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Estimating the Logistics Efficiency to Promote the Economic Well-being of Mongla Port in Bangladesh

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Developing an efficient maritime logistics system is a priority for enhancing regional economic development and strengthening the trade network. The management process often encounters problems such as procedural delays and bottlenecks within the institution, particularly at less significant gateways in developing nations. Through this paper, attempts have been made to determine the overall impact of administrative bottlenecks, digital transformation, and the human resources that are necessary to bring the logistics of Mongla Port into a whole new order. This article considers C&F agents, forwarders, and terminal operators as a set of forty identified individuals as key stakeholders for a survey conducted in 2026, which would be an important independent set of variables that influence the dependent operative variables. At first, the descriptive and diagnostic analysis of the data reveals that the delayed documents and obsolete computer systems (25.0%) were the biggest hurdle for overall operations, followed closely by hardware and shallow sea channels. Secondly, for the technological upgrade, fast automation shifts are closely associated with the labor readiness, showing a significant “Human-Technical Gap” where a large percentage of responses are neutral or disappointed. Another point is that the reactive administrative working process and obscure tariffs act as negative key drags to the region’s competitive strength of the port. Based on the findings, workflow paper-intensive processes and labor training are poorly linked to the velocity of trade. Port authorities and the national government will provide stronger engagement with the performance of the port through implementing the common ‘Paperless Single Window’ and performance-based management system framework.



KEYWORDS

maritime logistics, trade facilitation, human-technical gap, single window system, Mongla Port.



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Оцінка ефективності логістики для сприяння економічному добробуту порту Монгла в Бангладеш

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Розробка ефективної системи морської логістики є пріоритетом для посилення економічного розвитку регіону та зміцнення мережі торгівлі. Процес управління часто стикається з такими проблемами, як повільність процедур та вузькі місця в установах, особливо на менш значущих шлюзах країн, що розвиваються. У цій статті було зроблено спроби визначити загальний вплив адміністративних вузьких місць, цифрової трансформації та людських ресурсів, необхідних для того, щоб привести логістику порту Монгла до абсолютно нового порядку. У цій статті розглядаються агенти C&F, експедитори, оператори терміналів як набір із сорока визначених осіб як ключові зацікавлені сторони для опитування, проведеного у 2026 році, яке було б важливим незалежним набором змінних, що впливають на залежні оперативні змінні. По-перше, описовий та діагностичний аналіз даних показує, що затримка документів та застарілі комп'ютерні системи (25,0 %) були найбільшою перешкодою для загальних операцій, за якими слідували апаратне забезпечення та мілководні морські канали. По-друге, для технологічного оновлення швидкі зміни в автоматизації погано пов'язані з готовністю робочої сили, що демонструє значний «розрив між людиною та технікою», де великий відсоток відповідей є нейтральними або розчарованими. Ще один момент полягає в тому, що реактивний адміністративний робочий процес та незрозумілі тарифи виступають негативними ключовими гальмами для конкурентоспроможності порту в регіоні. Виходячи з отриманих результатів, інтенсивність паперової роботи та навчання робочої сили слабо пов'язані зі швидкістю торгівлі. Адміністрація порту та національний уряд забезпечать більшу взаємодію з ефективністю порту шляхом впровадження спільної системи «єдиного безпаперового вікна» та системи управління на основі ефективності.

КЛЮЧОВІ СЛОВА

морська логістика, сприяння торгівлі, розрив між людиною та технікою, система єдиного вікна, порт Монгла.

