Evaluation of Factors of Service Quality for Intermodal Terminals

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Abstract

Intermodal transportation has revolutionized the movement of goods in domestic and international trade. A vital role is played by inland intermodal terminals in hinterland connectivity of containerized intermodal movement. This study is aimed at identifying and examining various factors which define service quality and customer satisfaction for users of intermodal terminals. The stakeholders aim to understand these factors within limited resources and time. Therefore, ranking the factors is indispensable to increase the customer satisfaction at the inland intermodal terminals. In the present paper, the factors are graded by applying one of the multi-criterion decision-making (MCDM) practices recognized as the Best Worst Method (BWM). This study intends towards addressing the research gap in service quality for intermodal terminals and suggest focus areas to improve service quality for the industry players.

Keywords
Intermodal Terminals, Dry Ports, Service Quality, Customer Satisfaction, BWM

1. Introduction
In the modern history, advent of containerization became revolution in international logistics. It brought safety, lesser handling, economy and unitization to the cargo which were earlier moving in loose condition and so were prone to handling and cargo safety issues leading to inefficiencies. Invented in USA in 1960s, following decades witnessed large scale adoption of containerization across supply chain and transportation modes. Shipping vessels, railcars, trucks and ports were standardized to enable seamless and smoother containerized transport of goods. Till date, many economies have seen unsurpassable surge in market share of containerized transport against bulk cargo. Today, share of intermodal railcars in total railcars originated in USA market is at all-time high, exceeding beyond 45% (American Association of Railroads, 2022).

In India, the surge in market share for intermodal wagons (container wagons in Indian context) over total rail wagon has been meagre in comparison to other economies. Container wagons accounted for about 5.12% of the total tonnes originating on the state-owned Indian railways' freight operations in FY2020-21(Indian Railways Yearbook, 2021). Indian railways joined the containerization revolution by institutionalizing the container business by incorporating Container Corporation of India or the CONCOR in year 1988(Indian Railways Yearbook, 2021). Indian railways also took many other initiatives like allowing private participation in container train operations through concessionaire arrangement, opening many commodities for container movement, so on and so forth. With such initiatives, many public sector undertakings, Indian private players and multinational logistics services providers invested in intermodal infrastructure like inland intermodal terminals (called the Inland Container Depots, ICD in India), container trains and ancillary services(Gangwar, et al., 2010). Based on our survey of current market. there are about 14 public and private container train

concessionaires delivering services for international and domestic container movement. Development of ICDs is also on the rise, with around 113 rail linked ICDs already operational and 32 ICDs under development across the country. With increasing competitive landscape in Indian intermodal terminal marketplace, service quality will play a vital role in business sustainability. While many detailed studies have been done in diverse industries to understand factors of customer satisfaction, the current study shall focus on identifying and evaluating factors of customer satisfaction for users of intermodal terminals in Delhi NCR market of India. Thus, as per above discussion, objectives of research are established as below:

- To find the factors for ranking and valuation from literature review and business experts.
- To classify the factors by means of the MCDM method.

To accomplish the established research objectives, a two-step procedure covering of identification of the factors followed by prioritization using BWM approach is used. The paper is organized such as Section 2 confers the literature review, Section 3 embodies the research method ology while Section 4 covers the data validation. Further, Section 5 discusses results and conclusion of the article is presented in section 6.

