International Journal of
INTELLIGENT SYSTEMS AND APPLICATIONS IN ENGINEERING
ISSN:2147-6799 www.ijisae.org Original Research Paper

Factors Effecting Adoption of Information and Communication Technology for Business Promotion by Micro Entrepreneurs of Rural South Odisha – The SEM Approach.

Rahul Goel[1*], Dr K. K. Veluri[2], Dr. Sarbesh Mishra[3]

Submitted: 11/03/2024 **Revised**: 27/04/2024 **Accepted**: 05/05/2024

Abstract: It is well known that Information, and communication technology, (ICT) has, in many ways, improved the quality of life. It has also changed the way businesses promote themselves. Application of Information and communication technology for business promotion is often termed as Digital Marketing. It is a very effective tool available for marketing. its effectiveness has not only reduced marketing costs but also assisted business owners in improving customer engagement. Additionally, it aids in gathering and analysing consumer behaviour data to enable business owners to develop more effective plans for achieving their objectives. In 2023, Sheoliha et al. Numerous research projects have examined how entrepreneurs use digital marketing. Nonetheless, further research needs to be done on how India's rural microentrepreneurs use digital marketing tools.

Purpose of study: Presented study aims at Identifying the factors effecting the utilisation of ICT in the form of Digital Marketing by micro entrepreneurs of rural South Odisha.

Methodology used: The study employs the combination of UTAUT and TOE model. It is done on the basis of primary data obtained from 386 respondents from the region. The data is then subjected to EFA for factor extraction and CFA for hypothesis testing.

Outcome: The outcome of the study suggests that the factors like Performance expectancy, Effort expectancy, Technological factors, Organisational factors, and Environmental factors impact the adoption of Digital marketing by micro entrepreneurs of rural South Odisha.

Keywords: *Information and communication Technology, Digital marketing, micro entrepreneurs, rural entrepreneurs, rural micro entrepreneurs, rural micro entrepreneurs of India, South Odisha.*

1. Introduction

Information and Communication Technology (ICT) is used in Businesses for various functions. One such function is Marketing. Where the use ICT is often termed as Digital Marketing and is defined as promoting products and services through ICT such as the internet, smart phones, online advertising, and other mediums, has revolutionized how businesses engage with consumers [Smith et al., 2012]. Digital platforms facilitate efficient inventory control and active information exchange, transforming the landscape of consumer engagement. The exponential rise in online advertising is fuelled by the widespread adoption of smartphones and personal computers. In 2017, around $51.3 billion were spent by advertisers on various social media platforms [Solakis et al., 2022]. By 2018, digital advertisements generated USD 273 billion, accounting for 44% of the total USD 629 billion advertising expenditure [Nhuvira & Dorasamy, 2021].

Direct marketing's capacity to achieve business objectives like higher revenue, better brand exposure, better customer relations, and higher lead generation has led to imbalances in advertising budgets [Eid & El-Gohary, 2013].

The internet, often considered the third wave of technological development, has significantly impacted direct marketing by simplifying the buying and selling of goods online [Solakis et al., 2022]. Information and Communication Technology encompasses a diverse range of products, services, and strategies, utilizing various digital media to achieve its goals. Stakeholders can engage digitally at any time, with the primary aim of attracting new clients and providing interactive avenues with the business [He et al., 2014]. Key components of ICT based Digital Marketing include search engine optimization, text message marketing, affiliate marketing, social media, email marketing, and online advertising.

Most literature focuses on larger businesses rather than smaller enterprises and organizations [Ritz et al., 2019]. Small businesses often need to develop mobile-friendly websites and seek external expertise for these tasks. Economic constraints hinder 55% of small US businesses

*Research Scholar – School of Management Studies GIET University – Gunupur Ph: +91-9971578570
rahulgoel@giet.edu , rxrgoel@gmail.com
[2]Professor, School of Management Studies GIET University – Gunupur , kkveluri@giet.edu
[3]Professor-NICMAR Hyderabad
sarbeshmishra@nicmar.ac.in
***Corresponding author** Rahul Goel
*Research Scholar – School of Management Studies GIET University – Gunupur Ph+91-9971578570rahulgoel@giet.edu

from having websites [Pandey et al., 2020], a trend also observed due to financial limitations [Nuseira & Aljumah, 2020]. SMEs, particularly in emerging nations like India, must stay abreast of technological advancements. Consequently, robust ICT infrastructure is vital for SME competitiveness.

While digital infrastructure advancements facilitate fixed and mobile internet access, disparities persist in digital communications, particularly in rural areas of affluent economies (Ofcom, 2016; Riddlesden & Singleton, 2014; Philip et al., 2017). Numerous studies have examined the factors influencing SMEs' and startups' implementation of ICT in both developed and developing nations. However, understanding these factors is crucial for rural entrepreneurs facing infrastructural, economic, social, and educational challenges (Goel, 2024).

This study is undertaken to understand the various factors impacting the use of Information and Communication Technology for business promotion among micro-entrepreneurs in South Odisha through a quantitative approach based on the UTAUT theory. Primary data collected via convenience sampling will undergo exploratory factor analysis using SPSS, followed by hypothesis testing through linear regression analysis and Confirmatory Factor Analysis through AMOS. . By focusing on Information and Communication Technology in rural South Odisha, this research addresses a gap in existing literature and provides insights applicable to other rural areas in India. The findings will benefit academics, managers, entrepreneurs, and business owners by enhancing their understanding of Information and Communication Technology . Additionally, it will help micro, small, and startup companies identify the factors influencing Information and Communication Technology adoption, enabling them to grow and address various challenges.

