CONFIRMATORY FACTOR ANALYSIS APPLIED TO THE BUSINESS MODEL OF THE ARTISAN SECTOR, CASE OF TENANGO DE DORIA, HIDALGO, MEXICO

Gabriela Ortiz Cordero 1
Gisela Yamin Gómez Mohedano 2
Maria Teresa Sarabia Alonso 3

ABSTRACT

Purpose: The purpose of this study is to examine the applicability and effectiveness of the Canvas Model in the artisan sector, specifically focusing on microenterprises in Tenango de Doria, Hidalgo, Mexico. The goal is to understand how the various components of the Canvas Model influence the success of local handicrafts, identifying key factors for their development and sustainability.

Theoretical Framework: The study is based on the theoretical foundations of the Canvas Model, which includes nine key elements crucial for business success. Recent literature highlights the need for tailored business strategies in artisan sectors, recognizing the unique challenges and opportunities they present.

Design/Methodology/Approach: A cross-sectional and correlational quantitative research design is adopted. Surveys are conducted with 401 potential customers of "Tenango" handicrafts, followed by a confirmatory factor analysis to evaluate the nine key elements of the Canvas Model.

Findings: The findings underscore the importance of 'sales', 'distribution channels', and 'innovation' in the Canvas Model within the artisan sector, while 'key partners' emerge as less significant. These findings suggest the need to adapt the Canvas Model to the artisanal context, focusing on effective sales and distribution strategies and strengthening the unique value proposition of the crafts.

Research, Practical & Social Implications: This pioneering study provides a solid foundation for future research in the artisan sector and offers valuable insights for the development of business strategies. The findings have significant implications not only for the artisans of Tenango de Doria but also for other artisan contexts, potentially guiding the development and sustainability of micro-enterprises in various cultures and regions.

Originality/Value: The study marks a novel approach by applying a quantitative analysis to assess the Canvas Model in the artisan sector, highlighting the complexities of formulating a successful business model in this field and contributing valuable perceptions for its development and sustainability.

Keywords: Confirmatory Factor Analysis, Business Model, CANVAS Business Model, Artisan Sector.
Estrutura Teórica: O estudo é baseado nos fundamentos teóricos do Modelo Canvas, que inclui nove elementos-chave cruciais para o sucesso dos negócios. A literatura recente destaca a necessidade de estratégias de negócios sob medida em setores artesanais, reconhecendo os desafios e oportunidades únicas que eles apresentam.

Projeto/Metodologia/Abordagem: Adota-se um projeto de pesquisa quantitativa transversal e correlacional. Os inquéritos são realizados com 401 potenciais clientes de artesanato "Tenango", seguidos de uma análise fatorial de confirmação para avaliar os nove elementos-chave do Modelo de Tela.

Constatações: Os resultados destacam a importância das "vendas", dos "canais de distribuição" e da "inovação" no Modelo Canvas no setor artesanal, enquanto os "parceiros-chave" emergem como menos significativos. Estes resultados sugerem a necessidade de adaptar o Modelo de Tela ao contexto artesanal, com foco em estratégias efetivas de vendas e distribuição e fortalecimento da proposta de valor único do artesanato.

Investigação, Implicações Práticas e Sociais: Este estudo pioneiro proporciona uma base sólida para a investigação futura no setor artesanal e oferece informações valiosas para o desenvolvimento de estratégias empresariais. As descobertas têm implicações significativas não só para os artesãos de Tenango de Doria, mas também para outros contextos artesanais, potencialmente orientando o desenvolvimento e a sustentabilidade de microempresas em várias culturas e regiões.

Originalidade/Valor: O estudo marca uma nova abordagem, aplicando uma análise quantitativa para avaliar o Modelo de Tela no setor artesanal, destacando as complexidades de formular um modelo de negócios bem-sucedido neste campo e contribuindo com percepções valiosas para o seu desenvolvimento e sustentabilidade.

Palavras-chave: Análise de Fator Confirmatório, Modelo de Negócio, Modelo de Negócio CANVAS, Setor Artesanal.

ANÁLISIS FACTORIAL CONFIRMATORIO APLICADO AL MODELO DE NEGOCIO DEL SECTOR ARTESANO, CASO TENANGO DE DORIA, HIDALGO, MÉXICO

RESUMEN

Propósito: El propósito de este estudio es examinar la aplicabilidad y efectividad del Modelo Canvas en el sector artesanal, específicamente enfocado a microempresas en Tenango de Doria, Hidalgo, México. El objetivo es comprender cómo los diversos componentes del Modelo Canvas influyen en el éxito de las artesanías locales, identificando factores clave para su desarrollo y sostenibilidad.

