UNIVERSIDAD SAN FRANCISCO DE QUITO USFQ

Colegio de Ciencias e Ingenierías

Application of the Holm Placement Method for the feasibility study of a hardware store in the valleys of Quito.

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Angie Gabriela Vásquez Tobar

Ingeniería Civil

Trabajo de fin de carrera presentado como requisito
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HOJA DE CALIFICACIÓN

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ABSTRACT

For this project, a multivariate study was used to select two areas with greater potential within the 3 sectors analyzed: Cumbayá, Tumbaco and Valle de los Chillos. In addition, a survey was conducted with 380 potential customers to obtain information about their consumption habits, preferences and purchasing needs. The results obtained give a vision with a better focus towards the proposed objectives, a more thorough understanding of the client's profile in the selected areas and a more accurate analysis of the competition in the areas.

It also presents an evaluation of the opportunities and challenges that a hardware store would face in each of the areas studied, as well as recommendations to differentiate itself from the competition and maximize the opportunities identified.

In this way, valuable information can be obtained for strategic decision making for a possible hardware store in the areas of Cumbayá, Tumbaco and Valle de los Chillos, based on quantitative and qualitative data collected from the study of the areas.

Key words: Hardware store, construction, location, survey, needs, variables, clients, Valleys, strategies.

RESUMEN

Para este proyecto se realizó se empleó un estudio multivariable para seleccionar dos zonas con mayor potencial dentro de los 3 sectores analizados: Cumbayá, Tumbaco y el Valle de los Chillos. Además, se realizó una encuesta a 380 posibles clientes para obtener información sobre sus hábitos de consumo, preferencias y necesidades de compra. Los resultados obtenidos dan una visión con un mejor enfoque hacia los objetivos propuestos, una comprensión más minuciosa del perfil del cliente en las zonas seleccionadas y un análisis más preciso de la competencia en las zonas.

Asimismo, se presenta una evaluación de las oportunidades y desafíos a los que se enfrentaría una ferretería en cada una de las zonas estudiadas, así como recomendaciones para diferenciarse de la competencia y maximizar las oportunidades identificadas.

De esta forma, se podrá obtener información valiosa para la toma de decisiones estratégicas para una posible ferretería en las zonas de Cumbayá, Tumbaco y Valle de los Chillos, basada en datos cuantitativos y cualitativos recopilados del estudio de las zonas.

Palabras clave: Ferretería, construcción, ubicación, encuesta, necesidades, variables, clientes, Valles, estratégias.

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1. INTRODUCCIÓN

Today, there are millions of people with amazing business ideas. But what does it depend on whether the same type of business prospers and another fails? What is the reason for the success of a business? Although, an infinity of variables can be listed to consider before starting a business, there are certain factors that significantly mark the prosperity of a business in the market.

In Ecuador, around 19,601 businesses were created in 2022. (Castillo & González, 2023) According to the GEM, "Ecuador is the second most entrepreneurial country in the region with an Entrepreneurial Activity Rate (TEA) of 36.2%. But, almost 80% of ventures fail in their initial stage, that is, 8 out of 10"; this was stated by Guillermo Celi, candidate for the presidency of the SUMA movement. (Redacción, 2020) For this reason, it is necessary to give due importance to the study and preparation of the business idea you have in mind.

This project considers that the site where a business is going to be placed is a transcendental factor when starting a business. Therefore, this research is based on the "Placement Method" of Sheila Holm to discover the most convenient location in the province of Quito and make this business idea successful.

The vision and mission of this business project is to obtain a high degree of recognition in the Quito market in terms of marketing hardware products and construction materials according to the specific needs of customers in a particular area. In addition, we want to meet the demands and needs of customers, while providing excellent service and quality products.

1.1. Theoretical Framework

Research before executing any type of project is paramount before starting a business. In essence, a market study is the first step when you want to start a business in any sector, this tool will be key to the optimal development of a business since it allows you to get a clearer idea of the demand in that sector, as well as the competition that the business will face. That

is, with this you can evaluate the pros and cons before placing it by making known whether or not it will have acceptance in the public.

In addition, this study gives us the profile of the client of that sector. This means that we will have available the needs and demands of future consumers.

Since the construction sector and related activities represent 10% of GDP in the country, that is, indispensable for the country's economy, this industry will continue to grow constantly over the years, which means a huge advantage for this project.

1.2.   Choice of the Community

The choice of the community is a transcendental factor before choosing the location of the future business, for this it is necessary to have curiosity and interest in the inhabitants of the sector.

This means that certain questions must be raised and resolved and thus obtain as much information as possible from that group of inhabitants to assess whether or not the sector is suitable. Questions such as:

a.   What is the degree of demand for hardware products?

b.   Does the product I am going to sell cover a market need?

c.   What is my client's profile? What are your habits and preferences?

d.   What are the characteristics of the inhabitants of the sector: age, social class, profession, hobbies?

e.   In the legal field, what permits must I acquire to start the business and what are the restrictions of the area?

f.   Who are my competitors and how can I distinguish myself from them?

g.   What type of sector is it: residential, commercial, executive, school?

h.   What will be my sales strategies to attract customers?

i.   Is the business viable in the future, is there population growth in the area?

1.3.   Choice of venue

A large physical space and with the possibility of growth is essential for this type of business, whether you prefer a main or secondary street it is necessary to have an adequate storage capacity for a hardware store.

This study focused on three specific areas of the city of Quito: Cumbayá, Tumbaco and Valle de los Chillos. These areas were selected through a multivariate analysis that considered various factors explained in detail in the sections below.

1.3.1.   Features for the choice of premises.

Analysis of competition in the region revealed that there are several hardware stores established in the selected areas as indicated in Figure 1, indicating a competitive market. However, opportunities were identified to differentiate themselves from the competition, such as focusing on specific products and services that are not offered by existing hardware stores.
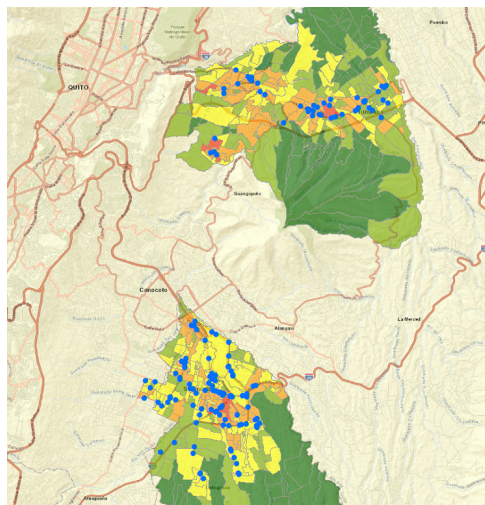
Figure 1. Location of the current hardware stores in the three Valleys.