2. Literature Review

Information and Communication Technology in Marketing

Implementation of Information and Communication Technology in marketing is commonly called Digital Marketing. It leverages technology to enhance marketing processes, enabling better customer understanding by catering to their needs. Online marketing involves connecting with clients through smartphones, laptops, and other devices via social media, websites, applications, and other channels. The potential of Information and Communication Technology or Digital Marketing is immense, with one of its primary goals being to understand customer usage of new technology and apply that knowledge to the company's advantage. This facilitates more effective communication with potential customers. Companies in developed nations recognize the importance of Information and Communication Technology and the need to integrate traditional and online methods to succeed [Bala & Verma, 2018].

Information and Communication Technology in India

India ranks second globally in internet usage, with 49.15% of its population (692 million people) online, following China with 74.36% (1.05 billion people) [explodingtopics, 2023]. The growing trend of online advertisement and shopping in India is fueled by young, internet-savvy individuals with rising socioeconomic status, influencing consumer preferences. Commonly purchased online goods and services include books, electronics, travel, financial services, clothing, and cosmetics. Although the internet currently contributes a small percentage to India's GDP, retailers anticipate significant growth [Sharma & Thakur, 2020].

Advantages of using Information and Communication Technology for Business Promotion

Information and Communication Technology has revolutionized marketing practices by offering numerous benefits, making it indispensable for businesses. Key advantages include:

1. Extended Reach: Information and Communication Technology enables businesses to reach customers globally through platforms like Meta, Google, and Instagram.

2. Targeted Marketing: It allows precise targeting based on online activities and interests, filtering out irrelevant audiences at the marketing stage [Fachrurazi et al., 2022].

3. Cost Reduction: Information and Communication Technology reduces marketing costs by promoting products virtually, eliminating the need for traditional printing and distribution [Fachrurazi et al., 2022].

4. Enhanced Analytics: Provides better marketing analytics for future follow-up and retargeting, aiding market depth.

5. Effort Efficiency: Information and Communication Technology requires less effort when compared to old methods, as it has no time or geographical limits.

6. Real-time Customer Service: Facilitates real-time assistance to customers, enhancing their significance [Yamini & Chand, 2020].

7. Competitive Advantage: Offers small and micro-entrepreneurs competitive advantages with lower budgets and resources [Kano et al., 2022].

Micro Entrepreneurs in India

Micro-entrepreneurs in India are individuals or small businesses operating at a micro level, typically with few employees and limited resources. They work in various sectors, including small-scale vending, repair services, and other business ventures [Olaposi, 2021]. These micro-enterprises are crucial to the Indian economy, generating jobs, fostering innovation, and contributing to poverty reduction and economic advancement.

The MSME Act of India, amended in 2020, classifies an organization as a micro-enterprise if its annual turnover does not exceed 50 million INR or its investment in plant and machinery is not more than 10 million INR, regardless of the sector.

Rural Areas

In India, rural areas, often referred to as 'countryside' or 'villages,' have low population densities and rely on agriculture, cottage industries, fishing, ceramics, etc., for income. Various agencies define rural India differently:

- As per to the Planning Commission, towns with the population not more than 15,000 are rural.
- Rural areas as defined by National Sample Survey Organisation (NSSO) are the regions having the density of population less than 400 people per square kilometre, villages lacking a municipal board but having well-defined survey borders, and at least 75% of working-age males engaged in agriculture or related fields.
- As per the Reserve Bank of India (RBI) rural areas are the regions having population lower than 49,000 (tier-3 to tier-6 cities).

Approximately 70% of Indians reside in rural areas, contributing significantly to the GDP through construction, self-employment, agriculture, and services. Rural spending accounts for 55% of national monthly expenditure, with one-third of all Indian FMCG sales coming from the rural population [Dhanlaxmi Bank report, 2020].

3. Theoretical Framework

Research on human-technology interaction has focused on understanding factors influencing technological acceptance over the past few decades. The theory of reasoned action (TRA) by Ajzen and Madden (1986) led to the development of the model of technology acceptance (TAM) [Davis et al., 1989]. TRA says that an individual's intention to engage in a particular behavior is heavily influenced by attitudes towards the behavior and subjective norms—social pressures to engage in or abstain from the behavior [Ajzen, 1991].

The model of technology acceptance (TAM), a reliable tool of gauging in what manner rapidly new technologies are embraced, has been widely used in academic research. TAM and its extensions have been employed to measure the advantages and disadvantages of ICT use by older individuals and the driving forces behind it [Maranguni´c & Grani´c, 2015]. Fishbein and Ajzen's TRA and Ajzen's theory which talks about planned behaviour (TPB) [Ajzen, 1991] provided foundation for TAM [Davis et al., 1989]. TAM is a widely accepted model for understanding the effects of technology adoption on people's behavior [Guner & Acarturk, 2020]. Perceived utility and perceived convenience of use are identified as essential factors influencing technology adoption decisions in TAM [Hardill & MacDonald, 2000; Venkatesh et al., 2003].

Extended versions of TAM, incorporating variables like expectation of efforts required, learning related difficulty perception, and social impact, have been proposed to better fit specific study purposes [Ahmad et al., 2013; Hogeboom et al., 2010]. The unified theory of acceptance and use of technology (UTAUT), which includes TAM2 and TAM3, integrates various technology models with different TAM versions [Venkatesh et al., 2003; Venkatesh et al., 2016; Venkatesh et al., 2012]. The TOE framework, supported by consistent empirical research and a strong theoretical foundation, is also powerful in ICT innovation fields. Alatawi et al. (2013) proposed the TOE model as a effective option for studies examining IT use from an organizational perspective.

We are basing the study on the combinations of factors given in UTAUT and TOE, taking into consideration the requirements of the current investigation. Performance expectations, required efforts, technological, organisational, and environmental context are among the factors considered for the study.

