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Research Article

Implementation and Challenges : ``Digital Payment System Port Transportation in Developed Countries in Southeast Asia"

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Abstract.
ASEAN makes development priorities and policies for structuring and integrating world ports in ASEAN STOM with three focuses such as Single Shipping Market (ASSM), ASSM Coordination Board, and Electronic Data Interchange (EDI). The study aims to look at the implementation and challenges of developing the Payment System Port Transportation in Southeast Asian countries with the development system of Single Shipping Market (ASSM), ASSM Coordination Board and Electronic Data Interchange (EDI) in Mainland Asia Country and Insular Asia Country. The method used is a literature study with meta-analysis and information from previous research. The results obtained by Laem Chabang Port, Thailand occupy category I Focus on Single Shipping Market (ASSM) Development, ASSM Coordination Board and Electronic Data Interchange (EDI). Meanwhile, in the Insular Asia Country at the ports of Singapore and Tanjung Priok, Jakarta the challenges faced were 33% policy and regulatory issues, 25% infrastructure problems, 22% institutional and human resources and 20% of planning and budgeting. Recommendations were given for the formation of integration and cooperation of ASEAN countries in formulating a transportation development strategy by creating a digital payment system environment so as to help entrepreneurs and industry as well as transportation users.

Keywords: Dygital payment system, port transportasi development

1. Introduction

Public Policy [1] that part of the bureaucratic support that is maintained and improved on the relevant electronic government policy so that it becomes a very valuable concept to be explained in a proper way. The concept of Public Policy is also explained [2] that public policy is one of the capitals in placing the wishes of a country in the future.

Transport policy is carried out in Spain using a dynamic probability model that uses the simultaneity of exports and the location of the company, the high cost of entering the export market and investment in infrastructure are potential development issues in several neighboring countries [3].

[4] that the management of public transportation policies leads to a pattern of collaboration that is built and integrated. [5] stated that transportation will lead to a digital-based 4.0 era so that digitally applicable efforts become a development platform in mass transportation. [6] The strategy built on the basis of community development has a main component value in terms of regional development other than population and natural resources. For example, Raja Ampat has a ratio of land to sea area of 1:6, with the water area being more dominant. As a developing expansion area, the development of transportation, especially sea transportation between large islands and small islands in Raja Ampat Regency, is needed to be affordable by the middle to lower economic community in these islands.

Transportation Policy the use of digital media in policy is a trend among countries in Southeast Asia. E-Commerce in digital applications into several platforms. [7] E-Commerce is a pillar for the development of technology, business and has implications for social value for human development. The development of technology, business and strengthening social values was quickly responded by countries in Southeast Asia with issues discussed in the International forum at the International Organization of the Association Of South East Asia Nation (ASEAN) at the 42nd Senior Transport Officers Meeting (ASEAN STOM).) and the 22nd ASEAN Transport Ministerial (ATM) Meeting which was attended by regulators in the transportation sector of countries that are members of ASEAN, the issue of transportation was again discussed.

The centric issues discussed in this forum are ASEAN Single Shipping Market (ASSM), Framework of Cooperation on Certification of Competency for Near Coastal Voyage issued by ASEAN Member States, ASEAN Shipping Network, ASEAN Agreement on Aeronautical & Maritime Search & Rescue Cooperation, Monitoring Key Performance Indicators, and Implementation of Electronic Data Interchange (EDI) in ASEAN ports. The concept of the application is in accordance with the research conducted [8] that the national green port strategy in Vietnam is to build legal corridors and infrastructure in building a sustainable economy in 2045. So the concept of infrastructure and legal force is the basis for national development in Vietnam. The same planning concept is also carried out [9] the analysis of the level of service of the passenger terminal at the Balikpapan port, it was found that during the survey period, it was found that the majority of passengers obtained tickets through agents (56%), but there were still many

also through brokers (33%) at very expensive prices. Finally, many passengers stay at the port solely to get a normal ticket in addition to waiting for the scheduled departure. The consumer satisfaction index (CSI) for passenger terminal services as a whole is 59.72% which shows the very weak ability and readiness of administrative and field officers in responding to the needs of passengers at the port. The Information of source at TransporOfficers Meeting ASEAN 2016 ([10]. Some of these problems that arise in several transportation issues in ports in ASEAN can be seen in Figure 1 below:

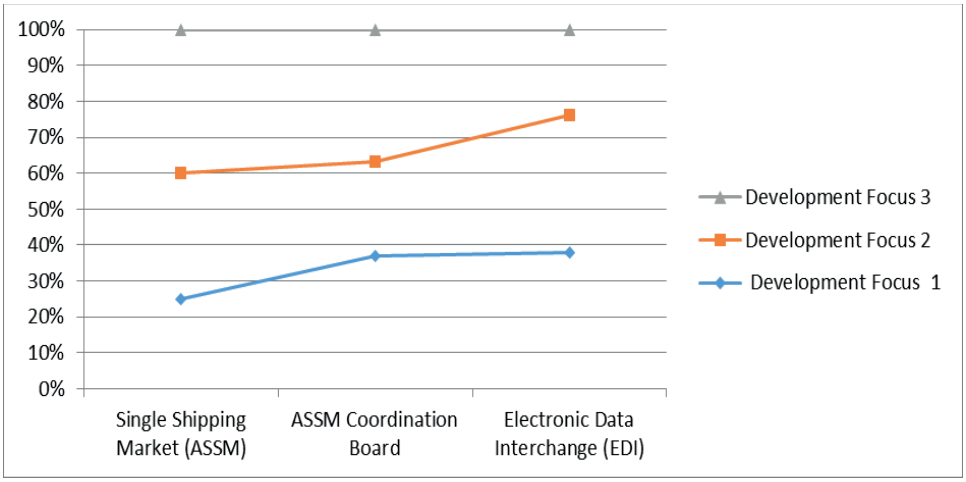


Figure 1: Issues of Development of Lake and Sea Transportation in ASEAN.

The issue of transportation development in ASEAN is quite important to discuss, there are many impacts faced by the community in transportation development, for example in Vietnam the main problem is the port from an ecological perspective, the Hong Kong port is constraining ship flow regulation, Turkish ports are non-price aspects such as customer service, Ports in England and Australia have problems in the privatization of ports and some ports have institutional problems, political economy, engineering science and so on [11]. Then, [12] explained that the development of transportation in Jakarta has an impact on the high cost economy, security and order, safety, comfort, smoothness, punctuality, equity, justice, and traffic law enforcement because many ASEAN countries' economic integration is carried out through sea and lake routes. ASEAN countries have diverse territories. For example, some ASEAN countries themselves territorially consist of mountainous plateaus, valleys and seas to rivers that separate Southeast Asia from China and the northwestern part of India. Maritime trade routes have become an insular issue in archipelagic countries. This maritime route develops economic issues, trade routes to the integration of international cooperation. For example, first, the issue of Single Shipping Market (ASSM), this issue discusses issues related to service standards developed by ASEAN such as macro and micro industries. Second, the issue of the ASSM Coordination Board which discusses

considerations on the issue of harmonization and standardization of reporting formats from several cooperating countries, then lastly Electronic Data Interchange (EDI) is used in exchanging shipping documents where the standards set are adjusted to ports in Asean member countries. Building the Maritime Axis, especially economic trade and transportation routes through Indonesian ports through regulations and policies to be better understood by the private sector, strengthening the implementation of the Law on land acquisition for development and land acquisition and thirdly preparing more mature port projects offered by the private sector and the latter provides a variety of physical and non-physical incentives [13].

The Economic And Social For Asia And The Pacific [14] dividing the port area in the world with the land behind the city or port called Hinterland. Hinterland is an area where the port has a monopoly position in the area of origin and destination of the port. The harbor hinterland consists of two parts, namely the main hinterland and the margin hinterland. The main hinterland is an exclusive area where the port has a monopoly position in attracting cargo. The concept of port service (Hub and spoke) means that local or regional ports are usually located in the main hinterland area of the main port (hub port). The phenomenon that appears in the development of port transportation in ASEAN is still in the problem of exchanging shipping documents where the specified standard does not reflect an accommodative system. This can be seen in table 1 the following :

The focus built in this research is to see how to see the public service system built through an integrated port system in countries in Southeast Asia. The land area of Southeast Asia has a total area of about 4,500,000 square kilometers. The water area is about 5,060,100 kilometers. So Focus and locus divide the Southeast Asia region into two, namely Mainland and Insular. The impact of transportation infrastructure and Information and Communication Technology on Trade Exchange Rates in ASEAN and East Asia that it is necessary to improve transportation infrastructure for ASEAN and East Asian countries because it can increase the trade exchange rate [15]. Exports of information and communication technology goods domestically as well as for export purposes need to be increased to improve the value of terms of trade. Efficient efforts are needed so that export costs are cheaper and rational. The same is true for the connectivity of service systems to sea transportation connectivity to economic growth in Southeast Asian maritime countries. The estimation shows that the Linear Shipping Connectivity Index has a positive and significant effect on the GDP of Maritime Southeast Asian Countries, the Logistics Performance Index has a positive and significant impact on the GDP of Asian Countries. Maritime Southeast Asia, Total trade Does not affect

Table 1: The Biggest Ports in the World.