1. Introduction

In the present era of global trade, the efficiency of maritime gateways serves as one of the central engines of a nation's economic growth, competitive power of industry, and inter-country trade linkages. In the words of Wilson et al. (2003), world trade figures are substantially sensitive to a nation's trade facilitation capabilities, which suggests that improving efficiency at the secondary maritime gateways represents an indispensable structural requirement for countries, such as the historically over-centralized (and still developing) Bangladesh, which have long conducted much of their international trade through centrally operated sea gateways. While Clark et al. (2004) contend that port and public authorities and other government bodies need to cooperate on security and service standards for developing safer procedures, they also conclude that secondary ports have an important role in driving the socio-economic directions of peripheral regions, which is now significantly heightened due to a new mega-project: the Padma Bridge. As Cullinane & Talley (2006) indicate, there are two main conditions to reduce operational risks and procedural delays: strengthening the knowledge capacity of public enterprises and instituting administrative practices compatible with technical change. But the results from real empirical investigation demonstrate that though several connectivity and infrastructural upgradation projects have been going on in full swing, effective working speed in Mongla port is still impeded by the deep roots of socio-institutional stifles, human resources deficiency, and soft infrastructural lags. Operational failures that stem from the administrative friction of an old, outdated procedure have become 'business-as-usual' in the management of contemporary port systems, as observed by Castles (2002) that labor can be an equally significant shaping force to the technical evolution as technological changes can to the configuration of institutions. Apart from the macroscopic physical measure, one significant component in recent-days-trade studies has always been the identification of bottleneck points on procedural level, and quantification of the 'today' status of the 'inner logistics' of processed goods from the main industry stakeholders' perspective; the segmentation of administrative workflows, the bureaucratic islands and reactionary approach towards problem resolving during acute timeframes when congestions blockages occurs in terminals. Modern-trade facility demands to critically appraise the 'human – technical' gap, and how human behavior interruption, clerks' mistakes, or mind rigidity leads to an inactive institutional approach and causes ships to pile up during the introduction of advanced software automation (e.g., computerized billing systems) among the low-skill workforce. To do that, an important aspect for the research to isolate physical/environmental obstacles (e.g. River- siltation along the Pashur corridor and machine shortage on area) from administrative challenges (e.g. Document processing delay and non-transparent port fees), and specify which factor represents the greatest logistical barrier on ports; and assess soft infrastructure short-falls (e.g. Opaque billing arrangements and arbitrary tariff changes) on Mongla Port's competitiveness with primary gateway such as Chittagong Port; in this paper the researchers considers these dimensions to understand which specific governmental and governing mechanisms are best able to reduce the human-technical obstacles, guarantee the tariff, post-LDC environmental regulatory compliance and ultimately enhance regional trade welfare in the long run.

2. Literature Review

The gravity model and institutional setup can also be applied to interpret the relationship between vessel delay and the performance of a port, and a nation's competitive standing. In particular, port-trade connection regarding operational reliability of minor hubs is closely connected (Clark, Dollar, and Micco, 2004), and while moving maritime logistics from the 25th percentile to the 75th percentile, the ocean shipping cost disorder increases by 12 percent. Moreover, administrative delay still imposes continuing pressure to cause minor ports, like Mongla, to take the bottleneck structure, which leads regional trade costs to about 15 percent above the global average, according to Begum (2015) in a maritime dissertation setting. As physical handling capacity is the most recently changing driver to determine selecting terminals since human/ inefficient storage cannot cope with the present global shipping lines anymore, while crane moves and maximum handling capacity are the more profitable parameters yet often associated with the negative returns on capital if it cannot be correlated with certain hard infrastructure like devoted berths with soft infrastructure like a digitized interface as illustrated by Blonigen and Wilson (2008). Hence, it causes a regional gate an operating reliance on

