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Competitive advantages of the Panama Canal in the integration of transport between the Atlantic and the Pacific Ocean

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Abstract

This project describes the conditions through which the Panama Canal has evolved and developed throughout time, and in particular, since the year 2016 with the implementation of the expansion of the Canal.

Furthermore, we were able to identify the competitive advantages of the Panama Canal in the integration of transportation between the Atlantic and Pacific oceans, achieving a detailed description of the efficiency and competitiveness of the port. In addition, we analyzed the problems of the port within the general context of its socio-economic development. Its effects and how its infrastructure contributes to the operation of the Panamanian canal.

In the development of the work, it was found that the Panama Canal has one of the most modern and competitive port terminals in the maritime market, which has generated growth in the maritime and logistics industries and at the same time has an increase in the economic activities of the country. Facilitating the commercialization of goods and services worldwide; likewise, the expansion of the Canal allowed the country to increase its competitive capacity thanks to the entry of larger ships such as the Neopanamax, which allows the transport of larger volumes of cargo, generating a reduction in costs, time and distance.

Keywords: Panama Canal, trade, advantages, competitiveness, International Relations

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Introduction

When we mention great works of the world, we must talk about the Panama Canal. For centuries, there was an attempt to open a waterway for navigation from the Pacific to the Atlantic Ocean, with the intention of turning it into a strategic passage that would allow for shortening distances, improving costs and increasing competitiveness at the global level.

After the inauguration of the Panama Canal in 1914, it has provided services for the revitalization of world trade, although the work was completed in 1921, the Panama Canal can be defined as a business strategy in which it allows all types of international operations, specializing in transshipment, loading and unloading of goods, influencing world trade patterns, driving the economic growth of the country and many regions.

According to the Economic Commission for Latin America and the Caribbean (ECLAC)

For most of its history, the Canal was under the U.S. administration, with different operational and service criteria than international commercial shipping. However, since the year 2000, the Canal was under Panamanian administration, it began to design and operate a different profile, which occurred at a time when operational limitations due to the original design capacity began to approach their maximums. At the same time, international maritime transport, production and trade logistics, port services, etc. They experienced a spectacular change in their routes, in the conditions of that moment, as well as in the projected ones, turning towards a previously unknown perspective. (Sabonge, 2009, p. 7)

The Panama Canal has one of the most modern and competitive terminals in the market, in which a huge exchange of goods is generated, one can say that it is a great driver of the world economy. Its geographical position currently offers a series of maritime and commercial services.

It is important to analyze the Canal in its different dimensions of infrastructure, technology and operation, therefore, the competitiveness of the Panama Canal in front of the world.

With the expansion of the Canal, the aim is to increase the capacity of cargo storage, reception of goods and the flow of ships, while promoting the economic development of the country, the region and the world. At the same time, the expansion of the Canal will boost the country's economy. (CNC-Panama, 2010)

1. Project formulation

1.1 State of the art

According to the Panama Maritime Chamber (CMP), the eventual growth of the maritime and logistics industry contributes 33.5% to the GDP, 20% corresponds to the Panama Canal, 18% to the maritime sector and 62% to other segments linked to logistics for world trade, according to Luciano Fernandez, executive director of the Panama Maritime Chamber. (Summa, 2015)

Likewise, maritime activity includes all types of services, such as the sale of marine fuels, port terminals, shipping lines and internal maritime transport; it is an important link that interacts with each other to strengthen the sector.

Since its inauguration in 1914, it has been the navigation route that led the Panamanian people to become a commercial engine in the region. (Gonzalez N., 2014) The canal presented a proposal for expansion, starting in September 2007, which would allow the doubling of the capacity of the inter-oceanic route to meet the demand of world trade. (Gonzalez N., 2014)

According to Luciano Fernandez, executive director of the Panama Maritime Chamber (CMP), the Canal acts as a hook for the sector, (Diaz, 2015) attracting ships that decide to make transshipment, where they find a variety of services that allows them to operate in an efficient and effective manner. As a complement, the port terminals are located at the entrance of the canal, one is located on the Atlantic side and the other on the Pacific side, which increases the movement of local and transshipment cargo to other countries.

