ISBN: 978-628-95207-8-1. ISSN: 2414-6390. Digital Object Identifier: 10.18687/LACCEI2024.1.1.1282

Unlocking Retail Success: A Comprehensive Exploration of Information and Communication Technology (ICT) Operations Practices in Nanostores

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Abstract*– The integration of new information and communication technologies (ICT) plays a pivotal role in advancing Industry 4.0 within retail supply chains. However, the successful implementation of ICT in nanostores (i.e., small family-run traditional grocery shops, typically mom-and-pop stores under 100 m^2) presents unique challenges. This study aims to identify and analyze key operational practices associated with ICT implementation in nanostores. Leveraging a combination of literature review, an academic expert panel, and surveys conducted with nanostores owners, the collected data underwent rigorous testing through Exploratory Factor Analysis. The empirical findings reveal three principal factors elucidating the obtained variance: Customer and Supplier Management, Operations Management, and Inventory Management. This not only aligns with existing literature but also offers contemporary quantitative insights for prioritizing ICT implementation in nanostores. The outcomes of this study serve as a valuable guide for academics, nanostores owners, and practitioners, facilitating informed decisions in ICT implementation and enabling proactive measures in implementation initiatives. In the landscape of the Internet of Things and the Fourth Industrial Revolution, the study highlights the significance of ICT implementation in nanostores, addressing a critical gap in the current scientific literature.

***Keywords*-- nanostores, Information Technology, Exploratory Factor Analysis, Exploratory Factorial Analysis.**

I. Introduction

In the context of the Fourth Industrial Revolution, Information and Communication Technologies (ICT) have emerged as pivotal catalysts driving advancements in theory and practice across various industries [1]. The proliferation of the Internet of Things, fostering interconnected networks among objects, underscores the critical role of ICT in efficiently managing retail supply chains [2]. These systems enable comprehensive information capture for each object, enhancing data access and quality throughout the supply chain.

The implementation of ICT in retail supply chains has yielded multifaceted benefits, including cost reduction, error minimization, diminished product loss, and optimization of inventory levels and lead times [3]. Such efficiency enhancements contribute to heightened productivity and customer satisfaction, bolstering the competitiveness and sustainability of retail enterprises [4].

However, despite the evident advantages, it is crucial to acknowledge that ICT implementation is not universally straightforward, particularly in the realm of nano-retail stores or nanostores, i.e., colloquially referred to as mom-and-pop stores, epitomize the essence of traditional grocery retail. These quaint establishments, typically spanning less than 100 m2, are characterized by their familial operation, independence, and absence of formal organization [5]. Coined by Blanco and Fransoo [6], the term "nanostores" encapsulates their unique charm and significance in the retail landscape[7]. To fully capitalize on ICT benefits, it becomes imperative to identify and adeptly manage the associated challenges[8] [9]. While existing studies touch upon barriers to ICT adoption, few delve into the intricacies of the implementation process, especially through empirical quantitative analyses. Quantitative data prove invaluable in providing insights during implementation, enabling proactive measures, and elevating the likelihood of project success.

Against this backdrop, this study endeavors to identify, validate, and elucidate the principal operational practices in nanostores implementing ICT. The methodology encompasses a comprehensive literature review to pinpoint salient practices in nanostores that have embraced ICT. Subsequently, a content validity analysis, featuring the participation of an expert panel from various international universities, is conducted. Additionally, a survey involving 143 nanostores owners who have implemented ICT is undertaken, employing statistical analyses such as Exploratory Factor Analysis to discern and structure the most relevant operational practices.

To fill this gap, research questions guiding this study are as follows:

1) What are the primary operational practices in nanostores implementing ICT?
2) How are these operational practices organized and interconnected within the nanostores context?

To answer these questions, the study objectives are outlined as follows:

1) Identify the primary operational practices in nanostores implementing ICT.

Digital Object Identifier: (only for full papers, inserted by LACCEI).
ISSN, ISBN: (to be inserted by LACCEI).
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2) Validate the identified practices through content validity analysis.
3) Analyze and structure the identified operational practices using Exploratory Factor Analysis.
4) Discuss the obtained results and their practical implications.
5) Conclude the study and propose potential directions for future research.

The study is organized as follows: Section 2 provides a literature review, defining ICT and presenting the derived benefits from its implementation in nanostores. Section 3 details the methodology, encompassing the literature review, content validity analysis, and survey. Section 4 presents the results from the Exploratory Factor Analysis. Section 5 delves into the discussion of results and their practical implications. Finally, Section 6 encapsulates the study's conclusions and proposes avenues for future research.