capital dredging, and the capital deepening strategy is deemed critical for stable Pashur channel operations due to the riverine logistics, based on Islam and Haider (2016). Port operations with an inadequate adaptation of the personnel to the machines frequently suffer from strong negative throughput variations. Cognitive flexibility and technical feasibility among terminal operators have been documented to contribute improvements in throughput according to Cullinane & Talley (2006). Therefore, the limitation of human capital causes short-sightedness in terms of maritime efficiency performance. Vessel dwell time analytics indicates similar findings-disparity between digital technology and workforce expertise leads to 20% of relative increased turnaround delay as compared to regional competitors, according to Notteboom & Rodrigue (2009), turning an efficient gateway into a digital divide within the marine sector of Bangladesh. Ultimately, it is the structural connectivity to the hinterland, which in turn influences, at its largest, the reach of maritime competitiveness. A port's internal logistical efficiency is, according to De Langen (2004), "in the end, severely constrained by the efficiency of the modal hinterland access". Where regional flows perform poorly, it is possible for massive-scale container hubs to completely bypass second-level gateways by inter-modal disintermediation (Hilling, 1996). This "transit friction" has been radically altered following counterfactual analysis of the Padma Multipurpose Bridge, according to Hawlader et al (2024), which reduced land transit costs over the key Mongla-Dhaka corridor by 45%, thus pulling the economic center of gravity towards the south-west of the country. Another theoretical issue is about the non-linear returns of human capital investment in the rapid structural modernization era. The specialty industrial training structure became the basis of modern enterprise performance as presented by Becker (1964). On the other hand, rapid technological transition disarranges current labor habits without the active reinforcement of peer and observational learning (Bandura, 1977) on the integration of high-tech logistics software by institutions. Meyer & Allen (1991) identified that the lack of emotional and affective commitment from employees resulted in active or passive institutional resistance to the success of modernization, which has been the most dominant non-human factor responsible for the derailment of 40% of digital modernization in the South Asian ports (Tongzon, 2021). At an optimum level, local adaptation occurs when transformational governance, together with leadership, is used to cut down bureaucratic compartments and reform structures of traditions. To use the quote of Trottier et al. (2008), "transformational leadership at the sea governance has strong linkage with non-corrupt regime and good spirit at the governmental department." For example, Avolio et al. (2009) give theoretical explanation about it when they say "policymakers were seen as the important "architects of institutional change," a concept relevant to transitioning from paper based to paperless automated customs operations," but that cannot be solely achieved through software improvements, thus there must be a top-down direction on strategies to make all the separate supply chain integration networks cohesive (Mentzer et al. 2001). There is no escaping from associating environmental compliance and human capital building with long-run policy regimes. Local institutions mediate sustainable trade expansion (Pelling & Uitto, 2001), and according to Barro, R. J. (2000), port district-level inclusive growth is a structural precondition in order to avoid local stagnation and poverty traps. Nevertheless, Lam and Notteboom (2014) conclude that environmental rules and regulations are not a 'side-policy' anymore but 'the effort to get into the trading market' under the new Green Port paradigm (Chiu et al., 2014), requiring a strategic and government-subsidized training program (Hesse and Rodrigue, 2004) to achieve the goal of sustained trade growth in the post-LDC period. Another limitation to improving trade capability is moving from bureaucratic-minded policies to results-oriented execution. It is shown by Kusek and Rist (2004) that direct application of clear policy mechanisms, not short-term changes, has saved the public money from being stolen by policy officials, thus justifying the utilization of Results-Based Management (RBM). Meanwhile, short-term administrative change and occasional ad hoc modifications of tariffs could cause modest cost loss (Amiti & Konings, 2007), just like minor interruption causes small friction and will eventually be eliminated over long-term rewards. Therefore, long-term trade openness at port is directly correlated to automated trade facilitation measures, like Single Window Systems, that have compressed transaction costs by up to 14.3 percent at global levels by UNCTAD (2023). Although physical harbor expansions were widely documented, the existing literature does not make clear as to what such a human-technical "gap" entails for operators working within an inappropriate institutional setting. Grothmann & Patt (2005) also state that "a missing option for joint training can be a cause of fatalistic frustrated despair about the technological restructuring." The administrative collision would be one structural feature that would also need a significant empirical

analysis, and it has direct relevance in the effectiveness of the policies for national economic prosperity and for trade at sea at the Mongla Port.

3. Methods and Materials

This study performs an empirically driven, content-based, and administrative analysis to assess internal operating processes of the Mongla Port. Basic quantitative data were collected through a structured diagnostic stakeholder survey assessing key operational variables (human, technical, and process-related) at a local level. Primary data was obtained from the cross-sectional survey of 100 important stakeholders (C & F agents, forwarders, and terminal operators) of the port. To avoid biased analysis without personally observing individual behavior, the data have been de-personalized from individual stakeholder responses to become institutional performance indicators. The major statistical tool used in this research study is the modeling of the descriptive distribution with software such as Statistical Package for the Social Sciences (SPSS), and JASP. Besides, bipolar and tripolar distributions in a 5-point Likert scale (Strongly Disagree = 1; Disagree = 2; Neutral = 3; Agree = 4; Strongly Agree = 5) are analyzed since the operational experience across different stakeholders is contradictory. But to determine the physical and economic extent of specific operational constraints (which were evaluated using the primary challenge matrix), independent variables such as siltation of the river channel and variable costs of port tariffs were also analyzed. Furthermore, the results obtained from the descriptive frequency tables will be analyzed and presented in a direct synthesis, based on theoretical paradigms and existing theories which are listed in the literature review.

4. Data Analysis

In order to analyze the operational effects of modernization, survey data was collected from port stakeholders concerning the implementation of the digital infrastructure. The question specifically relating to this section asked port stakeholders to assess how automatic transitions have contributed to the turnaround time of cargo. The resultant data on perceptions towards digitalization (E-port system) reducing cargo clearance time are laid out below in a formatted Table 1.

