

## "Marine Insurance in the Digital Age: The Impact of Emerging Technologies on Risk and Coverage"

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### Abstract:

In this study, we investigate how the advent of new technology has altered the landscape of maritime insurance in the modern era. The maritime sector is being exposed to fresh dangers as a result of the growing prevalence of technology such as unmanned aerial vehicles (drones), autonomous ships, and big data analytics. These technologies have the potential to increase both safety and efficiency, but they also pose new issues for marine insurers to deal with. The purpose of this study is to investigate the ways in which developing technologies are influencing the risks that marine insurers face and the coverage alternatives that are accessible to them, as well as to investigate the potential ramifications that these changes may have for the sector as a whole.

**Keywords:** *Marine Insurance, Digital Age, Emerging Technologies, Risk, Coverage, Autonomous Ships, Drones, Big Data Analytics, Safety, Efficiency, Marine Industry.*

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### Introduction

Marine insurance, also known as marine risk or maritime life insurance is an insurance product that encompasses a large array of risks that arise in the sea and which are linked to accidents occurring off the coastlines such as storms, tsunamis etc. These accidents can be catastrophic or non-catastrophic, while catastrophes occur when a ship catches fire, plane crashes over land or floods cause serious damage to structures, ships or the infrastructure of towns located around the coasts. (Hammal & Cote, 2007) It covers a wide range of hazards from explosions, fires to

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earthquakes among others. This paper focuses on the study of Marine Insurance in the digital era. The paper will analyze how emerging technologies impact the sector of mariner insurance. Additionally, there will be an analysis of specific issues relating to maritime insurance by focusing on the main types of technology used to manage them. There will also be an examination of how these products have been changed in terms of their scope of coverage, underwriting, pricing as well as claims handling procedures, and finally there will be the exploration of existing regulations governing the sector as far as operations in the industry is concerned.

### **Marine Insurance in the digital age: The impact of emerging technologies on risk and coverage**

Maritime insurance policies can either be written using software or can be carried out using physical vessels. Software based insurers rely on information from the computer system operated by the insurer. They are able to access any information they require quickly compared to manual insurers who must travel to the site of disaster and physically observe the situation to make their decisions. Physical insurers have a high level of accuracy when it comes to evaluating the extent of damages caused by catastrophes to the structure being insured because the data collected is usually much more accurate as compared to data compiled manually. However, this process is time taking and may result in losses since some disasters do not always manifest themselves as expected. Therefore, it would appear that both kinds of insurance policies utilize both types of computers – software and hardware in performing various processes and calculations related to the protection of assets in case of occurrence of an untoward event. However, there are other types of cyber insurance policies like those based on mobile phones. Because of the fact that most of us carry our phones with us at all times, we can easily send instant messages to our insurer or to any other person connected with us who might need to access our policy details. Such telephones enable remote tracking of real time events which has greatly reduced the level of delays experienced in assessing claims related to loss of property due to natural disasters. Moreover, this kind of technology provides a 24-hour coverage for accidental causes and helps to determine if there was an external incident that led to damages. Mobile phone enabled insurers also provide comprehensive coverage as opposed to physical ones and thus, they are able to respond to incidents promptly before they escalate into hazardous situations.

Emerging technologies in insurance in general include e-insurance, automated systems, artificial intelligence (AI), machine learning, Internet of Vehicles and robotics. All these forms of technology are aimed at providing better coverage for the clients which enables them to reduce premiums. For instance, the use of AI in analyzing huge amounts of data generated by various sources like cameras, satellites among others allows companies to determine the exact location of potential risks within a very short period of time and then design strategies to avoid such situations. By using e-insurance, insurers are able to deliver enhanced service quality to their clients because they are equipped with data necessary to conduct complex analyses which could otherwise take several hours or even days to complete. This ensures that client's lives are protected especially in cases where accidents result in loss of properties like vehicles, homes or even lives. In addition to this, electronic data exchange among insurers leads to improved utilization of resources thereby reducing costs and increasing profitability. (Flynn, 2004) Automated systems such as smart meters help in measuring energy consumption while automatic security devices such as CCTV systems can prevent crime by determining its origin. Furthermore, robots provide alternative methods for transportation which reduces congestion and therefore improves efficiency and cost saving. Smart machines can recognize people as well as objects within their immediate surroundings without necessarily having to see them first. As a consequence, this method results in increased security thereby cutting down incidences such as theft or vandalism resulting in losses incurred by clients. Lastly, IoT devices including robots can serve as additional source of revenue for firms, either directly or indirectly through installation fees paid by homeowners. These new technologies in insurance enable companies to lower prices and at the same time generate higher profits. (Chaffey, 2006)