A more competitive Canal and a growth in the transit of ships, being the United States, China and Chile the main users of the Canal; According to Canal Administrator Jorge Luis Quijano, "This new transit route is the tip of the iceberg for Panama to once again consolidate itself as the logistics center of the Americas.

The expansion of the Canal is an important player not only for regional maritime trade but also globally," said Oscar Bazan, the Panama Canal Authority's executive vice president for trade planning and development. "The canal is a winning bet. Customers will benefit from savings not only in time but also in money, because the canal is a route that shortens distance. (Our Sea Foundation, 2016)

Panama has made progress in logistics and infrastructure that has allowed it to strategically connect the countries of the world in the Atlantic and Pacific Oceans, becoming increasingly competitive at the global level.

"The operation of the Canal is continuous 24 hours a day, 365 days a year, which represents availability and competitiveness". (Gonzalez & Mira, 2014)

1.2 Problem Statement

The Panama Canal has its importance to the world as a major source of integration for trade between the Pacific and Atlantic Oceans. This connection provides a short and economical transit route for the transportation of goods worldwide.

For this reason, we will analyze the competitiveness of the Panama Canal, such as its operation, infrastructure, technology, storage, distribution and efficiency in loading and unloading operations, and we will develop the following question.

Problem question:

How does the transportation of goods between the Atlantic and Pacific Oceans benefit the capacity of the Panama Canal?

Table 1: Research Problem Statement

Symptoms	Causes	Forecast	Forecast Control
<p>Inefficiency and delays in the loading processes in the Panama Canal.</p> <p>High costs due to journey time.</p> <p>Little competitiveness</p>	<p>Global export growth and a development in maritime transport, the reasons being that the ships were too big to fit through the Canal.</p>	<p>Centuries ago, Nicaragua proposed its inter-oceanic canal and trade routes to expedite the passage of cargo from the Atlantic to the Pacific, making the Panama Canal obsolete and unserviceable</p>	<p>To be able to design a wider Canal, seeking to satisfy demand and obtain growth in the provision of services worldwide.</p>

Own elaboration

1.3 Background

At the beginning of the last century, the construction of the Panama Canal was the result of the identification of new trade patterns with the objective of cutting time and distance. Initially it was created for military purposes, but over time it became a trade facilitator for the world. Since its inauguration, until the end of fiscal year 2013, more than one million ships had transited through the Panama Canal and more than 9.4 billion long tons of cargo, which shows that the Panama Canal has been a catalyst for international trade that has reduced transportation time and distance, resulting in greater competitiveness for many countries and regions. (ECLAC, 2014, p. 17)

After so many attempts to build the Canal, it went through several adversities, such as worker deaths from disease and animal bites, the abandonment of Canal construction by several countries. Colonel George Washington Goethals, states that, "Stevens devised, designed and anticipated practically all the contingencies linked to the construction and subsequent operation of the magnificent project". (Panama Canal, n.d.)

Panama declared its independence from Colombia on November 3, 1903 by means of the Hay-Bunau-Varilla treaty, which granted the United States the concession of the Canal in perpetuity for the development of an area of the Canal, which would exercise its own sovereignty.

The creation of this Canal had several sacrifices, since the country had to yield the sovereign rights for the development of its nation. As of December 31, 1999, the United States returned the administration of the canal to the governmental entity known as the Panama Canal Authority (ACP), assuming the administration of the inter-oceanic route, a fact that took one hundred years for Panama to recover its sovereignty, operating under the model of profitability and income generation for the state.