II. Conceptual Framework and Propositions

A. ICT in Nanostores

Within this subsection, the transformative role of Information and Communication Technologies (ICT) in nanostores is examined. nanostores, characterized as small retail establishments, are witnessing substantial growth amid the advent of Industry 4.0. ICT stands as a pivotal driver in reshaping these stores, fostering enhanced operational efficiency, refined supply chain management, and an enriched shopping experience for patrons.

The realm of ICT in nanostores spans diverse technologies, encompassing point-of-sale (POS) systems, electronic price tagging, inventory management systems, real-time data analytics, payment systems, and mobile applications for customer interaction, among others. These technologies empower nanostores to optimize their operations, heighten product visibility, deliver personalized promotions, and offer a convenient and efficient shopping experience.

B. Enhancing ICT Operations in Nanostores

This subsection delves into the exploration of ICT practices of operations in nanostores, spotlighting the implementation and utilization of technologies to enhance the efficiency and effectiveness of retail operations. Key practices of operations include:

1) *Optimized Inventory Management*: ICT facilitates real-time inventory tracking, empowering nanostores to optimize supply chain management, minimize losses due to stock imbalances, and make informed decisions, thus reducing associated cost [10].
2) *Personalizing the Customer Experience*: Leveraging technologies like mobile apps and real-time data analytics, nanostores can tailor the shopping experience. This involves offering product recommendations based on customer preferences and purchase history, as well as personalized promotions, fostering customer satisfaction and store loyalty [11].
3) *Improved Operational Efficiency*: Automation of tasks in nanostores through ICT, such as automated POS systems and electronic price tagging, enhances operational efficiency by reducing checkout wait times and minimizing errors [12].
4) *Supply Chain Management*: ICT streamlines procurement processes, optimizes logistics, and enhances product flow visibility, contributing to improved supply chain management [13].

Despite offering significant competitive advantages, literature on nanostores is scant regarding operations practices in ICT implementation [14]. Moreover, ICT implementation is contingent on the type and maturity of each nanostores [15]. There is no one-size-fits-all model, as functionality must align with the individual characteristics of each nanostores. Additionally, costs associated with technology implementation can vary considerably based on the extent of installed ICT [16].

Understanding operations practices adopted by companies in general ensures optimal outcomes for future nanostores implementations.

To identify and organize these difficulties, a literature review was conducted, compiling 19 operating practices forming the empirical basis of this research. These practices are detailed in Table I.

TABLE I
Operations Practices Associated with ICT Implementation

Item	Scale (Practical)	Ask
1	E-Busines	I use internet-connected applications to inform my customers about the products I offer [17].
2	Effectiveness in implementation	I make purchases on the Internet to stock my store [18].
3		I sell products from my store using the Internet [18].
4	Service Technology	I use my business phone (landline or cell phone) to serve my customers [19].
5	Process control	I have some kind of technology that tells me when to stock my store [20].
6		I have an application on my phone that alerts me when to stock my store [20].
7	Electronic Business Interfaces	I often promote my products on social networks or phone applications [21].
8		I communicate with my clients through social networks or phone applications [21].
9	Service Management Process Technology	I am willing to implement technology to improve the sales service to my customers [22].
10		I feel that repetitive activities (customer payments, closing) can be performed automatically [22].
11	Use of Information Technologies with Customers	The implementation of technology could help me obtain higher profits [23].
12		Obtaining information on my customers' consumption habits could help my store [23].
13	Customization Levels	The location of my store is strategic to have new customers [24].
14	Mass customization	The products I sell are appropriate for the location of my store [25].
15	Digitization of the supplier sales process	Some of my suppliers make a digital record of my orders [26].
16		In the event of a delay in the delivery of my order, I have a means of contacting the supplier [26].
17	Marketing	I pay for advertising space on the Internet in order to reach more customers. [26].
18	E-Sales/Sales	My suppliers offer online catalog of their products [17].
19		I use mobile applications to track suppliers in real time [17].

[a] Own elaboration.

C. Propositions

This subsection presents propositions based on the theoretical and conceptual framework applied in Honduras, serving as an example of a developing country. These propositions lay the foundation for developing hypotheses and conducting future research.

1) *Proposition 1*: Nanostores in Honduras are actively adopting ICT.
2) *Proposition 2*: Operational practices in Honduran Nanostores serve as evidence of ICT implementation.