The selected areas have a high population density, with a mix of residential and commercial areas (Figure 2). Most residential areas are upper-middle class, with a significant presence of condominiums and housing estates.
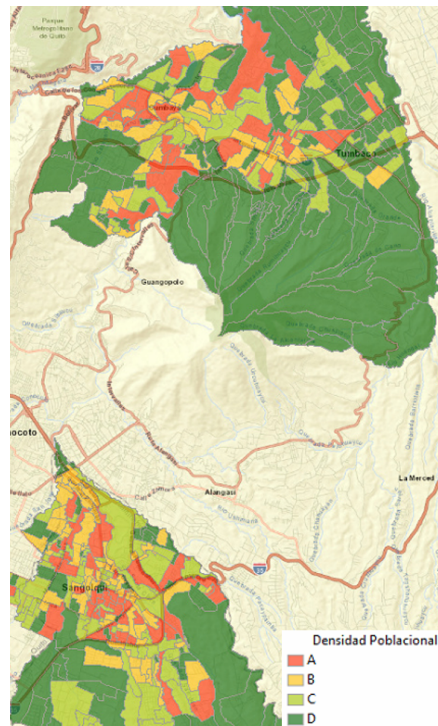
Figure 2. Population distribution of the 3 valleys.

Most business areas are focused on food and beverage services, as well as professional services (Figure 3).
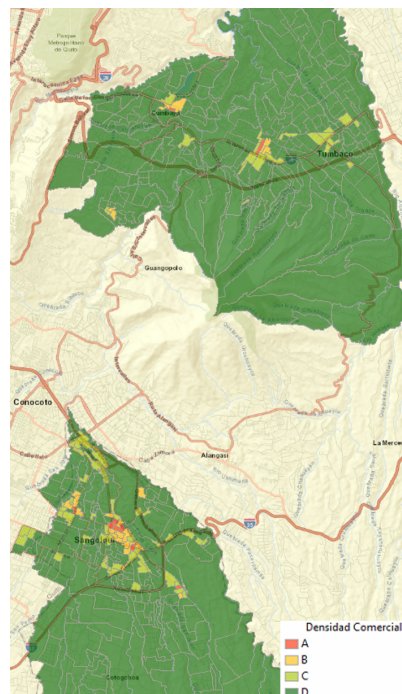
Figura 3. Distribución comercial de los 3 valles.

In summary, the areas selected as possible hardware store locations have a diverse population and established competition in the market. However, there are opportunities to

differentiate yourself from the competition by focusing on specific products and services that are not currently offered.

1.4. Objectives

The main objective of this project is to determine 2 competent areas in each Valley: Cumbayá, Tumbaco and de los Chillos for the placement of a neighborhood hardware store, where people can acquire quality products along with a good service by the local.

In addition, the following specific objectives have been proposed:

a. Performing a multi-criteria analysis has allowed to refine the study area to determine the potential areas.

b. Satisfy the demands and needs of customers based on the answers of a survey carried out.

c. Provide quality products with costs that stand out from today's market.

d. Obtain a high degree of recognition in the Quito market in terms of marketing of hardware products.

e. Establish the future competition of the business, in such a way that a business plan is established that attracts a greater clientele.

f. Determine a customer profile in these areas through an analysis of the survey responses, considering the ages, frequency of purchase and preference of the future customer.

1.5. Hypothesis

This project is based on the Placement Method exposed by Sheila Holm, so the following parameters must be evaluated:

a. Number of people who prefer the "Do it yourself" option.

b. Number of people who are more regular in attending a hardware store.

c. The population density of each sector.

This process will be carried out by taking data from a survey carried out in each selected sector.

With this, it will be possible to analyze which sector has the greatest potential for business growth and the strategies that must be exercised based on the needs of each sector.

2. DEVELOPMENT

2.1. Methodology

It will be used for an analysis, variables such as: socioeconomic level, commercial density, population density, main roads and location of the most important hardware stores in these study areas. In addition to these variables, urban growth in these areas will be used with the data provided by the municipality of Quito.

Each of these variables will be weighted and normalized in a range of 0 to 1 in order to perform the multicriteria analysis. Then a weighting matrix will be made, the Saaty Matrix, in which specific weights are given to each of the variables depending on the importance and objective of the project.

With all these variables weighted and normalized, an equation is obtained that once entered in the software, QGIS, generates a process called map algebra, where each of the variables is multiplied and obtained as a result a map painted by colors depending on the importance of the sector for the project. In this way, the potential areas are visually obtained and a georeferenced map with the areas of importance of the analysis, that is, the areas where the surveys should be carried out will have been focused. This map already analyzed shows the most important areas of each sector. With this, it is possible to obtain the existing population in each of the sectors and in turn the calculation of the representative sample, that is, the number of surveys that must be carried out. Once the sample was obtained, the questionnaire and the face-to-face survey were carried out in each area of importance.

The weighting of each of the answers obtained from the result will be carried out to obtain as a result the final profile of the client. In this way, intelligent work has been generated, in

which surveys are already in potential areas of economic growth.

2.2. Sources of Information

The information to which you have access is the census information of the INEC, with an administrative address of: provinces, cantons, parishes, zones and census sector. For this project, the information of the census sector that corresponds to polygons distributed in all the cantons of the cities of the country, divided into zones of between 4 and 6 blocks, was used.

In the municipality of Quito the data of Cumbayá and Tumbaco were taken, while for the area of the Valley of the Chillos the parishes of the municipality of Rumiñahui were taken which are of Sangolqui, Cotochoa and Rumipanda. This is equivalent to the delimitation of the study area.

The socioeconomic level is publicly available to INEC, from the 2010 census.

2.3. Consumer characteristics

Based on the location of the areas studied, it can be established that our hardware store would be focused on a market with purchasing power of class C- and C +.

2.4. Socioeconomic status

Socioeconomic status can be defined as "the economic or social capacity of a person, family or country and can be classified based on education, income and type of work" (Navarro, 2015). In Ecuador, the socioeconomic levels are divided into five groups: A, B, C+, C- and D, as indicated in figure 4 obtained from the INEC website. (Censuses, 2011) Figure 4 shows that in the country groups C- and C+ is concentrated almost half of the population, this corresponds to a medium-low standard of living.
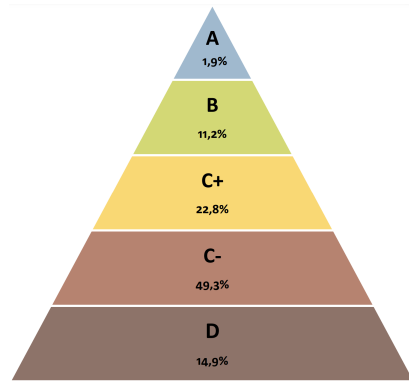
Figure 4. The classification of the socioeconomic level of Ecuador

The classification of the socioeconomic level of these 2 cantons of Quito analyzed is given by the INEC, which is the National Institute of Statistics and Census, in the last census 2010. Figure 5 shows the first layer entered into software, corresponding to the NSE classification of the three Valleys.
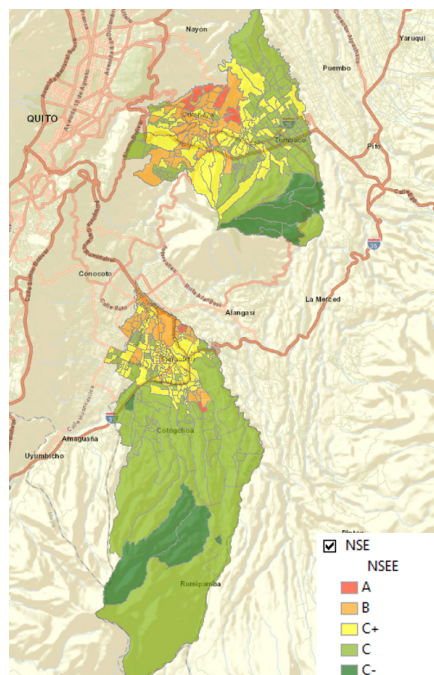
Figure 5. NSE classification of the three Valleys.

