

NATO 2026



ANKARA SUMMIT

THE MARITIME STRATEGIC ECOSYSTEM

AND

THE TRANSFORMATION OF EURO-ATLANTIC SECURITY ARCHITECTURE

ANKARA 2026 – A TURNING POINT
IN THE EVOLUTION OF CONTEMPORARY
MARITIME SECURITY



A COMPREHENSIVE FRAMEWORK
FOR CONVERGENCE, RESILIENCE, COGNITIVE SUPERIORITY
AND ANTICIPATORY GOVERNANCE

CRISTINA ELENA POPA TACHE

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THE MARITIME STRATEGIC ECOSYSTEM AND THE TRANSFORMATION OF THE EURO-ATLANTIC SECURITY ARCHITECTURE

Ankara 2026 – the turning point in the evolution of contemporary maritime security

**AUTHORS: Admiral (ret.) PhD. Aurel POPA, Rear Admiral (ret.) PhD. Sorin LEARSCHI
Rear Admiral (Ret.) PhD. Constantin CIOROBEA,
Commander (Ret.) University Professor PhD. Ioan CRACIUN**

*“When the strategic environment changes, the real challenge
is not merely to observe the change,
but to develop the concepts through which we can understand it.”*

PRESENTATION OF THE STUDY

Understanding the maritime security environment today requires more than just analysing events, risks or power balances. The rapid transformations driven by geopolitical competition, the technological revolution, artificial intelligence, the vulnerability of critical infrastructure and the interdependence between the legal, military, economic and information dimensions call for the development of new research tools and conceptual frameworks capable of explaining the complexity of the contemporary maritime phenomenon.

Since its inception, the Maritime Security Forum (MSF) has sought to contribute to the development of a culture of strategic maritime analysis in Romania and to provide the academic and professional communities with studies based on scientific rigour, interdisciplinarity and practical relevance. The research published by the Forum has consistently tracked developments in maritime security, the law of the sea, geopolitical competition, critical infrastructure, energy security, emerging technologies and the transformation of the security architecture in the Black Sea region and the Euro-Atlantic area.

This ongoing research activity has enabled the accumulation of a solid knowledge base and laid the foundations for the development of proprietary analytical tools, tailored to the current challenges of the strategic environment. This study reflects this evolution and marks the transition from the analysis of maritime phenomena to the development of conceptual models, analytical methods and indicators capable of capturing the dynamics and complexity of contemporary maritime security.

The paper proposes the Maritime Strategic Ecosystem as a new fundamental unit of analysis and develops an original conceptual architecture, comprising the concepts of the Maritime Strategic Centre of Gravity (MSCoG), Maritime Strategic Convergence, Maritime Strategic Resilience, Maritime Strategic Elasticity and Maritime Cognitive Superiority, integrated through the Maritime Strategic Convergence Framework (MSCF) and the Integrated Maritime Security Architecture (IMSA). These tools are designed to facilitate a systemic analysis of the maritime domain and to support both academic research and the processes of strategic assessment and decision-making.

Using the NATO Summit in Ankara (2026) as a case study demonstrates the practical applicability of this conceptual framework and highlights how the new analytical tools enable a deeper understanding of the transformation of the Euro-Atlantic security architecture.

This study reflects the conviction that the evolution of the strategic environment must be accompanied by a corresponding evolution of the tools used to analyse it. In this context, the Maritime Security Forum has taken on the mission of contributing not only to the interpretation of developments in the field of maritime security, but also to the development of a Romanian school of strategic thought, capable of generating concepts, methodologies and analytical models relevant to contemporary research and to the formulation of public policy.

Through this publication, the Maritime Security Forum invites the academic community, experts, practitioners and decision-makers to participate in an open scholarly dialogue on the development and validation of new conceptual tools, tailored to the maritime security challenges of the 21st century.

The Maritime Security Forum aims to be not only an observer of changes in the maritime strategic environment, but also a space for reflection and conceptual innovation, where practical experience, interdisciplinary research and scientific rigour converge to develop new methods of analysis, concepts and tools designed to understand and anticipate contemporary maritime security challenges.

Abstract

The maritime strategic environment has undergone profound transformations over the last decade, driven by geopolitical competition, technological innovation, the growing importance of critical maritime infrastructure, digital interconnectivity and the increasing convergence between security, law, economics and energy. Whilst the existing literature offers substantial contributions regarding sea power, maritime strategy, maritime security, governance and hybrid threats, these approaches remain primarily focused on individual dimensions of the maritime domain and

provide only limited explanations of the systemic interdependencies that increasingly characterise contemporary maritime security. Against this background, the present study examines the 2026 NATO Ankara Summit as a representative strategic case study through which broader transformations in the Euro-Atlantic maritime security architecture can be observed. Rather than analysing the summit as an isolated political event, the research interprets it as an institutional expression of an ongoing evolution in maritime strategic thinking. The study employs an interdisciplinary methodology combining doctrinal analysis, legal analysis, strategic analysis, comparative analysis, and case study research. A comprehensive examination of the principal doctrinal contributions of Alfred Thayer Mahan, Julian Corbett, Ken Booth, Geoffrey Till, Christian Bueger, Martin N. Murphy and Sam Bateman demonstrates that each theoretical model successfully explains particular dimensions of maritime security whilst leaving open a broader analytical space concerning the interaction between military capabilities, critical infrastructure, international law, technological innovation, the maritime economy, energy security and governance. Building upon this observation, the article develops an integrated conceptual framework centred on the Maritime Strategic Ecosystem as the fundamental unit of analysis. Within this framework, several complementary analytical concepts are introduced, including **the Maritime Strategic Centre of Gravity (MSCoG), Maritime Strategic Convergence, Maritime Strategic Resilience, Maritime Strategic Elasticity and Maritime Cognitive Superiority**. These concepts are subsequently integrated into the Maritime Strategic Convergence Framework and operationalised through the Integrated Maritime Security Architecture, providing a systemic approach to analysing contemporary maritime security. The study argues that the principal evolution in maritime strategic thought no longer concerns the reinterpretation of sea power itself, but rather the transition from analysing isolated maritime components towards understanding the dynamic interactions that characterise the contemporary maritime strategic ecosystem. In doing so, the article proposes a new analytical unit for contemporary maritime security studies.

Keywords: maritime security; NATO Ankara Summit 2026; maritime strategic ecosystem; maritime strategic convergence; sea power; maritime governance; critical maritime infrastructure; maritime resilience; maritime elasticity; maritime cognitive superiority; international law of the sea; hybrid threats; Euro-Atlantic security; Black Sea; strategic studies.

JEL Classification: F51, F52, H56, K33, O33, Q34

List of abbreviations

Abbreviation	Full name
AI	Artificial Intelligence
AIS	Automatic Identification System
A2/AD	Anti-Access / Area Denial
EU	European Union
GNSS	Global Navigation Satellite System
IMO	International Maritime Organisation
IMSA	<i>Integrated Maritime Security Architecture</i>
ISR	Intelligence, Surveillance and Reconnaissance
MCS	<i>Maritime Cognitive Superiority</i>
MDA	Maritime Domain Awareness
MEC	<i>Maritime Ecosystem Concept – if used</i>
MSE	<i>Maritime Strategic Ecosystem</i>
MSC	<i>Maritime Strategic Convergence</i>
MSCF	Maritime Strategic Convergence Framework
MSEL	<i>Maritime Strategic Elasticity</i>
MSCoG	Maritime Strategic Gravity (<i>MSCoG</i>)
MSR	<i>Maritime Strategic Resilience</i>
NATO	North Atlantic Treaty Organisation

OSINT	Open Source Intelligence
UNCLOS	United Nations Convention on the Law of the Sea
USV	Uncrewed Surface Vehicle
UUV	Uncrewed Underwater Vehicle

Abbreviations of the original concepts in the study

Concept (Romanian)	Official name (English)	Abbreviation
Strategic Maritime Ecosystem	Maritime Strategic Ecosystem	MSE
Maritime Strategic Centre of Gravity (MSCoG)	Maritime Strategic Centre of Gravity	MSCoG
Maritime Strategic Convergence	Maritime Strategic Convergence	MSC
Maritime Strategic Resilience	Maritime Strategic Resilience	MSR
Maritime Strategic Elasticity	Maritime Strategic Elasticity	MSEL
Maritime Cognitive Superiority	Maritime Cognitive Superiority	MCS
Maritime Strategic Convergence Framework	Maritime Strategic Convergence Framework	MSCF
Integrated Maritime Security Architecture	Integrated Maritime Security Architecture	IMSA

Reading Guide – Conceptual Map of the Research

Any major scientific research requires a logical framework that enables the reader to understand how conclusions are drawn and original contributions substantiated. In the case of this paper, the research structure does not follow the traditional model of a simple descriptive analysis of the NATO Summit held in Ankara in 2026. On the contrary, the summit serves merely as the case study through which a much broader transformation of contemporary maritime security is analysed.

The research is structured progressively, with each stage forming the foundation for the next and contributing to the development of a coherent argument.

The first stage is devoted to analysing the evolution of maritime thought. Beginning with the seminal contributions of Alfred Thayer Mahan and Julian Corbett and continuing with the works of Ken Booth, Geoffrey Till, Christian Bueger, Martin Murphy and Sam Bateman, the research examines how the specialist literature has successively expanded our understanding of the maritime domain. The doctrinal analysis demonstrates that each generation of authors has added new dimensions to the research, without abandoning the conceptual foundations developed previously.

The second stage aims to identify the explanatory gaps that remain in the academic literature. The comparative analysis highlights the fact that established models provide a rigorous explanation of maritime power, naval strategy, the political functions of maritime forces, maritime security, contemporary threats and governance mechanisms. However, each of these models is built around a single main object of analysis and does not seek to integrate, simultaneously, the relationships between critical infrastructure, international law, emerging technologies, the maritime economy, energy security and military capabilities.

Building on this observation, the third stage develops the conceptual framework of the research. The concepts introduced in this paper are not merely terminological constructs, nor do

they constitute premises for the argument. They emerge gradually from doctrinal analysis and from an examination of recent strategic developments, and are formulated to describe relationships and processes for which there are as yet insufficient conceptual tools in the current literature. The Maritime Strategic Centre of Gravity, Maritime Strategic Convergence, Maritime Strategic Resilience, Maritime Strategic Elasticity and Maritime Cognitive Superiority describe complementary dimensions of the same strategic ecosystem.