2. Literature Review

2.1 Service Quality and Customer Satisfaction

Service quality can be regarded as the center of buying behavior of the customer (Rabin, 1983). Service quality is defined as the holistic experience of the user of comparative superiority (or inferiority) of the services and the organization providing these services(Bitner, et al., 1990). As quality of service is different from that a physical product due to intangibility i.e., non-measurability (Bateson, 1977); heterogeneity i.e., variance in services (Booms, et al., 1981) and inseparability i.e. production and consumption are not separate (Gronroos, 1982). When a service provider understands how the consumer will assess the service, the service provider can accordingly propose innovative service designs and features to deliver desired customer experience(Gronroos, 1982). However, service quality is such an obscure construct that it is complex to describe and assess,(Parasuraman, et al., 1985) . Therefore, the service quality quantification also has different mechanisms from that of product quality. There have been two prominent approaches for measuring service quality i.e., the American approach and the Nordic approach. The American notion basically is based on comparison made by consumer between expectation and actual experience of delivered service (Parasuraman, et al., 1985) whereas the Nordic notion believes only in the concept of perceived or experienced service quality by the consumer during the consumption of service (Gronroos, 1982).Initially, various studies on service quality recommended that service quality is a measure of match between the services delivered with expectations from customer. Thus, quality of service is directly proportional to customer expectation compliance. Therefore, a model based on gap analysis between expected and perceived service was initially proposed, named as service quality model which suggested 10 service quality determinants (Parasuraman, et al., 1985). However, in later studies, this model was renamed as the famous SERVQUAL model which compressed the earlier stated 10 determinants into 5 dimensions of service quality termed as tangibility, empathy, responsiveness, reliability and assurance. The SERVQUAL model has been increasingly used to calculate qualified rank of five dimensions in inducing customer's complete quality perception. Numerous studies have used this model in various industries i.e., online banking (Han, et al., 2004); telecommunication services; higher education; tourism. SERVQUAL model also seems to be a proven and preferred choice of researchers in logistics industry. Researchers used SERVQUAL model for refrigerated transport (Teresa, et al., 2015), seaports (Shanaki, et al., 2011), container terminals of India (Hemalatha, et al., 2018), Nigeria (Ugboma, et al., 2007), Croatia (Kolanovic, et al., 2011), Iran (Sayareh, et al., 2016), Denmark (Safaei, 2003).

2.2 Intermodal Terminals

Intramodality is a distinctive feature of a transport system where a load unit is used to hold the goods, and this load unit or shipping container itself is handled (loaded or unloaded) on various transport modes to form an end-to-end supply chain. This enables reducing handling on the cargo itself (Commission of the European Communities, 1997). Another definition suggests a dry port as an inland terminal which connects the seaports to hinterland with a high-capacity transport mode(Roso, et al.). Few researches address the service quality in dry ports. For South Indian dry ports, user's perception was studied through self-administered questionnaires and was found that the service quality variables for dry ports can be bundled into quick response, track service, distribution service, infrastructure, reputation, good operations, and equipment & facilities (Hemalatha, et al., 2017). Another study conducted in Ethiopia on two regional dry ports used SERVQUAL model (Gudisa, 2016) for service quality assessment. The European commission in its IQ report (2000) analyzed the quality of intermodal transport in two components viz. quality of terminals (internal quality) and the quality of the networks (external quality). In another study, the quality of service is considered as a key parameter in the design and operation of intermodal freight terminals (Ballis, et al., 2002). However, the SERVQUAL model needs customization as per application and service industry (Finn, et al., 1991). Therefore, it can be seen that

extant research on intermodal terminals' service quality has not been done for India's National Capital Region. Despite of growing importance of dry ports, there are few studies on service quality for them.

3. Methodology

Identification and evaluation of factors and consequences of customer satisfaction for intermodal terminals is explained in the following steps:

3.1 Identification of Factors

Based on our literature review, the factors for customer satisfaction are proposed and shown in Table 1.

