such applications could be enhanced. The business benefits of ecommerce applications need to be highlighted amongst the women. This could be supplemented with success stories that they can relate to.

The statistically significant influence of EE suggests that the women entrepreneurs need to be convinced regarding the simplicity and ease of use of such technology. Workshops and training modules can be instrumental in building their confidence to handle ecommerce applications. The findings of this study also indicate SI via social networks of friends, family, customers, business partners, bankers is an important driver for the behavioral intent to adopt this technology. SI exerts a statistically significant influence on women entrepreneurs' intention to use e-commerce. Social awareness campaigns highlighting that investment in ICT for ecommerce is imperative for the success of women entrepreneurs can be utilized to strengthen the social influence.

FC too emerged as a strong driver for both intention to use and usage behavior, suggesting that agencies responsible for promoting women entrepreneurship need

to stay focused on providing necessary resources and infrastructure for encouraging the women entrepreneurs to use e-commerce applications. Since, PV has a positive significant influence on behavioral intention to accept ecommerce, support agencies via campaigns can attempt to convince these women that long term business benefits of ecommerce adoption would outweigh the monetary costs. Entrepreneurship development programmes should continue to inculcate and enhance the entrepreneurial personality traits like innovativeness (IN) and achievement orientation (AM) amongst these women entrepreneurs so as to induce stronger intention to use ecommerce.

The interventions by institutions, both Government and private, need to reach a wider section of women owners of small and micro enterprises in the interiors of the country. Schemes which offer financial and technical assistance to new entrants to incorporate ecommerce and other technologies in their business firms, can be redesigned especially for women owned small and micro enterprises. Such schemes which solely target this segment can help the women entrepreneurs to overcome the digital divide which still persists in various locations. Information regarding availability of affordable ICT infrastructure and connectivity needs to be disseminated and highlighted in this target group. Widespread awareness building and motivational campaigns to reduce the attitudinal barriers to ecommerce usage can help to ensure large scale and effective adoption of these applications by the women entrepreneurs.

## References

1. Abushakra, A., Nikbin D.: Extending the UTAUT2 Model to Understand the Entrepreneur Acceptance and Adopting Internet of Things (IoT). In: Uden L., Ting IH., Corchado J. (eds) Knowledge Management in Organizations, KMO 2019. Communications in Computer and Information Science, vol. 1027, pp 339-347. Springer, Cham (2019).
2. Acharya, V., Junare, S. O., Gadhavi D. D.: E-Payment: Buzz Word or Reality. International Journal of Recent Technology and Engineering 8(3S2), 397-404 (2019).
3. Afrah, S, H., Fahiha, S.T.: Empowering women entrepreneurs through information and communication technology (ICT): A case study of Bangladesh. Management 7(1), 1-6 (2017).
4. Alazab, K., Dick, M., Maleki far, S.: Assessing the Effect of UTAUT2 on Adoption of B2B/C2C E –Marketplaces. Journal of Internet and e-Business Studies, 2020, doi: 10.5171/2020.690228 (2020).
5. Alotaibi, S. S.: The influence of information quality and gender on the social commerce adoption framework by Saudi Arabian Users using the UTAUT2 theory (2018). <http://mars.gmu.edu/handle/1920/10955>. Accessed 4 August 2020
6. Alshardan, A., Goodwin, R., Rampersad, G.: Measuring the benefits of IS in small organizations in developing countries. Management 1(2), 12-17 (2013).
7. Amponsah, R.A., Panford, J. K., Hayfron-Acquah, J. B.: Factors Affecting Cloud Computing Adoption in a Developing Country– Ghana: Using Extended Unified Theory of Acceptance and Use Of Technology (UTAUT2) Model. International Research Journal of Engineering and Technology 3(11), 59-76 (2016).
8. An, L., Han, Y., Tong, L.: Study on the Factors of Online Shopping Intention for Fresh Agricultural Products Based on UTAUT2. In Proceedings of 2nd Information Technology and Mechatronics Engineering Conference (ITOEC 2016), pp. 303-306 (2016).