Marco Teórico: El estudio se basa en los fundamentos teóricos del Modelo Canvas, que incluye nueve elementos clave cruciales para el éxito empresarial. La literatura reciente resalta la necesidad de estrategias de negocios a medida en los sectores artesanales, reconociendo los desafíos y oportunidades únicas que presentan.

Diseño/Metodología/Enfoque: Se adopta un diseño de investigación cuantitativa transversal y correlacional. Se realizaron encuestas a 401 clientes potenciales de artesanías "Tenango", seguidas de un análisis factorial confirmatorio para evaluar los nueve elementos clave del Modelo Canvas.

Hallazgos: Los hallazgos subrayan la importancia de las 'ventas', los 'canales de distribución' y la 'inovación' en el Modelo Canvas dentro del sector artesanal, mientras que los 'sociedades clave' emergen como menos significativos. Estos hallazgos sugieren la necesidad de adaptar el Modelo Canvas al contexto artesanal, enfocándose en estrategias efectivas de venta y distribución y fortaleciendo la propuesta de valor único de las artesanías.

Investigación, Implicaciones Prácticas y Sociales: Este estudio pionero proporciona una base sólida para futuras investigaciones en el sector artesanal y ofrece valiosas perspectivas para el desarrollo de estrategias empresariales. Los hallazgos tienen implicaciones significativas no solo para los artesanos de Tenango de Doria sino también para otros contextos artesanales, potencialmente orientando el desarrollo y sostenibilidad de las microempresas en diversas culturas y regiones.

Originalidad/Valor: El estudio marca un enfoque novedoso al aplicar un análisis cuantitativo para evaluar el Modelo Canvas en el sector artesanal, destacando las complejidades de formular un modelo de negocio exitoso en este campo y aportando valiosas percepciones para su desarrollo y sostenibilidad.
1 INTRODUCTION

The artisan sector in Mexico holds significant cultural and economic importance. Mexican handicrafts are unique products that represent the identity and diversity of their communities. These objects are more than just everyday items; they are testimonies of ancient wisdom and traditions.

The artisan sector is immersed within the classification of Micro, Small, and Medium Enterprises (MSMEs), which have great economic relevance due to the percentage that exists in the region (ECLAC, 2009). Although they sustain the national economy, they face very focused problems, such as empirical management, funding scarcity, limited access to technology; issues common in the artisan sector, coupled with plagiarism of their products (De la Cruz, 2022).

Due to their remote location from urban and consumption centers, the specific characteristics of this situation contribute to greater marginalization and complicate their condition, with low levels of academic training and limited business technical training. The problems detected in the artisan sector imply a lack of competitive strategies that promote innovation in this sector (Ramírez, Domínguez, and Vallejo, 2011). In Mexico, about 5% of artisans achieve success and innovation, while 65% use basic methods to subsist in their craft, and the remaining 30% are in an intermediate situation (Puc et al., 2018).

In the current environment, the creation and validation of effective business models are essential for the success and sustainability of organizations such as artisan microenterprises. A solid business model provides the necessary roadmap for the operation and profitability of a company. In this context, the Canvas Model has become a widely recognized and used tool for describing, analyzing, and designing business models.

This article presents a significant contribution in the field of business model creation and validation, focusing on the artisan sector of Tenango de Doria, Hidalgo, Mexico. The main objective of this research is to endorse a business model based on the Canvas Model through a rigorous confirmatory factor analysis. To achieve this, surveys were conducted with 401
customers of the handicrafts called “Tenango”, addressing 9 key items related to fundamental elements of the business model.

One of the most notable findings of this study is the identification of a variable that, according to the confirmatory factor analysis, does not contribute significantly to the proposed model. This particular result relates to the "key partners" category of the Canvas Model, implying an adjustment in the original model, leaving a total of 8 variables from the initial 9. This discovery has important implications for understanding and adapting business models in the specific context of Tenango de Doria handicrafts.

