

Reliability of the Result of the Keys in Combing Challenges and Constraints of the Philippine Slipper Industry Using Mathematical Analysis

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Abstract - The slipper business has the ability to contribute greatly to the country's economic development. Gapan, Nueva Ecija, is known as "The Footwear Capital of the North." It is one of the province's five component cities. Its principal sector is slipper manufacture, which employs 15,000 people and generates an annual revenue of around P 500 million. However, to assure the industry's existence, persistent difficulties and limits must be solved. As a result, the focus of this body of work was on an in-depth assessment of the challenges and limits facing the Philippine slipper industry in Gapan, Nueva Ecija, with the purpose of creating strategic solutions to the issues. The researcher conducted surveys and interviews with 46 local slipper makers, and the results of the study were verified using mathematical analysis. The biggest difficulty, according to comprehensive research, is the pricing of their items. As a strategic strategy, the researcher suggested the Plan-Do-Check-Action technique, which is the fundamental and iterative four-step management method and the basis of Total Quality Management.

Index Terms - Challenges and constraints, Footwear, Plan-Do-Check-Action, Slipper industry, Total quality management,

INTRODUCTION

Gapan, often known as "The Footwear Capital of the North," is one of five cities in the Nueva Ecija province where slipper manufacture is the main industry [1]. This industry generates around P 500 million in annual revenue and employs 15,000 people [2]. The slipper-making industry began in Gapan in the early 1930s, according to the City Planning and Development Office of the Local Government Unit (LGU).

Many slipper producers now operate in the barangays of Pambuan, Mangino, and San Lorenzo, with some of their wares reaching as far as Visayas and Mindanao.

The first written reference of the slipper is from the 12th century [3]. Most wealthy men wore slippers made of soft leather, silk, or velvet by the mid-16th century, frequently in patterns that matched their clothing. According to [4,] shoe production in the 18th century in Europe and the United States was done by farmers who handcrafted shoes to be traded with their other items. Farmers transformed become artisans, creating shoe shops and tiny factories.

The worldwide footwear market is segmented by kind of footwear, end-users of footwear, various platforms for marketing footwear, material utilized, and sales across different geographies. Leather footwear is a key export from Asian countries such as China and India throughout the developed world (UK and US). The research discusses the several types of materials used to produce footwear, such as leather and non-leather, as well as the market for both.

Gapan's slipper business has been growing for a long time. Because most local department stores and boutiques buy cheaper foreign products, when low-cost footwear from other nations, such as China, came in the Philippines in 2009, it had an influence on the local slipper sector [2]. The reduction in demand in the local footwear sector also harmed Gapan, whose primary source of income is slipper production. Some locals switched to more productive forms of income, such as farming, cattle, and other small and medium-sized companies, while their principal source of income was threatened (SMEs).

Recognizing the problem with Gapan's slipper industry, the Department of Trade and Industry (DTI) took the initiative to encourage slipper makers in the city to expand their business by promoting trade fairs and providing them with a multi-purpose cooperative that could assist them with their needs and broaden their benefits.

The DTI effort resulted in the formation of the Gapan slipper industry as a brand for high-quality slippers [2].

Nonetheless, as the sector grew, various challenges occurred, the most notable of which was a reduction in the supply of raw materials for creating slippers as a result of House Bill 4831, which restricted the slaughter of farm animals, primarily carabaos, in 2011. Gapan slipper makers were forced to employ synthetic leather and rubber in the making of their footwear due to regulatory regulations.

Despite the fact that the Gapan slipper industry left an indelible mark on the country's history, slipper producers were known to confront obstacles, problems, and concerns that made it difficult for their firm to thrive and survive.

These concerns and troubles in the sector were directly affecting thousands of people's livelihoods as well as the Gapan slipper industry. As a result, the primary objective of this study is to: (1) characterize the Philippine slipper industry's obstacles and limits; and (2) recommend a slipper industry strategic action plan.

METHODS

The research method used in the study was descriptive quantitative research. "Descriptive research is concerned with existing conditions, practices, structures, differences, or relationships, opinions held, processes in progress, or trends that are useful in presenting facts concerning the nature and status of everything," according to [5]. The Gapan slipper industry was documented in this study utilizing descriptive research and value chain analysis on input provision, production, marketing, and cost-benefit analysis. Mathematical analysis was also used to test its reliability in terms of frequency count, ranking, and identification of the problem and restrictions. The slipper makers' concerns and limits were also mentioned, which served as the foundation for presenting a strategic action plan.

The study's respondents were the 46 slipper manufacturers from Gapan's Barangays Pambuan, Mangino, and San Lorenzo. The distribution of respondents by barangay is shown in Table I.