No	Port Name	Problems
1	Singapura port, (Singapura)	The buildup was recorded at 22 percent where the increase in ships reached 45 ships due to the main container relationship, a complicated logistics ecosystem until the Covid-19 outbreak caused the transit line or transportation sector to fluctuate widely.
2	Hong Kong port and Shenzhen (China)	Congestion rates occur at ports of up to 10.4 percent, influenced by weather conditions also during typhoon Kompasu.
3	Klang Port and Tanjung Pelepas, (Malaysia)	Congestion Up to 14.5 percent above normal and 29.9 percent higher than usual.
4	Tanjung Priok Port, (Indonesia)	Container congestion reached 6.7 percent above normal
5	Manila Port, (Philipina)	The increase in congestion is up to 6.5 percent higher than usual.
6	Ganda Los Angeles Port And Long Beach Port (Amerika)	There was a queue of up to 79 ships waiting off the coast of Southern California.
7	Savannah, Georgia Port (Amerika)	Experiencing traffic jams throughout 2021. There are about 28 ships lining up to dock.
8	Piraeus Port (Yunani)	Experiencing long queues in April-October 2021, as many as 18 ships have been waiting at the port to the Aegean Sea.

Source : Transportation Information [10]

the GDP of Maritime Southeast Asian countries, this explains that economic growth in maritime countries in Southeast Asia is influenced by Sea Transportation Connectivity [16]. The same was done in a study conducted [17] .

The East-European transportation market as an alternative route on the Suez Canal and the Mediterranean Sea is a market opportunity for Iran by utilizing port transportation access. So what distinguishes this study from previous research is that this study provides information on major ports in Southeast Asia with limitations on Mainland Asia and Insular Country Asia. Mainland or mainland in Southeast Asia itself is geographically part of the continental which is related to the continent. Some Southeast Asian countries are mainland countries because they have a canal from the Asian continent. Then it has a river that extends from the highlands that separates Southeast Asia from China and the northwestern part of India. Countries in Southeast Asia that are members of mainland countries include: Burma (Myanmar), Thailand, Laos, Cambodia and Vietnam, while insular countries have many islands, so they are called archipelagic countries consisting of water areas, both rivers and seas. Southeast Asian countries that are members of Insular Southeast Asia include: Malaysia, Singapore, Indonesia, the Philippines and Brunei Darussalam. The concept described has not existed before

in the same study. The implementation and challenges of developing the Payment System Port Transportation system in Southeast Asian countries with the development system of Single Shipping Market (ASSM), ASSM Coordination Board and Electronic Data Interchange (EDI) in Mainland Asia Country and Insular Asia Country?

2. Theoretical framework

2.1. Public Policy And Management Policy

Public Policy [1] that part of the bureaucratic support that is maintained and improved on the relevant electronic government policy so that it becomes a very valuable concept to be explained in a proper way. The concept of Public Policy is also explained [2] that public policy is one of the capitals in placing the wishes of a country in the future. Transport policy is carried out in Spain using a dynamic probability model that uses the simultaneity of exports and the location of the company, the high cost of entering the export market and investment in infrastructure are potential development issues in several neighboring countries [3]. [4] that the management of public transportation policies leads to a pattern of collaboration that is built and integrated.

2.2. E-Commerce Transportation

Transportation Policy the use of digital media in policy is a trend among countries in Southeast Asia. E-Commerce in digital applications into several platforms. [7] E-Commerce is a pillar for the development of technology, business and has implications for social value for human development. The development of technology, business and strengthening social values was quickly responded by countries in Southeast Asia with issues discussed in the International forum at the International Organization of the Association Of South East Asia Nation (ASEAN) at the 42nd Senior Transport Officers Meeting (ASEAN STOM).) and the 22nd ASEAN Transport Ministerial (ATM) Meeting which was attended by regulators in the transportation sector of countries that are members of ASEAN, the issue of transportation was again discussed.

