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Cross-border freight movement between Thailand-Malaysia-Singapore: utilising border based dry ports for effective inland transaction

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ABSTRACT

Trade plays an important role in economic growth. Thence, a smooth cross-border transaction between Thailand-Malaysia-Singapore provides a significant implication in international trade. Currently, cross-border transactions face several issues during the crossing of borders between countries and, specifically, happens during the transactions of cargo. A very rigid documentation process within the custom clearance and theresulting severe congestion will affect the trade flow in this particular zone. Inconsistency of freight transaction documents at the cross-border also makes the transaction procedure more complicated and affects the performance of the manufacturer's competitiveness. Thus, this paper explores the current issues at the borders involving Thailand-Malaysia-Singapore. This paper also initiates to figure out the challenges and some key success factors in modelling efficiency for cross-border transactions amongst these countries. A qualitative approach has been adapted to answer the proposed research questions. The initial results stressed that congestion, thorough and repetitious documentation procedures, involvement of many documents, as well as the time-consuming clearance of documents are key issues encountered during cross-border freight movement. This situation has caused several issues such as delays in freight delivery, losses in tax collection due to delays, reluctance to share information, and effects on the competitiveness of the freight supply chain. Development in infrastructure, information sharing, regulations, logistics performance, and customs clearance procedure can overcome the problems during cross-border Thailand-Malaysia-Singapore activities. The model outcome is expected to be smoother for the administrative process during customs clearance and it is expected to be able to efficiently reduce costs.

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1 Introduction

International trade refers to the transaction of goods and services across national borders generally including the import and export trades. International trade can adjust the domestic utilisation rate, improve international supply and demand, adjust economic structure, and increase fiscal revenue. To enhance the international trade and supply chain, the One-Belt-One-Road (OBOR) project was proposed and further promoted by Premier Li Keqiang whilst visiting Asia and Europe (Huynh, 2019). Thereafter, US President Joe Biden suggested founding an initiative from democratic countries to compete with the OBOR project (Tan, 2021). From this scenario, the cross-border transaction has become vital to boosting international trade inland. However, some issues have been encountered during trade transactions, specifically related to different standard documentation requirements during custom clearance. Snitbhan, et al. (2004) highlighted that major issues during cross-border freight movement were congestion, limited space availability, keenness to use manual procedures, and lack of necessary facilities to support customs clearance operations. Therefore, this paper has been initiated to explore the challenges and key success factors during cross-border freight movements between Thailand-Malaysia-Singapore.

2 Cross-border transaction

This section discusses the global trend and challenges of the current issues in cross-border transactions; whereas, customs clearance and documentation, transport procedures, and legal aspects are the key factors for the successful cross-border trade. Besides that, motivation factors for the cross-border movement amongst Malaysia, Thailand, and Singapore is also explored in detail.

2.1 Global trend in current cross-border transactions

International conventions and documents relating to cross-border road freight transport is the agreement on the contract for international road freight transport introduced in 1956 (Hodgkinson, 2016). The consignment note is made out in three documents signed by the sender and by the transporter, and typically a fourth copy for the carrier. The primary duplicate (red) is given over to the sender after the transporter has gotten the products. The second duplicate (blue) is given over to the consignee when the products have arrived at their destination. The third copy (green) is for the carrier. The fourth copy (black) is also for the carrier. Bill of lading, packing slip, commercial invoice, Canada customs invoice and certificate of origin are based on USA-CANADA freight cross-border shipping documents. Any of these documents may be listed as a general document for the transportation of goods at the cross-border. Meanwhile, in Europe, they have removed the border barriers so that transporting goods has become easier and more efficient. However, it has affected countries within Europe as they have lost tariff collectors, and this has reduced the income of the countries in Europe. This is because collecting tariffs is onr of the main income providers in their countries (Brooks, 2005).

International Labour Organisation (2006) reported customs documentation and transport procedures often caused delays and long waiting times at cross-border trade areas in Southern Africa. For example, trucks have always been delayed for up to five days at the Rwanda-Uganda border due to customs clearance issues (Chibira and Mdlankomo, 2015). The relevant documents from the revenue office in Kampala have been misplaced and not delivered to the related party. A study has been carried out in cross-border corridors in East Africa. In the study, Hanaoka, et al. (2019) addressed that proper conditions; facilities such as roads, railways, and ports; and institutions are important to reduce transportation costs and time spent in landlocked developing countries. Stakeholders from Kenya, Tanzania, Uganda, Rwanda, and Burundi highlighted that they preferred a reduction in operating costs, increased volumes of cargo handled, a fast clearance process and harmonisation of documentation, and a reduction in cross-border charges. However, they complained of too many weighbridges in road corridors that involved spending more time, more costs, and corruption (Adzigbey, et al., 2007). Meanwhile, international trade amongst China, Myanmar, and Vietnam has been studied by considering the geographical elements, and the geographical factors affecting the cross-border logistics route choice were analysed (Li, et al., 2020). They highlighted that customs clearance efficiency was one of the deciding factors for seaport selection decision-making.

Dezan and Associates (2019) said that import and export cargoes are subject to relevant customs clearance standards under Law No. 54/2014/QH13 and certain types of cargo need to go through customs inspections, such as imported pharmaceuticals. The import and export company needs to obtain the company's business registration certificate and import/export business code registration certificate. Besides that, imported cargo requires the bill of lading, import goods declaration form, import permit, certificate of origin, cargo release order, commercial invoice, customs import declaration form, inspection report, packing list, delivery order, technical standard/health certificate, and terminal handling receipts. On the other hand, exported cargo requires electronic export customs declaration, bill of lading, contract information, certificate of origin, commercial invoice, customs export declaration form, export permit, packing list, and technical standard/health certificate. The export processing may be completed on the same day, but the import processing time may take one to three days for the full container loads (FCL) and less than container loads, (LCL).

2.2 The challenges of cross-border transactions

Based on Chibira and Mdlankomo (2015), the challenges facing transportation operators at the cross-border of Southern African Development Country (SADC) are delays, longer travel times, fewer return trips, high operating costs, reduced reliability, and reliability of services that result in reduced productivity and capital efficiency. Next, the challenges of the administrative authority are insufficient subsidising and assets to completely operationalise the command and actualise high effect fit-for-reason interventions, deficient abilities, lack of ability to react to incidents, obsolete systems, restricted innovation, and lacking the ability to manage industry matters. Similar to the SADC, Malaysia has the same issue as Mustakim and Saud (2018) who said that there was a pause in the processing of documentation at the Malaysian-Thailand border.