TABLE I
DISTRIBUTION OF RESPONDENTS PER BARANGAY

Barangay	Number of Respondents
Pambuan	15
Mangino	26
San Lorenzo	5
Total	46

To collect the necessary data, the researcher used a questionnaire. The instrument was created with the intention of gathering vital information from respondents in order to describe the slipper industry in Gapan.

Unstructured interviews supplemented the questionnaire by eliciting additional information and ensuring consistency of responses. The questionnaire for slipper manufacturers focuses on the issues that slipper manufacturers face in each of the aforementioned areas.

The instruments were tested on other slipper makers who were not included in the study to compare and determine the clarity of the items and directions in the questionnaire, as well as the questionnaire's reliability.

The researcher traveled to Gapan to obtain permission to collect secondary data relevant to the current study, specifically the number of slipper manufacturers and previous activities involving the Tsinelas Festival and its participants. The researcher also obtained secondary data from Gapan Footwear Multi-Purpose Cooperative and other online reading materials.

The questionnaire was then administered by the researcher personally. Following the completion of the questionnaire, an interview with the slipper makers was conducted. The researcher organized and analyzed the data using Microsoft Excel Spreadsheets after conducting the survey and interview.

To explain the many obstacles of the slipper sector in terms of input provision, production, and marketing, the researcher employed frequency distribution, percentage, and ranking. To uncover the issues and constraints faced by slipper makers, data was examined and presented in narrative style.

RESULTS AND DISCUSSION

The problems and constraints encountered by the slipper manufacturers are described in terms of input provision, production, and marketing. Four (4) problems were identified from the slipper manufacturers grounded on input provision. Table II shows the degree of these problems based on ranks.

TABLE II
SLIPPER MANUFACTURER'S PROBLEMS WITH INPUT PROVISION

<i>Problems</i>	<i>f</i>	<i>%</i>	<i>Rank</i>
The spiraling cost of raw materials and labor	27	58.70	1
Lack of capital	16	34.78	2
Shortage of supplies of raw materials	12	26.09	4
Poor quality of raw materials	15	32.61	3

Table II shows that slipper manufacturers suffered most from the rising cost of raw materials coupled with the shortage of labour. According to Cruz [6], raw material inputs are produced locally, and most are imported from other countries. Manufacturers attributed 55-70 percent of the total cost of slipper manufacturing to raw materials input.

The spiralling cost of materials would have drawbacks on the income of the slipper manufacturers. The increase in labour turnover has made their operation at times at a standstill. This means lesser production.

A shortage of capital, according to some manufacturers, is another issue they face. It implies that only individuals who have registered their enterprises are eligible for financial loans from banks and other lending organizations. From the previous data, 33 out of the 46 slipper manufacturers were unregistered; hence they found difficulty in availing bank credit. Especially in banks, a loan cannot be availed of if the business is unregistered. Because of this, these slipper manufacturers were forced to avail of the loan offered by lenders and private individuals, where interest rates are much higher.

The scarcity and availability of raw resources was also noted as a difficulty. When there were mass orders that needed to be delivered on specified dates, most of the slipper makers here ran into this issue. This conclusion is similar to Morato's [7], who discovered that other issues reported by footwear producers in purchasing raw materials include availability, delivery delays, and poor quality.

TABLE III
SLIPPER MANUFACTURER'S PROBLEMS WITH PRODUCTION

<i>Problems</i>	<i>F</i>	<i>%</i>	<i>Rank</i>
Lack of upgraded equipment and machines	6	13.04	6
Lack of support from Local Government Unit in terms of technical know-how on proper organization and management	35	76.09	3
Lack of workers	40	86.96	2
Attitude of workers	42	91.30	1
Small production area	4	8.70	7
High cost of production	7	15.22	5
Electric interruption	23	50.00	4
Lack of timely designs	3	6.52	8.5
High rate of defective or spoiled output	3	6.52	8.5

Table III presents the problems of slipper manufacturers in the aspect of slipper production.

Top on the list of the nine (9) problems surveyed by slipper manufacturers was the "attitude" of the workers, which rank first. Most of them displayed some unwanted behavior like not coming to work without notice and poor social relations with the manufacturer and co-workers. Some resigned from work over preference for mall jobs such as baggers and cashiers.

This has become a perennial problem for the manufacturers especially when the demand for production is high. Therefore, the slipper manufacturers have no other option but to replace them and have the new workers trained again. This adds up to the delay in production.

The third problem was the "lack of support from the Local Government Unit (LGU)". Perhaps, the slipper manufacturers claiming this were those unregistered. The LGU may only extend support to those who have complied with the law. It would be difficult to ask for business support of any form from the LGU since their existence is not legally recognized.

The fourth problem was "electric interruption". Frequent brownouts affected their production. Power supply disruption is common in this District. Other problems mentioned can be remedied by the slipper manufacturer themselves. They just must be resourceful as they opined.