This article is structured as follows: Initially, a detailed review of the literature is conducted to establish a solid and clear foundation for the topics addressed. In the methods section, the instrument used in the study is explained, providing clear operational definitions and detailing the evaluation model for the considered variables, as well as the implementation of specific statistical techniques for Confirmatory Factor Analysis. Additionally, at the end of the article, graphs and tables are included that exhibit the Kaiser-Meyer-Olkin (KMO) adequacy index applied to the survey items. These results provide an additional perspective on the robustness and validity of the collected data, contributing significantly to the understanding of business models in the artisan sector of the region.

2 LITERATURE REVIEW

2.1 ARTISAN SECTOR

The artisan sector has a rich and profound history, rooted in the traditions of the numerous indigenous groups and local communities in the country. Artisans hail from a diversity of cultures and regions, each with its unique styles, techniques, and materials. These artisanal practices are inherited from generation to generation (Chillogalli, 2021).

The artisan sector stands out as one of the most dynamic and sustainable within the cultural industries, driving development that spans multiple dimensions. It possesses a dual ability; on one hand, it promotes job creation and economic progress; on the other, it enhances the value of the invaluable resource that is culture. Simultaneously, it provides a new approach to the use of traditional knowledge, which needs to adapt and relocate in the current context of globalization and cultural homogenization (Bravo, 2020).
According to the Economic Commission for Latin America and the Caribbean (CEPAL), the artisan sector is integrated into the category of MSMEs (Micro, Small, and Medium Enterprises), which are of great economic importance as they represent 99.8% of the companies in Mexico. These organizations are present throughout the national and global territory, playing a crucial role in the economy, both for their significant contribution to job creation and their impact on the Gross Domestic Product (GDP) (CEPAL, 2009).

In the context of globalization, artisanal MSMEs emerge as a viable option for various social groups, creating employment opportunities and leveraging the creative and artistic talent rooted in indigenous peoples since pre-Hispanic times. They represent an opportunity to develop competitive strategies, with the aim of improving their economic and social position, thus allowing them to maintain their presence in the market (Ontiveros, 2023).

Vázquez (2022) mentions that the application of business models and innovation in the artisan sector is of great importance as they can yield benefits such as designing their product, finding more attractive ways to capture the attention of their customers, and understanding how to distribute or promote their product at local, national, and international levels.

2.2 TENANGO DE DORIA

Tenango de Doria is one of the 84 municipalities of Hidalgo, with an area of 210.7 square kilometers, representing 1.01% of the state's surface area. The municipality of Tenango de Doria has a total population of 17,503 inhabitants, of which 48% are men and 52% women (INEGI, 2020). In the municipality, the predominant indigenous group is the Otomi, and a total of 3,031 people speak an indigenous language. Migration in this municipality is high, as most young people migrate to the United States in search of better opportunities with the aim of improving their family's economy, leaving women to take care of the home. The municipality of Tenango has educational infrastructure at the preschool level with 37 schools and primary level with 46 schools, in addition to 16 secondary schools. However, the educational offerings at the upper secondary level are quite limited, with only two high schools available. As for higher education, two universities have recently been established. The main vocations of the population are agriculture and livestock. The women of the community dedicate themselves to the production of tenangos (typical garments embroidered with colored threads), an activity that is passed down from generation to generation; currently, the sale of tenangos provides a low economic return to the community (INEGI, 2020).
2.3 BUSINESS MODEL

The business model is considered a cornerstone for business success, as it defines how a company creates, delivers, and captures value. A robust business model not only allows the company to identify growth opportunities but also improves its efficiency, profitability, and ability to adapt to changing market scenarios (Pang et al., 2019). Therefore, it is imperative that companies fully understand the importance of the business model and integrate it intrinsically into their overall strategy.

Toniut (2020) maintains that a business model revolves around four fundamental elements: the value proposition, the profit formula, the key activities, and resources necessary for its success. Similarly, Ponce, Delgado, and Lucas (2022) note that the business model can be described in more detail through nine essential blocks. These blocks encapsulate the dynamics underlying the way an organization intends to generate revenue and are anchored in the four functional areas common to any company, which aim to solve problems or meet customer needs.

The long-term success of a company crucially depends on its business model; in a highly competitive market environment saturated with quality products, merely having an outstanding product or a well-designed marketing strategy is not enough. The key to sustainable success lies in building and maintaining a robust and adaptive business model (Chávez, 2019).

