

MARITIME BUSINESS

A SHORT INTRODUCTION



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Institute Teknologi Sepuluh November (ITS) Surabaya

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Foreword

The Maritime Business Management is the post graduate program of the Institute of Sepuluh November Surabaya Technology (ITS). It is also major issue of Indonesia as an archipelagic country and as one of the largest economies of the world which mean having economic commodity transaction in a large number, and it must be and mostly transported by sea and the maritime ecosystem in the country and all the networked ones. The challenge is how to manage this issue. The program is one of the responses.

It was many literatures on maritime business. However, we would like to deliver a very short of introduction on the subject notable a material that, perhaps, more suitable for Indonesia and the study of business maritime of the country.

The book is an experimental one, as created as series of discussion among us, three scholars, Riant Nugroho, Tri Achmadi, and Ngurah Buana, and three artificial brain, Chat GPT, Gemini, and Deep Seek. We would like to dedicated the book for all the maritime business, especially toward Indonesia case, by making it free to access academic literature. We hope, the exercise will help students, practitioners, and all the learners to be able to enhance its capacity and capability better on the global maritime management.

Jakarta, July 1th, 2025

RN, TA, IGNSB

Chapter One. Introduction

Economic growth has been becoming the new imperative for Government, especially for the developing countries. There some reasons. It creates economic prosperity. It makes the country trusted by global investors, that drives the next growth; its booster the existing economic growth. It secures government presences. There are two main sources of economic growth: government and business—I prefer “business” than private, as government also has become one of the business actors, or a kind of “state capitalism”.

However, the most efficient, effective, sustainable, and even very natural, is economic growth by business sector. Some countries are preferring government driven economic growth, but it definitely always led to fail. Government is always the centre of cost, naturally. Even the premise of Osborne-Gaebler of *Reinventing Government* (1992), that government should be also profit centre, was believed as mistaken. In some developing countries, that mistaken teaching had led Government to create many “creative taxes” that make the economy getting high cost and alarming. Mancur Olson, a Swedish economist, in his *Power and Prosperity* (2000) found that phenomenon in some countries in Africa, and named that regime as the “banditry government”, and even a “stationary banditry government”. Government had created the legal-creative-taxes, supported by academicians, even the western-well-educated scholars. It was due to the need of the Government to collect revenue as much as they can, to deliver some subsidy and cash transfers—the ECCT, the everlasting conditional cash transfer—to increase the lower income, or poor, population. Even, the global financial institution is helping them if develop the policy, system, and infrastructure, and also some well-made-up theories to secure the idea. The Keynesian economic model has been hijacking as its was transformed from an emergency solution for economic crises into an everlasting economic policy. As noted by Harvard Historian Niall Ferguson “Keynesian economists often dismiss ... long-run concerns when the economy has short-run problems.” Even, Keynes has been

betrayed, as Keynesian stabilization policy involves increasing government spending or lowering taxes to stimulate the economy in recessions, and then reversing those policies when the economy improves. Today's government policy is become "Big Government" by imposing consistent increased taxes. Therefore, especially in the developing countries, the more government –as administrative organization—increase its effort to generate economic growth, the more economic suffer; as the business sector and citizen had the excessive taxation that consequently reduce its competitive capability so sustain, adapt, and growth. Government in some developing countries had chosen the 1930s strategy bluntly as their beliefs –mentioned as the *Zombie Economics* by John Quiggin (2010). Indeed, Drucker has shown the today economy is the "house of Keynes", but he noted that what it needed is the "beyond Keynes", as the today's economic theories has been impoverished by believing the "zombie economics".

So, the belief is not that taxes are not important; but business growth first is the priority rather than taxes. The economic growth has to be come from business growth. The developed countries in northern Europe, especially the Scandinavian, has imposed high taxation because their business has already big, strong, and competitive. And the taxation system secures the sustainability of the business competitiveness, by reducing all the social and political cost of the ecosystem. Therefore, the premise here is how Government prioritizing business growth rather than government or administration growth. As business creates jobs –to confront the poverty; create product that value the society; create country's competitiveness; and, surely, deliver strong tax resources for government. Prioritizing business means it is better to take good care of the golden goose and wait for its eggs, than to slaughter the golden goose and cook it to consume.

What is Business

Business refers to any activity or organization engaged in the production, sale, or exchange of goods and services to fulfil consumer needs and generate profit. It involves various processes such as manufacturing, marketing, finance, and management. At least, there are five key aspects of business. Purpose: To

create value by providing products or services that meet customer demands. Profit Motive: Most businesses aim to earn profits, though some may operate as non-profits. Risk & Uncertainty: Businesses face risks like market competition, economic changes, and operational challenges. Legal Structure: Can be a sole proprietorship, partnership, corporation, or LLC. And, Economic Role: Drives economic growth, creates jobs, and fosters innovation.

There are some types of Businesses: Manufacturing: Produces physical goods (e.g., cars, electronics); Service: Provides intangible services (e.g., consulting, healthcare); Retail & Wholesale: Sells products directly to consumers or other businesses; E-commerce: Online buying and selling (e.g., Amazon, Shopify stores); and Franchise: Operates under an established brand (e.g., McDonald's).

As we mentioned, the importance of Business generates employment, encourages innovation, contributes to GDP, improves living standards, and create nation's competitiveness. In some issues, business help government to gain its global acknowledgment, trust, and support.

Business as a course of study (often referred to as Business Administration, Business Management, or Business Studies) is an academic discipline that explores the theories, principles, and practices of running organizations efficiently. Peter F. Drucker (Management Guru) defines business studies as *"The discipline that teaches how to allocate resources efficiently, make strategic decisions, and lead organizations to achieve economic and social objectives."* He emphasizes management, innovation, and entrepreneurship as core components of business education. Michael Porter (Strategy Expert) views business studies through a competitive lens: *"Business education equips students with frameworks for analyzing industries, understanding competitive advantage, and formulating strategies to sustain profitability."* His Five Forces Model and Value Chain Analysis are key concepts taught in business courses. Philip Kotler (Marketing Scholar) describes business studies with a marketing focus: *"It is the science of creating, communicating, and delivering value to customers while managing profitable relationships in dynamic markets."* Marketing, consumer behavior, and branding are essential parts of business curricula. Henry Mintzberg (Organizational Theorist) critiques traditional

business education, arguing: *"Business schools often overemphasize analytical models while neglecting practical leadership and organizational behavior skills needed in real-world management."* He advocates for a balanced approach combining theory and experiential learning. Harvard Business School (Institutional Definition) defines business studies as: *"A multidisciplinary field integrating economics, finance, operations, leadership, and ethics to prepare students for decision-making in complex global environments."* Case-study methodology (pioneered by HBS) is a hallmark of modern business education.

Core Disciplines of business study is Finance (Investments, Accounting); Marketing (Consumer Behavior, Branding); Operations (Supply Chain, Logistics); Human Resources (Organizational Behavior); and Strategy (Competitive Analysis, Business Models). The Skills Developed are Analytical thinking, People Development, Leadership & teamwork, Financial literacy, Strategy, and Communication. In conclusion, business as an academic field blends theory and practice, drawing from economics, psychology, and sociology to train future leaders. Experts like Drucker, Porter, and Kotler highlight its role in shaping decision-makers, innovators, and strategists for the corporate world.

Chapter Two. Discourse on Business Theory

Business theory provides frameworks for understanding how organizations operate, compete, and grow. Experts from different schools of thought have contributed foundational theories that shape modern business education and practice.

Management Theories

First arena is *Management Theories*. There are four main theories on management. First, Scientific Management (Frederick Taylor, 1911) with core idea is efficiency optimization through time-motion studies and standardized work processes. The Key Principles are (1) Break tasks into small, measurable units; (2) Use incentives to motivate workers; and (3) Separate planning (management) from execution (workers). The criticism is the theory is overly mechanistic; ignores human aspects of work. Frederick Taylor's Scientific Management is a management theory that emphasizes the systematic analysis and optimization of work processes to enhance efficiency and productivity. It advocates for using scientific methods to standardize tasks, measure output, and incentivize performance, leading to improved labor efficiency and overall organizational effectiveness.

Key Principles of Scientific Management are:

1. **Standardization:** Taylor believed in standardizing work processes, tools, and methods to ensure consistency and efficiency.
2. **Job Specialization:** He advocated for dividing tasks into smaller, specialized roles to maximize individual expertise and productivity.
3. **Time and Motion Studies:** Taylor used time and motion studies to analyze work processes and identify the most efficient methods for performing tasks.

4. **Scientific Selection and Training:** He emphasized the importance of selecting employees based on their skills and abilities and providing them with appropriate training.
5. **Performance-Based Incentives:** Taylor believed in rewarding employees based on their output and performance to motivate them to work effectively.
6. **Cooperation between Management and Workers:** He emphasized the need for collaboration and communication between management and workers to achieve shared goals.

Taylor's ideas significantly influenced the development of industrial engineering and production management. His work has been instrumental in improving efficiency and productivity in various industries, particularly in manufacturing and assembly lines.

Despite its positive impact, Taylor's theory has faced criticism for its focus on efficiency and its potential to dehumanize workers. Some argue that it may lead to repetitive and monotonous work, reduce worker autonomy, and overlook the importance of human factors in job satisfaction and motivation.

In essence, Frederick Taylor's Scientific Management provides a framework for optimizing work processes and improving productivity through the application of scientific methods and principles.

Second, Administrative Theory (Henri Fayol, 1916) with core idea is focuses on organizational structure and managerial roles. The theory introduced Five Functions of Management (POCCC): Planning, Organizing, Commanding, Coordinating, and Controlling. He had introduced 14 Principles of Management:

1. **Division of Work:** Specializing tasks among employees to improve efficiency and expertise.
2. **Authority and Responsibility:** Managers have the power to give orders and the responsibility to ensure work is done.
3. **Discipline:** Employees should follow rules and regulations to ensure a productive and harmonious work environment.

4. Unity of Command: Each employee should receive orders from only one superior to avoid confusion.
5. Unity of Direction: Everyone should work towards a single, clear objective with one leader.
6. Subordination of Individual Interests to General Interests: The organization's goals should take precedence over individual interests.
7. Remuneration: Fair and reasonable pay and rewards are essential for employee motivation.
8. Centralization and Decentralization: The balance between top-down and shared decision-making should be appropriate for the situation.
9. Scalar Chain: A clear line of authority and communication should exist from top to bottom in the organization.
10. Order: Everything should be in the right place at the right time, including materials and personnel.
11. Equity: Employees should be treated fairly and with respect.
12. Stability of Tenure: Job security and a stable workforce help employees feel safe and perform better.
13. Initiative: Employees should be encouraged to take initiative and share ideas.
14. Esprit de Corps: A strong team spirit and camaraderie are beneficial for a positive work environment.

Third, Human Relations Theory (Elton Mayo, Hawthorne Studies, 1930s). The core idea is that the employee productivity is influenced by social factors, not just pay and conditions. The Key Findings are (1) Informal groups affect performance, and (2) Recognition and participation boost morale. The theory has impacted to Organizational Behavior (OB) as a discipline. Elton Mayo's Human Relations Theory emphasizes the importance of social needs and informal groups in the workplace, advocating for a more humanistic approach to management that prioritizes employee well-being and satisfaction. This theory suggests that workers are motivated by social interaction, recognition, and belonging, not just monetary incentives.

Key Principles of Mayo's Human Relations Theory are:

1. **Organizations are Social Systems:** Mayo viewed organizations not just as structured hierarchies, but as social systems where informal groups and relationships play a crucial role.
2. **Emphasis on Human Needs:** The theory highlighted the importance of psychological and social needs, such as belonging and recognition, in influencing employee behavior and productivity.
3. **Informal Groups:** Mayo recognized the significance of informal groups within the workplace and their influence on worker behavior and performance.
4. **Importance of Communication:** The theory emphasized the need for effective communication and open dialogue between management and employees to build trust and improve morale.
5. **Employee Well-being:** Mayo believed that a supportive and positive work environment, where employees feel valued and appreciated, leads to increased job satisfaction and productivity.

Mayo's Human Relations Theory emerged from his research at the Hawthorne plant, a Western Electric factory, where he conducted a series of experiments exploring the relationship between working conditions and productivity. The initial experiments focused on the impact of lighting on productivity, but Mayo's findings revealed that the social and psychological aspects of the workplace were more influential than physical conditions.

Mayo's theory has significantly influenced modern management practices, particularly in the field of human resource management. His work highlighted the importance of Employee engagement and morale, in which organizations now recognize the value of creating a positive and supportive work environment that promotes employee engagement and job satisfaction; Teamwork and collaboration which emphasis on social interactions and informal groups has led to a greater focus on teamwork and collaboration within organizations.; Employee recognition and appreciation where organizations are increasingly implementing programs to recognize and appreciate employee contributions to boost morale and motivation.; and Open communication and feedback that taught he importance of effective

communication and open dialogue between management and employees is now widely recognized.

Fourth, Modern Management (Peter Drucker, 1954 - "The Practice of Management"). The Core Idea is that management is a profession, not just a role. Key Contributions are (1) Management by Objectives (MBO); (2) Knowledge Worker Productivity; and (3) The concept of decentralization. Peter Drucker, often called the "Father of Modern Management," revolutionized business thinking by emphasizing the importance of people, clear goals, and social responsibility. He advocated for a management style that focused on outcomes, rather than just processes, and encouraged continuous learning and adaptation. Drucker's ideas, including Management by Objectives (MBO), have had a lasting impact on how businesses are run and how leaders think. Key aspects of Drucker's modern management approach are:

1. **Emphasis on People:** Drucker believed that effective management requires understanding and valuing the human element within organizations, including empowering employees and fostering a sense of purpose in their work.
2. **Focus on Results:** He emphasized the importance of setting clear objectives, measuring performance, and continuously improving processes to achieve desired outcomes.
3. **Continuous Learning and Adaptation:** Drucker stressed the need for organizations to be proactive in anticipating and responding to changes in the external environment, and to continuously learn and adapt their strategies.
4. **Social Responsibility:** He advocated for businesses to operate ethically and with a sense of social responsibility, considering the impact of their actions on society.
5. **Management by Objectives (MBO):** This approach, developed by Drucker, involves setting clear goals and measuring performance against those goals, encouraging collaboration between supervisors and subordinates.

6. Decentralization: Drucker believed in empowering employees and decentralizing management, allowing for greater autonomy and flexibility within organizations.

Drucker's ideas have been widely adopted by businesses and are taught in business schools around the world. His work has had a profound influence on organizational leadership and continues to inspire managers and leaders in the 21st century. He is credited with transforming management into a discipline that is both effective and ethically sound.

Strategic Management Theories

The second arena of theories is *Strategic Management Theories*. The most prominent figure is Michael E Porter with his Porter's Competitive Advantage (1985). The Core Idea is that the firms achieve dominance through cost leadership, differentiation, or focus. There is concept of Five Forces Model: (1) Threat of New Entrants; (2) Bargaining Power of Suppliers; (3) Bargaining Power of Buyers; (4) Threat of Substitutes; and (5) Industry Rivalry. Detailed Explanation of Each Force:

1. Threat of New Entrants: This force refers to the ease or difficulty with which new competitors can enter the market. Factors like barriers to entry (e.g., high capital investment, regulatory requirements, strong brand loyalty) can make it more challenging for new entrants, potentially reducing the threat.
2. Bargaining Power of Buyers: This force examines the power that customers have over suppliers. Factors like buyer concentration, the cost of switching to alternative suppliers, and the availability of substitute products can influence buyer power.
3. Bargaining Power of Suppliers: This force focuses on the power that suppliers have over buyers. Factors like supplier concentration, the availability of substitute inputs, and the cost of switching to alternative suppliers can influence supplier power.
4. Threat of Substitutes: This force considers the presence of alternative products or services that can fulfil the same customer needs. If there

are many substitutes available, it can reduce the profitability of the industry, as buyers have more choices.

5. **Competitive Rivalry:** This force examines the intensity of competition among existing players in the industry. Factors like the number of competitors, the concentration of market share, product differentiation, and the cost of switching to alternative products can influence the intensity of rivalry.

Figure 2.1. Porter's Strategic Management: Five Forces



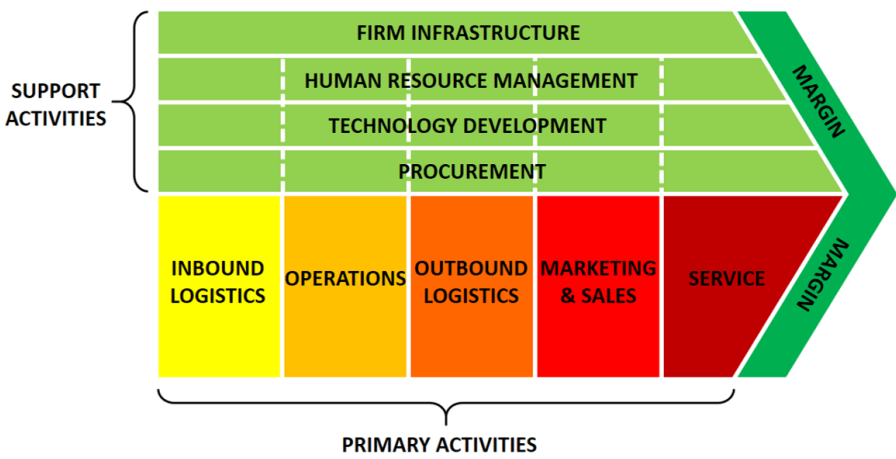
Source: <https://www.business-to-you.com/porters-five-forces/>

The second main Porter's contribution is Value Chain Analysis. It is a strategic management tool that breaks down a company's operations into distinct elements to identify where value is created and where competitive advantage can be gained. It helps companies understand how their activities contribute to the overall value they provide to customers and identify areas for improvement. Here's a more detailed breakdown:

The Core Concepts is *value chain*, *primary activities*, and *support activities*. Value Chain is a collection of activities a company performs to design, produce,

market, deliver, and support its products or services. Primary Activities is any activities that directly involved in the creation, delivery, and support of the product or service. Examples include inbound logistics, operations, outbound logistics, marketing and sales, and service. Support Activities is any activities that provide the necessary infrastructure for primary activities to be performed efficiently and effectively. Examples include procurement, human resource management, technology development, and infrastructure.

Figure 2.2. Porter’s Strategic Management: Value Chain



Source: <https://coursius.com/article/read/value-chain-model-untuk-meningkatkan-efisiensi-dan-efektivitas-proses-bisnis>

The value chain is working on four steps. First, Identify Activities. The process begins by identifying all the key activities within the company, both primary and support. Second, Analyze Each Activity. Each activity is then analyzed to determine how it adds value, what costs are associated with it, and how it relates to other activities in the value chain. Third, Identify Strengths and Weaknesses. By analyzing each activity, the company can identify its strengths and weaknesses in terms of creating value and reducing costs. Fourth, Develop Strategies. Based on the analysis, the company can develop strategies to

improve its performance in the value chain, such as optimizing specific activities, improving efficiency, or leveraging its strengths.

Benefits of Using Porter's Value Chain Analysis are improved Understanding of Cost Drivers: Helps identify where costs are being incurred and how they can be reduced; Enhanced Differentiation: Identifies opportunities for differentiation and creating unique value propositions; Better Resource Allocation: Provides insights into where to focus resources to improve performance; Competitive Advantage: By optimizing the value chain, companies can gain a competitive advantage in the market. In essence, Porter's Value Chain Analysis is a powerful tool for understanding how a company creates value, identifying areas for improvement, and developing strategies to gain a competitive advantage.

The second mainstream idea on strategy is Resource-Based View (RBV) strategy, which developed by Barney (1991). The core idea is that sustainable advantage comes from VRIO resources: Valuable, Rare, Inimitable, Organized to exploit. VRIO is a strategic framework to evaluate a company's internal resources and capabilities. It helps determine if these resources can provide a sustainable competitive advantage based on their value, rarity, imitability, and how well the organization is set up to exploit them. A resource is considered valuable if it helps the company exploit opportunities or defend against threats; it's rare if it's not widely possessed by competitors; it's inimitable if competitors find it difficult or costly to imitate; and the company must be organized to effectively leverage the valuable, rare, and inimitable resource.

Table 2.1. Resource-Based View (RBV) Strategy

VRIO Element	Key Question	Competitive Impact
Valuable	Does it create value?	No → Competitive disadvantage
Rare	Do few others have it?	No → Competitive parity
Inimitable	Is it hard to copy?	No → Temporary advantage
Organized	Can the firm exploit it?	No → Unused potential
All Four: Yes		Sustained Competitive Advantage

VRIO framework using a real-world company: Apple Inc. Specifically, let's evaluate Apple's brand and ecosystem as a resource. First, on Valuable. Apple's brand and integrated product ecosystem (iPhone, Mac, iCloud, Apple Watch, etc.) offer users a seamless experience. This creates customer loyalty, repeat purchases, and pricing power, which are clear sources of value. The conclusion is: Yes – Apple is Valuable. Second, on Rare. Few companies have the same level of global brand recognition and integrated hardware-software ecosystems. Competitors may have strong brands (like Samsung), but Apple's level of customer engagement and ecosystem lock-in is rare. The conclusion is: Yes – Apple is Rare. Third, on Inimitable. Apple's brand is built over decades through design, innovation, marketing, and trust. Its ecosystem is protected by proprietary software, design patents, and tight hardware-software integration. The culture, customer loyalty, and innovation pipeline are hard to replicate. The conclusion is: Yes – Apple is Inimitable. Fourth, on Organized to Exploit. Apple has the organizational capability to fully leverage these resources: Retail stores, R&D infrastructure, Global supply chain, and Marketing excellence. Its structure supports continual innovation and monetization. The conclusion is: Yes – Apple is well Organized. Because Apple's brand and ecosystem are Valuable, Rare, Inimitable, and Organized to exploit, they are a source of sustained competitive advantage.

The third most valuable strategy is Blue Ocean Strategy (Kim & Mauborgne, 2005). The Blue Ocean Strategy is a business framework developed by W. Chan Kim and Renée Mauborgne in their 2005 book, *Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant*. Red Ocean: Represents existing industries where companies compete fiercely (e.g., price wars, market share battles). Blue Ocean: Refers to unexplored markets where competition is irrelevant because the company creates new demand. The strategy encourages companies to break away from saturated, highly competitive markets ("Red Oceans") and instead create new demand in untapped market spaces ("Blue Oceans"). The core idea is instead of competing in saturated markets ("Red Oceans"), create uncontested spaces ("Blue Oceans"). In sum, Blue Ocean Strategy is a business strategy that encourages companies to create new market spaces ("blue oceans") that are free from

competition, rather than competing in existing industries ("red oceans") where rivals fight over limited demand.