Snitbhan, et al. (2004), said, the current customs procedures still rely primarily on printed documentation, as the Electronic Data Interchange (EDI) is still not fully functioning. Indeed, much of the delay at border customs arise from problems with documentation. Thai customs declaration forms are, however, more complex than the Malaysian forms. Customs procedures would require documents such as (1) one of nine different customs declaration forms depending on the mode of transport and the type of the goods being imported, (2) 11 different forms/documents relating to the relevant import duties and the payment of those duties, and (3) six forms/documents re-

lating to tariff privileges or tax returns. In addition, both customs offices have limited spaces and lack of equipment for unloading and reloading goods and containers at the border (Snitbhan, et al., 2004).

The haulier needs to be registered in both Malaysia and Thailand, and needs to carry two license plates because they do not share the information. Snitbhan, et al. (2004) argued that it should be noted that only trucks operating on both sides of the border, in both Thailand and Malaysia, carry two license plates. It is because different authorities who do not share information may subject an imported product to independent random checks.

In addition, congestion has occurred at the borderlines, this is due mainly to inefficient management in processing and flow. The costs of the cross-fringe inland transport has been identified with the China Railway Express; for inland clients, the expense of traditions tax at neighbourhood dry ports is lower than at seaports since the additional expense of remote tasks is dispensed with (Lam & Gu, 2016). There have been three categories of border challenges reported: regulation, infrastructure, and information (Brooks, 2005). From a legislative viewpoint, The North American Free Trade Agreement (NAFTA) uses committees to create new rules and dispute resolution procedures. For example, the Land Transportation Standards Subcommittee made significant progress on legislation to regulate drivers and equipment in the trucking industry in North America. However, NAFTA has failed to release all the promises, especially for the Mexican trucking cross-border access (Brooks, 2005).

According to the International Labour Organisation (2006), international trade border-crossing procedures involve documentation processing, cargo inspection, and checking by different parties. However, discrepancies happen amongst the different border-crossing services in the same country. They also stated that the cross-border delays are due to the inefficiency of control procedures, insufficient application of computerised procedures, time-consumption without risk management techniques, complex procedures for weighing of vehicles, illegal migration control, implementation of veterinary and phytosanitary controls, lack of coordination between the customs administrations, lack of cooperation amongst the authorities responsible for controls, non-compliance with Transport Internationaux Routiers (TIR) procedures, failure in providing information to the professionals and private sector, changes without notice to the procedures, compulsory convoys, compulsory pay services, and lack of transparency in rules for payment in some cases.

On the other hand, Thomson Reuters (2016) took asurvey to analyse the legal aspects of cross-border transactions based on key economic hubs around the world. There were four trends found in the cross-border transactions, such as cross-border work in attractive manner and likely to increase in volume, legal complexity limiting transaction volumes, deals and drafting being increasingly standardised internationally, and reliable sources of information and insight being hard to find, but online resources are becoming important. These trends have been giving both challenges and opportunities to cross-border trade between Malaysia-Thailand-Singapore.

2.3 Motivations to explore the cross-border freight mobility

Cross-border delays impact transport services costs as well as the cost of products traded in the region. When a delay occurs, there are fewer turnaround trips than in scenarios where and when delays are reduced. That's going to affect the economy. Reducing delays will increase trade volumes and per-corridor earnings. The delays in the corridors will reduce the productive time required for cross-border road transport. This reduces the region's potential for trade, international integration, and economic facilitation. It has been concluded that the challenges affect the sustainability, productivity, efficiency, quality, and cost of the transport services, as well as the costs of the products traded in the region (Chibira & Mdlankomo, 2015). Next, the Padang Besar Container Terminal (PBCT) is not well organised, and it has prevented fast clearance. Limited customs facilities at the border between Malaysia and Thailand and the heavy congestion caused by carriers obstruct customs and dry ports' personnel from quickly clearing the transporters. Limitations in the PBCT space and infrastructure, and certain border policies make cross-activity more difficult. Transporters from Thailand to Malaysia, for example, are restricted to within two kilometres of the border with Malaysia and this causes inefficiency in rail deck container arrangements. Nonetheless, the situation in Thailand is different as Malaysian haulers can move more than 55 kilometres from Thailand's border (Othman, et al., 2016).

The landbridge train service runs in both directions (See Figure 1), southbound from Thailand to Malaysia and northbound from Malaysia to Thailand; however, the trade flows are not balanced and, in general, more goods are carried out southbound. The quantities of the containers transported by the landbridge train service have been variable over the years. Presently, there is a rising trend of the quantities of containers being transported. The control authorities present at the Padang Besar (Malaysia) railway station are: Malaysia Immigration Department (Security and Passport Division) for security and immigration control, Royal Malaysian Customs Department authorities, and Quarantine and other authorities if necessary for specific types of goods. The Auxiliary Police is present on the gate check in the adjacent Padang Besar Terminal.

In addition, border congestion gives the transportation operators' negative perceptions of the delays. Transport issues at the Malaysia-Thailand cross-border can be classified into procedural and system-related issues involving human capital, organisations, institutional, documentation, infrastructure, and facilitation of trans-