Honduras, with an HDI of 0.634 in 2019, falls within the medium human development category, ranking 132nd out of 189 countries and territories. Between 1990 and 2019, Honduras experienced a 22.2% increase in HDI, with notable progress in life expectancy, average years of schooling, expected years of schooling, and GNI per capita.

These propositions establish theoretical linkages among the study's key variables, offering a starting point for empirical research. Future research endeavors are anticipated to validate and expand upon these propositions, thereby contributing to a more comprehensive understanding of ICT operations practices in nanostores and their impact on the retail industry.

III. METODHOLOGY

This research encompassed seven distinct stages, delineated as follows.

1) *Literature Review*: The initial step involved an extensive literature review to establish a theoretical foundation for the research. This included an exploration of operations practices in nanostores implementing ICT. Searches were conducted across prominent academic databases (Emerald, WoS, Scopus, Springer, Elsevier) and specific books on supply chain, operations management, and nanostores.
2) *Development of Expert Panel Instrument*: A specialized instrument was formulated based on identified operations practices in ICT implementation. Seven experts in the operations field evaluated and structured the instrument. Each expert rated the importance of each operations practice on a scale from 1 to 5. A pre-test was conducted to ensure the instrument's efficacy. Google Forms facilitated the distribution, collecting 143 responses over two weeks, serving as content validity for subsequent surveys. [27].
3) *Survey Development for nanostores*: Leveraging expert panel outcomes, the survey was customized to align with nanostores contexts and specific research objectives. Questions and approaches were adapted to capture pertinent knowledge and information from retail nanostores owners.
4) *Data Collection*: The survey questionnaire was administered to 143 retail nanostores owners through students from various university classes. Informed consent was obtained from both student participants and nanostores owners, ensuring data privacy and confidentiality. Regular communication with students-maintained clarity, provided guidelines, and addressed any concerns throughout the data collection process.
5) *Tabulation*: Collected survey data were organized and analyzed to gain a comprehensive understanding of nanostores owners' responses, facilitating decision-making and informing ongoing research.
6) *Statistical Treatment*: Statistical treatment involved applying diverse statistical techniques to analyze tabulated data. Initial emphasis was on the examination of Cronbach's alpha coefficient to identify internal consistency issues. Values between 0.70 and 0.95 were sought to ensure reliability. Subsequent exploratory factor analysis (EFA) was performed for downsizing variables.
7) *Analysis of Results*: Results from tabulated and statistically treated data were scrutinized and interpreted to draw meaningful conclusions. The analysis provided valuable insights into research objectives and contributed to understanding the retail nanostores industry. The data were evaluated using Cronbach's alpha coefficient ranging from 0 to 1. Values closer to 1 signified greater internal consistency. Values between 0.70 and 0.95 were deemed acceptable. Exploratory Factor Analysis (EFA): The EFA process involved several steps outlined in Table II, utilizing the principal component analysis extraction method and Varimax orthogonal rotation method. Key considerations included overall data sample adequacy (Kaiser-Meyer-Olkin), validity of correlations between variables (Bartlett's test of sphericity), and the need to eliminate certain variables (anti-image correlation matrix)[28] [29].

According to Table II, the data collected were analyzed using the technique, through seven steps.

TABLE II
STEPS FOR EFA APPLICATION

Step	Description
1	To reduce the number of variables analyzed: principal component analysis extraction method; to minimize the number of variables with high factor loadings on each factor (each variable is associated with only one factor): orthogonal rotation Varimax method [30].
2	Overall adequacy of the data sample to perform EFA: Kaiser-Meyer-Olkin (KMO), where value must be > 0.6 [30].
3	Check whether correlations between variables are valid: Bartlett's test of sphericity, which checks whether variables are uncorrelated in the population. EFA can be performed when there are correlations between variables [31].
4	Evidence of the need to eliminate a certain variable from the model: anti-image correlation matrix, with the Sampling Suitability Measure (SAM), where the values of the main diagonal of the anti-image correlation matrix must be > 0.5, otherwise the variable must be eliminated [32].
5	Portion of the variance that a variable share with all the other variables considered: communality analysis, where the values must be > 0.5. If not, to ensure internal consistency the variable must be eliminated and EFA re-done [30].
6	Analysis of the factorial model generated and interpretation of the extracted factors, which should explain at least 60% of the variances, considering the extracted factors with eigenvalues greater than 1.0 (Kaiser normalization criterion). For samples composed of 143 nanostores, the factor loading value is ≈ 0. 5 [33].
7	Interpretation and naming of the factors, according to the skill and knowledge of the researcher. It is also recommended to test the internal reliability of these new factors through Cronbach's alpha coefficient (>0.6). [31].