After achieving independence, the canal was on the verge of becoming obsolete due to the demand and the size of the ships through the current Canal, leading to its most important transformation which was in 2009 achieving the financing of 2.3 billion dollars for the expansion of the Canal. (Sabonge, 2014, p. 5)

Since then, it has increased the movement of the fleets of ships, opening the doors to new markets, favoring the development of world maritime trade, developing exchanges between countries and markets. (Panama Canal, 2016)

Panama's geographical position favors the opportunity to build ports along its coastal strip in the Pacific and Atlantic oceans, providing a network of ports dedicated to the handling of containerized cargo. Panamanian ports are divided into two groups, private ports and state ports. The private ports were assigned to port operators, after being privatized and the state-owned ones are those operated by the state under the administration of the Panamanian Maritime Authority (ACP) offering berthing and anchoring services. Under ACP administration, the Canal continues to be one of the main viable and economic transportation arteries for world trade, due to the investments in infrastructure improvements, training and modernization that it commits to lead the maritime industry. (Georgia Tech Panama, s.f.)

1.4 Objectives

1.4.1 General Objective

Identifying the competitive advantages of the Panama Canal in the integration of transport between the Atlantic and Pacific Oceans

1.4.2 Specific Objectives

- Describing the characteristics of efficiency and port competitiveness of the Panama Canal.
- Analyzing the port problems within the general context of the socio-economic development of the Panama Canal and its effects
- Verify how the infrastructure contributes to the operation of the Panama Canal.

1.5 Justification

Over the years, globalization has given way to economic openness and the exchange of goods or services around the world, which has enabled global economic growth. Thanks to this there was an increase in maritime trade, the Panama Canal is no stranger to these needs to expand and increase to a third set of locks that would allow it to be more competitive and aligned with world needs.

On the other hand, the expansion of the Canal will allow it to increase its capacity as a competitive logistics center for Latin America and the world, which means greater sustainability and diversification for the country.

At the same time, the geographic position of the Panama Canal allows it to revolutionize the market, generating an increase in transit and transportation of goods worldwide.

It is worth saying that the greatest importance of the Canal is its logistics center, being its greatest competitive advantage. Additionally, the importance of this research lies in the need to know the competitive advantages and effectiveness of the operations provided by the Panama Canal. Nevertheless, it is important to mention the difficulties presented in the execution of the research project.

It should be noted that this research was based on an in-depth survey of one of the Canal's employees, which undoubtedly gave us an insight into the knowledge and development of the research.

1.6 Framework

1.6.1 Theoretical framework

Over time, the Panama Canal has developed multiple strategies to position itself in the international maritime market. This positioning has been one of the biggest dreams of companies in modern and contemporary history. This is why several authors have taken initiatives to exercise the growth of the sector. For this reason, it is necessary to know the competitiveness of the Panama Canal, which consists of an organized platform and a set of processes to create, communicate and deliver value to customers, which benefits Panama. (McCullough, 2004)

However, the movement of cargo through the Panama Canal has evolved in its years of operation, in accordance with the transformations that have occurred in the international economic-political environment, technological changes, international trade policies and raw material requirements, processed and finished products from the main economies that benefit from the Canal route. (Sabonge, 2014, p. 9)

Likewise, the greatest advantage that Panama has is its geographical position, since it has ports in both oceans and is located in the center of the American continent whose access is by land, air and sea, with a dollarized economy that allows this country to reach become a great platform that is of great benefit to world trade. (Bernal & Aguilar, 2015, p. 131)

With the inauguration in 2016 of the most important work for Panama and the world "the expansion of the Panama Canal" there was great expectation among locals, due to the economic and commercial impact it would generate in the country, the region and even world level; On the other hand, Sabonge, an ECLAC expert consultant, says that the Canal expansion will increase its potential as a transshipment center to the rest of the Latin American and Caribbean region. Today, Panamanian ports are the transportation headquarters for the world's main shipping companies, Maersk, CMA-CGM, MSC, APL / MOL, Hapag Lloyd, Evergreen and Hamburg Sud. (Sabonge, 2014, p. 17)