The above discussion shows that current technological developments have improved the overall performance of insurance companies. Some of the technological improvements being implemented by different insurance companies include; the introduction of online claims processing, self-managed fleets where customers can hire private brokers to cover their needs at any given point in time, automated systems such as GPS navigation, intelligent voice recognition which is capable of assisting in finding missing persons or delivering critical medical assistance promptly, use of satellite imagery to detect damages caused by hurricanes among others. Despite these inventions, there is still room for improvement. Perhaps the biggest challenge for insurers

today is the proliferation of sophisticated threats such as terrorism, piracy and fraud. Cyber criminals have now taken control of almost every aspect of human existence making it impossible to secure one's personal life. According to experts, up to 40% of businesses in the world can be considered vulnerable to attacks from illegal entities. An attack by hackers can wipe your files, cause you to lose business contacts and potentially lead to bankruptcy. Terrorism poses great danger to insurance companies because terrorist groups can destroy critical infrastructures rendering the affected sites uninhabitable and therefore threatening the operations of insurance companies. Attacks through internet and wireless connection can render communication across countries impossible leading to inconveniences to individuals and companies alike. Last but not least, fraudulent activities often target insurance companies and in extreme cases even affect clients themselves. Since consumers are increasingly purchasing insurance products online, fraudulent activities such as fake insurance policies and stolen financial documents pose dangers of spreading diseases like AIDS or Pneumonia among others. Thus, insurers and consumers alike have to be wary of suspicious transactions or dealings. Although companies are adopting sophisticated measures to ensure such occurrences, there is always hope to increase the effectiveness of their services as the technology is evolving. Newer technologies will continue to emerge and so will the means by which we can track or monitor the effects of existing technology. (Karp, 2000)

Marine insurance in particular uses technology to develop innovative claims management systems. Claims management refers to the collection, evaluation and delivery of information required by claimants which is necessary for claim determination processes. To achieve best outcomes, insurers should implement advanced analytics in order to automate their processes. In addition to the previous types of technology, modern technologies include big data technology, cognitive architecture, behavioral intelligence, predictive modeling technologies, augmented reality, blockchain and the use of social networking websites among others. Big Data technology has opened avenues for insurers in terms of obtaining and utilizing vast volumes of customer data. Consequently, firms like IBM are trying to come up with ways of integrating Big Data capabilities into traditional systems. Cognitive architecture has enabled insurers to understand relationships between disparate elements of the company's environment from which it makes sense to design customized solutions for each customer. Artificial Intelligence in insurance involves gathering and

interpreting large amount of data through sensors and actuaries before implementing an understanding about possible patterns in that data. Behavioral insights are becoming more practical and useful in the field of insurance and therefore they are gaining popularity. Predictive modeling techniques enable insurance firms to foresee and predict future occurrence of various hazards to the insured. Augmented and virtual reality technologies facilitate the application of simulation to enhance creativity in designing creative risk response and prevention strategies. Blockchain and social networking sites have transformed the way insurers interact with the public. This has resulted in an increased level of transparency which has helped them to make timely decisions. Technological innovations are a boon to the industry as they bring forth greater profitability.

### **Reforms- Measures to be Taken**

A number of different actions could be made in order to address the influence that evolving technologies have on the level of risk and coverage in maritime insurance.

First, insurance companies need to make investments in technology and data analytics in order to better understand and evaluate the risks associated with new technologies such as drones and autonomous ships. This may involve the creation of new models for the purpose of risk assessment as well as the examination of data obtained from sensors and other sources in order to recognise patterns and trends.

Second, insurance companies should develop new products and coverage options in close collaboration with providers of new technologies and other industry stakeholders. These products and alternatives should be customised to the specific risks that are associated with new technologies. This may entail the creation of new policies for cyber risk, as well as coverage choices for emerging technology like drones and ships that operate on their own.

