

# Challenge of COVID-19 Pandemic in the Supply Chain of Taiwan's Pleasure Yacht Industry

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**Abstract**—Taiwan ranks as the 6<sup>th</sup> largest producer of pleasure yachts worldwide and the first in Asia. More recently, there has been a growing demand for luxurious products due to increased income and spending. Taiwan's superyacht industries have taken advantage of these trends to meet increasing demand. However, the recent event of the COVID-19 pandemic devastated the industry. The supply chain of the industry was effectively disrupted. This research was conducted to understand the pandemic's effects and strategies sought to mitigate the same. Specifically, the research sought to review the challenges of the COVID-19 pandemic on the supply chain of Taiwan's pleasure yacht industry. Interestingly, demand increased significantly during this period. Taiwan has sought to foster its internal market and manufacturing capacity to reduce their vulnerability during the pandemic.

**Keywords**—Yacht, super yacht, pleasure boats, SCM, supply chain management, COVID-19 coronavirus

## I. INTRODUCTION

### A. Background

The COVID-19 pandemic has had profound effects on the luxury and travel industries across the globe. At the very least, the pandemic has affected the production of boats and luxury yachts worldwide. The COVID-19 pandemic created uncertainties in the consumption and production of luxurious products. As the world sought to reduce the spread of the virus across the world, the focus shifted towards the production and supply of essential products like medication and medical equipment. Most other industries were neglected, especially those engaged in producing luxurious products. One such industry was Taiwan's pleasure yacht manufacturing industry.

The yacht industry represents growth in industrial capability and contributes to the economy's overall performance and related sectors like tourism, engineering, fashion, and design. North America represents one of the world's largest markets for the pleasure yacht industry closely, followed by Europe (UCS, 2019). Traditionally, Europe and the United States are the largest producers of pleasure yachts in the world. However, in recent years, yacht builders in Taiwan have increased their market share, representing 6% of the global industry share. Chuang

(2015) reports that, between 2009 and 2019, Taiwan ranked as the 6<sup>th</sup> largest yacht producer in terms of tons, relative to countries like the United Kingdom, Netherland, and Germany (BOAT International, 2021). During this period, the consumption of pleasure yachts increased in revenue, reflecting an increase in quantity consumed in Australian and Asian markets (Fig. 1.). Despite a positive projection, the industry was disrupted by the advent of the COVID-19 pandemic.

### B. The Taiwanese Pleasure Yacht Industry

Till recently, Taiwan ranked sixth globally in the production of super yachts and first in Asia. Over 40 years ago, there were a relatively limited number of producers in the country. (TETDC, 2022) indicates that the country producers have honed their skills for several years by collaborating with other stakeholders worldwide, especially in Europe. With increasing excellence in craftsmanship, enhanced technology, and growing design capabilities, the yacht industry in Taiwan has grown to become globally recognized. There are numerous renowned companies in the country, including Horizon Yacht and Ocean Alexander, which rank among the top producer in the world (UCS, 2019). The 'Taiwan Yacht' brand is well renowned and exemplified worldwide; hence a major competitor compared to some of the well-established brands in Europe, the United Kingdom, and the United States. In addition to producing superyachts, Taiwan has the capability of developing small and relatively medium-sized boats that meet the diverse demands of consumers.

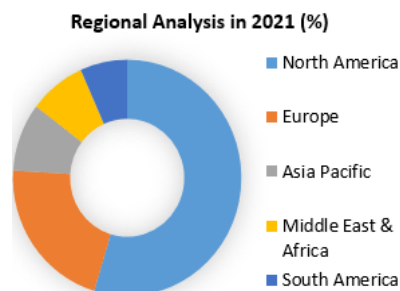


Figure 1. Market by region.