The next stage is devoted to operationalising these concepts. To ensure that the conceptual architecture can be used as an analytical tool and not merely as a theoretical model, the research develops two complementary methodological tools: the Maritime Strategic Convergence Framework (MSCF) and the Integrated Maritime Security Architecture (IMSA). These enable the simultaneous analysis of the legal, military, economic, technological, energy and institutional dimensions of contemporary maritime security.

It is only after this conceptual framework has been established that the NATO Summit in Ankara is analysed. Its selection as a case study is based on methodological grounds rather than exclusively political ones. The summit brings together, within a single institutional context, many of the transformations identified previously, thereby offering the opportunity to assess the robustness and explanatory power of the conceptual framework developed in the course of the research. Consequently, the summit is not the starting point of the demonstration, but the main instrument through which it is validated.

The final stage is devoted to the theoretical and practical implications of the research. The analysis goes beyond the scope of the case study and examines how the proposed conceptual framework can contribute to the development of future research in the fields of maritime security, international law, strategic studies and maritime governance. At the same time, the implications that this approach may have for strategic planning processes and public policies concerning the protection of critical maritime infrastructure are highlighted.

The logical progression of the research can be summarised as follows: the doctrinal analysis leads to the identification of a gap in the existing literature; the identification of this gap justifies the development of an integrated conceptual framework; this framework is transformed into an operational methodological tool; the tool is validated through the case study of the NATO Summit in Ankara; and the resulting conclusions underpin the theoretical contributions and practical implications of the research.

From this perspective, the research does not seek to replace established theories on maritime power and security, nor to critically reinterpret them. On the contrary, it builds upon their robustness and explanatory value and proposes their integration into a systemic perspective, appropriate to a strategic environment characterised by interdependence, convergence and continuous adaptation.

The essential contribution of this study lies not solely in the formulation of new concepts, but in changing the fundamental unit of analysis for maritime security. Whilst classical and contemporary literature successively examines naval power, strategy, security, threats or governance, this research proposes that the main focus of analysis should be the strategic maritime ecosystem and the interdependent relationships that determine its functioning. From this perspective, maritime security is no longer understood as the result of the action of components analysed in isolation, but as an emergent property of the entire system formed through the interaction of the legal, military, economic, technological, energy and institutional dimensions.

Foreword

Maritime security is undergoing one of the most profound transformations of recent decades. The intensification of geopolitical competition, the development of emerging technologies, the expansion of critical subsea infrastructure and the growing dependence of the global economy on maritime flows have significantly altered the relationship between the maritime domain and

international security. In this context, the sea is no longer merely a space for navigation, trade or the projection of naval power, but a strategic ecosystem in which legal, economic, energy, technological and military interests converge.

The specialist literature offers fundamental contributions on maritime power, international law of the sea, naval security and the governance of maritime space. However, an analysis of recent developments highlights that these perspectives, whilst indispensable, are for the most part developed within distinct disciplinary frameworks. Strategic studies examine power relations and doctrinal shifts among state actors. Legal research focuses on the interpretation and application of the rules of international law of the sea. Economic analyses examine the functioning of logistics chains and energy markets, whilst literature on emerging technologies concentrates on the impact of digitalisation and artificial intelligence. In practice, however, these dimensions no longer evolve in isolation. They constantly interact and produce cumulative effects on maritime security.

This observation forms the starting point of the research. The study does not set out to formulate new concepts, nor does it aim to construct an original doctrinal framework. On the contrary, the approach began with an analysis of the transformations taking place in the maritime strategic environment and an examination of how these are reflected in recent strategic documents, in state practice and in the specialist literature. As the research progressed, it became evident that many of the observed phenomena could not be satisfactorily explained using established conceptual frameworks. The relationships between critical infrastructure, digital technologies, energy security, international law and naval power transcended traditional disciplinary boundaries and suggested the existence of a broader systemic logic.

In this context, the NATO Summit held in Ankara in 2026 was chosen as a case study not because it represents the sole source of the transformations analysed, nor because it marks the moment when these transformations first emerged. The choice is based on methodological grounds. The summit brings together, within a single institutional framework, concerns regarding the resilience of critical infrastructure, energy security, the development of emerging technologies, the strengthening of the defence industrial base, and the adaptation of the Euro-Atlantic security architecture. Consequently, it provides a prime context for observing the convergence of developments that have gradually unfolded in recent years.

From this perspective, the Ankara Summit is not the exclusive subject of this research, but rather the primary tool through which the deeper transformations in contemporary maritime security are analysed. The study does not aim to describe the meeting or to comment in detail on the documents adopted. These are used as empirical support for assessing a strategic development that goes beyond the scope of a single event and concerns the overall architecture of Euro-Atlantic security.

To achieve this objective, an interdisciplinary methodology was employed, constructed by combining several complementary research methods. The doctrinal analysis enabled a critical examination of the main contributions in the literature on maritime power, collective security and maritime security, with the aim of identifying elements of continuity and the explanatory limitations of existing models. The legal analysis sought to interpret the relevant provisions of international law of the sea, NATO documents, European Union strategies and other relevant normative and strategic instruments. Strategic analysis was used to assess geopolitical developments, doctrinal shifts and changes in the relationships between the relevant actors in the maritime environment. The case study method enabled the integration of these perspectives into the analysis of the NATO Summit in Ankara, whilst comparative analysis facilitated the linking of the conclusions to the specialist literature and to developments observed in other maritime areas.

Systemic analysis played a key role in the development of the research. This enabled an examination of the functional relationships between components that are traditionally analysed separately. Rather than adopting an approach focused exclusively on individual actors, capabilities or incidents, the research examined how critical infrastructure, international law, technology, the maritime economy and strategic power form an ecosystem characterised by interdependence and continuous adaptation.

The concepts developed throughout this thesis emerged from this analytical process and did not constitute pre-existing premises of the research. The observation of the concentration of strategic interests in certain maritime spaces led to the formulation of the concept of the Centre of Maritime Strategic Gravity. The analysis of the interdependence between the military, legal, energy and technological dimensions highlighted the need to define Maritime Strategic Convergence. The examination of the role of information and emerging technologies in the decision-making process underpinned the development of the concept of Maritime Cognitive Superiority, whilst the analysis of the behaviour of maritime ecosystems during and after major disruptions enabled a distinction to be drawn between Maritime Strategic Resilience and Maritime Strategic Elasticity. At a later stage of the research, these concepts were integrated into a unified methodological framework and represented by a conceptual architecture designed to facilitate systemic analysis.

This sequence explains both the order of the chapters and the development of the argument. The research does not aim to replace established theories of maritime power, nor to reinterpret international law of the sea. On the contrary, it builds upon the robustness of these doctrinal constructs and seeks to integrate them into a perspective capable of responding to the challenges posed by the contemporary strategic environment.

At the same time, the limitations of this research must be explicitly acknowledged. The conceptual framework presented in the following pages is the result of an interdisciplinary analysis applied to a representative case study. Its usefulness and robustness can only be fully assessed through its application to other maritime regions, through comparison with other explanatory models, and through critical engagement with the relevant international literature. From this perspective, this work does not aim to formulate a definitive theory of maritime security, but rather to develop the foundations of an integrated conceptual framework, open to validation and refinement through further research.

Ultimately, the ambition of this research is not so much to provide definitive answers as to open up a new direction for reflection on maritime security. If the present analysis helps to stimulate dialogue between international law, strategic studies, maritime economics, critical infrastructure analysis and research into emerging technologies, then its fundamental objective can be considered achieved.

Introduction

The history of the North Atlantic Alliance can also be viewed through the lens of the summits that have marked moments of redefinition of its strategic identity. From the consolidation of collective defence during the Cold War, to post-bipolar enlargement, the integration of crisis management operations after 1990, the response to international terrorism following the attacks of 11 September 2001, and the return to conventional deterrence following the illegal annexation of Crimea in 2014, each stage has led to the Alliance's doctrinal and institutional adaptation to a constantly changing international environment.

The NATO summit held in Ankara in July 2026 must be analysed within this historical context, yet its significance extends beyond that of a routine meeting dedicated to assessing the security environment. The central hypothesis of this study is that Ankara 2026 marks the moment when maritime security ceases to be treated as a distinct operational domain and begins to be integrated at the heart of the Euro-Atlantic strategic architecture. This is not a matter of a formal amendment to the Alliance's founding treaties, nor of the emergence of a new official doctrine, but rather the consolidation of a strategic orientation that reflects the profound transformations that have taken place in the international security environment.

In recent decades, the maritime domain has ceased to be solely the arena in which states project their naval power. The sea has become the physical and informational infrastructure of globalisation. Approximately ninety per cent of world trade takes place by sea, the majority of international digital communications pass through submarine cables, and the energy security of

many states depends on offshore pipelines, maritime terminals and shipping lanes that traverse regions affected by strategic competition and instability. In this context, the vulnerability of maritime infrastructure has repercussions that extend beyond the military sphere, affecting the economy, communications, food security and the functioning of democratic institutions.

The Russia-Ukraine conflict has accelerated this transformation. The Black Sea has become an arena where conventional warfare coexists with hybrid operations, attacks on critical infrastructure, the use of autonomous systems, electronic warfare and information warfare. At the same time, tensions in the Middle East have demonstrated that the security of energy routes and freedom of navigation at maritime chokepoints directly influence global economic stability. These developments have highlighted the limitations of a fragmented approach to maritime security and laid the groundwork for an integrated perspective, in which the Black Sea, the Eastern Mediterranean, the Red Sea and the Persian Gulf are viewed as elements of the same strategic system.

Building on this observation, this study argues that the NATO Summit in Ankara marks a turning point in the way maritime security is understood and organised. The significance of the summit lies not solely in the decisions adopted, but in the fact that they reflect the maturing of a conceptual shift. At the heart of this shift lies the recognition of the interdependent nature of the military, legal, energy, technological and information dimensions of maritime security. In the new strategic context, the protection of subsea infrastructure, the resilience of supply chains, the integration of artificial intelligence into decision-making processes and the strengthening of cooperation between allies are no longer sectoral objectives, but components of the same security architecture.