Jarma (2018) emphasizes the vital importance for each microenterprise to clearly recognize its own business model and how it distinguishes itself from the competition. Calva (2020) mentions that the task of a business model is not limited to improving profits by directly impacting aspects such as price, volume, or cost through its internal processes, but also includes the ability to alter the operational processes of competitors.

2.4 TYPES OF BUSINESS MODELS

There are various types of business models, each with unique characteristics and applications, adapting to specific market needs and strategies; according to Vázquez, Lucas, and Rodríguez (2022), some types of business models are:

E-Commerce Model: where electronic commerce (E-Commerce) is presented as a contemporary way of conducting commercial transactions using electronic networks. This approach has emerged in response to recent technological advancements and the
adoption of innovations within the business world.

Freemium Business Model: In this model, basic services are provided for free, noting that a percentage decides to pay for the Premium versions of these services.

Subscription Business Model: It is based on charging customers a fixed amount to access products or services. The implementation of this model varies depending on what is offered, with different modalities:

  Fixed Subscription: Involves making recurring payments (weekly, monthly, or yearly) for a specific product or service.
  Unlimited Subscription: Offers unrestricted access to all content of an online service or website after a single payment.
  Terminal Subscription and Pay-Per-Use: Combines an initial payment for a product, such as a mobile phone, with rates based on subsequent use, such as data consumption.
  Limited Subscription: Involves acquiring a limited set of features of a service or product, with the option to renew, as occurs in the purchase of hotel service packages.
  Canvas Model: It is articulated in nine key elements that address fundamental areas of a company: customers, offer, infrastructure, and financial viability. It focuses on solving problems or meeting specific customer needs, offering personalized solutions for common challenges.

2.5 CANVAS BUSINESS MODEL

Osterwalder and Pigneur (2011) emphasize that a business model is a reflection of how an organization "creates, delivers, and captures value". Their approach is based on the Business Model Canvas, a strategic tool applicable to all types of companies in terms of size and sector. This model is considered an ideal choice for making business ideas viable in the market due to its ease of application.

The Canvas employs nine modules as shown in figure 1, which are fundamental for addressing the essential areas of a company: customers, offer, infrastructure, and economic viability (Osterwalder and Pigneur, 2011).

The nine modules employed by the Canvas business model are as follows:

  Value Propositions: Represents the solution to the customer's need, focusing on the solution more than the product itself and how it differs from the competition.
  Market Segments: Identifying the main customers to detect business opportunities.
Channels: Methods used to deliver the value proposition to the main customers, including distribution, communication, and sales channels.

Customer Relationships: Interaction and follow-up with the target customer group.

Revenue Streams: The income obtained from the sales of the value proposition to customers.

Key Resources: The assets and resources essential for implementing the business idea.

Key Activities: The fundamental tasks to achieve the business objectives.

Key Partnerships: Partners and suppliers necessary to achieve and materialize the business objectives.

Cost Structure: The elements that make up the financial statements of the company.

**Figure 1**

*Business Model Canvas*

![Business Model Canvas](image)

Source: (Osterwalder y Pigneur, 2011)

A detailed analysis of each element of the Canvas Model not only reduces the risk of business failure but also provides a deeper understanding of the organization's financial performance. Additionally, it offers an effective tool to manage the development and growth of micro and small enterprises in the current business environment (Chaguy et al., 2019). According to Puga (2023), through the analysis of the nine blocks of the Canvas, it is possible to identify commercial opportunities and challenges, facilitating more informed strategic planning for microenterprises.
Jin et al. (2022) emphasizes the importance of the Canvas Business Model for companies, as it provides a clear and accessible view of the various components of the business model. This facilitates the identification of opportunities for improvement and innovation, effective adaptation to market variations, and an increase in profitability.

The Canvas Business Model is a common strategic approach that benefits companies of different sizes, from microenterprises to large corporations. Its adoption is widely recommended as a means to increase the likelihood of business success and to improve the efficiency and effectiveness of business operations (Fakieh, Al-Malaise, and Ragab, 2022). According to Erlyana and Hartono (2017), by adjusting to market demands and current trends in the business world, the business model can increase the ability of microenterprises to generate profits and boost their sales.

2.6 CONFIRMATORY FACTOR ANALYSIS

Confirmatory Factor Analysis (CFA) is a statistical technique used in psychometrics and social research to evaluate and validate theoretical models that explain the underlying structure of a set of observed variables. This technique is an extension of Exploratory Factor Analysis (EFA) and is used when there is a prior hypothesis or theory about how latent (unobserved) variables relate to the observed variables (Rigo and Donolo, 2018).

