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Business Strategy to Achieve the Target Time of Loading and Unloading (Laytime) of Coal Commodities

Alfian Indrakusuma[1], Jhony Warlouw[2]

[1,2]PT Anglomas Kargo Abadi, Kota Baru, Kalimantan Selatan

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Abstract

This study examines the business strategies a coal mining company in South Kalimantan, Indonesia, can adopt to improve its achievement of the target loading and unloading time (laytime) for coal shipments. The company's reliance on leased jetties, barge transport along the Barito River, and spot contracts has frequently caused loading schedules to shift, resulting in demurrage penalties charged by vessel owners when loading exceeds the agreed laytime. Using purposive sampling, data were collected through interviews with the port, logistics, and business process teams, direct observation of port and logistics operations, and a review of company documents and performance records. Qualitative data were analyzed descriptively, while quantitative data were evaluated using Internal Factor Evaluation, External Factor Evaluation, and SWOT analysis. The results place the company in Cell I of the IE Matrix and Quadrant I of the Grand Strategy Diagram, indicating that its strengths outweigh its weaknesses and its opportunities outweigh its threats. The recommended strategy is therefore an integrative one—specifically backward integration—implemented by acquiring jetties around the coal mines to reduce dependence on leased facilities and accelerate the distribution of stockpiled coal. Demurrage data further show that of 146 shipments incurring demurrage, 60 percent were attributable to jetty-related problems, underscoring jetty ownership as the most critical lever for reducing demurrage costs and achieving the company's laytime targets.

INTRODUCTION

This study focuses on a coal mining enterprise that holds a coal concession in South Kalimantan, Indonesia. Within an increasingly competitive coal sector, the firm continually seeks to expand its yearly production targets as a means of strengthening profitability. Such growth in output, however, brings a parallel rise in the volume of coal that must be shipped, making close cross-departmental collaboration and continuous innovation in logistics indispensable to the company's operations. Because the Barito River is frequently too shallow for large vessels—craft that require considerable draft to avoid grounding—barges have become the customary mode of coal haulage in the region. Given that a great many of South Kalimantan's coal mines sit in remote locations where building comprehensive road infrastructure would be both impractical and financially burdensome, the river serves as the principal corridor linking these mines to the port facilities at the Bunati Anchorage Point.

A single jetty cannot bear the burden of loading barges for the company's entire output. As shipment volumes climb in step with rising production, the firm requires access to several jetties simply to keep congestion and waiting times manageable. Fazi and Roodbergen (2018) observe that mounting congestion at ports has pushed land transport systems around the globe toward greater dependence on inland terminals, and that expanding this mode of transport helps offset the drawbacks associated with trucking. In the case of this company, though, the jetty it uses is not owned outright but leased, leaving it without full authority over how the facility is scheduled—an arrangement that regularly disrupts barge loading timetables. The difficulty stems from the fact that the same jetty is shared among several tenant companies, which makes the coal loading calendar exceedingly tight and hard to reorganize once set.

Any departure from the agreed barge loading schedule carries consequences for the vessel's own unloading timetable. Laytime, once it begins, keeps accumulating regardless of whether loading is actually underway while the vessel waits on a barge. For this reason, the company must monitor the precision of its coal loading process closely enough to stay within the laytime window set by the contracting parties; falling short exposes the company to a demurrage penalty owed to the vessel's owner whenever loading runs past the agreed laytime. These circumstances point to three specific problems confronting the company: first, barge movements are constrained by the fixed schedule for opening the Barito Bridge, which limits when barges can sail; second, the company has no authority over coal loading performed at the leased jetty, so the loading timetable shifts often; and third, the prevalence of spot contracts frequently generates disruptions in coal supply.

From a theoretical standpoint, Suhandi (2012) defines laytime as the span of time that a charterer and shipowner agree upon for completing loading and unloading operations at a designated port. It represents the window within which the seller is expected to finish loading the coal; exceeding that window triggers a demurrage charge, while finishing

ahead of it earns the seller a dispatch payment. The laytime clock starts once the vessel is confirmed ready in every respect. Baughen (2016) notes that, contrary to a common assumption, laytime and demurrage provisions are not confined to voyage charterparties alone—sales contracts, too, carry their own rules governing laytime and demurrage, sometimes setting independent short-term terms and at other times drawing directly on provisions taken from a charterparty.