The study pursues four main objectives. The first is to analyse the NATO Summit in Ankara in the context of the Alliance's strategic evolution and the transformation of the international security environment. The second aims to assess the legal and strategic implications of the guidelines emerging from the summit on maritime security and the application of international law of the sea. The third aims to identify the consequences for the Black Sea region and for Romania, in its capacity as a littoral state and a member of both NATO and the European Union. Finally, the fourth objective is to formulate a conceptual framework capable of explaining the convergence between the military, economic, energy, technological and legal dimensions of contemporary maritime security.

From a methodological perspective, the research adopts an interdisciplinary approach, combining legal analysis, strategic studies, the evaluation of official documents, comparative analysis and methods specific to prospective research. The Ankara Summit is treated as a case study, but the conclusions aim to go beyond the scope of the event analysed and contribute to the development of a theoretical perspective on the transformation of maritime security in the 21st century.

The main contribution of the study lies in the argument that Ankara 2026 must be understood not merely as a NATO summit, but as the moment when the Alliance begins to operate within a framework of multi-domain convergence, in which naval power, critical infrastructure, economic resilience, technology and international law form a single strategic system. From this perspective, maritime security is no longer merely a component of collective defence, but one of its cornerstones.

Chapter 1

From naval dominance to integrated maritime security: the evolution of NATO's strategic concept

1.1. The end of the classical maritime concept

The transformations that took place in the international security environment during the first decades of the 21st century profoundly altered the conceptual foundations of maritime power. Whilst during the Cold War naval superiority was assessed primarily in terms of fleet size, power projection capability and control of maritime lines of communication, the contemporary strategic environment demonstrates that these criteria, whilst still relevant, are no longer sufficient to explain the complexity of maritime security.

The classical model of naval power, decisively influenced by the works of Alfred Thayer Mahan and subsequently by the doctrinal developments of Julian Corbett, was constructed at a time when military confrontation took place predominantly between naval platforms, and the main strategic objective was to gain control of the seas or, where appropriate, to deny it to the adversary. According to this logic, the maritime domain was viewed as a distinct operational theatre, conceptually separate from other areas of security.

However, the first decades of the 21st century have shown that this separation no longer corresponds to strategic reality. The digital revolution, economic globalisation, the development of offshore energy infrastructure and the emergence of hybrid threats have altered the nature of the maritime domain. The sea is no longer merely the environment in which naval forces operate, but the infrastructure through which energy, information, trade and a significant part of the global economy flow.

In these circumstances, the destruction of a frigate may have less strategic impact than the compromise of an undersea communications cable, the sabotage of an offshore pipeline or the paralysis of a port through a cyber-attack. Strategic value is thus shifting from the military platform to the ecosystem that enables the functioning of the entire maritime domain.

This transformation necessitates a re-examination of the very concept of maritime security. At present, it can no longer be defined solely in terms of military control of the seas, but must be analysed as an expression of a state's or an alliance's capacity to simultaneously protect critical infrastructure, communications, trade flows, energy resources and the international legal order governing the use of the maritime domain.

1.2. The changing nature of threats

The evolution of the strategic environment highlights an equally profound change in the nature of threats. In the past, maritime risks were mainly associated with naval confrontations, naval blockades or the disruption of maritime communication lines by conventional means.

Today, threats are characterised by a high degree of interdependence and ambiguity. Actions targeting undersea infrastructure, cyber-attacks on ports, interference with satellite navigation systems, the use of autonomous drones and information operations conducted in parallel with conventional military activities demonstrate that the distinction between peace and conflict is becoming increasingly blurred.

This development is illustrated by numerous incidents in recent years involving submarine cables, offshore energy installations and port infrastructure, which have highlighted the difficulty of attributing responsibility and the limitations of traditional response mechanisms. In such situations, the main challenge lies not only in defending a target, but also in identifying the perpetrator, determining the legal classification of the incident and coordinating the response between civilian and military authorities.

Consequently, contemporary maritime security must be understood as a continuous process of multi-domain risk management and not exclusively as a military activity conducted in the maritime domain.

1.3. The war in Ukraine and the acceleration of doctrinal transformation

Whilst the changes mentioned above were already evident before 2022, the conflict between the Russian Federation and Ukraine has decisively accelerated the doctrinal transformation of maritime security.

Operations in the Black Sea have demonstrated that states with limited naval resources can influence the strategic balance through the integrated use of satellite intelligence, autonomous systems, precision-guided weapons and cyber capabilities. At the same time, the conflict has highlighted the vulnerability of port infrastructure, energy facilities and trade corridors, confirming that the economic and logistical effects of an attack can exceed the strictly military consequences.

In parallel, the importance of the Port of Constanța, the solidarity corridors developed for Ukrainian exports and the energy infrastructure in the Black Sea has demonstrated that regional security cannot be separated from economic resilience and the functioning of global supply chains.

In this regard, the conflict in Ukraine should not be viewed merely as a regional military confrontation, but as the main catalyst for the doctrinal transformation that was to be reflected, in a consolidated form, in the strategic guidelines discussed at the NATO Summit in Ankara.

1.4. Convergence of strategic domains

One of the most significant characteristics of the contemporary security environment is the blurring of conceptual boundaries between traditional domains of action. Maritime operations are constantly influenced by developments in cyberspace, space infrastructure, artificial intelligence, economic resilience and the international legal framework.

This convergence is bringing about a profound change in the strategic planning process. The decision to protect an undersea pipeline simultaneously involves considerations of international law, energy security, military defence, cyber security and diplomatic cooperation. Similarly, the security of a modern port depends equally on physical infrastructure, the digital systems that manage traffic, and the authorities' ability to respond to hybrid threats.

Consequently, the analysis of maritime security can no longer be carried out within a single discipline. It requires an interdisciplinary approach, capable of integrating international law, strategic studies, economics, technology and risk analysis within a common conceptual framework.

1.5. Ankara 2026 in the context of this transformation

In light of these developments, the NATO Summit in Ankara does not appear as an isolated event, but as the institutional expression of a doctrinal transformation that has been underway for several years. The decisions and guidelines adopted at the meeting reflect the recognition that maritime security can no longer be treated as a sectoral component of collective defence.

The significance of the Ankara summit lies precisely in the integration, at a strategic level, of dimensions that until recently were analysed separately: collective defence, the protection of critical infrastructure, economic resilience, digital transformation and technological competition. In this context, the maritime domain becomes the arena where the Alliance's fundamental interests converge and where strategic success depends on the ability to coordinate military and non-military instruments within a coherent architecture.

Thus, Ankara 2026 does not mark the beginning of the transformation of maritime security, but rather the moment when this transformation takes on political and strategic expression at NATO

level. Understanding this development is essential for analysing the summit's implications for the Black Sea, for international law of the sea and for the future Euro-Atlantic security architecture – aspects which will be explored in the following chapters.

Chapter 2

The evolution of maritime thinking: from naval power to the strategic maritime ecosystem

2.1. The evolution of maritime thinking and the transformation of the scope of maritime security

In recent Romanian literature, research carried out within the framework of the Maritime Security Forum has contributed to broadening the analysis of maritime security beyond the strictly naval dimension. Studies coordinated or authored by Aurel Popa and Sorin Learschi have analysed maritime resilience, critical infrastructure, hybrid threats, doctrinal adaptation, autonomous systems, institutional architectures and the role of the law of the sea. Taken together, these contributions outline an integrated Romanian approach to maritime security, relevant to underpinning the Strategic Maritime Ecosystem, though not to be confused with the specific conceptual framework developed in this research.

Few fields of strategic studies have exerted a comparable influence on the development of international relations as maritime thought. For over a century, control of the seas, the use of naval power and the protection of maritime communications have been central themes of doctrinal reflection and strategic planning. Some of the most influential theories concerning the assertion of state power, geopolitical competition and the stability of the international order have been built around these ideas. The relevant literature convincingly demonstrates that the development of great powers cannot be separated from their ability to utilise the maritime domain for trade, the projection of power and the linking of economic and political interests on a global scale.

This doctrinal continuity must not, however, be confused with the permanence of the subject under analysis. Whilst the foundations of maritime thought have remained remarkably stable, the strategic reality within which they operate has changed profoundly. The contemporary maritime domain is no longer merely the environment in which states project their military power or protect their trade routes. It has become the invisible infrastructure of globalisation, the backbone of digital communications, the main energy corridor of the world economy and one of the most complex spaces of strategic interdependence within the international system.

This transformation inevitably alters the focus of research as well. In the classical literature, the fundamental questions concerned the relationship between naval power and state assertiveness, control of maritime communications, or the strategic use of the sea during armed conflicts. Contemporary literature is gradually broadening this perspective to include transnational crime, piracy, terrorism, marine environmental protection, ocean governance and human security. Over the past decade, the development of submarine infrastructure, the digitalisation of maritime transport, the proliferation of autonomous systems, the global economy's dependence on submarine cables and the intensification of hybrid threats have added new dimensions that are altering the very nature of maritime security.

In these circumstances, research can no longer be limited to the analysis of naval power, nor to the separate interpretation of the legal, economic or technological dimensions of the maritime domain. The relationships between these components have become so close that the functioning of

each depends on the functioning of the others. A disruption to undersea communications has simultaneous economic, legal and strategic consequences. A cyber vulnerability in a commercial port can affect military mobility and energy security. A disruption to trade flows can alter regional geopolitical balances. These examples illustrate that the focus of research has gradually shifted from the analysis of individual components to the analysis of the relationships between them.

From this perspective, the evolution of maritime thought can be interpreted as a succession of successive expansions of the explanatory framework. Alfred Thayer Mahan lays the foundations for the theory of sea power and demonstrates the link between control of the seas and the rise of great powers. Julian Corbett introduces the strategic dimension and subordinates the use of the seas to the state's political objectives. Ken Booth shifts the analysis towards the political and diplomatic functions of naval power. Geoffrey Till adapts the theory of sea power to the context of globalisation and international cooperation. Christian Bueger extends the concept of maritime security beyond the military dimension, integrating governance, development and human security. Martin Murphy and Sam Bateman analyse asymmetric threats, maritime crime and modern governance mechanisms.

