Beyond the Horizon:
Unveiling the Wonders of Offshore Tourism

TEK 765 - Leading in a Digital World
Group 10

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1. The Offshore-tourism Industry

1.1 Stakeholders

In the offshore tourism industry there are many stakeholders. Some examples of primary stakeholders are typically tourism companies, tour operators, travel agencies, local communities, governments, environmental organizations and tourists themselves. Understanding the customer needs is crucial for the success of any business in this industry.

1.2 Customers

Customers in the offshore tourism industry can vary widely, but they generally include individuals and groups seeking unique travel experiences, adventure seekers, nature enthusiasts and those interested in exploring marine ecosystems and coastal areas. Their needs can be catorized as follows:

1. **Unique experiences:** Customers seek immersive and memorable experiences in offshore destinations, such as snorkeling or diving in coral reefs or other underwater environments. They seek to observe marine wildlife, remote islands or simply just engage in water sports activity.
2. **Safety and comfort:** Customers have a need for safety during their offshore adventures. They expect safe and well-maintained vessels, experienced guides, and that they adhere to safety protocols. The tourists also expect comfortable accommodations, amenities and reliable transportation to and from the coast are also important to enhance their overall experience.
3. **Environmental awareness**: Many customers today have an increased concern for the environment and sustainability. They expect tour operators to have responsible practices, such as promoting eco-friendly activities, reducing plastic waste, and supporting local conservation efforts.
4. **Cultural engagement:** Customers often seek opportunities to learn about the local culture, traditions, and heritage of the offshore destinations they visit. They value authentic experiences and interactions with local communities.

1.3 Value Creation

Value is created in the offshore tourism industry through a combination of factors. These include:

1. **Destination appeal**: Offshore tourism offers access to unique and picturesque locations, often with pristine beaches, diverse marine life, and stunning natural landscapes. The beauty and exclusivity of these destinations create value for customers.
2. **Experimental offerings**: The industry creates value by providing customers with a range of experiences, such as guided tours, adventure activities, wildlife encounters, and opportunities for relaxation.
3. **Expertise and convenience**: Tour operators and travel agencies add value by offering expert

knowledge, organizing travel routes, handling logistics, and ensuring a hassle-free experience for customers

4. **Emotional connection**: Offshore tourism can create emotional connections through the creation of lasting memories, transformative experiences and a sense of discovery and exploration. This is especially true for people not living near the coast.

1.4 Customer needs

Despite the progress made in the offshore tourism industry, there are some customer needs that are not adequately met today. Two key areas where improvement is required include sustainable practices and accessibility/affordability. In terms of sustainable practices, while there has been growing recognition of the importance of sustainability among customers, there is still a need for greater adoption of such practices across the industry. Many customers are increasingly concerned about the environmental impact of offshore tourism and expect companies to take proactive measures to reduce their ecological footprint. Moreover, customers also desire to see a greater commitment to supporting local communities and economies, ensuring that the benefits of tourism reach beyond just the industry itself.

Another significant customer need is related to accessibility and affordability. Offshore tourism experiences can often be exclusive and costly, making them inaccessible to certain customer segments. Many potential travelers are hindered by the high prices associated with offshore tours and activities, which limits their ability to enjoy such experiences. To address this, the industry must work towards providing more affordable options that cater to a wider range of people. Moreover, efforts should be made to ensure that offshore tourism destinations and activities are accessible to individuals with disabilities or those facing mobility challenges. Creating infrastructure and services that are inclusive and accommodating will enable a broader customer base to participate in and enjoy offshore tourism. (Södra bohuslän turism. (2021).

1.5 Sustainability

The declining state of the ocean has a significant influence on the offshore tourism industry, and it presents various sustainability challenges, particularly those related to the ocean. These challenges have a direct impact on the industry's operations, customer experiences, and long-term viability.

One of the primary challenges is the ecological impact caused by the deterioration of oceans health The declining marine biodiversity, and habitat degradation directly affect the scenic beauty and wildlife encounters that are crucial to offshore tourism. Tour operators and industry stakeholders must therefore address these challenges by promoting responsible practices that minimize negative ecological impacts. This includes implementing ocean floor friendly diving and snorkeling practices, supporting ocean floor restoration initiatives, and educating tourists about the importance of protecting marine ecosystems.

Climate change is another critical challenge. The ocean plays a crucial role in regulating the Earth's climate, but it is facing the impacts of rising sea temperatures, ocean acidification, and sea-level rise. These changes can lead to the bleaching and degradation of coral reefs, which are not only aesthetically damaging but also impact the biodiversity of offshore destinations. The offshore tourism industry needs to adapt to and mitigate these impacts by adopting sustainable tourism practices,

advocating for climate action, and supporting initiatives that promote the resilience of marine ecosystems. (EEA. (2021, May 11).

Pollution and waste management pose significant challenges to the industry as well. Marine litter, plastic waste, and oil spills degrade the marine environment and impact the aesthetic value of coastal areas. The offshore tourism industry must prioritize sustainable waste management practices, reduce single-use plastics, and actively participate in beach clean-ups to combat these issues. By minimizing pollution and waste, the industry can contribute to the preservation and conservation of the ocean.

Overfishing and depleted fish stocks also pose challenges to offshore tourism. Unsustainable fishing practices can deplete fish populations and disrupt marine ecosystems, impacting the availability of marine wildlife for tourists to observe and engage with. To address this challenge, the industry should support sustainable fishing practices, promote responsible seafood consumption, and advocate for the establishment of marine protected areas.