[a] Own elaboration.

While suitable factors resulting from EFA can be named for ease of understanding, the naming process is acknowledged as challenging. The recommendation is to commence with factor scores or multiple scales as indices.

A. *Sample Characteristics*

The study aimed to survey over 5,000 Honduran nanostores with up to 5 employees in major cities of the northern and central areas. The sample comprised 143 valid questionnaires, achieving a sampling error of 10%, a confidence level of 95%, and a persistence of 50%. The sample, characterized as probabilistic, ensured random respondent selection. Notably, respondents were nanostores owners, and the sample boasted quality in terms of ownership levels and nanostores work experience [27].

B. *Sample Demographics*

The study targeted nanostores in Honduras, resulting in 143 valid responses. Of these, 82% were located in urban areas, with the remaining 18% in rural areas. Approximately 69% had formalized their business procedures, and only 10% of owners owned more than one store. nanostores, on average, had been operational for 11 years, employing two to three people. In terms of infrastructure, stores averaged around 47 square meters and served approximately 97 customers daily.

IV. Results

A. *Internal Reliability Analysis*

After collecting data from 143 ICT respondents in nanostores, Cronbach's Alpha was computed to assess the internal reliability of the questionnaire. The resulting value of 0.918 validated the questionnaire's reliability [29].

B. *Exploratory Factor Analysis for Scale Reduction*

In line with the chosen extraction and orthogonal rotation methods (principal component analysis and varimax, respectively), the EFA process was conducted in two rounds. In the first round, items 13 and 15 were eliminated due to communalities below 0.5 [34].

The second round involved a comprehensive analysis, as described below.

1) *Sampling Adequacy:*
- Kaiser-Meyer-Olkin (KMO) test yielded 0.896, indicating good data quality [30].
- Bartlett's test of sphericity demonstrated significant correlations (Chi-square = 1603.41, $p < 0.001$).

2) *Measure of Sampling Adequacy (MSA)*: Anti-image correlation matrix indicated high adequacy, with all values exceeding 0.80 [32] (Table III).

TABLE III
MSA Indices in Anti-Image Correlation Matrix in Second Round Of EFA Application

Correlación anti-imagen

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 14	Item 16	Item 17	Item 18	Item 19
Item01	0.92																
Item02		0.94															
Item03			0.92														
Item04				0.92													
Item05					0.88												
Item06						0.88											
Item07							0.88										
Item08								0.94									
Item09									0.93								
Item10										0.95							
Item11											0.82						
Item12												0.83					
Item14													0.76				
Item16														0.76			
Item17															0.92		
Item18																0.88	
Item19																	0.91

[a] Own elaboration, from SPSS 23.

3) *Factor Model Validity:* Three components with eigenvalues greater than 1.0 were identified (7.714, 2.412, 1.206), collectively explaining 66.66% of data variances.

C. *Measure of Sampling Adequacy (MSA)*

As highlighted above, the minimum portion of the variance that a variable share with all the other variables considered (communality) is 0.5[35] [36]. In the second round, the communalities of the variables presented satisfactory values (Table IV).

TABLE IV
Values of Communality for Variables Evaluated in Second Round

Item	Extraction	Item	Extraction
Item01	0.707	Item10	0.583
Item02	0.560	Item11	0.721
Item03	0.697	Item12	0.718
Item04	0.547	Item14	0.589
Item05	0.693	Item16	0.626
Item06	0.681	Item17	0.675
Item07	0.834	Item18	0.631
Item08	0.791	Item19	0.689
Item09	0.591		

[a] Method: Principal component analysis.

1)*Factor Model Validity*: Three components with eigenvalues greater than 1.0 were identified (7.714, 2.412, 1.206), collectively explaining 66.66% of data variances.

Having met all the above criteria, it was possible to generate a first factor model. As mentioned above, according to Kaiser's normalization criterion, the factor model generated must explain at least 60% of the variances for factors that have eigenvalues greater than 1.0 [33]. In this research, three components had eigenvalues greater than 1.0, components 1,2 and 3 presented values of 7.714, 2.412 and 1.20 6 respectively. Together, these three components explain 66.66% of the variances of the data. Therefore, the generated model can be considered valid. The valid factor model generated is shown in Table IV.