Viewed together, these contributions are neither mutually exclusive nor do they replace one another. On the contrary, they form part of a continuous process of doctrinal development in which each author responds to the dominant challenges of their era and builds upon the foundations laid by previous generations. It is precisely this continuity that explains why the present study does not seek to identify outdated theories, nor to formulate an alternative to the established literature. Such an approach would be artificial and would ignore the fundamental contribution of the authors who have shaped modern maritime thought.

The approach adopted in this chapter is different. The comparative analysis aims to identify the explanatory scope of each doctrinal framework and to assess the extent to which it responds to the transformations taking place in the strategic environment of the 21st century. Each model is analysed within the historical context in which it was developed; its key contributions and impact on the evolution of the specialist literature are highlighted; and its capacity to explain phenomena such as critical subsea infrastructure, multi-domain competition, artificial intelligence, energy security or the systemic interdependencies characteristic of contemporary maritime ecosystems is subsequently examined.

This approach helps to avoid a reductive perspective on the existing literature. None of the theories analysed is invalidated by recent developments, nor do they lose their explanatory relevance. Instead, the analysis demonstrates that each of these theories accurately describes a specific dimension of maritime security, without, however, simultaneously incorporating the full range of legal, economic, technological and strategic relationships that define the current maritime environment.

Consequently, the fundamental question that will guide the doctrinal analysis is not whether the classical theories are still valid, but whether, taken together, they fully account for maritime security in the 21st century. The answer to this question will form the basis for the development of the following chapters and will justify the need for an integrated conceptual framework, designed not to replace the established literature, but to bring together its contributions within a coherent architecture and to explain the systemic relationships that characterise the contemporary strategic maritime ecosystem.

Table 1. The evolution of the fundamental unit of analysis in maritime theory: from naval power to the Maritime Strategic Ecosystem

Author	Representative work	Fundamental unit of analysis	Main doctrinal question	Contribution to the evolution of maritime thought
Alfred Thayer Mahan	<i>The Influence of Sea Power upon History</i> (1890)	Sea Power	Why is sea power decisive for the assertion of states?	He sets out the theory of sea power and the importance of controlling maritime communications.
Julian Corbett	<i>Some Principles of Maritime Strategy</i> (1911)	Maritime Strategy	How should maritime power be utilised to achieve political objectives?	Integrates naval power into the state's overall strategy and introduces the concept of control of the use of the sea.
Ken Booth	<i>Navies and Foreign Policy</i> (1977)	Maritime Functions	What is the political and diplomatic role of naval forces?	Expands the analysis to include the military, diplomatic and law enforcement functions of naval power.
Geoffrey Till	<i>Seapower: A Guide for the Twenty-First Century</i>	maritime power in the context of globalisation	How is maritime power evolving in a globalised and interdependent world?	It integrates the economic, commercial and - institutional dimensions of maritime power.
Christian Bueger	<i>What is Maritime Security?</i>	Maritime security	What is maritime security and what are its components?	It introduces a multidimensional approach based on the interdependence of security, development, the environment and governance.
Martin N. Murphy	<i>Contemporary Piracy and Maritime Terrorism</i>	Hybrid and asymmetric maritime threats	How are maritime threats evolving in the context of globalisation?	Analyses non-state actors, piracy, organised crime and contemporary maritime vulnerabilities.
Sam Bateman	<i>Maritime Security Governance</i> (collection of papers)	Maritime governance	How can maritime security be managed through cooperation and institutions?	It reinforces the concept of maritime governance and the role of international cooperation.
This study	Original conceptual proposal	The Strategic Maritime Ecosystem	How can all dimensions of maritime security be integrated into a systemic model?	Proposes shifting the fundamental unit of analysis from individual components to the strategic maritime ecosystem and the interdependencies between the legal, military, economic, technological, energy and institutional dimensions.

Source: own work based on the writings of Alfred Thayer Mahan, Julian Corbett, Ken Booth, Geoffrey Till, Christian Bueger, Martin N. Murphy and Sam Bateman.

Figure 1. Evolution of the Fundamental Unit of Analysis in Maritime Thought (1890–2026)

PERIOD	AUTHOR	FUNDAMENTAL UNIT OF ANALYSIS	MAIN DOCTRINAL FOCUS	KEY QUESTION	CONTRIBUTION TO THE EVOLUTION OF MARITIME THOUGHT
1890	 Alfred Thayer Mahan	 SEA POWER	Fundamental naval power as the key to national strength.	What is important at sea?	He established the theory of maritime power and the importance of maritime communications for national prosperity and security.
1911	 Julian Corbett	 MARITIME STRATEGY	The use of sea power as an instrument of political strategy.	How should naval power be used?	He integrated sea power into the general strategy of the state and introduced the concept of control of sea lines of communication.
1977	 Ken Booth	 MARITIME FUNCTIONS	What political roles does the sea play?	What political roles does the sea play?	He extended the analysis beyond the military sphere to diplomatic, economic and legal functions in external policy.
2009	 Geoffrey Till	 GLOBAL MARITIME POWER	How maritime power is transformed in a globalized world?	How is maritime power transformed in globalization?	He integrated economic, commercial, technological and institutional dimensions into global power and interdependence.
2015	 Christian Bueger	 MARITIME SECURITY	What is maritime security?	What is maritime security?	He introduced a multidimensional approach based on the interdependence of security, development, the environment and governance.
2016–2020	 Martin N. Murphy	 HYBRID THREATS	How are maritime threats evolving?	How are maritime threats evolving?	He analyzed non-state actors, piracy, organized crime, and information warfare as major contemporary maritime threats.
2020+	 Sam Bateman	 MARITIME GOVERNANCE	How can maritime security be governed?	How can maritime security be governed?	He consolidated the concept of maritime governance and the role of cooperation and international institutions.
2026	 Present Study	 MARITIME STRATEGIC ECOSYSTEM	How does the strategic maritime ecosystem function?	How does the strategic maritime ecosystem function?	Proposes the evolution of the fundamental unit of analysis toward a complex, transdisciplinary maritime ecosystem integrating legal, military, economic, technological, energy and institutional dimensions.

 This progressive shift in the fundamental unit of analysis reflects the growing complexity of the maritime strategic environment and justifies the adoption of the maritime strategic ecosystem as the new fundamental unit of analysis.

2.2. Alfred Thayer Mahan and the foundations of modern naval power

Few authors have influenced strategic thinking to an extent comparable to that of Alfred Thayer Mahan. The publication of **The Influence of Sea Power upon History, 1660–1783** in 1890 marked one of the defining moments in the evolution of maritime studies and profoundly altered the way in which states understood the relationship between naval power, economic prosperity and geopolitical assertiveness. Far from being merely a historical analysis, Mahan's work provided an explanatory model through which the development of great powers was linked to their ability to control maritime communications and to use the sea as an instrument of political and economic assertiveness.

The context in which this theory was formulated is essential to its understanding. The late nineteenth century was characterised by the expansion of world trade, colonial rivalry amongst the major European powers and the rapid development of naval technology. The advent of steam-powered ships, the development of global supply networks and the intensification of imperial rivalries shifted the focus of strategic competition towards control of sea routes. In this context, Mahan formulates one of the most influential ideas in the entire body of strategic literature: a state's prosperity and international influence depend decisively on its ability to utilise and control the sea.

The originality of his contribution lies in the fact that naval power is no longer analysed exclusively as a military instrument. It is integrated into a set of economic, geographical and political factors that explain the development of states. Mahan identifies an interdependent relationship between geographical position, the configuration of the coastline, economic resources, the development of trade and the existence of a fleet capable of protecting these interests. Thus, the sea becomes the primary arena through which wealth, influence and power circulate.

This perspective had an extraordinary doctrinal impact. The maritime policies of the United States, the United Kingdom, Japan and other naval powers were influenced by Mahan's ideas for several decades. Even today, concepts such as control of maritime lines of communication, the protection of maritime trade, or the importance of naval bases have their roots in this doctrinal

framework. Numerous contemporary strategic documents continue to reflect, directly or indirectly, the Mahanian logic of the relationship between naval power and national interests.

From the perspective of current research, Mahan's contribution remains indispensable as it establishes, for the first time, that the maritime domain is a determining factor in the international order. At the same time, he demonstrates that the analysis of naval power cannot be separated from the economy and the state's commercial interests, thereby anticipating one of the central ideas of modern strategic studies: security and prosperity are deeply interdependent.

Nevertheless, the strategic environment in which states operate at the beginning of the 21st century differs fundamentally from the context analysed by Mahan. At the time he was developing his theory, the maritime domain was viewed primarily as an arena for naval confrontation and the movement of goods. Underwater communications infrastructure, offshore energy networks, digital navigation systems, satellites, artificial intelligence and cyber vulnerabilities did not exist as elements of strategic competition. Consequently, his theory could not incorporate phenomena that were to emerge more than a century after the work was written.

This observation does not diminish the value of Mahan's doctrinal framework. On the contrary, it highlights the robustness of a model that continues to explain the geostrategic importance of the sea and the role of naval power in the assertion of state power. Its explanatory limitations only become apparent when the focus of research shifts from the analysis of naval power to the analysis of the strategic maritime ecosystem. In this new context, control of maritime routes remains essential, but it is merely one component of a far more complex system, in which critical infrastructure, digital communications, energy flows, institutional resilience and emerging technologies equally influence the security of the maritime domain.

From this perspective, Mahan's contribution can be interpreted as the foundation upon which the entire body of modern maritime strategic thought has been built. However, contemporary analysis calls for the unit of analysis to be expanded beyond naval power itself. Whilst for Mahan the central focus was the fleet and the state's ability to control the seas, current research is compelled to take into account the whole range of relationships between critical infrastructure, technology, the economy, international law and military power. This evolution does not represent a doctrinal break, but rather a progressive expansion of the explanatory framework of maritime security.

Understanding this evolution also allows for a more nuanced interpretation of Mahan's legacy. He does not provide an answer to all the questions raised by 21st-century maritime security, nor does he set out to do so. What he does provide is the conceptual foundation without which no serious analysis of the strategic importance of the sea can be constructed. It is precisely this solidity that explains why contemporary literature continues to take Mahan as its starting point, even when developing doctrinal perspectives focused on digitalisation, critical infrastructure or multi-domain competition.