2.5. Commercial Density

Commercial density corresponds to the number of commercial premises in a given area. For this project, information based on the Mardis census was used for each of the areas (Figure 6). A georeference was taken from commercial places such as: hardware stores, bases,

stationery, spare parts, stores, groceries, etc.
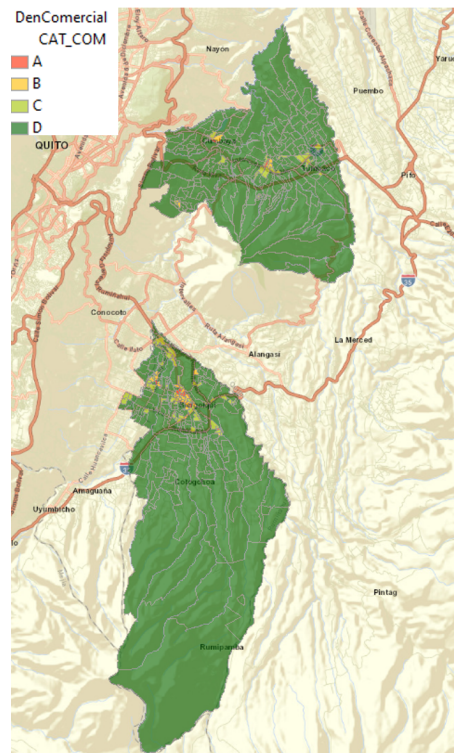
Figure 6: Commercial density

The Mardis census service is a market study that aims to collect detailed and updated information on businesses in Ecuador. This study allows Mardis to know in depth the local market and provide valuable information to make optimal business decisions." The result of the census is a complete and updated database that contains detailed information about businesses in Ecuador, including their location, size, economic activity, level of sales, among other relevant aspects. (MARDIS, 2021)

2.6.   Population density

The population density indicates an average of the number of inhabitants that exist in a certain area. For population density, two information agencies were taken as a basis: the 2010 INEC census added to the projection of the population in each of the census sectors towards 2023 made by Mardis (figure 7). It is calculated similarly to commercial density. Both are divided by the number of premises or population for the area of each study area..
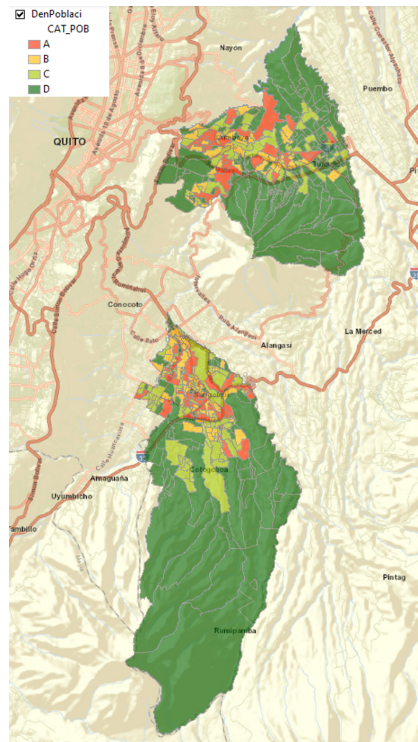
Figure 7. Population projection based on INEC information

2.7.   Competence

In figure 8 you can see the location of each of the hardware stores that will be future competition. The best-selling hardware stores were given a greater weight. Importance values range from 1 to 0. 1 being the most important value and 0 being the lowest.

Figure 8. Population projection based on INEC information.

2.8.   Urban Growth Zones

They are the growth areas managed by the municipality of Quito that have grown the most or that have a projection to grow. That is, an importance/weight of 1 was given to the areas that are marked by the municipality of Quito as areas of urban growth.

Figure 9. growth zones managed by the municipality of Quito

2.9.   Weighted Matrix

It consists of granting, based on a professional criterion, an importance score to each of the variables, in such a way that the weights that each variable has can be weighted according to the criteria of each expert (figure 10). As there are 6 variables, each one has a level of importance from 1 to 6. Referring to 6 as the most important variable and one as the least important.

	Ferreterias	Vias Principales	DenComercial	DenPoblacional	NSE	Crec Urbano
Experto 1	3	4	2	6	1	5
Experto 2	6	2	5	3	1	4
Experto 3	3	4	2	5	1	6
Totales	12	10	9	14	3	15

Figure 10. Importance of each of the variables analyzed

2.10.   Saaty Matrix for Multicriteria Evaluation

Finally, the Saaty matrix is made, which consists of a comparison between all the variables analyzed above and the degree of importance of each in relation to another. The criteria for evaluation are shown in Figure 11.

Figure 11. Saaty Matrix for Multicriteria Evaluation

With this criterion, the Saaty matrix of the project takes the following form (figure 12).

	Ferreterias	Vias Principales	DenComercial	DenPoblacional	NSE	Crec Urbano	Wi	Ci	Lamdai
Ferreterias	1.0	3.0	6.0	0.2	6.0	0.3	1.82	0.13	1.40
Vias Principales	0.3	1.0	4.0	0.3	4.0	0.3	0.76	0.06	0.64
DenComercial	0.2	0.3	1.0	0.3	3.0	0.8	0.32	0.02	0.36
DenPoblacional	6.0	4.0	3.0	1.0	6.0	0.5	6.00	0.43	1.70
NSE	0.2	0.3	0.3	0.2	1.0	0.2	0.08	0.01	0.14
Crec Urbano	3.0	3.0	1.3	2.0	5.0	1.0	4.83	0.35	1.11
Pi	10.67	11.50	15.58	3.92	25.00	3.17	13.81		5.35

Figure 12. Saaty matrix

In this way, the equation that will be entered into the software to generate the map algebra is obtained. This is the final step to obtain a visual map with the degree of importance in each sector depending on the color you mark.

		Pesos
C1	Ferreterias	13%
C2	Vias Principales	6%
C3	Dens. Comercial	2%
C4	Dens. Poblacional	43%
C5	NSE	1%
C6	Crecim. Urbano	35%
		100%

Figure 13. Percentage weight of importance of each variable.

2.11. Map Algebra

Once all the previous process has been carried out, map algebra can be obtained (figure 14), which is a methodology that considers each of the georeferenced variables with their respective weight.
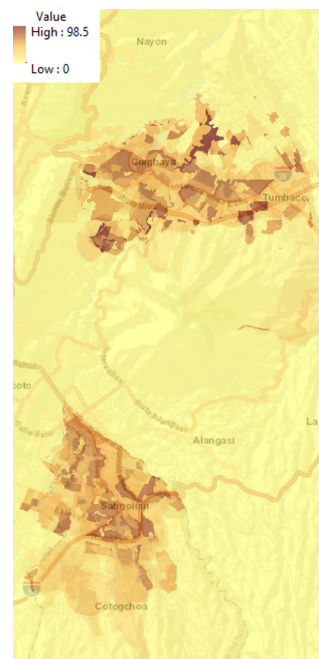
Figure 14. Map algebra

Each of the images (shapes) shown and explained above are added and converted to raster to obtain the map algebra. Its values range from 0 to 100 depending on the weights (Alcalá Escamilla & López López, 2016).