Taiwan’s yacht industry is primarily reliant on the export markets. In 2019, the value of yacht exported from Taiwan topped over 230 million dollars, representing a 38% increase from the previous year. Approximately 68.7% of the yachts produced in the country are destined for the United States, 13.8% in Australia, and 2.6% in Japan (Crook, 2016). It is estimated that over 80% of the companies engaged in yacht production in Taiwan are located in Kaohsiung. The city harbors numerous players in the production process, including research and development centers, manufacturers of various components, marketing firms, agencies, and dealers (Yan, 2018). This represents almost the entire country’s yacht production industry supply chain. The centralization of these key players in one location has indeed contributed to reducing lead time and the cost of production. However, Taiwan is not entirely independent as many components are imported from Europe, the United Kingdom, Australia, and the United States.

II. RESEARCH PROBLEM

Prior to the onset of the COVID-19 pandemic, the superyacht industry in Taiwan experienced a series of turbulences. The construction of superyachts or pleasure yachts is capital intensive. Hence, by its nature, it is not ideal for new companies and entities that have limited budgets. There are two main reasons why the expansion of the industry has been limited. One of the reasons is inherent to the fact that superyachts are luxury products; hence, marketing strategies ought to be in line with the consumer’s expectation, characterized by the desire for luxury and an extravagant lifestyle. The second challenge is associated with the nature of construction contracts. For instance, funds for yacht construction (Fig. 2.) may take over 2.5 years to secure (Chuang, 2018). Additionally, the Taiwanese yacht industry is subject to changes in the external environment, which include regional challenges, fluctuations in currencies, sudden changes in equipment costs, labor shortages, and other unexpected challenges that, in turn, affect the industry’s profitability.