The core of Blue Ocean Strategy is offering higher value at lower costs by differentiating while reducing unnecessary features. Example: Cirque du Soleil redefined the circus industry by blending theatre with acrobatics, eliminating costly animal acts. To reconstruct market boundaries, companies should have the “Four Actions Framework” of ERRC: Eliminate factors the industry takes for granted; Reduce overdesigned elements; Raise aspects that exceed industry standards; Create new features never offered before. The Six Paths Framework of a systematic approach to identifying Blue Oceans are: Looking across alternative industries, strategic groups, buyer groups, complementary offerings, functional-emotional appeal, and time (trends). Benefits of blue ocean strategy are: Avoids direct competition; Expands market potential; Can lead to higher profitability and growth. However, there some criticism, as not all Blue Oceans remain uncontested indefinitely, and the execution risks if the market isn’t ready for innovation.

Table 2.2. Blue Ocean Strategy

Red ocean strategy	Blue ocean strategy
Compete in existing market space	Create uncontested market space
Beat the competition	Make the competition irrelevant
Exploit existing demand	Create and capture new demand
Make the value/cost trade-off	Break the value/cost trade-off
Align the whole system of a company's activities with its strategic choice of differentiation or low cost	Align the whole system of a company's activities in pursuit of differentiation and low cost

Source: <https://hbr.org/2004/10/blue-ocean-strategy>

There are some examples of Blue Ocean Strategies Implementation. They are Uber which combined technology with ride-hailing, reducing wait times and improving convenience; Apple iTunes that simplified music purchasing by offering single-track downloads instead of full albums; and Nintendo Wii by targeted casual gamers with motion-sensing instead of competing on graphics with Sony and Microsoft.

Organizational Theories

The third arena –after management theory and the strategy—is Organizational Theories. The first modern thought of organization is Max Weber by coined the concept of Bureaucracy Theory (Max Weber, 1922). The concept of bureaucracy was systematically analyzed by Max Weber (1864–1920), a German sociologist, in his work on organizational structures and authority. Weber saw bureaucracy as the most efficient and rational way to organize human activity, especially in large-scale institutions like governments and corporations. Weber defined bureaucracy as a formal system of organization and administration designed to ensure efficiency, predictability, and fairness. Core Idea is the organizations should be structured with Hierarchy, Rules & Procedures, and Impersonal Relationships.

Weber outlined several characteristics of an ideal bureaucracy. Hierarchy of Authority – Clear chain of command with each level controlling the one below. Division of Labor – Tasks are specialized, and roles are clearly defined. Formal Rules & Procedures – Standardized operations ensure consistency. Impersonality – Decisions are based on rules, not personal preferences. Career Orientation – Employment is based on technical qualifications and merit. And, Written Documentation – Records and rules are documented for accountability.

Table 2.3. Weber ideal bureaucracy

Feature	Explanation
1. Clearly Defined Roles (Division of Labor)	Jobs and tasks are specialized, and everyone knows their responsibilities.
2. Hierarchical Structure	A clear chain of command exists—from top management to entry-level employees.
3. Formal Rules and Procedures	Operations are governed by written rules to ensure uniformity and predictability.
4. Impersonality	Decisions are made without favoritism or personal relationships—only based on rules and logic.
5. Employment Based on Technical Qualifications	Hiring and promotion are based on merit, qualifications, and performance—not personal connections.
6. Career Orientation	Employees see their roles as a long-term career, offering stability and advancement through ranks.

There advantages of bureaucracy: Efficiency – Clear procedures reduce ambiguity; Predictability – Rules ensure consistent outcomes; Fairness – Impersonality minimizes favoritism; Scalability – Effective for large organizations.

Weber believed bureaucracy was the most rational and efficient way to organize complex organizations, like governments or corporations, especially in industrial societies.

While influential, Weber’s model has faced criticism for being rigid and slow to adapt to change, discouraging creativity and innovation, promoting "red tape" and excessive paperwork, creating a dehumanizing work environment, depersonalization by lack of flexibility can frustrate employees and customers, problem of goal displacement as it imposed principle of following rules becomes more important than achieving objectives, and power concentration that can lead to authoritarian tendencies.

Despite criticism, bureaucratic principles remain influential. However, bureaucracy is still visible in governments, universities, hospitals, and large corporations, even though, today, there's a shift toward more flexible, decentralized, and agile structures, but Weber's model still serves as a benchmark for understanding organizational design. For government and public administration, it ensures fairness and accountability in policies. For corporations, the large businesses use bureaucratic structures for efficiency (e.g., HR policies, compliance). The International Organizations as the UN, WTO, and EU rely on bureaucratic systems for regulation.

There are some adaptations of bureaucracy, as many organizations now adopt flatter hierarchies (e.g., tech start-ups). There are the Hybrid Models which combining bureaucracy with flexibility (e.g., *Agile management* in IT). And, recently, there is the Digital Bureaucracy in which AI and automation streamline bureaucratic processes (e.g., e-governance).

While classical bureaucracy is sometimes seen as outdated, its core principles (rules, hierarchy, specialization) still underpin modern organizations. The challenge today is balancing structure with adaptability to avoid inefficiency while maintaining fairness and order.

The second theory on organization is the Contingency Theory (Joan Woodward, 1960s) which the core idea is that there's no "one best way" to manage—structure depends on environment, technology, and size.

The Contingency Theory of Joan Woodward is a foundational concept in organizational theory that emphasizes the relationship between a firm's structure and its technological context. Joan Woodward (1916–1971) was a British management scholar who conducted empirical research in the 1950s and 1960s on industrial organizations. Her studies focused on how different production technologies influenced organizational structure and effectiveness. Woodward examined about 100 manufacturing firms in England, categorizing them based on their production technology into three main types. First, Unit/Small-Batch Production, with characteristics of customized, small-scale production (e.g., tailor-made furniture, specialized machinery); flexible,

decentralized, organic structure with less formalization of the organizational structure, and the more supervisory, employee autonomy, and adaptability of management style. Second, Mass/Large-Batch Production, with characteristics of the standardized, assembly-line production (e.g., automobiles, appliances); mechanistic, hierarchical, with strict rules and formal procedures of the organizational structure; and the clear chain of command, specialized roles, and bureaucratic control of management style. Third, the Continuous Process Production, characterized by the highly automated, non-stop production (e.g., chemical plants, oil refining); moderately organic but with complex controls due to technology of the organizational structure; and highly skilled workers, teamwork, and less direct supervision of its management style.

Woodward’s findings challenged the idea of a “one best way” to organize a company (as proposed by classical management theories). Instead, she argued that organizational success depends on aligning structure with technology—no single structure works universally. Technology determines structure: The complexity and predictability of production processes shape whether a firm should be mechanistic (rigid, formalized) or organic (flexible, adaptive). Performance is contingent on fit: Firms that matched their structure to their technology performed better than those that didn’t. and, middle managers in mass production: Woodward found that large-batch firms had the most layers of management, whereas unit and process firms required fewer levels.

Table 2.4. Woodward’s organizational success

Type of Technology	Description	Example
1. Unit/Small Batch	Custom-made products in small quantities	Tailored suits, specialized machinery
2. Mass/ Large Batch	Standardized, large-scale production	Automobile assembly lines
3. Process Production	Continuous flow production	Oil refining, chemical manufacturing

However, there are some criticisms and limitations of the work. The theory was too focused only on manufacturing firms, limiting generalizability. Its overemphasized technology while neglecting other factors (e.g., environment,

culture). Later contingency theorists (like Lawrence & Lorsch) expanded the framework to include external environments.

Table 2.5. Lawrence & Lorsch organizational success

Technology Type	Best Structure	Characteristics
Unit/Small Batch	Organic	Flexible, adaptable, decentralized
Mass Production	Mechanistic	Standardized, hierarchical
Process Production	Mixed/Organic	Technical expertise, tight control

In some, Contingency Theory challenges the idea of one-size-fits-all management. Instead, success depends on alignment between environment, strategy, structure, and technology. Woodward’s work was pivotal in shifting management thought from universal principles to contingency-based thinking, influencing later theories like Lawrence & Lorsch’s Differentiation-Integration Theory and Thompson’s Technological Determinism. Her research remains relevant in operations management, organizational design, and industrial sociology.

The third important theory of organization is Institutional Theory (DiMaggio & Powell, 1983). The core idea is that the organizations conform to norms and regulations to gain legitimacy. The Institutional Theory developed by Paul J. DiMaggio and Walter W. Powell is a foundational framework in organizational sociology that explains why organizations within the same field tend to become increasingly similar over time—a phenomenon they term “institutional isomorphism.” Key Concepts of DiMaggio & Powell’s Institutional Theory are:

1. Institutional Isomorphism. Refers to the process by which organizations in a given field grow more alike in structure, culture, and practices, even if these changes don’t necessarily improve efficiency.
2. Three Types of Isomorphism. Three main mechanisms drive isomorphism. Coercive Isomorphism: External pressures from regulations, laws, or cultural expectations force organizations to adopt certain practices (e.g., government mandates, industry standards). Mimetic Isomorphism: Organizations imitate successful or prestigious peers in response to uncertainty (e.g., adopting “best practices” without clear evidence of their effectiveness). And, Normative

Isomorphism: Professionalization and shared norms among experts (e.g., through education, certifications, or industry networks) lead to homogenization.

Table2.6. DiMaggio & Powell Institutional Theory

Type	Description	Example
1. Coercive Isomorphism	Pressure from laws, regulations, or powerful stakeholders (like governments or funders).	Hospitals complying with government health standards.
2. Mimetic Isomorphism	Organizations copy others, especially in uncertain situations.	A start up copying Google’s culture (free food, open offices) to appear innovative.
3. Normative Isomorphism	Arises from professional norms, education, and associations.	Accountants using the same auditing standards because they were trained similarly.

3. The Role of Organizational Fields. DiMaggio & Powell emphasize that isomorphism occurs within *organizational-fields*—groups of organizations (e.g., universities, hospitals, corporations) that interact under a common regulatory, technological, or cultural framework.
4. Legitimacy Over Efficiency. Organizations often adopt structures and practices not because they are the most efficient, but because they confer legitimacy, helping them gain acceptance and resources.

Why Do Organizations Conform? To gain legitimacy, access to resources, or to appear trustworthy—even if it's not the most efficient way to operate. “Organizations become similar not because it is better for performance, but because it is better for acceptance.” The Key Takeaways are that the organizations don’t operate in a vacuum—they respond to social expectations; there are institutional pressures lead to similarity across organizations in the same field; and the goal is often legitimacy, not just efficiency or profitability.

For example, the universities around the world are looks alike: Degree structures (Bachelor’s, Master’s, PhD), Ranking systems, and Accreditation

standards. Why? Because of normative pressures (from academic associations), coercive pressures (from governments), and mimetic pressures (copying prestigious institutions).

However, there are criticisms as some argue the theory overlooks agency and strategic choice. Later scholars (like Richard Scott) expanded it by incorporating cultural-cognitive dimensions.

On Competition Theory

The fourth arena of business theory –management, strategy, and organization—is competition. Business is always in competition. Therefore, all the business theory has to exercise in the competition arena. The first and induced theory is Porter’s Five Forces: Analyzing Industry Competition (*Michael Porter, 1979*). It is a framework to assess the profitability potential of an industry by examining five competitive forces:

1. Threat of New Entrants (Barriers to entry: capital, regulations, brand loyalty).
2. Bargaining Power of Suppliers (Can suppliers dictate prices?).
3. Bargaining Power of Buyers (Can customers demand lower prices?).
4. Threat of Substitutes (Are there alternative products/services?).
5. Industry Rivalry (Intensity of competition among existing players).

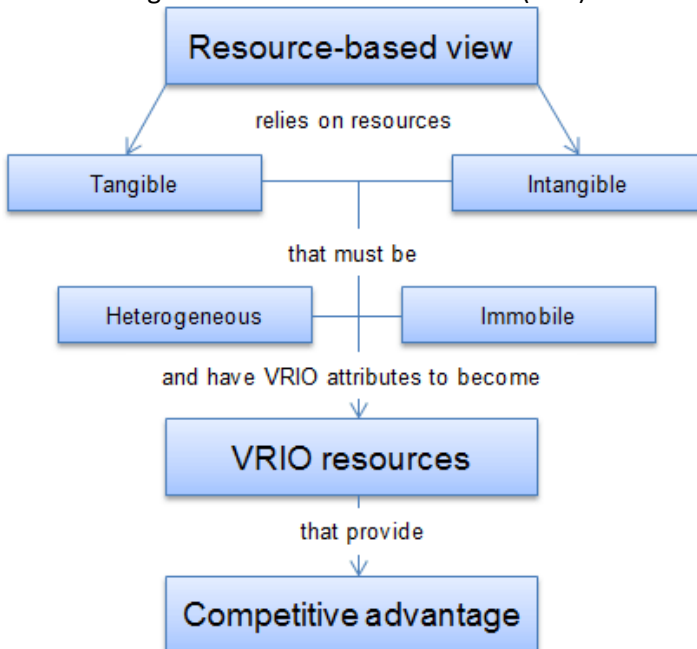
The theory was applied, for example, in the Airline Industry. The raising questions are regarding to the five competitive forces. Low Barriers to Entry? No (high capital costs, regulations). Supplier Power? High (Boeing/Airbus dominate aircraft supply). Buyer Power? High (customers compare prices easily via Expedia, Skyscanner). Substitutes? Yes (trains, video conferencing). Rivalry? Extreme (price wars, low profit margins). Result: Airlines struggle with profitability (except luxury carriers like Emirates with differentiation).

Critiques toward recent issue is that the theory ignores disruption. It didn’t predict Uber (taxi industry substitute) or SpaceX (supplier disruption). It didn’t embrace the digital ecosystems: Platforms like Amazon/Alibaba change power

dynamics. It takes to become the Sixth Force Proposed: by adding "Complementors" (e.g., iOS apps boost iPhone sales).

The second theory is Resource-Based View (RBV) that raised issue of "Why Some Companies Dominate" (Jay Barney, 1991), we have already discussed. We have discussed that the core concept is sustainable competitive advantage comes from unique, hard-to-copy resources (VRIO framework). The raised question we have delivered are: Valuability: does the resource create value? Rareness: is it scarce in the market? Inimitability: can competitors replicate it? And Organizabilities the firm structured to exploit it?

Figure 2.3. Resource-Based View (RBV)



Source: <https://strategicmanagementinsight.com/tools/resource-based-view/>

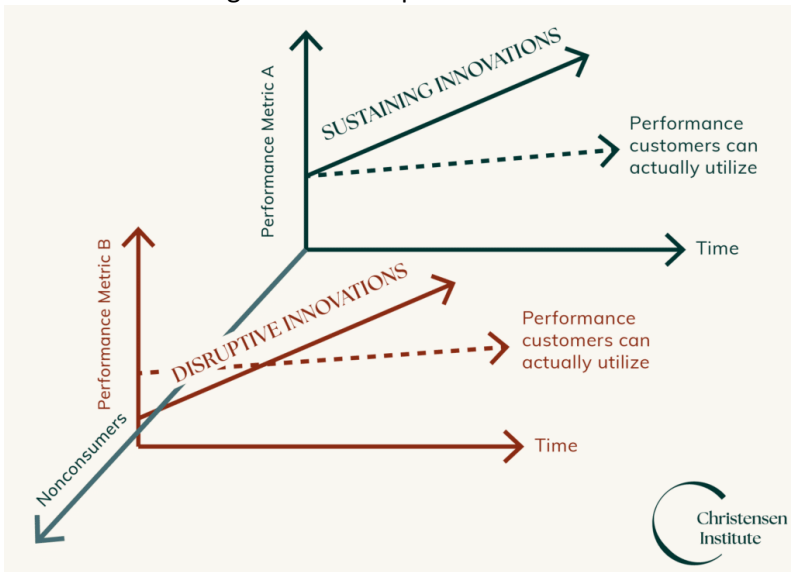
As we recognized, at least there are two critics toward RBV theory. First, according to the Dynamic Capabilities Theory (Teece, 1997), in fast-changing markets (e.g., tech), firms must continuously adapt (e.g., Apple pivoting from

iPods to iPhones). Second, the theory is overemphasis on Internal Factors ignores external shocks (e.g., COVID disrupting supply chains).

The third theory is the Disruptive Innovation: How Start-ups Topple Giants (Clayton Christensen, 1997). The core concept is the innovations that start at the low end (cheaper, simpler products) and eventually displace incumbents that focus on high-margin customers, start-ups target overlooked segments, and quality improves until start-ups dominate.

Real-World cases are Netflix vs. Blockbuster, in which Blockbuster focused on DVD rentals (high margins), Netflix started with mail-order DVDs (low-end), then streaming (disruption). Other example is Digital Cameras vs. Kodak. Kodak ignored digital (protecting film profits), and start-ups like Canon/Sony disrupted the market.

Figure 2.4. Disruptive Innovation



Source: <https://www.christenseninstitute.org/theory/disruptive-innovation/>

However, not All Disruptions Succeed as many start-ups fail –we presumed 90-95% start-up was failed. Also, there is a Hybrid Disruption reality (Bower & Christensen, 1995) where some incumbents adapt (e.g., Microsoft embracing cloud/AI). And, there is a "Market-Creating Innovation" (Christensen's Later Work) where disruption can also expand markets (e.g., mobile banking in Africa).

We might synthesize and make interact those three theories in practice. Porter's Five Forces explains industry attractiveness, RBV explains why certain firms win within that industry, and Disruptive Innovation explains how new entrants overthrow incumbents.

Platform Economies, i.e. Amazon/Google defy traditional industry boundaries. AI & Data: is becoming the new "resources" (e.g., ChatGPT's training data) challenge RBV. There is a phenomenon of Speed of Disruption, i.e. TikTok rose faster than Christensen's model predicted.

Key Takeaway for Business Leaders are use Porter to scan your industry, apply RBV to audit your firm's strengths, and Anticipate Disruption by asking: *"Who's serving unmet needs cheaply?"*

Marketing Theories

The fifth arena of business theory –management, strategy, organization, and competition—is Marketing Theories. The first theory is Marketing Mix (4Ps) of Jerome McCarthy (1960). The Marketing Mix 4Ps, introduced by E. Jerome McCarthy in his 1960 book *Basic Marketing: A Managerial Approach*, is a foundational framework for developing effective marketing strategies. The 4Ps represent the four key elements businesses must consider to successfully market their products or services.

Figure 2.5. Marketing Mix (4Ps)



Source: <https://www.mageplaza-com.translate.goog/blog/4-ps-of-marketing.html>

Table 2.7. Marketing Mix (4Ps)

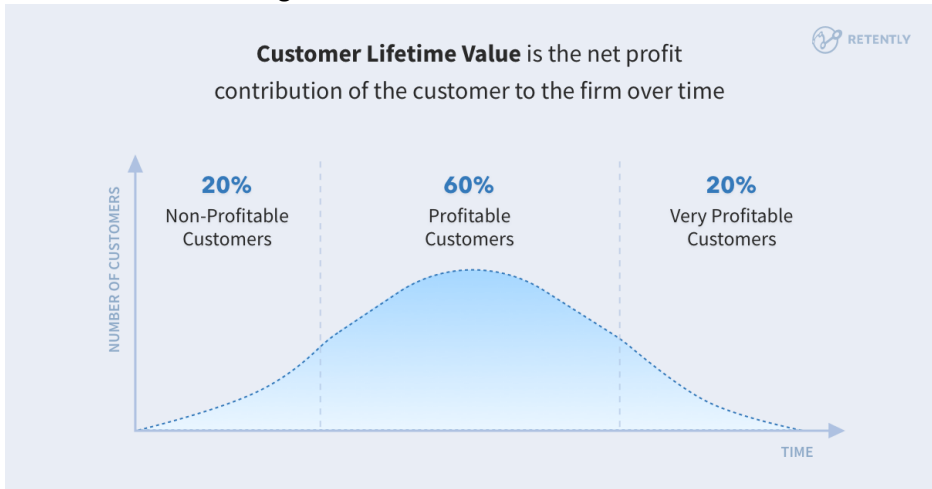
P	Element	Key Question
1. Product	What are we selling?	The goods or services offered to meet customer needs. Includes design, quality, features, branding, and after-sales service.
2. Price	What is the value exchange?	The amount customers must pay. Involves pricing strategy, discounts, payment terms, and perceived value.
3. Place	Where and how is it available?	The distribution channels and locations where the product is accessible. Covers logistics, online/offline presence, and convenience.
4. Promotion	How do we communicate with customers?	The methods used to inform and persuade the market. Includes advertising, sales promotions, public relations, and social media.

Product is the item or service being offered to meet customer needs. Key considerations are: Features, design, quality, branding; Product variety, packaging, warranties; and Lifecycle management (introduction, growth, maturity, decline). Price is the amount customers pay for the product. Key considerations are: pricing strategy (premium, penetration, economy, etc.); discounts, payment terms, financing options; and competitor pricing and perceived value. Place (Distribution) is about how and where the product reaches customers. The key considerations are: distribution channels (online, retail, wholesale, direct sales); logistics, inventory management, supply chain; and market coverage (intensive, selective, exclusive distribution). Promotion is the communication strategies to inform and persuade customers. The key considerations are: Advertising (TV, digital, print); public relations (PR), sales promotions; and, now, the social media, influencer marketing, content marketing.

The 4Ps matter as it helps businesses align offerings with market needs, guides strategic decision-making across different marketing functions, and provides a structured approach to competitive positioning. Later, the model was extended to 7Ps to better accommodate service-based businesses by adding People (employees, customer service); Process (service delivery mechanisms); and Physical Evidence (tangible aspects like environment, branding).

The second theory of marketing is Customer Lifetime Value (CLV) that developed by Kotler (1990s). The core idea is that the marketing effort should focus on long-term customer profitability rather than one-time sales. Customer Lifetime Value (CLV) is a marketing metric that estimates the total value a customer brings to a company over the entire duration of their relationship. Philip Kotler helped popularize CLV in strategic marketing by emphasizing that businesses should focus not just on one-time sales, but on building long-term, profitable relationships with customers.

Figure 2.6. Customer Lifetime Value



Source: <https://www.retently.com/blog/increase-customer-lifetime-value/>

CLV is important as it helps businesses prioritize high-value customers, guides marketing investments and customer service efforts, supports decisions around customer acquisition cost (CAC), and encourages customer retention strategies. The basic formula of CLV is:

CLV = Average Purchase Value × Purchase Frequency × Customer Lifespan

For more advanced calculations (especially in finance and SaaS businesses), CLV is often discounted for time value of money:

$$CLV = \sum_{t=1}^n \frac{R_t - C_t}{(1 + d)^t}$$

Where:

- R_t = revenue from the customer in time period t
- C_t = cost to serve the customer in time period t
- d = discount rate
- n = number of periods

In Kotler's strategic marketing framework, CLV is not just a financial formula — it's a philosophy of customer-centricity. He argued that "the most valuable asset of a company is its customers." From his perspective, firms should segment customers by lifetime value, focus more resources on high-LTV customers, and develop loyalty programs, customized communication, and value-added services to increase CLV.