Table 1. Factors of Customer satisfaction

S No	Factors	Description	Reference	Notation
1	Accuracy in Records & Billing	Incorrect record keeping and billing information creates hassle for the customer as information on Bills and Records are used for many references. Therefore, accuracy in keeping correct records and billing is an important criterion for the users of Dry Ports.	(Kolanovic, et al., 2011)	ARB
2	Terminal Infrastructure & Equipment	Use of technology in processes and Equipment for efficiently and safely handle containers and cargo.	(Lu, et al., 2011)	TIE
3	Cargo Safety & Information Security	Assurance to the safety of cargo under ICD's Custody in terms of preventing damages during handling, abstain pilferage. Securing information of shipper, consignee, shipment etc shared by customer to ICD during processing of shipment.	Newly introduced variable	CSIS
4	Cargo Tracking & Regular Updates	Providing regular information to the customer in appropriate language regarding shipment status, location, delays, departure and arrival.	(Kolanovic, et al., 2011)	CTRU
5	Competitive Pricing	Pricing of the Intermodal Terminal for its services to customer is very important variant in a competitive market.	(Lu, et al., 2011)	CP
6	Services Availability	SuiTable business hours, Location, Value-Added Services, Queing Time etc.	(Andersson, et al., 2016); (Lu, et al., 2011)	SA
7	Staff Behaviour & Complaint Resolution	Staff Friendliness and service ability to effectively deal with customer. Timely resolution of customer complaints and claims by the ICD.	(Lu, et al., 2011);	SBCR
8	Terminal Image	Terminal's reputation in market, past record, Professionalism influences the customer satisfaction for users of Intermodal terminal. Good relationship with other stakeholders like Railways, Road Transporters, Shipping Lines and Ports& Social Responsibility.	(Yeo, et al., 2015); (Kolanovic, et al., 2011)	TI
9	Service Punctuality	Waiting time has significant influence on customer loyalty in service industries. Services provided by the Intermodal Terminal operator to be delivered efficiently, accurately, consistently and as promised.	(Bielen, et al., 2007); (Kolanovic, et al., 2011)	SP

10	Technology & Automation	Level of Automation in Terminal Operations and processes with use of latest technology like Automated Container Survey, Container location, Crane Automation, Gate-in Gate-out automation.	Newly introduced variable	TA

3.2 Best Worst Method (BWM)

MCDM problem is made of some alternatives& multiple criteria and each alternative has a score with respect to each criterion. The main purpose of an MCDM problem is to find the best alternative with the best overall score. There are many different methods to calculate the overall score for each alternative and the simplest way is to use an additive weighted value function (Keeney, et al., 1993). We use best-worst method (BWM) to determine the weight of each criterion. Since we have the score of each alternative, the overall score can easily be obtained. Based on BWM we need to track the following steps to calculate the vector (Rezaei, 2015):

Step 1. Define a set of criteria. In this step the decision-maker should define a set of criteria that is used to make a decision about alternatives.

Step 2. Define the best and the worst criterion. At this point, we ask the decision-maker to determine the best and the worst criterion regarded to their importance.

Step 3. Define the preferences of the best criterion over the other criteria. In this step the decision-maker determines a vector called Best-to-Other (BO). The resulting vector of "Best-to-Others" is:

$$V_B = \left(v_{B1}, v_{B2}.., v_{Bn}\right)$$

Where v_{Bi} denotesthe numerical importance of the best criteria *B* over i^{th} attribute and $v_{BB} = 1$.

Step 4. Define the preferences of all criteria (j) over the worst criterion W In this step, the decision-maker determines a vector called Other-to-Worst (OW). The consequential vector of "Worst-to-Others" stands:

$$V_W = \left(v_{1W}, v_{2W}.., v_{nW}\right)^T$$

Where v_{iW} gives the preference of the i^{th} criteria over worst criteria *W* and $v_{WW} = 1$.

Step 5. Search for the optimal solution. In this step we must find the optimal weights of the criteria (vector W). To do this, we must find a solution, which minimizes the maximum gaps between obtained weights and the opinion of decisionmaker. The purpose of this stage is to estimate the optimal weighting vector $\left(x_1^*, x_2^*..., x_n^*\right)$ of the criteria.

The ideal weight of i^{th} criteria is the one which addresses the mentionedcriteria: $\frac{x_B^*}{x_i^*} = v_{Bi}$ and $\frac{x_i^*}{x_W^*} = v_{iW}$.