Finally, with the factorial model generated, it was possible to analyze the most influential variables in the rotated components matrix. We requested that the application should only present factor loadings greater than 0.5 [30] thus demonstrating those variables that are truly influential. The rotated components matrix, in which it is possible to visualize the most influential variables, is shown in Table V.

TABLE V
MATRIX OF ROTATED COMPONENTS AND FACTOR LOADINGS > 0.5

		Component		
Item	**Ask**	**1**	**2**	**3**
Item07	I often promote my products on social networks or phone applications.	**.845**	.340	-.069
Item03	I sell products from my store using the internet.	**.809**	.199	-.054
Item06	I have an application on my phone that alerts me when to stock my store.	**.803**	.166	.096
Item19	I use mobile applications to track suppliers in real time.	**.798**	-.010	.227
Item05	I have some kind of technology that tells me when to stock my store.	**.794**	.240	.063
Item17	I pay for advertising space on the Internet in order to reach more customers.	**.788**	-.108	.207
Item01	I use internet-connected applications to inform my customers about the products I offer.	**.770**	.336	-.017
Item08	I communicate with my clients through social networks or phone applications.	**.744**	.483	-.072
Item02	I make purchases on the Internet to stock my store.	**.690**	.102	.270
Item11	The implementation of technology could help me obtain higher profits.	.064	**.834**	.147
Item12	Obtaining information on the consumption habits of my customers could help my stores.	.038	**.761**	.371
Item10	I feel that repetitive activities (customer payments, closing) can be performed automatically.	.375	**.658**	.098
Item09	I am willing to implement technology to improve the sales service to my customers.	.483	**.587**	.116
Item04	I use my business telephone (landline or cellular) to attend my customers.	.449	**.568**	.151
Item16	In the event of a delay in the delivery of my order, I have a means of contacting the supplier.	.040	.213	**.761**
Item18	My suppliers offer online catalog of their products.	.341	.100	**.711**
Item14	The products I sell are appropriate for the location of my store.	-.108	.485	**.584**
	Cronbach's alpha	0.935	0.830	0.624
Extraction method: principal component analysis. Rotation method: Varimax with Kaiser normalization.				

[a] Own elaboration, from SPSS 23.

2) Factor Naming and Interpretation The analysis of Table 5 allows the identification of 17 influential items (Items 1 to 12, item 14 and items 16, 17, 18 and 19) capable of representing the difficulties related to the implementation of ICT in nanostores, structured in three distinct groups (or factors), according to the rotated components matrix, as seen next:

- Customer and Supplier Management (45.375%): Variables associated with e-Business, Marketing, e-Sales, Implementation Effectiveness, Sales/Purchase Process Control, and Business e-Interfaces.
- Operations Management (14.190%): Variables linked to service technologies, management process technology, and technology usage for customer information.
- Inventory Management (7.093%): Variables related to correct inventory and the product replenishment process [31].

D. *Verification of Propositions*

Descriptive statistics, including mean and standard error, were applied to the items, and the results are presented in Table VI.

TABLE VI
DESCRIPTIVE STATISTICS

Item	**Media**	**SE**	**N**
Item01	2.08	1.434	143
Item02	2.20	1.375	143
Item03	2.01	1.379	143
Item04	2.78	1.567	143
Item05	1.97	1.348	143
Item06	1.76	1.278	143
Item07	1.98	1.407	143
Item08	2.36	1.526	143
Item09	3.10	1.523	143
Item10	2.90	1.521	143
Item11	3.78	1.269	143
Item12	3.94	1.223	143
Item14	4.37	.998	143
Item16	4.14	1.231	143
Item17	1.88	1.361	143
Item18	3.27	1.511	143
Item19	1.87	1.365	143

Factor	**Media**
F1: Customer and supplier management.	2.01
F2: Operations management.	3.30
F3: Inventory management.	3.93

[a] Own elaboration, from SPSS 23.

Proposition Verification

1) Proposition 1 (nanostores in Honduras are adopting ICT): The average across all factors (3.1) indicates not only the use but also the significance of these technologies for business owners.
2) Proposition 2 (There are operations practices in Honduran nanostores as evidence of ICT implementation): Three practices involve ICT implementation—Customer and supplier management, operations management, and inventory management. The latter two receive more attention from nanostores owners.

These findings affirm the presence and significance of ICT adoption in nanostores, aligning with the propositions established in the conceptual framework.

V. Discussion

This study aimed to contribute to the advancement of theory and practice in nanostores implementing ICT. The analysis of results and their practical implications in relation to the stated objectives allows for a comprehensive discussion of the findings.