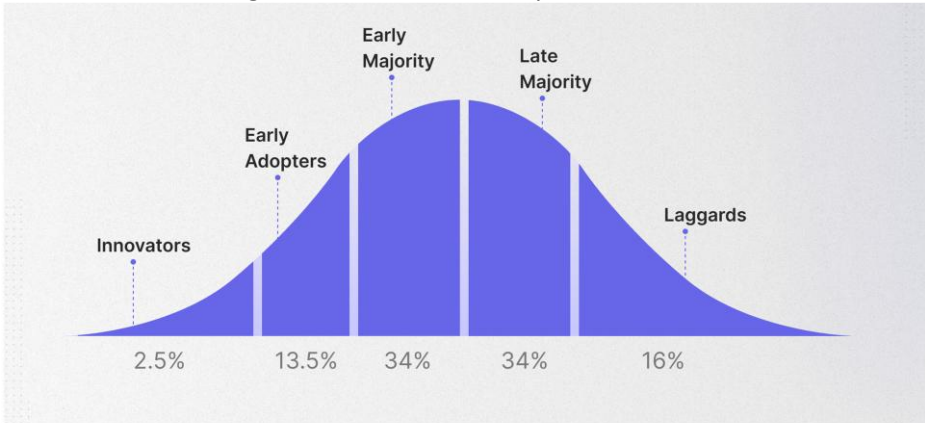
Starbucks is one of the examples. A regular Starbucks customer might spend $\$5 \text{ per visit} \times 4 \text{ visits/week} \times 50 \text{ weeks/year} \times 10 \text{ years} = \$10,000+$ lifetime value. Starbucks uses this data to justify investments in loyalty programs and personalized mobile apps to increase frequency and retention.

The third theory on marketing, perhaps is the least theory that acknowledged as marketing theory, is the theory of the Diffusion of Innovation (Everett Rogers, 1962). The core idea is the products spread through innovators, early adopters, early majority, late majority, and laggards. Everett Rogers, a communication theorist and sociologist, introduced the Diffusion of Innovation Theory in his 1962 book *"Diffusion of Innovations."* The theory explains how new ideas, products, or technologies spread through a population or market over time.

The Diffusion of Innovation (DOI) Theory, developed by Everett Rogers in 1962, is a foundational concept in marketing that explains how, why, and at what rate new products, ideas, or technologies spread through a population. This theory is highly relevant in marketing for several key reasons. First, to understanding consumer adoption patterns. Rogers classified consumers into five adopter categories:

1. Innovators (2.5%) – Risk-takers, tech enthusiasts, first adopters, eager to try new products.
2. Early Adopters (13.5%) – Influential, opinion leaders, open to change.
3. Early Majority (34%) – Deliberate, thoughtful, adopt once proven, Pragmatic consumers who adopt after early proof.
4. Late Majority (34%) – Sceptical, only adopt when a product is mainstream, adopt after peer pressure.
5. Laggards (16%) – Resistant to change, last to adopt.

Figure 2.7. Consumer Adoption Patterns



The marketing relevance of the theory is helping marketers segment audiences and tailor strategies for each group, understanding that the early adopters are crucial for word-of-mouth marketing and viral growth, and knowing that the early majority requires social proof (reviews, testimonials) before buying.

The theory explains how products move from introduction to mass adoption. There is a need for innovators and early adopters drive initial sales. It was then an action toward crossing the chasm (Geoffrey Moore's extension of DOI) that highlights the challenge of moving from early adopters to the early majority. Lastly, marketing strategies must evolve as the product gains acceptance (e.g., from exclusivity to mass-market appeals).

Rogers identified five key attributes that affect how quickly an innovation spread. Relative Advantage – Is it better than existing solutions? (Marketing must highlight benefits.). Compatibility – Does it fit with consumers' values and habits? (Positioning is key.). Complexity – Is it easy to use? (Simplification & education matter.). Trialability – Can consumers test it before committing? (Free samples, demos.). Observability – Are results visible to others? (Social proof & influencer marketing.)

The marketing relevance of the theory is that the marketers must address these factors in messaging (e.g., Apple’s "user-friendly" positioning), and at the same time reducing perceived risk (e.g., free trials, money-back guarantees) speeds adoption.

The other marketing relevance of the theory is regarding the strategic pricing and distribution. First, Skimming Pricing: Target innovators & early adopters with high prices, then lower them for the majority. Second, the Penetration Pricing: Low initial prices to accelerate mass adoption. Third, the Distribution: Early stages may use exclusive channels (e.g., Tesla’s direct sales), later expanding to mass retail.

The other marketing relevance of the theory is also regarding with communication and persuasion strategies. There is the Early Stages: Focus on education (explaining the innovation). There is the Growth Stage: Leverage social influence (testimonials, influencer marketing). And, there is the Maturity Stage: Highlight widespread acceptance ("Join millions of users").

Table 2.8. Adopter’s element & Role in Marketings

Element	Role in Marketing
Adopter Categories	Guide targeting and messaging
Adoption Curve	Shapes product launch timing
Innovation Attributes	Help improve product design and appeal
Strategic Insights	Predict diffusion speed and barriers

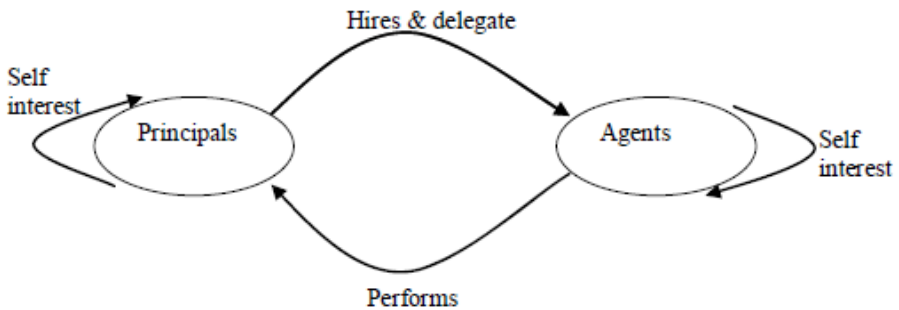
Rogers’ Diffusion of Innovation Theory remains crucial in marketing because it provides a structured framework for understanding how products gain traction. By applying its principles, marketers can segment audiences effectively, tailor messaging to different adoption stages, accelerate adoption by addressing barriers, optimize pricing, distribution, and promotion strategies, and helps forecast how fast and widely a product will be adopted. The theory is much useful for new product, new tech, apps, and social trends.

Financial and Economic Theories

The sixth arena of business theory—management, strategy, organization, competition, and marketing—is Financial and Economic Theories. The first theory needs to be acknowledged is the Agency Theory (Jensen & Meckling, 1976). Agency Theory, developed by Michael Jensen and William Meckling in their seminal 1976 paper "*Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure*," is a foundational concept in corporate governance, finance, and organizational behavior. It examines the conflicts of interest that arise when one party (the principal) delegates work to another (the agent).

The Core Concepts of Agency Theory of Jensen & Meckling is that there are Principal-Agent Relationship. There is Principal, the party delegating authority (e.g., shareholders, employers), and the Agent: The party performing tasks on behalf of the principal (e.g., managers, employees). For example, shareholders (principals) hire CEOs (agents) to run a company. There is Agency Problem. Agents may prioritize their own interests over the principal's goals due to information asymmetry (agents have more knowledge), divergent risk appetites (e.g., managers avoid risky but profitable ventures), and moral hazard (agents slack off or misuse resources). There is the Agency Costs, that Jensen & Meckling define these as the costs incurred to align agent behavior with principal goals monitoring costs (e.g., audits, performance reviews), bonding costs (agents' efforts to prove trustworthiness, like certifications), and residual loss (inefficiencies that persist despite safeguards).

Figure 2.8. Agency Theory of Jensen & Meckling



Source: https://www.researchgate.net/figure/Agency-theory-model-Jensen-Meckling-1976-212-Stewardship-theory-Stewardship_fig1_350546531

There are three key implications in business and finance. First, Corporate Governance. There are mechanisms to reduce agency costs by managing Executive compensation (stock options align CEO-shareholder interests), doing Board oversight (independent directors monitor management), and takeover threats (disciplines underperforming managers). Second, controlling Moral Hazard in Financial Markets. Banks (agents) taking excessive risks because depositors (principals) bear losses and might solved via regulations (e.g., capital requirements). Third, there is Behavioral Conflicts. In short-termism, managers may cut R&D to boost short-term profits. In empire-building perspective, CEOs over-expand to increase personal power.

Table 2.9. Agency Theory of Jensen & Meckling

Concept	Description
Principal	The person or group that delegates authority—e.g., shareholders or owners.
Agent	The person acting on behalf of the principal—e.g., managers or CEOs.
Agency Problem	The conflict that arises when the agent's interests diverge from the principal's interests.
Agency Costs	The costs incurred to monitor, align, or control agents to reduce conflicts (e.g., bonuses, audits, contracts).

The Agency Theory has been criticized by some theories. Stewardship Theory critics that s Some agents act responsibly without incentives. Behavioral Agency Model critics that Agents’ psychological biases affect decisions. Multiple Principals criticize that conflict between shareholders, creditors, and stakeholders. One of the critical issues is the Enron Scandal in which there is an Agency Failure: Executives (agents) hid debts to inflate stock prices, harming shareholders (principals), and the solution is the Post-Enron reforms (Sarbanes-Oxley Act) increased monitoring.

Table 2.10. Element and Description

Element	Description
Theory Name	Agency Theory
Founders	Michael C. Jensen & William H. Meckling (1976)
Focus	Principal–Agent relationships and conflicts of interest
Problem	Agents may act in their own interest, not the principal’s
Solution	Monitoring, incentives, contracts, and governance

The Agency theory still relevant as it explains why CEOs get stock-based pay, why activist investors push for governance changes, explains why strategic misalignment happens inside firms, guides how to design compensation systems and governance structures. important in mergers, acquisitions, franchising, investor relations, and public company regulation, and how blockchain (smart contracts) could reduce agency costs.

The second is the theory of Efficient Market Hypothesis (EMH). The Efficient Market Hypothesis (EMH) is a financial theory proposed by Eugene Fama in the 1960s. It states that: financial markets are "informationally efficient," meaning that all available information is fully reflected in asset prices at any given time. In simpler terms, stock prices always reflect all known information, therefore, it's impossible to consistently "beat the market" through expert stock picking or market timing. In sum, the Stock prices reflect all available information. The Efficient Market Hypothesis (EMH) is a cornerstone of modern financial theory. It asserts that financial markets fully reflect all available information at

any given time, making it impossible to consistently "beat the market" through superior analysis or insider knowledge.

There are two core principles of EMH. First, Market Efficiency. Asset prices (stocks, bonds, etc.) instantly adjust to new information. No investor can consistently achieve abnormal returns (above market average) without taking higher risk. Second, there are three forms of efficiency (Fama’s Classification). First, Weak Form EMH: Prices reflect all past market data (historical prices, trading volumes), and the implication is technical analysis (chart patterns) is useless. Second, Semi-Strong Form EMH: Prices reflect all publicly available information (news, financial statements, etc.). the implication is fundamental analysis (e.g., P/E ratios) cannot consistently outperform. Third, Strong Form EMH. The prices reflect all public + private (insider) information. The implication is, even insider trading shouldn’t yield excess returns (though illegal).

The key assumptions of EMH is that the investors are rational and respond quickly to new information, all relevant public information is immediately and fully reflected in stock prices, and price changes happen only when new, unpredictable information arises.

Table 2.1. Efficient Market Hypothesis

Form	Description	Implication
Weak Form	Prices reflect all past market data (e.g., price trends, volume).	Technical analysis (charting) won’t help you outperform the market.
Semi-Strong Form	Prices reflect all publicly available information (e.g., news, reports).	Neither technical nor fundamental analysis can provide an edge.
Strong Form	Prices reflect all information, including insider information.	No one, not even insiders, can consistently earn excess returns.

EMH is important as it challenges the idea that active investing (trying to pick winning stocks) can consistently outperform the market, supports passive

investing strategies (like index funds), and underpins much of modern portfolio theory and finance education.

Table 2.12. Efficient Market Hypothesis Areas & Suggestions

Area	EMH Suggests...
Investment Strategy	Use low-cost index funds rather than active trading.
Market Timing	It's pointless to try to predict short-term movements.
Insider Trading	In the strong form, even insiders have no advantage.
Financial Regulation	Emphasizes the need for transparency and disclosure.

Behavioral economists (like Robert Shiller) criticize that markets are often driven by irrational behavior and psychological biases. Robert Shiller argue markets are irrational due to herding, overreaction, and cognitive biases (e.g., bubbles like the 2008 crash). Empirical Exceptions criticize that value stocks (low P/E) historically outperform (Fama-French model), and momentum strategies sometimes work (contrary to weak-form EMH). The Information Asymmetry criticized that insiders or institutional investors may exploit gaps (e.g., high-frequency trading). Market bubbles and crashes (e.g., Dot-com bubble, 2008 crisis) suggest prices do not always reflect true value. Some investors (like Warren Buffett) have beaten the market for decades, which raises questions about absolute market efficiency.

Table 2.13. Efficient Market Hypothesis: Aspect & Explanation

Aspect	Explanation
Theory	Efficient Market Hypothesis (EMH)
Founder	Eugene Fama (1960s)
Core Idea	Prices reflect all available information
Key Forms	Weak, Semi-Strong, Strong
Investment Impact	Supports passive investing; questions stock-picking effectiveness

EMH Still Matters as it justifies index funds (Warren Buffett bets on them!), guides regulatory policies (e.g., insider trading laws), and sparks debates

on market predictability. EMH supports passive investing (e.g., index funds), which matches market returns at lower cost. As to Random Walk Theory, price changes are unpredictable and follow a "random walk" (linked to weak-form EMH). Fama-French Three-Factor Model (1992) has expanded EMH by showing that size (small-cap stocks) and value (high book-to-market) factors explain returns better than just market risk (Beta).

The third, is the Game Theory in Business focusing on the Nash Equilibrium. Game Theory is the study of strategic interactions between decision-makers (called *players*), where the outcome for each depends on the choices made by others. In business, it's used to analyze situations like Pricing wars, Market entry, Negotiations, Competitive strategy. Named after John Nash, a mathematician and Nobel laureate, the Nash Equilibrium is a key concept in Game Theory. Game Theory is a powerful framework used in business and economics to analyze strategic interactions between rational decision-makers. One of its most famous concepts is the Nash Equilibrium, developed by mathematician John Nash (of *A Beautiful Mind* fame).

Definition of the Nash Equilibrium is a situation where no player can improve their outcome by unilaterally changing their strategy, given the strategies of others. The key insight is, even if the outcome isn't the "best" for everyone (like in the Prisoner's Dilemma), it's stable because no one has an incentive to deviate. Key Assumptions in Nash Equilibrium of the Game Theory is that the players are rational and seek to maximize their payoff, they consider what others will do before acting, and all players know the rules and payoffs. A Nash Equilibrium occurs when no player can improve their outcome by changing their strategy, as long as the other players keep their strategies unchanged. In other word everyone is doing the best they can, given what everyone else is doing. Imagine two companies, Firm A and Firm B, each deciding whether to set a High Price or Low Price for a similar product.

Table 2.14. Game Theory: Nash Equilibrium

Firm B ↓ / Firm A →	High Price	Low Price
High Price	A: \$10MB: \$10M	A: \$6MB: \$12M
Low Price	A: \$12MB: \$6M	A: \$8MB: \$8M

If both choose High Price, they earn \$10M each. If one cuts price (Low), they gain market share, and the other loses. If both cut, they both earn less (\$8M each). What is Nash Equilibrium in this case? Both choose Low Price, because neither can improve their profit unilaterally.

Business Applications of Nash Equilibrium is on the issue of the oligopoly pricing, in which companies in concentrated markets (e.g., airlines, telecom) often match competitors' prices to avoid losing customers, leading to price stability (even if tacit collusion is illegal). It is also relevant for the advertising wars. If one firm boosts ad, rivals must follow (e.g., Burger King vs. McDonald's), often leading to escalating costs without increased market share. To my experience, in 1990s, there are advertising war between Marlboro and Lucky Strike in Indonesia. While Marlboro doing massive above the line ads, LS doing below the line, as they had to fight in a different way. It is also relevant on the issue of product launches. Tech firms (e.g., Apple vs. Samsung) time releases based on competitors' moves to maximize impact. And, the last, is relevant on trade negotiations. Countries impose tariffs knowing retaliation is likely (e.g., U.S.-China trade war), hurting both sides.

The challenge of the theory is its always assumes rationality, while the real-world players may act emotionally or irrationally. It based mostly on multiple equilibria, in which some games have several Nash Equilibria (e.g., coordination games like "drive on left vs. right"). The theory is facing the fact of dynamic games. Nash Equilibrium focuses on one-shot games, but businesses compete repeatedly (see Repeated Games or Folk Theorem).

However, there are A Beyond Nash, or Other Game Theory Tools. It is a Prisoner's Dilemma: Explains why cooperation is hard even when mutually beneficial. It is a Bayesian Games: For incomplete information (e.g., bidding in

auctions). And, it is an Evolutionary Game Theory: How strategies evolve over time (e.g., tech standards like Blu-ray vs. HD DVD).

Table 2.15. Game Theory: Concept & Explanation

Concept	Explanation
Game Theory	Strategic decision-making among interdependent players.
Nash Equilibrium	A stable state where no player can improve their outcome by changing strategy alone.
Business Use	Competitive strategy, pricing, market entry, advertising, negotiation.

Game theory is matter as it able to predicts competitor behavior in competitive markets, helps design incentives (e.g., avoiding price wars), and guides negotiation tactics and auction bidding.

Challenges of Business

Businesses have faced evolving challenges throughout history, shaped by economic systems, technological shifts, and societal changes. The first age, perhaps, is the Ancient & Pre-Industrial Challenges (Before 1800s), in which we might found the scholars as Adam Smith, Ibn Khaldun, Chanakya. Business is merely trade and transportation. There were limited infrastructures (e.g., Roman roads, Silk Route risks), as Ibn Khaldun (14th century) highlighted how geography and tribal conflicts disrupted trade. There was a lack of formal institutions, as No banking, contracts, or property rights, as noted by Chanakya (Arthashastra, 300 BCE), which emphasized corruption and unstable governance as business risks. There was subsistence economy, as most businesses were small-scale (farming, crafts), as noted by Adam Smith (Wealth of Nations, 1776) that brought the critiqued of (state) mercantilism (government monopolies stifling free trade).

The second age was the Industrial Revolution Challenges (1800s–Early 1900s), in which we might found the works of Karl Marx, Frederick Taylor, Max Weber. It was Karl Marx that found the labor exploitation and the worker unrest, as Harsh factory conditions led to unions and strikes. Karl Marx (Das Kapital, 1867)

predicted class struggle between capitalists and workers. Frederick Taylor found problem of inefficient production caused by manual processes caused waste. Frederick Taylor (Scientific Management, 1911) advocated standardization to improve efficiency. Max Weber exercised the bureaucratic rigidity as large corporations became sluggish. Max Weber (Bureaucracy Theory, 1922) had warned about red tape killing innovation.

The third age was the Mid-20th Century Challenges (1940s–1990s) in which we meet the scholars as Peter Drucker, Michael Porter, W. Edwards Deming. The first issue was the Post-War Competition, where globalization forced firms to differentiate. It was Michael E. Porter (1980s) that companies had struggled with low-cost rivals (e.g., Japanese automakers vs. Detroit). The second issue was Quality Control Issues in which the cheap mass production led to defects. It was Edward Deming (Total Quality Management, 1950s) that taught continuous improvement (adopted by Toyota). The third issue was the Management Short-Termism which focus on quarterly profits over long-term strategy. It was Peter F. Drucker (1954) who criticized firms for ignoring knowledge workers' potential.

The fourth age is Modern Challenges (2000s–Present) in which we met Clayton Christensen, Satya Nadella, Klaus Schwab, who coined Industrial Revolution 4.0. it was an issue of Digital Disruption that legacy firms (e.g., Blockbuster, Kodak) failed to adapt. It was Christensen (Disruptive Innovation, 1997) that premise that "start-ups undermine incumbents by targeting overlooked markets.". Data Privacy and Cybersecurity is another issue, as GDPR, Facebook scandals, ransomware attacks have presence. Satya Nadella (Microsoft) noted that "Every company is now a tech company—security is non-negotiable." There is also issue of Sustainability and ESG Pressures as climate change demands green business models. Klaus Schwab (WEF) reminds the calls for "stakeholder capitalism" over pure profit focus.

There recent issue of Geopolitical Instability as there are trade wars (U.S.-China), Brexit, supply chain shocks. Ray Dalio (Principles for Navigating Big Debt Crises, 2018) taught that "businesses must diversify or collapse in volatile times." The other challenging recent issue is AI and Job Displacement, as the

automation threatens traditional roles. Erik Brynjolfsson (MIT) noted of "The challenge is reskilling, not just efficiency."

The fifth challenge is The Future one: The Emerging Challenges (2020s and Beyond) in which we have experts as Amy Webb, Yuval Noah Harari, Azeem Azhar. At least, there are four emerging challenges. First, AI Ethics and Bias which questioning who’s accountable for AI decisions? Timnit Gebru (AI Ethics Researcher) has worn on "Unchecked AI reinforces inequality." Second, the Hybrid Work Models which underline the remote vs. office culture clashes. Adam Grant (Organizational Psychologist) highlighted the "productivity ≠ presence." The third is the Metaverse and Web3 Uncertainty which bring a question, i.e., will blockchain/Virtual Reality redefine commerce? Mark Zuckerberg (Meta) reminding that “the next platform is immersive—but adoption is slow." The fourth is the Pandemic Resilience as COVID-19 exposed fragile supply chains. Bill Gates (The Next Pandemic, 2022) noted that "businesses need pandemic playbooks."

Table 2.16. Key Takeaways Across Eras

Era	Biggest Challenge	Expert
Ancient	Trade instability	Ibn Khaldun
Industrial	Labor exploitation	Karl Marx
20th Century	Global competition	Michael Porter
Modern	Digital disruption	Clayton Christensen
Future	AI ethics	Timnit Gebru

Lesson Learned and Reflection: The Constant in Business Challenges

While tools and technologies change, core struggles remain in three arenas: Adapting to change (from Silk Road bandits to cyberattacks); Balancing profit & ethics (from slave labor to ESG investing); and Managing human capital (from factory workers to gig economy).