In order to meetthese criteria, the maximum absolute difference needs to be minimized for all criteria. $\left|\frac{x_B}{x_i} - v_{Bi}\right|$ and $\left|\frac{x_i}{x_W} - v_{iW}\right|$

Therefore, the optimal weights for criteria can be calculated through the following programming problem (Rezaei, 2015):

$$\min \max_i \left\{\left|\frac{x_B}{x_i} - v_{Bi}\right|, \left|\frac{x_i}{x_W} - v_{iW}\right|\right\}$$

Subject to

$$\sum_n x_i = 1$$

$$x_i \geq 0 \qquad \forall i = 1, 2, ..., n; \tag{P2}$$

Problem (P2) is corresponding to the subsequent linear programming formulation (P3):

$$\min \ \phi$$

Subject to

$$\begin{aligned} &\left|x_B - v_{Bi}x_i\right| \le \phi \qquad \forall i = 1,2,...,n \\ &\left|x_i - v_{iW}x_W\right| \le \phi \qquad \forall i = 1,2,...,n \\ &\sum_i x_i = 1 \\ &x_i \ge 0 \qquad\qquad \forall i = 1,2,...,n \end{aligned} \tag{P3}$$

Above problem (P3) is linear in nature and has a exclusive ideal result. On solving problem (P3), the value of ϕ^* and optimal weights $\left(x_1^*, x_2^* ..., x_n^*\right)$ are determined.

Step 6: Checking the reliability of solution.
The nearer the consistency ratio to zero is, the more compatible the decision makers strategy is. By calculating a consistency ratio, we verify the consistency of the solution:

$$\text{Consistency Ratio} = \frac{\phi^*}{\text{Consistency Index}}$$

Table 2 is used to get the value of the consistency index (Rezaei, 2015).

Table 2. Consistency Index Table for BWM

v_{Bi}	1	2	3	4	5	6	7	8	9
Consistency index (max)	0.00	0.44	1.00	1.63	2.30	3.00	3.73	4.47	5.23

The consistency ratio value nearer to' 0' is more consistent, while values nearer to' 1' are less consistent. The consistency ratio not equal to zero (0) means that we don't have full consistency in the pair comparison matrix but multiple optimality.

4. Data Validation

Ranking Factors using Best-Worst Method:
We conducted a survey with 6 industry experts and freight services users to rank the top and the least preferred criteria (the Factors) from the above identified 10 Factors. The respondents are industry experts, dry ports service providers and dry port service users. Four out of six decision makers selected CP as best factor and remaining two selected SP as the best alternative responsible for service quality of intermodal terminals. On the other hand, SA was chosen as the worst alternative by DMs. Using step 3 and 4 from section 3.2, the best to other and others to worst preferences were calculated and the ranks for all identified factors of customer satisfaction along with respective weights were determined using step 5. The optimal solution is determined by solving the linear programming problem (P3)using Lingo software. Prioritization of all the factors is then evaluated by ranking them according to their respective weights as shown in Table 3.

Table 3. Ranking of Factors using BWM method

Notation	Factors	Weights	Rank
CP	Competitive Pricing	0.19	1
SP	Service Punctuality	0.189	2
CTRU	Cargo Tracking & Regular Updates	0.173	3
CSIS	Cargo Safety & Information Security	0.126	4
ARB	Accuracy in Records & Billing	0.083	5
SBCR	Staff Behaviour	0.064	6
TA	Technology & Automation	0.052	7
TI	Terminal Image	0.043	8
TIE	Terminal Infra & Equipment	0.029	9
SA	Service Availability	0.026	10

5. Result

The key aim of this research is to recognize and classify most significant factors which define service quality for intermodal terminal users leading to customer satisfaction. Based on previous theoretical frameworks from the logistics and cargo terminal establishments, the study firstly identified 10 factors of customer satisfaction as per Table 1. To rank the factors based on customer priority, BWM method was used and the weight of different factors was obtained. Table 3 suggests respective weights of the factors as per replies received in the survey.

As per the calculated weights, respondents have selected competitive pricing as the most important factor followed by service punctuality. Cargo tracking & regular updates is the third closely followed by cargo safety & information security, and last in top 5 ranked factor is accuracy in billing &records. It is also important to note the consistency index as consistency of the comparisons is represented by it. If values of consistency ratio are very close to zero, it represents high consistency of the comparisons, and thus high reliability of the results (Figure 1).