Confirmatory Factor Analysis (CFA) has emerged as an essential tool in social sciences research (Cajo and Cervera, 2021). This is largely due to its ease of working with reduced data sets, allowing more effective manipulation of variables. Its utility lies in researchers’ ability to avoid errors in evaluating and analyzing data, which in turn facilitates the justification of discrepancies between variables (Aráuz, 2015).

CFA is rooted in structural equation models and focuses on analyzing measurement models, specifically examining the relationships between a set of observed variables and latent variables. These observed variables can represent items or questions from a test or results obtained through behavioral categorization tools (Arias, 2008). CFA, as highlighted by Morata, Holgado, Barbero, and Méndez (2015), is particularly relevant for assessing the validity of a construct and provides valuable information about measurement instruments, allowing the acceptance or rejection of specific hypotheses.
Following the line of thought of Luna and Laca (2014), CFA serves to summarize the information contained in a data matrix and construct a model that establishes hypotheses about the variables.

In this sense, CFA is considered a technique used to verify the reliability of measurements and proposed standards. The evaluation of the fit model in CFA involves the use of various fit indices or indicators, which can be classified as absolute or comparative methods (Pérez, 2020).

As noted by Arias (2008), in CFA, the researcher must specify and substantiate the key elements of the research model, including factors and indicators, based on theoretical grounds, with the purpose of testing theories and hypotheses. In this context, Aráuz (2015) emphasizes that CFA is a tool used to evaluate a measurement model supported by theoretical or empirical bases that must be validated. Additionally, it is highlighted that the researcher can present the factor loadings of each factor.

In CFA, the valuation of responses to items is associated with an unobserved variable known as a latent factor, which explains the variability of the items. However, the variability of the responses cannot be fully explained, which is attributed to measurement error. It is crucial that the designed model reflects good data concordance, the appropriate direction, and the importance of its parameters (Herrero, 2010).

Domínguez (2019) emphasizes that during the review of a new CFA model, the factor loadings of each item are shown and information about the level of error of each one, also known as residual value, is provided. This level of error can vary depending on the questions asked and various aspects, such as the state or trait of a person, among others.

The literature review demonstrates that CFA is often considered a continuation of Exploratory Factor Analysis (EFA) to obtain more robust and valid results. De Frutos, Ruiz, and San Martín (1998) highlight that fit indices in nested models depend largely on the reference model used. The less restrictive the base model, the higher the fit index obtained.

According to Pérez (2020), CFA is a crucial tool in data analysis in social sciences and plays a fundamental role in evaluating the validity of constructs. Researchers must specify and substantiate their theoretical models, which allows them to adjust parameters and evaluate data concordance. CFA is considered a continuation of EFA and is frequently used in research to obtain robust and reliable results (Gutiérrez and Montoya, 2021).
2.7 BUSINESS MODEL VALIDATION

Business model validation is an essential process in business development that involves verifying and adjusting a business plan to ensure it is viable and effective in the market (Flores, 2022). In short, business model validation is a critical process for minimizing risks and increasing the chances of business success. It is a continuous cycle of testing, learning, and adjustment that allows you to adapt to the changing realities of the market as well as the needs of your customers.

3 DATA AND METHODOLOGY

In this study, a quantitative, correlational, non-experimental, cross-sectional research design (Hernández et al., 2014) was employed to explore the applicability of the CANVAS business model in the artisan sector of Tenango de Doria, Hidalgo, Mexico. The choice of this approach allowed an objective and quantitative evaluation of the perceptions and preferences of potential customers towards local handicrafts.

A representative sample of 401 individuals, identified as potential customers of Tenango handicrafts, was selected. These participants were approached through stratified random sampling, focusing on those who showed previous or potential interest in purchasing these artisan products. Data collection was carried out using surveys specifically structured to assess participants’ opinions about the nine components of the Canvas business model. The survey consists of two sections: the first collects sociodemographic information of the respondents, including their age, place of origin, and monthly income range. The second part of the instrument includes nine items corresponding to the elements of the Canvas model (customer segments, value proposition, distribution channels, customer relationships, key activities, key resources, key partners, cost structure, and revenue streams), each with five response options on a Likert scale.

This cross-sectional design (Hernández et al., 2014), focused on a specific moment in time, was essential for understanding the current dynamics of the artisan market in Tenango de Doria and providing a snapshot of consumer attitudes and behaviors towards local handicrafts.