Question for Reflection is *which historical challenge do you think still impacts businesses the most today?* (e.g., Is "worker exploitation" in sweatshops any different from "gig economy precariousness"?). We had a case comparison of

Ford's 1914 Labor Challenges vs. Amazon's Modern Workforce Issues, that exercise compares Henry Ford's revolutionary \$5/day wage (1914) with Amazon's labor controversies (2020s) to show how worker treatment remains a core business challenge—even as technology evolves.

Ford Motor Company (1914): The \$5/Day Wage Experiment. Early 1900s: Factory work was gruelling, with high turnover and union unrest. Ford's Model T production required efficient assembly lines, but workers kept quitting. Ford's Challenge were high turnover (370% annually) as workers hated repetitive tasks, and low productivity: Training new hires slowed production. The solution was doubled wages to \$5/day (vs. industry avg. of \$2.34), reduced shifts from 9 hrs to 8 hrs, and implemented "Sociological Department" to ensure workers met moral standards (e.g., no drinking). The result was turnover dropped, productivity soared, and workers could afford cars they built (created a consumer class). The problem was there was a paternalistic control: Ford monitored workers' personal lives, and race/gender exclusion: \$5/day mostly went to white men. Peter Drucker solution might call Ford's move "efficiency wages"—paying more to retain talent. While Karl Marx would argue Ford just co-opted workers to prevent unionization.

Amazon (2020s) business is The Algorithmic Warehouse. As we knew, e-commerce demands speed and scale, leading to hyper-efficient (and stressful) warehouses. Amazon's workforce includes 1.5M employees, many in fulfilment centres.

Amazon's Challenge was the high injury rates: OSHA data shows Amazon warehouses have double the injury rate of competitors; Turnover (150% annually): Burnout from AI-driven quotas (e.g., packing 300 items/hr). the solution was to raised average wage to \$18/hr (vs. retail avg. of \$12), upskilling programs (e.g., Career Choice pays for education), and introduces robot assistants (reducing physical strain). The outcome is Amazon able to has the faster deliveries which customer loyalty, and some workers advance to tech roles. The new problem is time off task (TOT) tracking: Algorithms penalize bathroom breaks, and union resistance: Amazon aggressively opposes unions (e.g., Staten Island victory overturned). Clayton Christensen might analyze that

Amazon’s model is "efficiency innovation" which the solution is cutting costs at human expense. Zeynep Ton (MIT) might argues "good jobs strategy" (better pay + training) boosts long-term profits.

Table 2.17. Key Parallels & Differences

Aspect	Ford (1914)	Amazon (2020s)
Labor Challenge	High turnover from monotony	Burnout from AI surveillance
Solution	Higher wages + shorter hours	Higher wages + robots
Worker Control	Moral policing (Sociological Dept.)	Algorithmic monitoring (TOT system)
Social Impact	Created middle-class consumers	Accelerated gig economy precarity
Criticism	Exclusionary, paternalistic	Dehumanizing, anti-union

Both Ford and Amazon boost productivity but face backlash for worker dignity issues. Lesson is short-term efficiency gains can backfire (e.g., unionization pushes, reputational harm). The issue is then the Technology’s Double-Edged Sword. Ford’s induced assembly line, and Amazon replace people with robots. The question is does technology or AI empower or exploit workers. However, it is still the same issue: the wage debate: Ford’s \$5/day was revolutionary then; is Amazon’s \$18/hr enough today amid inflation.

The final discussion is Can Modern Businesses Avoid Ford’s Mistakes? The answer is Yes, if they listen to workers (e.g., Microsoft’s hybrid work policies), and invest in upskilling (e.g., Starbucks’ college programs). But it might be “No”, because shareholder pressure prioritizes short-term profits over labor welfare, and technology and AI surveillance may worsen worker alienation.

Chapter Three. Maritime Business

The maritime business has evolved dramatically from ancient trade routes to today's high-tech, globalized industry. We made a short but concise comparison of its historical roots and modern dynamics, along with key drivers of change. Maritime business encompasses all commercial activities related to oceans, seas, and waterways, including shipping & logistics, fisheries & aquaculture, offshore energy (oil, gas, renewables), port operations & shipbuilding, and marine tourism.

In the past (Pre-20th Century) the key characteristics of maritime business is exploration. Therefore, it might be cited as the Age of Exploration (15th–18th Century) in which purpose was colonial trade (spices, silk, slaves), with tools was the wind-powered ships (e.g., Spanish galleons), and the players were the European empires (Portugal, Spain, Dutch VOC). The second was the age of Industrial Revolution (19th Century) which introduced technology of steam engines and steel hulls of sailing ships, and had trade routes of Suez Canal (1869) cut Europe-Asia travel time. The business model was national monopolies (e.g., British East India Company). The challenge at the age was piracy, the Barbary Coast raiders, Caribbean buccaneers; Navigation Risks as no GPS; reliance on stars; and labor challenge as they were in the exploitative conditions (e.g., press-ganged crews).

The third is the Present (21st Century). The age is characterized by globalized Supply Chains, in which 90% of world trade moves by sea (UNCTAD), and the megaships, the container vessels (24,000 TEU capacity) dominate. There is the technology revolution of automation, such as AI-driven ports (e.g., Rotterdam's unmanned cranes), and digitalization, the blockchain bills of lading, IoT-enabled cargo tracking. The business has the sustainability focus, as there are Green Shipping: LNG-fuelled ships, hydrogen pilots; and IUU Fishing Crackdowns: Satellite surveillance (Global Fishing Watch). However, there are Geopolitical Tensions in the chokepoints of the Strait of Malacca (20% of global trade), and territorial disputes in South China Sea, Arctic routes. The novel challenges are climate change, as such the rising seas threaten ports;

overcapacity, as such Shipping rates volatility (e.g., COVID-19 disruptions), and labor shortages, the coming of aging workforce in shipbuilding.

3.1. Key Drivers of Change

Factor	Past	Present
Technology	Compass, sextant	AI, blockchain, automation
Energy	Wind → Coal → Diesel	LNG, hydrogen, offshore wind
Trade Routes	Colonial monopolies	Globalized, China-centric
Regulation	None → Flag state rules	IMO 2020 (sulphur caps), ESG

The age of the Future (2030+). In this age there will be the Autonomous Ships, as we see the Rolls-Royce’s unmanned cargo vessels; the Blue Economy, a Carbon-neutral aquaculture, deep-sea mining; and Arctic Shipping, as melting ice opens new routes (Russia-China).

Definition of Maritime Business

According to scholars, maritime business encompasses *"The commercial activities related to the transportation of goods and people by sea, the exploitation of marine resources, and the infrastructure supporting these activities, including ports, ships, and logistics networks."* – Stopford, M. (2009), *Maritime Economics*. The key elements are Shipping and Logistics (bulk carriers, container ships); Port Operations & Management; Fisheries, Aquaculture & Offshore Energy; and Marine Tourism & Coastal Development.

In economic view, as defined by Branch (2007) *"Maritime business is a derived demand—it exists to serve global trade. Its health depends on GDP growth, commodity cycles, and trade policies."* The definition focus on freight rates, supply-demand balance, market cycles.

In the Logistics/Supply Chain View, as defined by Notteboom & Rodrigue (2008) *"The maritime sector is the backbone of global supply chains, with containerization and hub ports reshaping production networks."* The definition focus on port efficiency, intermodal connectivity, just-in-time shipping.

In the Legal/Regulatory View, as defined by Molenaar (2015), *"Maritime business operates within a complex web of international law (UNCLOS), flag state regulations, and environmental treaties (IMO)."* The definition focus on flagging, liability, piracy laws, emissions compliance.

In the Sustainability View, as defined by Couper et al. (2015) *"The 'Blue Economy' demands balancing profit with ocean health—sustainable shipping, IUU fishing eradication, and decarbonization."* The focus of the definition is about green corridors, ESG investing, circular fisheries.

In the Strategic/Geopolitical View, and defined by Mahan (1890) *"Control of sea lanes equals economic power. Today, chokepoints (Malacca, Suez) and BRI ports are strategic assets."* The definition focus on China's port investments, Arctic shipping routes.

Key Debates Among Scholars. There are Globalization vs. Protectionism debates, such as should cabotage laws (e.g., Indonesia's *Pelayaran Rakyat*) protect local shipping or liberalize for efficiency. There is debate on Automation vs. Labor which discussed about the unmanned ships (Rolls-Royce) could cut costs but eliminate jobs. It is a debate on State vs. Private Control, which raised issue of should ports be PPPs (Singapore model) or state-run (China model). Still, there is a debate between Growth vs. Sustainability, as deep-sea mining for clean energy minerals vs. ocean ecosystem risks.

Blue Economy and Maritime Economy

There are key differences between the Blue Economy and Maritime Economy, though they overlap. Here's a concise breakdown based on scholarly definitions and real-world applications:

Definition & Scope. Maritime Economy had a core focus on Commercial use of ocean resources (shipping, ports, fisheries). Meanwhile, core focus of Blue Economy is Sustainable use of oceans for growth, while preserving ecosystems. The scope of the maritime economy is Broader: Includes *all* ocean-related

industries (even unsustainable ones). Meanwhile, Blue Economy scope is narrower: on *eco-friendly* and *innovative* uses of marine resources. The key sectors of maritime economy are shipping, logistics, oil/gas, fisheries, shipbuilding, while blue economy's key sectors are offshore wind, marine biotech, eco-tourism, coral restoration.

World Bank (2017) noted that *Blue Economy* emphasizes "sustainability, inclusivity, and resilience." While Stopford (2009) noted that *Maritime Economy* covers "traditional industries dependent on sea trade."

Maritime economy main issue is profit making, while blue economy on sustainability. Therefore, Maritime Economy may include unsustainable practices (e.g., overfishing, oil spills). For example, bottom trawling for fish (profitable but destructive). Blue Economy prioritizes circularity (zero waste) and renewables, with examples seaweed farming for biofuels (absorbs CO₂). However, the two might be aggregated in a single sentence of Gunter Pauli on *The Blue Economy* (2010): "*The Blue Economy is the maritime economy done right.*"

The growth driver of the maritime economy is trade volume and GDP contribution. The policy tools i.e. port subsidies, shipping lanes. The global actors of maritime economy are China (in shipping), Saudi (on oil). Meanwhile, blue economy growth driver is green jobs, climate resilience; its policy tools are marine protected areas (MPAs), carbon credits and trading, and the main global actors are Norway (offshore wind), and Seychelles (blue bonds).

We might take Indonesia case study. In term of maritime economy, Indonesia's Maritime Economy is the world's 2nd-largest wild fish catch (\$27B/year). In term of blue economy, Indonesia's Blue Economy acted on mangrove restoration (carbon credits) and seaweed exports.

The key difference of the two study and practices is that the purpose or the maritime economy is profit, while blue economy is on profit plus planet sustainability. On innovation, the maritime economy is concern about efficiency (e.g., bigger ships), while blue economy is on eco-design (e.g.,

biodegradable fishing gear). The policy under maritime economy is free trade agreements, meanwhile blue economy is about achieving UN Sustainable Development Goal 14 (Life Below Water).

Maritime economy is matters for Indonesia as Indonesia fix port delays is problem (costing 24% of GDP). Blue Economy is matters for Indonesia, as, for example, to lead in seaweed processing (vs. exporting raw).

Indonesia Maritime Business

Indonesia's maritime business—a sector with immense potential but also unique challenges. Given Indonesia's status as the world's largest archipelago (17,000+ islands, 3.25 million km² of ocean), maritime industries are critical for trade, food security, and energy. Below is a structured breakdown of key opportunities, challenges, and policy strategies.

Maritime business is matters for Indonesia. Historically, Indonesia once the spice trade epicentre, Indonesia can reclaim maritime leadership. Today challenge is that Indonesia needs to modernize ports, fisheries, and shipping to compete with Singapore/Vietnam. In the future, offshore wind, seaweed biofuels, and green shipping could be Indonesia's new "spice trade."

There are some Indonesia in Scholarly Discourse on maritime business. Stopford (2009) highlights Indonesia's *"archipelagic disadvantage"*—high logistics costs due to fragmented geography. Sekimoto (2020): Praises Indonesia's *anti-IUU fishing policies* as a global model but critiques *port inefficiencies*. Wang (2022) warns of *"debt-trap diplomacy"* in Chinese-funded ports (e.g., Kuala Tanjung).

There are five main sectors of maritime business in Indonesia. First. shipping and logistics. The domestic shipping, Indonesia needs to connects islands (pelayaran rakyat / "pelra"). The international trade, 90% of Indonesia's exports move by sea. The challenges are the high logistics costs (24% of GDP vs. 13% in Malaysia) and ageing fleet (60% of ships >20 years old).

According to fisheries and aquaculture, the potential is as the world's 2nd-largest wild fish catch, but IUU fishing (illegal fishing) costs \$20B/year. The opportunities are shrimp farming as Indonesia is a top global exporter, and sustainable aquaculture, i.e. seaweed, grouper, lobster. The offshore energy of Indonesia, in oil and gas, there are Masela Block, and Natuna Sea Block. There is also a renewable energy as such offshore wind, tidal energy (e.g., NTT pilot projects).

The tourism and coastal development economy as such marine tourism at Raja Ampat, Komodo, Wakatobi. However, the challenges are overcrowding and coral reef damage.

The ports and maritime infrastructure, there are some key hubs, as such Tanjung Priok (Jakarta) and Tanjung Perak (Surabaya). The issues are congestion, inefficiency (dwell time ~3 days vs. Singapore's 1 day).

Major Challenges in Indonesia's Maritime Business of the Indonesia maritime business is Illegal Fishing (IUU) that caused by weak enforcement and corruption, while the impact was loss of US \$ 20 billion dollars per year. Port inefficiency is also the main challenge. It is caused by bureaucracy, port management, and also the problem of the overall economic policy the creating the early de-industrialization that in effect decreasing the volume of the containerized product. The problem of economic scale then caused the inefficiency of the port business management, in which drive the high shipping cost. The other challenge is poor ship-building industry performance caused by lack of investment, market, and unadvanced technology. Therefore, Indonesia maritime business has relied on the foreign ships, as many of the internal sea-connection is served by foreign ships with domestic/national company's flag. Maritime business is also facing the issue of marine pollution as many of unrecycled wasted as plastics and oil spills that damaged fisheries and deteriorated the maritime tourism. Climate change has been challenged Indonesia maritime business as rising sea level and coral bleaching is becoming policy concern as it threatens coastal livelihoods.

Box: **De-industrialization in Indonesia**

De-industrialization in Indonesia refers to the decline in the contribution of the manufacturing sector to the country's GDP and employment, despite Indonesia's historical reliance on industrialization for economic growth. Here are the key aspects of the problem:

Declining Share of Manufacturing in GDP. Indonesia's manufacturing sector once contributed around 30% of GDP in the early 2000s but has since fallen to around 18-19% (as of 2023). This decline contrasts with other Southeast Asian nations (like Vietnam and Thailand) where manufacturing remains a stronger driver of growth.

Causes of De-industrialization. The first is commodity Boom Dependence (2000s-2010s): High global prices for coal, palm oil, and other raw materials shifted investment away from manufacturing toward resource extraction. Second, Lack of Industrial Upgrading: Indonesia has struggled to move from low-value manufacturing (textiles, footwear) to high-value sectors (electronics, machinery). Third, Infrastructure Gaps: Poor logistics, electricity shortages, and inefficient ports raise production costs. Fourth Global Competition: Cheaper labor in Vietnam and Bangladesh, along with China's dominance in exports, has eroded Indonesia's competitiveness. Fifth, Policy Shortcomings: Inconsistent regulations, weak intellectual property protection, and limited R&D investment hinder industrial growth. Sixth, Premature De-industrialization: Some economists argue that Indonesia is experiencing de-industrialization before reaching high-income status, unlike developed nations that de-industrialized after achieving wealth.

Consequences of the De-industrialization is, first, slower Job Creation: Manufacturing traditionally provided stable, formal-sector jobs, but growth in low-productivity service jobs has replaced them. Second, Trade Deficits in Manufactured Goods: Indonesia imports more high-tech goods while exporting raw materials, leading to trade imbalances. Third, Vulnerability to

Commodity Price Shocks: Over-reliance on commodities makes the economy volatile when prices drop.

There are Government Responses & Challenges. Indonesia government had conduct Down-streaming Policy: Indonesia is pushing for domestic processing of raw materials (e.g., nickel for EV batteries) to add value; Omnibus Law (Job Creation Law): Aims to improve the investment climate but faces criticism over labor rights; Industrial Zones & SEZs: Developing industrial hubs like Batam and Kendal to attract foreign manufacturers; and Green Industrialization: Efforts to transition to renewable energy and sustainable manufacturing.

According to our finding, the de-industrialization caused less containerized product of industries. Therefore, the issue of port effectiveness is also caused by the upstream sides of the economy. All government policy and effort are struck in the middle of the process, as the problem of de-industrialization is a systemics one, rather than on industrial investment alone.

The success of the Indonesia maritime business depends on the size of the overall economics, support from banking system, improving infrastructure, education, and innovation while avoiding protectionism that could isolate Indonesia from global supply chains. If managed well, Indonesia could revive manufacturing through electric vehicles (EVs), digital economy growth, and ASEAN market integration.

It was delivered policy solutions and business opportunities. To combat illegal fishing (IUU), government might employ satellite monitoring by expand fishing vessel monitoring system (VMS), and developed a system of blockchain traceability by ensure legal and sustainable seafood exports (e.g., EU market demands). The other strategy is to empower local fishermen by providing cheaper cold storage & processing.

The issue of port management might be tackled by modernize ports and shipping management. The option is might try to automate Tanjung Priok as

AI-based cargo tracking (like Rotterdam). Other strategy is by boosting the cabotage by incentivizing domestic shipbuilding (tax breaks for PT PAL Indonesia). It is also option to develop some green ports, i.e. by solar-powered docks, and LNG bunkering.

To develop the blue Economy Indonesia could develop offshore wind farms partnering with Denmark/Japan for tech. Seaweed industry is still the effective strategy by scale up processing (currently, 70% exported raw). Indeed, there is an opportunity to develop marine biotech, i.e. algae for biofuels, and also for pharmaceuticals products.

Maritime economy is also another opportunity for Indonesia with main concern to create a sustainable marine tourism ecosystem by –this is an extreme policy—creating visitor caps, for example proposed a kind of Bali’s “tourist tax”, and/or exercise the eco-certification, a reward for tourist destination, i.e. resorts, who protecting coral reefs. There were some countries with their strategies that might be learned by Indonesia.

Table 3.2. Successful Models to Learned

Country	Strategy	Lesson for Indonesia
Norway	High-tech aquaculture	Use AI for smart fish farms
Singapore	Mega-port automation	Cut dwell time via digital ports
Philippines	Community-based fisheries	Local co-ops reduce IUU fishing
Netherlands	Offshore wind	Leverage Java Sea wind potential

Indonesia might develop an actionable policy strategy that significantly leverage the maritime economic potencies. It takes a response on question of “What’s Next?”. The short term (2024) priority is to impose strict VMS enforcement against IUU fishing, while develop a pilot AI port system in Surabaya. In the Medium-Term (2025–2027), it probable to exercise the tax incentives for eco-friendly shipbuilding, while founding an ASEAN blue

economy partnership (e.g., with Vietnam on shrimp farming). In the Long-Term (2030+) is to make Indonesia a global seaweed processing hub, while implementing the net-zero shipping corridors (e.g., Jakarta-Singapore green lane).

Indonesia's Maritime & Logistics Transformation Roadmap 2024 – 2030 might be developed in five sectors. First, Logistics & Maritime Transport (*Goods & People*) on goal of reducing logistics costs from 24% to 12% of GDP by 2030. It is also critical to improve Domestic Shipping (Pelayaran Rakyat / "Pelra"), by exercising three sequential steps:

- 2024–2025: Subsidize 100 new Ro-Ro ships for short-haul routes (e.g., Jakarta–Sumatra), while digitize "Pelra" bookings via app (like Tiket.com for ships).
- 2026–2027: mandate GPS tracking for all vessels >100 GT (reduce smuggling), while merge small operators into co-ops (e.g., 5,000 ships under KUD Maritim).
- 2030: 50% of inter-island cargo moves via scheduled shipping (vs. 20% today).

In International Shipping, the proposed sequential steps are:

- 2024–2025: tax holiday for shipping companies using <10-year-old vessels, while introducing ASEAN "Green Lane" for container ships (Jakarta–Singapore 24hr clearance).
- 2027–2030: build 2 LNG bunkering hubs (Batam, Surabaya) for clean-fuel ships;

The second sector is port by focusing on port modernization on goal of cutting dwell time from 3 days to <1 day by 2030. On primary port, Tanjung Priok (Jakarta) and Tanjung Perak (Surabaya) the agenda would be:

- 2024–2025: implementing AI cargo scanning regulation (like Singapore's PORTNET); while imposing 24/7 operations with shift bonuses for customs staff.
- 2026–2027: automated stacking cranes (reduce loading time by 40%), while implemented blockchain bills of lading (end paper delays).

On secondary ports (Belawan, Makassar, Sorong) the proposed agenda would be exercising PPP model for private investment (e.g., ICTSI upgrades Makassar) scheduled on 2024-2025 and implementing the "One-Stop Maritime Service" (permits via app) started in 2027.

The third sector is fisheries, that, in fact, need policy fisheries reform on goal of end illegal fishing (IUU) by 2027; to make double fisher incomes by 2030. There are two agendas proposed. First, enforcement and sustainability started by exercising on 2024–2025 the satellite surveillance on all >30 GT boats (real-time VMS), and ban trans-shipment at sea (stops illegal catches mixing with legal ones), while on 2026–2027 introduce community patrols (pay fishers to report IUU). The second is value-added processing, started in 2025 to impose tax breaks for cold storage in 10 fishing hubs (e.g., Bitung), while on 2030 target to export 50% processed fish (vs. 30% today).

The fourth sector is Offshore Energy (Oil/Gas + Renewables) on goal to boosting oil/gas output 20% by 2030; launch 2 GW offshore renewables. On oil and gas, on 2024–2025, government need to impose the fast-track Masela Block (prioritize LNG for Asia), while put tax incentives for deep-water tech (e.g., FLNG). On 2027 it would be need for local content mandate on rigs industry (40% of rigs built by PT PAL). On offshore wind and tidal, started on 2025, it would be a pilot of 100 MW wind farm (Java Sea, partnered with Ørsted). On 2030 proposed to develop 1 GW tidal energy in Lombok Strait.