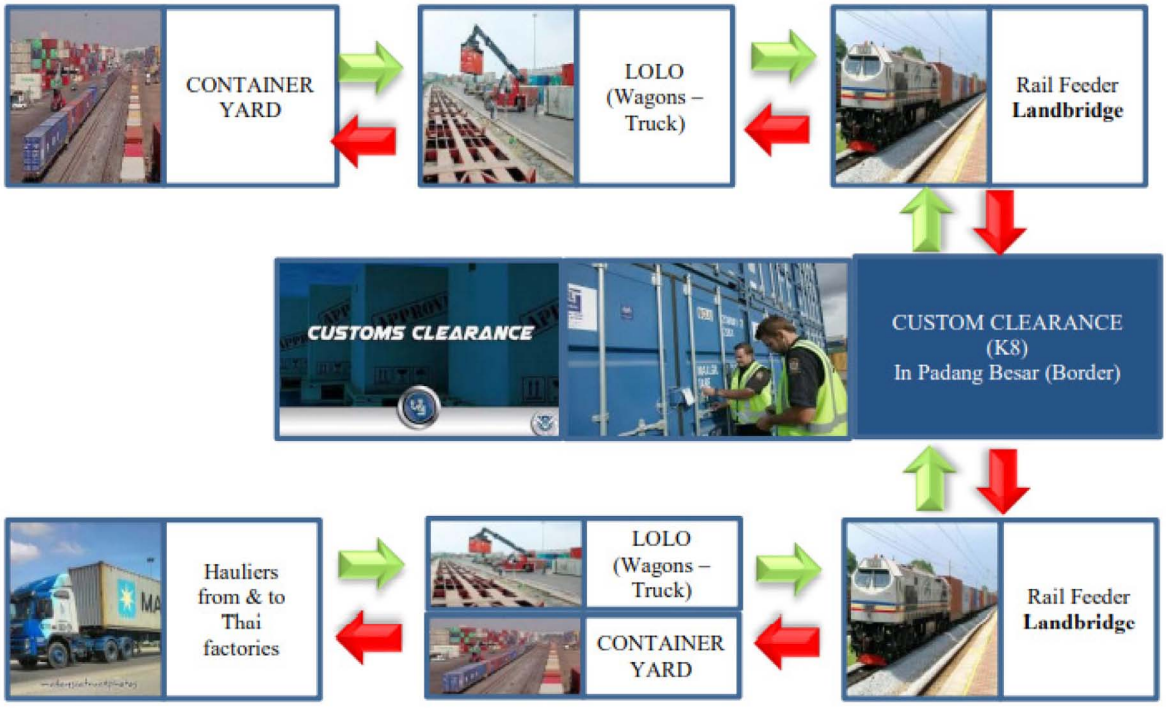

Figure 1 Landbridge Business Model – Flow of Practices

Source: Adapted from ESCAP (2018)

portation. By using the relevant facilities, the production of trucking and containerised vehicles in moving cargo could improve the characteristics and professional cross-border administration (Mustakim Melan, 2018). Furthermore, the problem of smuggling inadvertently occurs. They make subsidised items a target. It is even more difficult if integrity issues or elements of corruption have been found in connection with smuggling activities. Therefore, the Malaysian anti-Corruption Commission (MACC) needs to be more aware and address this issue more effectively (Ismayatim, 2019). Lastly, the inconsistency of the freight transaction documents at the cross-border between Malaysia and Thailand make the transaction procedure more complicated (Beck, 2016). The document do not match the standard freight documentation. Owing to bureaucratic redundancy, the transactions at the cross-border becomes more complicated and inefficient. This can affect the receiving time of goods to the client, congestion, image of Padang Besar Cross-Border, and volume of trade.

Other than that, in order to grow the economy within Malaysia, Thailand, and Singapore, many challenges must be faced, especially in the process of the exchange of goods, especially at the cross-border. According to Koh (2018), the Singapore-Malaysia land crossing is described as one of the busiest in the world. Johor authorities reported an average of 296,000 pedestrians per day in 2015. The figure did not include motorcyclists (about 100,000 registered for auto-release), cars, vans, trucks, and buses. The data are a bit stark, but reports have shown 126,000 vehicles daily (including about 4,000 trucks entering Singapore) are only on the causeway built in 1923. Therefore, crossing the border country is a problem for customs clearance between the two countries. In this regard, ease of customisation and other administrative procedures will increase efficiency, and reduce costs and the financing of mobile goods internationally (Jeevan, et al., 2016).

In addition, industries and municipalities in Singapore and Malaysia have produced significant increases in demand for both passenger and freight transportation. Therefore, the busy Malaysia-Singapore road conditions with the increasing number of passengers travelling between the two countries also raise other issues where a lack of regulations or boundaries during border checks during effective customs inspections is often seen as a possible obstacle to better transport networks (Barter, 2006).

Each country has its own rigid procedure for crossing the borders of itscountry because they want to prevent or curb smuggling activities that are not authorised by the government or that have the tax value paid by third parties to governments such as cigarettes and drugs. In cross-border transport transactions, it involves two different countries and of course, the structure of the operating procedure is also different and adheres to the technical standards for different transport between the two countries. This is supported by Rodrigue (2017) who found that the differences impeded the continuation of the

cross-border delivery process. For example, for shipment of food to Singapore, there are many requirements that a company must adhere to, such as the quality of the food. This can be ensured by the listing of food processing or exporting programmes in Singapore, which is one of the activities under the official control of the Ministry of Health (MOH), and the purpose of the programme is to ensure that the exported food meets the quality desired by Singaporeans.

Furthermore, the obstacles encountered at the border are administrative burdens for transit because they often add costs to shipping. As such, it affects transit goods as there are various direct transit charges and customs charges for transit countries, some of which must be paid in advance and follow some routes. These government regulations require high costs and heavy procedures involving the bureaucracy to manage all the procedures involved in transit involving the country (Faye, et al., 2004).

The last problem is the inconsistent transport documentation across the border. As a result of this problem, it can affect the effectiveness of the country as it can cause delays and will increase the cost of transportation for a company. For example, Singapore only needs some documents such as import or export permits with some other support like Bill of lading, packing list, and invoices to be submitted to the customs. In contrast, some other countries, such as China, India, and Malaysia, require extensive documentation of customs clearance such as bill of lading, shipping instruction, invoice, certificate of origin, import/export permit, packing list, and freight quotation.

The challenges of the crossings at the Malaysia, Thailand, and Singapore borders were discussed previously, however, the research to date has not been able to provide robust evidence for overcoming the challenges into improvements for efficiency of the crossings at the Thailand-Malaysia-Singapore borders. Therefore, this research would like to close the gap, to study the challenges and key success factors to overcome the problems.