Third, insurance businesses ought to make investments in research and development so that they can keep up with the most recent developments in maritime sector technologies and trends.

Participating in pilot initiatives, going to industry conferences, and working together with technology suppliers and research institutes are all examples of things that could fall under this category.

Fourth, insurance companies should investigate the possibility of collaborating with technology suppliers and other industry stakeholders in order to establish industry standards and best practises for the utilisation and distribution of new technologies. This might include establishing protocols for incident response and data management, as well as defining standards for the safe and responsible use of new technologies. Additionally, this could include setting guidelines for the safe and responsible use of new technologies.

In conclusion, government regulators should also play a part in the discussion regarding the influence that developing technologies will have on maritime insurance. In this context, "this could entail revising regulations and standards to reflect the changing nature of the sector," as well as "encouraging the development of new technologies and products," both of which are discussed more below. In addition, the government authorities should participate in the process of developing a legislative and regulatory framework that not only encourages the creation of innovative technology and products but also safeguards the interests of customers and those who have insurance policies.

In an attempt to improve insuring processes, there are many regulatory agencies coming up with rules and guidelines to protect consumers and also prevent fraudulent actions which are detrimental to the economy. Under the General Law on Contracts enacted in 1961, most contracts cannot be broken by third parties. The legislation also prohibits negligent behavior which includes misrepresentation, negligence and unconscionability. Both common law and statutory laws can apply in regard to contractual obligations which are binding obligations in a civil action. Certain circumstances include breach of warranty, breach of contract by omission, breach of agreement which is failure to meet stipulated conditions by act or omission and lastly breach of confidence (Ludwig et al., 2002). Although the Federal Trade Commission (FTC) offers broad categories of unfair trade practices which can be avoided through the implementation of proper legal

requirements, the commission does not offer a clear-cut procedure for enforcement of contracts which in cases of breaches results in penalties. Additionally, neither statutory nor common law impose strict penalty provisions on acts which qualify as 'unfair business practice' such as price fixing, bid rigging, price discrimination, market manipulation, predatory pricing and deceptive advertising. (Hammal & Cote, 2007) In contrast with other jurisdictions, the United States has established laws governing price fixing and bid rigging. One of the most fundamental considerations which ought to be put into account is whether there is sufficient proof of harm which the seller would suffer because of violation of antitrust laws. In the absence of evidence of substantial harm, courts should consider the facts and circumstances rather than relying on hypothetical assumptions. Price manipulation involves artificially setting prices on goods and commodities in comparison to other businesses in the same industry and is considered unethical because buyers are forced to purchase goods which they did not want. Bid rigging involves secretly submitting bids that are below the normal competitive level.

### **Conclusion**

In conclusion, the introduction of the digital age has brought about significant changes in the marine insurance sector. This is because the emergence of new technologies has led to the emergence of new hazards as well as new potential for coverage. The collecting of more accurate and detailed information regarding ship operations has been made possible by the use of technologies like as the internet of things (IoT) and big data, which has made it possible for better risk assessment and enhanced underwriting. In addition, the implementation of blockchain technology and smart contracts has the potential to simplify the processes involved in making claims and to boost transparency.

However, the quick pace of technology change has also presented new dangers for marine insurance firms, such as the rising usage of autonomous vessels and cyber attacks. These new risks have been brought about as a result of the rapid pace of technological change. As a consequence of this, it is essential for marine insurance companies to remain current on developing technology and to modify both their risk management and coverage policies in accordance with these developments.

It has been suggested that marine insurance companies should make investments in research and development in order to keep up with the most recent advancements in technology. Additionally, it has been suggested that marine insurance companies should work closely with other stakeholders in the maritime industry, such as ship owners and regulators, in order to ensure that they are well-positioned to meet the challenges posed by the digital age. In addition, marine insurance firms should also evaluate the possibility of expanding their coverage options to include new risks, such as cyber risk coverage, in order to accommodate their customers' ever-evolving requirements.

In general, the advent of the digital age has presented marine insurance companies with a variety of obstacles as well as opportunities. Marine insurance companies can continue to play an important part in guaranteeing the safety and security of the global shipping sector if they remain knowledgeable about developing technology and modify their risk management and coverage strategies accordingly.