The canal becomes a competitive center due to the improvement of infrastructure and equipment on the interoceanic highway, the new toll structure, the expansion of the Canal, the construction of the new locks, had a multiplier effect on expansion investments throughout the world, particularly along the East Coast of the United States, the transit time in Canal waters decreased from 33 to 23 hours, marking the increasing efficiency and confidence in the Panama Canal (Panama Canal, 2019). In turn, the Canal offers a shorter route compared to alternative routes, it has reduced an estimated 800 million tons of carbon emissions, which the expanded Canal has accelerated even more, since it allows ships to carry even greater amounts load in fewer trips, saving time, fuel and emissions. (Panama Canal, 2019)

The main private ports with the greatest movement are the port of Panama Ports Co Balboa and Panama Ports Co Cristobal. Each with a specific purpose in order to have organized and centralized operations; in turn, Panama Ports Co Balboa is located on the other side of the Panama Canal located at the entrance to the Pacific, it is the only container terminal that operates from the Pacific Ocean, receiving the different shipping lines for boarding, disembarking and transshipment of goods to the region (Georgia Tech Panama, s.f.)

This port of Balboa has improved due to the flow of goods, initially they were two separate ports for the handling of general cargo, now it is a modern terminal capable of receiving containers and simultaneously three ships, its technology is equipped to handle containers, Ro-Ro, bulk, solids, liquids and general cargo (Georgia Tech Panama, s.f.)

On the other hand, the port of Panama Ports Co Cristobal, has been operating for more than 150 years, its purpose was to transport materials and workers in the construction of the railway, this was the gateway to the Atlantic for ships carrying passengers from New York , at this time it only had few docks built in iron and wood, this port is operated by the Panama Ports Company (PPC) granted by the state and extensible for 25 years, since then Panama Ports began to transform the docks and their adaptation to the new patterns of world trade (Georgia Tech Panama, s.f.)

However, the port of Cristóbal a century after its operation has been threatened by many factors that have affected its operational capacity, be it due to the increase in daily

operations, the increase in the flow of goods, the maritime and commercial expansion of a status and other factors in globalization processes worldwide (Georgia Tech Panama, s.f.).

1.7 Methodological Framework

1.7.1 Research method

The research method used is the inductive one, starting from specific facts to reach general and important conclusions that determine the characteristics that make the Panama Canal an important pillar for maritime transport. Information is extracted from operational personnel of the Port of Balboa in Panama, with 10 years of experience as a port planner.

An in-depth interview was conducted, consisting of 20 questions regarding the Canal, its advantages and its operation. To culminate the research, 7 questions were taken as the main source of information.

Questions:

- What is the function of the Panama Canal?

The function it has is to generate a faster connection for the ports and to be able to perform the operations.

- Why the Panama Canal is considered one of the largest multimodal centers?

For the amount of services it provides, helping ships reduce time and not having to turn around to enter the Canal and cross quickly from the Atlantic for cargo or personnel handling.

- How long does it take for a vessel to transit the Panama Canal?

Around a period of 18 hours, it could be less than that, but this is the time to save water and reduce consumption.

- What is the operational capacity and number of collaborators of the Canal?

In operation are about 3000 employees and the port of Balboa are 2000 people for the movement of cargo, registration, paperwork, invoices, collections, maneuvers, among others.

- What is the daily boat capacity in the Canal?

The maximum capacity is 32 boats that pass through per day, either going to the Atlantic or to Balboa, you could have more, but the locks use a lot of water and for savings does not support more.

- From your perspective, what are the advantages of the latest Panama Canal expansion?

The most important advantage is the profit that the operation leaves in the canal, due to the increase of merchandise that the expansion of the canal left, this forced the shipping agencies to make bigger ships to move more merchandise, this helps to have faster and more efficient movements, as the ships are bigger, have more capacity and do not need so much transit of ships. In addition, its implementation of new technology is very important.

- What do you think has been the impact of the Canal on international maritime trade?