3.1: Expectations for performance

According to Venkatesh, V. et al. (2003) and Ghalandari, K. (2012), performance expectancy is a model that expresses how much a person expects the layout of their surroundings to help them in performing their daily tasks effectively and profitably. In the context of M-technology, "performance expectancy" refers to the technology's usefulness [Chao, C.-M.2019, Nikolopoulou, K.et al 2021]. It gives users location-independent access to information at any time through social interaction. Performance expectation is the main factor affecting a user's behavioural decision of adopting M-technology [Onaolapo, S.; Oyewole, O.2018]. According to Nyembezi [Nyembezi, N.; Bayaga, A. 2014], older people's expectations for their performance increase in direct proportion to their desire to use M-technology. The factors taken into consideration here are perceived risk associated with using digital marketing, perceived relative advantage of using digital marketing,

and relevance of using digital marketing to the business goal.

Hypothesis 1: Performance expectancy is related to the utilisation of ICT for marketing by micro-entrepreneurs of rural south Odisha.

3.2: Efforts Expectancy

According to theory, people's perception of their ability to benefit from the new technology with less work or efforts is known as their effort expectancy [Venkatesh, V. et al. 2003, Miloševi¬c, et al. 2015]... As per Alraja et al. [Alraja, M.N. et al 2016], effort expectancy is a function of both user-friendliness and self-efficacy. Technology can only be used and applied successfully if its users are convinced that it fulfils their needs and wants and have a thorough understanding of its benefits. [Abdallah, O.; Bohra, O. 2021, Maiga, G.; Namagembe, F. 2014; Abdallah, N.]. Miloševi¬c et al. [Milosevic, D.; Andrei, S.; Vishny, R.W. 2015] state that efficiency of oneself and convenience in use are the factors that significantly impact the user's decision to accept or reject the technology. It takes expected efforts to find out what someone thinks about using technology [Mcmanus, P.; Standing, C.; Zanoli, R. 2009]. Therefore, in this case, the variables are the intricacy of the digital marketing process, compatibility of the process with the team's skill set, and accessibility of vendors (for outsourcing the digital marketing services).

Hypothesis 2: Effort expectancy is related to the utilisation of ICT for marketing by micro-entrepreneurs of rural south Odisha

3.3: Technological Context

An organization's technological environment typically explains the characteristics of IT innovation that impacts the organization's adoption of ICT (Chau and Tam, 1997; Thong, 1999). This is in agreement with earlier research on IT adoption that used a TOE framework (e.g., Grover, 1993; Iacovou et al., 1995; Thong, 1999). Three factors were taken into account in this study: the accessibility of IT infrastructure, technical expertise, and perceived trends (with regard to the industry's use of digital marketing).

Hypothesis 3: Technological factors are related to the utilisation of ICT for marketing by micro-entrepreneurs of rural south Odisha

3.4: Organisational Context

The adoption of technological innovation within an organisation may be influenced by the factor related to organisation, which describes the various impactful characteristics an organisation has in relation to the utilisation of technological innovation within the organisation, in accordance with the Technology Acceptance Framework (TOE) (Chau and Tam, 1997; Tornatzky and Fleischer, 1990). The availability of advisors, skilled staff, and other technological services, promotes innovation (Rees et al., 1984). Four variables are taken into consideration for this study based on the literature that is currently available: firm size (number of employees), financial resources (allocated by the organisation for that purpose), top management support and training, and team readiness (for adoption of digital marketing).

Hypothesis 4: Organisational factors are related to the utilisation of ICT for marketing by micro-entrepreneurs of rural south Odisha

3.5: Environmental Context

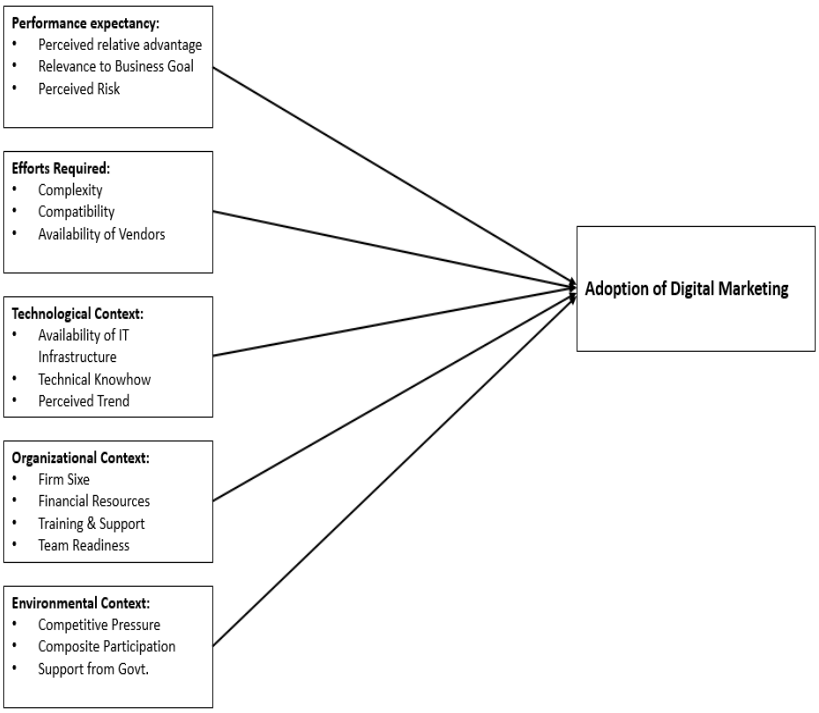
It includes the industry structure, the availability of technological service providers, and the assertive atmosphere. For example, one way that industrial structure has been studied is the fierce competition that drives the adoption of innovation (Mansfield, 1968; Mansfield et al., (1977).

Leading firms in the value chain can encourage innovation among their peers, claim Kamath and Liker (1994). Innovation is also impacted by the infrastructure that supports technology. Organisations that pay workers who are better skilled are expected to be required to implement effort-saving innovation (Globerman, 1975; Levin et al., 1987). Finally, government regulation may benefit or harm organisations based on whether its policies foster or impede innovation (Baker, 2011).

Therefore, The variables included in this factor are government support, composite participation, and competitive pressure.