The fifth sector is sustainable aquaculture on goal of becoming world's top seaweed processor by 2030. On 2024 – 2025 proposed to develop cluster farms of seaweed and shrimp (e.g., 10,000 ha in Sulawesi) with AI water monitoring, while impose export ban on raw seaweed (force processing investment). On 2027 the would be a "Blue Carbon" credits for mangrove-shrimp farms. The lobster and grouper commodity would be proposed on 2025 to develop the hatchery subsidies to stop wild fry harvesting. On 2030, about 50% of lobster exports are farmed (vs. 10% today). The agenda is about funding and enforcement, that exercised in the table below:

Table 3.3. Funding & Enforcement

Policy	Funding Source	Accountability
Port upgrades	PPPs (e.g., MNC Infra)	Ministry of Transportation
Fisheries surveillance	EU/ASEAN anti-IUU grants	Navy, KKP
Aquaculture hubs	Green bonds	Ministry of Marine Affairs

The timeline ad KPIs proposed as below

Tabel 3.4. Timeline & KPIs

Year	Key Milestone	Success Metric
2025	AI ports in Jakarta, Surabaya	Dwell time <2 days
2026	1st LNG bunkering hub (Batam)	100+ ships refuelled
2027	Zero IUU fishing	\$20B/year saved
2030	2 GW offshore wind/tidal	1M homes powered

The overall agenda is to make Indonesia as a maritime powerhouse. However, Indonesia need to have a regional alignment, especially ASEAN and China. Here's a strategic roadmap to align Indonesia's maritime policies with ASEAN and China, balancing sovereignty, economic growth, and regional collaboration on focus of the win-win strategies for sovereignty and shared prosperity.

The first agenda is to align with ASEAN to develop a "One Maritime Community" Vision, with objective of a position Indonesia as ASEAN's maritime leader while harmonizing regional rules. There is a need to develop a joint ASEAN Policy. First, the ASEAN Single Shipping Market, with the main partner in ASEAN are Thailand and Vietnam Which Indonesia's Role is to push for standardized port digitization (adopt Singapore's PORTNET). it would be an Anti-IUU Fishing Task Force, with the main partner in ASEAN are Philippines and Malaysia which Indonesia's role is to share satellite surveillance data to track illegal vessels. It would be an ASEAN Green Lane for Cabotage on all ASEAN member which Indonesia's role is to lead domestic shipbuilding (PT PAL

as regional hub). The action needs a start, for example by propose an ASEAN Maritime Ministers Summit 2025 in Jakarta.

The second agenda is making ASEAN-China Sea Governance, with stance, for example, to invite Chinese investment only in non-strategic sectors (e.g., aquaculture tech, not ports near Natuna), and to leverage China’s BRI: Negotiate "Blue BRI" deals for renewable energy (offshore wind farms, not coal ports) and fisheries processing plants (not fishing fleets).

China is the strategic partner to be engaged by strategy of “Collaborate but Protect” Strategy on “red Lines” No compromise on Natuna sovereignty and illegal fishing. There is need for safe collaboration areas as described below:

Table 3.5. Safe Collaboration Areas

Sector	China’s Strength	Indonesia’s Demand
Port Modernization	COSCO’s global port ops	Chinese tech, not ownership (e.g., AI cranes in Priok).
Offshore Wind	China’s 25 GW capacity	Joint ventures (51% Indonesian equity).
Marine Biotech	Algae-to-biofuel research	Tech transfer to local universities.

The next agenda is countering exploitation by demand transparency by asing all Chinese fishing vessels must use AIS/VMS, penalize violations, by ban Chinese companies involved in IUU (e.g., blacklist COSCO subsidiaries if caught), and enhance the alternative partners, for instance to balance China with Japanese/Dutch investments in ports (e.g., Mitsui for Patimban).

To strengthen the strategy, Indonesia need to develop a “Sovereignty-First Policies” with the area of non-negotiables are (1) no foreign ownership of strategic ports (e.g., Natuna, Sorong); (2) all maritime data stored locally (no Chinese cloud servers); and (3) ASEAN-first hiring: Chinese projects must employ 30% local/ASEAN workers.

The Step-by-Step Implementation would take three phases. The first phase is to build ASEAN Consensus (2024–2025) on Q3 2025 by drafting ASEAN Maritime Data-Sharing Pact (track IUU, piracy), and on Q1 2026 launching ASEAN-China Blue Economy Forum (focus on renewables, not fishing). The second phase is to secure strategic concession with China (2026–2028) with the main prerequisite is China funds 50% of Indonesia's seaweed processing plants (in exchange for market access), while leveraging, for instance, by to delay China's high-speed rail Phase 2 until maritime demands are met. The third phase is to lock in regional wins (2028–2032) by imposing the ASEAN-wide cabotage law, by means that Only ASEAN-built ships can trade intra-ASEAN; and to develop China-ASEAN "Blue Fund", a jointly finance tidal energy research.

The key message to ASEAN is that Indonesia's maritime growth lifts all ASEAN boats—let's unite against IUU and climate threats; to China is "We welcome win-win partnerships, but our seas are not for sale"; and to Indonesian Citizens is "Laut kita adalah masa depan kita" (Our seas are our future.)

The idea might work because ASEAN solidarity counters China's divide-and-rule tactics; China needs Indonesia more than Indonesia needs China (e.g., 60% of China's seaweed imports come from Indonesia); and Tech transfers build long-term sovereignty (e.g., Dutch-taught port automation).

Chapter Four: Maritime Transport

Maritime Transport Management blend core industry knowledge, modern challenges, and strategic leadership skills. Below is a structured breakdown of essential subjects to prepare students for careers in shipping, ports, and logistics. To study the maritime transport in Indonesia, it takes a foundational maritime knowledge on subjects of Introduction to Maritime Industry by studying history, key players (Maersk, MSC, COSCO), and global trade routes; studying the Ship Types and Cargo Operations, as such containers, bulk carriers, tankers, Ro-Ro, LNG carriers; and to study the Maritime Geography, by studying the strategic chokepoints (Malacca, Suez), archipelagic logistics (Indonesia's challenges).

There is a need to study the Maritime Economics and Business on subjects of Freight Markets and Chartering, i.e., spot vs. time charters, Baltic Exchange indices; Port Pricing & Competition, i.e., on why Tanjung Priok loses cargo to Singapore; and Supply Chain Integration, i.e., just-in-time shipping, hub-and-spoke networks. There is also issue of Port and Terminal Management on subjects of Port Operations, as such berth planning, cargo handling, dwell time reduction; Port Governance Models, i.e. public vs. private (PPP) ports (e.g., Rotterdam vs. Jakarta); and Smart Ports and Automation, i.e. AI cranes, blockchain bills of lading (see Port of Rotterdam).

Shipping Law and Regulation is the next part of the study, on subjects of International Maritime Law (UNCLOS, IMO) (Flag state vs. port state control); Contracts & Liability (bills of lading, Hague-Visby Rules, INCOTERMS 2024); and Environmental Compliance (IMO 2020 (sulphur cap), CII ratings, EU ETS for shipping). There is issue on Logistics and Multimodal Transport, on subjects of Intermodal Connectivity (Ship-to-rail/road (e.g., Patimban Port's rail link)); Cabotage Policies (Indonesia's *Pelayaran Rakyat* vs. ASEAN open skies); and Cold Chain Logistics (transporting tuna from Papua to Japan).

Maritime Transport Management is also about Technology and Innovation. There are, at least, three subjects: Digitalization in Shipping (IoT, AI for route optimization (see Maersk's remote containers)); Green Shipping (LNG, ammonia, and hydrogen fuels (Wärtsilä's pilot projects)); and Cybersecurity Risks (Protecting AIS data from spoofing (e.g., China's "dark ships")). Maritime Transport Management is facing Risk and Crisis Management issue, on main subjects are Piracy and Security (best Management Practices (BMP5) in Somali waters); Insurance (P&I Clubs) (how shipowners cover spills, groundings); and Climate Risks (Rising seas vs. port infrastructure (Jakarta's sinking quays)).

Maritime Transport Management need Strategic Leadership, especially on subjects of Maritime Policy Advocacy, i.e. how Indonesia shapes ASEAN shipping rules; Negotiation Skills, on charter party disputes, labor union talks; and Entrepreneurship, for instance launching a *local feeder shipping service* in Eastern Indonesia. The last issue is the Emerging Trends with subjects to watch are Arctic Shipping (Russia's Northern Sea Route); Autonomous Ships (Yara Birkeland in Norway); and Blue Economy (Offshore wind, seaweed farming).

Maritime Transport Management (MTM) is a multidisciplinary field that scholars define through the lenses of economics, logistics, law, and sustainability. According to Martin Stopford (2009), the foremost scholar in maritime economics: "Maritime transport management is the systematic coordination of ships, ports, and logistics networks to facilitate global trade while optimizing costs, efficiency, and environmental impact."

The Core Components Maritime Transport Management are Fleet Management --Vessel acquisition, deployment, and operations; Port-Centric Logistics --Integrating ports into supply chains (Notteboom & Rodrigue, 2008); Regulatory Compliance --Adhering to IMO, UNCLOS, and regional laws (Molenaar, 2015); and Risk Mitigation --Addressing piracy, climate change, and market volatility (Talley, 2017).

Key Theoretical Frameworks & Critical Issues

Scholars analyze MTM through some lenses. First, the Maritime Economics (Stopford, 2009), which seeing the cyclical markets: shipping demand derives from global trade (GDP-linked); Freight Rate Determinants: Supply/demand imbalances drive volatility. For example: COVID-19 caused freight rates to spike 500% (2021). Second, the Port Cluster Theory (Notteboom & Rodrigue, 2005) which discussed ports evolve from cargo handlers to logistics hubs. The Case Study might be Singapore's shift from trans-shipment to digital port services.

Third, Flag State vs. Port State Control (Molenaar, 2015). Flag State is about where a ship is registered (tax/crew rules). Port State is regard to the Inspections to enforce safety/env. laws (e.g., Paris MoU). The fourth, Green Shipping (Psaraftis, 2019), as such IMO 2050: Decarbonization via alternative fuels (ammonia, hydrogen); and Slow Steaming: Reducing speed to cut emissions (but increases voyage time).

Critical Issues in Maritime Transport Management (MTM)

According to some scholars, at least there are three four critical issues: Automation, it is on *Labor vs. Efficiency* (Rodrigue, 2021); Cabotage Laws, as noted as issue of *Protectionism vs. Competition* (Branch, 2007); Piracy, as agenda of *Security Costs vs. Trade Flow* (Talley, 2017); and Climate Adaptation as problem of *Port Resilience* (Becker et al., 2018)

Table 4.1. Critical Issues in Maritime Transport Management

Issue	Scholarly Debate	Example
Automation	<i>Labor vs. Efficiency</i> (Rodrigue, 2021)	Rotterdam's unmanned cranes.
Cabotage Laws	<i>Protectionism vs. Competition</i> (Branch, 2007)	Indonesia's <i>Pelayaran Rakyat</i> .
Piracy	<i>Security Costs vs. Trade Flow</i> (Talley, 2017)	Somali piracy insurance premiums.
Climate Adaptation	<i>Port Resilience</i> (Becker et al., 2018)	Miami's elevated terminals.

However, maritime transport itself is a critical issue of the world economy as it is work as the backbone of global trade, moving over 80% of the world's goods. However, it operates in a complex and ever-changing environment, facing numerous "critical issues" that impact its efficiency, profitability, safety, and sustainability. The first critical issue is Environmental Regulations and Sustainability. The most significant challenge is decarbonization. The industry is under immense pressure to reduce greenhouse gas (GHG) emissions, with targets like a 40% reduction by 2030 and significant decarbonization by 2050. This requires massive investments in cleaner fuels (e.g., LNG, hydrogen, ammonia), new ship designs, and energy-efficient technologies. The industry is also generated air and water pollution. Beyond GHGs, ships emit sulphur oxides (SOx), nitrogen oxides (NOx), and particulate matter, impacting air quality in port cities and coastal areas. Ballast water management and preventing oil spills are also ongoing concerns. There is also underwater noise pollution. Ship noise can disrupt marine life, particularly marine mammals, affecting their communication, migration, and reproduction. The business could face the compliance costs in meeting new and evolving environmental regulations often involves substantial financial outlays for upgrades, new equipment, and operational changes.

The second issue is geopolitical tensions and security. The agenda is piracy and armed robbery. Despite declines in some regions, piracy remains a serious threat, particularly in areas like the Gulf of Guinea, leading to crew kidnappings, cargo theft, and increased insurance costs. There is agenda of

geopolitical instability. Conflicts and political unrest (e.g., Red Sea attacks, war in Ukraine) disrupt key shipping lanes (Suez Canal, Panama Canal, Black Sea), forcing longer routes, higher fuel consumption, and increased costs and risks. Today, the new issue is trade wars and protectionism. There is shifting trade policies and protectionist measures can impact trade volumes and routes, creating uncertainty for shipping companies.

The third issue is supply chain disruptions and port operations. Indonesia is still had a case of port congestion. The case was raised by the overwhelmed ports due to increased cargo volume, labor shortages, or inefficient operations lead to significant delays, increased waiting times for vessels, and ripple effects across global supply chains. Post Covid 19, there is issue of supply chain resilience. The COVID-19 pandemic highlighted the vulnerability of global supply chains. Building more resilient and diversified supply chains is crucial to mitigate future disruptions. There are container shortages or imbalances as the uneven demand recovery and logistical bottlenecks can lead to shortages of shipping containers in certain regions, impacting cargo movement. The next agenda is the chokepoint vulnerabilities. The business has reliance on narrow, critical waterways (e.g., Panama Canal, Suez Canal, Strait of Hormuz) makes the entire system vulnerable to disruptions caused by natural disasters, geopolitical events, or even single vessel incidents.

The fourth critical issue is human resources and workforce management. Still, there is problem of crew shortages. An aging workforce, coupled with a lack of new entrants and the demanding nature of seafaring, leads to significant crew shortages. The other is seafarer welfare. Long periods away from home, limited connectivity, and the mental health challenges associated with seafaring are critical issues for crew retention and well-being. The next is training and adaptation to new technologies. As the industry digitalizes and adopts new green technologies, there's a need to upskill and reskill seafarers and shore-based personnel.

The fifth critical issue is economic and financial challenges. The issue raised by volatile fuel prices. Fuel is a major operating expense, and fluctuating oil prices significantly impact profitability and budgeting. Fluctuating Freight Rates is still

the classic issue. Market volatility, influenced by supply and demand, geopolitical events, and operational costs, leads to unpredictable freight rates, making financial planning difficult. There is problem of rising operating costs. The overall costs, including newbuild prices, maintenance, insurance, and compliance, are increasing. Insurance costs and liability has contributed to the agenda. The rising frequency and severity of incidents (e.g., cyberattacks, environmental fines) lead to higher insurance premiums.

The sixth critical issue is digitalization and cybersecurity. Indeed, there is a lot of improvement supported by digital technology and AI. However, there is cybersecurity threats. Increased digitalization of shipping operations, vessels, and ports makes the industry vulnerable to cyberattacks, potentially leading to operational disruptions, data breaches, and financial losses. Technological integration is becoming the next concern. The adoption of new technologies like AI, IoT, and blockchain offers efficiency gains but also presents challenges in terms of integration, data management, and workforce adaptation. At last, there is problem of data silos and lack of interoperability. Fragmented data systems across different stakeholders hinder efficient information flow and decision-making.

The last critical issue is political one, as problem of regulatory compliance and bureaucratization. Complex regulatory landscape is problem. The maritime industry is governed by a vast and often complex web of international and national regulations. Navigating this bureaucracy can be challenging. The paralel problem is over-regulation. Some argue that an increasing number of regulations can create an undue burden on shipping companies, particularly smaller ones.

Addressing these critical issues requires a concerted effort from all stakeholders, including shipping companies, governments, international organizations (like the IMO), technology providers, and academic institutions. Innovation, collaboration, strategic planning, and a focus on long-term sustainability are essential for the maritime transport industry to navigate these challenges and continue its vital role in global trade.

However, those critical issues are management problem. It is the quality of management of the business that capable to response the challenges. The quality of management is not just an issue; it's arguably the overarching factor that determines how effectively those critical issues are addressed, or if they become even more critical. The quality of management is a critical *enabler* (or *disabler*) in maritime transport. First agenda of management is strategic planning and corporate visioning. In the maritime transport industry with poor management, we might find the lacks foresight, reactive instead of proactive. Fails to anticipate regulatory changes (e.g., IMO 2020, future decarbonization targets), geopolitical shifts, or technological advancements. This leads to costly last-minute adjustments, missed opportunities, and a loss of competitive edge. While in the well manage one, the company will develop long-term strategies, invests in R&D for green technologies, diversifies routes to mitigate geopolitical risks, and builds resilient supply chains. They see challenges as opportunities for innovation.

The second agenda is managing risk. Poor management will fail to identify, assess, and mitigate risks effectively. This can lead to increased incidents (accidents, piracy), financial losses (uninsured liabilities, fines), and reputational damage. Lack of contingency plans for disruptions. The well-manage one will able to implement robust risk assessment frameworks, invests in security measures, diversifies vessel types and routes, and has clear protocols for emergency response and crisis communication.

People is still the challenge. In a poor managed industry, the HR management neglects seafarer welfare, leading to high crew turnover, low morale, and potential human error-related incidents. Fails to invest in training and development for new technologies, creating a skills gap. In a well-managed one, they prioritize seafarer well-being (fair wages, adequate rest, mental health support), invests in continuous training programs, and fosters a strong safety culture. They understand that a skilled and motivated workforce is essential.

Business is about operational efficiency and optimization. In a poor management, it might be inefficient port operations, poor vessel scheduling,

inadequate maintenance, and lack of data utilization. This leads to higher operating costs, delays, and reduced profitability. While the well-manage embraces digitalization, invests in port automation, uses data analytics for route optimization and predictive maintenance, and streamlines processes to reduce turnaround times and fuel consumption. The operational efficiency must be the concern of the company. The action would be route optimization, just-in-time port calls, and the tool might be employed is AI-driven voyage planning (e.g., Windward).

Maritime transport company need capability for managing financial prudence. In the poor management, there would be poor budgeting, insufficient capital allocation for fleet upgrades or compliance, and inability to navigate volatile markets. In the well-managed there would be an exercise of strict cost control, strategically invests in fleet modernization (e.g., dual-fuel vessels), manages financial risks (e.g., fuel hedging), and seeks opportunities for operational savings. The financial management agenda is regarding to the chartering strategies, bunker hedging, while the model of implementation might use the Baltic Exchange's freight derivatives.

The most neglected is about compliance and governance. The company with poor management usually tries to not-to-comply with international and national regulations, leading to fines, detentions, and legal issues. Lack of transparency and ethical conduct. While the well-managed one is always ensuring strict adherence to all regulations (safety, environmental, labor), maintains strong governance structures, and operates with integrity. The regulatory need to be compliance for examples are SOLAS, MARPOL, BIMCO contracts.

The last competitive edge of the company is adaptability and innovation. In the poor one, company resistant to change, slow to adopt new technologies or business models, and unable to adapt to evolving market conditions. While in the well-managed one, company fosters a culture of continuous improvement, embraces innovation, and is agile in responding to market shifts and emerging challenges. Company need, also, to keep the agenda of sustainability in its business as their competitive edge, as its adaptability and innovation, by

implementing, for instance, the circular port economies or the green corridors. Los Angeles, for example, have implemented the zero-emission port trucks.

In essence, while factors like decarbonization or geopolitical instability are indeed "critical issues" that impact the industry, the quality of the management team within each shipping company and across the broader maritime ecosystem determines how these issues are *handled*. High-quality management can turn threats into opportunities, while poor management can exacerbate existing problems and lead to significant failures. Therefore, the quality of management is not just an issue, but a fundamental driver of success (or failure) in navigating the complex landscape of maritime transport.

Indonesia-Focused MTM Challenges

Indonesia, as the world's largest archipelagic nation, relies heavily on maritime transport for its economic activities and national connectivity. However, it faces several critical issues that hinder its maritime transport sector's efficiency and potential.

The problem is the infrastructure limitations and inefficiency. Regarding to the inadequate port infrastructure, many Indonesian ports suffer from limited loading and unloading facilities, outdated technology, shallow drafts limiting the size of vessels that can dock, and insufficient stacking areas. This leads to long transit times for vessels and overall operational inefficiency. On poor inter-port connectivity, there is poor connectivity between routes in the hub and spoke operation scheme, leading to double handling of goods and increased logistics costs. Responding to the issue of limited investment, the maritime sector, particularly port infrastructure development, faces limited investment, both public and private. On maintenance issues, existing infrastructure often suffers from a lack of proper maintenance.

Indonesia has also meet with the problem of high logistics costs and price disparities. It was caused by inefficient logistics system. Indonesia's national logistics costs are significantly higher than the ASEAN average, largely due to infrastructure limitations and operational inefficiencies. The second cause is

the unbalanced supply and demand. There's an imbalance in the supply and demand of goods, especially between western and eastern Indonesia, leading to price disparities for basic and essential goods. The last, but not least, is the high "invisible costs". Shipping companies report high "invisible costs" that impede their improvement and modernization.

There is problem of fleet shortages and aging vessels. Indonesia has a high dependency on foreign fleets for its maritime transport needs. A significant portion of the domestic fleet is old, often over 10 years, leading to higher maintenance costs and lower efficiency. The majority of domestic ships have relatively low capacities compared to those in other countries. Still, today, shipping companies face a lack of funds for fleet expansion and modernization.

There is common problem in Indonesia maritime transport industry: human resources and capacity gaps. There's a shortage of skilled labor in the logistics sector, including qualified seafarers and personnel with expertise in modern logistics technologies. Vocational training for seafarers in traditional shipping industries is limited. The today problem is lack of IT capabilities. There's a critical need to upskill port personnel in IT capabilities to support smart port initiatives.

It should be recognized that there is regulatory and governance challenge. It is a complex regulations and policy changes. The logistics sector operates within a complex regulatory environment with frequent policy changes, affecting customs duties, taxes, and import/export rules. The next is the case of unsynchronized regulations. Regulations across the maritime sector are not always synchronized. It is acknowledged it is an overlapping authority in maritime security. Multiple agencies in maritime security lead to coordination inefficiencies and overlapping responsibilities, resulting in various inspections from different agencies. The unfinished business if the unsettled maritime boundaries. Unclear maritime delimitation with neighbouring states can lead to issues in law enforcement, particularly regarding illegal, unreported, and unregulated (IUU) fishing and piracy.

