

# Shipping 5.0: Customization of Experience through Digital Transformation

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Over the past three decades, the global economic landscape has experienced a substantial transformation process, which has led to the spread of service economies and the corresponding decline of traditional industry-based businesses. Shipping, like most industries, is undergoing a digital transformation process which influences existing business models and operational practices in multifaceted ways. Today, the module of the shipping business has been changing to incorporate various social demands, environment, innovation and sustainability priorities into fundamental shipping strategies while taking advantage of technological advancements. In the era of the state-of-art industrial revolution, which constituted the evolution of advanced communications and information technologies and promoted sustainable,

human-centric and resilient business development strategies, shipping industries need to embrace a broader perspective and a deeper understanding of it. In addition, the uptake of digital processes, automation and other efficient driving technologies will increase in the coming years because of the impact of COVID-19 on ports and terminals. Moreover, the current geopolitical situation, such as the conflict in Ukraine, is pushing the shipping industry toward Shipping 5.0, where skilled and experienced people will work alongside robots and smart machines. This will reduce the human casualty and also increase shipping efficiency.

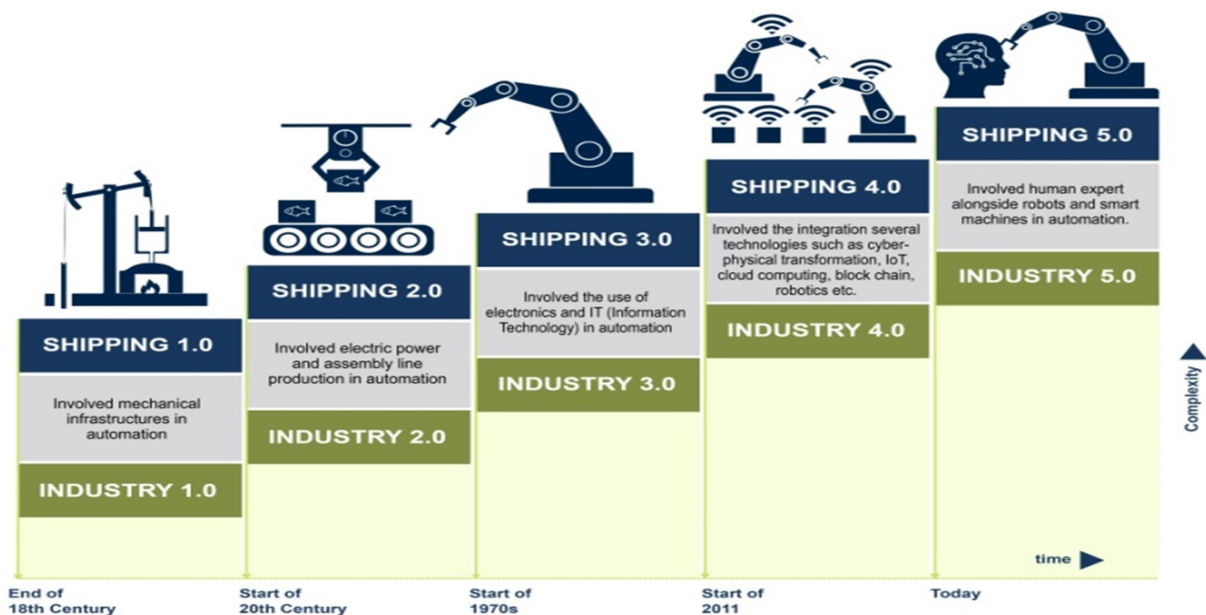
Shipping 5.0 uses all the components of the Industry 5.0 framework, It embraces automation and innovative technologies, including Artificial Intelligence (AI), Big

Data, Internet of Things (IoT), Blockchain and Skilled Personnel to improve its performance. In the last decade, most modern industries tried to revolutionize themselves through Industry 4.0 by using technologies, eg. machine-to-machine communication, cognitive computing, Radio Frequency Identification (RFID), IoT, robotics, cloud computing, mobile technologies, computing, data storage and connectivity. Subsequently, production efficiency improved by leaps and bounds, resulting in a spurt in the growth of the world economy. The global shipping industry, which is the lifeline of the global economy, moves about 90% of world trade by volume and in the process, generates an estimated annual income of over half trillion USD in freight rates needed to replicate this technology-driven growth. Hence, Industry 4.0 was also embraced by the shipping industry to improve its value chain and management to enhance profits and reduce overheads by improving efficiency. This technological transformation in the shipping industry was termed Shipping 4.0. During the COVID-19 pandemic, it was felt that robots and intelligent machines should work alongside skilled human resources in the shipping sector, leading to the Shipping 5.0 revelation. Several research studies found that robots guided by humans work better and faster by leveraging advanced technologies like the IoT and AI. It also increases the efficiency of automation.