Hypothesis 5: related to the utilisation of ICT for marketing by micro-entrepreneurs of rural south Odisha

On the basis of the discussions above the conceptual framework of the study is as follows:



4. Methodology:

The components of this study's construct are items from earlier research. This is to make sure the information is valid.For example, the performance expectancy items are derived from Rogers (1983), Dinev, T., & Hart, P. (2006), and Fichman, R. G., & Kemerer, C. F. (1997). On the other hand, the organisational context data comes from Eze, S. C. et al. (2020) and Chong et al. (2005). The effort expectancy variables are taken from Rogers (1983). The technological elements are taken from Rogers (1983), Xu, X., Zhang, W., & Barkhi, R. (2010), and Kimaro, H. C., & Nhampossa, J. L. (2005). Items from the environmental context are derived from Chong et al (2005). The list of factors from the literature is summarised in the table below.

Factors	Reference
Performance expectancy	Rogers (1983), Fichman, R. G., & Kemerer, C. F. (1997), and Dinev, T., & Hart, P. (2006)
Organisational Context	Chong et al (2005) and Eze, S. C et al (2020).
Efforts Expectancy	Rogers (1983).
Technological Factors	Kimaro, H. C., & Nhampossa, J. L. (2005), Rogers (1983), and Xu, X., Zhang, W., & Barkhi, R. (2010)
Environmental Context	Chong et al (2005)

List of factors and literature reference.

Data was gathered and the study's questionnaire created based upon 5-point Likert scale, responses were gathered, with the following values:

Strongly disagree (1), disagree (2), agree (4), and strongly agree (5).

In the fourth quarter of 2023, information was gathered from the districts of Malkangiri, Koraput, Nabarangpur, Rayagada, Gajapati, Kalahandi, Kandhamal, and Nuapada in south Odisha. Out of the 423 total responses, about 386 were deemed suitable for analysis.

5. Analysis

Cronbach's Alfa:

Scale -1 (Organisational factors)

Statistics of Reliability

Cronbach Alpha	Cronbach's Alpha based upon Standardised Item	No. of Items
.902	.903	4

Scale 2 (Performance expectancy)

Statistics of Reliability

Cronbach Alpha	Cronbach's Alpha based upon Standardised Item	No. of Items
.985	.986	4

Scale 3 (Efforts required)

Statistics of Reliability

Cronbach Alpha	Cronbach's Alpha based upon Standardised Item	No. of Items
.957	.957	4

Scale 4 (Technological Factors)

Statistics of Reliability

Cronbach Alpha	Cronbach's Alpha based upon Standardised Item	No. of Items
.996	.996	4

Scale 5 (Environmental Factors)

Statistics of Reliability

Cronbach Alpha	Cronbach's Alpha based upon Standardised Item	No. of Items
.986	.986	4

Scale 6 (Adoption of Digital Marketing)

Statistics of Reliability

Cronbach Alpha	Cronbach's Alpha based upon Standardised Item	No. of Items
.984	.984	3

Further to proceed with Exploratory factor analysis we first conducted KMO and Bartley Test.

The KMO and Bartlet test values obtained are as follows:

KMO and Bartlet's Test		
KMO Measure of Sampling Adequacy.		0.889
Bartlet's Test of Sphericity	Approx. Chi-Square	18845.932
	DF	253
	Significance	.000

The KMO test measures the proportion of variance among different variables. Values range from 0 to 1. A KMO value closer to 1 indicates that the sample is adequate for factor analysis.

A KMO value of 0.889 suggests that the sampling adequacy is "meritorious," meaning that the sample is more than adequate for factor analysis.

The high KMO value (0.889) indicates that the sample size is adequate for factor analysis.

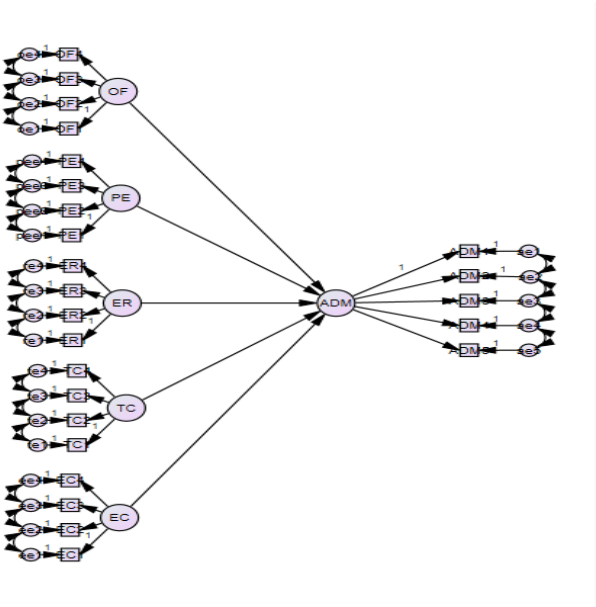
The significant result of Bartlett's test (p = .000) shows that there are significant correlations among variables, making the dataset fit for EFA.

We performed EFA to extract the factors and test the hypothesis.

Following results were obtained:

Rotated-Component-Matrix					
	Component				
	1	2	3	4	5
Organisational-Constraints					
OF-1.					0.879
OF-2.					0.84
OF-3.					0.881
OF-4.					0.816
Performance-Expectancy					
PE-1.			0.941		
PE-2.			0.96		
PE-3.			0.949		
PE-4.			0.961		
Efforts-Required					
ER-1.				0.937	
ER-2.				0.945	
ER-3.				0.933	
ER-4.				0.943	
Technological-Context					
TC-1.	0.983				
TC-2.	0.975				
TC-3.	0.985				
TC-4.	0.983				
Environmental-Context					
EC-1.		0.978			
EC-2.		0.976			
EC-3.		0.967			
EC-4.		0.962			
Extraction: Principal Component					
Rotation: Varimax with Kaiser Normalization.					

As the successive step we performed Confirmatory Factor Analysis. After which Following Results were Obtained:



After the above-mentioned model was run in AMOS Following results were obtained.