Additionally, the phenomenon of overtourism and carrying capacity is a concern for the offshore tourism industry. The popularity of certain destinations can lead to overcrowding, exceeding the carrying capacity of fragile ecosystems, and causing habitat destruction, increased pollution, and negative impacts on local communities. To address this, it is crucial to manage visitor numbers, implement sustainable tourism practices, and diversify tourist flows to less-visited areas. By spreading tourism impact and preserving the integrity of destinations, the industry can mitigate the risks of overtourism (Södra Bohuslän Turism AB, 2021).

Addressing these sustainability challenges requires a collective effort from industry stakeholders, governments, local communities, and tourists themselves. Collaboration is needed to promote sustainable practices, raise awareness about the importance of ocean conservation, and implement regulations and policies that protect the marine environment while ensuring a positive and authentic experience for tourists. By prioritizing the health of the ocean, the offshore tourism industry can contribute to the long-term sustainability of both the industry itself and the marine ecosystems on which it depends (Sustainable Travel International, 2020).

1.6 Digital Technologies

When it comes to digital technologies, it has greatly impacted offshore tourism by revolutionizing customer experience and operational efficiency. Through online booking and information platforms, customers now have easy access to comprehensive details about destinations, pricing, and reviews, empowering them to make informed decisions. Moreover, digital tools enable tour operators to provide personalized travel plans and customized experiences based on individual preferences, enhancing customer satisfaction and meeting specific needs. Direct and instant communication through channels like social media and messaging enables efficient customer service and quick problem solving. Virtual reality and augmented reality technologies offer immersive previews of offshore tourism activities, showcasing underwater ecosystems and providing interactive information. Additionally, the influence of social media has increased, as users share their experiences, photos, and reviews, shaping customer perceptions and generating interest through user-generated content. (iED. (Bouronikos, 2021)

2. PESTEL analysis

2.1 Political

The global political landscape will directly, and indirectly, affect the offshore tourism industry, due to the industry being heavily relying on international visitors seeking new experiences. Political relations can provide opportunities or limit the export of tourism to a country. The political tools accessible to influence this area of export to or from a country are, international relations, diplomatic ties, visa policies, and travel restrictions. All of which can have a huge impact on the offshore industry. For example, imagine if the Republic of Maldives, which is heavily reliant on its tourism sector, had bad political relations with other countries or even a travel ban.

The COVID-19 pandemic serves as a great example, as governments worldwide implemented measures such as border closures and quarantine requirements, significantly reducing international travel and severely affecting the tourism industry. For the Maldives this meant a loss of almost 57% from its tourism sector, which contributed to a loss in GDP by 1.76 billion USD. Historically the Maldives have had almost 60% of its GDP come from tourism, which in 2020 meant 3.17 billion USD. COVID-19 truly highlighted how much some countries depend on tourism. (WorldData, 2020)

Another crucial aspect that can impact offshore tourism is the diplomatic relations between countries. Positive diplomatic ties often have a positive effect on tourism, as they create an environment of trust and cooperation that encourages travelers to explore new destinations. For example, when diplomatic relations between the United States and Cuba improved, there was a surge in American tourists visiting the island. (Wetherall, 2016)

Visa policies are another critical factor in determining the accessibility of offshore tourism destinations. Simplified visa procedures or relaxed requirements can attract a higher number of visitors, leading to increased tourism. However, stricter visa regulations could create barriers for potential tourists. (Li & Song, 2013)

The stability and security of a country are important considerations for tourists when selecting their destinations. Travelers prioritize safety and seek stable environments for their vacations. Countries experiencing conflicts or political instability often witness a decline in tourism due to safety concerns. The conflict in Syria, for instance, led to a substantial drop in tourism as visitors perceived the destination as unsafe. (Matakovic´ & Matakovic´, 2019)

2.2 Economic

Various economic aspects can significantly influence the affordability and attractiveness of offshore tourism destinations.

Exchange rates and economic stability are key factors to consider. Currency fluctuations can directly impact the cost of travel and the purchasing power of international visitors. When the local currency weakens against major international currencies, offshore tourism destinations become more affordable and appealing to foreign tourists. On the other hand, a strong local currency may make the destination relatively more expensive, potentially reducing the number of visitors. Economic stability is also

essential for maintaining a well running business environment and attracting investment in the offshore tourism industry. Political stability and low inflation rates both contribute to building confidence among tourists.

Global economic conditions also play a significant role in the success of the offshore tourism industry. Economic trends, such as recessions or economic booms, can have a profound impact on disposable incomes and what consumers spend their money on. During periods of economic downturns, individuals most often will prioritize essential expenses over travel, resulting in a decline in tourist arrivals. However, during economic upswings, increased incomes and consumer confidence can lead to higher numbers of travelers and an uptick in offshore tourism. This is why it is important for the offshore tourism industry to adapt to global economic conditions to effectively manage demand and tailor offerings to meet changing consumer preferences. (Rossello-Nadal et al., 2019)

Economic factors such as government policies and infrastructure investments can also have negative and positive effects on the growth and competitiveness of the offshore tourism industry. Favorable government policies, such as tax incentives or subsidies for tourism-related businesses, can stimulate investment and add to industry growth. (Khan et al., 2019)

2.3 Social

The growing availability of information and the increasing use of the internet have significantly impacted consumer behavior, especially in the realm of sustainable choices when traveling. As people search the internet and become more knowledgeable about environmental and social issues, there is a heightened awareness and desire to make sustainable choices while exploring the world. Therefore, it has become crucial for industries, including offshore tourism, to adapt to these new demands. Failure to do so can have negative consequences in the long run. (Broska, 2019)

One significant factor in this shift is the influence of social media and influencers. With the widespread use of social media platforms, individuals can easily share their travel experiences and recommendations with just a few clicks on their mobile phones. Influencers, who have gathered substantial followings and established credibility in specific areas, have become powerful voices in shaping consumer opinions. In the realm of offshore tourism, the positive comments or critique of an influencer can have a big impact on the business. Positive reviews from influential individuals can drive significant customer interest and boost bookings, while negative experiences can have a negative effect on bookings.