9. Bagozzi, R. P., Yi, Y.: The evaluation of structural equation models. *Academy of Marketing Science* 16(1), 74-94 (1988).
10. Barroso, R. M., Ferreira, F. A., Meidutė-Kavaliauskienė, I., Banaitienė, N., Falcão, P. F., Rosa, Á. A.: Analyzing the determinants of e-commerce in small and medium-sized enterprises: a cognition-driven framework. *Technological and Economic Development of Economy* 25(3), 496-518 (2019).
11. Boateng, R. M., A., Heeks, R., Hinson, R.: Advancing E-commerce Beyond Readiness in a Developing Economy: Experiences of Ghanaian Firms. *Journal of Electronic Commerce in Organizations* 9(1), 1-16 (2011).
12. Browne, M. W., Cudeck, R.: Alternative ways of assessing model fit. In: K. A. Bollen and J. S. Long (eds.) *Testing structural equation models*, pp. 136-162. Sage, Beverly Hills, CA (1993).
13. Chau, P. Y. K., Hu, P. J.: Information technology acceptance by individual professionals: a model comparison approach. *Decision Sciences* 32(4), 699-719 (2001).
14. Chen, J.: Analyzing the Factors Influencing for Third-Party E-Commerce Payment with DEMATEL Based UTAUT2 Model. In: *Proceedings of 9th International on Education and Social Science (ICESS 2019)*, pp. 1342-1346. Francis Academic Press, UK (2019).
15. Chin, W. W., Todd, P. A.: On the Use, Usefulness, and Ease of Use of Structural Equation Modeling in MIS Research: A Note of Caution. *MIS Quarterly* 19(2), 237-246 (1995).
16. Dell: Dell Women's Global Entrepreneurship Study: India Key Findings. [https://i.dell.com/sites/csdocuments/Business\\_smb\\_merchandizing\\_Documents/en/India-Research-Results-Fact-Sheet.pdf](https://i.dell.com/sites/csdocuments/Business_smb_merchandizing_Documents/en/India-Research-Results-Fact-Sheet.pdf) (2012). Accessed 3 January 2020
17. Dwivedi, Y. K., Rana, N. P., Jeyaraj, A., Clement, M., Williams, M. D.: Re-examining the Unified Theory of Acceptance and Use of Technology (UTAUT): Towards a Revised Theoretical Model. *Information Systems Frontiers* 21(3), 719-734 (2019).
18. Eneizan, B., Mohammed, A. G., Alnoor, A., Alabboodi, A.S., Enaizan, O.: Customer acceptance of mobile marketing in Jordan: An extended UTAUT2 model with trust and risk factors. *International Journal of Engineering Business Management* 11, 1-10 (2019).
19. Erumi-Esin, R., Heeks, R.: E-business adoption and use among African women-owned SMEs: an analytical study in Nigeria. In: *Proceedings of the Seventh International Conference on Information and Communication Technologies and Development*, pp. 11-21. ACM (2015).
20. Frese, M., Gielnik, M. M.: The psychology of entrepreneurship. *Annual Review of Organisational Psychology and Organisational Behaviour* 1(1), 413-438 (2014).
21. Garg, A. K., Choeu, T.: The adoption of electronic commerce by small and medium enterprises in Pretoria East. *The Electronic Journal of Information Systems in Developing Countries* 68(1), 1-23 (2015).
22. Google: Toward Gender Equity Online. [http://services.google.com/fh/files/misc/toward\\_gender\\_equity\\_online.pdf](http://services.google.com/fh/files/misc/toward_gender_equity_online.pdf) (2019). Accessed 10 January 2020
23. Gregorio, D. D., Kassicieh, S. K., Neto, R. D. G.: Drivers of e-business activity in developed and emerging markets. *IEEE Transactions on Engineering Management* 52(2), 155-166 (2005).
24. Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E.: *Multivariate Data Analysis*. Prentice Hall, Englewood Cliffs, NJ (2010).
25. Hair, J. F., Jr., Anderson, R. E., Tatham, R. L., Black W. C.: *Multivariate Data Analysis with Readings*. Prentice Hall, Englewood Cliffs, NJ (1998).