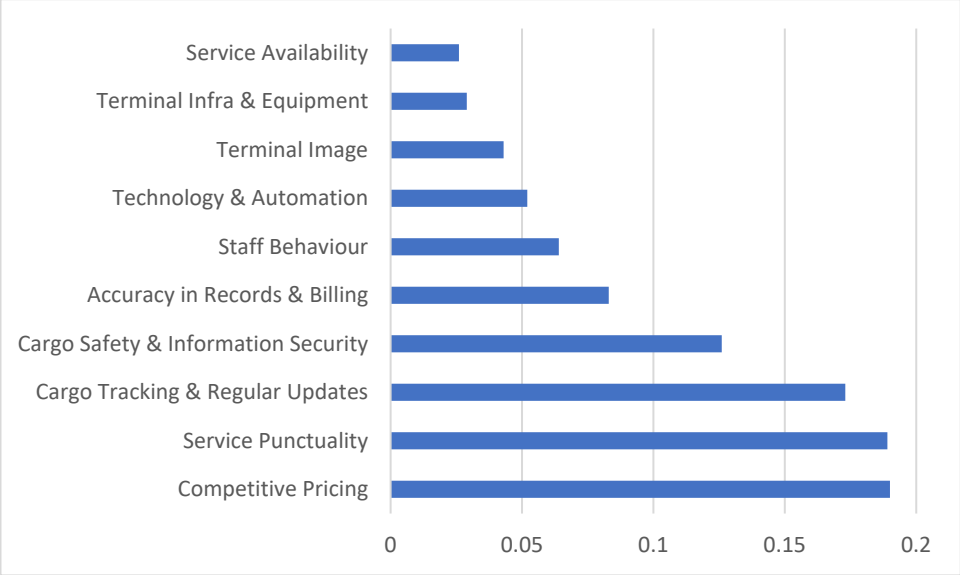

Figure 1. Weights of the factors

6. Conclusion

As competition from other modes of transport and within the intermodal terminal industry deepens, service providers are willing to increase the overall service quality delivered to the customers to achieve high customer satisfaction. This study concludes that the management of intermodal terminals should focus on 10 identified factors for achieving service quality and creating the favourable and memorable experiences for the customers. However, the management may not often deliver all factors at the same time due to constraint of adequate available resources. Therefore, they may consider the top ranked factors as priority areas to allocate its resources to deliver high quality services and customer satisfaction. It is also suggested that the intermodal services should be designed to ensure timely delivery of services at highest value for money for the customer. Customer gain confidence if they are given visibility of service delivery through regular updates and access to tools for tracking shipment as and when needed. As an inherent property of intermodal transport, custody of shipment is changed many times thus making it vulnerable to pilferages and damages. Also, customer shares lot of important and confidential information with the service provider, and thus expects Safety of cargo and security of information. Accuracy in billing and records is the 5th most important factor where customer expects the intermodal terminal staff to maintain sanctity in record keeping and billing processes. It is recommended that further studies should include more factors which effect the customer satisfaction and also other MCDM tools can be used to confirm model of this study.

References

Alwin D F and Hauser R M *The Decomposition of Effects in Path Analysis,* American Sociological Review, Vol. 40 , 1975.

American Association of Railroads AAR Data Centre// www.aar.org. - Association of American of Railroads - https://www.aar.org/data-center/railroads-states/., 2022

Anderson E W and Sullivan M W The antecedents and consequences of customer satisfaction for the firms: *Marketing Science* Vol. 12, 1993

Andersson Dan and Roso Violeta, Developing Dry Ports through the use of Value-Added Services,*Commercial Transport. Lecture Notes in Logistics*, Springer, Cham, 2016.

Ballis Athanasios and Golias John,Comparative evaluation of existing and innovative rail-road freight transport terminals, *Transportation Research Part A: Policy and Practice,* 7 : Vol. 36, 2002

Baron R M and Kenny D A, The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations,*Journal of Personality and Social Psychology*, Vol. 51 1986

Bateson John E.G "Do We Need Service Marketing?," in Marketing Consumer Services: New Insights, Cambridge, MA: Marketing Science InstituteVols. Report #77-115, 1977

Berry Leonard L, Services Marketing Is Different,*Business* - Vols. 30 (May-June), 1980

Bielen Frederic and Demoulin Nathalie, Waiting time influence on the satisfaction-loyalty relationship in services,*Journal of Service Theory and Practice*, 2007.