Indonesia, as an archipelagic country, has a specific geographic and environmental factor, however, there is a challenging geographical condition as Indonesia's vast archipelagic nature makes goods distribution highly complex and costly. Tropical climate with long rainy seasons and extreme weather events often disrupt the flow of goods, leading to delays and increased costs. The rapid pace of infrastructure development, particularly under initiatives like the Belt and Road Initiative, raises environmental sustainability concerns due to potential ecological impacts on marine ecosystems. Indonesia's strategic location makes it vulnerable to criminal activities like piracy and maritime terrorism. Institutionally, the budget cuts for the Indonesian Maritime Security Agency (Bakamla) limit its ability to patrol effectively and ensure maritime security. Incursions by foreign vessels, particularly Chinese vessels in the North Natuna Sea, pose a sovereignty and security challenge.

Addressing these critical issues requires strategic policies focusing on sustainable investment, operational efficiency enhancement, technology integration, human resource development, regulatory reform, and international cooperation. The government's "Maritime Highway" (Tol Laut) program aims to mitigate some of these challenges by improving connectivity and reducing price disparities, but consistent and comprehensive efforts are still needed.

The mentioned port inefficiency is regard to the dwell times 3× longer than Singapore (Sekimoto, 2020), the IUU Fishing that costs \$20B/year (Couper et al., 2015), and the challenge of the archipelagic logistics in which high costs due to fragmentation (Stopford, 2009). There is an idea of developing the ASEAN Single Shipping Market to compete with China's Belt and Road ports.

Challenge and Agenda for Port Company in Indonesia

The agenda that will exercise is what to do if we are a port company in Indonesia, facing the critical issues in maritime transport requires a multi-faceted and strategic approach. Some advises will be, first, is to optimize infrastructure and operations. The agenda will be Modernize and Expand Facilities by: (a) Invest in new equipment: Upgrade to modern, high-capacity

cranes (e.g., super post-Panamax cranes), automated guided vehicles (AGVs), and other advanced cargo handling machinery to increase throughput and reduce turnaround times; (b) Improve yard management: Implement smart yard management systems to optimize storage space, track containers in real-time (using RFID and GPS), and streamline internal movements, minimizing congestion and delays; (c) Deepen drafts: where feasible and economically viable, invest in deepening port drafts to accommodate larger, more efficient vessels (economies of scale); (d) Develop integrated logistics zones: Explore opportunities to develop or partner with integrated logistics zones near your port to offer value-added services and improve hinterland connectivity. The next agenda is Embrace Digitalization and Smart Port Technologies by: (a) Implement a Port Community System (PCS): Integrate systems like Inaportnet, SIMLALA, and NLE into your operations to standardize and coordinate port services, streamline documentation, and enhance data exchange with all stakeholders (customs, shipping lines, logistics providers); (b) Adopt IoT and AI: Utilize Internet of Things (IoT) devices (sensors, wireless technologies) for real-time monitoring of operations, asset tracking, and predictive maintenance. Leverage AI for route optimization, traffic pattern forecasting, and efficient resource allocation; (c) Automate processes: Invest in automation for various stages of port operations, from gate automation (like Pelindo's initiative) to automated quay cranes, reducing human error and increasing 24/7 processing capabilities; (c) Enhance cybersecurity: As you digitize, prioritize robust cybersecurity measures to protect your systems and data from cyber threats. The last will be Improve Inter-Port Connectivity by: (a) continuing support "Maritime Highway" initiatives: Align your operations with the government's "Tol Laut" program by ensuring efficient connectivity with hub ports and supporting inter-island shipping routes, and (b) Enhance multimodal transport: Develop seamless connections with road and rail networks to improve the flow of goods to and from your port's hinterland.

The second advise is addressing logistics costs and price disparities by Increase Operational Efficiency, Optimize Cargo Flow, Collaborate with Logistics Providers, and Explore new business models. In Increase Operational Efficiency it would be modernization and digitalization to directly contribute to reducing operational costs, which can then be passed on to customers or improve your

competitiveness. In Optimize Cargo Flow agenda is to implement real-time tracking, advanced analytics, and efficient scheduling to reduce dwell times and improve the overall flow of goods. Regarding to the agenda of Collaborate with Logistics Providers, it takes a work closely with shipping companies, freight forwarders, and logistics firms to optimize supply chains and identify areas for cost reduction. And, to explore new business models, company need to consider offering integrated logistics services beyond just port operations to capture more value in the supply chain.

The third advise is regarding Fleet Development and Management (if applicable, or influence as a port). The port needs to attract larger vessels by improving your port's efficiency, turnaround times, and facilities, you can attract larger, more modern vessels, helping to reduce reliance on aging domestic fleets. The next is to support domestic shipping (indirectly) by encourage efficient operations that make it more attractive for domestic shipping companies to operate to and from your port.

The fourth challenge is human resources and capacity building by invest in training and skill development. The business policy encompassing the program of providing extensive training for your personnel in IT capabilities, smart port technologies, and data analytics to achieve the next level of digital literacy; to improve the operational excellence by delivering training programs in modern cargo handling techniques, equipment operation, and safety procedures; increasing the quality of leadership and management by developing programs to enhance leadership and management skills within your organization; and collaborate with academic institutions by partnering with universities and vocational schools to develop relevant curricula and internship programs, creating a pipeline of skilled talent. The next program is to foster a culture of continuous improvement: Encourage employees to identify inefficiencies and propose innovative solutions.

The fifth challenge is to navigate regulatory and governance agendas by being stay Updated on Regulations with strategy to proactively monitor and understand changes in Indonesian maritime law, customs procedures, and port

regulations (e.g., Omnibus Law, MOT Regulations); ensure compliance by implement robust internal processes to ensure full compliance with all relevant regulations to avoid penalties and delays; advocate for streamlined processes, by collaborating with government agencies and industry associations to advocate for clearer, more synchronized, and more efficient regulations. Actively participate in discussions on national logistics and maritime policies; and embrace transparency, by implement transparent operational practices and utilize digital systems to reduce opportunities for "invisible costs" and corruption, aligning with government initiatives like the National Corruption Prevention Strategy (Stranas PK).

The sixth is promoting environmental sustainability. First by adopt green port initiatives and executing the project of Energy efficiency --invest in energy-efficient equipment, LED lighting, and explore renewable energy sources for your port operations (e.g., solar, wind); Shore-to-ship power --implement shore-to-ship power systems to allow vessels to turn off their engines while docked, reducing emissions; waste management --develop and implement effective waste management and recycling programs within the port area; eco-friendly equipment --consider adopting electric or hybrid equipment for internal transport; and environmental monitoring --implement systems to monitor air and water quality within the port area. Second, seek certifications by working towards achieving green port certifications to demonstrate your commitment to environmental responsibility. Third, collaborate on green solutions by engaging with technology providers and other stakeholders to implement innovative eco-friendly technologies.

The seventh is strengthening maritime security (collaborative efforts). There is an effort to enhance port security by implement robust security measures within your port facilities to prevent piracy, theft, and other criminal activities. Company also need to increase it collaboration with authorities. It needs to work closely with the Indonesian Maritime Security Agency (Bakamla), Navy, and other relevant law enforcement agencies to share information and coordinate security efforts. There is an imperative to utilize technology for surveillance by deploying advanced surveillance systems, including drones and real-time tracking, to enhance security within your operational area.

By proactively addressing these challenges with a strong focus on modernization, digitalization, human capital development, and sustainable practices, your port company can not only survive but thrive in Indonesia's dynamic maritime landscape, contributing to the nation's economic growth and global competitiveness.

Maritime Transport vs. Industrial Management Challenges

Maritime transport management faces all the challenges of traditional industrial management (e.g., supply chains, HR, finance) plus the volatile, uncontrollable forces of nature and geopolitics. Maritime transport management is uniquely complex compare to the industrial management, and we found why maritim is harder.

Table 4.2. Maritime Transport vs. Industrial Management Challenges

Challenge Category	Industrial/Manufacturing Management	Maritime Transport Management	Why Maritime is Harder
Human/ Operational	▪ Labor productivity ▪ Quality control ▪ Supplier coordination	▪ Multinational crews ▪ Piracy/security ▪ Sanctions compliance	Crews from 5+ nationalities + high turnover (30% in shipping vs. 10% in manufacturing).
Financial	▪ Cost accounting ▪ ROI on machinery	▪ Freight rate volatility ▪ Bunker hedging ▪ Charter party disputes	Baltic Dry Index can swing 300% in a year; oil spills bankrupt firms (e.g., <i>Exxon Valdez</i>).
Environmental	▪ Factory emissions ▪ Waste disposal	▪ IMO 2030/2050 decarbonization ▪ Ballast water invasive species ▪ Oil spill liabilities	Ships burn the dirtiest fuel (HFO); storms sink vessels (<i>MV Tutor</i> 2024).
Geopolitical	▪ Trade tariffs ▪ Local content rules	▪ Sanctions (Russia, Iran) ▪ Piracy (Gulf of Guinea) ▪ Chokepoint blockades (Suez, Malacca)	60% of oil shipments pass through conflict zones.
Natural Forces	▪ Minimal impact (controlled factories)	▪ Typhoons ▪ Arctic ice ▪ Rising sea levels	Weather delays cost shipping \$3B/year (Allianz).

Maritime Transport Management is Uniquely Complex. First, it is about the "moving factory" problem. In industrial sector, Factories are fixed; processes repeat identically. In MTM, each voyage faces new routes, weather, port bureaucracies. For instance, a container ship calling at Jakarta may face 3-day dwell times vs. 8 hours in Singapore. Second, regulatory overload. In industrial, applied mostly local labor/environment laws. In MTM, the company must comply with Flag state (ship registry), port state (inspections), IMO (global rules), EU/UN sanctions. For instance, IMO's CII ratings (2023) force ships to retrofit or scrap. Third, human capital intensity. In industrial, there are workers clock in/out with stable schedules. In MTM, crews work 6–9 months nonstop (mental health risks). There is a need for specialized skills: Navigating, cargo handling, crisis response (*Captain Phillips*-style piracy). Fourth, on asset illiquidity, in the industrial, machines can be repurposed or sold quickly; while in MTM a VLCC tanker is a \$120M asset that can't carry laptops if oil demand falls, and the scrapping a ship takes 18+ months and yields pennies on the dollar. Herewith,

Table 4.3. Case Study: Climate Change vs. Manufacturing vs. Shipping

Impact	Manufacturing	Maritime Transport
Rising Temperatures	AC costs rise; worker fatigue.	Cargo spoilage (e.g., LNG boil-off increases).
Extreme Weather	Roof damage; supply chain delays.	Port closures (e.g., Houston hurricanes).
Regulatory Shifts	Carbon taxes on factories.	IMO 2050: Zero-emission ships or bans.

Scholars had developed frameworks for maritime complexity. Psaraftis (2019) on Maritime Risk Cube promoted three axes of risk: Operational (crew errors, engine failure), External (storms, wars), and Regulatory (IMO, sanctions). Unlike factories, maritime must manage all three simultaneously. Williamson (1981) on transaction cost economics explain the asset specificity of MTM, in which ships are useless outside shipping (unlike trucks, which can carry diverse cargo). There is the uncertainty which freight rates, fuel costs, and piracy are unpredictable.

Indeed, there is a set of coping strategies for maritime managers. First, it is a resilience planning to manage redundant routes –i.e. avoid Suez during crises (like Houthi attacks)—and weather AI –i.e. StormGeo predicts typhoons 72h ahead. Second, regulatory agility, which regard to the flag hopping –i.e. register ships in Panama/Liberia for flexibility— and scrubbers –i.e. \$5M retrofits to comply with IMO 2020 sulphur caps. The third is human capital, which regard to the crew welfare apps -- mental health support for isolated seafarers; and automation -- unmanned engine rooms (but still need certified officers). Fourth, financial hedging, for instance following FFAs (Forward Freight Agreements) to lock in rates amid volatility; and managing bunker derivatives by hedging fuel price swings.

Therefore, it is some key takeaways as, however, maritime transport management is industrial management 3 due to Mobile assets, nature's fury, and global regulatory patchworks; in which the success requires multidisciplinary skills (nautical + finance + geopolitics) and the adaptive strategies (e.g., switching from oil to wind turbine transport).

Case Study, Indonesia's Cabotage Policy: A Critical Evaluation

Cabotage Law was exercised by Article 8 of Law No. 17/2008 (revised by PP No. 41/2021) reserves domestic sea transport (between Indonesian ports) for Indonesian-flagged ships, Indonesian-owned/controlled vessels (min. 51% local equity), and crewed by Indonesian sailors; with objective to boost local shipping industry, reduce dependence on foreign vessels, and enhance maritime sovereignty.

Table 4.4. Key Impacts (Pros & Cons)

Aspect	Successes	Challenges
Local Industry	▪ Growth of <i>Pelayaran Rakyat</i> (small-scale shipping). ▪ Increased Indonesian-flagged ships (from 5,000 in 2008 to 12,000 in 2023).	▪ Many ships are old & inefficient (avg. age 25+ years). ▪ Limited financing for new builds.
Logistics Costs	▪ Reduced foreign dominance in domestic routes.	▪ High freight rates: 30% costlier than Malaysia due to limited competition.
Employment	▪ 500K+ jobs for sailors, dockworkers.	▪ Skill gaps: Only 40% of crews are certified (STCW).
Trade Efficiency	▪ Protected routes for local operators.	▪ Port congestion: Lack of capacity to handle demand (e.g., Java-Sumatra routes).

By data-driven analysis, there is a cost impact: domestic shipping costs 24% of GDP (vs. 13% in Malaysia). For example, coal transport from Kalimantan to Java costs \$12/ton (vs. \$7/ton if foreign ships allowed). There is issue of safety which 60% of *Pelayaran Rakyat* ships fail safety audits (DKP, 2023).

World Bank (2022) criticizes that *"Indonesia's cabotage policy protects inefficiency. Allowing limited foreign competition could reduce costs without killing local jobs."* Indonesian Shipowners' Association (INSA) stated the *"we need subsidies for shipbuilding, not deregulation. Otherwise, China's COSCO will dominate."* For example, on case of Tanjung Priok-Bitung Route that having problem only 5 Indonesian-flagged ships serve this route, causing 2-week delays. If foreign ships were allowed, Singaporean vessels could clear backlog in 3 days. The trade-off is: lower costs vs. local industry survival. The agenda is questioning the relevance of the policy, and the next will be what next to do.

Cabotage is still relevant, but advised but, perhaps, with reforms. First, keep cabotage for strategic routes (e.g., remote islands). Second, liberalize selectively on overcapacity routes (Java-Sumatra). Third, invest in local ships to compete long-term.

Table 4.5. Options for Improvement

Policy Option	Pros	Cons
1. Gradual Liberalization	▪ Allow foreign ships on high-demand routes (e.g., Jakarta-Sorong). ▪ Reduce logistics costs.	▪ Political backlash from local operators.
2. Strengthen Local Capacity	▪ Tax breaks for new ship purchases. ▪ Partner with Japan/Korea for tech transfer.	▪ Requires \$2B+ in subsidies.
3. Hybrid Model	▪ Foreign ships allowed but must partner with local firms (51% equity).	▪ Bureaucratic complexity.
4. Safety & Skill Reforms	▪ Mandate STCW certification for all crews. ▪ Enforce ship age limits (<15 years).	▪ Could shrink <i>Pelayaran Rakyat</i> fleet by 40%.

BOX: INDONESIA’S CABOTAGE POLICY REFORM DRAFT
(Balancing Sovereignty, Efficiency & Competitiveness)

1. Policy Title:
"Gradual Liberalization with Local Capacity Building"
*(Revision to PP No. 41/2021 on Cabotage Implementation) *

2. Objectives
- 1. Reduce logistics costs (target: 15% of GDP by 2030 vs. current 24%).
 - 2. Modernize Indonesia’s fleet (avg. ship age <15 years by 2030).
 - 3. Maintain sovereignty by protecting strategic routes.

3. Key Reforms

A. Route Classification & Access

Table 4.6. Route Classification & Access

Route Type	Vessel Eligibility	Example Routes
Strategic Routes	Indonesian-flagged only.	Remote islands (e.g., Papua, Maluku).
High-Demand Routes	Foreign ships allowed via joint ventures (min. 51% local equity).	Java-Sumatra, Jakarta-Bitung.
Overcapacity Routes	Open for foreign ships (max. 2-year permits).	Bali-Lombok (tourism supplies).

- B. Fleet Modernization (1) Tax Incentives: (a) 0% VAT for Indonesian companies purchasing new ships (<10 years old); (b) Double tax deductions for green ships (LNG/hydrogen-powered); (2) Funding: Maritime Development Fund (Rp 5T/year) for low-interest ship loans.
- C. Crew Competency: (1) Mandate STCW certification for all crews by 2027; (2) Subsidized training: Govt covers 50% of seafarer courses at BP3IP Jakarta/Surabaya.

- D. Safety & Enforcement (1) Ship Age Limit: Ban vessels >25 years old from domestic routes (phased by 2026); (2) Penalties: Fines up to Rp 10B for foreign ships violating cabotage rules.

4. Implementation Timeline

Table 4.7. Implementation Timeline

Year	Phase	Key Actions
2025	Pilot Liberalization	Open Jakarta-Bitung to foreign JVs.
2026	Safety Crackdown	Ground 100+ oldest <i>Pelayaran Rakyat</i> ships.
2027	Full STCW Enforcement	Suspend uncertified crews.
2030	Review & Adjust	Expand/restrict routes based on KPIs.

5. Monitoring & KPIs

Table 4.8. Monitoring & KPIs

KPI	Target (2030)	Responsible Agency
Avg. shipping cost	15% of GDP	Ministry of Transportation
Indonesian-flagged ships	15,000 (from 12,000)	INSA (Indonesian Shipowners)
Crew certification rate	90% (from 40%)	Ministry of Maritime Affairs

6. Stakeholder Roles

Table 5.9. Stakeholder Roles

Actor	Responsibilities
Government	Enforce age/safety rules; fund shipbuilding.
Private Sector	Form JVs with foreign firms; upgrade fleets.
Universities	Expand maritime training programs.
ASEAN/IMO	Align with regional safety/emission standards.

7. Risk Mitigation: (1) Local Industry Backlash: Compensation: Offer scrapping premiums for old ships; (2) Foreign Dominance: Sunset Clause: Revise permits if local capacity improves.

8. Rationale: the concept is based on idea of balances protectionism (sovereignty) and liberalization (efficiency), which inspired by Vietnam's hybrid model (foreign ships allowed on select routes) and Norway's fleet renewal (tax breaks for green ships).

Chapter Five: Maritime Logistic Management

Maritime Logistics Management refers to the comprehensive planning, implementation, and management of the movement of goods and information across the seas. It encompasses a wide range of activities involved in shipping and the coordination of transport chains to ensure efficient, cost-effective, and timely delivery of goods globally.

Maritime Logistics Management involves on, first, planning and coordination. This includes selecting optimal shipping routes and carriers, coordinating the movement of goods between origin and destination, and synchronizing activities among suppliers, carriers, and customers. Second, shipping operations, by managing the actual transportation of cargo by sea, which involves various types of vessels (container ships, bulk carriers, Ro-Ro ships, etc.) and understanding their specific cargo handling needs. Third, on port operations. It is on efficiently managing the loading, unloading, and storage of cargo at ports. Ports are crucial hubs that connect sea routes with inland transportation networks, facilitating customs clearance, inspections, and documentation. Fourth, customs clearance and regulations. It is on handling documentation and ensuring compliance with complex international trade regulations, safety standards, and environmental protocols across multiple borders. Fifth, cargo handling and inventory management, by ensuring the safe and efficient handling of goods, including specialized cargo, and monitoring inventory levels during transit. Sixth, supply chain integration, by integrating maritime logistics seamlessly into the broader supply chain to minimize disruptions, enhance resilience, and facilitate real-time tracking of shipments. Seventh, risk management, on identifying and mitigating potential threats and challenges that can arise in maritime shipping, such as unforeseen delays, regulatory changes, or security issues. Eight, on technology and innovation, by utilizing smart technologies like container tracking systems to monitor critical information (e.g., temperature, humidity) and improve operational efficiency. In essence, Maritime Logistics Management is crucial for global trade, as over 90% of global trade is carried by sea. It's about more than just moving goods;

it's about creating value through integrated, coordinated, and efficient processes that cater to customer requirements in the maritime and business environments. Maritime Logistics Management (MLM) and Maritime Transport Management (MTM) are related but distinct fields. Stopford (2009) explained that MTM is about "vessels and infrastructure," while MLM covers "the entire logistics pipeline." Notteboom & Rodrigue (2008) explained that MLM includes landside linkages (e.g., warehousing, trucking).

Table 5.1. Maritime Logistics Management (MLM) and Maritime Transport Management (MTM)

Aspect	Maritime Transport Management (MTM)	Maritime Logistics Management (MLM)
Primary Scope	Focuses on movement of goods/people by sea (ships, ports, routes).	Broader: Integrates maritime transport with end-to-end supply chains.
Key Activities	▪ Ship operations ▪ Port management ▪ Freight pricing	▪ Supply chain coordination ▪ Multimodal logistics ▪ Inventory/cargo optimization
Goal	Efficient transportation of cargo/passengers.	Seamless flow of goods from origin to destination (including pre/post-shipping).
System Boundaries	▪ Starts at port loading and ends at port discharge. ▪ Example: Optimizing a container ship's route from Tanjung Priok to Rotterdam.	▪ Reduce total logistics costs (24% of GDP). ▪ Link fisheries/minerals to global markets. ▪ Spans supplier to customer (door-to-door) ▪ Example: Managing electronics shipped from a Surabaya factory to a German retailer, including customs, trucks, and warehouses.
Stakeholders	Shipping lines, port authorities, ship crews.	Adds freight forwarders, 3PLs, manufacturers, retailers.

Tools & Metrics	▪ Ton-miles ▪ Port dwell time ▪ Charter rates	▪ Total logistics cost ▪ Order-to-delivery cycle time ▪ Inventory turnover
Career Paths Graduates	▪ Shipbroker ▪ Port manager ▪ Vessel operator	▪ Supply chain analyst ▪ Logistics planner ▪ 3PL manager
Segment	"Ocean segment" of logistics	"Ocean + Land + Data" to optimize supply chains.

Despite differences, they intersect in port-centric logistics, it is on how ports integrate into supply chains (e.g., Tanjung Priok’s bonded zones); and intermodal transport: it is on connecting ships with trains/trucks (e.g., Indonesia’s Patimban Port rail link). For example, an MTM expert ensures a Maersk ship sails efficiently, while an MLM professional ensures the cargo reaches a Jakarta warehouse just in time for production.

For Indonesia, MTM is critical to fix on port congestion (Jakarta’s 3-day dwell time), and cabotage laws (*Pelayaran Rakyat* reforms). While, MLM is vital to policy implication, as Indonesia needs both—strong MTM to compete with Singapore, and MLM to boost exports. Teach MTM first (ships/ports basics), then expand to MLM (integration with ASEAN supply chains).