2.12. Map Algebra Normalization and Vectorization with Census Tracts

This program results in a data table for each census sector according to its degree of importance, that is, it exports the values of all the variables analyzed: socioeconomic level, population density, categorization of the population commercial density, commercial

categorization.
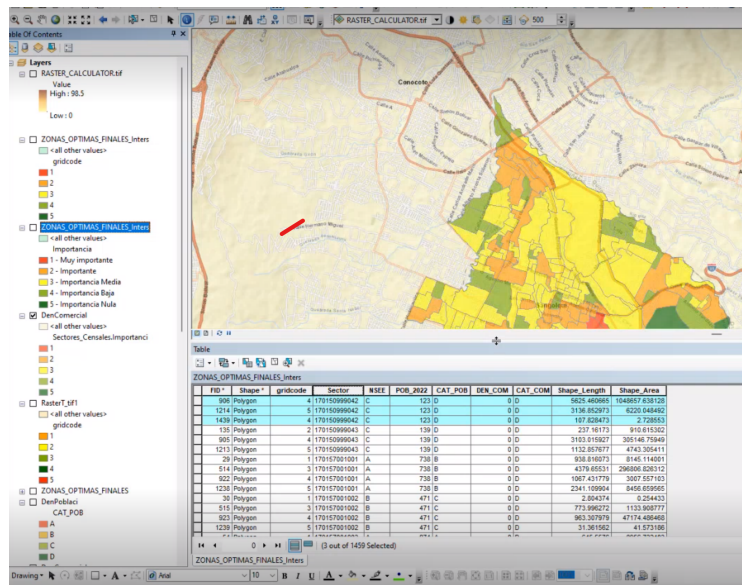
Figure 15. Importance of each census tract generated by the QGIS program

In addition, you can see a map of each sector with its degree of importance (figure 16).
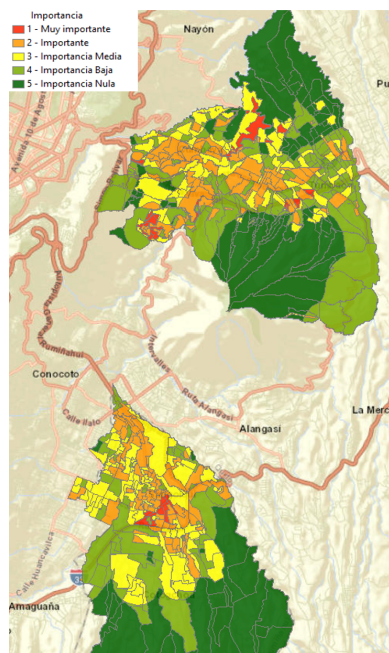
Figure 16. Result of map algebra with its respective importance.

With these results you can already obtain the potential areas of the 3 sectors: Cumbayá, Tumbaco and Valle de los Chillos. The process performed acts as a filter. That is, it tells us which areas are the most convenient to carry out our surveys.

In addition, in this way it is possible to reduce the population and thus reduce the sample only

to the most convenient areas related to the objective of the project.

With these results extracted from the program, a dynamic table was made (Figure 17), where only the areas with importance 1 and 2 were filtered. Obtaining the following potential zones.

Etiquetas de fila	Suma de POBLAC.	Suma de POBLAC.2	Cuenta de POBLAC.2
⊟Chillos	46295	50.7%	57
1	3920	4.3%	5
2	42375	46.4%	52
⊟Cumbaya	23696	25.9%	32
1	3103	3.4%	5
2	20593	22.5%	27
⊟Tumbaco	21364	23.4%	30
1	2051	2.2%	3
2	19313	21.1%	27
Total general	91355	100.0%	119

Figure 17. The 2 most important areas with the amount of the census sector.

2.13. Potential areas

The most convenient areas to conduct the survey in Cumbaya and Tumbaco are shown in figures 18 and 19 and their most accurate location is:
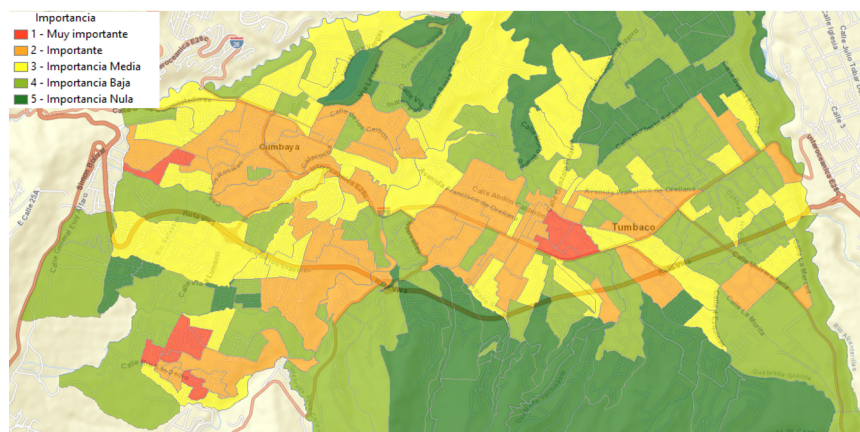
Figure 18. Cumbayá and Tumbaco area

a. Cumbayá:

- Lumbisí Sector

- Los Olivos and Libertadores Street

- Sector San Juan de Cumbayá

- The Chaquiñán

b. Tumbaco:

- Belermo Streets between Interoceanic and Rumiñahui (and trasnversal)

- Surroundings of Tumbaco Central Park to Ventura Mall

- Sector between Calle Rumiñahui and Calle Rosa Zárate

- Sector la Morita
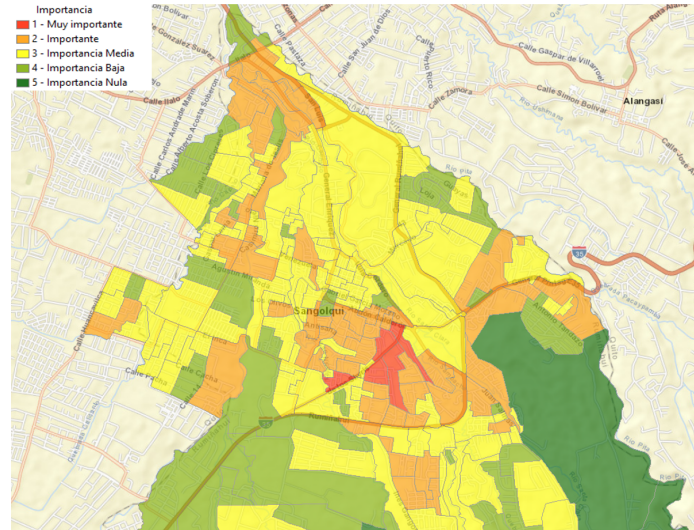
Figure 19. Potential areas of economic growth.

c. Valle de los Chillos:

- Sector between Av. de los Shyris and Av. Abdón Calderón and Surroundings

- Av. de los Puruhaes

- Capelo

In this way, intelligent work has been generated, in which surveys are already in potential areas of economic growth.