Furthermore, social media as a whole has become one of the most powerful marketing tools for businesses and it seems to only keep growing. It allows direct engagement with consumers, enables the sharing of beautiful visual content, and makes it easier to make targeted advertising campaigns. The viral nature of social media platforms amplifies the reach of marketing efforts and it could help businesses in the offshore tourism industry to attract new customers and maintain relationships with existing ones. (Kim et al., 2019)

When looking at demographic trends worldwide, it is evident that the global population is aging, and overall wealth is increasing. (canvas sidan) The combination of an aging population and higher disposable incomes can lead to changes in consumer preferences and behavior. Older and wealthier individuals have greater opportunities for travel, of course including offshore tourism experiences.

2.4 Technological

Technological advancements have the possibility to revolutionize the offshore tourism industry, offering numerous benefits that enhance accessibility, convenience, personalization, and overall appeal to potential travelers. These advancements include for instance online booking platforms, mobile applications, data analytics, personalized marketing, and virtual reality experiences.

Online booking platforms and mobile apps have changed the way travelers plan and book their offshore tourism experiences. With just a few clicks, individuals can research and compare destinations and activities, making the process more efficient. The ease of access to information, availability of real-time pricing and availability, and the ability to read reviews and recommendations from fellow travelers contribute to a more informed decision-making process.
(Hennig-Thurau & Walsh, 2019)

Data analytics and AI can also play a crucial role in helping the offshore tourism industry understand consumer preferences and behavior. By the help of AI analyzing vast amounts of data, businesses can gain valuable insights into customer preferences and interests. This information enables them to tailor their offerings and promotions to meet individual needs. By utilizing personalized marketing strategies, businesses can create targeted campaigns that resonate with specific customer segments.

Another exciting technological advancement with significant potential for offshore tourism is virtual reality (VR). VR technology offers incredible experiences that allow individuals to explore and interact with virtual environments that replicate offshore destinations and activities. Through VR, potential travelers can get a taste of what it would be like to engage in activities such as scuba diving, whale watching, or relaxing on a beach. This immersive experience can spark curiosity and excitement, and ultimately motivate individuals to book an actual trip to experience the destination in person. (Tsai, 2020)

2.5 Environmental

Extreme weather events and ecological disruptions have the potential to significantly impact the attractiveness and viability of offshore tourism destinations. The beauty of the ocean can be noticeably influenced by environmental changes, ultimately impacting the choices and preferences of tourists.

Climate change-induced extreme weather events, such as hurricanes, cyclones, and storms, can damage coastal areas and marine ecosystems, affecting the beauty that attracts tourists to offshore destinations. If there is an increased frequency and intensity of these events it can result in physical damages to infrastructure, beaches and other natural attractions, leading to a decline in tourist interest and visitation. (Pansch, 2018)

Ecological disruptions as ocean acidification, and habitat degradation, pose significant threats to the marine ecosystems that underpin the attractiveness of offshore tourism.
This can have a big effect on the overall appeal and economic viability of offshore tourism destinations.

Furthermore, the rising awareness of environmental conservation and sustainability has reshaped customer preferences and behaviors. Travelers are increasingly seeking eco-friendly and responsible tourism options, including those that prioritize environmental protection, conservation, and sustainable practices. The awareness of the ocean ecosystems and the desire to minimize one's ecological footprint has led to a shift in consumer choices. Tourists are more likely to support and choose destinations that show a commitment to environmental efforts, such as promoting marine conservation, reducing plastic waste, and supporting local communities. (Brown, 2012)

In response to these changing preferences, the offshore tourism industry has started embracing sustainable practices and adopting eco-friendly initiatives. Many businesses are implementing measures to reduce their environmental impact, such as energy-efficient operations, waste management systems, and sustainable transportation options. Additionally, eco-certifications and sustainable tourism labels have emerged to help tourists identify and select environmentally responsible destinations and operators.

2.6 Legal

Legal factors play a significant role in shaping the operations and experiences within the offshore tourism industry. Various legal frameworks, regulations, and compliance requirements have a direct impact on businesses.

One crucial aspect is regulations and compliance. Governments establish legal frameworks to that effect offshore tourism activities, such as immigration policies, safety regulations, and environmental protection laws. Immigration policies, including visa requirements and border control measures, determine the ease of travel and accessibility for tourists visiting offshore destinations. To comply with safety regulations is essential to ensure the well-being of visitors and maintain the reputation of the destination. Additionally, environmental protection laws play a big role in preserving the natural beauty and integrity of offshore ecosystems, ensuring sustainable tourism practices that minimize negative impacts. (Czaika & Neumayer, 2017)

Intellectual property and copyrights also hold significance within the offshore tourism industry. Protecting intellectual property and copyrights is crucial for businesses involved in creating and disseminating digital media and creative content. This includes photographs, videos, promotional materials, and branding assets used to market and showcase offshore tourism destinations.

Connection to legal frameworks and regulations is important for businesses operating in the offshore tourism industry. Failure to comply with applicable laws can result in legal consequences and disruption of work. Therefore, industry stakeholders must stay informed about the evolving legal landscape, maintain a proactive approach, and implement robust measures to ensure the legal and ethical operation of their businesses.

3. Disruptive technologies 5 - 10 years

Over the next 5-10 years, disruptive technologies are poised to have a significant impact on the offshore tourism industry, transforming activities such as whale watching, island tours, and diving. These technologies are expected to mature and revolutionize the industry in several ways.