CMIN

Mod.	NPAR	C.MIN.	D.F.	P.	C.MIN/D.F.
Default mod.	79	445.317	246	.060	1.810
Saturated model	325	.000	0		
Independence mod.	25	26132.382	300	.060	87.108

RMR, GFI

Mod.	R.M.R.	G.F.I	A.G.F.I.	P.G.F.I.
Default mod.	.096	.852	.804	.645
Saturated mod.	.000	1.000		
Independence mod.	.311	.303	.244	.279

Baseline Comparison.

Mod.	N.F.I. Delta1	R.F.I. rho1	I.F.I. Delta2	T.L.I. rho2	C.F.I.
Default mod.	.945	.933	.954	.943	.954
Saturated mod.	1.000		1.000		1.000

R.M.S.E.A.

Mod.	R.M.S.E.A.	L.O. 90	H.I. 90	P.CLOSE
Default mod.	.049	.044	.053	.060
Independence mod.	.372	.369	.376	.060

HOELTER.

Mod.	HOELTER .05	HOELTER .01
Default mod	212	230
Independence mod.	9	9

Interpretation of the result:

Model Fit Summary

- **CMIN (Chi-square Minimum Discrepancy)**:

o **Default model**: $\chi^2(246) = 445.317$, p = .060, CMIN/DF = 1.810

o The chi-square value is moderate and the p-value is .060, which is slightly above the conventional significance threshold of .05, suggesting that the model is not significantly different from the observed data. CMIN/DF (chi-square/degrees of freedom) of 1.810 is below the generally accepted threshold of 3, indicating good fit.

RMR, GFI

- **RMR (Root-Mean-Square-Residual)**: .096

o Lower values are better; typically values <.08 are acceptable. This value is slightly above the threshold, indicating a moderate fit.

- **GFI (Goodness of Fit Index)**: .852

o Values closer to 1 indicate a better fit. GFI > .90 is generally considered good; .852 indicates a reasonable but not excellent fit.

- **AGFI (Adjusted Goodness of Fit Index)**: .804

o Like GFI, but adjusted for degrees of freedom. Values > .90 are considered good; .804 is marginal.

- **PGFI (Parsimony Goodness of Fit Index)**: .645

o Values typically range from 0 to 1; higher values indicate a more parsimonious model. .645 suggests moderate parsimony.

Baseline Comparisons

- **NFI (Normed Fit Index)**: .945
- **RFI (Relative Fit Index)**: .933
- **IFI (Incremental Fit Index)**: .954
- **TLI (Tucker-Lewis Index)**: .943
- **CFI (Comparative Fit Index)**: .954

o All these compare the default model with the baseline model. Values > .90 indicate a good fit. The values here suggest that the model is a good fit relative to the baseline model.

RMSEA (Root Mean Square Error of Approximation)

- **Default model**: .049 (LO 90: .044, HI 90: .053)

o RMSEA < .05 indicates a close fit, .05-.08 a reasonable fit, .08-.10 a mediocre fit, and > .10 a poor fit. .049 indicates a close fit. The p-value for RMSEA (PCLOSE) is .060, which supports that the RMSEA is not significantly different from zero.

HOELTER Critical N

- **HOELTER(.05)**: 212
- **HOELTER(.01)**: 230

o It says the sample size for which the model would be accepted. Values > 200 are generally desired. The values here suggest the model is acceptable and somewhat robust.

Result Summary

Overall, the model shows good fit indices. While the RMR value indicates a moderate fit, the other indices such as NFI, CMIN/DF, IFI, CFI, RMSEA, and TLI, indicate a good fit. The p-value of .060 for the chi-square test suggests the model is not significantly different from the observed data, and the RMSEA value of .049 indicates a close fit. The model is reasonably well-fitting and robust.

6. Results and Discussion:

A scale's reliability is determined by Cronbach's alpha, which calculates the extent to which scores from several items which aim to measure same general construct are comparable to one another. Elevated Cronbach's alpha coefficients indicate a comparatively high level of internal consistency for the items. A value of $\alpha \geq 0.7$ is considered good, and $\alpha \geq 0.9$ is exceptional. Since we obtained $\alpha \geq 0.9$, the scale's reliability has been proven.

Two statistical tests are used to identify if the data is fit for analysis: Bartlet's Test of Sphericity together with the Kaiser-Meyer-Olkin (KMO) test of Sample Adequacy.

Numerous studies state that the KMO should be > 0.5 (Norisis 2008, Li et al 2011, Field 2013). For the scale in use, the KMO test value is 0.689. For Bartlet's test significance-value must be less than 0.05 (Chan 2010). According to the analysis, the value is significantly lower than the same, meaning the sample passes the Adequacy and Correlation Matrix tests.

Exploratory Factor Analysis (EFA) was done to extract the factors. Organisational factors are shown in items OF1 through OF 4 of the EFA table; performance expectations are related to items PE1 through PE4, efforts required are related to items ER1 through ER4, technological context is related to items TC1 through TC 4, environmental context is related to items EC1 through EC 4, and adoption of digital marketing is measured by items ADM1 through ADM3.
After the factors were identified by the EFA, we implemented a confirmatory factor analysis (CFA) to examine the relationship between each independent and dependent variable in order to test our hypothesis.

According to Bentler, P.M. (1990), the CFA results for all five variables demonstrate significant relationships ($p>0.05$) between the independent and dependent variables. Thus, the following theories are agreed upon.