Table 1. Digitalization (E-port systems) has successfully reduced cargo clearance time

Opinion	Frequency	Percentage, %	Valid Percentage, %	Cumulative Percentage, %
Strongly Disagree	13	13.0	13.0	13.0
Disagree	12	12.0	12.0	25.0
Neutral	30	30.0	30.0	55.0
Agree	42	42.0	42.0	97.0
Strongly Agree	3	3.0	3.0	100.0
Missing	0	0.0		
Total	100	100.0		

Source: Authors' compilation based on field survey, 2026.

Reviewing the digital infrastructure, it appears only 45% of users fully support the claim that E-port systems facilitate reduced clearance times, with a sizeable 30% remaining neutral and another 25% disagreeing, implying that resistance from the digitally challenged staff still obstructs the digital migration process. So, it's more than enough just deploying new software to the staff without fully preparing them for the new technological adoption and what will happen if you impose an advanced technological solution upon staff that is not accustomed to doing things at pace without any support, and that would not work.

When bottlenecks arise in operations, port authorities must also rely on active supporting measures to keep operations going. In the empirical study, the speed of responses of administrative systems when they encountered unforeseen logistic impediments or congestions in dock-side were examined. To demonstrate these phenomena, empirical responses in port administration providing logistic support when delays occur or when there are jams on the cargo flow are presented in Table 2.

The complication is further supported by the operational feedback, where following from the structural issues, reactive administration has been witnessed and the service support is rather reactive than proactive. As only 40 percent of participants agree or strongly agree that port authorities are of

assistance when cargo jams occur but a combined 60 percent are neutral or unsatisfied with existing cargo jams. In effect, this illustrates the coordination gaps within the port authority when cargo jams occurs and as soon as these occur, the gap in the provision of prompt and coordinated support service results in container delay on land-based systems since there is no evidence that the operational delays at the port can be effectively resolved with enhanced software capabilities without improvements in administrative cooperation.

Table 2. Port authorities give helpful support when there are delays or cargo jams

Opinion	Frequency	Percentage, %	Valid Percentage, %	Cumulative Percentage, %
Strongly Disagree	10	10.0	10.0	10.0
Disagree	12	12.0	12.0	22.0
Neutral	38	38.0	38.0	60.0
Agree	27	27.0	27.0	87.0
Strongly Agree	13	13.0	13.0	100.0
Missing	0	0.0		
Total	100	100.0		

Source: Authors' compilation based on field survey, 2026.

A proper check of whether and how economic performance of a country on a macro scale has improved can only be determined based on observed phenomena over a sustained and fixed number of years. Here, the survey was design to find whether and how much has regional cargo, shipping and other commercial activities change in the last two year and overall trade position has change over last two years, in case of Mongla port which is reflected in the table 3 below, is the sum up results of the respondent's answers for 'whether the overall trade position of Mongla port has improved in the last 2 years.'

Table 3. Overall trade performance of Mongla Port has improved in the last 2 years

Opinion	Frequency	Percentage, %	Valid Percentage, %	Cumulative Percentage, %
Strongly Disagree	8	8.0	8.0	8.0
Disagree	20	20.0	20.0	28.0
Neutral	25	25.0	25.0	53.0
Agree	37	37.0	37.0	90.0
Strongly Agree	10	10.0	10.0	100.0
Missing	0	0.0		
Total	100	100.0		

Source: Authors' compilation based on field survey, 2026.

On top of institutional challenges, the data on regional trade expansion activity reveals that 47.5 percent agree regarding the past two years' improvement in overall trade performance. However, with fully 27.5% openly disagreeing with this assessment, the report reveals that increasing volume is straining the internal inefficiencies at the port, thereby impeding a more positive gain to fully satisfied usage, and effectively creating local business cost increases. Land transport access to the port has been immensely enhanced via highways and bridge building, but internal procedural slowness prevents businesses from obtaining benefits from the increase in traffic.

The competitive performance of a secondary maritime gateway is primarily evaluated based on how well it compares with the performance levels of primary domestic ports. The analysis presented in this section compares the local infrastructure and service performance level with the large-scale domestic comparisons, to establish local deficiency or success in infrastructure and services offered by the gateway. The cross-tabulated results of the survey on public and professionals' opinions on whether Mongla Port would be able to compete with Chittagong Port regarding its efficiency are presented in Table 4 below.