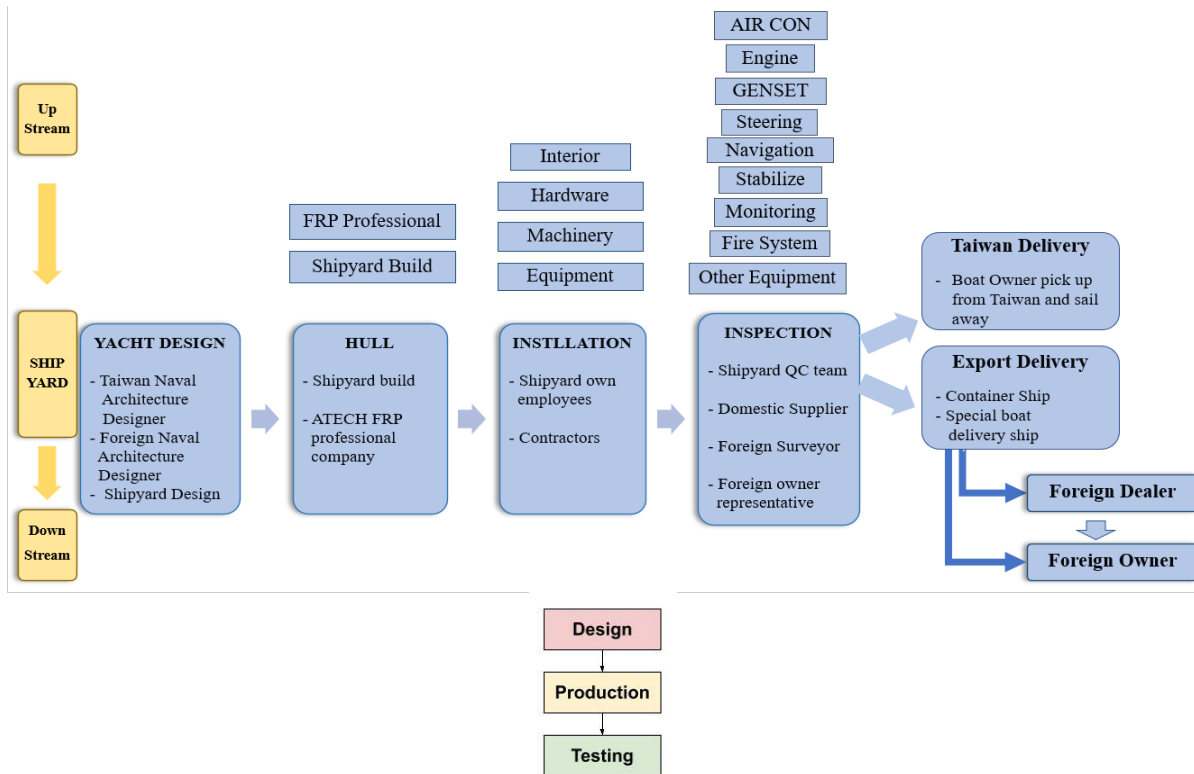


Figure 2. Yacht construction process

During the COVID-19 pandemic, the demand for superyachts remained relatively high. Demand was driven by several factors, including the increased desire for privacy among the super-rich during the pandemic. However, Taiwan depends on the global market to import raw materials used in production and export the manufactured end products. (Wong, 2021) denotes that the supply chain of the Taiwanese superyacht industry greatly influences performance. While these issues have remained constant in the sector, the recent COVID-19 pandemic exacerbated the challenges faced (Prudour, 2022).

However, limited studies have examined how the supply chain of the Taiwanese pleasure yacht industry weathered the COVID-19 pandemic and some of the strategies that have been critical in the industry’s success.

C. Research Objective

This research explores how Taiwan’s pleasure yacht industry was disrupted by the COVID-19 pandemic and the strategies deployed to ensure stability.

Specific research objectives include:

- Determine the effects of the COVID-19 pandemic in the supply chain of Taiwan's super yacht industry.
- Determine strategies deployed to overcome the challenges created by the COVID-19 pandemic.

#### D. Specific Research Questions

- How did the COVID-19 pandemic affect the supply chain of Taiwan's pleasure yacht industry?
- How was the effect of the COVID-19 pandemic mitigated by industry players?

### III. METHODOLOGY

The research aimed to explore how the COVID-19 pandemic affected the pleasure yacht industry in Taiwan. The effects of the COVID-19 pandemic have been extensively examined in the last three years. There is a dearth of literature on how the pandemic has affected different aspects of the supply chain. There is, however, limited literature on how the pandemic shaped the Taiwan pleasure yacht industry. Thus, an explorative methodology using a systematic literature review was considered ideal. The methodology was critical in identifying research gaps and areas that should be further studied.

The current study utilizes secondary sources of information. The sources were identified through a search process. A search was conducted on the Google search engine using the following terms; Yacht, super-boat, superyacht, pleasure yacht, COVID-19, coronavirus, effects, pandemic, COVID-19, luxury industry, and other alternative terms and synonyms. Search results were limited to studies conducted in Asia, the United States, and Europe. Studies were also considered ideal if they detailed the Taiwan industry.

Thematic content analysis was used to analyze the data collected. Each source was thoroughly reviewed, and notes were taken during the reading. The first portion of this report focuses on the supply chain process in the industry. It also delves into the unique challenges experienced during the pandemic by the industry and the supply chain in particular. The second theme is the response to the challenges faced by the industry. The third theme includes recommendations for preparedness in case of such eventualities in the future.

An explorative literature review is considered ideal and delimited to the research conducted. For instance, using this approach was ideal relative to time and cost. However, it is limited by the fact that most of the literature on the industry is not written in the English language.

### IV. RESULTS AND DISCUSSION

#### A. Challenges of the COVID-19 Pandemic

The COVID-19 pandemic affected different sectors of the economy. Some of the most significant sectors of the shipping economy in Taiwan are: manufacturing and the export and import sector. The manufacturing sector experienced disruption in the distribution of products. For example, shipping routes were temporarily closed to curb

the spread of the virus and in response to the reduced number of workers in logistical hubs and yards. Manufacturers also experienced a build-up in inventory, which increased the cost of operations and storage. Ports at the time were overwhelmed by numerous products yet to be cleared and transported to the point of delivery. These conditions ultimately translated to a relatively high transportation cost of raw materials and finished products.

In every industry, the supply chain process is critical to the success of the marketing process. The supply chain affects the delivery time, product quality, and customer satisfaction. There is also more specific element like skills of the staff and reliability, outsourcing and subcontracting relationship, and most notably, profitability of the company that is affected. The COVID-pandemic affected the time taken to meet the needs of the consumers and other stakeholders. However, to the Taiwanese yacht industry, these effects were inherent to the nature of the industry.