In this sense, the theory of sea power must be understood as the first stage in the evolution of modern maritime thought. It explains why the sea matters to the power of states. Subsequent doctrinal stages will seek to answer a different question, namely how this power should be utilised and how it changes as the strategic environment becomes increasingly complex and interdependent. The answer to this question was first provided by Julian Corbett, who shifted the emphasis from control of the sea to its strategic use in accordance with the state's political objectives.

2.3. Julian Corbett and the transformation of naval power into an instrument of political strategy

Whilst Alfred Thayer Mahan laid the foundations for the relationship between maritime power and a state's assertiveness within the international system, Julian Stafford Corbett shifted the focus of strategic reflection to how this power should be utilised. The publication of **Some Principles of Maritime Strategy** in 1911 marked one of the most significant developments in the of

modern maritime thought, as it shifted the analysis from the intrinsic value of naval power to its function within the state's overall strategy.

The historical context explains this shift in perspective. At the beginning of the 20th century, rapid technological development, geopolitical transformations and the experiences of recent conflicts had demonstrated that mere naval superiority did not automatically guarantee strategic success. The great European powers possessed impressive fleets, but their effectiveness depended on their integration into a coherent political strategy. Corbett observes that the sea should not be viewed solely as an object of military control, but as a space through which broader political objectives are pursued.

This idea represents one of the author's most significant doctrinal contributions. Contrary to simplified interpretations that portray him as an opponent of Mahan, Corbett does not dispute the importance of sea power, nor the decisive role of the navy in defending the state's interests. He complements this perspective by demonstrating that naval power is not an end in itself, but an instrument in the service of politics. In this respect, his thinking follows the tradition established by Carl von Clausewitz, according to which war is the continuation of politics by other means.

Building on this premise, Corbett develops one of the most influential ideas in modern maritime strategy: control of the sea should not be understood as absolute and permanent domination over the maritime domain. In practice, what states seek is control over the use of the sea to the extent necessary to achieve their political and military objectives. This control may be limited in time, geographically restricted and adapted to the circumstances of each conflict. Consequently, naval superiority is not assessed by the mere existence of a more powerful fleet, but by its ability to create freedom of action for one's own state and to restrict the freedom of the adversary.

This nuance has profound doctrinal implications. Whilst Mahan prioritises the material dimension of maritime power, Corbett introduces a functional and strategic perspective. The maritime domain ceases to be analysed exclusively as the arena of naval confrontation and becomes an environment through which land operations are supported, communications are protected, the adversary's decisions are influenced, and the conditions necessary for achieving political objectives are created.

The importance of this approach is also reflected in the way Corbett redefines the relationship between naval and land operations. In his view, maritime strategy cannot be analysed independently of the state's overall strategy. Operations conducted at sea and on land form components of the same strategic effort, and the success of one often depends on coordination with the other. This perspective anticipates, to a certain extent, the principles of joint operations and multi-domain integration developed much later in contemporary military doctrine.

Corbett's influence on the development of maritime studies is considerable. Numerous modern naval doctrines continue to draw upon the distinction between control of the sea and use of the sea, and the flexible analysis of sea power proposed by the author remains one of the most robust explanations of the relationship between the military instrument and political objectives. At the same time, the emphasis on the relative nature of maritime control and on adapting strategy to specific circumstances continues to provide a particularly useful analytical framework for contemporary conflicts.

Nevertheless, the Corbettian model also reflects the strategic realities of the era in which it was developed. The central actor in the analysis remains the state, and the maritime domain is interpreted primarily as a theatre of competition between naval powers. The economic and legal dimensions are incorporated to the extent that they influence military strategy; however, critical undersea infrastructure, global communications networks, energy dependence, artificial intelligence and cyber vulnerabilities could not form part of the scope of this research.

This limitation does not diminish the relevance of the doctrinal framework developed by Corbett. On the contrary, it highlights the robustness of a theory that continues to explain how maritime power should be employed in relation to political objectives. However, when the unit of analysis shifts from naval operations to the functioning of the strategic maritime ecosystem, dimensions emerge that classical theory did not set out to incorporate. At present, freedom of the

seas depends not only on the balance of naval power, but also on the security of submarine cables, the resilience of port infrastructure, the protection of digital systems, the stability of energy markets and the functioning of highly complex global logistics chains.

From this perspective, Corbett's contribution must be understood as an essential extension of the theory of sea power, rather than as an alternative to it. Whilst Mahan explains the strategic importance of the sea, Corbett explains how this importance is translated into strategy. However, developments over recent decades will necessitate a further expansion of the explanatory framework. As strategic competition begins to encompass increasingly complex economic, legal, informational and technological dimensions, the analysis of maritime security can no longer be limited to the relationship between naval power and political objectives. It must also incorporate the diplomatic, economic and social functions of maritime power, an approach that was developed in a remarkable way by Ken Booth and, subsequently, by contemporary authors on maritime security.

2.4. Ken Booth and the expansion of the functions of maritime power into the political and diplomatic spheres

The evolution of maritime thought in the second half of the 20th century reflects the profound transformations that took place in the international system following the end of the Second World War and, subsequently, during the Cold War. Whilst for Alfred Thayer Mahan the fundamental issue was the assertion of state power through control of the seas, and for Julian Corbett the use of this power within the framework of overall strategy, Ken Booth shifts the analysis towards the role that naval forces play in managing political relations between states in peacetime and during periods of crisis.

*The work *Navies and Foreign Policy**, published in 1977, represents one of the most significant contributions to the development of a modern perspective on the use of naval power. Booth begins with the observation that the activity of naval forces cannot be reduced to preparations for war or the conduct of military operations. In reality, the majority of a fleet's existence takes place outside armed conflicts, and its value must also be assessed in terms of its ability to influence the international political environment, to support diplomacy and to contribute to regional stability.

Building on this premise, Booth formulates one of the most influential interpretations of the functions of sea power. In his view, naval forces simultaneously perform military, diplomatic and international law enforcement functions. These functions are not independent but complement one another, enabling the state to utilise its naval capabilities in a much wider range of situations than armed conflict itself.

The military dimension remains essential, but it represents only one of the expressions of maritime power. Equally important is the diplomatic function, through which a naval presence conveys political messages, strengthens alliances, deters hostile behaviour and demonstrates a state's commitment to the security of a region. At the same time, the public order function highlights the role of naval forces in combating piracy, protecting freedom of navigation, enforcing international sanctions, combating illicit trafficking and supporting compliance with the norms of international law.

This conceptual expansion marks a significant shift in the evolution of maritime doctrine. For the first time, naval power is analysed within a framework that goes beyond purely military logic and is integrated into the functioning of international relations as a whole. Booth demonstrates that the presence of a fleet produces political effects even in the absence of the use of force, and that its strategic value often stems from its ability to prevent conflicts, not merely to win them.

This perspective has exerted a significant influence on the subsequent development of maritime studies. Numerous modern naval doctrines place greater emphasis on peacekeeping operations, maritime cooperation, naval diplomacy and crisis management. Indirectly, Booth's thinking also contributed to the expansion of the concept of maritime security into areas that go

beyond national defence and include the protection of critical infrastructure, maritime transport security and international cooperation.

The importance of this contribution is also evident in the current context. Naval missions carried out by NATO, the European Union or other international organisations demonstrate that maritime forces are frequently used to monitor trade routes, protect submarine cables, escort strategic shipments, combat piracy and strengthen regional stability. All these activities confirm Booth's observation that the value of a fleet cannot be assessed solely by its capacity to wage war.

However, the transformations that have taken place over the last two decades also highlight the explanatory limitations of the model developed by Booth. Although the author considerably broadens the scope of the functions of maritime power, the analysis remains centred on the naval instrument and on relations between states. Critical subsea infrastructure, offshore energy platforms, global digital communications networks, artificial intelligence and information ecosystems do not occupy a central place in his theoretical framework, as these were not yet defining factors in strategic competition at the time the work was written.

Furthermore, Booth's approach treats military, diplomatic and law enforcement functions as complementary expressions of the same maritime power, without analysing in depth the interdependencies between these and the other dimensions of maritime security. Today, the protection of freedom of navigation can no longer be separated from the cyber security of ports, the resilience of energy infrastructure or the functioning of global communications systems. The diplomatic dimension of maritime power is directly influenced by technological, economic and legal developments, and these relationships go beyond the explanatory framework of the model proposed by Booth.

This observation does not diminish the importance of his contribution. On the contrary, it highlights the visionary nature of a theory that has transcended the limits of classical naval thought and demonstrated that maritime power must be analysed as an instrument of foreign policy and international stability. It is precisely this conceptual openness that will enable future generations of researchers to extend their analysis to maritime governance, human security and international cooperation.

Viewed within the broader context of doctrinal evolution, Booth's contribution marks the stage at which maritime power ceases to be exclusively a matter of naval strategy and becomes an integral part of international politics. However, as globalisation accelerates and economic and technological interdependencies become dominant, research will be compelled to address a further question: how is the very nature of maritime power transforming in a world characterised by global connectivity and extensive cooperation? The answer to this question is brilliantly formulated by Geoffrey Till, who adapts the theory of maritime power to the strategic realities of the 21st century and paves the way for the transition to contemporary concepts of maritime security.

2.5. Geoffrey Till and the reinterpretation of maritime power in the era of globalisation

The rapid pace of globalisation, the expansion of international trade and the transformations in the strategic environment following the end of the Cold War have given rise to a new generation of thinking on the role of the sea in the international order. Among contemporary authors, Geoffrey Till occupies a distinctive position through his attempt to adapt the classical theory of sea power to the economic, technological and geopolitical realities of the 21st century. His seminal work, **Seapower: A Guide for the Twenty-First Century**, is one of the most influential doctrinal syntheses in modern literature and serves as a benchmark for numerous studies on contemporary maritime security.

The originality of Till's contribution lies not in abandoning classical theories, but in reinterpreting them within a profoundly different strategic context. The author starts from the premise that the fundamentals formulated by Mahan and Corbett remain valid, but the environment in which they operate has changed radically. Maritime power remains essential to the assertiveness

of states, but its functions can no longer be understood solely in terms of naval confrontation or control of sea lanes. Economic globalisation, the technological revolution and growing interdependencies have considerably expanded the role of the sea in the functioning of the international system.