Today, the shipping industries use digitalization for connectivity - to get real-time information about a ship's performance at sea; for maintenance - to enable remote diagnostics of the machinery of ships at sea; and for

safety-to ensure the shore-based monitoring of gas emissions and cargo temperatures of its seagoing assets, to decrease the operational cost and risk of failure due to negligence. Most seaports also use digitalization to facilitate their activities. A smart port is realized by utilizing wireless devices, smart sensors, actuators, data centres, and other IoT-based systems connected and exchanging information. The seamless communication of ships, cargoes, and waterway and shore-based facilities, based on 5G and IoT technologies, constitutes the infrastructure of the smart port and shapes the innovation potential of the emergent maritime logistics services and applications. The efficiency, security, and safety of port operations and the achievement of the highly prioritized sustainable development goals are substantially improved by automating port operations, ie. Vessel management, container terminal operations, and yard automation.

Although digitizing in the shipping industry is still in an embryonic phase, it has already become hugely popular. This popularity has led to exponential data creation, supported efficiently by hardware (computing power) and 'Cloud'-based data-storage solutions (on-site storage). Another area where digitalization is being implemented in the shipping industry is cargo shipment using blockchain technology. A 'blockchain' is basically a way to store, share and verify information using a 'ledger'. The stored information in the blockchain exists as a shared, secured, decentralized and encrypted 'public ledger', which inherently resists any modification and is easily verifiable. This, therefore, enhances cyber



security, resulting in the blockchain process becoming a platform of trust and value in industries that have adopted this technology. Introducing blockchain technology in the shipping industry can cut administrative and operational risks for ship owners, charters and brokers, as it ensures greater transparency, enhances security, improves traceability, increases efficiency and speed of transactions, and reduces costs.

Shipping 5.0 has been implemented in many countries like the USA, Germany, France, UK, China, Japan, Korea and Thailand. Particularly in the supply chain area, digitalization and integration of AI and IoT, sharing economy and blockchain are important in addition to other core technologies. Logistics has not been associated with high technology for a long time since it was recognized as an industry in the mid of the nineteenth century. The situation is changing with the increase of Logistics 5.0 efforts. This logistic transformation is directly related to shipping sectors,

presenting a more efficient, sustainable, error-free and secure approach.

Despite of the enormous advantages of adopting Shipping 5.0, the shipping industries may face the following barriers in the next few years:

- > Cost: Initially, the development and set up of Shipping 5.0 technology is expensive. Maintenance is also costly, as companies need to rely heavily on experts to iron out teething problems in the beginning.
- > Lack of standardization: One of the common obstacles in shipping is the fragmented market, making the business case difficult for anyone who wants to justify an investment, which is also reflected in the lack of standardized data and consequently, incompatibility of data. A major barrier lies in the sector's inability to have information in time, ie, to analyse and make use of data in real time, thus, obtaining information that will support better decision-making.
- > Migrating from legacy systems: Migrating over from older systems is

expensive and time-consuming. Staff working on simpler systems must first undergo rigorous training on how to use cutting-edge technology before business as usual can commence.

> High energy use: All these new technologies need uninterrupted energy sources to function in real-time. When a new node is created, it communicates to all other nodes in the Cyber Network. It draws large quantities of computational power. It is also expensive and drains precious resources, Like most industries, the shipping sector aims to reduce its carbon footprint, not increase it.

Bangladesh's economy is growing comparatively faster than other regional countries. The present government, assuming office in 2009, concurrently envisioned and undertook massive investment in development projects, helping GDP growth multiplication. As a maritime nation, Bangladesh's booming economic growth mainly depends on the sea and its shipping sectors, More than two-thirds of Bangladesh's trade by volume is transported by ships of different sorts and sizes. The shipping industry's contribution to the country's economic sustainability is enormous and will even be more in the future. Bangladesh's global trade value for exports and imports was \$74.47 billion in 2014, which grew by \$116.23 billion by 2021. The trade growth is 2.68% compared to the global growth of 6.61%.

The growth trend of the shipping industry was promising even during the COVID pandemic, The seagoing vessel number increased from 48 to 80 by June 2022. Chittagong Port currently handled 119 million tons of import and export cargo, including 3.21 million TEUs of container in 2021-22 FY. The annual growth rate of container traffic has been increased about 10-12% over the last 5 years. Realizing the potential of Bangladesh's ocean shipping sector, its digital transformation is necessary for achieving sustainable development goals, Bangladesh Government has also set up a goal to bring 5G to all metropolitan cities by 2026, which will undoubtedly boost the technological transformation. Although Bangladesh has not yet grown technologically as a modern country, and we have budget constraints, still the county is moving progressively towards a vision of becoming a digital Bangladesh, The government is taking megaprojects for sustainable development through diverse digital transformations. Thus, the adaptation of Shipping 5.0 by all major actors in the Bangladeshi shipping industry, especially seaports, can help the country to be globally competitive and meet its demands.

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