The first technology we think can have a huge impact on offshore tourism is Virtual Reality (VR) and Augmented Reality (AR). These are technologies that hold tremendous potential for offshore tourism. They can provide immersive experiences that allow tourists to explore underwater environments, interact with virtual marine life, and visit remote islands virtually. This advancement in VR and AR can enhance the accessibility of offshore tourism, enabling individuals to experience these destinations from the comfort of their own homes. It also presents an opportunity for tour operators to create additional revenue streams by offering virtual experiences alongside physical ones.
However these technologies also might have a product cannibalistic effect on the already existing services, which can be a threat to the industry.

The second disruptive technology we imagine being introduced is drones equipped with high-resolution cameras. The tourism companies can then capture stunning aerial views of coastal areas, islands, and marine wildlife. Tour operators can leverage drone technology to create compelling promotional content, showcase their destinations, offer unique perspectives to potential tourists and even scope out the best places to visit, to maximize the customer's experience.

The third technology we expect to expand is the usage of big data, to bring about valuable insights of the offshore tourism industry. As more data is collected from tourists, operators can analyze the data to get a better understanding of visitor patterns, preferences, and feedback. This knowledge can enable operators to optimize their offerings, tailor experiences to individual needs, and make informed business decisions, ultimately enhancing customer satisfaction.

Another aspect of offshore tourism that surely will evolve in the next 5 to 10 years is the usage of sustainable alternatives. Innovations in clean technologies such as electric boats and vessels, eco-friendly diving equipment, and renewable energy sources will definitely be developed to reduce the industry´s ecological footprint. Embracing these sustainable and clean technologies can attract environmentally conscious tourists and contribute to the preservation of marine ecosystems, ensuring the long-term viability of the industry.

A fifth technology we think will be introduced to the offshore tourism industry is the usage of artificial intelligence. Artificial intelligence (AI) can be used to personalize and enhance the customer experience. For example AI chatbots can assist tourists in planning their trips, providing personalized recommendations based on their preferences and interests. AI algorithms can also optimize routes and schedules, improve customer service, and help operators manage resources more efficiently, leading to enhanced operational efficiency and customer satisfaction.

It's important to acknowledge that the adoption and impact of these disruptive technologies in offshore tourism will depend on various factors, including regulatory frameworks, infrastructure development, and consumer acceptance. However, when properly implemented, we think that these technologies will have the potential to revolutionize the way tourists engage with offshore destinations, contribute to the sustainability of the industry, and drive its continued growth and success.

4. Interview takeaways

In addition to conducting extensive secondary research, we recognized the utmost importance of firsthand perspectives. Therefore, we sought out the expertise of industry professionals through a series of seven external interviews, each focusing on one crucial component of the PESTEL framework. Additionally, we had the privilege of engaging in a compelling conversation with an extra interviewee free of subject, an expert, further enhancing our understanding of the industry's landscape. The objective of the interviews was to gain an even wider perspective on the marine data gap, what the view is on the subject today and what can be done to counteract the issue. By talking and discussing with professionals in different areas of profession, we increased our understanding of what the actual people in the working environment find important, and what they do not. Below we present the main takeaways from each of the individual interviews.

4.1 Political

The political interview, conducted on May 3rd, 2023, featured Tomas Kronståhl, a member of the Swedish social democratic party. With a background as chairman in the municipal executive board in Västervik, Tomas now serves on the Committee on Agriculture and Environment at the Swedish Parliament. While his primary focus is hunting and fishing, he acknowledged the significance of addressing the marine data gap. Although he lacks extensive knowledge on the matter, he emphasized the importance of impartiality and relies on data and reports from independent sources to inform his decisions. Tomas expressed support for universities as reliable sources and mentioned regular contact with the Swedish University of Agricultural Science (SLU) for knowledge acquisition. He welcomed the concept of low-cost sensors, recognizing their potential value as long as the data quality remains high and there is a substantial time series.

4.2 Economic

The economic interview of the PESTEL framework took place May the 8th 2023 with Louise Biddle from Voice of the Ocean. At the company Louise holds the position of Director on Ocean Knowledge. Her background is rooted in earth sciences, particularly geoscience, and she holds a PhD in physical ethnography. At Voice of the Ocean she described how they have been working with underwater gliders for over a decade to collect high resolution data. In contrast to our affordable sensor, their gliders come with a substantial price tag, ranging between 200,000 and 300,000 euros per unit. The collected data from these gliders are available in real time, with subsampling every 30 seconds and full datasets are obtained upon retrieval. During the interview, the topic of engaging a wider audience in marine data collection, including tourism and children, was discussed as we ventured into the field with our sensor. She stressed the significance of user-friendly interfaces and data visualization to maintain interest and participation from the general public. Louise expressed optimism about the progress in miniaturization of sensors and technological advancements, foreseeing a shift toward smaller, lower-cost sensors. She acknowledged the necessity of robust quality control as data collection expands, particularly when involving diverse users. She also talked about how, at Voice of the Ocean , they share their data through an open-access platform and collaborate with scientific research projects and decision-making processes.

4.3 Social

The social interview of the PESTEL framework took place May the 15th 2023 with Karin Rosenberg at Tradition Sailings. The company operates primarily in Bohuslän, north of the Gothenburg region and its operation focuses on sailing tours of varied length, which makes Karin an exceptional interviewee for our chosen industry. From the start of the interview, she made it clear that she doesn't have much knowledge to contribute regarding the data gap of the ocean. However, that was not the main objective of this interview as our focus was rather regarding the industry itself. When asked about her use and view of sensors, she mentioned the wind as the most important source of data for her and her workers, which is comprehensible since it is a sailing company. Besides simple weather forecasts, the wind was the main data information that the company uses at the moment and for that she mentioned that she uses ViVa which is a website for wind and water information and a subdivision of Sjöfartsverket (the Swedish Maritime Administration). We further asked about her settings towards collecting data with low cost sensors during her sailings. She was rather neutral and saw no reason they couldn't apply sensors to their boats while sailing. However, for them to use the sensors, she would like them to have a minimum amount of effort for maintaining and using the sensors. But, if the installment, handling of the data and service were handled by the sensor provider, they could think of having sensors deployed on their boats. This gave an important perspective, as the incentive factor is very important to take into account in order to convince people and companies to use the sensor.