Maritime Logistics Management (MLM) is a specialized field that integrates maritime transport with end-to-end supply chain operations. The core components of MLM is ocean transport (vessel operations, route optimization, and fleet management), port-centric logistics (ports as integrated hubs), intermodal connectivity (seamless ship-to-rail/truck transitions), and supply chain integration (coordination with manufacturers, retailers, and 3PLs).

According to Panayides & Song (2013) maritime logistics is the process of planning, implementing, and controlling the efficient, cost-effective flow and storage of goods, services, and information from origin to consumption, involving ocean transport and its interfaces with other modes. Photis Panayides stated that "maritime logistics is where ocean meets strategy—

connecting producers, ships, and markets at the lowest cost and highest reliability."

Key Theoretical Frameworks in MLM is Systems Theory (Bertalanffy, 1968) which premise that MLM is a subsystem of global supply chains. In application MPM means optimizing total logistics cost (not just shipping costs), for example balancing slow steaming (fuel savings) vs. higher inventory costs. The second theory is Network Theory (Notteboom & Rodrigue, 2008) which premise that ports and shipping lines form a network of nodes and links. In application, there is hub-and-spoke systems (e.g., Singapore as ASEAN's transshipment hub). The third theory is Transaction Cost Economics (Williamson, 1981), which premise that firms choose between markets (spot charters) and hierarchies (owning ships), by example of why Maersk vertically integrates (ships + ports + logistics). The fourth theory is Lean Logistics (Womack & Jones, 1996) with premise to eliminate waste in maritime supply chains, on example of the just-in-time (JIT) container deliveries to reduce port dwell time. There are critical issues in MLM: Port Congestion, Decarbonization, Digitalization, to the Geopolitical Risks.

Table 5.2. Scholarly Insight VS Real-World Case

Issue	Scholarly Insight	Real-World Case
Port Congestion	<i>Dwell time reflects systemic inefficiencies</i> (Song & Panayides, 2015)	Jakarta's 3-day dwell vs. Singapore's 1-day.
Decarbonization	<i>Green corridors require tech + policy alignment</i> (Psaraftis, 2020)	Maersk's methanol-powered ships.
Digitalization	<i>Blockchain reduces documentation delays</i> (Wang et al., 2021)	TradeLens by Maersk-IBM.
Geopolitical Risks	<i>Chokepoints disrupt global logistics</i> (Stopford, 2009)	Suez Canal blockage (2021).

There are "5 Flows" of MLM (Panayides, 2006). Physical Flow, on movement of goods (e.g., containers, bulk cargo). Information Flow, on ETA updates, customs documentation. Financial Flow, on freight payments, bunker hedging. Risk Flow, on piracy, climate disruptions, cargo damage. Reverse Flow, on empty container repositioning, recycling. For example, there is physical and info flow when IoT sensors track Indonesian coal exports to China in real-time. There are financial + risk flow, when hedging fuel costs amid volatile oil prices.

According to Indonesia, there are some specific MLM challenges. Indonesia had an archipelagic fragmentation impacted on high costs due to disconnected ports (Sekimoto, 2020). The next challenge is IUU Fishing, that undermines sustainable seafood logistics (Couper et al., 2015). There is problem on data gaps, as there is poor integration between Pelindo ports and trucking firms. The possible solution is to adopt ASEAN's Single Window to streamline customs (Notteboom, 2022), and develop "Blue Logistics" for sustainable fisheries (Pauli, 2010).

It could be concluded the MLM is broader than shipping; it's about integrating sea transport into global supply chains. Theories like Network Theory and Lean Logistics provide tools to reduce waste. For Indonesia, digitalization and intermodal links are urgent priorities.

Chapter Six: Oil and Gas Maritime Transport

Oil and gas maritime transport refers to the shipping of crude oil, refined petroleum products (like gasoline, diesel, jet fuel), liquefied natural gas (LNG), and liquefied petroleum gas (LPG) across oceans and other waterways using specialized vessels. It's a critical component of the global energy trade, enabling the movement of these vital resources from production areas to refineries and consuming markets worldwide.

Oil and gas maritime transport works on vessels. The first is tanker vessels. It is large tankers, including Very Large Crude Carriers (VLCCs) and Ultra Large Crude Carriers (ULCCs), are used for crude oil. Smaller tankers and product carriers transport refined petroleum products. The second is LNG carriers, the specialized vessels with insulated tanks are used to transport LNG at extremely low (cryogenic) temperatures. The third is LPG tankers; tankers that designed to handle pressurized or refrigerated LPG in its liquid form. The fourth is offshore support vessels (OSVs), a broad category including Platform Supply Vessels (PSVs) that deliver supplies to offshore rigs, Anchor Handling Tug Supply (AHTS) vessels for positioning rigs, and Diving Support Vessels, among others, crucial for offshore exploration and production activities. The fifth is floating production storage and offloading (FPSO) units of vessel. These are floating vessels used for processing hydrocarbons extracted from nearby platforms and for storing oil before it's offloaded onto tankers.

The second works is loading and unloading. Oil and gas cargoes are loaded and unloaded at major ports and terminals with specialized infrastructure. The third is trade routes. Maritime oil and gas transport follow established global trade routes connecting major producing and consuming regions. Key choke points like the Strait of Hormuz, Strait of Malacca, and Suez and Panama Canals are vital to these routes. The fourth is agreements. Shipping companies and oil/gas producers or traders enter into charter agreements, which can be for single voyages (spot charters) or long-term contracts. The fifth is safety and regulations. Due to the hazardous nature of the cargo, stringent safety and

environmental regulations are in place. The International Maritime Organization (IMO) sets global standards to prevent spills, accidents, and pollution. Vessels undergo rigorous inspections to ensure compliance.

Maritime transport is indispensable for supplying the world with oil and gas, as production and consumption centers are often geographically separated. Ships can carry immense volumes of oil and gas, making maritime transport the most cost-effective method for long-distance bulk transportation compared to other modes like pipelines (though pipelines are dominant for overland transport), rail, or trucks. It offers flexibility in connecting diverse markets and adapting to changing global demand. There is the economic impact, as the industry supports a vast network of jobs in shipping, logistics, port operations, and related sectors. Fluctuations in freight rates, influenced by global oil prices and vessel availability, significantly impact the economics of the global energy trade. The challenge is the industry faces ongoing challenges related to environmental concerns (e.g., oil spills, emissions), geopolitical risks affecting trade routes, and the need for continuous innovation in vessel design and fuel efficiency to meet decarbonization targets.

In sum, the oil and gas maritime transport business is a critical segment of the global energy industry, focusing on the movement of crude oil, natural gas, and refined petroleum products across oceans and waterways. It's an intricate network that connects production sites (often offshore platforms) with refineries, storage facilities, and ultimately, consumers worldwide.

The key aspects of the business are, first, transportation of hydrocarbons. The primary function is to transport vast quantities of liquid and gaseous hydrocarbons. This includes: Crude Oil (unrefined oil extracted from wells); Refined Petroleum Products (such as gasoline, diesel, jet fuel, and lubricants, produced after crude oil is processed in refineries); Liquefied Natural Gas (LNG) (natural gas that has been cooled to a liquid state for easier and more efficient transport), and Liquefied Petroleum Gas (LPG) (a mixture of hydrocarbon gases used as fuel). The second aspect is specialized vessels, as we mentioned before. The third is logistics and supply chain management. This involves intricate planning and coordination to ensure efficient and safe transport. Key

elements include Route Planning, by optimizing routes to minimize transit time, fuel consumption, and avoid hazardous areas (e.g., piracy zones, chokepoints like the Suez and Panama Canals); scheduling, by coordinating vessel movements with production, refining, and consumption schedules; inventory management, by managing the flow and storage of oil and gas throughout the supply chain; port and terminal services, by essential for loading, unloading, and storing cargo at various points.

The fourth aspects of the business are regulatory compliance and safety. Given the hazardous nature of the cargo and the global scale of operations, the business is highly regulated. Strict adherence to international maritime regulations (e.g., IMO standards) and local authorities is paramount for preventing accidents, such as oil spills, fires, and explosions; environmental protection by minimizing pollution (e.g., emissions, ballast water treatment); and crew safety by ensuring proper training, welfare, and safety protocols for personnel.

The oil and gas maritime transport business faces numerous challenges. It was safety and environmental risks. The potential for accidents, spills, and emissions poses significant environmental and safety concerns. It was regulatory compliance: Navigating a complex and evolving landscape of international and national regulations, particularly those related to decarbonization and emissions reduction. It was market volatility, the fluctuations in oil and gas prices, global demand, and geopolitical events can significantly impact profitability and operational planning. It was geopolitical tensions and piracy. Disruptions in strategic waterways, conflicts, and piracy threats can lead to rerouting, increased costs, and safety risks. It was the aging fleet and decarbonization. A significant portion of the world's shipping fleet is aging, requiring substantial investment in new, more fuel-efficient, and greener vessels to meet emission reduction targets. It was infrastructure constraints, such as limited port capacity, outdated infrastructure in some regions, and challenges in developing new pipelines or terminals can hinder efficient transport. It was crew shortages, therefore attracting and retaining skilled maritime personnel is an ongoing challenge. It was cybersecurity threats. Increasing digitalization of operations makes the industry vulnerable

to cyberattacks. Despite these challenges, maritime transport remains the most efficient and cost-effective way to move large volumes of oil and gas globally, making it an indispensable part of the world's energy supply chain. The industry is constantly evolving with technological advancements and a growing focus on sustainability to address these complexities.

Oil & Gas Maritime Transport

Oil and Gas Maritime Transport is the specialized shipping of crude oil, refined petroleum products (e.g., gasoline, diesel), LNG (liquefied natural gas), and LPG (liquefied petroleum gas) via tankers and carriers. The Shipowners are Frontline, Euronav, Teekay. The charterers are Shell, ExxonMobil, Saudi Aramco. The main ports are Rotterdam, Fujairah, Houston. Total market size around \$62 billion industry (2023), transports ~60% of globally traded oil (*Clarksons Research*).

Table 6.1. Types of Oil & Gas Tankers

Vessel Type	Cargo	Example Routes	Expert Insight
VLCC (Very Large Crude Carrier)	2M barrels crude oil	Middle East → China	"VLCC rates swing with OPEC output" – Stopford (2022).
Suezmax	1M barrels crude oil	West Africa → Europe	"Flexible for mid-sized ports" (Lloyd's List).
Aframax	750K barrels crude/products	Indonesia → Japan	"Workhorses of regional trades" (Drewry).
LNG Carrier	-160°C liquefied gas	Qatar → EU/Asia	"Boil-off gas fuels engines" (DNV GL).
LPG Carrier	Propane/butane	USA → China	"Growing demand for petrochemicals" (IEA).

Shipping business model of the oil and gas maritime transport regarding to chartering strategies. There is the spot market, it is about one-off voyages (volatile rates; e.g., \$100,000/day for VLCC in 2022). There are the time charters, it is about long-term leases (stable income; e.g., Shell’s 5-year LNG carrier contracts). There is COA (Contract of Affreightment), it is about guaranteed volume over time (e.g., Saudi Aramco’s annual deals). Martin Stopford, *Maritime Economics* (2023) noted that *"integrated oil majors use COAs to hedge price risks, while independents gamble on spot markets."*. The other shipping business model of the oil and gas maritime transport is freight rate rivers. Geopolitically, there are imposed sanctions (e.g., Russian oil price cap), and regard to the Middle East tensions. There is also refining demand, it is about Asian growth vs. EU decarbonization. There is ship supply, as the orderbook trends (2023: 5% fleet growth). There are critical challenges of the industry as describe below.

Table 6.2. Critical Challenges

Challenge	Industry Impact	Expert Solution
Decarbonization	IMO 2030/2050 targets; CII ratings.	<i>"LNG dual-fuel tankers bridge the gap"</i> (DNV).
Sanctions	Russian oil rerouted to India/China.	<i>"Shadow fleet of aging tankers"</i> (Clarksons).
Piracy	Gulf of Guinea attacks (2023: 35 incidents).	<i>"Armed guards + AIS masking"</i> (IMB).
Port Congestion	US Gulf Coast delays (avg. 5 days).	<i>"Digital queuing systems"</i> (Wärtsilä).

Oil & Gas Maritime Transport as Business Management

The maritime transport management of oil and gas shares core principles with general business management (e.g., strategy, finance, operations), but it has critical unique aspects driven by the industry’s technical, regulatory, and geopolitical complexities. Martin Stopford on *Maritime Economics* (2023)

noted that at its core, tanker shipping is a business of assets (ships) and cashflows (charters), but the devil is in the industry’s unique details.

Table 6.3. Similarities to General Business Management

Aspect	Shared with Business Management	Example in Oil & Gas Shipping
Strategic Planning	Market analysis, SWOT, competitive positioning.	Choosing VLCCs over Suezmax based on trade routes.
Financial Mgmt.	Profitability, cost control, investment decisions.	Hedging bunker fuel prices to manage volatility.
Operations Mgmt.	Process optimization, efficiency, logistics.	Reducing port turnaround time for tankers.
Risk Mgmt.	Identifying/mitigating risks (financial, operational).	Piracy insurance, sanctions compliance.
HR Mgmt.	Crew training, labor relations, safety protocols.	STCW-certified crews for LNG carriers.

There are unique aspects of oil and gas maritime management. First, the extreme capital intensity and asset specificity. A single VLCC tanker costs \$120M; LNG carrier exceeds \$250M and the assets are non-fungible (e.g., an LNG carrier cannot transport crude). The implication is decades-long ROI horizons require precise demand forecasting. There is also geopolitical sensitivity. Oil/gas trade routes are shaped by OPEC decisions, sanctions (e.g., Russia), and wars (e.g., Red Sea attacks). The implication is managers must track political risk indices (e.g., Gulf of Guinea piracy). There are also complex chartering structures, as time charters (3–5 years) vs. spot market (volatile rates). It also the COA (Contract of Affreightment) that asked guaranteed volumes with penalties. The implication is, it is requiring hybrid expertise in law, finance, and logistics. There are stringent environmental and safety regulations as there is IMO 2020 (sulphur cap), CII ratings, EU ETS (carbon tax), double-hull mandates post-Exxon Valdez spill. The

implication is compliance costs can exceed \$2M/year per vessel (DNV GL). There is the niche technical expertise on cargo-specific handling for crude oil (heating to reduce viscosity) and LNG (cryogenic (-160°C) containment systems); and boil-off gas (BOG) management for LNG carriers. The implication is that the crews need specialized certifications (e.g., SIGTTO for LNG). The last is a cyclical market dynamic which freight rates swing wildly (e.g., VLCC rates: \$100k/day in 2022 → \$25k in 2023). The implication is that the hedging tools (FFAs – Forward Freight Agreements) are essential. An anonymous VLCC Operator (2023) noted that managing a tanker fleet is like running a factory where the factory moves, the raw material is explosive, and the customers change daily

Table 6.4. Case Study: Managing a VLCC Fleet

Business Mgmt. Task	General Approach	Oil & Gas Maritime Adaptation
Pricing Strategy	Cost-plus or market-based.	World scale system: Freight rates tied to route complexity.
Customer Relations	B2B contracts, CRM tools.	Charter parties: Legally binding contracts with oil majors.
Risk Management	Diversification, insurance.	Sanctions screening: Avoiding embargoed cargoes (e.g., Iran, Venezuela).

The uniqueness’s matter for Investors to concern on high barriers to entry (capital, expertise); for Managers, must master technical + commercial + regulatory trifecta; and for Governments, it needs of energy security depends on tanker fleet resilience (e.g., Indonesia’s *Pertamina* chartering).

Tools for Oil and Gas Maritime Managers are market Intelligence, for example Clarksons Research regarding on tanker fleet data, and Baltic Exchange: Freight rate benchmarks. The next is regulatory compliance, for instance, Right Ship’s GHG Rating that regard to track carbon efficiency. The last is operational optimization, especially on DNV’s ECO Insight on fuel-saving AI for routes.

While oil and gas maritime transport management overlaps with general business principles, its uniqueness lies in hyper-specialized assets and operations, geopolitical dependencies, regulatory intensity, and extreme market volatility.

There are the future trends oil and gas maritime transport management. There would be an energy transition as phenomenon on declining crude demand (IEA: -25% by 2050), rise of hydrogen/ammonia carriers (e.g., Kawasaki's 2024 prototype), digitalization as there is AI for bunker optimization (saves 10% fuel), blockchain for bill of lading (Maersk's Tradelens), and it would be arctic shipping, i.e. Rosneft's ice-class LNG carriers on Northern Sea Route. The key takeaways for businesses are volatility is the norm: Hedge freight rates with derivatives, compliance is costly: IMO 2020 sulphur cap added \$2M/year/tanker, and localize strategies, i.e., Indonesia needs smaller, greener tankers.

Case of Indonesia

Indonesia, as a vast archipelagic nation with significant oil and gas reserves, has a crucial and complex experience in the oil and gas maritime transport business. Given its geography, maritime transport is the backbone of Indonesia's domestic energy distribution. Oil and gas from production areas (often offshore or on different islands) must be transported by sea to refineries, power plants, and consumption centres across the archipelago. Indonesia strongly upholds the "cabotage principle," which mandates that domestic transportation of goods and passengers be undertaken only by Indonesian-flagged vessels with Indonesian crews. This policy aims to strengthen the national shipping industry, create jobs, and ensure energy security. While there are provisions for foreign-flagged vessels to operate in Indonesian waters for specific activities (like offshore construction, drilling, or surveys) if local vessels are unavailable, the general rule strongly favors domestic shipping.

A key player in this regard is Pertamina International Shipping (PIS), a subsidiary of the state-owned energy company Pertamina. PIS is the backbone

of Indonesia's national energy transportation, moving billions of liters of fuel and LPG annually across the country with a large fleet of vessels. They are actively expanding their fleet, including environmentally friendly Very Large Gas Carriers (VLGCs), and aiming for a significant share of "green cargo" like LNG and petrochemicals.

Indonesia has historically been a significant global exporter of Liquefied Natural Gas (LNG), particularly to regional buyers like Japan, South Korea, and China. While its market share has decreased due to increased competition from other producers, it remains an important regional supplier. LNG is transported by specialized LNG carriers.

Despite its oil production, Indonesia has become a net crude oil importer due to rising domestic demand for petroleum products and limited refining capacity. This means a substantial portion of its crude oil and refined product needs are met through maritime imports. Crude oil and refined products are transported by various types of tankers. Indonesia relies entirely on maritime transport for its international petroleum trade as it does not have international oil pipelines.

The oil and gas maritime transport business in Indonesia presents both significant opportunities and notable challenges, given the country's strategic location, growing energy demand, and evolving regulatory environment. Indonesia is a key maritime hub in Southeast Asia, sitting along major shipping routes (e.g., Strait of Malacca, Lombok Strait). Proximity to major energy consumers (China, India, Japan, South Korea) enhances demand for tanker shipping and offshore support vessels (OSVs). Indonesia remains a net oil importer despite being a gas exporter (LNG), driving demand for crude and refined product tankers. Government push for gas infrastructure (LNG terminals, pipelines) boosts opportunities for LNG carriers and FSRUs (Floating Storage Regasification Units). New oil & gas projects (e.g., Masela Block, East Natuna) require offshore support vessels (OSVs), FPSOs (Floating Production Storage Offloading), and shuttle tankers. Indonesia's aging oil fields need enhanced recovery, increasing demand for specialized maritime logistics. Cabotage Policy (requiring Indonesian-flagged vessels for domestic transport)

benefits local shipping companies. Then, there is a need to plan to expand LNG bunkering hubs (e.g., Batam, Bontang) to support green shipping trends.

Indonesia had been facing challenges as well as opportunities. First, aging infrastructure and declining production. Many of Indonesia's oil and gas fields are mature, leading to declining production. This necessitates increased exploration in more complex areas (including deep-water) and the application of advanced technologies like Enhanced Oil Recovery (EOR), which requires substantial investment and specialized expertise. This impacts the volume of crude oil available for domestic transport and potentially increases the need for imports. Second, investment climate. Attracting foreign investment in the upstream oil and gas sector has been a challenge due to factors like a perceived inflexible regulatory framework and a history of corruption. The government is working to improve the investment climate through incentive-based approaches and international collaborations. Third, maritime security. As a major maritime nation with critical sea lanes like the Malacca Strait, Indonesia faces ongoing challenges in maritime security, including piracy, illegal fishing, and drug trafficking. Ensuring the safety and stability of these waterways is crucial for the smooth flow of oil and gas transport. Fourth, decarbonization and green shipping. Like the global shipping industry, Indonesia's maritime oil and gas transport sector faces increasing pressure to decarbonize. This involves investing in alternative fuels (like LNG, ammonia, hydrogen), upgrading fleets to meet new efficiency standards, and developing green maritime infrastructure. PIS, for example, is actively pursuing a decarbonization plan.

Fifth, port infrastructure and logistics. Optimizing port infrastructure and logistics is essential for efficient oil and gas transport. The government's "Sea Toll" program aims to connect major ports and reduce logistics costs across the archipelago. Sixth, regulatory landscape. Indonesia's shipping laws are constantly evolving, as seen with the recent updates to the Shipping Law in late 2024. These changes address cabotage, port management, environmental protection, and foreign ownership in shipping companies, creating a complex regulatory environment that businesses must navigate.

Seventh, public policy. Frequent changes in shipping and energy policies create uncertainty, besides foreign ownership restrictions (max 49% in some sectors) limit investment. Eighth, infrastructure and port limitations. Many Indonesian ports lack deep-water capabilities, restricting VLCCs (Very Large Crude Carriers) and large LNG carriers, besides inefficient customs and logistics increase operational costs. Ninth, competition and market risks. It is a strong competition from Singaporean and Malaysian maritime players, besides the volatile oil prices impact charter rates and profitability. Tenth, environmental and safety concerns. Stricter IMO 2020 sulphur regulations increase compliance costs. It is also risk of piracy, illegal bunkering, and oil spills in Indonesian waters.

The future outlook and recommendation are that the growth Potential with rising LNG exports and domestic refinery expansions (e.g., Tuban, Bontang), demand for gas carriers and product tankers will rise. On investment areas, there are growth of LNG transport & bunkering (aligned with global decarbonization trends), offshore logistics for new E&P projects, and domestic tanker fleet upgrades (to meet cabotage rules). To do risk mitigation is to do partner with local players (e.g., Pertamina, AKR Corporindo) and leverage government incentives.

In summary, Indonesia's experience in oil and gas maritime transport is characterized by its strategic geographical position, strong commitment to its cabotage principle, the dominant role of state-owned enterprises like Pertamina International Shipping, and the ongoing challenges of securing investments, modernizing infrastructure, ensuring maritime security, and adapting to global decarbonization efforts.