2.14. Sampling method

The survey was conducted in person and lasted approximately three weeks for the areas of the 3 sectors analyzed. The procedure consisted of asking people of different ages who were walking around the place and others who were leaving to buy from the hardware stores "competition".

1.   Sample calculation

Figure 20 shows the data with the number of inhabitants of each sector.

Sectores	Cantidad Población	% Población	Cantidad de Sectores
Chillos	46295	51%	57
1	3920	4%	5
2	42375	46%	52
Cumbaya	23696	26%	32
1	3103	3%	5
2	20593	23%	27
Tumbaco	21364	23%	30
1	2051	2%	3
2	19313	21%	27
Grand Total	91355	100%	119

Figure 20. Resulting data.

.

$$n = \frac{\sigma^2 N p q}{e^2 (N - 1) + \sigma^2 p q}$$

Donde:

N: Total population of potential areas in each sector

σ^2 : 95% confidence level= 1.96

p: Probability in favor50%

q: Probability against50%

e^2: 5% estimation error (rango de 4% a 6%)

$$n = \frac{\sigma(1.96)^2 * (91355) * 0.5 * 0.5}{(0.05)^2 * (91355 - 1) * \sigma(1.96)^2 * 0.5 * 0.5}$$

$$n \approx 380 \ encuestas$$

This means that between the sectors of Cumbayá, Tumbaco and El Valle de los Chillos, a total of 380 surveys must be carried out, guaranteeing 95% reliability in the results.

The advantage of the study of locating potential areas becomes a smart job. By filtering each of the sectors, fewer surveys are needed because the population is reduced to a more specific and more important area according to the objects raised in this hardware project.

Once the total of 380 surveys was obtained, the number of corresponding surveys was calculated for each of the three sectors, this was done based on the weight of the population of each sector, which is found in the previous table.

1.   Número de encuestas para el Valle de los Chillos

$$\# = 380 * 0.505 = 192$$

1.   Número de encuestas para el Valle de Cumbayá

$$\# = 380 * 0.258 = 98$$

1.   Número de encuestas para el Valle de Tumbaco

$$\# \ 380 * 0.237 = 90$$

2.15.   Análisis de los resultados

The survey consists of 10 multiple-choice questions and one to order certain attributes that the hardware store should have based on the degree of importance of each customer.

These questions are intended to obtain data that allow analyzing the profile of the hardware customer and obtain the most important needs of the future customer depending on each potential area analyzed. In addition, it will be a good indication of marketing strategies to attract a greater number of customers.

The results of each question were analyzed according to 3 structures: the study area, the age of the respondent and their gender.

The questions of the survey executed together with its results and analysis are the following:

1.   Choose your Zone:

   a. Cumbayá

   b. Tumbaco

   c. Chillos
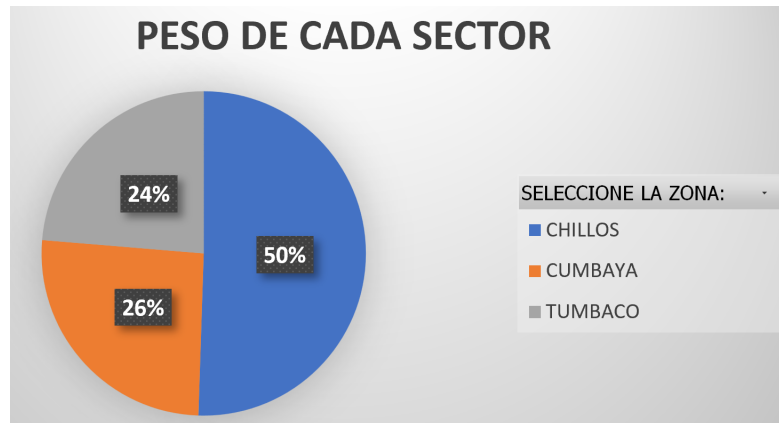
Figure 21. Number of surveys for each sector.

As mentioned above, of the 380 surveys, half were destined to the Valle de los Chillos, 26% to Cumbayá and 24% to Tumbaco.

a. Choose your gender.

The following table of disposition of men and women within each sector was obtained.

Zona	Cantidad	%
CHILLOS	192	51%
FEMENINO	88	46%
MASCULINO	104	54%
CUMBAYA	98	26%
FEMENINO	54	55%
MASCULINO	44	45%
TUMBACO	90	24%
FEMENINO	56	62%
MASCULINO	34	38%
Grand Total	380	100%

Figure 22. Gender of each sector.

That is to say that in the Valley of the Chillos there was a greater number of male respondents while in Cumbayá and Tumbaco women predominated, as indicated by the figure.
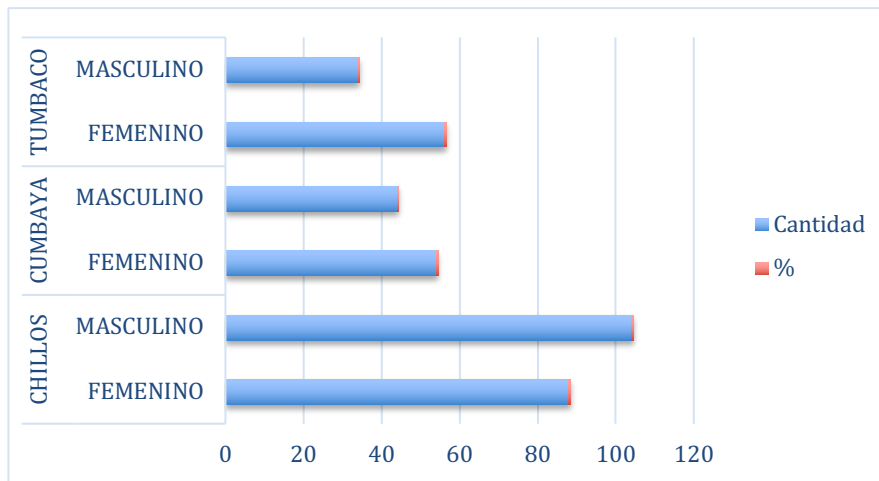
Figure 23. Gender of each sector.

It means that 52% of respondents are women and 48% are men.

b. Enter your age.

The ages were divided according to gender, obtaining the following groups.

Zona	Cantidad	%
⊟ FEMENINO	198	52%
18 - 25 AÑOS	34	17%
26 - 33 AÑOS	66	33%
34 - 45 AÑOS	64	32%
46 - 65 AÑOS	34	17%
⊟ MASCULINO	182	48%
18 - 25 AÑOS	28	15%
26 - 33 AÑOS	42	23%
34 - 45 AÑOS	60	33%
46 - 65 AÑOS	52	29%
Grand Total	**380**	**100%**

Figure 24. Ages of each sector.