An anchorage point denotes the location at which a mother vessel secures its mooring lines or deploys anchoring gear; here, that location is Muara Berau. Should a vessel reach the anchorage without being fully prepared, its Notice of Readiness is voided, and the laytime clock does not begin until the vessel has attained full readiness. The clock stops once the whole coal cargo has been loaded and stowed and every piece of loading and unloading equipment has been cleared from the vessel. Where, twelve hours after loading concludes, departure is still blocked because the seller has not furnished the documentation needed for sailing clearance, the laytime calculation resumes only once those documents reach the anchorage agent. The resulting laytime figures are compiled into a time sheet, which the counterparties must confirm and accept within thirty days of the vessel's departure from anchorage; this document then tells the seller precisely how long the loading operation took.

A number of earlier studies have looked into coal loading practices in Indonesia. Sutrisno et al. (2019) demonstrated that the method used for berthing ships exerts a direct, positive, and highly significant influence on the performance of goods supply at the Suralaya Steam Power Plant. Sakdillah (2016), meanwhile, identified a fairly strong link between coal supply levels and the actual rate of coal loading, attributing demurrage largely to declines in that actual loading rate. Dewi and Majid (2020) argued that curbing demurrage calls for close coordination between shipowners and charterers, swift and accurate ship positioning, properly executed ship-to-ship transfers, and diligent tank cleaning. Storms et al. (2023) contended that cutting down on idle time and containing demurrage expenses would, in turn, strengthen intermodal transport performance. In line with these findings, the present study echoes the observation by Diamar and Chandrawulan (2020) that maritime cargo transport is particularly prone to scheduling lapses, which can translate into considerable financial losses—demurrage stemming from laytime overruns being a prime example.

Accordingly, this study sets out to formulate strategies for improving how well the company meets its coal loading and unloading targets, which entails mapping the relevant internal factors, mapping the relevant external factors, and, on that basis, devising strategies capable of lifting the company's performance against those targets.

METHODS

The subject of this investigation is a contractor entrusted by the Government of the Republic of Indonesia with carrying out coal mining operations spanning both exploration and production. Fieldwork was carried

out in South Kalimantan Province, roughly 60 kilometers southwest of Samarinda, in an area traversed by the Barito River. Informants were selected through purposive sampling, chosen for the particular roles and expertise they held in relation to the research topic; they were drawn from the company's port team, logistics team, and business process team, all directly engaged in the firm's coal logistics operations.

Three data-gathering methods were employed. The first, interviews, involved structured sessions with key informants from the logistics, port, and business process functions, guided by a pre-established interview protocol designed to capture every relevant aspect of the company's operations. The second, observation, entailed the researchers watching port and logistics activities firsthand so as to grasp the practical difficulties inherent in coal transport and loading. The third, document review, drew on company records and reports covering coal loading operations, performance indicators, and logistics procedures, supplying quantitative evidence to complement the qualitative findings.

The resulting dataset combined qualitative and quantitative elements. Descriptive qualitative techniques were applied to the qualitative material, while the quantitative data underwent Internal Factor Evaluation, External Factor Evaluation, and SWOT analysis. Together, these methods were used to craft a strategy aimed at sharpening the company's logistics efficiency and hitting its target laytime for coal loading.

RESULTS AND DISCUSSION

SWOT Result

The discussion above points to several interdependent factors that bear directly on the company's ability to meet its performance targets. A SWOT framework sorts these into strengths, weaknesses, opportunities, and threats. To build a full picture of where the company stands on each of these dimensions, the researcher carried out a SWOT analysis, and the findings—organized around the study's problem formulation and objectives—are set out below.

Opportunities: (1) a rise in the Reference Coal Price (Harga Batubara Acuan, HBA) index can boost company earnings, which in turn can be channeled into expanding logistics-supporting facilities; (2) the company's mine sits within Samarinda City; (3) relations between the company and government authorities remain fairly favorable; (4) an array of new technologies is now available to support coal logistics work; and (5) prospective hires tend to come with a solid educational background.

Threats: (1) barges nominated for rental are not always in sound condition; (2) shared use of the same jetty by multiple companies makes the barge loading schedule highly changeable; (3) residents near the mine periodically stage protests; (4) barge movements must conform to the bridge's fixed opening and closing times; and (5) processing the clearance documents for barges and vessels consumes a substantial amount of time.