Indonesia's oil & gas maritime transport sector is promising but complex. Companies that navigate regulatory challenges, invest in modern fleets, and align with Indonesia's energy transition (LNG, biofuels) stand to benefit significantly. However, success requires strong local partnerships, risk management, and adaptability to policy shifts.

Chapter Seven: Shipyard Industries

The shipyard industry refers to the specialized industrial facilities where ships and other marine vessels are designed, built, repaired, maintained, converted, and refitted. These facilities are typically located on the shores of seas, rivers, or other large bodies of water to allow for easy access for vessels. The large shipyard industry site usually located near coastlines or rivers equipped with dry docks, slipways, cranes and welding equipment, and fabrication shops

The key function of shipyard industry is as shipbuilding (construction). Shipbuilding involves designing and constructing new vessels such as cargo ships, oil tankers, passenger ships (e.g., cruise ships, ferries), naval ships (for military use), fishing boats, and offshore platform. This is the core activity, involving the creation of new vessels from raw materials. This can include cargo ships, tankers, passenger ships, military vessels (warships, submarines), yachts, fishing boats, and offshore platforms. Modern shipbuilding often uses "block construction," where sections of the ship are prefabricated and then assembled at the building dock.

Shipyard industry is conducting ship repair and maintenance. Shipyards provide essential services for existing vessels, addressing damages, carrying out regular maintenance, and performing necessary overhauls to ensure ships remain in good condition and meet regulatory standards. This can involve repairs to the hull, engine, navigation equipment, and other systems. Ship repair and maintenance includes services like hull repairs, engine overhauls, refitting and retrofitting, painting and coating, and periodic dry-docking for inspection and upgrades.

Shipyard industry is managing conversion and retrofitting. This involves modifying an existing vessel to adapt it for new requirements or regulations. This could include changing propulsion systems, deck layouts, or making hull modifications for a new purpose. Shipyard industry is making design and engineering. Shipyards house design and engineering teams that create detailed blueprints, models, and specifications for new vessels or

modifications to existing ones. Naval architects and engineers play a crucial role in this phase. The shipyard industry employs a range of skilled labor such as naval architects; marine engineers, welders-electricians-fitters, and project managers and logistics specialists

Shipyards are complex industrial sites equipped with specialized infrastructure to support their operations. There is infrastructure of building berths/slipways; it is loping areas where ships are constructed and then launched into the water. It is dry docks (graving docks/floating docks), a basin that can be drained of water to allow full access to the underside of a ship for construction, repair, or maintenance. Floating dry docks are massive platforms that can submerge to take in a vessel and then rise to lift it out of the water. Cranes infrastructure, various types of cranes, including enormous gantry cranes, are used to lift and move heavy components of ships. Workshops infrastructure is a specialized workshop for various trades, including plate cutting and bending, welding, pipe fabrication, electrical work, machinery repair, and painting. Then, warehouses infrastructure for storing raw materials, spare parts, and equipment. Administrative and design offices space for project planning, coordination, and engineering.

The shipyard industry is vital for global trade, national defense, and various maritime activities. It supports global commerce –by producing the ships that transport goods across oceans, facilitating international trade; national security –through the construction and maintenance of naval vessels; employment –providing jobs for a wide range of skilled professionals, including engineers, naval architects, shipwrights, welders, electricians, painters, and more; economic development –contributing significantly to the economies of countries with strong maritime sectors; technological advancement –shipyards are often at the forefront of adopting new technologies and innovations in maritime engineering and construction. In essence, the shipyard industry is a fundamental pillar of the maritime world, enabling the creation, upkeep, and evolution of the vessels that navigate our waters.

In sum, shipyard industry is essential for international shipping and logistics, national defense and maritime security, offshore oil and gas industry, employment and regional industrial development. There are environmental and technological trends that make the industry is adapting to green shipping technologies (e.g., LNG-fuelled ships), digital design and automation, environmental regulations on emissions and ballast water. The countries with strong shipbuilding industries include South Korea (e.g., Hyundai Heavy Industries), China (e.g., China State Shipbuilding Corporation), Japan (e.g., Mitsubishi Heavy Industries), Germany, Italy, and USA also have notable shipyards.

Indonesia Shipyard Industry

Haris Eko Faruddin, at The Jakarta Pots, comprehensively analyze on Indonesia shipyard industry. It was presented that, currently, 117 shipyard companies under the Indonesian Shipbuilding Association (Iperindo) operate around 27,000 commercial vessels — 21 percent of which are older than 25 years — across the country. Most of the firms base their businesses in Surabaya, East Java, (21 companies) and in Batam (15 companies). Other than shipyards, Iperindo members also consist of 72 supporting industries companies, four classification bureaus and five consultant companies. Some of them are cable factories, paint factories, classification companies and ship designers, among other businesses. During its golden era supported by a coal price boom in 2010 and 2011, as many as 150 shipyards operated in the country. However, only around 50 percent of these shipyards were in operation at the time. Batam, as a free trade zone, offers a big opportunity in shipbuilding as the required engines and spare parts are free of duty. As many as 15 shipyards base their businesses in the area. The question arises whether or not Batam can overtake Singapore's market. This is quite difficult to do as the tanker repair process in Singapore, for instance, only takes two weeks thanks to the availability of supporting industries and manpower. In comparison, the same process needs six weeks in Indonesia as shipyard facilities in the country are not as sophisticated as in the city-state. The shipyard business itself generally consists of two jobs, namely ship repair and construction, both of which have different income characteristics. As for ship repair, it has a relatively small revenue but

has a larger profit margin of between 20 and 25 percent. However, ship construction can gain a higher revenue but a lower profit margin compared to the repair business¹.

One of the problems of Indonesia's shipyard industry is that it still imports 65 to 70 percent of its raw materials. Trade Ministry data shows that ships and floating building imports ranked sixth in 2018 imports and amounted to US\$1.31 trillion, far higher than the aviation industry and its spare part imports worth \$908 million. In fact, Indonesia as a maritime country is expected to champion the shipping industry and its supporting sectors in the region. The supporting industries must grow so that the quality of local products will improve. If more local products are available, imports will decline in the next five to 10 years, and the country can even export these products. Meanwhile, Iperindo has also pushed the Industry Ministry to exempt raw materials needed by the sector from import duties and value added tax because when compared to shipyard businesses in Malaysia, Vietnam and China, components in Indonesia cost at least 15 percent higher due to import duties of 5 to 12 percent. It is not just about lower prices. China, for instance, also offers more relaxed terms for acquiring a ship. A company can buy one with a down payment of 10 percent, which can be paid in four to five instalments, and is allowed to pay the remaining 90 percent of the price once the ship's construction is completed. Not only does it require the government's support, the shipyard industry also needs financial support from banks. Investment loans abroad could be repaid in up to 15 years, but in Indonesia, payment instalments must be done within five to seven years on average. The situation weighs on the company's cash flow, forcing many companies to import used ships. Banks also have their respective considerations in providing financing amid slowing economic growth. On the other hand, Iperindo also expects lending interest rates to lower to single digits².

it possibly, one of the challenge stems from the policy. Indeed, there is

¹ <https://www.thejakartapost.com/news/2019/09/25/shipyard-industry-still-needs-support.html>

² *ibid*

protection as such cabotage laws (2008) aimed to boost local shipbuilding but lacked follow-up investments in infrastructure/skills. However, still bureaucratic bottlenecks: Permits for new shipyards take 3–5 years (vs. 1 year in China). Inconsistent subsidies are another issue as no sustained tax breaks or low-interest loans for modernization.

Shipyard industry also facing problem of technological obsolescence in term of outdated facilities, which 80% of Indonesian shipyards can only build vessels <10,000 DWT (small coastal ships). The next problem is lack of R&D, as spending on maritime tech is 0.1% of GDP (vs. China's 1.2%). Indonesia is less competitive to China, as Chinese-built ships are 30–50% cheaper due to economies of scale. Indonesia has problem of declining orders as Indonesian shipping companies prefer foreign-built second hand ships (avg. age 20+ years). There is problem of infrastructure gaps as there is limited deep-water ports, in which only Batam has docks capable of building Panamax-sized ships. Energy costs is another problem, as electricity for shipyards is 2× costlier than in China. The total figure of the industry is Indonesia's shipbuilding output is 230,000 DWT/year (2023), compare to China's of 40 million DWT/year.

The question is how China became a shipbuilding superpower. The first is always government intervention It is a state-driven industrial policy. China had implemented "Made in China 2025" Policy which one of the targets is shipbuilding industry. Targeted shipbuilding as a strategic sector with \$30B+ subsidies (2015–2025) for R&D and automation, Tax holidays for export-oriented shipyards, and forced technology transfers with joint ventures (e.g., with South Korea's DSME) mandated knowledge sharing. The industry economies of scale also the agenda. China has developed the mega-shipyards industry, as China has 7 of the world's 10 largest shipyards (e.g., Jiangnan, Dalian). China also develop clustering policy, as advised by Michael E. Porter in his *Competitive Advantage of Nations* (1998), where suppliers (steel, engines) are located near shipyards, cutting costs by 20%. China promote innovation and automation by introducing robotic welding which cuts labor costs by 40% (vs. Indonesia's manual labor) and green ship focus by leading in LNG carriers (+50% global market share) and electric ferries. China also try to capture the global market, even on using dumping strategy, by sold ships below

cost to dominate markets (e.g., COSCO’s tankers). The Belt and Road (BRI): Financed African/Asian ports with mandated Chinese-built ships had supported the shipyard industry. In sum, China builds 50% of global ships (2023), meanwhile Indonesia’s 0.6%.

Table 7.1. Side-by-Side Comparison

Factor	Indonesia	China
Government Support	Ad-hoc subsidies, weak enforcement.	Long-term subsidies, strict KPIs.
Technology	Reliant on 1980s Japanese/Korean tech.	AI-driven design, robotic production.
Labor Productivity	10x slower than China (per ship).	Highly trained, automated workforce.
Supply Chain	Import 70% of steel/engines.	Localized (e.g., Baosteel for hulls).
Market Strategy	Focused on domestic cabotage.	Global export dominance (+BRI leverage).

What Indonesia lessons to learned? First, a short-term fixation (2024–2027), on targeted subsidies by fund upgrades for 5 strategic shipyards (e.g., PT PAL, Batam yards); on streamline permits, by fast-track approvals for FDI in shipbuilding (e.g., Hyundai’s Batam investment); and local content waivers by allowing temporary imports of critical parts (e.g., engines) until local capacity improves. Second, a long-term strategy (2028–2035), on developing Special Economic Zones (SEZs) that offer 20-year tax breaks for shipyards in Batam, Surabaya; R&D partnerships by collaborate with Dutch/Korean firms on green ship tech (e.g., ammonia engines); and workforce training by establishing "Maritime Academies" with German/Japanese curricula. The third, to leverage maritime advantages, on bauxite/aluminium exports by mandating local processing into shipbuilding materials; on fishery fleet renewal by replacing 10,000 traditional boats with Indonesian-made modern vessels.

We might, perhaps, saw the case of PT PAL’s Limited Success. The company had successfully built 40+ naval vessels (e.g., *KRI Nagapasa* submarines with South Korean help). However, the company is still struggling in commercial

shipbuilding due to high costs (30% above Chinese prices), and lack of scale (only 2 dry docks). It is possible for PAL to partner with China's CSSC for tech transfer, but mandate 51% Indonesian ownership.

In conclusion, it might be admitted that Indonesia's shipbuilding decline stems from short-term policies and underinvestment, while China's success is built on state capitalism and global ambition. To compete, Indonesia need to prioritize shipbuilding like China's 2025 plan, fix infrastructure (power, ports, steel supply), and leverage its archipelagic demand (replace aging *Pelayaran Rakyat* fleet locally).

BOX: Policy Draft Ready of Indonesia's 10-Year Shipbuilding Roadmap (2025–2035)

Objective: Revitalize Indonesia's shipbuilding industry to achieve 5% global market share (from 0.6% today) and reduce reliance on foreign vessels.

Phase 1: Foundation (2025–2027)

Goals: Modernize infrastructure, attract FDI, and boost local capacity.

Key Actions:

1. Strategic Shipyard Upgrades

- Designate 5 priority shipyards (PT PAL Surabaya, Batam, Banten, Makassar, Sorong) for state-funded upgrades.
- KPIs:
 - Increase dry dock capacity by 50% (new docks for vessels up to 50,000 DWT).
 - Reduce construction time by 30% via automation (robotic welding, 3D printing).

2. Policy Reforms

- Tax incentives: 0% VAT for local shipbuilders; 10% corporate tax for foreign investors.
- Fast-track permits: Approve new shipyard licenses in ≤6 months.

- KPI: Attract \$2B in FDI (e.g., Hyundai, Mitsubishi partnerships).
- 3. Workforce Development
 - Train 10,000 workers via German/Dutch-certified programs at BP3IP academies.
 - KPI: Certify 5,000 STCW-compliant welders and engineers by 2027.

Phase 2: Scaling (2028–2030)

Goals: Compete regionally in commercial shipbuilding and green technology.

Key Actions:

1. Local Supply Chains
 - Partner with Krakatau Steel to produce ship-grade steel (reduce imports by 70%).
 - KPI: Local content in ships increases from 30% to 60%.
2. Green Ship Leadership
 - Launch ammonia/hydrogen-powered ferry pilot (Surabaya-Bali route).
 - KPI: Build 50 green vessels (tankers, ferries) by 2030.
3. Export Push
 - Target ASEAN markets (Philippines, Vietnam) with cost-competitive cargo ships (<\$20M/unit).
 - KPI: Export 200 vessels by 2030.

Phase 3: Global Competitiveness (2031–2035)

Goals: Become a top-10 global shipbuilder and hub for R&D.

Key Actions:

1. Mega-Shipyard in Batam
 - Build a Panamax-capacity yard (joint venture with South Korea's DSME).
 - KPI: Construct vessels up to 150,000 DWT (e.g., VLCCs).
2. R&D & Innovation
 - Establish National Maritime Tech Institute (focus: automation, alternative fuels).
 - KPI: File 50 patents in shipbuilding tech by 2035.

3. Circular Economy

- Recycle 50% of retired ships domestically (vs. current 5%).
- KPI: Reduce steel waste by 40%.

Table 7.2. KPIs Summary Table

Area	2025–2027 Target	2028–2030 Target	2031–2035 Target
Production	500,000 DWT/year	1.2M DWT/year	3M DWT/year (Top 10 global)
Local Content	30%	60%	80%
Exports	50 ships (\$1B revenue)	200 ships (\$4B revenue)	500 ships (\$10B revenue)
Green Ships	5 pilot vessels	50 vessels (10% of output)	30% of total output
Employment	10,000 skilled workers	50,000 workers	100,000 workers

Funding & Partnerships

1. Government: Allocate Rp 50T/year (≈\$3.2B) from sovereign wealth fund (INA).
2. Private Sector: PPPs for shipyards (e.g., PT PAL + Mitsubishi).
3. International: Loans from JICA (Japan) and BRI (China) with tech-transfer clauses.

Table 7.3. Risks & Mitigation

Risk	Mitigation
Foreign competition	Tariffs on imported ships <10 years old.
Skill gaps	Mandate OEMs (e.g., Hyundai) train locals.
Steel shortages	Subsidize Krakatau Steel expansion.

Case Study: Vietnam’s Success

- Lesson: Vietnam rose to #4 global shipbuilder via:
 - FDI incentives (e.g., Samsung Shipbuilding).

- Focus on niche markets (offshore support vessels).
- Adaptation: Indonesia should target green ferries and LNG carriers.

Conclusion: This roadmap balances protectionism (local jobs) and global integration (exports, tech). With disciplined execution, Indonesia can transform from a ship importer to a shipbuilding powerhouse.

Singapore as A Case Study

Singapore's rise as a global shipbuilding and repair powerhouse—despite its tiny size—is a masterclass in strategic policymaking, geographic leverage, and relentless innovation. The Singapore had the geographic and historical Advantages. Geographically, there is natural deep-water ports, where Singapore's location on the Strait of Malacca (30% of global trade) made it a natural hub. Historically, Singapore was the British colonial legacy which inherited ship repair docks from the 19th century (e.g., Keppel Harbour). But geography alone didn't suffice—deliberate policies transformed these advantages into dominance.

Singapore had the strategic government interventions. The first, is a state-led industrialization. Keppel and Sembcorp are the two state-owned giants (now privatized) were nurtured via land grants: Cheap coastal land for shipyards, and R&D funding: \$500M+ for automation/AI in the 2010s. The intervention is to support Maritime and Port Authority (MPA) by streamlined permits (shipyard licenses in 48 hours vs. months in Indonesia). The second strategic intervention is due to the tax and financial incentives, for instance, giving 0% corporate tax for ship repair firms until 2000, and maritime cluster fund, by subsidized worker training (e.g., robotic welding certs). The third is foreign investment magnetism, by forced JVs by required foreign firms (e.g., Rolls-Royce Marine) to partner locally and transfer tech, and no cabotage laws, as open competition attracted global players like Halliburton and Schlumberger.

Singapore choose to have specialization in high-value niches, avoided competing with China on mass-produced ships. The shipyard industry

dominated market of offshore and marine (O&M) as the world's #1 builder of oil rigs (Keppel's jack-up rigs: 70% global share), FPSOs (Floating Production Storage Offloading): \$3B+ projects, LNG Carrier Repairs by having market 30% of global LNG repairs done in Singapore, and cruise ship refits, luxury liners choose Singapore for upgrades. In some, Singapore's shipyards generate \$8B/year (vs. Indonesia's \$1.2B).

Singapore has workforce and technology edge by skills development. Singapore Polytechnic had 1,000+ maritime grads/year (vs. Indonesia's fragmented BP3IP schools), while wages 3× higher than Indonesia's, but productivity 5× higher. Singapore had introduced automation in robotic arms weld hulls 24/7 (cuts labor costs by 50%), and digital twins simulate ship repairs before dry-docking.

There are the infrastructure synergies on Jurong Island Integration which the shipyards co-located with oil refineries (Shell, Exxon) and steel mills, and a Just-in-time supply chains, which hull steel arrives by barge in 2 hours. Singapore also develop the mega port links as the PSA terminals feed shipyards with spare parts from global hubs.

Lessons for Indonesia is, it might be copy is to have niche focus by targeting LNG bunker ships or electric ferries (not VLCCs), having state-backed champions by transforming PT PAL into a Keppel-like conglomerate, and skills on pipeline by centralizing training under BP3IP Jakarta with German/Japanese curricula. However, thing not to be recommended is to become overprotection, compare to Singapore's openness that bred competition and innovation, and scattergun Subsidies: Support only yards meeting export KPIs.

Indonesian had a unique Opportunities as having the archipelagic demand, as least need to build 1,000 hybrid ferries for domestic routes. Besides, the nickel down-streaming might be optimizing by use local nickel for battery-powered tugboats.

The Keppel's Success Formula is (1) having Govt Backing --1970s state funding to buy Dutch rig tech; (2) Global Clients --built rigs for Saudi Aramco, Petrobras;

and (3) vertical integration —makes its own cranes, drills, and control systems. Indonesia's PT PAL could partner with Brazil's Petrobras to learn FPSO construction, and bid for ASEAN patrol vessel contracts.

In sum, there is a key takeaway, as Singapore's success wasn't luck—it was ruthless focus on high-value segments, state-private coordination, and relentless upskilling. Indonesia has more resources (nickel, bauxite, domestic demand) but needs Singaporean discipline.

Chapter Eight: Conclusion

Maritime business refers to the commercial activities related to the sea and ocean. The book is discussing the four main issues: maritime transport, maritime logistic, management oil and gas maritime transport, and shipyard industries. Maritime Transport Management blend core industry knowledge, modern challenges, and strategic leadership skills. Maritime Transport Management (MTM) is a multidisciplinary field that scholars define through the lenses of economics, logistics, law, and sustainability. Maritime Logistics Management refers to the comprehensive planning, implementation, and management of the movement of goods and information across the seas. It encompasses a wide range of activities involved in shipping and the coordination of transport chains to ensure efficient, cost-effective, and timely delivery of goods globally. Oil and gas maritime transport refers to the shipping of crude oil, refined petroleum products (like gasoline, diesel, jet fuel), liquefied natural gas (LNG), and liquefied petroleum gas (LPG) across oceans and other waterways using specialized vessels. It's a critical component of the global energy trade, enabling the movement of these vital resources from production areas to refineries and consuming markets worldwide.

The shipyard industry refers to the specialized industrial facilities where ships and other marine vessels are designed, built, repaired, maintained, converted, and refitted. These facilities are typically located on the shores of seas, rivers, or other large bodies of water to allow for easy access for vessels. The large shipyard industry site usually located near coastlines or rivers equipped with dry docks, slipways, cranes and welding equipment, and fabrication shops.

Compare to other business management, however, maritime business facing the more complex ecosystem, and therefore its management. However, the management process is the same. There is *planning, organizing, executing, leading, and controlling*. But the scope, complexity, and risks are different, therefore its difficulties. They are range from business alone, political,

environmental, to the natural risks, and even criminal risks across the border -pirates.

The uniqueness of its management and its VUCA –volatility, uncertainty, complexity, and ambiguity—created a different ecosystem of the business and its competition. It is also government response toward the business, on its public policy, especially business maritime regulation. Policy makers of the developing country, mostly handicapped to have a prominent response as most of them, include Indonesia, has no effective clue to manage its maritime business ecosystem. Some of Indonesia cases would be important to understand its difficulties, as public policy in the area has to be implemented across and beyond its borders. And, many global regulations have already settled to manage this global business. At is the next learning.

This book exercise very short on overall phenomenon on maritime business with intention to provide the general abstraction to the student on what they might have learned. As an introduction, there are some limitations, as the exercise could be a general perspective, alone. However, the book would like to challenge the students –an us— to manage the next, probable, more comprehensive introduction.

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Prosperity comes from healthy and sustainable economic growth. And, it comes from healthy and sustainable business sector growth, because they create profits, jobs, taxes, and continuous capital accumulation. While the government is a cost center, every growth from the government requires additional taxes and new debt.

So, growing the business sector is commonplace. However, it is not easy to advance the maritime sector business, from sea transportation, logistics, to shipyards. The existence of the business is extremely different from businesses in general, such as manufacturing or retail trade. Whereas globalization is an era characterized by globalized supply chains, in which 90% of world trade moves by sea. The challenge as well as the course is a critical one, especially for Indonesia, a maritime country with 17,001 islands.

This book is about maritime management, which is one of the subjects of the Master of Maritime Studies Program at the Department of Marine Transportation Engineering, at the Faculty of Marine Technology, of ITS, Surabaya. Specifically, this book discusses maritime management and business in Indonesia, as a developing country, and public policies related to maritime business.



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