A. *Identification Of Operating Practices*

1) Two out of the initially proposed 19 items were not validated due to low communalities, emphasizing a lack of consensus among nanostores owners on the importance of practices such as "Order Digitization" and "Store Location."
2) Seventeen validated items were identified as relevant practices in nanostores implementing ICT.

B. *Exploratory Factor Analysis.*

Validated variables were grouped into three significant factors: "Customer and Supplier Management," "Operations Management," and "Inventory Management," providing a clearer organizational picture of interrelated operating practices in nanostores.

C. *Relevance of Findings.*

Practices like "Order Digitization" and "Store Location" may lack universal importance among nanostores owners, possibly due to slow adoption by suppliers and varying perceptions among owners based on their learning curves and knowledge about ICT.

D. *Factor Insights*

Factor 1 (Customer and Supplier Management): Emphasizes the challenge of managing the large volume of data generated by ICTs. nanostores need effective operationalization and accurate knowledge to fully leverage these technologies.

Factor 2 (Operations Management): Highlights the importance of strategic planning before ICT implementation, indicating a long-term commitment and consideration of added value for nanostores.

Factor 3 (Inventory Management): Stresses the significance of active engagement in successful ICT implementation, acquiring necessary requirements, and gaining competitiveness through these technologies.

E. *Implications*

1) The study offers insights into key operational practices, challenges, and considerations for nanostores implementing ICT.

2) Nanostores can leverage these findings to enhance ICT implementation, increase operational efficiency, and achieve a competitive advantage.

In conclusion, the results of this study provide valuable contributions to both theoretical understanding and practical application in the context of nanostores adopting ICT. Understanding key operational practices, challenges, and the significance of strategic planning can guide nanostores toward more effective ICT implementation, fostering operational efficiency, and ultimately enhancing competitiveness in the retail industry.

In a nanostore, these interlinked operational practices are systematically integrated to ensure efficiency and consistency across all store areas. They complement each other to provide customers with a cohesive and fulfilling shopping experience.

VI. Conclusions

This exploratory and descriptive study on Information and Communications Technology (ICT) operations practices in nanostores has provided valuable insights into the successful implementation of these technologies in the Honduran retail context. The identification of three main groups of practices establishes a foundation for understanding and addressing the challenges associated with ICT implementation in nanostores.

A. *Practical Implications for Nanostores*

nanostores owners can utilize the study's findings as a guide for making informed decisions during the ICT adoption process, reducing associated risks, and increasing the likelihood of successful implementation.

B. *Academic Contribution and Future Research*

1) The results pave the way for future research and discussions in the field of ICTs in retail supply chains, suggesting the replication of methodological procedures in other countries for a broader perspective.
2) More focused studies are encouraged to explore practical solutions to the challenges identified in ICT implementation in nanostores.

C. *Research Limitations as Opportunities*

1) Acknowledging the limitations of sample size and a specific geographic context, these constraints can serve as a starting point for future research.
2) Recommendations include expanding the sample and considering diverse contexts to validate and extend the current findings.

D. *Practical Implications for Nanostore owners and Managers.*

1) Owners and managers of retail supply chains are advised to seek precise knowledge about ICT in nanostores through university consulting services and collaboration with supply chain companies.

2) Emphasizes the importance of planning and support in ICT operations practices to minimize barriers during implementation.
3) Highlights the need to empower owners with technical skills to maximize the benefits of ICT.

E. Economic and Social Implications

1) The successful implementation of ICT in nanostores can enhance efficiency and sustainability in retail operations.
2) ICT utilization may positively impact economic development, resource utilization, and influence social prospects regarding technology adoption and innovation in small-scale retail establishments.

F. Originality And value.

1) This research stands out for identifying and structuring the main ICT operations practices in nanostores, contributing valuable knowledge for future research in this field.
2) Results serve as a crucial starting point for practitioners, researchers, and policymakers interested in optimizing ICT implementation in the retail sector and capitalizing on its potential benefits.

Despite being an exploratory study, the sample size is deemed satisfactory given the limited use of ICTs in nanostores in Honduras. Future research could replicate the methodological procedures in other countries to uncover similarities and differences. Additionally, more focused studies aimed at proposing solutions are warranted to further enrich the knowledge in this domain.

ACKNOWLEDGMENT

Grupo de Investigación de Cadena de Suministro y Operaciones GICSO-2021-04, Facultad de Ingeniería, Universidad Nacional Autónoma de Honduras.

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