The opening of new routes for larger vessels, this leads shipping companies to change their service system and unify the services they offer.

- **Research Focus**

This research has a qualitative approach, based on documentary means, such as in-depth interviews with qualified personnel of the Panama Canal and complemented with primary and secondary sources such as ECLAC, the World Trade Organization, Mincanal, the Panama Maritime Authority and the Port Portal, to carry out this type of study.

- **Type of study**

In the development of this type of study we used a descriptive system, since the object of study is to narrate how events occur in the development of the Panama Canal and the benefits it brings, to determine what the competitive advantages of the Panama Canal are.

1.8 Research methodology

- **Techniques and instruments for collecting information**

The techniques and instruments used for data collection were:

1. In-depth interview:

Where we collected information via telephone in Panama, about the advantages that the Canal has and correlated them from statistical sources of data from magazines and Panama Canal reports, where they extended us more information.

2. Web page: The main pages of the Panama Canal and its competitiveness were used to collect information.

Secondary information found in the Esumer university repositories on the subject was collected.

- **Information selection and analysis**

The method used is qualitative, based mainly on observation and analysis of the information collected from secondary sources to supplement this information.

The report will show the characteristics that have allowed the Panama Canal to increase its competitiveness, growth and development as a logistics platform.

- **Bias Control**

To avoid bias we rely on official sources from the Panama Canal and additionally use pages and reports with investigative rigor, starting from repositories of Esumer University, the world trade organization, to magazines from the Panama Canal.

1.9 Scope

The present investigation consists of knowing the effectiveness and advantages of the Panama Canal at world-wide level, where it is tried to carry out an analysis of the present state in infrastructure, technology and capacity to operate, that allows to identify the impact of the strategies in the decision to transship in Panama.

Delimitations

1.9.1 Spatial delimitation

This research will be delimited in the Panamanian Canal and the two most important ports of Panama, such as Puerto Balboa and Puerto Cristóbal.

1.9.2 Temporal delimitation

The stipulated time for project execution is three months from March 5 to May 24 of this year. Starting the investigation of the problem and analysis of the case; once the requested information has been collected within the investigative parameters, we proceed to the information collection techniques about the effectiveness of the Panama Canal, its ability to meet the current market demand and thus have the bases of the job.

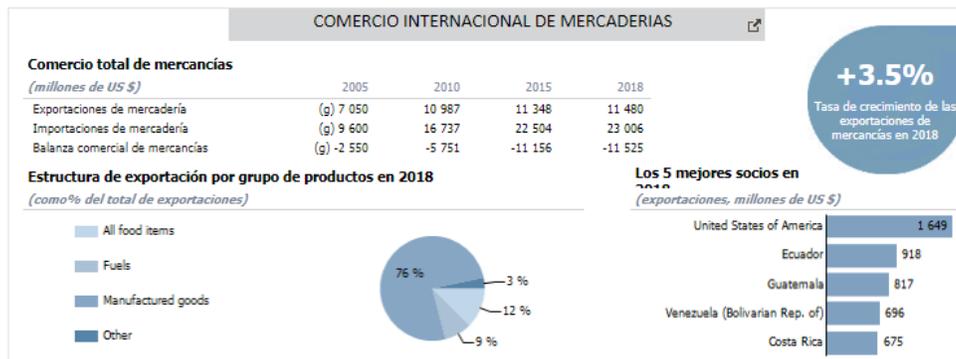
2 Research development

In 2016, the third set of locks began operating, and it is estimated that traffic will increase through the Canal, which will lead to an increase in economic activities and services in the maritime industry. (ACP, 2018)

"This increase in economic activities would generate between 150 and 250 thousand additional jobs throughout the country by 2025" (Restrepo & Areiza, 2015, p. 15), in addition to the generation of jobs, the increase in economic activities of the entire conglomerate will allow for an increase in the country's gross domestic product, an increase in exports, and a reduction in the foreign debt. (Restrepo & Areiza, 2015, p. 15)

According to the International Maritime Organization (IMO), it shows us graphically how it has increased export operations in Panama and which are its main allies, leading the table the United States, followed by Ecuador and Guatemala.