From this perspective, Till redefines maritime power as the result of the interaction between naval capabilities, the maritime economy, port infrastructure, global trade, the shipbuilding industry, technological research and the state's ability to utilise these resources in a coherent manner. Maritime power is no longer analysed exclusively as an expression of military force, but as the product of a combination of material and institutional resources that enable the state to participate actively in the global economy and security.

This approach represents one of the most significant doctrinal developments of recent decades. For the first time, the economic and strategic dimensions are integrated into a single analysis, and the sea is presented as an essential infrastructure of globalisation. Maritime trade, ports, logistics chains and international connectivity are becoming just as important to a state's security as its military fleet. In this respect, Till anticipates many of the concerns that would later dominate the literature on supply chain resilience, energy security and the protection of critical infrastructure.

Another significant contribution by the author concerns his understanding of international cooperation. Whilst the classical literature is built primarily around competition between states, Till observes that globalisation is producing an unprecedented level of interdependence. States continue to compete for influence and access to resources, but this competition takes place within a system in which the prosperity of each actor depends on the stable functioning of international trade and global maritime infrastructure. Consequently, cooperation and competition are no longer opposing phenomena, but complementary processes that coexist within the same strategic architecture.

This interpretation has a profound influence on how contemporary maritime security is understood. International naval missions, the protection of trade routes, cooperation to combat piracy, the securing of offshore energy infrastructure and the development of joint crisis response mechanisms largely reflect the logic described by Geoffrey Till. In many respects, subsequent literature on maritime governance and extended maritime security has its origins in this reinterpretation of the concept of maritime power.

The doctrinal significance of his work is all the greater because the author does not limit his analysis to the military or economic dimensions, but emphasises the multidimensional nature of maritime power. He demonstrates that the development of a high-performing fleet is insufficient in the absence of a competitive maritime economy, efficient infrastructure and a coherent maritime policy. Maritime power is thus interpreted as the result of the coordinated functioning of a set of components that extend far beyond the realm of naval operations.

From the perspective of the present study, Geoffrey Till is probably the author who comes closest to the idea of an integrated approach to maritime security. His analysis highlights the existence of complex relationships between the military, economic and institutional dimensions and offers one of the most robust explanations of the transformation of the role of the sea in the context of globalisation.

However, even this doctrinal framework struggles to explain certain phenomena that have become dominant over the past decade. At the time Till's main works were written, undersea digital infrastructure, autonomous systems, artificial intelligence, predictive analytics, cyber competition and the vulnerability of information ecosystems did not yet occupy the central position they hold today in the strategic landscape. Furthermore, although the author emphasises the multidimensional nature of maritime power, the analysis remains structured around the concept of power rather than around the systemic relationships between all components of the maritime ecosystem.

This distinction is crucial. Till's model provides a remarkable explanation of the transformation of maritime power in a globalised world, yet its primary focus remains on maritime power itself. The present study pursues a different objective. The focus is not on power itself, but on how critical infrastructure, emerging technologies, international law, the maritime economy, energy

security and military capabilities interact and collectively generate security or vulnerability at the level of the entire system.

In this light, Geoffrey Till's contribution can be interpreted as the culmination of the evolution of classical maritime power theory and, at the same time, as the starting point for the development of approaches geared towards the analysis of strategic maritime ecosystems. It is precisely this evolution that explains the emergence of authors such as Christian Bueger, who shift doctrinal reflection away from the concept of power towards the concept of maritime security and towards the governance mechanisms that underpin the functioning of the contemporary maritime domain.

2.6. Christian Bueger and the reconceptualisation of maritime security

The transformations that have taken place in the international environment since the end of the Cold War have led to a gradual broadening of the concept of security, both in strategic studies and in international law and public policy analysis. In the maritime sphere, this development is exemplified by the contributions of Christian Bueger, one of the authors who has decisively influenced the way in which maritime security is understood in contemporary literature.

Unlike the tradition pioneered by Mahan and continued by Corbett, Booth and Till, Bueger's primary concern is neither to explain maritime power nor to develop a theory of naval strategy. His focus is on defining the concept of maritime security and identifying the relationships between the various domains that comprise it. This shift in perspective marks one of the most significant doctrinal developments of recent decades and reflects the profound change in the international strategic environment.

In his works on maritime security, Bueger begins with the observation that the term is frequently used in the documents of international organisations and states, yet lacks a universally accepted definition. In practice, maritime security is successively associated with the protection of maritime borders, the fight against piracy, energy security, environmental protection, the enforcement of international law, the safety of navigation, or economic development. This terminological diversity gives rise to conceptual difficulties and hinders the ability of research to establish a common language.

To overcome this problem, Christian Bueger develops one of the most influential conceptual frameworks in the specialist literature, known as the *Maritime Security Matrix*. Rather than offering a rigid definition of maritime security, the author proposes a framework that highlights the relationships between four main domains: national security, economic development, human security and the protection of the marine environment. The central idea is that maritime security cannot be reduced to any one of these components, but rather arises from their interaction.

This approach represents a major doctrinal contribution as it shifts the analysis from actors to the relationships between these domains. The sea is no longer interpreted exclusively as a space for strategic confrontation or the assertion of naval power, but as an environment in which economic, legal, social and political interests converge. At the same time, the author demonstrates that maritime security cannot be understood without taking into account international cooperation and the governance mechanisms developed by regional and global organisations.

The influence of this perspective on contemporary research is considerable. Numerous maritime strategies drawn up by NATO, the European Union, the International Maritime Organisation and other international organisations reflect the expansion of the concept of security beyond the strictly military dimension. Combating maritime crime, protecting the environment, developing the blue economy and strengthening the resilience of maritime infrastructure are increasingly addressed as complementary elements of the same security process.

From the perspective of the present study, Bueger's contribution is particularly significant as it represents the first doctrinal step towards an integrated approach to maritime security. The author convincingly demonstrates that the various components of security should not be analysed in

isolation and that understanding the phenomenon requires an examination of the relationships between them. In this respect, his analysis aligns closely with the methodological approach adopted in this paper.

However, the comparative analysis also highlights the existence of certain explanatory limitations arising from very recent transformations in the strategic environment. The conceptual framework developed by Bueger integrates the military, economic, human and environmental dimensions, but pays less attention to certain elements that have become decisive over the last decade. Critical subsea infrastructure, artificial intelligence, cyber competition, autonomous systems, predictive analytics, the resilience of digital infrastructure and informational interdependencies now occupy a central place in the architecture of maritime security, yet they are not systematically developed within the proposed model.

At the same time, the conceptual framework developed by Bueger serves primarily a descriptive and explanatory purpose. It identifies the domains that make up maritime security and highlights the relationships between them, but does not develop a model capable of explaining the dynamics of interdependencies between infrastructure, technology, international law, military power and the economy in the context of multi-domain strategic competition. In other words, the matrix provides a very convincing answer to the question of what maritime security entails, but offers fewer tools for analysing the mechanisms through which the various components generate stability or vulnerability at the level of the system as a whole.

This observation does not detract from the value of the doctrinal framework developed by Bueger. On the contrary, it highlights the importance of a contribution that has permanently transformed the way in which maritime security is conceptualised and which has made it possible to move beyond exclusively military interpretations. It is precisely this conceptual expansion, however, that lays the groundwork for the development of a further stage of research, focused not only on identifying the components of maritime security, but also on analysing the systemic relationships between them.

From this perspective, Christian Bueger's contribution can be interpreted as the moment when maritime security doctrine definitively broke away from the exclusively naval paradigm and shifted towards a multidimensional understanding of the maritime domain. Subsequent strategic developments would, however, demonstrate that this perspective too requires further expansion. As hybrid threats, transnational crime, attacks on critical infrastructure and competition for control of maritime flows become increasingly complex, research will need to integrate the operational and maritime governance dimensions more thoroughly. This line of inquiry will be developed significantly by Martin Murphy and Sam Bateman.

2.7. Martin N. Murphy and the changing nature of maritime threats

The rapid development of globalisation and the intensification of maritime trade flows have produced not only an unprecedented increase in international connectivity, but also the emergence of new forms of vulnerability. In this context, Martin N. Murphy's contributions mark a significant shift in the specialist literature by shifting the focus from the classical relations between great powers towards the asymmetric and hybrid threats affecting maritime security.

His works on piracy, maritime crime and ocean security demonstrate that many contemporary risks cannot be explained by traditional concepts of naval confrontation. Non-state actors, criminal organisations, terrorist networks and groups involved in illicit trafficking utilise the maritime domain in a manner that differs from the logic of interstate conflicts. In many situations, they avoid direct confrontation and exploit the vulnerabilities of maritime infrastructure, logistical systems and international legal mechanisms.

This observation profoundly alters the perspective on maritime security. Whilst classical literature was primarily concerned with control of the seas and the use of naval force against an identifiable adversary, Murphy demonstrates that many contemporary threats are characterised by

ambiguity, dispersion and adaptability. In such situations, the distinction between peace and conflict becomes increasingly difficult to draw, and the traditional tools of naval strategy are often insufficient for managing risks.

The author pays particular attention to maritime piracy, which he interprets not as an isolated phenomenon, but as an expression of political, economic and institutional imbalances. Piracy is not merely a matter of public order at sea, but reflects the fragility of state institutions, the vulnerability of trade routes and the existence of areas where public authority is insufficiently established. In this way, maritime security ceases to be analysed exclusively through the prism of naval capabilities and becomes the result of the interaction between political, economic and social factors.

Murphy's contribution is particularly relevant due to the emphasis he places on the adaptive nature of threats. Criminal organisations and non-state actors are constantly modifying their methods of operation, utilising available technologies and exploiting differences between national legal regimes. From this perspective, the maritime environment appears as a space characterised by continuous competition between security mechanisms and the adversaries' ability to identify new vulnerabilities.

This interpretation anticipates many of the current concerns regarding hybrid warfare, sabotage of subsea infrastructure, the use of autonomous vehicles, cyber-attacks on ports and the manipulation of trade flows. Even though these issues did not yet occupy the central position they hold today, Murphy's analysis provides an important conceptual foundation for understanding the changing nature of maritime threats.