The centric issues discussed in this forum are ASEAN Single Shipping Market (ASSM), Framework of Cooperation on Certification of Competency for Near Coastal Voyage issued by ASEAN Member States, ASEAN Shipping Network, ASEAN Agreement on Aeronautical & Maritime Search & Rescue Cooperation, Monitoring Key Performance Indicators, and Implementation of Electronic Data Interchange (EDI) in ASEAN ports.

The concept of the application is in accordance with the research conducted [8] that the national green port strategy in Vietnam is to build legal corridors and infrastructure in building a sustainable economy in 2045. So the concept of infrastructure and legal force is the basis for national development in Vietnam.

3. Methods

This study uses the method of literacy analysis on the development of existing literature studies or meta-analysis. Literacy study method or literature review is a summary of the analysis of a research on problems that have been studied and developed with references to describe phenomena, social studies that occur in society and others. This research takes references and sources from journals, books, additional references to strong theories on the problems being analyzed [18] with [19]. Strengthening by collecting secondary data through social media and official transportation platforms in ASEAN with an analysis of the categories agreed upon in ASEAN a makes development priorities and policies for structuring and integrating world ports in ASEAN STOM with three focuses including: Single Shipping Market (ASSM), ASSM Coordination Board, and Electronic Data Interchange (EDI) where if you have all three indicators you will get category I, if you have two indicators you will get category II and if you have one indicator you will get category III.

4. Results and Discussion

The results from the discussion above, it can be seen in the development of each port, including in the Southeast Asian region which consists of mainland Asia Country and Insular Country. This information can be seen in table 4.1 below:

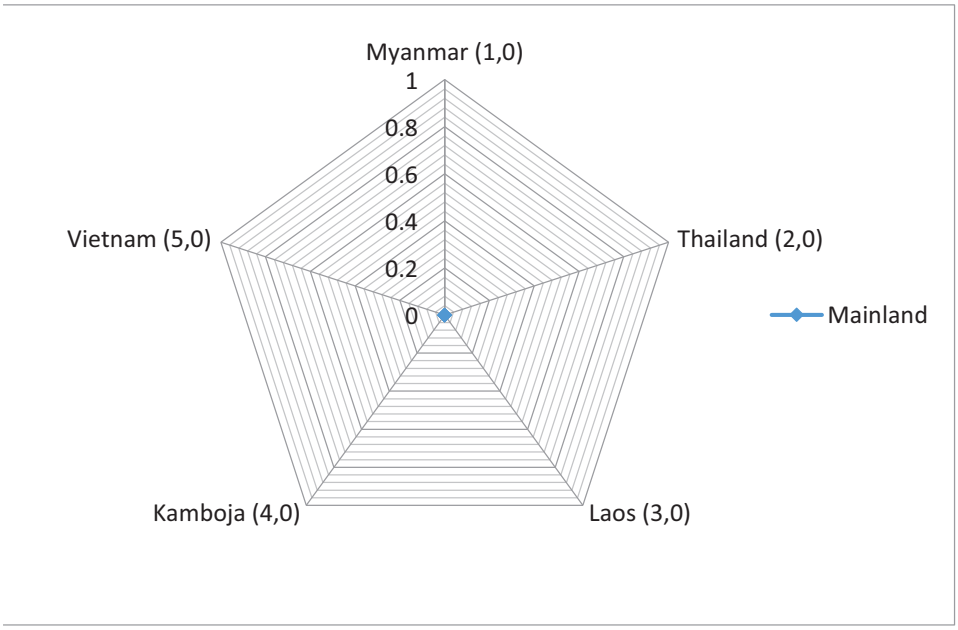
4.1. Mainland Asia Country

This description with Mainland Asia Country has a port that is used in economic activities. however, this research uses 5 ports as objects. This information can be seen in table 2 and Figure 2 below:

Table 2: Port Conditions in Mainland Asia Country.