4.4 Technological

The technological interview of the PESTEL framework took place May the 3rd 2023 with Bengt Karlsson who works as an oceanographic researcher at SMHI (Swedish Meteorological and Hydrological Institute). This interview proved to be highly valuable as Bengt's extensive experience and expertise in working with sensors for marine data collection greatly benefited our project. He specializes in researching phytoplankton and algal blooms, which gives him extensive knowledge in marine sensors - an expertise we aimed to leverage in this interview. He highlighted the low sampling frequency as a significant factor contributing to the marine data gap. Increasing the number of measurements for physical and chemical parameters is essential to obtain a comprehensive understanding of marine environments. He also emphasized the challenges posed by technology in the field as a significant setback to consider. Marine biofouling, where bacteria and microalgae accumulate on sensors and equipment, can render the data useless. Therefore, there is a need for the development of sensors and technical equipment that are more resistant to such issues. Bengt highlighted positive trends, such as advancements in imaging technology and the application of AI for analyzing vast amounts of collected data and images from marine environments. Real-time data collection can be achieved through the development and utilization of diverse platforms like unmanned crafts and gliders. To encourage broader participation in quantitative data collection, he suggested leveraging simple measurements and mobile phones. Bengt emphasized the significance of accessing high-quality data to ensure meaningful and useful data collection. Additionally, he stressed the challenges associated with sharing data promptly and making it available for resource purposes. Balancing the need to publish results while benefiting the research community through data sharing is crucial.

4.5 Environmental

The environmental interview of the PESTEL framework took place May the 3rd 2023 with Mikael Krysell who works as head of the Environmental Monitoring Division at Havs- och vattenmyndigheten (Swedish Agency for Marine and Water Management). Firstly, he provided a brief description of the role of the Head of the Environmental Monitoring Division, which involves supplying the rest of the agency with information regarding the state of the environment.
He explained their approach of procuring environmental surveillance services from external providers and establishing collaborations with various authorities, consultancies, and research projects to obtain data. To engage and foster public interest, they employ a user-friendly interface and data visualization techniques. They actively share their data through an open platform, facilitating collaboration with scientific research projects and informing decision-making processes.
He highlighted that a current challenge they face is collecting data on biodiversity and ecosystem functionality. However, they are actively exploring modern technical solutions, including the utilization of satellites and underwater drones, to overcome these obstacles. He discussed the company's priority of focusing on data that yields significant environmental benefits, placing emphasis on understanding relations in the environment and comprehending the long-term effects of change.Data from the Environmental Monitoring Division is collected by various stakeholders, but the authority act as a data host, meaning the data is accessible for the general public and decision-makers. He also emphasized the importance of quality requirements to ensure reliability and usability of the data. He emphasized the importance of involving the public in data collection to raise awareness about environmental issues and foster environmentally friendly behaviors. He pointed out that citizen science can be a useful tool to validate models and give basic data to improve the understanding of the environment.

4.6 Legal

The legal interview of the PESTEL framework took place May the 8th 2023 with Mikael Westin who works as a lawyer specified in environmental law at the legal agency Føyen. His work encompasses legal processes, permit and concession applications, consultations with authorities and individuals, negotiation of agreements with stakeholders, and representing clients in court and before government agencies. In water law, he has over thirty years of experience in permit processes, which made him a perfect candidate for an interview for us to gather a good legal perspective. In the interview, he highlighted how coastal states possess distinct powers and jurisdictional zones to determine and regulate activities in the sea, including territorial waters, exclusive economic zones, and continental shelves. He filled in on the fact that pollution and temperature changes significantly affect marine environments, leading to negative effects on ecosystems, fishing, maritime transportation, and energy extraction. Hence, collecting data is important to understand and monitor the impact on marine environments. He also pointed out that there is an interest in making data accessible to researchers and stakeholders in various industries. He also pointed out that, during the implementation of projects within the energy sector, including those involving the authorization for energy extraction, an environmental impact assessment is performed to evaluate the impact on different interests such as shipping, fishing, and biodiversity. Additionally, he emphasized the criticality of careful planning for the placement of measuring equipment, citing potential issues if, for instance, a grid of 500 sensors obstructs a fishing trawler's path.

4.7 Expert Interview

The 7th interview which was conducted without any links to the PESTEL framework took place May the 9th 2023. The interviewee in question for this interview was Jessica Hjerpe Olausson, who works as a maritime expert and project manager at RISE (Research Institutes of Sweden). She has a meritorious background working at a variety of organizations and authorities, such as the Swedish Board of Fisheries, Swedish Agency for Marine and Water Management and the Swedish Maritime Administration, therefore we found her perfect for an expert interview. Jessica acknowledged the fact that there is a huge knowledge- and data gap existing within marine environments and that there is a lot of data that can be collected and used to fill this gap. Some of her examples of necessary data were environmental parameters, topography, streams, and fauna- and flora. However, she stressed the importance of thinking about the use of the data and why it is important. She thought one of the biggest challenges within the area of the data gap was funding. Data collection carries costs, necessitating clear delineation between responsibilities for financing and data collection. Additionally, she emphasized the need to have the courage to base decisions based on current data. She highlighted the value of developing cost-efficient data collection methods, leveraging existing ocean structures and innovative approaches. Furthermore, she believes that emerging technologies, such as autonomous systems and sensors, will profoundly impact the marine environment. She firmly believed in the potential of involving tourists to engage a larger audience in data collection efforts. This could be achieved by utilizing physical sensors or leveraging mobile devices like smartphones to capture data, tapping into people's interest in contributing to marine research. She also identified some potential limitations and challenges related to low-cost sensors, such as reliability, accuracy, and the managing of large data sets. Addressing these issues would be crucial to ensure that the sensors are effectively utilized and yield reliable results.