To conduct this study, Confirmatory Factor Analysis (CFA) was used as the main statistical tool, applied using the SPSS statistical software. This technique was selected for its
ability to validate the structure of a pre-established theoretical model, in this case, the CANVAS business model, adapted to the context of the artisan sector.

The CANVAS model was broken down into nine distinct blocks, each with a specific set of items representing different aspects of the business model as shown in Table 1.

Table 1
Operational Definition of Variables

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>OPERATIONAL DEFINITION</th>
<th>ITEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Proposition</td>
<td>Focused on identifying the unique value that Tenangos offer to their customers.</td>
<td>1B-18B</td>
</tr>
<tr>
<td>Distribution Channels</td>
<td>How Tenangos are distributed to consumers.</td>
<td>1C-8C</td>
</tr>
<tr>
<td>Customer Relationships</td>
<td>Strategies to maintain and improve relationships with customers.</td>
<td>1D-7D</td>
</tr>
<tr>
<td>Key Activities</td>
<td>Decisions regarding the resources and actions that lead to a vision of the business model.</td>
<td>1E-3E</td>
</tr>
<tr>
<td>Key Resources</td>
<td>Fundamental resources for the operation of the company.</td>
<td>1F-3F</td>
</tr>
<tr>
<td>Key Partners</td>
<td>People, organizations, or entities with which a company strategically collaborates to operate and grow effectively in its target market.</td>
<td>1G-2G</td>
</tr>
<tr>
<td>Costs</td>
<td>Main expenses associated with the business.</td>
<td>1H-2H</td>
</tr>
<tr>
<td>Sales</td>
<td>Main revenues associated with the business.</td>
<td>1I-13I</td>
</tr>
<tr>
<td>Innovation</td>
<td>Innovation practices within the sector.</td>
<td>1J-4J</td>
</tr>
</tbody>
</table>

Source: Prepared by the authors (2024)

The implementation of this analysis allowed for a detailed evaluation of how each of these blocks contributes to the overall success of the business model in the artisanal context of Tenango de Doria.

The statistical analysis in SPSS began with the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity. The KMO test, with a value of 0.875, measures the suitability of the sampling for factor analysis. This high value suggests that the partial correlations between items are low and that factor analysis is appropriate. Bartlett's test, on the other hand, assesses the null hypothesis that the variables in the sample are orthogonal (uncorrelated). A significant result in this test supports the suitability of factor analysis.

Subsequently, factor extraction was carried out, a process where the underlying latent factors that explain the correlations among the observed variables are identified. In this study, two main components were identified. The choice of the number of factors to extract was based on criteria such as the scree plot and Kaiser's criterion (eigenvalues greater than 1).

The rotation of the component matrix, a crucial step in confirmatory factor analysis, was used to facilitate the interpretation of the factors. The resulting values show how each item loads on the factors, revealing the data structure and the relationships between variables.
4 RESULTS AND DISCUSSION

4.1 RESULTS

The confirmatory factor analysis conducted in SPSS revealed important insights into the structure and relevance of the various components of the CANVAS business model in the unique context of the artisan sector of Tenango de Doria. The Kaiser-Meyer-Olkin (KMO) measure showed a remarkably high sampling adequacy (0.889), which is indicative of the pertinence of factor analysis for this data set (Table 2). Furthermore, Bartlett's test of sphericity showed a significant correlation among the variables, reinforcing the suitability of factor analysis (Table 3).

Table 2
KMO and Bartlett's Test

<table>
<thead>
<tr>
<th>Kaiser-Meyer-Olkin Measure of Sampling Adequacy</th>
<th>0.889</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bartlett's Test of Sphericity</td>
<td></td>
</tr>
<tr>
<td>Approximate Chi-Square</td>
<td>1594.848</td>
</tr>
<tr>
<td>Gl</td>
<td>36</td>
</tr>
<tr>
<td>Sig.</td>
<td>.000</td>
</tr>
</tbody>
</table>

Note: This table presents the values of the KMO measure (0.889) and the results of Bartlett's Test of Sphericity, indicating a high suitability for factor analysis.
Source: Prepared by the authors (2024)