Graph 1: Export structure by product group in 2018



Source: United Nations 1 (UNCTAD, s.f.)

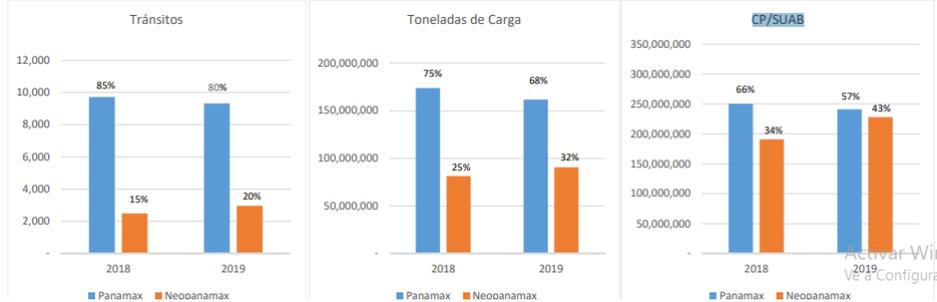
We see how Panama has had an increase in its international trade operations after the expansion of the Canal. Source recovered from the International Maritime Organization (IMO) The article published in the magazine El Tiempo states "the expansion of the Canal was inaugurated, which will allow the passage of Neopanamax ships, with triple the cargo capacity of those that until now cross the centennial route between the Pacific and Atlantic oceans" (Time, 2016).

According to Canal President Juan Carlos Varela, the expansion of the Canal will provide more opportunities for international trade and will enable the country to increase its competitive capacity as a global logistics center (Lucro, 2016).

At the same time, the Panama Canal web page refers to the fact that the operation of larger ships has increased, improving the competitiveness and efficiency of the Canal, as indicated in the following chart: (Panamá, El canal expandido, 2018)

Graph 2: Panama Canal Traffic by Lock Type and Market Segment

Segmento de Mercado	Tránsitos				Toneladas de Carga				CP/SUAB ⁽²⁾			
	Panamax		Neopanamax		Panamax		Neopanamax		Panamax		Neopanamax	
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
Portacontenedores	1,241	1,395	1,334	1,209	13,037,143	16,203,583	43,332,595	40,954,153	38,614,753	46,360,145	126,188,375	112,649,955
Graneleros	2,362	2,476	295	210	76,189,959	81,354,094	13,891,652	11,462,749	59,113,827	61,147,894	17,404,269	12,591,439
Portavehiculos/RoRo	826	793	54	41	4,951,959	4,955,919	423,424	322,770	49,294,192	46,654,427	3,887,048	2,903,148
Quimiqueros	2,026	2,035	9	9	40,758,275	41,715,158	407,908	371,662	44,104,256	44,203,309	248,854	250,234
Gas Natural Licuado	6	-	393	290	46,696	-	13,022,224	11,502,566	114,540	-	42,899,809	31,527,005
Gas Licuado de Petróleo	373	407	714	610	4,973,942	4,848,297	14,710,603	13,377,906	9,742,331	9,646,220	28,047,513	23,841,384
Petrolieros	566	583	149	94	12,968,376	14,874,728	4,882,752	3,317,631	14,630,842	15,719,259	7,929,662	5,091,644
Pasajeros	230	236	12	20	-	-	-	-	8,765,148	9,486,155	1,175,670	1,910,750
Carga General	654	658	-	-	5,656,774	6,551,335	-	-	8,540,274	8,821,793	-	-
Refrigerados	668	779	-	-	2,822,287	3,018,413	-	-	6,552,876	7,234,838	-	-
Otros	366	348	3	6	308,619	200,604	4,138	16,434	1,431,102	1,000,074	93,935	137,428
Gran Total	9,318	9,710	2,963	2,489	161,714,029	173,722,131	90,675,295	81,325,870	240,904,141	250,274,114	227,875,135	190,902,993



Source: Mi canal de Panamá 1 (micanaldepanama, s.f.)