Bitner M, Booms B and Tetreault M, The Service Encounter: Diagnosing Favourable and Unfavourable Incidents., *Journal of Marketing,* April : Vol. 54, 1990

Bolton R N and Drew J H, A Myultistage Model of Customers' Assessment of Service Quality and Value, *Journal of Consumer Research*, Vol. 54(4), 1991

Booms Bernard H and Bitner Mary J Marketing Strategies and Organization Structures for Services Firms, *American Marketing*, 1981.

Brown Stephen W and Swartz Teresa A, A Gap Analysis of Professional Service Quality, *Journal of Marketing*, April : Vol. 53, 1989

Carboni Angela and Orsini Federico, Dry Ports and Related Environmental benefits: a case study in Italy,*Case Studies on Transport Policy*, 2020.

Carman James M, Consumer Perceptions of Service Quality: An Assessment of the SERVQUAL Dimensions, *Journal of Retailing*, 1 : Vol. 66, 1990

Conference on Communities Intermodality and Intermodal Freight Transport in the European Union, - Brussels : *Commission of the European Communities*, 1997.

Cronin J and Taylor S, Measuring Service Quality: a re-examination and extension, *Journal of Marketing*, 1 : Vol. 56, 1992

Delgado Ballester E and Munuera Aleman, Brand Trust in the context of consumer loyalty, *European Journal of Marketing*, 11-12 : Vol. 35, 2001

Devaraj S, M Fan and Kohli R, Antecedents of B2C Channel Satisfaction and Preference: Validating e-Commerce Metrics, *Information Systems Research*, 3 : Vol. 13, 2002

Dick Alan S and Basu Kunal, Customer Loyalty: Toward an integrated conceptual framework,*Journal of the Academy of Marketing Science*, Vol. 22 , 1994

Eisingerich A B, Why recommend a brand face-to-face but not on Facebook? How word-of-mouth on online social sites differs from traditional word-of-mouth,*Journal of Consumer Psychology*, 1 : Vol. 25, 2015

Finn David W and Lamb Charles W, An Evaluation of the SERVQUAL Scales in a Retailing Setting,*Advances in Consumer Research*. Provo, UT : Association for Consumer Research, 1991.

Fornell C, A national customer satisfaction barometer: The Swedish Experience,*Journal of Marketing*, Vol. 56, 1992

Gangwar Rachna and Raghuram G, Container Train Operators in India: Problems and Prospects, *IIM Ahmedabad*, 2010.

Gronroos Christian, Strategic Management and Marketing in the Service Sector,*Helsingfors*: Swedish School of Economics and Business Administration, 1982.

Hamza V K, Antecedents and Consequences of Customer Satisfaction: An Empirical Evaluation in Indian Context, *International Journal of Business Insights and Transformation*, 2 : Vol. 10, 2017

Han Sang-Lin and Baek Seung, Antecedents and Consequences of Service quality in Online Banking: An Application of the SERVQUAL Instrument, *Advances in Consumer Research*, Vol. 31, 2004

Hemalatha M and Karthikeyan Dr. GB, Service Quality in selection of Dry Ports by the Logistics Intermediaries, *EPRA International Journal of Economic and Business Review.* pp. 112-116, 2017

Hemalatha S, Dumpala Lingaraju and Balakrishna B, Service Quality Evaluation and Ranking of Container Terminal Operators through Hybrid Multi-Criteria Decision Making Methods,*The Asian Journal of Shipping and Logistics*. pp. 137-144, 2018

Indian Railways Yearbook, New Delhi, 2020-21

Keeney RL, Raiffa H and Meyer RF,*Decisions with multiple objectives: preferences and value trade-offs,* 1993.