From these data it can be established that the male group surveyed was higher for the age range of 34 to 45 years, while in the female group it was in the range of 26 to 33 years.
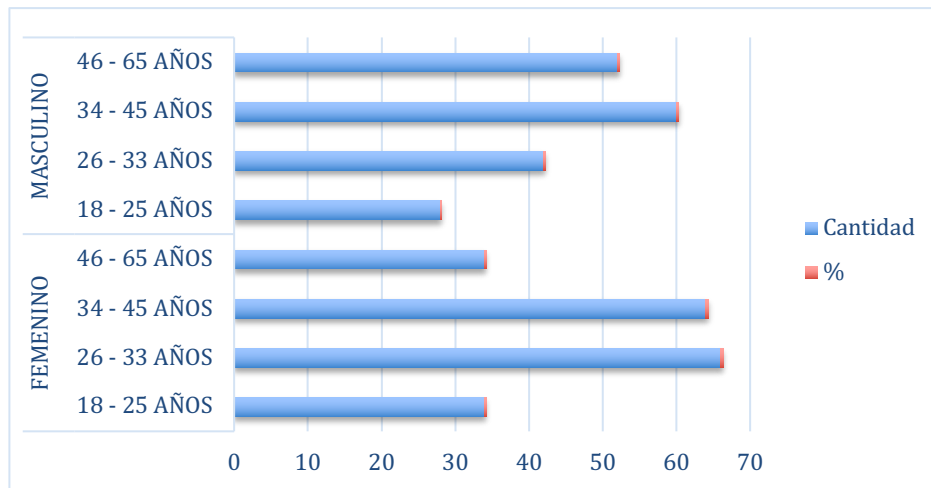
Figure 25. Ages of each sector.

The questions were as follows:

1.   In case you need to fix or compose something in your home. What do you prefer?

It is necessary to know the number of potential customers who will need plumbing materials, carpentry, building material or electrical installations for their homes when having to fix it by themselves.

Preferencia	%
PREFIERE ARREGLAR USTED MISMO	55%
PREFIERE QUE UN ESPECIALISTA LO ARREGLE	45%
Grand Total	**100%**

Figure 26. Preference as to the settlement of damage.

The following graph shows that the Valle de los Chillos sector has the greatest weight in customers who prefer to solve the damage to the home by themselves, followed by Cumbayá and Tumbaco, where the votes are equally divided.

Zona	%
CHILLOS	**51%**
PREFIERE ARREGLAR USTED MISM	58%
PREFIERE QUE UN ESPECIALISTA L	42%
CUMBAYA	**26%**
PREFIERE ARREGLAR USTED MISM	53%
PREFIERE QUE UN ESPECIALISTA L	47%
TUMBACO	**24%**
PREFIERE ARREGLAR USTED MISM	50%
PREFIERE QUE UN ESPECIALISTA L	50%
Grand Total	**100%**

Figure 27. Percentage analysis, question 1.

As can be seen in Figure 28, clients with a range between 34 and 45 years are those who prefer to fix their home themselves, that is, a greater emphasis should be placed on services such as business advice to these clients..

Zona	%
⊟CHILLOS	51%
PREFIERE ARREGLAR USTED MISM	58%
PREFIERE QUE UN ESPECIALISTA L	42%
⊟CUMBAYA	26%
PREFIERE ARREGLAR USTED MISM	53%
PREFIERE QUE UN ESPECIALISTA L	47%
⊟TUMBACO	24%
PREFIERE ARREGLAR USTED MISM	50%
PREFIERE QUE UN ESPECIALISTA L	50%
Grand Total	100%

Figure 28. Percentage analysis, question 1.

2.   *How often do you buy items at a hardware store per month?*

72% of respondents buy hardware products at least once a month and 17% of respondents make their hardware purchases more than three times a month.

Frecuencia	%
MENOS UNA	28%
UNA	41%
DOS	13%
TRES	8%
CUATRO	4%
MAS CUATRO	5%
Grand Total	100%

Figure 29. Frequency with which hardware supplies are purchased.

As for the sector, it is important to know that Cumbayá has the highest percentage of people who go to a hardware store more than 3 times a month, with 22%.

Zona	%
⊟CHILLOS	51%
MENOS UNA	33%
UNA	40%
DOS	13%
TRES	9%
CUATRO	3%
MAS CUATRO	2%
⊟CUMBAYA	26%
MENOS UNA	43%
UNA	22%
DOS	12%
TRES	4%
CUATRO	6%
MAS CUATRO	12%
⊟TUMBACO	24%
MENOS UNA	2%
UNA	66%
DOS	17%
TRES	9%
CUATRO	4%
MAS CUATRO	2%
Grand Total	**100%**

Figure 30. Percentage analysis, question 2.

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With regard to gender, men have a higher frequency of purchase than women, 37% of them go to a hardware store more than 3 times a month, and the same happens to those who are in an age range between 46 and 65 years.

.	Frecuencia						
Edad	MENOS DE UNA	UNA	DOS	TRES	CUATRO	MAS CUATRO	Grand Total
18 - 25 AÑOS	32%	48%	6%	13%	0%	0%	100%
26 - 33 AÑOS	33%	42%	8%	11%	4%	2%	100%
34 - 45 AÑOS	24%	42%	21%	3%	3%	6%	100%
46 - 65 AÑOS	26%	35%	14%	7%	9%	9%	100%
Grand Total	**28%**	**41%**	**13%**	**8%**	**4%**	**5%**	**100%**

Figure 31. Analysis according to age, question 2.

3.   *¿Dónde prefiere comprar artículos de ferretería? (Competencia del sector)*

As for the current customer preference, 30% of them make their purchases in the place they are open, 24% in small hardware stores and 46% of customers do it in large chains and distributors. This indicates that the potential lies in attracting customers based on the schedule and those who do not have a preference for large chains or distributors..

COMPETENCIA	%
LA QUE ESTE ABIERTA	30%
OTRA	24%
MEGAKIWI - KIWI	23%
FERRETERIA CANO LASTRA	5%
FERRISARIATO	5%
OTRO DISENSA	5%
FERRETERIA TRUJILLO DUQUE	4%
FERRETERIA DON VALENTIN	2%
GABYFER	2%
Grand Total	**100%**

Figure 32. Places where it is preferred to buy hardware supplies.

Figure 33 is of paramount importance, it already tells us consumer preferences. This allows us to know the competition gives an advantage and create marketing strategies based on consumer needs..

%	ZONA			
COMPETENCIA	CHILLOS	CUMBAYA	TUMBACO	Grand Total
LA QUE ESTE ABIERTA	32%	10%	46%	30%
MEGAKIWI - KIWI	29%	15%	20%	23%
OTRA	21%	37%	16%	24%
FERRISARIATO	8%	5%	0%	5%
OTRO DISENSA	4%	8%	2%	5%
FERRETERIA DON VALENTIN	4%	0%	0%	2%
GABYFER	2%	2%	0%	2%
FERRETERIA CANO LASTRA	0%	20%	0%	5%
FERRETERIA TRUJILLO DUQUE	0%	2%	17%	4%
Grand Total	**100%**	**100%**	**100%**	**100%**

Figure 33. Percentage analysis, question 3.

4.   *Would you like a hardware store to offer you a "how to do it yourself" advisory service?*

81% of potential customers prefer personalized advice from a trained salesperson who offers them a good service and information necessary to solve the problems by themselves, as far as possible. This additional service should be kept in mind as it could be a source of attraction for customers.

ASESORIA	%
SI	81%
NO	19%
Grand Total	**100%**

Figure 34. Clients who prefer personalized advice.