As demonstrated in the table, it is quite evident that public perception toward the capability of the facility to counter a primary gateway like Chittagong Port has not been very much changing. While 35% felt optimistic, 65% had doubts or neutral opinions that the hard infrastructure deficiency has not been enough to transform it to overcome the established secondary port status. Port competitiveness over the long run rests on schedule reliability and reduced operational cost. Low confidence of its users

demonstrates that while good geographic positioning and transport connectivity are important, this is undermined if day-to-day processes inside the port are tardy and chaotic.

Table 4. Mongla Port is capable of competing with Chittagong Port in terms of efficiency

Opinion	Frequency	Percentage, %	Valid Percentage, %
Strongly Disagree	7	7.0	7.0
Disagree	28	28.0	28.0
Neutral	30	30.0	30.0
Agree	15	15.0	15.0
Strongly Agree	20	20.0	20.0
Missing	0	0.0	
Total	100	100.0	

Source: Authors' compilation based on field survey, 2026.

In several previous research studies, human resources capacity and expertise are considered key factors affecting terminal efficiency and machinery operating skills. In this survey study, questionnaires were developed, including questions for the respondents to evaluate the adequacy of institutional resources, training gaps, and workforce and human resources. The field data of responses from the key informants about whether the port facility has a sufficient number of workers and specialist staff are shown in the following Table 5.

Table 5. The port has enough skilled workers and expert staff

Opinion	Frequency	Percentage, %	Valid Percentage, %	Cumulative Percentage, %
Strongly Disagree	5	5.0	5.0	5.0
Disagree	22	22.0	22.0	27.0
Neutral	23	23.0	23.0	50.0
Agree	40	40.0	40.0	90.0
Strongly Agree	10	10.0	10.0	100.0
Missing	0	0.0		
Total	100	100.0		

Source: Authors' compilation based on field survey, 2026.

An internal concern regarding the available human resource data reveals a grave shortage in skilled labor at the terminal. Half of the respondents confirmed that there is sufficient workforce available in skilled manpower for the port, while the other half have neutral or pessimistic responses, thus indicating that recent speedy technological evolution in term of automatization has over taken industry and enterprise specific workforce up skilling, leaving gaps in the implementation, where new technologies encounter manual work practices resulting in errors that may arise from human intervention (computer bugs and handling issues are rampant), increasing vessels turn time and hence rendering comparison with regional ports unfavorable.

Financial uncertainty can be eliminated for members of the supply chain if the maritime pricing is made institutionally transparent. This research inspects whether the stakeholders were explored with a focus on the certainty, fairness, and routine basis of institutional service fees at the port. Table 6 includes practical distributions that demonstrate stakeholders' collective belief in whether the Port Authority provides an equitable, transparent billing and tariff system.

Table 6. Transparent and fair billing/tariff structures are maintained by the Port Authority

Opinion	Frequency	Percentage, %	Valid Percentage, %	Cumulative Percentage, %
Strongly Disagree	3	3.0	3.0	3.0
Disagree	20	20.0	20.0	23.0
Neutral	32	32.0	32.0	55.0
Agree	28	28.0	28.0	83.0
Strongly Agree	17	17.0	17.0	100.0
Missing	0	0.0		
Total	100	100.0		

Source: Authors' compilation based on field survey, 2026.

The need to move towards transparent models is highlighted through the feedback from stakeholders on bill fairness. 45% of respondents believe that tariff structures are fair, while 55% have a mixed or negative perception that points to opaquely defined administrative costs and administrative risk inherent in these systems. This opaqueness in tariff rules and arbitrary sudden price hikes makes systems and costs unpredictable, a detriment to trade. They need to be driven by clear, outcomes-based management, and automated in nature – applying port tariffs strictly – taking individual administrative judgments out of the equation.

Aside from standard metrics for port management practices, identifying structural obstacles is necessary. Each person in the survey was asked to name a single critical bottleneck from infrastructure, regulations, and geography that's holding up current operations. Table 7 shows the frequency and percentage distribution regarding how the biggest challenge currently affecting the performance of the Mongla Port is chosen.