From the perspective of the present study, one of the author's most valuable contributions lies in demonstrating that the vulnerability of the maritime domain cannot be assessed solely in terms of the balance of power between states. Numerous risks arise at the intersection of infrastructure, organised crime, technology, the economy and a lack of international cooperation. In this respect, Murphy helps to broaden the scope of maritime security beyond the military dimension and brings the specialist literature closer to a systemic approach.

However, the comparative analysis highlights the fact that the focus of the research remains primarily on the nature of threats and the mechanisms through which they evolve. The interdependencies between critical infrastructure, artificial intelligence, energy security, international law and decision-making processes do not form the central focus of the author's doctrinal framework. Threats are analysed rigorously, but the functional relationships between all components of the strategic maritime ecosystem remain only partially explored.

This limitation must be interpreted in the context of the objectives of his research. Murphy does not seek to develop a general theory of maritime security, nor to devise an integrated conceptual framework. His primary interest lies in understanding the nature of threats and identifying the ways in which they affect the stability of the maritime domain. For this reason, his contribution remains one of the most robust explanations of the evolution of contemporary maritime risks.

Viewed within the broader context of doctrinal development, Martin Murphy's work marks the point at which the specialist literature began to prioritise systemic vulnerabilities and non-state actors. At the same time, it paves the way for a broader approach to maritime governance, in which security no longer depends exclusively on the power of states, but also on their ability to establish effective mechanisms for international cooperation and the management of the maritime domain. This line of thinking is developed in particular by Sam Bateman, who shifts the focus of analysis towards the concept of maritime governance and the role of institutions in managing the challenges posed by the contemporary maritime environment.

2.8. Sam Bateman and the consolidation of the concept of maritime governance

The evolution of the concept of maritime security in the early decades of the 21st century has been accompanied by an ever-increasing focus on the institutional mechanisms through which it can be achieved. Whilst earlier literature explains the importance of naval power, the strategic functions of the sea, the expansion of the concept of security, or the nature of contemporary threats, the contributions of Sam Bateman shift the analysis towards how these challenges can be managed through cooperation, institutional coordination and governance.

In his numerous works on maritime security in the Asia-Pacific region and ocean governance, Bateman begins with the observation that the maritime domain is characterised by a high degree of legal, economic and strategic interdependence. No single state has the capacity to manage on its own the full range of challenges posed by transnational crime, piracy, illegal fishing, marine environmental protection, transport security or the use of maritime resources. Consequently, maritime security cannot be reduced to the sum of measures adopted individually by each state, but depends fundamentally on the existence of effective mechanisms for international cooperation.

This perspective marks an important stage in the evolution of maritime doctrine. For Bateman, the sea must be understood as a shared space of interdependence, and its effective management requires the development of institutions capable of coordinating differing national interests without undermining the stability of the international legal order. International law of the sea, regional organisations, information-sharing mechanisms and mutual trust between states thus become indispensable components of maritime security.

One of the author's major contributions lies in demonstrating that many maritime risks cannot be eliminated through the exclusive use of military force. Combating illegal fishing, protecting marine ecosystems, preventing maritime accidents and monitoring trade routes all require the simultaneous involvement of naval authorities, civil institutions, international organisations and economic actors. From this perspective, governance emerges as the mechanism through which the various components of maritime security are coordinated in a coherent manner.

Bateman's contribution is also significant for the emphasis he places on the role of international law. In contrast to purely strategic interpretations, the author emphasises that stability in the maritime domain depends on compliance with legal norms, the strengthening of international institutions and the development of common practices capable of reducing uncertainty and the risk of escalation. In this regard, international law of the sea is viewed not merely as a set of rules governing the delimitation of maritime areas, but as the foundation of global maritime governance.

This approach has a significant influence on contemporary scholarship and the policies developed by numerous international organisations. Strategies concerning *Maritime Domain Awareness*, regional information-sharing, the development of joint coordination centres and the strengthening of institutional resilience largely reflect the logic proposed by Bateman. Particularly in the Indo-Pacific region, his contributions have shaped the debate on the need for multilateral mechanisms capable of addressing the challenges posed by strategic competition and the intensive use of the maritime domain.

From the perspective of the present study, the significance of the doctrine developed by Bateman lies in the recognition that maritime security is the result of the interaction between institutions, legal norms and cooperation mechanisms. In this regard, the author moves beyond approaches centred exclusively on naval power and makes a decisive contribution to the development of a multidimensional perspective on the maritime environment.

However, the comparative analysis highlights the fact that this perspective, too, remains focused on governance processes and institutional cooperation. The relationships between critical undersea infrastructure, information ecosystems, artificial intelligence, predictive analytics, energy security and strategic decision-making processes are not systematically developed within the model. In other words, governance explains how actors cooperate to manage the maritime domain, but it explains to a lesser extent the mechanisms through which technological, economic and legal interdependencies generate stability or vulnerability across the entire system.

This observation should not be interpreted as a criticism of Bateman's contribution. On the contrary, it reflects the very rapid evolution of the strategic environment in recent years. At the time the author was developing his main works, digital submarine infrastructure, artificial intelligence, generativ , autonomous systems, the competition for control of data and the protection of information ecosystems were not yet dominant aspects of maritime security. Consequently, his analysis rigorously addresses the challenges of the era in which it was written.

Viewed as a whole, Sam Bateman's contribution marks the maturing of the concept of maritime governance and complements the doctrinal evolution begun over a century ago by Alfred Thayer Mahan. Whilst Mahan explains the foundations of maritime power, Corbett its strategic use, Booth its political functions, Till its adaptation to globalisation, Bueger the expansion of the concept of security, and Murphy the transformation of threats, Bateman demonstrates that the effective management of the maritime domain requires the existence of complex mechanisms of institutional cooperation and coordination.

The comparative analysis carried out thus far, however, leads to a conclusion of methodological relevance. Contemporary literature offers sound explanations regarding maritime power, naval strategy, the political functions of maritime forces, maritime security, asymmetric threats and ocean governance. Nevertheless, these perspectives remain centred on different objects of analysis and are not integrated into a model capable of simultaneously explaining the relationships between critical infrastructure, emerging technologies, international law, the maritime economy, energy security, decision-making processes and military capabilities. It is precisely this observation that sets out the research direction upon which this study is based and justifies the need for an approach focused on analysing the strategic maritime ecosystem as the fundamental unit of contemporary maritime security.

2.9. Doctrinal convergence and the remaining explanatory gap

A comparative analysis of the main doctrinal contributions highlights one of the defining characteristics of the evolution of modern maritime thought: each stage has progressively expanded the scope of maritime security analysis without abandoning previously established foundations. From this perspective, the specialist literature should not be viewed as a succession of competing theories, but as a cumulative process of conceptual development in which each author adds a new dimension to the understanding of the maritime domain.

Alfred Thayer Mahan demonstrates that the sea is one of the main determinants of a state's power and establishes the relationship between control of maritime communications, trade and geopolitical influence. Julian Corbett complements this perspective by incorporating the strategic dimension and by subordinating the use of maritime power to the state's political objectives. Ken Booth extends the analysis to the diplomatic and law-and-order functions performed by naval forces, whilst Geoffrey Till adapts the concept of maritime power to the realities of globalisation and economic interdependence. Christian Bueger shifts the doctrinal focus towards the concept of maritime security and the relationships between national security, economic development, human security and environmental protection, whilst Martin Murphy and Sam Bateman analyse the transformation of threats and the development of modern mechanisms of maritime governance.

Taken individually, all these contributions offer rigorous and coherent explanations of the dimensions they investigate. Together, they constitute one of the most robust doctrinal frameworks in the field of strategic studies and international law. It is precisely this robustness that explains the influence that maritime literature continues to exert on the strategic documents drawn up by states and international organisations.

However, comparative analysis reveals a common feature shared by all these models. Each constructs its explanation around a central object of analysis. Depending on the author, this focus may be naval power, strategy, the political functions of maritime forces, maritime security, asymmetric threats or governance mechanisms. Even when the interdependencies between different

domains are acknowledged, they are analysed in relation to the central focus of the research and not as part of a single system of interrelationships.

This observation takes on particular significance in the context of the transformations that have taken place in recent years. The development of critical subsea infrastructure, the digitalisation of maritime transport, the use of artificial intelligence in decision-making processes, competition for control over information flows, the vulnerability of logistics chains and the growing importance of energy security have profoundly altered the architecture of the maritime environment. At present, many risks can no longer be attributed to a single dimension, nor do they produce effects limited to a single sector. A disruption to subsea infrastructure can simultaneously affect global communications, financial markets, military mobility, energy supplies and the functioning of state institutions. Similarly, a cyberattack on a commercial port can have economic, legal and strategic consequences that cannot be analysed solely through the lens of a single discipline.

In these circumstances, the focus of research inevitably shifts. The focus is no longer solely on the performance of each component of maritime security, but on the functional relationships between them. Naval power remains essential, but its effectiveness depends on the resilience of critical infrastructure. International law remains the foundation of the maritime order, but its application is influenced by technological transformations and new forms of strategic competition. The maritime economy generates prosperity, but the vulnerability of logistics chains can have strategic effects comparable to those of a military conflict. At the same time, emerging technologies are altering decision-making processes and creating new forms of interdependence between state and non-state actors.

These developments suggest that contemporary maritime security can no longer be understood solely through an analysis of its individual components. Explaining the phenomenon requires examining how these components interact, influence one another and generate cumulative effects on the entire system. From this perspective, the relationships between components become just as important as the components themselves.

This observation represents the point at which current literature leaves room for doctrinal reflection. This is not a matter of existing theories being inadequate, but rather of the emergence of a strategic reality whose complexity exceeds the objectives for which they were originally devised. Each of the models analysed continues to retain its full utility within its respective field of application. However, none explicitly seeks to integrate critical infrastructure, emerging technologies, international law, the maritime economy, energy security, information processes and military capabilities into a single analytical framework.

From this perspective, the present study does not proceed from the premise of a doctrinal deficit in the established literature, but rather from the observation that the evolution of the strategic environment calls for an expansion of the unit of analysis. Whilst classical and contemporary literature successively examines power, strategy, security, threats and governance, recent transformations suggest the need to analyse the interrelationships between these dimensions as a whole. In other words, the focus is shifting from the study of individual elements to the study of the system they collectively form.