Especially, the Valle de los Chillos shows a greater predisposition towards this additional service.

ASESORIA	%
SI	81%
NO	19%
Grand Total	**100%**

Figure 35. Clients who prefer personalized advice.

In terms of gender, women have a greater need for this service due to the customs of the country, where men are directed from a very young age to help and solve household problems.

GENERO	ASESORIA		
Edad	SI	NO	Grand Total
FEMENINO	79%	21%	100%
MASCULINO	84%	16%	100%
Grand Total	**81%**	**19%**	**100%**

Figure 36. Analysis according to gender, question 4.

In addition, it should be noted that the age range most open to receiving this advice is between 26 and 45 years.

.	ASESORIA		
Edad	SI	NO	Grand Total
18 - 25 AÑOS	77%	23%	100%
26 - 33 AÑOS	83%	17%	100%
34 - 45 AÑOS	82%	18%	100%
46 - 65 AÑOS	79%	21%	100%
Grand Total	**81%**	**19%**	**100%**

Figure 37. Analysis according to age, question 4.

5.   *Would you like a hardware store to open on Sunday or Saturday?*

20% more respondents suggest they would prefer them to open on Sundays rather than Saturdays. This can have several reasons, for example: being a day where you do not work, mostly, people can take advantage to solve the damages of their homes, in this way they save having to hire external people.

APERTURA	%
DOMINGO	33%
SABADO	13%
SABADO Y DOMINGO	54%
Grand Total	**100%**

Figura 38. Preferencias respecto a si desean que una ferretería abra los domingos.

In the valley of the Chillos it is remarkable to see the difference of preference towards Sunday. Another reason, it may be that the vast majority of nearby or "neighborhood" hardware stores usually close on Sundays, leaving only the large chains available to people, who usually sell their products at a higher value than neighborhood hardware stores..

Zona	%
⊟ CHILLOS	51%
DOMINGO	42%
SABADO	10%
SABADO Y DOMINGO	48%
⊟ CUMBAYA	26%
DOMINGO	12%
SABADO	5%
SABADO Y DOMINGO	83%
⊟ TUMBACO	24%
DOMINGO	38%
SABADO	27%
SABADO Y DOMINGO	36%
Grand Total	**100%**

Figure 39. Analysis according to the sector, question 5.

addition, the following two tables show that, regardless of gender or age, all respondents chose Sunday over Saturday.

.	APERTURA			
GENERO	DOMINGO	SABADO	SABADO Y DOMINGO	Grand Total
FEMENINO	35%	16%	48%	100%
MASCULINO	31%	9%	60%	100%
Grand Total	**33%**	**13%**	**54%**	**100%**

Figure 40. Analysis according to gender, question 5.

6. ¿ What times do you normally go to a hardware store?

With global response, 31% was obtained from 9am to 11am, so you must have an excellent service especially at this time. At this time, promotions or discounts strategies could also be applied that attract the attention of the customer and make him want to return to the same business.

HORARIO	%
7AM a 9AM	16%
9AM a 11AM	31%
11AM a 4PM	28%
4PM a 6PM	22%
6PM a 8PM	3%
Total	**100%**

Figure 41. Preferences according to the hours of operation.

In the Valle de los Chillos, unlike the other two, it has a greater clientele from 11am to 4pm.

Zona	%
CHILLOS	**51%**
7AM a 9AM	8%
9AM a 11AM	31%
11AM a 4PM	39%
4PM a 6PM	22%
6PM a 8PM	1%
CUMBAYA	**26%**
7AM a 9AM	17%
9AM a 11AM	30%
11AM a 4PM	27%
4PM a 6PM	22%
6PM a 8PM	4%
TUMBACO	**24%**
7AM a 9AM	32%
9AM a 11AM	32%
11AM a 4PM	9%
4PM a 6PM	20%
6PM a 8PM	7%
Total	**100%**

Figure 42. Preferences according to the hours of operation by sector.

7.   Would you like a hardware store to offer home delivery?

A very considerable percentage of respondents suggest that there should be home service. This benefit must be taken into account, since 77% of potential customers preferred it.

	%
NO	9%
NO ES RELEVANTE	13%
SI	77%
Total	**100%**

Figure 43. Preferences according to the home service.

It can be seen in the table below, that regardless of the sector of study, all people prefer this service, especially in the Tumbaco area.

Zona	%
CHILLOS	**51%**
NO	10%
NO ES RELEVANTE	16%
SI	74%
CUMBAYA	**26%**
NO	8%
NO ES RELEVANTE	18%
SI	73%
TUMBACO	**24%**
NO	9%
NO ES RELEVANTE	2%
SI	89%
Total general	**100%**

Figure 44. Analysis according to the sector, question 7.

8.   Would you like the hardware store to have parking service?

Parking is essential for customers. If there is nowhere to park, it is physically impossible to buy even if such a business is preferred..

This is confirmed by the survey, with 89% of respondents preferring parking.

	%
NO	4%
NO ES RELEVANTE	7%
SI	89%
Total general	**100%**

Figure 45. Parking service preference.

As for the different sectors of study. Although it is essential in all, for Tumbaco you must have great attention with this aspect. This will depend on the specific place where the business is going to be placed. If it is an area with high traffic, it is essential that the hardware store has its own parking.

Zona	%
CHILLOS	**51%**
NO	5%
NO ES RELEVANTE	6%
SI	89%
CUMBAYA	**26%**
NO	2%
NO ES RELEVANTE	14%
SI	84%
TUMBACO	**24%**
NO	4%
SI	96%
Total general	**100%**

Figure 46. Analysis according to sector, question 8

9.   *If you had to choose in a purchase, prefer a product:*

This question gives us an idea of consumer needs. Where the business should be focused based on the preferences of the buyer. Customer preference has been analyzed based on 2 parameters, quality and cost. However, we see that there is an indecision of this since they choose according to the need of the work, that is, if they consider the arrangement relevant so as not to have to do it again and not spend a lot of money.

47% chose the quality depending on the work to be done or the function and use that the tool or material purchased will fulfill. For example: a person who has a carpentry workshop, most likely buys high quality tools since their use will be daily, unlike a person who is not dedicated to that and will use it from time to time..

Preferencia	%
CALIDAD	29%
CALIDAD - DEPENDE TRABAJC	47%
COSTO	5%
COSTO - DEPENDE TRABAJO	19%
Total general	**100%**

Figure 47. Consumer preferences regarding the purchase of a product

In any sector you can see that quality plays a fundamental role when buying.

Zona	%
CHILLOS	**51%**
CALIDAD	38%
CALIDAD - DEPENDE TRABAJO	45%
COSTO	7%
COSTO - DEPENDE TRABAJO	10%
CUMBAYA	**26%**
CALIDAD	41%
CALIDAD - DEPENDE TRABAJO	27%
COSTO	4%
COSTO - DEPENDE TRABAJO	29%
TUMBACO	**24%**
CALIDAD - DEPENDE TRABAJO	73%
COSTO - DEPENDE TRABAJO	27%
Total general	**100%**

Figure 48. Consumer preferences according to sector, question 9

10.   *From 1 to 5. How important is the good attention that the hardware store has?*

Optimal attention can mark the loyalty of a person to a certain business. Education, efficiency and speed that the salesperson gives the customer is a predominant factor in attracting or repelling customers. And this is confirmed by 97% of the respondents of this project.