2.4 Research Method

In this paper, telephone interviews were conducted to collect information especially on the challenges at each border, implications arising from these limitations, and suggestions to improve the performances of cross-border transactions between Malaysia-Thailand- Singapore. A total of fourteen (14) respondents had been invited to participate but only seven (7) of them participated, amounting to fifty (50) per cent of the population. They were selected from manufacturers, inland terminal operators, freight forwarders operating at these two different borders. Four (4) of them were from Malaysia-Thailand and the remaining participants were from the Malaysia-Singapore border. The questionnaire for the telephone interviews had been precisely designed and consisted of three parts, with the first being the key challenges that normally occur during cross-border transactions between Thailand-Malaysia-Singapore. Secondly, it was about the implications that emerged due to the limitations during cross-border freight transactions. The final section was about the key success factors that can be proposed to enhance the efficiency of the cross-border transactions in these three different countries. This data collection was conducted during the covid-19 pandemic and some difficulties were faced, especially on securing appointments with the respondents. Due to this limitation, the convenience sampling strategy had been implemented to enhance the participation of the respondents in this research. Convenience sampling intends to select the eligible participants who are willing and available to be interviewed (Klassen, et al., 2012). The gathered data were analysed using a systematic design based on a grounded theory. This method is suitable for a case study as it enhances the validity of the qualitative research (Parker and Roffey, 1997). A procedural design is used as it creates themes by familiarisation, reflection, transparent coding, axial coding, and selective coding from a data analysis (Creswell, 2008). Data categorisation or themes were generated using a systematic design which is important for focusing the meaning in the context of the research as well as being understandable by an external audience (Jeevan, et al., 2019).

3 Result and Discussion

This section explains the result and discussion of the paper which comprises the contributions of a seaport towards the dry port and vice-versa. Besides that, the outcomes of the paper-based survey on the proposed research questions are discussed with supporting statements.

The following sections reveal the challenges at the cross-borders of Thailand-Malaysia-Singapore, the implications at TMS borders from current limitations and strategies to improve the efficiency in TMS cross-borders.

3.1 Challenges at the cross-borders of Thailand-Malaysia-Singapore

Based on the interview participants' responses (*R1, R2, & R3*), cross-border activities at Bukit Kayu Hitam (BKH) suffer from severe congestion and cause more delays compared to Padang Besar (PB). They indicate that the freight movement in PB is more efficient than BKH due to the existence of multimodal options in PB. The co-existence of various transportation options, such as road and rail, at PB enhances the modal shift and reduces the over-dependency on road or rail freight transportation. According to *R4*, '*BKH suffers from congestion due to a slow and unsatisfactory level of legal documentation processes*'. For example, The Thai Customs Department requires a detailed procedure, especially for vehicles coming from Thailand to Malaysia, which requires the drivers to get off the vehicles to stamp their passports from the Thai Immigration officers. Due to this procedure, the drivers have to wait for 6 hours to complete their documentation procedures

Table 1 Documentation required for freight transactions between Malaysia and Thailand

No.	Documentation	Malaysia to Thailand customs	Thailand to Malaysian customs
1	Delivery order	Required	Required
2	Customs form	Required	Required
3	Packing list	Required	Required
4	Trucking bill	Required	Not required
5	Invoice	Required	Required
6	Tax exemption document	Required	Required
7	Leaflet	Not required	Required
8	Insurance certificate	Not required	Required
9	Bill of lading	Not required	Required
10	letter of credit	Not required	Required
11	license	Not required	Required
12	Proof of fare payment	Not required	Required

Source: Authors

in immigration, customs, quarantine, and security (ICQS) checkpoints. According to R3 and R4, severe congestion at the Malaysia-Thailand check-point is exacerbated by inadequate infrastructure, equipment, lack of resources, stringent inspections, immigration checks, and delays in document declaration. Moreover, (*R1*) *indicates that the operating hours for ICQS clearance procedure at the Malaysian-Thailand border, especially in Padang Besar, is 16 hours (6 am to 10 pm) and 12 hours (7 am-7 pm) in BKH*. The lengthy operating hours in PB provide more opportunities for economic development compared to BKH.

The majority of the participants (*R1, R2, R3, & R4*) mentioned that documentation of freight transactions that are required from Malaysia to Thailand customs are delivery order, customs forms, packing slip, trucking bill, invoice, and tax-exempt documentation which will be shared by both countries. To ensure a trouble-free clearance of goods, the required documentation must be properly prepared and provided to the local customs. Documents to be provided from Thailand to Malaysian customs are invoices, packing lists, delivery orders, leaflets, catalogues, insurance certificates, bill of lading, credit letters, permits or licenses, ticket form and custom tax documentations. Almost 11 documents are required by Malaysia and almost half that are required by the neighbouring country (see Table 2). The lengthy documentation procedure from Malaysia to Thailand will affect the efficiency of cross-border transaction between these two regions.

There is a reason behind this strict procedure in Malaysia. The issue of trespass smugglers has become very serious between these two countries. According to R1 and R2, *the smugglers have cut down the border fence and brought out subsidised goods, whilst security personnel appeared to be taking no action despite that fact*. They also emphasised that the smugglers used the gap between the transition shifts of security personnel as early as 6 am to 9 am. The modus operandi of the smuggling is by removing a sack from a vehicle and quickly transporting it to a border fence that had been cut and handed over to their waiting members in the neighbouring country.

During the data collection, *R5* mentioned that the challenges they faced are *the congestion in the Malaysia-Singapore border and frequently missing the schedule to reach the destination on time. This has frequently happened during transporting of the cargo from Singapore to Port Klang, especially*. The consequence that might occur is the inability to deliver the cargo on time, unable to meet the schedule integrity at seaports and inland terminals, as well as clients. R6 mentioned that *the congestion at the Malaysia-Singapore borders have occurred because there are a huge number of labourers and freight vehicles moving across the Malaysia-Singapore border throughout the day*. The statement from *R6* was resounded by Herng and Zhang (2019), whereby almost 300,000 people and 145,000 vehicles crossed the Malaysia-Singapore border daily.

From the perspective of document procedures (*R5, R6, and R7*) mentioned that *Singapore implies a soft procedure by receiving some basic documentation, such as invoice, quotation and bill of lading, and all of this information will be passed on to the freight forwarding agents*. These respondents also agreed that *there are very limited difficulties faced by Malaysian freight transporters whilst delivering cargo to Singapore due to the less restricted standard procedure provided by Singaporean customs*. This is possible because they are under pressure to complete all shipments and perform tasks accordingly in the respective seaports.

On the other hand, the same respondents also criticised the thorough procedures that have been implement-

ed on the Malaysian border (See Table 1). They agreed that this was mostly a manual procedure and errors in the information in the documentation worsened the efficiency of freight transactions on this busy border. Further, *R6 mentioned that incorrect documentation may also affect things such as delays in shipment and delays in payment for exported goods, and incorrect documents may also result in violations of export regulations*. As a result of this error, it will incur high costs as the company will have to bear all costs involved as a result of the delay (Khaslavskaya and Roso, 2019).