26. Hilbert, M.: Digital gender divide or technologically empowered women in developing countries? A typical case of lies, damned lies, and statistics. *Women's Studies International Forum* 34( 6), 479-489 (2011).
27. Hinson, R., Sorensen, O.J.: E-business triggers: an exploratory study of Ghanaian nontraditional exporters (NTEs). *Journal of Electronic Commerce in Organizations (JECO)* 5(4), 55-69 (2007).
28. IAMAI: India Internet 2019. <https://cms.iamai.in/Content/ResearchPapers/d3654bcc-002f-4fc7-ab39-e1fbcb00005d.pdf> (2019). Accessed 7 January 2020
29. Jelassi, T., Enders, A. *Strategies for e-Business: Creating Value through Electronic and Mobile Commerce*. Prentice Hall, London (2008).
30. Kartiwi, M., MacGregor, R. C.: Electronic Commerce adoption barriers in small to medium-sized enterprises (SMEs) in developed and developing countries: a cross-Country comparison. *Journal of Electronic Commerce in Organization* 5(3), 35-51 (2008).
31. Kartiwi, M., Hussin, H., Suhaimi, M. A., Jalaldeen, M. R. M., Amin, M. R.: Impact of external factors on determining E-commerce benefits among SMEs in Malaysia. *Journal of Global Entrepreneurship Research* 8(1), 1-12 (2018).
32. Keelery, S.: E-commerce in India. <https://www.statista.com/statistics/379167/e-commerce-share-of-retail-sales-in-india/> (2019). Accessed 7 January 2020
33. Kenneth W., Rebecca N. M., Eunice, A: Factors Affecting Adoption of Electronic Commerce among Small Medium Enterprises in Kenya: Survey of Tour and Travel Firms in Nairobi. *International Journal of Business, Humanities and Technology* 2(4), 76-91 (2012).
34. Kitching, B., Woldie, A.: Female Entrepreneurs in Transitional Economies: A Comparative Study of Businesswomen in Nigeria and China. In *Proceedings of Hawaii International Conference on Business*. Honolulu, Hawaii (2004).
35. Klaiber, U., Hermanus, T., Mason, R. B.: E-business Developments and Skills Requirements in the Retail Sector. *Corporate Ownership and Control* 12(4), 383-397 (2015).
36. KPMG Snapdeal Report: Impact of E-commerce on SMEs in India. [https://assets.kpmg/content/dam/kpmg/pdf/2015/10/Snapdeal-Report\\_-Impact-of-e-Commerce-on-Indian-SMEs.pdf](https://assets.kpmg/content/dam/kpmg/pdf/2015/10/Snapdeal-Report_-Impact-of-e-Commerce-on-Indian-SMEs.pdf) (2016). Accessed 7 February 2020
37. Lang, J. W. B., Fries, S.: A revised 10-item version of the Achievement Motives Scale: Psychometric properties in German-speaking samples. *European Journal of Psychological Assessment* 22, 216-224 (2006).
38. Lee, S. W., Hye, J. S., Jeon, H. M.: Determinants of Continuous Intention on Food Delivery Apps: Extending UTAUT2 with Information Quality. *Sustainability* 11(11), 1-15 (2019).
39. MacGregor, R.C.: The role of strategic alliances in the ongoing use of electronic commerce technology in regional small business. *Journal of Electronic Commerce in Organizations* 2(1), 1-14 (2004).
40. MacGregor, R. C., Vrazalic, L.: The role of gender in the perception of barriers to e-commerce adoption in SMEs: An Australian study. *Communications of the IBIMA* 4, 140-147 (2008).
41. Martinez,I., Nguyen,T.: *Using Information and Communication Technology to Support Women's Entrepreneurship in Central and West Asia*. ADB, Manila (2014).
42. Megadewandanu, S., Suyoto and Pranowo: Exploring Mobile Wallet Adoption in Indonesia Using UTAUT2 An Approach from Consumer Perspective. In *Proceedings of 2nd International Conference on Science and Technology-Computer, ICST 2016*, pp.11-16 (2016).