The construction of a pleasure yacht often requires a broad variety of materials, components, and parts that typically can individually cost hundreds of thousands of US Dollars. These components are also unique, and custom manufactured to suit individual projects. Most of the components used in the Taiwanese industry are sourced locally. There are cases where consumers demand certain specific quality product that cannot be sourced locally and are required to be as authentic as possible (TETDC, 2022). The individual suppliers are often tied to unique and inherent processes and procedures, terms, and conditions that the importer in Taiwan can dictate. The COVID-19 pandemic led to increased uncertainties amidst an already complex supply chain matrix (Prudour, 2022). In most cases, products were wasted and not immediately dedicated to manufacturing.

The COVID-19 pandemic resulted in the fluctuation of currencies and the underperformance of economies across the world. Fluctuation in currencies increased the cost of purchasing products. Logistics were also unreliable, with unpredictable delays due to events like strikes, shortages in labor, and other unforeseeable circumstances across the continent (Yan, 2018). When such an event arose, Taiwanese yacht producers faced numerous challenges in developing a new supplier relationship, which normally requires skills, time, and effort. The supply chain relationship for this industry ought to be grounded on mutual understanding, trust, resource availability, and in-depth negotiations. The disruptive nature of the pandemic undermined the realization of these conditions for better negotiations. During the pandemic, important events like the Taiwanese international boat show (TIBS) was cancelled, thus impacting connectivity and relationship with various stakeholder across the globe.

### V. STRATEGIES ADOPTED IN RESPONSE TO THE PANDEMIC

For the last two years, Taiwan and other industries worldwide have sought to adapt to the economic conditions caused by the COVID-19 pandemic. Response to the effects of the pandemic has been relatively slow and

untimely (Chuang, 2018). Such is attributed to the complex effects that the pandemic has caused. For instance, constructors have not been able to budget adequately. Even so, various strategies have been adopted. One of the most notable strategies is encouraging the local consumer market. Over 90% of the Taiwanese boats are exported (Wong, 2021). Taiwan boat manufacturers have been forced to look internally. This strategy is promoted by efforts to increase internal manufacturing capacity by reducing reliance on international manufacturers. Several infrastructural investments are underway to develop this capacity.

A supply chain includes suppliers offering products and services to achieve its operational and strategic goals. Through a supply chain, an entity can purchase, assemble, and maintain inventory of certain products and services sold in the market. Paul (2022) defines SCM as the process of designing, planning, executing, controlling, and monitoring activities in the supply chain to develop value and create a competitive infrastructure. Ideally, SCM includes activities that are aimed at creating value.

Over the years, various strategies have been developed by companies to ensure the success of the supply chain. Traditionally, the most common strategy has been minimization of wastage, which includes goods that are overstocked but undersold. With the use of the lean strategy, a company aims to maintain a relatively minimal quantity of stock and only places orders from suppliers when there is a demand. Hence, a company will minimize expenditure on stock and storage, thus, reducing costs on undersold stock and reducing wastage in the capital (Deloitte, 2020). While this strategy offers several advantages, it dictates that consumers must wait longer for certain goods and services. Lean strategy is deemed more effective when the key consideration is cost, and the demand is stable and predictable. Such was the case during the pandemic. With the disruption of most economies, businesses in all sectors were slowed down and experienced increased expenditure. The economic conditions were uncertain; hence, reducing the cost of production was paramount. On the other hand, the demand for superyachts was steady. Yet the leanness strategy was not entirely ideal for the existing market conditions.

During the course of the pandemic, other entities resorted to the agile system due to several considerations. Paul (2022) argues that when the demand is low, unpredictable and volatile and the availability of products is variable, companies need to be agile and flexible to survive or stabilize their performance. In an agile strategy, the supply chain involves international organizations and suppliers sharing information, systems, tasks, and logistical procedures. The pandemic presented a highly volatile and competitive environment. Most companies resorted to a hybrid approach, a mix of agile and lean supply chain strategies. A combination of the two approaches requires several considerations, including an in-depth analysis of the cost related to suppliers, parts required for manufacturing the end product and the logistical options available.