Strengths: (1) the crusher operates at a capacity of 1,500 mt/hour, backed by a sizable stockpile; (2) the workforce is of high quality; (3) the company invests heavily in employee training and development; and (4) the

office facilities made available to staff amply support their needs during working hours.

Weaknesses: (1) the company lacks an integrated database linking information across its departments; (2) it owns neither barges nor loading and unloading equipment, obliging it to lease such assets and depend on third parties; (3) it possesses only a single jetty of its own and must lease additional capacity; (4) loading plans are often revised at short notice, close to the scheduled loading time; and (5) a large share of its contracts take the form of spot agreements, which frequently unsettle the barge loading plan.

The weights, ratings, and scores assigned to each internal and external factor are set out in the tables and figures that follow, using the analytical instruments described here.

Analysis Based on the Internal-External Matrix

External Factor Evaluation yields a combined score of 3.59, made up of a 2.04 opportunities component and a 1.56 threats component—an outcome suggesting that the company handles opportunities and threats reasonably well, with its available opportunities sufficient to counterbalance the threats it faces. Internal Factor Evaluation produces a combined score of 3.40, comprising a 2.04 strengths component and a 1.36 weaknesses component, indicating that the company's strengths outweigh its weaknesses and are capable of offsetting them. Plotting these totals within the IE Matrix places the company's strategic position as shown in Figure 1.

Figure 1 situates the company in Cell I, a position associated with growth-and-development strategy recommendations. Practically speaking, this means the company's logistics operations can be advanced through integrative strategies—forward integration, backward integration, and horizontal integration.

SWOT Analysis

Computing the opportunity variable produces a weighted total of 3.84, while the threat variable comes to 3.31, each derived by multiplying weight by average rating. The strength variable similarly yields a weighted total of 3.85, against a weakness variable of 3.00, obtained through the same weight-times-rating calculation.

Grand Strategy Diagram Analysis

With the internal and external factors analyzed, the next step in the strategy analysis is to determine the weighted differences between them. The horizontal axis (X) is obtained by subtracting the weakness score from the strength score: 3.84 minus 3.31, giving 0.53. The vertical axis (Y) is obtained by subtracting the threat score from the opportunity score: 3.85 minus 3.00, giving 0.85.

These figures place the company's position on the strategy diagram—used to chart a path toward the target loading and unloading time (laytime) for coal—squarely in Quadrant I, where strengths outweigh weaknesses and opportunities outweigh threats. Companies occupying this quadrant are best served by sustaining their focus on the existing market through forward integration, backward integration, and horizontal integration, and the diagram accordingly points the company toward

these same three integrative approaches.

Strategy Formulation

Having worked through the IE Matrix and the Grand Strategy Matrix, the analysis converges on a strategy expressed through a SWOT matrix. Within it, the S-O (Strength-Opportunity) strategy rests on the idea of drawing on every internal strength the company possesses in order to seize the substantial opportunities available outside it. This yields several concrete recommendations: (1) equip employees with training on the fast-evolving technologies that ease inter-departmental communication; (2) install a barge-loading conveyor to help move coal that has built up in the stockpile, capitalizing on the rising coal price; (3) invest further in employee education, funded by the additional income generated by the rising coal price and by the advantage of the mine's Samarinda City location; and (4) acquire jetties in the vicinity of the coal mines, again capitalizing on the rising Reference Coal Price, so that coal held in sizable stockpiles can reach the market more quickly. These conclusions align with earlier studies on Indonesia's coal sector that applied SWOT analysis in the context of expanding the use of clean, efficient, low-carbon coal (Muflihhamim, 2022; Rahadian & Sumirat, 2022; Sugiyono et al., 2022).

Viable strategies were also identified through the Grand Strategy Matrix, which places the company in Quadrant I, flanked by the opportunity and strength axes, making the S-O strategy the clear fit. As before, the S-O strategy is built on using the company's internal strengths to capture the sizable opportunities present outside it, yielding recommendations that closely mirror those above: (1) train employees in the technologies now easing communication across divisions; (2) introduce a barge-loading conveyor to move accumulated stockpiled coal, taking advantage of the rising HBA; (3) expand employee education using the income gains tied to the rising HBA and the Samarinda City mine location; (4) acquire jetties near the coal mines to capitalize on the rising Reference Coal Price and speed up distribution of stockpiled coal; and (5) the resulting calculations from the IE Matrix and the Grand Strategy Matrix are presented next.