The series of external interviews conducted as part of our research proved to be immensely rewarding, providing us with invaluable firsthand perspectives and fresh insights. Engaging with industry professionals from diverse backgrounds allowed us to gather a wide range of viewpoints and deepen our understanding of the marine data gap and its potential solutions. Each interview offered unique insights into different aspects of the marine industry, contributing to a comprehensive understanding of the challenges and opportunities involved in data collection. From politicians to experts in various fields, we gained a multifaceted understanding of the importance of data, the need for reliable sources, and the potential impact of technological advancements. By incorporating these insights into our research, we are better equipped to address the challenges and work towards a more comprehensive and sustainable understanding of the marine environment.

5. Scenario matrix

In the following part of the deep dive, an impact-uncertainty matrix was created. This was based on various identified PESTEL-forces, out of these forces a few critical-uncertainties were picked out along with some certain and important trends.

5.1 Pestel Forces

In this segment we explain and summarize the identified PESTEL-forces. The majority of the forces were mentioned in earlier parts of the deep dive.

Within the next 5-10 years we expect to see a number of PESTEL forces that can and probably will have different amounts of impact on the industry of offshore-tourism. To be able to assess these forces and evaluate the amount of impact they will have and the certainty/uncertainty that revolves around them we will have to create an impact-uncertainty classification matrix. The forces that will be considered in this deep dive will be listed below followed by the matrix.

5.1.1 Political forces

- **Changes in Government policies**

  Government policies refers to rules and regulations set by the governing bodies and in this case those related to the tourism aspect. These changes can include traveling restrictions, visa policies, environmental regulations, etc.

- **Diplomatic relations**

  The diplomatic relation can be explained as the relationship between countries. This relationship can affect how we feel about other countries. Favorable diplomatic ties can often have a positive effect on tourism since it creates an atmosphere of trust and a sensation of safety.

- **Internal stability**

  With this we mean how stable and secure a country is. Safety and stable environments are often prioritized by tourists and a country that experiences internal struggles such as wars and political instability often see a decline in tourism due to safety reasons.

5.1.2 Economic forces

- **Economic trends**

  Economic trends can be described as the current state of the economy whether it is global, national etc. These trends have an effect on multiple variables such as spending habits.

- **Currency rates**

The rate of a country's currency can have a great impact on the tourism industry. Currency fluctuations have a direct impact on international travelers spending habits and their purchasing power.

- **Other economic factors**

  This force includes infrastructure investments and various government policies such as tax incentives and investments in tourist related infrastructure.

5.1.3 Social forces

- **Social media and influencers**

  The growing aspect of social media and the trust we feel for influencers with a large following creates a force that relates to the tourism-industry. Today's process of planning and booking a vacation is influenced by reviews and opinions on social media and those by influencers.

- **Consumer preferences**

  Shifts in consumer preferences and travel trends affect the way we perceive a travel location. These trends and preferences can for example include the growing demand for sustainable and eco-friendly tourism experiences.

5.1.4 Technological forces

- **Digitalization**

  Digitalization refers to the integration and the use of digital technologies in different aspects of the offshore-tourism industry, such as online booking, mobile apps and digital platforms. Digitalization can enhance efficiency, customer experience and operational effectiveness for the entire industry.

- **Data analytics and AI**

  The use of AI enables the analysis of vast amounts of data, which in turn makes it easier to understand customer preferences and makes it possible to tailor offers to meet individual needs.

- **Virtual reality**

  The use of VR technology offers incredible experiences that allow individuals to explore and interact with virtual environments that replicate offshore destinations and activities.

5.1.5 Environmental forces

- **Climate change**

  Climate change- induced extreme weather events, such as hurricanes, cyclones and storms. These events can have damaging effects on coastal areas and marine ecosystems which in turn affect the variables that attract tourists.

- **Environmental conservation**

  Increasing concerns regarding sustainability and environmental conservation can affect the perception and the regulations regarding offshore tourism.

- **Natural disasters**

  Natural disasters such as tsunamis and earthquakes that disrupts and damages the offshore tourism destinations

5.1.6 Legal forces

- **Visa requirements**

  Laws regarding the requirement of visa to allow entrance to said country. Changes in these laws will affect the accessibility of a country.

- **Environmental protection laws**

  New laws that are put in place to protect and preserve offshore ecosystems, ensuring sustainable tourism practices and minimizing negative impacts on local flora and fauna.