Marketing. Table IV presents the problems of the slipper industry in marketing their products.

TABLE IV
SLIPPER MANUFACTURER'S PROBLEMS WITH MARKETING

<i>Problems</i>	<i>f</i>	<i>%</i>	<i>Rank</i>
Inadequate transportation facilities	2 6	56.5 2	5
Absence of promotional activities and plans	3 3	71.7 4	2
Attitudes of distributors, retailers, and traders	1 6	34.7 8	6
Price manipulation by distributors	2 8	60.8 7	4
Lack of technical know-how in the proper recording of accounts	3 0	65.2 2	3
Low-priced products of competitors	4 0	86.9 6	1

The most significant issue that slipper producers face is product pricing. Some of their business rivals can afford to sell their goods at the cheapest possible price.

This problem is compounded by the fact that they have an arrangement with the distributors who supply them with financial support, in which the former determines the price they demand.

The absence of promotional activities and strategies is another marketing issue that the manufacturers seek to address. According to them, the only way to advertise their products is to provide free samples to potential consumers and distributors. Few people stated that they rarely attend trade shows, resulting in restricted market exposure.

Inadequate delivery facilities were another source of frustration for the makers. The majority of them lack delivery vehicles. Others simply take the bus or use commercial cars to transport their goods. They admitted that they lacked the funds to purchase one.

Financial literacy in terms of adequate accounting and transaction tracking has impacted their cash position, draining funds that could otherwise be invested in a more effective marketing endeavor [8].

The entry of identical items from other countries has made it difficult for them to compete on price and quality in the market.

Plan–Do–Check–Action, a fundamental and iterative four-step management approach and the cornerstone of Total Quality Management as conceived by quality Guru W. Edward Deming, forms the foundation of this strategic plan.

The purpose of this strategic plan is to address crucial issues in the marketing, management, technological, and financial elements of the firm and industry.

The study's proponent advocates the integration of management techniques to sustain the competitiveness of the slipper sector in Gapan, Nueva Ecija, in light of the emergence of challenges and uncertainties indicated by various industry players.

Stakeholders and authorities in charge of executing potential remedies to identified industry challenges are included in these proposed courses of action [9].

TABLE V
STRATEGIC ACTION PLAN FOR THE SLIPPER INDUSTRY IN TERMS OF INPUT PROVISION

Constraints/Problems	Intervening Strategy	Responsible Group/Unit
High Cost of Inputs	Government to subsidize the inputs needed by the slipper manufacturers	LGU, DTI
Lack of Capital	Capacitate cooperatives to offer loans at low-interest rates.	CDA Concerned Cooperative Groups
Shortage of Supplies of Raw Materials	Regulate cooperatives to become the main suppliers of raw materials in manufacturing slippers	LGU, DTI, Concerned Cooperative Groups
Poor Quality of Raw Materials		

The government plays a vital role in the industry of slipper industry in Gapan. It can change the status of this industry by extending help through direct cash assistance in the form of subsidies and indirect inputs such as state-of-the-art equipment and machines.

Based on the fundamental definition of business, working capital can be easily defined as the capital needed to finance all the current expenses of the business to continue its operation out of its income for a certain period or event, for instance, having a credit account is not new in any business organizations [10]. Credit is the best way to sustain the operations of the business.

Due to a lack of financial resources and knowledge, some manufacturers seek credit from unauthorized lending institutions — the underground economy to finance the operations of the business. Whereas capacitating cooperative is one of the best solutions to undertake this identified problem.

Logistics, distribution, and acquisition are the fundamental triad to be able to compete with other slipper industries and to have a better quality of production without sacrificing financial issues.

These agencies shall work together on how they can monitor the registration of these manufacturers. Furthermore, those manufacturers shall be well-oriented on the benefits of the legality of their existence including the privilege of availing loans from banking and non-banking financial institutions that are offering loan services.

The Local Government Unit (LGU) which plays a significant role in the success of the community may allocate a certain amount of its annual budget to subsidize the upgrading of equipment and machines that will be used by the slipper manufacturers for their production to become more efficient, thus delivering quality products to their distributors for continuous smooth and long-lasting business transactions. As to DTI, it must continue to give its full support to the industry through close monitoring of the sectors on the optimization of the use of their donated assets.

Maintaining the standing of a particular university or college is a delicate matter for academic institutions. Plaques, awards, and diplomas are merely a byproduct of accomplishment. Instruction and research are required, but without the transfer of knowledge through extension services, they are just that: papers. In this case, enlisting the help of private and government-owned universities' extension services to assist the community at large in transferring the university's knowledge, skills, and specialization, particularly in the areas of finance, product development, packaging, and marketing, is a good idea. By providing suitable training and coaching, the university may extend skills such as basic bookkeeping, simple accounting, organization, and management to these manufacturers.