Table 7: Determination of the single biggest challenge currently hindering the performance of Mongla Port

Option	Frequency	Percentage, %	Valid Percentage, %	Cumulative Percentage, %
The river water is not deep enough	17	17.0	17.0	17.0
Not enough modern machines	20	20.0	20.0	37.0
Delayed paper-work/Old computers	25	25.0	25.0	62.0
Bad roads or slow railway links	20	20.0	20.0	82.0
Port fees are too high	15	15.0	15.0	97.0
Other	3	3.0	3.0	100.0
Missing	0	0.0		
Total	100	100.0		

Source: Authors' compilation based on field survey, 2026.

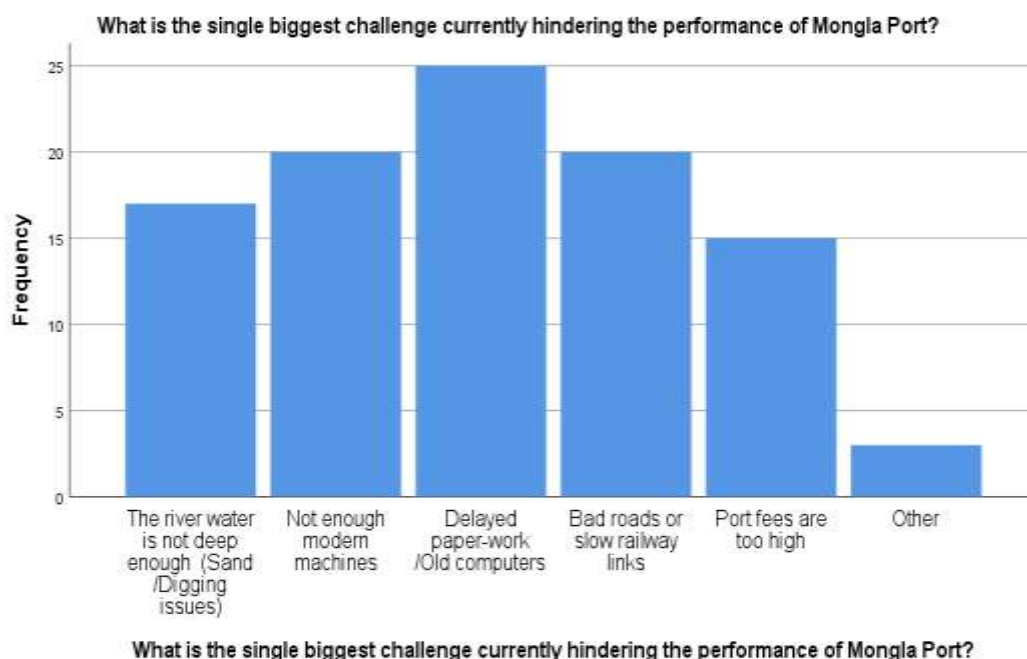


Figure 1. Major challenges against the performance of Mongla Port

Source: Authors' compilation based on field survey, 2026.

The overall logistical bottlenecks finally determine that the biggest pain in operations remains the paper stacks and old computers at 25%, beating physical machine shortages (20%), poor roads/rail links (20%), and shallow channels (17.0%). The conclusion is clear and proves that administrative

softness poses the greatest restriction to the speed of trade than physical restrictions such as dredging shallow rivers or upgrading poor roads/rail lines. In fact, solving this requires much harder efforts of developing an all-connected, paperless society than simply dredging the shallow river beds or making an upgrade to docks in order to build a lower-cost business.

5. Findings and Strategic Recommendations

The factual assessment of the digital infrastructure at the terminal obtained from Table 1 demonstrates that the technological transition is largely dependent upon the people and institutions, as supported by Notteboom & Rodrigue (2009) on workforce skills gap. Also based on the given empirical findings, the theory proposed by Wilson et al. (2003) is verified; the benefits of trade facilitation are still partially eroded if the existing bureaucratic culture and the usage of manual operations are to persist in parallel to new software architectures.

Building directly upon these structural constraints, the friction observed as the result of the workflow, identified within Table 2, demonstrates a reactive workflow, segregated along the lines of administration rather than that of supply chains. The very existence of these ‘bureaucratic silos’ at the Port Authority is consistent with Mentzer et al. (2001) assertion that real integration involves fragmenting silo’s institutions into linked, coherent networks and therefore avoids lengthy and imminent congestion of goods movement.

Adding to the isolation of these institutions, it is noted that the friction that occurs across the port logistical network explored in Table 3 indicates more fundamental and structural vulnerabilities, as volume increases cannot escape from a bureaucratic logic. Such a structure reflects the perspectives of Begum (2015), who found that when they are stressed, secondary ports arise as structural “bottlenecks” that raise the cost of trade from what it ought to be, from the world average, and so prevent volumes from turning to positive outcomes in terms of customer satisfaction.