Hypothesis 1: Performance expectancy is related to the utilisation of ICT for marketing by micro-entrepreneurs of rural south Odisha **- Approved**

Hypothesis 2: Effort expectancy is related to the utilisation of ICT for marketing by micro-entrepreneurs of rural south Odisha **- Approved**

Hypothesis 3: Technological factors are related to the utilisation of ICT for marketing by micro-entrepreneurs of rural south Odisha **- Approved**

Hypothesis 4: Organisational factors are related to the utilisation of ICT for marketing by micro-entrepreneurs of rural south Odisha **- Approved**

Hypothesis 5: Environmental factors are related to the utilisation of ICT for marketing by micro-entrepreneurs of rural south Odisha **- Approved**

7. Conclusion:

The objective of this study is to find how the utilisation of ICT based digital marketing by micro entrepreneurs in rural South Odisha is affected by several factors, like performance, and effort expectancy, technological, organisational, and environmental factors. Five hypotheses were selected, and the primary data gathered from the area was used in the research. The effect of independent variables on dependent variables is established through the analysis of the gathered data using the EFA and CFA methods. The study's findings show that, given the right infrastructure and assistance from the government, rural microbusiness owners are eager to adopt and make use of digital marketing tools. Promoting technical expertise in relation to digital marketing tools is also necessary.

Therefore, it might be advised that policymakers provide improved digital infrastructure and consider offering promotional subsidies to rural areas. Leaders in the digital marketing sector must simultaneously improve the tools' usability and accessibility while maintaining reasonably priced, basic advertising campaigns. The microentrepreneurs in South Odisha's rural areas are the only subjects of the study that is being presented. Given the diversity of cultures and beliefs found in India, a more thorough investigation could be conducted to determine the factors affecting the utilisation of ICT based digital marketing by microbusiness owners in the nation's rural areas.

References:

[1] Abdallah, N.; Abdallah, O.; Bohra, O. Factors affecting mobile learning acceptance in higher education: An empirical study. Int. J. Adv. Comput. Sci. Appl. **2021**, 12, 664–671. [CrossRef]

[2] Ahmad, M.O.; Markkula, J.; Oivo, M. Factors affecting e-government adoption in Pakistan: A citizen's perspective. Transform. Gov. People Process. Policy **2013**, 7, 225–239.

[3] Ahmad, S. R., Prasad, K. D. V., Bhakuni, S., Hedau, A., Narayan, P. S., & Parameswari, P. (2023). The role and relation of emotional intelligence with work-life balance for working women in job stress. The Scientific Temper, 14(01), 233-237.

[4] Ajzen, I. The theory of planned behavior. Organ. Behav. Hum. Decis. Process. **1991**, 50, 179–211. [CrossRef]

[5] Ajzen, I.; Madden, T.J. Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. J. Exp. Soc. Psychol. **1986**, 22, 453–474. [CrossRef]

[6] Alatawi, F. M. H., Dwivedi, Y. K., & Williams, M. D. (2013). Developing a conceptual model for investigating adoption of knowledge management system in Saudi Arabian public sector. International Journal of Business Information Systems, 14(2), 135-163.

[7] Alraja, M.N.; Hammami, S.; Chikhi, B.; Fekir, S. The influence of effort and performance expectancy on employees to adopt e-government: Evidence from oman. Int. Rev. Manag. Mark. **2016**, 6, 930–934.Appl. Geogr. 52, 25–33.

[8] Baker, J. (2011) 'Technology-organization-environment framework', in Dwivedi, Y.K., Wade, M.R. and Schneberger, S.L. (Eds.): Information

Systems Theory: Explaining and Predicting Our Digital Society, Vol. 1, pp.231–245.

[9] Bala, M. and Verma, D. (2018). A critical review of Information and Communication Technology . International Journal of Management, IT and Engineering, 8(10). ISSN: 2249-0558 Impact Factor: 7.119.

[10] Bentler, P.M. (1990). Comparative fit indexes in structural models. Psychological Bulletin, 107(2), 238-246.

[11] Brereton RG. ANOVA tables and statistical significance of models. Journal of Chemometrics. 2019; 33:e3019. https://doi.org/10.1002/cem.3019

[12] Chan, A.P.C.; Lam, P.T.I.; Chan, D.W.M.; Cheung, E.; Ke, Y. Critical Success Factors for PPPs in InfrastructureDevelopments: Chinese Perspective. J. Construct. Eng. Manag. 2010, 136, 484–494. [CrossRef]

[13] Chao, C.-M. Factors determining the behavioral intention to use mobile learning: An application and extension of the utaut model. Front. Psychol. **2019**, 10, 1652. [CrossRef] [PubMed]

[14] Chau, P.Y.K and Tam, K.Y. (1997) 'Factors affecting the adoption of open systems: an exploratory study', MIS Quarterly, Vol. 21, No. 1, pp.1–24.

[15] Chong Sandy., & B,Rameseshan. (2005).Factors influencing the adoption of electronic commerce among the small and medium sized enterprises in Australia. Journal of marketing & Communication , Volume 1 (Issue 2).

[16] Davis, F.D. Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Q. **1989**, 319–340. [CrossRef]

[17] Davis, F.D.; Bagozzi, R.P.; Warshaw, P.R. User acceptance of computer technology: A comparison of two theoretical models. Manag. Sci. **1989**, 35, 982–1003. [CrossRef]

[18] Dhanlaxmi Bank. (2010, December 1). In focus. https://www.dhanbank.com/pdf/reports/InFocus-December%201,%202010.pdf

[19] Dinev, T., & Hart, P. (2006). An extended privacy calculus model for e-commerce transactions. Information systems research, 17(1), 61-80.

[20] Eid, R.; El-Gohary, H. The impact of E-marketing use on small business enterprises' marketing success. Serv. Ind. J. **2013**, 33,31–50. [CrossRef]

[21] Exploding Topics. (n.d.). Countries with the most internet users in 2023. https://explodingtopics.com/blog/countries-internet-users

[22] Eze, S. C., Chinedu-Eze, V. C., Okike, C. K., & Bello, A. O. (2020). Critical factors influencing the adoption of Information and Communication Technology devices by service-oriented micro-businesses in Nigeria: A thematic analysis approach. Humanities and Social Sciences Communications, 7(1), 1-14.