3.2 The implications at TMS borders from current limitations

Based on the respondents' views (*R1, R2, R3, & R4*), *the main implication due to inefficiency in the cross-border is mainly the delays during freight deliveries*. They came to the consensus that *the bureaucratic nature is the main cause for the delays, especially for the Thailand-Malaysia cross-border users*. They agreed that the truck drivers were the main focus group who have been significantly affected. These opinions were well aligned with the argument by Mustakim Melan (2018) who agreed that the bureaucratic nature at the border between Malaysia and Thailand results in delays in the processing of documents which eventually affects the freight transportation from this border. In general, most of the cargo from this border will be transported to Penang Port and Port Klang. Owing to the documentation delays which cause the movement of freight to be behind schedule, the schedule integrity at the seaport has been affected, blank sailing arose, and the attractiveness of the seaport has been affected. During the pandemic situation and due to these delays, the container rotations within or between regions have become another issue.

The paper or manual documentation procedure is still used for freight during cross-border clearance. Lam and Gu (2016) argued that using simplified and computerised documentation enhances the connection between vehicle documentation and cargo documentation, and its effect is reduced vehicle delays. According to (*R3 and R4*), *additional time taken to release the freight from Thailand to Malaysia has caused the Malaysian government a loss in tax collection. Due to this lengthy and time-consuming procedure, a slender doubt and scepticism has aroused amongst the traders in Thailand, and this has caused them to become reluctant to share detailed information about the cargo, they added*. As a result, this condition has caused congestion at the border, chances for misplacing the documentation, and, for sure, a healthy and friendly trading system between neighbouring regions will be affected. According to Khaslavskaya and Roso (2019), the overlapping documentation information may be prevented by providing well-organised documents according to the requirements. However, to kick start a systematic documentation procedure, a hybrid procedure can be implemented by complementing the functionality of both manual and computerised procedures. This approach can be a paradigm shift to enhance the efficiency of cross-border transactions between Thailand and Malaysia.

Meanwhile, at the Malaysian-Singapore border, (*R5 and R6*) agreed that *the delays and congestion still happens due to unavoidable reasons and much less caused by the documentation issues. Here, the appointed agents play a very critical role to explain the situation at the border and try to make them (the clients) understand the situation that happens at the Malaysian- Singapore border*. They also added that *an agent with sufficient negotiation skills plays a major role to deliver the message to the clients and find an alternative solution to 'pull out' their cargo from being stranded in the congestion*. Therefore, the selection of agents who are capable of solving documentation issues during cross-border inspections is crucial. According to (*R5*), a skilful agent can handle all aspects of delivery and the company can offer its importers a comprehensive and timely service with goods delivered right to their door.

Participant (*R5*) also *added that the congestion that happens at the Malaysia-Singapore border does not affect the transportation cost as many of the clients possess their own transport*. Having their own transport services makes it more reliable for the company to handle their cargo either for the pick-up or delivery process. In the meantime, issues arise if the owner does not have any transport facilities and needs to rely on transport agents. In that case, the dry port operators can lead the situation by providing transport, storage, and delivery of the cargo to the clients and pick up the empty containers from them to ease the container rotation procedure.

Surprisingly the majority of the participants (*R5, R6, & R7*) provided the same answers in that they had never experienced duplication of information during their submission of the documents. Further, they clarified that information sharing is not an issue as all their businesses run smoothly and successfully as they assign agents to transmit information between the two parties. Some of them utilise the transport drivers who are well versed with the clearance procedure as an intermediate between the company and the customer. They emphasised that the *person who carries the documents (agents or drivers) needs to be well versed in the procedures at the border to avoid unnecessary delays*. According to Alexander, et al. (2017), establishing a platform for information sharing between companies and customers enables the benefits of comprehensive search capabilities, where customers can find answers to their questions using this platform. Besides information sharing, borders that utilise hybrid approaches (combining manual and computerised procedures) should assign a reliable agent or train their truck drivers to multitask as an agent during the cross-border procedure, which would be significant whilst waiting for the whole procedure to become digitalised.

4 Utilising dry port services for cross-border transactions between TMS

In Malaysia, there are two main dry ports which are mainly dedicated to cross-border transactions, especially from Singapore and Thailand. Dry ports in Malaysia possess the capacity to execute cross-border transactions between Thailand-Malaysia-Singapore. These dry ports can be utilised for perishable goods and cold freight transactions which require fast delivery via immediate clearance. In addition, two major functionalities of dry ports in Malaysia, namely, the transport and logistics function, and the information processing function, are focused on cros-border transactions between the nations (Jeevan, et al., 2015) For example, the transport and logistics function mainly focuses on regional freight transactions, spatial capacity for containers, cross border container transhipment centre through intermodal nodes, and connecting manufacturers for on-time delivery. Meanwhile, the information processing function is mainly on the documentation clearance for domestic and cross-border transactions. This situation indicates that the Malaysian dry ports have been developed to support not only regional economic development but also international 'inland' transactions, especially between borders.

In this cross-border transaction involving three nations, dry ports in Malaysia located in between these two nations can be utilised to ease the cross-border trade. In this paper, congestion, thorough documentation procedure, repetition in documentation procedure, involvement of many documents, and time-consumption during document clearance are some of the major issues that have been identified during cross-border trade procedures between Thailand-Malaysia-Singapore. Therefore, dry ports which remain underutilised in this nation can be used, especially for a modal shift which will reduce the congestion at the border. The application of a modal shift encourages the application of both transport modes, especially road and rail, for freight distribution within and outside the nation. However, the domination of road freight in the Malaysian freight distribution may slow down this process.

On the other hand, the establishment of the East Coast Railway Link (ECRL) which connects the west and east coast may release the domination of road freight and equalise the proportion between road and rail. This situation may utilise the dry ports in the region, especially for the modal shift between road and rail or vice versa. Another role of the dry ports is providing document clearance services away from seaports and borders. This situation may release the burden of the clearance terminal at the border to execute multiple tasks during the freight clearance procedure. Dry ports as a centre of documentation clearance may overcome some issues, especially reducing a thorough process during documentation clearance, avoiding repetition in the documentation procedure, as well as reducing time consumption during document clearance. With that, dry ports may also lead to proposed standard documents for cross-border transactions. This situation may prevent the involvement of many documents, especially from Singapore, Malaysia, and Thailand (see Table 2).