Against such a systemic background, inefficiencies continue to put downward pressure on the port’s performance, as can be seen in Table 4, creating two disparate views on whether the port can actually be used to supplement the role of a gateway of Chittagong port. Clark et al. (2004) show that bilateral trade competitiveness depends directly on port efficiency and maritime transport costs; the soft infrastructure shortcomings at the facility simply do not allow the port to move out of the shadow of a secondary port.

Based on the inner failures mentioned above, Table 5 suggests a significant mismatch in terms of the quality of human capital resource utilization, causing optimal operational efficiency not achievable. Such operational discrepancy correlates strongly with Becker’s (1964) Human Capital Theory, where speedy structural modernity leads to labor routines with no industry-focused capacity building; thus, the development of a “Human-Technical Gap” causes employee and institutional error, supported by Meyer and Allen (1991) & Tongzon, J. L. (2021).

Overcoming these baseline issues therefore means changing existing frameworks: it does away with traditional modes and suggests greater transparency and predictability of their functioning –as stakeholder insights presented in Table 6 suggest. As the need for more stringent and effective implementation of results-based management frameworks is strongly articulated by Kusek and Rist (2004), it reinforces the arguments of Amiti and Konings (2007) who note how opacity in the billing regime leads to a gross inefficiency and systematically impedes sustained trade liberalization.

In summation of the numerous structural issues which have been compiled over time in Table 7 and Figure 1, it must finally be recognized that aged computing systems combined with a lengthy paper-push to reach the final destination represent the most massive chokehold logistics-wise. More obviously, however, it has been shown that administrative bottlenecks, in contrast to physical and spatial constraints, represent the worst bottleneck and therefore show how paper-based hierarchical organization serves as trade rate dampers, which is directly aligned with UNCTAD (2023) principal strategy of reducing overall transaction costs via an automated Single Window.

According to the practical findings of “Human-Technical Gap” and institutional bottlenecks, the following appropriate public sector interventions should be taken for the economic development of Mongla port:

- *Unified Paperless Single Window:* To address the main stakeholder bottleneck of delayed paperwork (25.0%), the Shipping Ministry will need to eliminate manual data entries and

paper-based procedures. A single window system with complete automation will remove the inter-departmental barriers, speed up the customs procedures, and bring down the local transaction costs by at least 14.3% in line with the developed world.

- *Institute Government-Supported Dedicated Industry Training structure:* As one of the 50.0% gaps the stakeholders have perceived, the port authority should install constant and mandatory training programs based on human resource development, where it must increase its operators' cognitive flexibility and technical practicability in operating high-tech logistics software, thereby minimizing the 20% turnover delays caused by the digital gap.
- *Implementing Results-Based Management for Transparency of tariffs:* As a solution for the 55.0% negative to non-positive attitude towards billing clarity, the port authority should introduce clear-cut RBM processes. For instance, automatic clear tariff systems, which do not have room for arbitrary administrative changes to the tariff system, would be more public-friendly, thus conserving public funds.
- *Combine Green Logistics and environmental regulation frameworks:* Consistent with the post-Least Developed Country graduation agenda, national human capital development needs to be tied into environmentally sustainable trade. The state should provide financing for targeted human capital development initiatives focusing on environmental regulation and green port frameworks; turn environmental regulations from being an obstacle to entering the market into a long-term regional competitive advantage.

6. Conclusions

Improvement of the efficiencies in maritime logistics is an important and complex issue entirely relying on joint actions and collaborative public administrations, appropriate development of soft infrastructure, and well-trained human resource capacity. In an evidence-based manner, administrative inefficiencies, operation time, and a clear Human-Technical Gap have been major restraints on the functioning capacity of the Mongla port, a key driver of transformation of regional infrastructure to regional economic welfare. In this regard, the Padma Multipurpose Bridge and physical enhancement initiatives bring a solid structure into operation; however, the existing administrative structure and digital transformation system do not meet the human resources requirements, a lack of proactive service and tariff payment methods gives rise to additional transactional costs, and such administrative restraints have yet to be mitigated. Thus, structured public sector responses, including a harmonized, paperless, Single Window system, results-based management, and training at the industry level for its personnel, should be taken urgently.

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