43. Molla, A., Licker, P. S.: E-Commerce Adoption in Developing Countries: A Model and Instrument. *Information and Management* 42(6), 877-899 (2005).
44. Mueller, S. L., Thomas, A. S.: Culture and entrepreneurial potential: A nine country study of locus of control and innovativeness. *Journal of business venturing* 16(1), 51-75 (2001).
45. Munyua, A.W., Mureithi, M.: *Harnessing the Power of the Cell Phone by Women Entrepreneurs: New Frontiers in the Gender Equation in Kenya*. Grace Project, Kenya (2008).
46. Nair, S.: The rising role of India's e-commerce women entrepreneurs. <https://yourstory.com/2015/07/ecommerce-women> (2015). Accessed 7 February 2020
47. Ndayizigamiye, P. A.: Unified Approach Towards e-Commerce Adoption by SMMES in South Africa. *International Journal of Information Technology and Business Management* 16(1), 92-101 (2013).
48. Nejadirani, F., Behraves, M., Rasouli, R.: Developing countries and electronic commerce the case of SMEs. *World Applied Sciences Journal* 15(5), 756-764 (2011).
49. OECD: Bridging the Digital Gender Divide. <http://www.oecd.org/internet/bridging-the-digital-gender-divide.pdf> (2018). Accessed 7 January 2020
50. OECD: Empowering Women in the Digital Age: Where Do We Stand? [www.oecd.org/going-digital/empowering-women-in-the-digital-age-brochure.pdf](http://www.oecd.org/going-digital/empowering-women-in-the-digital-age-brochure.pdf). (2018). Accessed 7 January 2020
51. OECD: The ABC of Gender Equality in Education: Aptitude, Behaviour, Confidence. <https://www.oecd.org/pisa/keyfindings/pisa-2012-results-gender-eng.pdf> (2015). Accessed 7 January 2020
52. Oechslein, O., Fleischmann, M., Hess, T.: An Application of UTAUT2 on Social Recommender Systems: Incorporating Social Information for Performance Expectancy. In *Proceedings of 2014 47th Hawaii International Conference on System Science*, IEEE, pp. 3297-3306 (2014).
53. Powers, J., Magnoni, B.: *A Business To Call Her Own: Identifying, analyzing and overcoming constraints to women's small businesses in Latin America and the Caribbean*. Multilateral Investment Fund, IDB, Washington, DC (2010).
54. Rahayu, R., Day, J.: Determinant factors of e-commerce adoption by SMEs in developing country: evidence from Indonesia. *Procedia-Social and Behavioral Sciences* 195, 142-150 (2015).
55. Rufai, I. A.: The impact of communication technologies on the performance of SMEs in a developing economy: Nigeria as a case study. *The Electronic Journal of Information Systems in Developing Countries* 65, 1-22 (2014).
56. Sabrina, A.: Role of e-commerce in women empowerment. [https://www.academia.edu/6586964/Role\\_of\\_e\\_commerce\\_in\\_women\\_empowerment](https://www.academia.edu/6586964/Role_of_e_commerce_in_women_empowerment) (2014). Accessed 17 January 2020
57. Sachitanand, R.: How women are sidelined in India's e-commerce growth. *The Economic Times*. <https://economictimes.indiatimes.com/> (2019). Accessed 8 March 2020
58. Sääntti, R.: *Technology acceptance factors in ecommerce environment*. Master's Thesis. Aalto University. Espoo, Finland (2011).
59. Slade, E. L. , Dwivedi, Y. K., Piercy, N. C., Williams, M. D.: Modeling Consumers' Adoption Intentions of Remote Mobile Payments in the United Kingdom: Extending UTAUT with Innovativeness, Risk, and Trust. *Psychology and Marketing* 32, 860-873 (2015).



60. Saumell, R. P., Forgas-Coll, S., García, J. S., Robres, E.: User Acceptance of Mobile Apps for Restaurants: An Expanded and Extended UTAUT-2. *Sustainability* 11(4), 1210-1234 (2019).
61. Seбора, T. C., Lee, S. M., Sukasame, N.: Critical success factors for e-commerce entrepreneurship: an empirical study of Thailand. *Small Business Economics* 32(3), 303-316 (2009).
62. Singh, M., Matsui, Y.: How Long Tail and Trust Affect Online Shopping Behavior: An Extension to UTAUT2 Framework. *Pacific Asia Journal of the Association for Information Systems* 9(4), 1-24 (2017).
63. Staniewski, M. W., Nowacki, R., Awruk, K.: Entrepreneurship and innovativeness of small and medium-sized construction enterprises. *International Entrepreneurship and Management Journal* 12(3), 861-877 (2016).
64. Vagranti, S. Skilling Small and Medium Enterprises to conquer the world of online selling. *The Economic Times*. <https://economictimes.indiatimes.com/small-biz/marketing-branding/> (2019). Accessed 10 March 2020
65. Vagranti, S. No place for women entrepreneurs? Can e-commerce reverse low share of women-led businesses in India Inc. *The Financial Express*. <https://www.financialexpress.com/industry/sme/cafе-sme/> (2020). Accessed 10 March 2020
66. Venkatesh, V., Davis, F.D.: A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science* 46(2), 186-204 (2000).
67. Venkatesh, V., Morris, G., Davis, F.: User acceptance of information technology: toward a unified view. *MIS Quarterly* 27(3), 425-478 (2003).
68. Venkatesh, V., Thong, J. Y. L., Xu, X.: Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS Quarterly* 36(1), 157-178 (2012).
69. Widodo, T., Setiadje, P. and Sary, F.P.: (2017). Analysis of the ecommerce use behavior on music products. In *Proceedings of 2017 International conference on Engineering Technology and Technopreneurship (ICE2T)*, pp. 1-6, IEEE.
70. Yeh, C. H., Lee, G. G., Pai, J. C.: Using a technology-organization-environment framework to investigate the factors influencing e-business information technology capabilities. *Information Development* 31(5), 435-450 (2015).