It is identified as the year 2019 saw more movement of Neopanamax ships, due to the expansion of the Canal that gives way to handle larger volumes of cargo, allowing the passage of ships, increasing productivity, efficiency and opening new markets. This leads to savings in time, due to the new locks in the Canal, where it only takes one to two hours and eight hours to complete its passage through the Canal. Before this expansion, ships had to go around the South American cape, where their journey took 10 days. (Squire, 2019)

The Panama Canal is composed of several sectors and services, leaving a positive impact to the country of 53.8% of all maritime and commercial activity, the port system continues with an impact of 15.1%, fuel sales with 9.1% and shipping companies with 8.7%, among others. (Diaz, 2015)

3 Conclusions and Recommendations

3.1 Conclusions

Thanks to the effort that Panama has made to grow as a logistics and transportation center, we were able to identify the competitive advantages that the Canal presents as a logistics center. Without a doubt, the expansion of the Canal has been very relevant to achieve a great opening to valuable markets. This led us to conclude that Panama has experienced accelerated growth in recent years thanks to the presence of the Canal in its territory and its geographical position, making it a benchmark for economic growth for the region and the world. Significant figures were found to support the fact that the Canal is the main source of income for the Panamanian economy. The logistic platform is nowadays fundamental in its strategic operation and of union to world markets to establish itself as one of the most important Canals in the world. Likewise, the services it offers have developed rapidly, which can be highlighted as a great bulwark for the country's growth, in terms of the maritime and industrial industries, as well as the rest of the conglomerate involved in the canal.

3.2 Recommendations

The Panama Canal has a long way to go in terms of port adequacy, developing strategies to move containerized cargo more efficiently. Likewise, its geographical position makes it a competitive center where it must continue to advance in its logistical growth and generate greater connectivity worldwide.

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5. Annexes

5.1 In-depth interview

Full Name: Gustavo Adolfo Arango

ID card: 87992045 of Panama

Profession: Nautical Engineer

Position: Planner

Company name: Panamá ports Company

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These questions are only for educational purposes to achieve the degree as a professional in international business of the Esumer University.

Questionnaire:

1. How long have you been working on the Panama Canal?

I work in the port of balboa, 10 years ago.

2. Do you know the Panama Canal and its port operation?

Yes, I know it, the canal has two routes, one is the extended route and the other is the traditional route, made by the gringos, the port of Balboa has no direct relationship with the canal because we only use it for the racking of ships to the Atlantic, because the pilots do not take the ships to the docks, it is only for lockage or transit, so there is not much relationship with the canal.

The port of Balboa receives a lot of transfer goods because of the amount of ships that are received there; many times goods are received from the railroad and trucks, from the ports of Manzanillo, CPC and Cristobal. This port has both sea and land connections. Containerized, bulk and fuel goods arrive from anywhere in the world.

Racking: when the merchandise enters by truck at any of the ports.

3. What is the function of the Panama Canal?

The function that you have is to generate a faster connection for the ports and to be able to carry out the operations.

4. Why the Panama Canal is considered one of the largest multimodal centers?

For the amount of services it provides, helping ships to reduce time and not have to turn around to enter the channel and cross quickly from the Atlantic to handle cargo or personnel.

5. How is the process of entering a shipment into the Panama Canal?

The process begins when the vessel is out of the Canal, the vessel must make a registration in the single maritime window for the delivery of the documentation, this process must be ready 96 hours before it enters the Canal waters, after having the documentation ready, a few hours before entering the Canal, the port personnel goes to the vessel to make inspection and know that it complies with all regulations and schedule the time it will transit through the Canal.

6. How long does it take for a vessel to transit the Panama Canal?

About an 18-hour period, it could be less time, but for water savings and reduced consumption this is the time.