	%
5 - Muy Importante	71%
4 - Importante	27%
3 - Medianamente importante	3%
Total general	**100%**

Figure 49. Importance of good business service.

If a business has poor service, it is more than certain to lose customers. For obvious reasons everyone prefers to feel comfortable and well treated in the place where they choose to spend their money. In this way, the business will also be earning the recommendations of satisfied and grateful customers..

	%
CHILLOS	**51%**
5 - Muy Importante	70%
4 - Importante	28%
3 - Medianamente importante	3%
CUMBAYA	**26%**
5 - Muy Importante	69%
4 - Importante	24%
3 - Medianamente importante	6%
TUMBACO	**24%**
5 - Muy Importante	73%
4 - Importante	27%
Total general	**100%**

Figure 50. Importance of good care according to sector, question 10

11.   List from highest to lowest degree the attributes that you consider important for a hardware store to have.

This data provides valuable insights into the hardware store's customer profile, which will allow the company to adjust its marketing strategy and product offering to meet the needs and preferences of its customers.

40% of the people surveyed gave higher priority to quality product, followed by 31% to good service. That is, 71% of consumer priority is governed by these two aspects..

Atributos Valorados	%
PRODUCTO DE CALIDAD	40%
BUEN SERVICIO	31%
ASESORIA EN TIENDA	13%
BAJO PRECIO	12%
ESTACIONAMIENTO	4%
SERVICIO A DOMICILIO	2%
Total general	**100%**

Figure 51. Priority of importance of each service.

Of that remaining 60% who chose an attribute other than quality product as the highest value, the importance of these two qualities mentioned is emphasized by being again in first and second place.

	%
PRODUCTO DE CALIDAD	38%
BUEN SERVICIO	28%
BAJO PRECIO	17%
ASESORIA EN TIENDA	13%
ESTACIONAMIENTO	3%
SERVICIO A DOMICILIO	1%
Total general	**100%**

Figure 52. Priority of importance of 60% of respondents who did not choose quality products as their first option.

Services of last importance for the client correspond to parking, followed by advice in store and low price. Which gives a sense of contradiction, since in question #8 about parking 89% of respondents took this service as a preference. This means that, although people prefer to have their own parking in each place, this has very little importance compared to the quality of the product and the good service of the premises.

	%
ASESORIA EN TIENDA	10%
BAJO PRECIO	12%
BUEN SERVICIO	1%
ESTACIONAMIENTO	49%
SERVICIO A DOMICILIO	29%
Total general	**100%**

Figure 53. Services of minor importance to the client.

A comparison of preferences and needs can also be made between the 3 sectors surveyed: Los Chillos, Cumbayá and Tumbaco. As the main priority for the Chillos is the quality product with 52%, unlike Cumbayá that prefers in-store advice with 27% and Tumbaco that opted for good service with 53%.
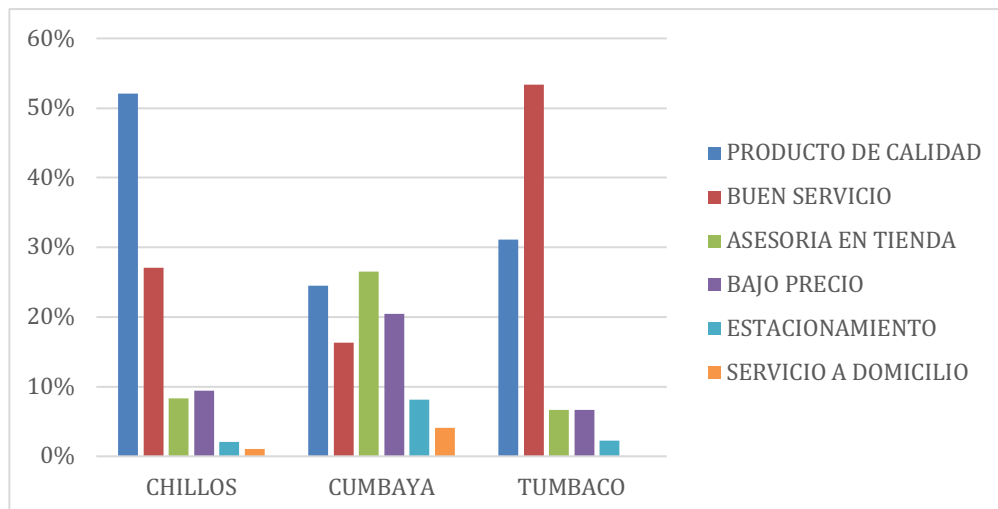
Figure 54. Representation of priority of importance according to each sector.

In this way, greater focus is given to what each sector demands, for example:

For the Chillos it may be essential that the business has suppliers that provide materials and tools with good standards and that comply with the regulations of excellent quality.

For Cumbayá, on the other hand, the advice provided by the store is essential, so it should hire employees who have excellent knowledge of the entire hardware and construction sector or they should be trained from time to time.

On the other hand, the clientele of Tumbaco should be treated with greater kindness, speed and efficiency at the time of purchase..

% Atributos Valorados	PRODUCTO DE CALIDAD	BUEN SERVICIO	ASESORIA EN TIENDA	BAJO PRECIO	ESTACIONAMIENTO	SERVICIO A DOMICILIO	Total general
CHILLOS	52%	27%	8%	9%	2%	1%	100%
CUMBAYA	24%	16%	27%	20%	8%	4%	100%
TUMBACO	31%	53%	7%	7%	2%	0%	100%
Total general	40%	31%	13%	12%	4%	2%	100%

Figura 55. Análisis de prioridades de acuerdo con el sector.

3. CONCLUSIONS

- The three study areas (Cumbayá, Tumbaco and Valle de los Chillos) present a high potential for the establishment of a hardware store, since there is a constant demand for hardware and home improvement products.

- The multicriteria analysis has allowed to refine the study area to determine the potential areas.

- Competition in these areas is moderate, but there is an opportunity for the hardware store to differentiate itself by offering unique products and services, such as online sales and home delivery.

- The customer profile of the hardware store in these areas is a mix of men and women, aged between 26 and 45 years. Most customers buy hardware products more than twice a month, with a strong preference for quality products and good service.

- Customers value convenience and price in choosing the hardware store where to buy, so it is important that the hardware store focuses on offering competitive prices and high-quality services.

- The hardware store should focus on offering high-quality products and recognized brands, as well as advice at the point of sale and home delivery to differentiate itself from the competition and attract customers.

4. RECOMENDATIONS

- It is recommended to establish a competitive pricing strategy to attract customers who value price and convenience in choosing the hardware store where to buy.

- It is important for the hardware store to establish a solid marketing plan, including online and social media advertising to reach a wider audience and attract new customers.

- It is suggested to establish a loyalty program for regular customers, offering exclusive discounts, promotions and personalized services to encourage loyalty and customer return..

- It is important that the hardware store has a trained and experienced staff in the area of hardware products, in order to provide advice and support to customers in their needs and requirements.

- The quality of customer service can be a determining factor in the choice of a hardware store by customers, so it is recommended to invest in the training and training of staff.

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