Table 3
Communalities

<table>
<thead>
<tr>
<th></th>
<th>Initial</th>
<th>Extraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Proposition</td>
<td>1.000</td>
<td>.702</td>
</tr>
<tr>
<td>Distribution Channels</td>
<td>1.000</td>
<td>.707</td>
</tr>
<tr>
<td>Customer Relationships</td>
<td>1.000</td>
<td>.687</td>
</tr>
<tr>
<td>Key Activities</td>
<td>1.000</td>
<td>.696</td>
</tr>
<tr>
<td>Key Resources</td>
<td>1.000</td>
<td>.677</td>
</tr>
<tr>
<td>Key Partners</td>
<td>1.000</td>
<td>.402</td>
</tr>
<tr>
<td>Costs</td>
<td>1.000</td>
<td>.560</td>
</tr>
<tr>
<td>Innovation</td>
<td>1.000</td>
<td>.637</td>
</tr>
<tr>
<td>Sales</td>
<td>1.000</td>
<td>.734</td>
</tr>
</tbody>
</table>

Note: Reflects how certain blocks of the CANVAS model, such as 'sales' and 'distribution channels', have high communalities, indicating their strong representation in the model.
Source: Prepared by the authors (2024)

Two main components explained 64.474% of the total variance (Table 4), highlighting the importance of 'sales', 'distribution channels', and 'innovation' in the first component, and 'key activities' and 'value proposition' in the second (Table 5). This indicates a strong representation of these aspects in the overall model. These blocks, along with their significant
loading on the first principal component, stand out as fundamental elements in structuring the business model in the artisanal field. This finding underscores the importance of effective sales and distribution strategies, as well as innovation, as fundamental pillars for commercial success in the artisanal sector.

**Table 4**

*Total Variance Explained*

<table>
<thead>
<tr>
<th>Component</th>
<th>Total</th>
<th>% Variance</th>
<th>% Accumulated</th>
<th>% Variance</th>
<th>% Accumulated</th>
<th>% Variance</th>
<th>% Accumulated</th>
<th>% Variance</th>
<th>% Accumulated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.440</td>
<td>49.329</td>
<td>49.329</td>
<td>4.440</td>
<td>49.329</td>
<td>3.453</td>
<td>38.366</td>
<td>38.366</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1.363</td>
<td>15.145</td>
<td>64.474</td>
<td>1.363</td>
<td>15.145</td>
<td>2.350</td>
<td>26.109</td>
<td>64.474</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>.684</td>
<td>7.603</td>
<td>72.077</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>.597</td>
<td>6.633</td>
<td>78.711</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>.496</td>
<td>5.512</td>
<td>84.223</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>.436</td>
<td>4.839</td>
<td>89.062</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>.388</td>
<td>4.313</td>
<td>93.374</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>.310</td>
<td>3.445</td>
<td>96.819</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>.286</td>
<td>3.181</td>
<td>100.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Shows that two principal components explain 64.474% of the total variance, underscoring the influence of these components on the business model.

Source: Prepared by the authors (2024)

**Table 5**

*Rotated Component Matrix*

<table>
<thead>
<tr>
<th>Component</th>
<th>Component 1</th>
<th>Component 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution Channels</td>
<td>.801</td>
<td>.255</td>
</tr>
<tr>
<td>Sales</td>
<td>.800</td>
<td>.306</td>
</tr>
<tr>
<td>Innovation</td>
<td>.798</td>
<td>.034</td>
</tr>
<tr>
<td>Costs</td>
<td>.743</td>
<td>.093</td>
</tr>
<tr>
<td>Customer Relationships</td>
<td>.674</td>
<td>.482</td>
</tr>
<tr>
<td>Key Partners</td>
<td>.606</td>
<td>.187</td>
</tr>
<tr>
<td>Key Activities</td>
<td>.012</td>
<td>.834</td>
</tr>
<tr>
<td>Value Proposition</td>
<td>.282</td>
<td>.789</td>
</tr>
<tr>
<td>Key Resources</td>
<td>.285</td>
<td>.772</td>
</tr>
</tbody>
</table>

Note: Provides details about the loading of each item on the components, highlighting the importance of 'sales', 'distribution channels', and 'innovation' in the first component, and 'key activities' and 'value proposition' in the second.

Source: Prepared by the authors (2024)

On the other hand, the rotated component matrix provided a more detailed understanding of the significant relevance of 'key activities' and 'value proposition' in the second principal component. This emphasizes the importance of focusing on activities that strengthen the unique value proposition of the crafts, thus ensuring a competitive edge in the market. This
aspect is crucial for differentiating artisanal offerings in an increasingly saturated and competitive market.