Killbarda Milorad and Andrejic Milan, Logistics Service Quality impact on customer satisfaction and loyalty,*2nd International Conference on Supply Chains,* 2012.

Kolanovic Ines, Dundovic Cedomir and Jugovic Alen, Customer based Port Service Quality Model,*Promet - Traffic & Transportation*. pp. 495-502, 2011

Libai B, Muller E and Peres R, Decomposing the value of word-of-mouth seeding programs: Acceleration versus expansion,*Journal of Marketing Research*, 2 : Vol. 50, 2013

Lovelock Christopher H, Towards a Classification of Services, *Theoritical Developments in Marketing*, C. Lamb and P.Dunne, eds., Chicago: American Marketing, 1980.

Lu Jing, Gong Xiaoxing and Wang Lei, An Empirical Study of Container Terminal's Service Attributes,*Journal of Service Science and Management*., Vol. 4. - pp. 97-109, 2011

Parasuraman A, Zeithaml Valarie A and Berry Leonard L, A Conceptual Model of Service Quality and Its Implications for Future Research, *Journal of Marketing*, Vol. 49 , 1985

Rabin Joseph H, Accent Is on quality in Consumer Services This Decade,*Marketing News*, 12 : Vol. 17, 1983

Rathmell John M, What is meant by Services? *Journal of Marketing,* October : Vol. 30, 1966

Rezaei Jafar, Best-worst multi-criteria decision-making method,*Omega, Elsevier*, C : Vol. 53. - pp. 49-57 - 2015

Rodrigue Jean-Paul, Functions and Actors of Inland Ports: European and North American Dynamics,*Journal of Transport Geography*, 4 : Vol. 18, 2010

Roso V, Woxenius J and K Lumsden, The dry port concept: connecting container seaports with the hinterland, *Journal of Transport Geography*. - Vol. 17. - pp. 338-345, 2020.

Sayareh Jafar, Iranshahi Sobhan and Golfakhrabadi Neda, Service Quality Evaluation and Ranking of Container Terminal Operators, *The Asian Journal of Shipping and Logistics*, 4 : Vol. 32, 2016

Shanaki Masoumeh, Rajbar Vahid and Shakhsian Fatemeh, Investigation on Relationship between Service Quality and Customer Satisfaction, *Indian Journal of Science and Technology*, 12 : Vol. 5, 2011

Taylor Steven A and Baker Thomas L, An assessment of the relationship between service quality and customer satisfaction in the formation of consumer's purchase intentions.,*Journal of Retailing*, 2 : Vol. 70, 1994

Thai Vinh V and Thanh Trong, Dry Port Service Quality and Customer Satisfaction: An Exploratory Study, *Australian and New Zealand Academy of Management Annual Confenference* 2013.

Tuan Le Anh, Vu Ho Tuan and Nhan Nguyen Le, Study of Satisfaction of Customers for the Qaulity of Sea Transport Services: Case in Tan Cang Shipping Joint Stock Company-Da Nang Branch, *International Research Journal of Advanced Engineering and Science*, 4 : Vol. 3, 2018

Ugboma Chinonye, Service Quality and Satisfaction measurements in Nigerian Ports: An Exploration, *Maritime Policy and Management*., 2007.

Werikhe Gerald Wanzala and Zhihong Jin, Dry Ports Development in East Africa - A Benchmarking approach, 2016.

Wilson D, An Integrated Model of Buyer-Seller Relationships,*Journal of the Academy of Marketing Science,* 4 : Vol. 23, 1995

Yeo Gi Tae, Thai Vinh V and Roh Sae Yeon, An Analysis of Port Service Quality and Customer Satisfaction: The Case of Korean Container Ports,*The Asian Journal of Shipping and Logistics*, 4 : Vol. 31, 2015

Zboja JJ and Voorkees C.M, The impact of brand trust and satisfaction on retailer purchase intentions, *Journal of Services Marketing*, 6 : Vol. 20 , 2006.

Zeithaml Valarie, A How Consumer Evaluation Process Differ between Goods and Services, *American Marketing*, 1981.

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