Every project is treated differently in the yacht building industry, which has implications for the supply chain's success and process. For instance, there is no base demand. Base demand translates to certain products and services that must be acquired and is commonly used in the process of production. Secondly, demand is unpredictable. Demand is not driven by certain factors that can easily be predicted (Gavalas & Syriopoulos, 2021). For example, the increased demand during the COVID-19 pandemic was driven by the desire to maintain privacy among the ultra-rich. Most of the yacht builders shifted towards the assembly of products. Due to the global nature of the supply chain, a series of employees, contractors, outsourced labor, customers and other key players, numerous challenges are bound to arise. One of the key success factors for most companies during the pandemic has been the use of information and communication technology (Paul, 2022). The wide use of technology has enabled manufacturers in Taiwan to coordinate, make timely enquiries and communicate effectively to customers to avoid overstocking and delay even in the course of the pandemic. The integration of ICT and communication networks is often performed by the boat builder, who plays the role of project manager. Coordination and integration are performed among different supply chain players (Paul, 2022). The COVID-19 pandemic did not offer sufficient time for training and analysis of management capabilities to respond to the needs of the industry at the time. However, yacht builders embarked on a rigorous process of seeking the appropriate supplier; by considering aspects like quality, price, and support level of the stakeholders.

#### *A. Recommendation for Recovery in Post-Pandemic Period*

The COVID-19 pandemic has resulted in significant lessons for the healthcare sector and the economy. Health pandemics and other related incidences are bound to arise. Evidence shows that pandemics can be disruptive and undermine the economic performance of numerous sectors. Some of the most notable lessons from the past two years of the COVID-19 pandemic can be instrumental in strengthening the Supply Chain of the pleasure yacht industry in Taiwan and across the continent.

One of the greatest lessons is increasing focus on the labor force. The labor force ought to be flexible, well equipped, and able to handle sudden changes in supply. A flexible labor force is well equipped and resourced to enable them to easily complete various tasks. Companies that rely on external suppliers should be able to identify possible risks and how to overcome them. While maintaining a relationship with a supplier is deemed fundamental, there is a need to be flexible on the sources of supply. It is highly recommended that overreliance on external suppliers be reduced with industry growth. Taiwan's industries have come of age. Today, they are more equipped and knowledgeable. Additionally, companies should be able to prepare for production agility and flexibility in times of uncertainty.

The COVID-19 pandemic exposed poor understanding of the end product consumer. The rise in demand was

unexpected. Hence, there is a need for proper customer knowledge; to determine the level of supplies that should be maintained as inventory. Producers ought to comprehend the demand impact that is relatable to their businesses.

## VI. CONCLUSION

Over the last few decades, Taiwan has risen to be one of the leading pleasure boat builders in the world; and the first in Asia. As consumer habits change across the globe and consumption of luxurious products increases, Taiwan has tapped into one of the most remarkable markets in the world. However, most recently, the industry was faced with the COVID-19 pandemic. Unlike other industries, the yacht construction industry was uniquely affected. The industry was mainly predisposed by relying on foreign consumption and the importation of products. This study delves into the effects of the pandemic on industry and measures that have been adopted to mitigate such events in the future.

The COVID-19 pandemic adversely affected Taiwan's shipping economy. Ship manufacturers experience delays in the delivery of products. For instance, shipping routes were temporarily locked down as part of the measures to curb the COVID-19 disease outbreak. Ship manufacturers were also unable to deliver finished yachts, thus incurring additional costs of storage. Overall, the pandemic led to uncertainties. Due to the broad range of raw materials required in yacht building, the risk of uncertainties was extensive. The pandemic also led to financial uncertainties, affecting the local currency and, thus, the profit margins of yacht builders. Manufacturers adopted several supply chain strategies, including the lean system, to obtain and utilize resources.

## CONFLICT OF INTEREST

The authors of this work have no conflicts of interest to declare, and no financial support was received for this study.

## AUTHOR CONTRIBUTIONS

Eva ChiaHua Chiu wrote the paper and Chi-Cheng Wu reviewed and verified it. All authors had approved the final version.

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