- **Intellectual property and copyright**

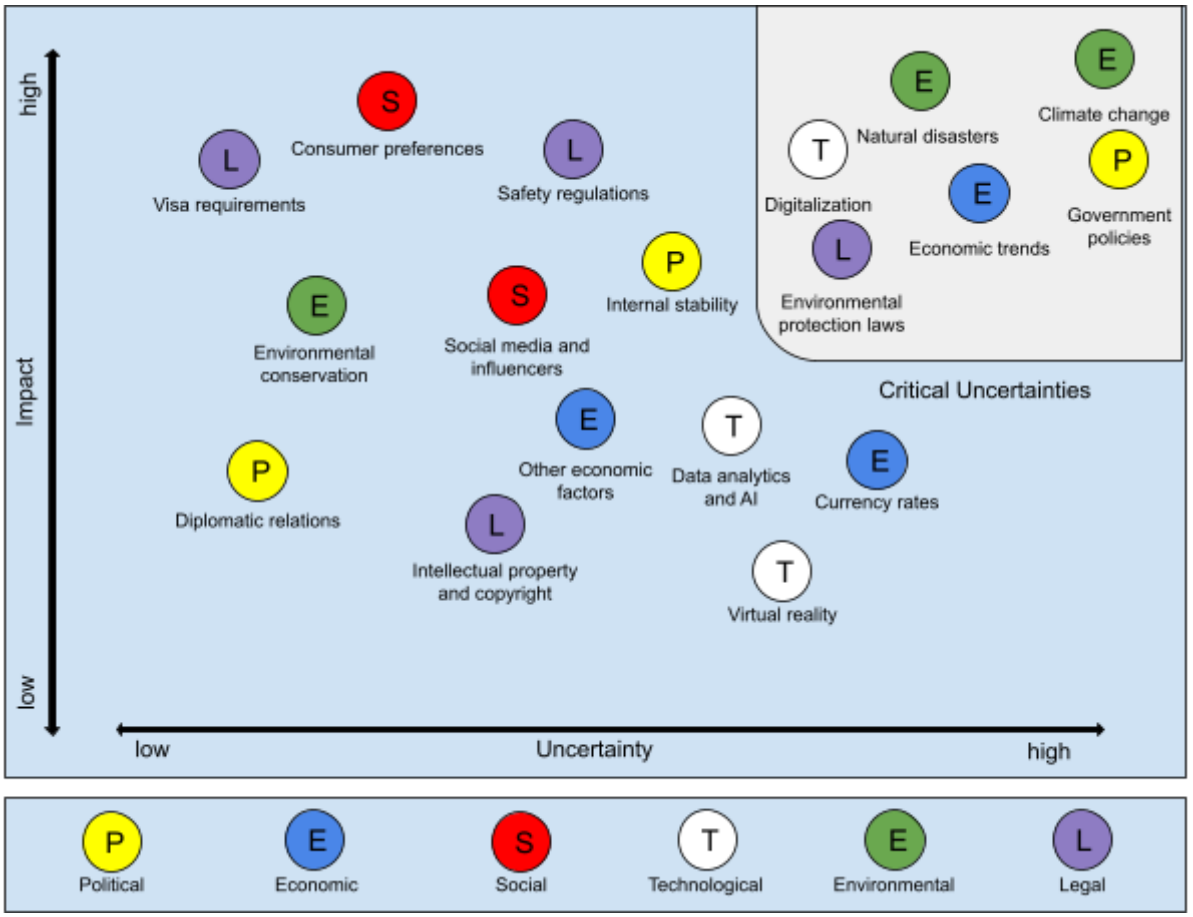
  Changes in laws regarding intellectual property and copyright that affects business ability to market themselves using branding materials, photographs, videos etc.

- **Safety regulations**

  Complying with safety regulations is essential to ensure the well-being of tourists and to maintain reputation. Changes in these can result in situations where companies need to rework their business models and strategies to comply with the new rules.

5.2 Impact-Uncertainty classification matrix

After the PESTEL-forces were identified and analyzed they were placed in an impact-uncertainty classification matrix. The matrix can be seen below:



The forces classified as critical uncertainties and both certain and important are listed below.

Critical uncertainties:

- Natural disasters
- Climate change
- Digitalization
- Government policies
- Economic trends
- Environmental protection laws

Certain and important:

- Consumer preferences
- Visa requirements
- Environmental conservation

5.3 The Scenario Matrix

Based on the critical uncertainties listed in the segment above we choose two that we have identified as the most critical to our industry. By looking at our impact- uncertainty matrix and discussing their individual effects on the offshore-tourism industry within the team we came to the conclusion that the two forces, climate change and government policies are the most relevant for the scenario matrix.