However, a notable point was the absence of a prominent loading for the 'key partners' item in the rotated component matrix. This may be attributed to a relatively low correlation with the main factors in the specific context of this study. Although this does not diminish the importance of the item in the overall business model, it suggests that, in this particular study, 'key partners' did not strongly align with the dimensions captured by the principal components. This finding could be a reflection of the unique nature of the artisan sector in Tenango de Doria, where other aspects of the CANVAS model may have a more direct and significant influence.

Altogether, these results provide a detailed and nuanced view of the crucial components of the CANVAS business model in the artisan sector of Tenango de Doria as shown in Figure 2. They reveal the complexity and multiple layers that constitute a successful business model in this sector, providing a solid foundation for future business strategies and marketing decisions. This analysis helps to better understand how each element of the CANVAS model contributes to success in a specific artisanal context, offering valuable strategies for artisans and managers in the sector.

Figure 2

Canvas Business Model in the Artisan Sector of Tenango de Doria

Note: Highlighting the importance of 'sales', 'distribution channels', and 'innovation', and the absence of a significant loading for the 'key partners' item.
Source: Prepared by the authors (2024)
5 DISCUSSION

The analysis presented in this article provides a deep understanding of how the Canvas Model can be applied and adapted to the artisan sector in Tenango de Doria, Hidalgo, Mexico. The results indicate that elements such as 'sales', 'distribution channels', and 'innovation' play a crucial role in structuring the business model in this area, highlighting their relevance in the commercial success of the artisans.

The absence of a prominent loading for 'key partners' in the model suggests the need to reevaluate and possibly redefine this component within the artisanal context. This could involve a greater focus on strengthening direct relationships with customers and exploring alternative distribution channels, rather than heavily relying on external partners.

Furthermore, the importance of 'key activities' and 'value proposition' in the second main component underscores the need to focus on activities that enhance the uniqueness and appeal of Tenango de Doria's crafts. This is especially critical in an increasingly globalized and competitive market, where differentiation and authenticity are essential to capture the attention and interest of customers.

The success of this business model will also depend on how artisans can adapt their practices to incorporate innovation strategies, without losing the essence of their traditions and the quality of their work. Balancing modernization with the preservation of cultural traditions is fundamental to ensuring the sustainability and long-term growth of the artisan sector in the region.

6 CONCLUSION

This study has demonstrated that the Canvas Model is an effective tool for analyzing and structuring business models in the artisan sector. However, it is crucial to adapt this model to the specific particularities and challenges of the sector, as evidenced by the variability in the importance and relevance of its different components.

The successful adaptation of the Canvas Model in this context underscores the need for a dynamic and flexible approach in business management, which can respond to the unique and changing characteristics of the artisan sector. This includes a greater focus on innovation, product differentiation, and optimization of distribution and sales channels while maintaining cultural integrity and artisanal quality.
This study represents a pioneering effort in the application of advanced quantitative analysis, specifically confirmatory factor analysis, to understand and measure the impact of the components of the CANVAS business model in the artisan sector, significantly contributing to the understanding of the applicability of business models in the artisan sector and establishing a solid foundation for future research and business strategies in this area. The findings of this study not only benefit the artisans of Tenango de Doria but also provide valuable insights for other artisanal contexts, potentially guiding the development and sustainability of micro-enterprises in various cultures and regions.

REFERENCES


Chillogalli, L. (2021). Impacto del sector artesanal en el desarrollo local de la parroquia San Sebastián de Sígsig en la última década (Bachelor's thesis) http://dspace.ups.edu.ec/handle/123456789/20236

Confirmatory Factor Analysis Applied to The Business Model of The Artisan Sector, Case of Tenango de Doria, Hidalgo, Mexico


Flórez Díaz, D. (2022). Diseño de un modelo de negocios para la comercialización de productos por medio de una plataforma de comercio electrónico en la Empresa Servicios Automotrices MFD. https://repository.unab.edu.co/handle/20.500.12749/16424


Ponce, A., Delgado, E., y Lucas, S. (2022). Modelo de Negocio e Innovación en el Contexto de Sector Artesanal del Cantón Montecristi. Dominio de las Ciencias, 8(1). http://dx.doi.org/10.23857/dc.v8i1.2564