No	Port Name	Conditions
1	Laem Chabang, Port (Thailand)	The fourth largest port in Southeast Asia has an annual traffic of 8 million, has the most advanced containers in Thailand. It has a terminal D capacity of 3.5 million TEU. This port once welcomed the largest ship that stopped at a Thai port, namely ONE Columba.
2	Otonomi Sihanoukville Port (Kamboja)	The port is located in Kompong Som bay, southwest of Cambodia. This port is directly controlled by the Royal Government of Cambodia with an area of 125 hectares. Terminal 9 berths. The plan is to build a large port for containers with 300,000 TEUs.
3	Thilawa Port , (Myanmar)	Myanmar International Terminals Thilawa, also known as the Yangon Port International Terminal or Thilawa Port, is a deep river port on the Yangon River, 16 kilometres south of downtown Yangon in Myanmar.
4	Luang Prabang Port (Laos)	This ship port is known as a riverboat port that connects the Mekong and Nam Khan rivers. Along the river is known as a Buddhist temple. The capacity of the ship used for crossing the community and goods that are not too heavy in capacity.
5	Thai Nai Port (Vietnam)	This port is located in Binh Dinh province which is known as the Hai Chang (Sea Port) area. This port has a maximum capacity of 644 tons. The port is a regional trading center in Champa. Army port and trading port.

Source : Transportation Information [10]



Source Transportation Information [10]

Figure 2: Mainland Country Southeast Asia.

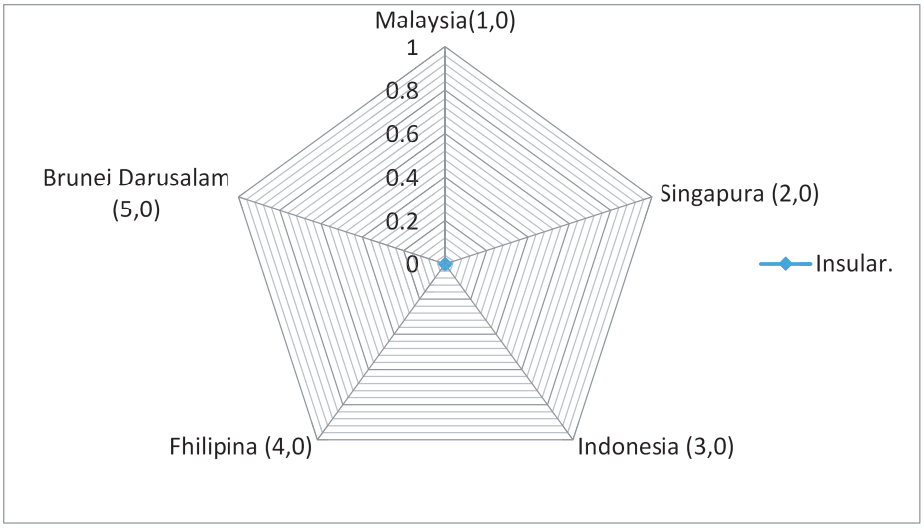
4.2. Insular Asia Country

The explanation that can be given to this insular Asia Country is to make 6 large ports the object of research. This information can be seen in Table 3 and Figure 3 below:

Table 3: Port Conditions in Insular Asia Country.

No	Port Name	Conditions
1	Singapura Port, (Singapura)	This port is the busiest and largest port in Southeast Asia and the second busiest port after Shanghai. The port, which is included in the top 10 in the world, has transported 37.2 million TEU, an increase of 1.6%, known as The Maritime Port Authority (MPA) port with a capacity of 60 million TEU.
2	Klang Port, (Malaysia)	The second largest port in Southeast Asia with a line of 12.3 million TEU. This port is located on the Malayan peninsula in the Malacca Strait and is said to be the busiest route in the World. In 2018 the Klang port plans to develop the port by purchasing land as a regional expansion plan.
3	Tanjung Pelepas Port, (Malaysia)	This port is the number 3 largest port in Southeast Asia with 12 million TEU routes. This port has state-of-the-art technology with several record-breaking container ships ever. Port capacity is also being developed with a planned 30 million TEU in 2030.
4	Tanjung Priok Port, (Indonesia)	This port is located in the port of Jakarta with an Annual Traffic of 7.6 million TEU. This port is the busiest and most advanced port in Indonesia, handling 50% of the country's transhipment traffic. This port has seven new terminals handling 18 million TEU.
5	Muara Port, (Brunei Darussalam)	This port is also used as a maritime port in Brunei Darussalam. This port is said to be a fairly active port of almost 5 million TEUs.
6	Tabaco Port (Philipina)	This port is quite active and busy in the process of containers and sea transportation routes. This port uses 7 million TEU in the development process.