Taken together, the IE Matrix result—Quadrant I—and the Grand Strategy Matrix result—likewise Quadrant I—point the study toward a market-penetration strategy, which David (2022) associates with an integrative approach (forward, backward, and horizontal integration) for firms in this quadrant. Weighing the rating scores against the most heavily weighted opportunity and strength factors, the strategy best suited to lifting the company's performance against its laytime target for coal loading and unloading is to acquire jetties surrounding the coal mines, leveraging the rising Reference Coal Price so that stockpiled coal can move to market faster. David (2022) classifies this as a backward integration strategy, one aimed at securing greater ownership or control over a firm's suppliers. Even positioned in Quadrant I, however, the company continues to bear a fairly steep demurrage cost, since the loading and unloading problems behind that cost do not otherwise disrupt its wider business

operations. What this points to, ultimately, is that the company can strengthen its business by refining its operational practices so that loading and unloading finish within the target window and the demurrage expenses it pays are brought down.

The Demurrage Causes

The demurrage data reveal 146 shipments in which loading and unloading ran beyond the agreed time frame, triggering demurrage charges (Table 2). Jetty-related problems accounted for the largest share, 87 shipments or 60 percent; malfunctioning loading and unloading equipment accounted for 25 shipments or 17 percent; spot contracts accounted for eight shipments or 5 percent; documentation issues accounted for seven shipments or 5 percent; and other, miscellaneous causes accounted for the remaining 19 shipments, or 13 percent. Dewi and Majid (2020) had earlier found that cutting demurrage at PT Samudera Indonesia Jakarta hinges on coordination between shipowners and charterers, prompt and accurate ship berthing, properly executed ship-to-ship loading and unloading, and thorough tank cleaning.

Fazi and Roodbergen (2018) point out that demurrage and detention substantially undercut transportation efficiency, narrow the scope for consolidating shipments, and push operators toward using trucks as temporary buffers and holding containers at ports when they are not immediately required. Hilal (2024) similarly stresses that companies confronting a surge in demurrage need strategic responses built around vendor management, capacity optimization, technology adoption, and rigorous documentation. Demurrage and laytime issues tied to coal transport have likewise drawn attention from Belov et al. (2020), Kweon et al. (2022), Mangala et al. (2023), Rachman (2023), and Rosita (2023), while laytime specifically within coal mining and coal loading and unloading operations has been examined by Bali (2010), Mangala et al. (2023), Schofield (2021), and Ussalam et al. (2023). This body of work is further complemented by cross-country studies applying SWOT analysis to the coal industry, which emphasize safeguarding the safety of coal energy storage and tightening safety oversight, expanding the use of clean, efficient, low-carbon coal, and weighing the implications of coal's eventual exit from the energy mix (Apostu et al., 2022; Muflihhamim, 2022; Sugiyono et al., 2022; Zhang & Ponomarenko, 2023).

CONCLUSION

Taken as a whole, this study—centered on the business strategy needed to hit the target loading and unloading time (laytime) for coal commodities—establishes, through the analysis and discussion set out above, that the IE Matrix places the company in Cell I, a position tied to growth-and-development strategy recommendations. In practical terms, the company can pursue its logistics operations through integrative strategies: forward integration, backward integration, and horizontal integration. The Grand Strategy Diagram calculation likewise situates the company in Quadrant I, where its strengths exceed its weaknesses and its opportunities exceed its threats; firms in this quadrant are well served by

concentrating on their current market through the same three integrative strategies. Mapped onto the SWOT matrix, the company falls under the S-O (Strength-Opportunity) strategy, which calls on it to deploy its strengths in pursuit of the opportunities already available to it. The strategy this study puts forward is backward integration—defined by Fred R. David as a strategy aimed at securing greater ownership or control over a company's suppliers—implemented in practice by acquiring jetties around the coal mines and capitalizing on the rising Reference Coal Price so that coal held in large stockpiles can be distributed more rapidly.

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