Improvements to a production site's layout or the use of local government resources such as a gym and unoccupied offices for small market players. Location planning and floor layout are important factors in effective product and project management.

Outsource competent speakers from the DTI and other commercial organizations to establish the root cause of high manufacturing costs and identify viable by-products to generate additional revenue streams. In order to illuminate the perspective of the individual producer, it is beneficial to seek advice from expert businesspeople.

If there is no electricity, train workers to become manual slipper manufacturers as an alternative to purchasing a generator set through finance.

There is a narrow line between risk and uncertainty when preparing for the unexpected, because the future is never guaranteed. To reduce the impact of this uncertainty, an independent proponent of slipper producers must also plan for power outages or failures in order to avoid production snafus.

Extending appropriate and equitable compensation to employees is one technique to encourage them to work hard and efficiently. Job enrichment and expansion are also options for empowering workers.

Forms, benefits, and features are the three categories that make up the product platform. As a result, upgrading the design is one strategy to improve the slipper industry's product positioning in Gapan.

A delivery truck or van is a means of transportation that contributes significantly to a company's competitive advantage. It's a type of marketing activity that connects the industry to its supply chain partners, such as suppliers and customers, and has a big impact on consumer satisfaction with the company's ability to meet promised delivery dates and times. As a result, if the government provides the cooperative with delivery trucks or vans, it will go a long way toward attracting more members. Furthermore, the local government unit must understand the significance of transportation to the municipality's primary industry.

Slipper manufacturers participate in bazaars and displays. The "AIDAS (Attention, Interest, Desire, and Action) of Marketing" is the initial step in numerous marketing initiatives. The industry's sustainability depends on raising awareness.

Make a group to keep track of the costs of the materials needed by slipper producers. The sector will benefit from the partnership of the Local Government Unit (LGU) and the Department of Trade and Industry (DTI) in closely monitoring the pricing of raw materials used in slipper production. We can protect manufacturers from profiteers (TRAIN) law by organizing these concerned agencies and directing them to take prompt action to ease their miseries and protect them from profiteers abusing the impacts of the Tax Reform for Acceleration and Inclusion (TRAIN) law.

Workshop on bookkeeping and recordkeeping One of the most significant features shared by all successful businesses of any size is keeping correct records, which is also a legal necessity.

Concentrate on high-quality production and improve slipper producers' abilities. A freshly created business's path to success is to provide the greatest quality services and goods. For businesses, quality is more important than quantity. Because Gapan's slipper manufacturing enterprises are considered cottage industries, their ability to acquire distributors is determined by how they engage with their clients. Good quality is also the outcome of well-trained quality assurance and control employees.

Provide the best-integrated brand promotion through promotional techniques such as sales discounts, sales promotions, personal selling, and direct marketing to maintain the present market and gain more distributors. Buyer-seller connections can take numerous shapes, but when they're part of the sukian system, they produce loyal distributors and prevent misunderstandings, resulting in the maximum earnings. Promotional techniques such as sales discounts, sales promotions, and firms that provide quality and product impressions can help achieve this.

Intensive marketing methods are required to compete with Chinese items. Piggybacking marketing strategy is defined as a distribution strategy in foreign markets that involves working with a larger company that already operates in certain foreign markets and is willing to act on behalf of the manufacturer in the local market, allowing the manufacturer to carry the same band architecture of the local market through intensive, selective, and exclusive distribution

CONCLUSION AND RECOMMENDATION

One of the difficulties raised during the input process was the rising cost of materials. A shortage of money is another difficulty that some manufacturers have highlighted. Finally, a lack and availability of raw resources, as well as the persistent problem of excessive workforce turnover, were highlighted as issues.

The attitude of the workforce was the biggest challenge confronted in terms of output. The lack of cooperation from the Local Government Unit was the next concern (LGU). Manufacturers highlighted electricity brownouts as one of the challenges in production since they hampered their production.

The most challenging problem that slipper producers had was determining how much to charge for their products. A lack of promotional activities and strategies is another marketing issue that manufacturers wish to address. The makers were also hampered by a lack of delivery vehicles.

Various elements of the slipper manufacturing business and industry have multiple concerns, problems, and limits. The entrance of identical items from China, which compete directly with local slipper makers, is a serious issue.

As a result, the Gapan Local Government Unit (LGU) and the Department of Trade and Industry (DTI) should encourage and support unregistered slipper makers to use the Business Name Registration Caravan to apply for legalization of their operations. To satisfy the latter's needs, local governments and slipper producers must work closely together, notably in terms of subsidies and loans.

To address the slipper industry's worries, the study's researcher produced an intervention strategy that should be widely distributed. Researchers should undertake more value chain analysis studies in the future to get a better picture of what's going on in a similar industry.

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