Secondly, delay in freight delivery, loss in tax collection due to delays, reluctance to share the information, and less competitiveness of freight supply chains are some of the implications that have been caused due to the inefficiency of the cross-border transactions amongst these three nations. Again, the dry ports have been proposed to reduce these drawbacks, especially proposing the modal shift to reduce the delay of freight delivery. The role of this intermodal terminal as a consolidation and deconsolidation node combined with modal shift activities will expediate the freight delivery process with the region and outside the nation. Through this modal shift, dry ports will also manage to proceed with last-mile delivery by employing multimodal operators to convey the delivery, especially via artery connectivity. Other than that, the capacity of dry ports to connect with various players in the freight chain is also an added advantage to this node, especially for information sharing between the players. Since the dry ports have a significant connection with seaports, the Port Community System (PCS) can be utilised for information sharing amongst the players in the supply chain. Besides that, the availability of spatial, temporal, and intermodal transport options may increase the competitiveness of the supply chain as well as determine if the cargo will remain attractive at the final destination.

Thirdly, dry ports in this country are proven to enhance the competitiveness of the seaports. Therefore, there is a possibility that these dry ports may enhance the efficiency of cross-border trade. Although the participants have provided some recommendations to enhance the efficiency of the cross-border trade, the involvement of a dry port may expedite the procedure or generate a sustainable solution. In addition, the integration of dry ports as a medium to enhance the efficiency of the cross-border might be significant compared to the suggestion provided by the participants. For example, the respondents have suggested providing an additional lane for heavy vehicles, assigning relevant agencies to expedite the procedure by maximising import/export counters, providing the automated procedure for documents clearance, establishing a Special Border Economic Zone for the flexible and cost-efficient procedure, and merging customs clearance between TMS to improve the efficiency of the trade transactions at the borders. However, all these suggestions can be avoided by utilising the current dry ports to execute all the aforementioned functions. In addition, the nature of dry port investment is based on the Public-Private Partnership (PPP).

Utilising this entity in the cross-border trade procedure may encourage the involvement of the seaport authority, local city and state governments, and the railway department as they are the current investors in Malaysian dry ports to actively participate in the trade at the borders. Hence, the assimilation of dry ports in the cross-border trade activity may enhance the efficiency of the trading system, par-

Table 2 Summary of the findings and infusion of dry ports in cross-border trade

Bil	Items	Sub-components	Infusion of dry ports in cross-border transaction (key practices)	Percentage of responses from respondents (%)
1.	Issues in cross-border transaction between TMS.	• Congestion	• Modal shift	71
		• Thorough documentation procedure	• Centre for document clearance	57
		• Repetition in documentation procedure	• Centre for document clearance	43
		• Involvement of many documents	• Standardisation of the documentation	43
		• Time-consumption during documents clearance	• Centre for document clearance	43
2.	The implications at TMS borders from current limitations.	• Delay in freight delivery	• Modal shift	86
		• Reluctant to share the information	• Port Community System (PCS)	43
		• Loss in tax collection due to delays	• Artery connectivity	29
		• Affecting the competitiveness of freight supply chain	• Spatial, temporal and intermodal transport options	29
3.	The strategies to improve the efficiency in TMS cross-border	• The additional lane for heavy vehicles	• Dry ports as centre for customs clearance	57
		• Assign relevant agencies to expedite the procedure	• Dry ports	57
		• Maximising import/export counters	• Centre of consolidation & deconsolidation	43
		• Enforcing information sharing among the players	• Port Community System (PCS)	43
		• An automated procedure for documents clearance	• Dry ports as centre for customs clearance	43
		• Establishing Special Border Economic Zone for the flexible and cost-efficient procedure	• Documents clearance is one of the main tasks of Malaysian dry ports	43
		• Focusing on Public-Private Partnership (PPP) for infrastructure development	• Nature of dry ports investment plan	43
		• Enhancing logistics performance during cross-border transactions	• Modal shift	43
		• Merging customs clearance between Thailand-Malaysia-Singapore	• Dry ports as centre for customs clearance	43

Source: Authors

ticularly between Thailand-Malaysia-Singapore. Also, it encourages utilising the existing facilities and preventing insignificant investment, which involves a massive amount of financial implication. Alternatively, this investment can be channelled into connectivity development, modal split facilities, application of the 4th industrial revolution, as well as a capacity enhancement at dry ports.

4.1 Key success factors/strategies to improve the efficiency in TMS cross-borders

Based on the limitations and drawbacks that have occurred in border transactions at the borders of Malaysia, Thailand, and Singapore, these participants have also provided some significant strategies to improve the effectiveness of border freight transactions amongst these countries. At the Thailand-Malaysia border, the upgrading plan has been segregated into three main dimensions including infrastructure, information, and regulation. From an infrastructure perspective, participants (*R1, R3, and R4*) suggested that *opening all the lanes of heavy vehicles as well as facilities to accommodate the staff of all the relevant agencies under one roof to expedite the freight movement and documentation procedures are crucial. They added that these facilities are necessary to overcome congestion issues at the cross-border of Malaysia-Thailand due to the increasing volume of vehicles that is utilising the Thailand-Malaysia border every year.* Besides that, the respondents suggested maximising export and import counters at all entrances to enhance the volume of imports and exports between these two countries. They added that import and export counters need to be added to hasten the import and export

procedure between these two countries. These are supported by Chibira and Mdlankomo (2015) who reported that an enabling environment is needed to improve cross-border transactions to become more efficient. Therefore, increasing infrastructure and facilities is favourable to smooth the traffic and processes.

From the information perspective, the recent survey shows that congestion in the Malaysia-Thailand border occurs not only during public holidays and festive seasons, but it also happens all year round. Respondents (*R1, R2, and R3*) argued that *information sharing between countries and establishment of a border community centre which connects all players, including seaports, inland terminals, freight forwarders, customs, immigration, as well as health departments within the countries, need to be enforced immediately*. The information sharing between related parties can be enhanced by utilising automatic online documentation. Lam and Gu (2016) highlighted that automating documentation can improve the procedure of transporting goods at the land cross-border, which would have one-stop processing controls and a combination of processing procedures for all border agencies.