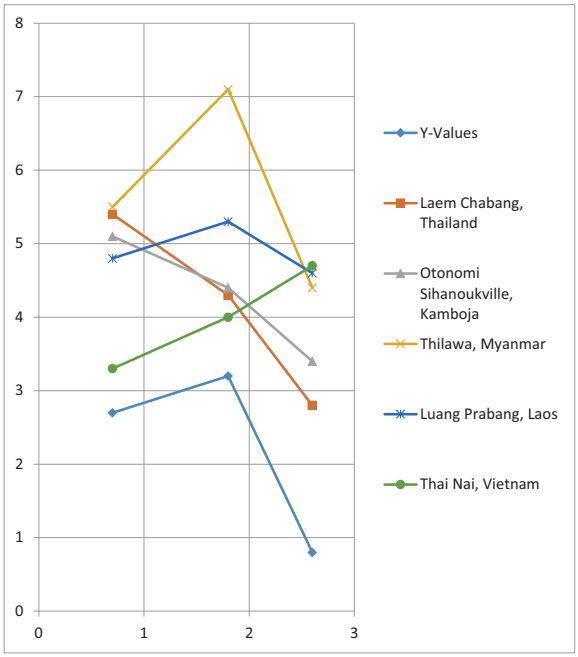
Source : Transportation Information [10]



Source : Transportation Information [10]

Figure 3: Insular Country Southeast Asia.

Based on the information above, it can be obtained how the Digital Payment System Port Transportation in Developed Countries in Southeast Asia which consists of Mainlad Asia Country and Insular Asia Country. The following information can be seen in Figure 4 below :



Source: Analysis Data 2022.

Figure 4: Digital Payment System Port Transportation Mainland Asia Country (ASEAN).

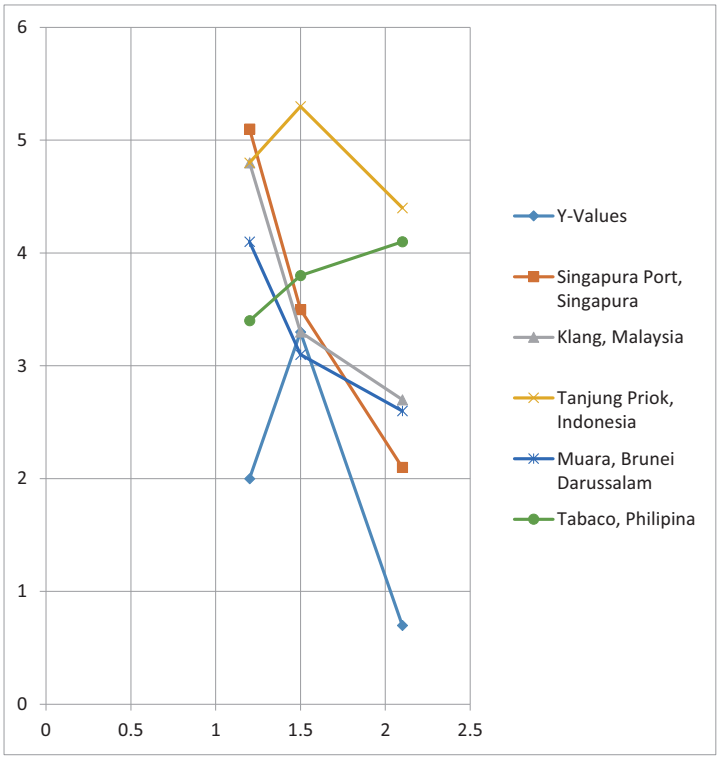
The priority for developing the use of the Mainlad Asia Country (ASEAN) Digital Payment System Transportation system can be explained in table 4 below:

TABLE 4: Payment Development System Port Transportation Mainland Asia Country (ASEAN).

No	Port Name	Development Focus			Category
		Single Shipping Market (ASSM)	ASSM Coordination Board	Electronic Data Interchange (EDI)	
1	Laem Chabang, Thailand				Category I
2	Otonomi Sihanoukville, Kamboja				Category III
3	Thilawa, Myanmar				Category II
4	Luang Prabang, Laos				Category II
5	Thai Nai, Vietnam				Category II

Source : Analysis Data 2022.

Development of the Mainland Asia Country Port Transportation Payment System, the development of the Payment System is also carried out on the Insular Payment System including This information can be seen in Figure 5 below:



Source : Analysis Data 2022.

Figure 5: Digital Payment System Port Transportation Insular Asia Country (ASEAN).

The priority for developing the use of the Insular Asia Country (ASEAN) Digital Payment System Transportation system can be explained in table 5 below:

TABLE 5: Payment Development System Port Transportation Insular Asia Country (ASEAN).