[23] Fachrurazi, F., Zarkasi, Z., Maulida, S., Hanis, R., & Yusuf, M. (2022). Ingcreasing micro small medium enteprises activity entrepreneurial capacity in the field of Information and Communication Technology . Jurnal Ekonomi, 11(03), 1653-1660.

[24] Fichman, R. G., & Kemerer, C. F. (1997). Object technology and reuse: Lessons from early adopters. Computer, 30(10), 47-59.

[25] Fichman, R. G., & Kemerer, C. F. (1997). The assimilation of software process innovations: An organizational learning perspective. Management science, 43(10), 1345-1363.

[26] Field, A. Discovering Statistics Using IBM SPSS Statistics; Sage: Newcastle upon Tyne, UK, 2013

[27] Fishbein, M.; Ajzen, I. Misconceptions about the fishbein model: Reflections on a study by songer-nocks. J. Exp. Soc. Psychol. **1976**, 12, 579–584. [CrossRef]

[28] Ghalandari, K. The effect of performance expectancy, effort expectancy, social influence and facilitating conditions on acceptance of e-banking services in Iran: The moderating role of age and gender. Middle-East J. Sci. Res. **2012**, 12, 801–807.

[29] Globerman, S. (1975) 'Technological diffusion in the Canadian tool and die industry', Review of Economics and Statistics, Vol. 57, No. 4, pp.428–434.

[30] Goel, R., Veluri, K. K., & Mishra, S. (2024). Understanding The Use Of Information and Communication Technology By Rural Micro Entrepreneurs Of India: A Systematic Literature Review. Educational AICTinistration: Theory and Practice, 30(5), 7629-7638.

[31] Gouda, S. K., Patro, Y. S. S., & Mishra, S. (2024). A Study of E-recruitment technology adoption in India. Educational AICTinistration: Theory and Practice, 30(5), 11804-11812.

[32] Grover, V. (1993) 'An empirically derived model for the adoption of customer-based interorganizational systems', Decision Sciences, Vol. 24, No. 3, pp.603–640.

[33] Guner, H.; Acarturk, C. The use and acceptance of ict by senior citizens: A comparison of technology acceptance model tam) for elderly and young adults. Univers. Access Inf. Soc. **2020**, 19, 311–330. [CrossRef]

[34] H.C. Kimaro and J.L. Nhampossa, "Analyzing the Problem of Unsustainable Health Information Systems in Less-Developed Economies: Case Studies From Tanzania and

Mozambique", Information Technology for Development, vol. 11, no. 3, pp. 273-298, 2005.
[35] Hardill, I.; MacDonald, S. Skilled international migration: The experience of nurses in the uk. Reg. Stud. **2000**, 34, 681–692. [CrossRef]
[36] He, W.; Wang, F.-K.; Zha, S. Enhancing social media competitiveness of small businesses: Insights from small pizzerias. New Rev.Hypermedia Multimed. **2014**, 20, 225–250. [CrossRef]
[37] Hogeboom, D.L.; McDermott, R.J.; Perrin, K.; Osman, H.; Bell-Ellison, B.A. Internet use and social networking among middle aged and older adults. Educ. Gerontol. **2010**, 36, 93–111. [CrossRef]
[38] Iacovou, C., Benbasat, I. and Dexter, A. (1995) 'Electronic data interchange and small organisations: adoption and impact of technology', MIS Quarterly, Vol. 19, No. 4, pp.465–485
[39] Jongebloed, H., Anderson, K., Winter, N. et al. The digital divide in rural and regional communities: a survey on the use of digital health technology and implications for supporting technology use. BMC Res Notes **17**, 90 (2024). https://doi.org/10.1186/s13104-024-06687-x
[40] Kamath, R. and Liker, J. (1994) 'A second look at supplier development', Harvard Business Review, November–December, pp.154–168.
[41] Kano, K., Choi, L. K., subhan Riza, B., & Octavyra, R. D. (2022). Implications of Information and Communication Technology strategy the competitive advantages of small businesses in indonesia. Startupreneur Business Digital (SABDA Journal), 1(1), 44-62.
[42] Levin, S.G., Levin, S.L. and Meisel, J.B. (1987) 'A dynamic analysis of the adoption of a new technology: the case of optical scanners', The Review of Economics and Statistics, Vol. 69, No. 1, pp.12–17
[43] Li, Y.Y.; Chen, P.-H.; Chew, D.A.S.; Teo, C.C.; Ding, R.G. Critical Project Management Factors of AEC Firms forDelivering Green Building Projects in Singapore. J. Construct.Eng. Manag. 2011, 137, 1153–1163. [CrossRef]
[44] Maiga, G.; Namagembe, F. Predicting adoption of mhealth technology in resource constrained environments. In Proceedings of the 2014 IST-Africa Conference Proceedings, Pointe aux Piments, Mauritius, 7–9 May **2014**; pp. 1–12.
[45] Mansfield, E. (1968) Industrial Research and Technological Innovation: An Economic Analysis, Norton, New York.
[46] Mansfield, E., Rapoport, J., Romeo, A., Villani, E., Wagner, S. and Husic, F. (1977) The Production and Application of New Industrial Technology, Norton, New York.
[47] Maranguni´c, N.; Grani´c, A. Technology acceptance model: A literature review from 1986 to 2013. Univers. Access Inf. Soc. **2015**, 14, 81–95. [CrossRef]
[48] Mcmanus, P.; Standing, C.; Zanoli, R. A preliminary Laddering Analysis on Mobile Services Usage; McGraw Hill: New York, NY,USA, 2009.
[49] Miloševi´c, I.; Živkovi´c, D.; Manasijevi´c, D.; Nikoli´c, D. The effects of the intended behavior of students in the use of m-learning. Comput. Hum. Behav. **2015**, 51, 207–215. [CrossRef]
[50] Milosevic, D.; Andrei, S.; Vishny, R.W. A survey of corporate governance. J. Financ. **2015**, 52, 737–783.
[51] Ministry of Micro, Small & Medium Enterprises. (n.d.). Know about MSME. https://msme.gov.in/know-about-msme
[52] Mishra, S., & Mohanty, M. (2009). Financing and Risk Management Techniques in Green Field Projects Under Public, Private Partnership (PPP) Model: A Case Study Of Rajiv Gandhi International Airport (RGIA) Ltd, Hyderabad. Interscience Management Review, 22-31.
[53] Nhuvira, C.E.; Dorasamy, N. Adapt Or Die: The Adoption of Information and Communication Technology by Fashion SMMES in South Africa. J. Manag. Inf.Decis. Sci. **2021**, 24, 1–16.
[54] Nikolopoulou, K.; Gialamas, V.; Lavidas, K. Habit, hedonic motivation, performance expectancy and technological pedagogical knowledge affect teachers' intention to use mobile internet. Comput. Educ. Open **2021**, 2, 100041. [CrossRef]
[55] Norusis, M. SPSS 16.0 Advanced Statistical Procedures Companion; Prentice Hall Press: Upper Saddle River, NJ,USA, 2008.
[56] Nuseira, M.T.; Aljumahb, A. Information and Communication Technology adoption influenced by relative advantage and competitive industry: A UAE tourism case study. Marketing **2020**, 11, 23–37.
[57] Nyembezi, N.; Bayaga, A. Performance expectancy and usage of information systems and technology: Cloud computing (PEUISTCC). Int. J. Educ. Sci. **2014**, 7, 579–586.
[58] Ofcom, 2016. Connected Nations Report 2016. Available at: https://www.ofcom.org.uk/
[59] Olaposi, T O. (2021, January 7). Towards the Development of the Informal Economy: The Case of Street Trading in Ile-Ife, Nigeria. https://scite.ai/reports/10.5772/intechopen.93871
[60] Onaolapo, S.; Oyewole, O. Performance expectancy, effort expectancy, and facilitating conditions as factors influencing smart phones use for mobile learning by postgraduate students of the University of Ibadan, Nigeria. Interdiscip. J. e-Ski.