Meanwhile, from the regulative perspective, the Malaysian government has agreed to establish the Special Border Economic Zone (SBEZ) project at the Malaysia-Thailand border which is the main foreign trade gateway (Halid, 2018). According to the respondents *(R3 and R4), this systematic regulation will assist in reducing the congestion at this border*. *From this systematic regulation, both sides can be flexible in their businesses as they can pick the right time to ship their goods and make sure the logistics are more cost-efficient.* This strategy has been resounded by Halid (2018) who declared that this project will be a catalyst for the business development plan between Malaysia-Thailand. Further, Malaysia and Thailand will cooperate to establish a project providing world-class facilities for manufacturing and commercial sectors, including free trade zones to aid bilateral trade between Asian countries. It is also predicted to broaden regional trade on the global market, especially between China and India.

Infrastructure, logistics performance, and clearance procedures are the main indicators to improve the cross-border freight transactions between Malaysia and Singapore. Furthermore, cross-border improvements in infrastructure are an important element of the trade sector due to the reliance on quality management through public-private partnership (PPP). According to the participants (*R6 and R7*), *infrastructure quality is another constraint for developing countries for improving the logistics performance index (LPI). Companies that participate in cross-border activities recognise that the qualities of information technology and telecommunications infrastructure are substantial for the provision of high-quality services*. Besides that, simplifying and computerising documentation would speed up the transporting process (Lam and Gu, 2016), and it will as well assist in information technology and telecommunications infrastructure.

Secondly, improving logistics performance has also been a major development objective, as it has a significant impact on cross-border economic activity. Respondent (R7) indicated *that logistics performance is crucial to ensuring a smooth cross-border transaction. It requires significant collaboration amongst the various players in the freight supply chain*. The logistics performance is strongly related to trade growth, diversification of exports, the ability to attract direct investment, and economic growth (Ojala and Celebi, 2015).

Thirdly, enhancement of cross-border efficiency can be incorporated in the Malaysia-Singapore customs clearance procedure. Respondents (*R5 and R7*) *argued that merging customs clearance between Malaysia and Singapore will be an effective approach as it will reduce the repetition of the customs procedures*. Customs clearance could be undertaken jointly on each side of the border and the time savings would be even greater (Snitbhan, et al., 2004). Although Malaysia has different methods or procedures when inspecting goods at the cross-border compared to Singapore, this will bring about new issues such as the level of national trust due to the differences in the way goods are checked in the neighbouring country. *These respondents suggested that information sharing, trust in cross-border trade transactions, confidence with their trading partners, and cooperating to boost the application of IR 4.0 in both countries to meet the international standard as well as concern on freight competitiveness are key indicators to execute similar procedures at the Malaysia-Singapore border.* Trade and transport developments are crucial to compete in the global market amongst countries. Therefore, international companies need to work on projects that comply with international standards to determine if their service levels can withstand local conditions. Hence, the efficiency during cross-border transactions is crucial as they must bring their services and assets across the country's borders by reducing costs and, at the same time, in real-time.

5 Conclusion

This research presents the challenges of cross-border freight transactions (Thailand-Malaysia-Singapore), the implications of cross-border transactions, and strategies for improving the efficiency of cross-border transactions. The challenges faced at the cross-border of Thailand-Malaysia are congestion and delays due to inadequate infrastructure, equipment, lack of resources, stringent inspections, immigration checks, and delays in document declaration. At the same time, trespass smugglers also become a serious issue facing Malaysia and Thailand. On the other hand, the Malaysia-Singapore border faces congestion and missing the schedule to reach the destination on time. It is due to a huge number of labourer and freight vehicles moving across the border of Malaysia-Singapore throughout the day. Furthermore, incorrect documentation has also caused delays and the companies have been forced to bear the costs. The main implication

to the cross-border of Thailand-Malaysia is bureaucratic and it has caused delays in processing documentation.

However, the majority of the participants stated that they had never experienced duplication of information during the submission of documents for the cross-border of Malaysia-Singapore. Thereafter, the participants have suggested several strategies to improve the efficiency of the Thailand-Malaysia-Singapore cross-border activities. For the Thailand-Malaysia border, infrastructure, information and regulation are proposed to overcome the problems. The infrastructure can be enhanced by opening all lanes of heavy vehicles and providing the maximum number of export and import counters to resolve the congestion and delays. Besides that, the information sharing system amongst Thailand-Malaysia and the related players should be considered. A Special Border Economic Zone (SBEZ) at the Thailand-Malaysia border and a free trade zone amongst the Asian countries are encouraging for international export-import trading activities. On the other hand, for the Malaysia-Singapore border, information, logistics performance, and clearance procedures are important to conquer the challenges being faced there. Effective logistics procedures combined with software solutions using the latest technology (Blockchain, Artificial Intelligent, Machine Learning) will help the customers maximise their operation cost savings. Cross-border freight mobility at the Thailand-Malaysia-Singapore borders requires a significant amount of product knowledge and coordination amongst the, three neighbouring countries such as an efficient customs documentation process by using single window online access to the authorities which will accelerate the seamless processing of the correct documentation of cargo, warehouse and distribution capacity, and coordination and communication amongst the stakeholders for accurate and on time delivery. A public-private partnership (PPP) programme, information technology & telecommunication infrastructure, and merging customs clearance between Malaysia and Singapore would ease the passage of shipments during cross-border movement.

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References

[1] Adzigbey Y, Kmaka C, Mitiku TN (2007) Institutional arrangements for transport corridor management in Sub-Saharan Africa, Sub-Saharan Africa. Transport Policy Program Working, paper 86.

[2] Alexander AJ, Shi L, Solomon B (2017) How fintech is reaching the poor in Africa and Asia.

[3] Barter PA (2006) Multiple dimensions in negotiating the cross-border transport links that connect and divide Singapore and Johor. Malaysia. Asia Pacific Viewpoint, 47(2), pp. 287-303.

[4] Beck Z (2016) US-Canada cross border freight shipping: 5 documents you need. February 6. https://www.freightera.com/blog/us-canada-cross-border-shipping-documents/.

[5] Brooks MR (2005) Borders and sustainable Trans-Atlantic freight transport. IATSS Research, 29(2), pp. 13–21. https://doi.org/10.1016/s0386-1112(14)60129-1.

[6] Chibira E, Mdlankomo B (2015) The impact of corridor delays on cross border road transport in the Sadc region : findings from research conducted by the cross-border road transport agency, (Satc), pp. 657–669.