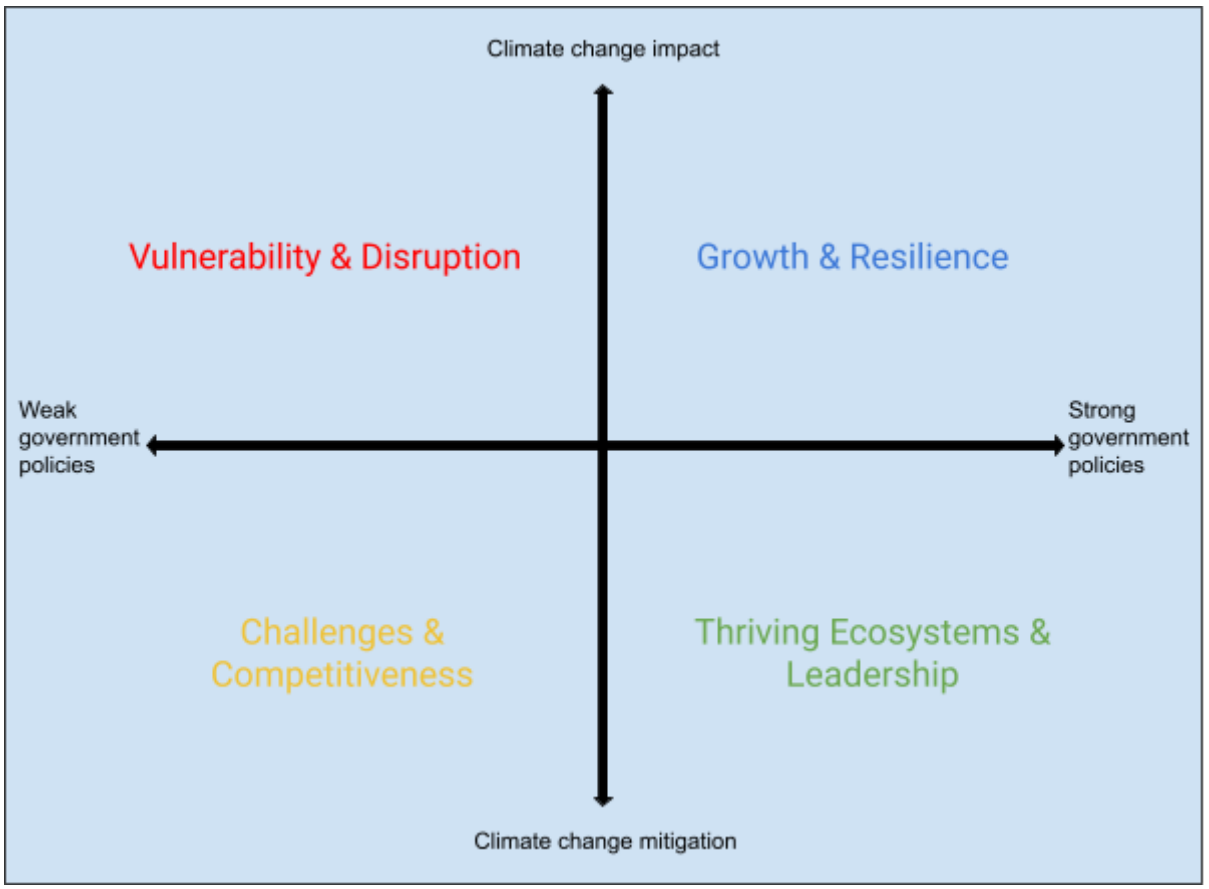
One of the greatest global challenges of our day, with effects on many different industries and sectors, is climate change. The offshore tourism sector, which depends on the beauty and attractiveness of coastal and marine surroundings, is among those who are seriously impacted.

Climate change is leading to rising sea levels, increased ocean temperatures, and more frequent extreme weather events such as storms and hurricanes. These changes pose a significant threat to coastal and marine ecosystems, including coral reefs, mangroves, and seagrass beds, which serve as natural attractions for tourists. The degradation or loss of these ecosystems diminishes the appeal of destinations, impacting the viability and sustainability of the offshore tourism industry. Climate change awareness among tourists is also increasing, and travelers are becoming more conscious of the environmental impacts their choices have. Offshore tourism destinations that are perceived as being negatively impacted by climate change may face reputational risks, with potential visitors opting for alternative destinations. Additionally, travelers are seeking more sustainable and eco-friendly tourism experiences, placing additional pressure on offshore tourism operators to adapt and implement environmentally responsible practices.

Moving on to government policies which are, in addition to climate change, crucial in determining the course and future of the offshore tourism business. Sustainable growth, the preservation of natural resources, and the long-term viability of tourist sites all depend on effective policies.

The offshore tourist sector is directly impacted by government regulations regarding environmental preservation and protection. The natural beauty and biological integrity of coastal and marine attractions depend on policies that handle challenges like pollution, waste management, and habitat conservation. Environmental degradation can have an impact on the appeal of travel sites and visitor experiences if there is uncertainty about the strictness or effectiveness of these rules. Furthermore, policies relating to crisis management and risk mitigation are critical for the offshore tourism industry. For visitor safety, security, and the industry's capacity to bounce back from unforeseen occurrences, policies addressing natural disasters, public health emergencies, or political instability are essential. Visitor trust can be damaged by doubts about the transparency, efficacy, or responsiveness of crisis management procedures, which can result in a drop in tourist numbers and revenue.

In conclusion, the two forces selected are most likely to have a significant impact on the offshore tourist industry while also being uncertain. Four various scenarios over the next five to ten years can be produced depending on their frequency and severity, each of which will recommend a different set of adjustments for the industry.



Vulnerability & Disruption - Weak government policies & Climate change impact
This scenario portrays a future where climate change impacts intensify, while government policies related to environmental protection and sustainable tourism development remain weak or inadequate. The loss of coastal and marine habitats causes severe disruptions in the offshore tourism sector, which results in a decrease in tourist attractions and experiences. The financial viability of enterprises is threatened by the rising expenses of infrastructure repairs and adaptations brought on by harsh weather and rising sea levels.

Growth & Resilience - Strong government policies & Climate change impact
This scenario depicts a future in which the effects of climate change worsen, but government initiatives for environmental protection and the growth of sustainable tourism are robust and successful. Strong government regulations guarantee the preservation and rehabilitation of marine and coastal ecosystems, preserving the allure of offshore tourist attractions. Government regulations encourage eco-friendly and responsible tourism, creating experiences that meet the expectations of visitors towards environmental stewardship.

Challenges & Competitiveness - Weak government policies & Climate change mitigation
This envisions a world in which the effects of climate change are lessened, but government initiatives on environmental preservation and the growth of sustainable tourism are ineffective or insufficient. Weak government regulations result in uneven adoption of sustainable practices, which causes inconsistent visitor experiences and lost possibilities for industry expansion. Due to a lack of robust

policies, offshore tourist sites confront difficulties in the market and risk losing travelers to locations with better sustainability reputations.

Thriving Ecosystems & Leadership - Strong government policies & Climate change mitigation
The effects of climate change are reduced, and government initiatives for environmental protection and the growth of sustainable tourism are solid and effective. Effective regulations enhance visitor experiences by conserving and restoring biodiversity, which strengthens the industry's value offer. The execution of climate change adaptation methods is made possible by strong government regulations that also safeguard infrastructure and guarantee the continuous delivery of tourism services.

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