Lifelong Learn. **2018**, 14, 95–115. [CrossRef] [PubMed]

[61] Pandey, N.; Nayal, P.; Rathore, A.S. Information and Communication Technology for B2B organizations: Structured literature review and future research directions. J. Bus. Ind. Mark. **2020**, 35, 1191–1204. [CrossRef]

[62] Petrovˇciˇc, A.; Petriˇc, G.; Manfreda, K.L. The effect of email invitation elements on response rate in a web survey within an online community. Comput. Hum. Behav. **2016**, 56, 320–329. [CrossRef]

[63] Philip, L., Cottrill, C., Farrington, J., 2015. Two-Speed Scotland: patterns and implications of the digital divide in contemporary Scotland. Scot. Geogr. J. 131 (3–4), 148–170

[64] Philip, L., Cottrill, C., Farrington, J., Williams, F., Ashmore, F., 2017. The digital divide: patterns, policy and options for connecting the final few in rural communities across Great Britain. J. Rural Stud. https://doi.org.10.1016/j.jrurstud.2016.12.002. research-and-data/infrastructure-research/connected-nations-2016.

[65] Rees, J., Macaulay, S., & Moffitt, M. (1984). The economic impact of technology services. Cambridge University Press.

[66] Riddlesden, D., Singleton, A.D., 2014. Broadband speed equity: a new digital divide

[67] Ritz, W.; Wolf, M.; McQuitty, S. Information and Communication Technology adoption and success for small businesses: The application of the do-it-yourself and technology acceptance models. J. Res. Interact. Mark. **2019**, 13, 179–203. [CrossRef]

[68] Rogers, Everett.M. (1983).Diffusion of Innovations. The free press, Newyork.

[69] Sharma, U. and Thakur, K.S. (2020). A Study on Information and Communication Technology and its impact on consumers purchase. International Journal of Advanced Science and Technology, 29(3):13096-13110.

[70] Sheoliha, N., Hajira, B., Singh, A., Rawat, P., Rawal, P., & Sharma, A. (2023). The Impact of Information and Communication Technology and Digital Transformation on E-Commerce, Positioning and Brand Promotion. Journal of Informatics Education and Research, 3(2).

[71] Smith, A.N.; Fischer, E.; Yongjian, C. How does brand-related user-generated content differ across YouTube, Facebook, and Twitter? J. Interact. Mark. **2012**, 26, 102–113. [CrossRef]

[72] Solakis, K.; Katsoni, V.; Mahmoud, A.B.; Grigoriou, N. Factors affecting value co-creation through artificial intelligence in tourism: A general literature review. J. Tour. Futures **2022**. [CrossRef]

[73] Thong, J.Y.L. (1999) 'An integrated model of information systems adoption in small businesses', Journal of Management Information Systems, Vol. 15, No. 4, pp.187–214.

[74] Tornatzky, L.G. and Fleischer, M. (1990) The Processes of Technological Innovation, Lexington Books, Lexington, Massachusetts.

[75] Venkatesh, V.; Morris, M.G.; Davis, G.B.; Davis, F.D. User acceptance of information technology: Toward a unified view. MIS Q. **2003**, 27, 425–478. [CrossRef]

[76] Venkatesh, V.; Thong, J.Y.; Chan, F.K.; Hu, P.J. Managing citizens' uncertainty in e-government services: The mediating and moderating roles of transparency and trust. Inf. Syst. Res. **2016**, 27, 87–111. [CrossRef]

[77] Venkatesh, V.; Thong, J.Y.; Xu, X. Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. MIS Q. **2012**, 36, 157–178. [CrossRef]

[78] Xu, X., Zhang W., and Barkhi, R., 2010. IT infrastructure capabilities and IT project success: a de velopment team perspective. Information Technology and Management, 11(3), pp. 123-142.

[79] Yamini, G. and Chand, N. (2020). Online marketing influence on startups and small businesses. International Journal of Scientific Research and Engineering Development, 3(6).