7. What is the Canal's operational capacity and number of employees?

In operation there are around 3000 employees and the Port of Balboa has 2000 people for the movement of cargo, registration, paperwork, invoices, collections, maneuvers, among others.

8. What is the daily capacity of vessels entering the Canal?

The maximum capacity is 32 boats that pass through per day, either going to the Atlantic or to Balboa, you could have more, but the locks use a lot of water and for the sake of saving you don't have more.

9. From your perspective, what are the advantages of the latest Panama Canal expansion?

The most important advantage is the profit that the operation leaves in the canal, due to the increase of merchandise that the expansion of the canal left, this forced the shipping agencies to make bigger ships to move more merchandise, this helps to have faster and more efficient movements, as the ships are bigger, have more capacity and do not need so much transit of ships. In addition, its implementation of new technology is very important.

10. From your perspective, what are the disadvantages of the latest Panama Canal expansion?

The expansion had an effect on the environment because of the type of construction that was done, although it has been gradually corrected.

The large ships can now transit, because before they arrived in Balboa and had additional movement of merchandise by transfer, which generated an entrance to the port and had more movement of this merchandise, but now the ships cross directly.

Many bigger ships are being built, where they cannot transit through the canal.

11. Having as reference the Asian and/or European ports (canals) how competitive is the Panama Canal?

Other canals do not have ports around them, so there is competition in the handling of cargo, because these canals are only for the crossing of the ships, and the Panama Canal has a way to cross and operate because they have the ports very close, this makes the costs of the merchandise decrease in Panama and increase elsewhere.

12. Is the Panama Canal a reference for economic growth in Latin America?

Yes, it is a very important reference.

13. Do you think that with the current infrastructure the Panama Canal can respond to traffic demand?

Yes, with the current infrastructure the canal can meet the demand

14. What do you think has been the impact of the Canal on international maritime trade?

The opening of new routes for larger vessels has led shipping companies to change their service system and unify the services they offer.

15. How does the Canal project itself into the future? Is its economic infrastructure solid enough?

Yes, with further growth, it should expedite transit and seek ways to save water and increase capacity and transit per day.

16. How did the construction of the Canal benefit the Panamanian people?

The construction of the Canal brought many benefits to the Panamanian people, because the profits that the operation leaves to the country, generates many sources of employment, those who work directly and indirectly, tourism also contributes to the people who have businesses within the Canal.

17. Does the Canal give way to the economic sustainability of the country?

It still needs to work on the issue, because the water from the locks is recycled, but not all of it, because this is drinking water, so it does not increase the port capacity because they are looking for ways to save more water.

18. Does the Canal need a new expansion, given the characteristics of the current market?

I don't think so, because the shipping agencies build the ships based on the measures of the canal, they are the size of the locks, currently they operate with the so-called neopanamas built after the expansion. The ships that were previously operating are called panamas which are rented to other docks or ports that are not so big.

19. What is the function of the locks?

The locks system of the old canal, works by three steps, the ships go up to 26 meters at sea level, in the Pacific there are two locks, the Miraflores and Pedro Miguel and in the Atlantic this Gatun with 3 steps, they are the chambers where the ships enter, these are filled with water and the ship goes to the next step.

20. How long does it take to fill the locks?

The approximate time is 25 minutes to half an hour.

5.2 Assertive consent

Medellín, May 18, 2020.

Subject: Consent

Interview on the Panama Canal

Sir:

Gustavo Adolfo Arango

Mr. Gustavo Adolfo Arango, identified with ID No. 87992045, is requested to respond to the following interview, which has as its educational purpose to obtain the title of International Negotiator at the Esumer University of Colombia. This information will not have any other use, simply as the object of research that we are carrying out on the competitiveness of the canal, in order to finish our degree. Due to the pandemic, the interview with Mr. Gustavo Adolfo Arango was transcribed and recorded.

Thank you very much.

Gustavo Adolfo Arango

ID 87992045 from Panama