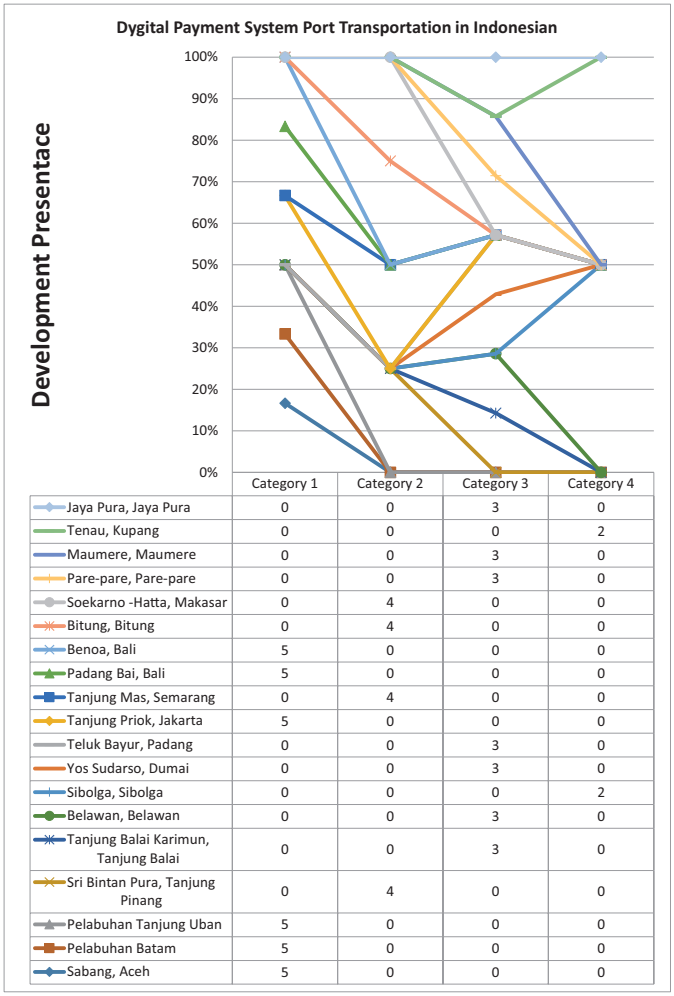
No	Port Name	Development Focus			Category
		Single Shipping Market (ASSM)	ASSM Coordination Board	Electronic Data Interchange (EDI)	
1	Singapura Port, Singapura				Category I
2	Klang,Malaysia				Category II
3	Tanjung Priok, Indonesia				Category I
4	Muara, Brunei Darussalam				Category III
5	Tabaco, Philipina				Category III

Source : Analysis Data 2022.

Based on the above results, the concept of Digital Payment System Port Transportation Asia Country in Mainlad Asia Country and Insular Asia Country obtained the following information: Laem Chabang Port, Thailand occupies category I with a focus on Single Shipping Market (ASSM) Development, ASSM Coordination Board and Electronic Data Interchange (EDI). Meanwhile, Insular Asia Country is located at the ports of Singapore Port and Tanjung Priok, Jakarta. The development of the Digital Payment System as seen in the planning concept between the Mainland Asia Country and the Insular Asia Country is very visible. The development of planning concepts in the Insular Asia Country is larger, for example Singapore Port, Klang Malaysia Port, and Tanjung Priok Port. One of the policies on the development of several large ports in the Insular Asia Port Country in Southeast Asia is based on cooperation and investment from several countries to Southeast Asia. For example, investments provided by the Chinese state such as the Silk Road investment Belt Road Investment (BRI) which connects several national strategic areas in Indonesia so that special areas and strategies are formed such as the integration of maritime highway policies as the development of maritime economic pathways developed through the Economic Zone. Special (SEZ) and National Strategic Areas (KSN). The integration of policies built on the basis of developing policies and regulations for ports in Indonesia that use the Dygital Payment System at major ports in Indonesia totals 19 ports, This information can be seen in Figure 6.

Based on the above, the problems found in the implementation of the Dygital Payment System system in the Mainland Country and Insular Country can be seen in Figure 7.