[7] Creswell, JW (2008) Educational research: planning, conducting and evaluating quantitative and qualitative research. 3rd edn, Kevin M. Davis, New.

[8] Dezan S, Associates (2019) Customs procedures in Vietnam: documentation and processing. Vietnam: Vietnam Briefing. April. https://www.vietnam-briefing.com/news/customs-procedures-in-vietnam-documentation-processing.html/. Accessed 20 2021.

[9] ESCAP (2018) Study on border crossing practices in international railways trasnport: KTMB presentation cross-border freight service Malaysia-Thailand, January 2017.

[10] Faye ML, McArthur JW, Sachs JD, Snow T (2004) The challenges facing landlocked developing countries. Journal of Human Development, 5(1), pp. 31-68.

[11] Halid S (2018) Govt to go ahead with development of SBEZ in Bukit Kayu Hitam. New straits times. July 15. https://www.nst.com.my/news/nation/2018/07/391140/govt-go-ahead-development-sbez-bukit-kayu-hitam.

[12] Hanaoka S, Sota M, Kawasaki T, Thompson RG (2019) Performance of cross-border corridors in East Africa considering multiple stakeholders. Transport Policy, 81, pp. 117-126.

[13] Herng YY, Zhang YA (2019) Feeding strait: imagining a cross-border commons between Singapore and Malaysia. The 6th International Conference on Architecture and Build Environment, Havana Cuba.

[14] Hodgkinson P (2016) Presentation on "Traincost" point-to-point train costing model. August 30-31. https://www.unescap.org/sites/default/files/ESCAP_Item%204_Overview%20of%20draft%20study%20report.pdf.

[15] Huynh QT, Younsa DS (2019) One belt one road a great project of far-reaching economic development & trend of global modern development rules. Global Journal of Politics and Law Research, 7 (5), pp. 19-35.

[16] International Labour Organization (2006) Labour and social issues arising from problems of cross-border mobility of international drivers in the road transport sector. Geneva: International Labour Office Geneva. INTERNATIONAL LABOUR ORGANIZATION.pdf. Accessed 23 April 2021.

[17] Ismayatim wf (2019) SPRM dedah klip video penyeludupan di Padang Besar. BH Online. October 18. https://www.bharian.com.my/berita/kes/2019/10/619017/sprm-dedah-klip-video-penyeludupan-di-padang-besar.

[18] Jeevan J, Bandara YM, Mohd Salleh NH, Ngah AH, Hanafiah R (2019) A procedure of implementing exploratry mixed method research in dry ports management. Transactions on maritime science, 8(02), pp. 157-170.

[19] Jeevan J, Chen SL, Lee ES (2015) The challenges of Malaysian dry ports development. The Asian Journal of Shipping and Logistics, 31 (1), pp. 109-134.

[20] Jeevan J, Chen SL, Pateman H (2016) Implications of one belt one road for Malaysian connectivity to international trade routes. In Proceedings of the" One Belt One Road" (OBOR) Conference.

[21] Khaslavskaya A, Roso V (2019) Outcome-driven supply chain perspective on dry ports. Sustainability, 11(5), pp. 1492.

[22] Klassen AC, Creswell J, Plano CVL, Smith KC, Meissner HI (2012) Best practices in mixed methods for quality of life research. Quality of Life Research, vol. 21, no. 3, pp. 377-80.

[23] Koh SY (2018) Challenges and opportunities of comparative urbanism: the case of Brunei-Miri and Singapore-Iskandar Malaysia. In Routledge Handbook of Urbanization in Southeast Asia, pp. 101-114. Routledge.

[24] Lam JSL, Gu Y (2016) A market-oriented approach for intermodal network optimisation meeting cost, time and environmental requirements. International Journal of Production Economics, 171, pp. 266-274.

[25] Leong B (2020) Cross-border trucking from Malaysia to Singapore. Asia's Logistics Simplified. https://janio.asia/articles/cross-border-trucking-malaysia-to-singapore/. Accessed 20 Feb 2021.

[26] Li S, Cao X, Liao W, He Y (2020) Factors in the sea ports-of-entry and road ports-of-entry cross-border logistics route choice. Journal of Transport Geography, 84, pp. 1-9.

[27] Malaysia National Trade Repository (2021) Documentary requirements. http://mytraderepository.customs.gov.my/en/pd/Pages/doc_req.aspx. Accessed 1 May 2021.

[28] MTCC (2013) The Chamber: The Malaysian-Thai Chamber of Commerce (MTCC). http://www.mtcc.or.th/about-mtcc/the-chamber/.

[29] Mustakim M, Saud MB (2018) Managing for better freight movements at cross border check points; a study on commercial vehicles industry between Malaysia and Thailand. *DOC PLAYER*. http://docplayer.net/103416769-Managing-for-better-freight-movements-at-cross-border-check-points-a-study-on-commercial-vehicles-industry-between-malaysia-and-thailand.html.

[30] Ojala L, Celebi D (2015) The World Bank's logistics performance index (LPI) and drivers of logistics performance. Proceeding of MAC-EMM, OECD.

[31] Othman MR, Jeevan J, Rizal S (2016) The Malaysian intermodal terminal system: the implication on the Malaysian maritime cluster. International Journal of E-Navigation and Maritime Economy, 4, 46–61. https://doi.org/10.1016/j.enavi.2016.06.005.

[32] Parker LD, Roffey BH (1997) Back to the drawing board: revisiting grounded theory and the everyday accountant's and manager's reality. Accounting, Auditing & Accountability Journal, Vol. 10, No. 2, pp. 212-247.

[33] Rodrigue JP (2017) The geography of transport system. New York: black and white illustrations.

[34] Snitbhan N, Nikomborirak D, Sinseubpol K, Weerawan P.A (2004) Study on cross-border transport of goods by road from Malaysia to Thailand. TDRI Querterly Review, pp. 17-27.

[35] Tan KW (2021) Biden suggests rival plan to China's 'Belt and Road'. Investor.com. https://klse.i3investor.com/blogs/kianweiaritcles/2021-03-28-story-h1543018824-Biden_suggests_rival_plan_to_China_s_Belt_and_Road.jsp. Accesed 5 May 2021.

[36] Thomson R (2016) Legal aspects of cross border transactions: trends, challenges and opportunities. UK & Ireland: Thomson Reuters.