Based on the results of the research above, several indicators of problems obtained from the implementation of the Dygital Payment System Port Transportation in Developed Countries in Southeast Asia are obtained, including: First, 33% of problems still occur in existing policies and regulations in countries that have ports and in development planning. Second, 25% are still in infrastructure and system application problems, this can be seen in several ports that do not have a goods application system, containers and crossing ports in this concept do not yet have Electronic Data Interchange (EDI). Third, 22% of institutions and human resources have not been able to develop an integrated payment system. Fourth. 20% Unplanned planning and budgeting in general in port development, especially in mainland Asia Country because it has not been made a priority scale in the construction of special ports.



	Category 1	Category 2	Category 3	Category 4
Jaya Pura, Jaya Pura	0	0	3	0
Tenau, Kupang	0	0	0	2
Maumere, Maumere	0	0	3	0
Pare-pare, Pare-pare	0	0	3	0
Soekarno -Hatta, Makasar	0	4	0	0
Bitung, Bitung	0	4	0	0
Benoa, Bali	5	0	0	0
Padang Bai, Bali	5	0	0	0
Tanjung Mas, Semarang	0	4	0	0
Tanjung Priok, Jakarta	5	0	0	0
Teluk Bayur, Padang	0	0	3	0
Yos Sudarso, Dumai	0	0	3	0
Sibolga, Sibolga	0	0	0	2
Belawan, Belawan	0	0	3	0
Tanjung Balai Karimun, Tanjung Balai	0	0	3	0
Sri Bintan Pura, Tanjung Pinang	0	4	0	0
Pelabuhan Tanjung Uban	5	0	0	0
Pelabuhan Batam	5	0	0	0
Sabang, Aceh	5	0	0	0

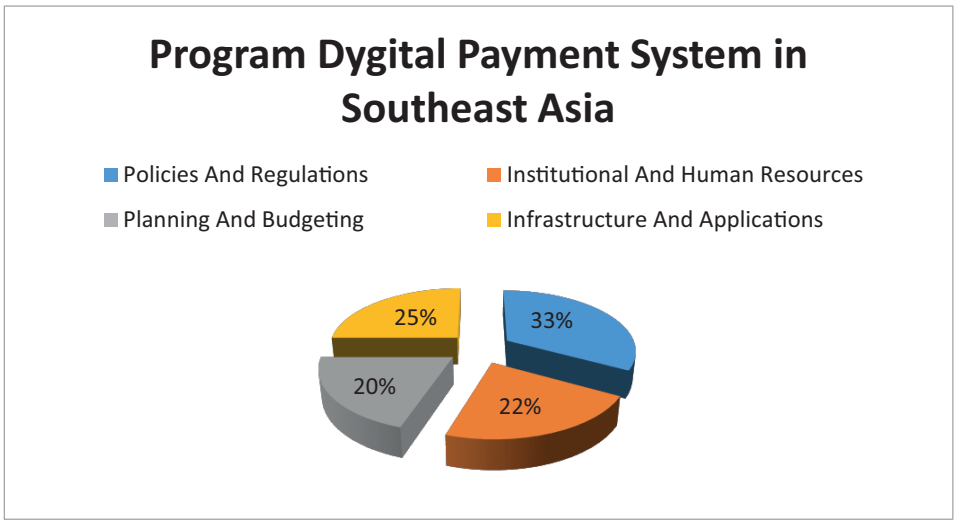
Source : Analysis Data 2022.

Figure 6: Development of an Integrated Digital Payment System Port System in Indonesia.

5. Conclusion

Based on the results of the research above, the following results were obtained: First, the concept of Digital Payment System Port Transportation Asia Country in Mainlad Asia Country and Insular Asia Country obtained the following information: Laem Chabang Port, Thailand occupies category I with a focus on Single Shipping Market (ASSM) development), ASSM Coordination Board and Electronic Data Interchange (EDI). Meanwhile, Insular Asia Country is located at the ports of Singapore Port and Tanjung Priok, Jakarta.

Furthermore, the problems that arise in the implementation of the Digital Payment System Port Transportation Asia Country include: First, 33% of the problems still occur in existing policies and regulations in countries that have ports and in development planning. Second, 25% are still in infrastructure and system application problems, this can be seen in several ports that do not have a goods application system, containers



Source : Analysis Data 2022.

Figure 7: Problems with Digital Payment System Port Transportation Mainland Asia Country and Insular Asian Country (ASEAN).

and crossing ports in this concept do not yet have Electronic Data Interchange (EDI). Third, 22% of institutions and human resources have not been able to develop an integrated payment system. Fourth. 20% Unplanned planning and budgeting in general in port development, especially in mainland Asia Country because it has not been made a priority scale in the construction of special ports.

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