In light of this observation, maritime security can be interpreted as an emergent property of a set of legal, strategic, economic, technological and institutional relationships that are in a state of constant interdependence. Such a perspective neither replaces existing doctrinal models nor diminishes their relevance. On the contrary, it builds upon their robustness and seeks to integrate their contributions into a conceptual framework capable of reflecting the complexity of the contemporary strategic environment.

It is precisely this shift in perspective that forms the foundation of the following chapters. Whilst the doctrinal analysis carried out thus far explains the evolution of the concepts through which the literature has successively understood maritime power, strategy, security and governance, the next stages of the research aim to develop a conceptual framework geared towards analysing the maritime strategic ecosystem and the systemic relationships that determine its functioning.

Chapter 3

The Sea as a Space of Global Strategic Competition: The Transformation of Maritime Security in the 21st Century

3.1. The reconfiguration of the centrality of the maritime domain

In the early decades of the 21st century, the maritime domain has consolidated its position as a central element of the international order. Whilst in the past its importance was primarily associated with international trade and the projection of naval power, today the sea represents the physical and functional infrastructure that underpins the global economy, digital connectivity, energy security and strategic mobility. Approximately ninety per cent of the volume of world trade is transported by sea, and the overwhelming majority of international electronic communications is transmitted via submarine cable networks. At the same time, the exploitation of offshore resources and the development of maritime energy infrastructure have transformed coastal areas and continental shelves into essential components of states' economic security.

This development is bringing about a fundamental shift in perspective. The sea can no longer be viewed solely as a transit route or as a theatre of naval confrontation. It is becoming a complex system in which critical infrastructure, technology, the economy and security are deeply interdependent. Any significant disruption to this system can trigger a chain reaction affecting international trade, energy markets, digital communications and political stability.

In this context, maritime security is no longer merely a concern for naval forces or coastal states. It has taken on the dimension of a global strategic asset, and safeguarding it requires extensive cooperation between international organisations, states, economic operators and institutions responsible for the security of critical infrastructure.

3.2. From maritime geography to maritime geostrategy

The geopolitical importance of the seas and oceans is not a new phenomenon. Throughout history, control of maritime routes has influenced the rise and fall of great powers. What sets the current period apart, however, is the intensity of the interdependencies created by globalisation and the speed with which local disruptions spread to the regional and global levels.

Maritime areas can no longer be analysed in isolation. The Black Sea, the Eastern Mediterranean, the Red Sea and the Persian Gulf now function as elements of an interconnected logistics and energy system. A crisis arising in one of these areas can rapidly affect trade flows, transport costs, energy supplies and food security on other continents.

This reality necessitates a shift from a geographical to a geostrategic approach. The value of a maritime area is no longer determined solely by its position on the map, but by the role it plays in the functioning of global transport, communications and energy networks. From this perspective, the Black Sea takes on a strategic importance that transcends its regional scope, as it connects Eastern Europe with the Mediterranean and directly influences the economic and military resilience of the Euro-Atlantic area.

3.3. Critical maritime infrastructure – the new centre of gravity for security

One of the most significant transformations of the past decade has been the shift in the primary focus of strategic competition. Whereas in the past attention was centred on military platforms and control of shipping lanes, critical maritime infrastructure is now becoming the main source of vulnerability and, consequently, one of the priority targets for state and non-state actors.

Submarine pipelines, communications cables, energy terminals, offshore installations, digital port management systems and integrated logistics networks are indispensable components of the functioning of the global economy. An attack on such a target can have effects disproportionate to the resources employed, simultaneously affecting economic sectors, military capabilities and the functioning of public institutions.

This shift is forcing states to rethink the relationship between military defence and the protection of civilian infrastructure. In practice, the distinction between the two domains is becoming increasingly blurred, as the same infrastructure can support both commercial activities and military operations. Ports, energy terminals and digital networks are relevant examples of this dual functionality.

3.4. The technological dimension of the transformation

Technological developments are amplifying this paradigm shift. Artificial intelligence, autonomous systems, big data analytics, distributed sensors and commercial satellite imagery are profoundly changing the way maritime spaces are monitored and protected. The ability to integrate information from multiple sources and transform this information into rapid operational decisions is becoming a key determinant of strategic advantage.

At the same time, technology is creating new vulnerabilities. The digitalisation of ports, the automation of logistics chains and reliance on electronic communications enhance operational efficiency, but also increase the surface area exposed to cyber-attacks, electronic interference and hybrid operations. Consequently, contemporary maritime security must be analysed simultaneously in both its physical and digital dimensions.

This transformation explains why investment in technology is no longer merely a tool for military modernisation, but an essential element of strategic resilience.

3.5. The Black Sea – a testing ground for the new paradigm

No other maritime area illustrates this transformation more clearly than the Black Sea. The conflict between the Russian Federation and Ukraine has demonstrated that operational success depends less and less on the numerical superiority of fleets and increasingly on the integration of information, the use of autonomous systems, the protection of critical infrastructure and rapid adaptation to changes in the operational environment.

At the same time, the region has highlighted the inseparable nature of the legal, economic and military dimensions of maritime security. Freedom of navigation, agricultural exports, energy security, the application of international law of the sea and the functioning of port infrastructure can no longer be analysed in isolation. Together, they form a strategic system in which the vulnerability of one component affects the functioning of the whole.

This experience explains why the Black Sea occupies a central place in NATO's doctrinal adaptation process and why the Ankara Summit must be interpreted in the context of the transformations taking place in this region.

3.6. The Background to the NATO Summit in Ankara

An analysis of the developments outlined in this chapter leads to the conclusion that the NATO Summit in Ankara does not appear to be a reaction to a single event, but rather an institutional response to the accumulation of structural transformations in the maritime strategic environment. The convergence of geopolitical competition, the vulnerability of critical infrastructure, the technological revolution and economic interdependence has created the conditions for a redefinition of the Alliance's priorities.

From this perspective, Ankara 2026 marks the moment when NATO recognises, at a political and strategic level, that maritime security can no longer be treated as a sectoral domain of collective defence. It is becoming one of the pillars of the Euro-Atlantic order, as the stability of the maritime domain underpins the functioning of all other components of contemporary security.

An understanding of these premises is essential for analysing the summit itself, as it allows the decisions adopted to be interpreted not as isolated measures, but as an expression of a profound conceptual transformation in NATO's strategic architecture.

Chapter 4

The Conceptual Architecture of the Maritime Strategic Ecosystem

4.1. Justification for the use of the concept of the Maritime Strategic Ecosystem (MSE)

The introduction of the concept of **the Maritime Strategic Ecosystem** is not merely a matter of terminology, but the result of a critical analysis of the limitations of the concepts used in the specialist literature to describe contemporary maritime security. The rapid transformations of the past two decades demonstrate that the maritime domain can no longer be satisfactorily explained by models centred exclusively on naval power, governance, maritime security or critical infrastructure analysed in isolation. The increasing interdependence between state and non-state actors, the

integration of digital technologies and artificial intelligence, the global economy's dependence on maritime corridors, and the vulnerability of subsea infrastructure necessitate the use of a framework capable of simultaneously capturing the relationships between all these components.

In the established literature, the term '**system**' is frequently used to describe sets of elements linked by functional relationships. Although this concept highlights the existence of interdependencies, it generally presupposes a relatively stable and delimited structure, geared towards achieving defined objectives. Systems are usually analysed in terms of their internal components and operating rules, without paying sufficient attention to the ongoing processes of adaptation, emergence and co-evolution of the actors involved.

The concept of '**architecture**', which is used extensively in NATO and European Union documents, describes the way in which institutions, capabilities and cooperation mechanisms are organised. It captures the structural and institutional dimension of security very well, but does not explain the dynamics of the relationships between actors, infrastructure and technologies, nor the processes through which these relationships evolve over time.

The notion of a '**network**' emphasises connectivity and flows between actors, but does not sufficiently capture the influence of the strategic environment or the adaptive nature of interactions. Similarly, the terms '**maritime domain**' or '**maritime environment**' define the scope of analysis, but do not provide a conceptual model to explain how its components generate collective behaviours and systemic transformations.

By comparison, the concept of an **ecosystem** offers a more comprehensive analytical perspective. In contemporary science, an ecosystem refers to a set of actors, resources, infrastructures and processes in a relationship of dynamic interdependence, in which a change to one component affects the whole system. The concept is already well-established in fields such as the digital economy (*innovation ecosystems*), technology governance (*digital ecosystems*), cybersecurity (*cybersecurity ecosystems*) and studies on organisational resilience.

The application of this concept to the field of maritime security is justified by the current characteristics of the strategic environment. The contemporary maritime domain operates through the continuous interaction between states, international organisations, economic operators, energy infrastructure, submarine cables, autonomous systems, digital platforms, legal norms and mechanisms for co-. None of these components can be analysed in isolation without losing sight of the effects they have on the whole.

The concept of **the Strategic Maritime Ecosystem** thus enables us to move beyond sectoral approaches and provides a framework for analysis capable of simultaneously capturing the structural, functional and adaptive relationships between the components of maritime security. Unlike a system, an ecosystem does not presuppose a permanent equilibrium, but rather accepts the existence of continuous transformation, adaptation and the emergence of new properties resulting from the interaction of actors. Unlike an architecture, an ecosystem describes not only institutional organisation but also the processes through which it evolves under the influence of strategic, technological and legal factors.

From this perspective, the choice of the concept of **the Strategic Maritime Ecosystem** is justified both theoretically and methodologically. It provides the conceptual framework necessary for the development of the new concepts introduced in this research – Maritime Strategic Gravity, Maritime Strategic Convergence, Maritime Strategic Resilience, Maritime Strategic Elasticity and Maritime Cognitive Superiority – and enables their integration into a unified explanatory architecture, operationalised through the Maritime Strategic Convergence Framework and the Integrated Maritime Security Architecture.

Table – Justification for the choice of the concept of ‘Maritime Strategic Ecosystem’

Concept used in the literature	What it explains	Main limitation	Reason for preferring the concept of the Strategic Maritime Ecosystem
Sea Power	Naval power and control of the seas	Military focus	Does not integrate the legal, economic and technological dimensions
Maritime Strategy	Strategic use of the sea	Operational focus	Does not explain systemic interdependencies
Maritime Security	Security threats and responses	A very broad and descriptive concept	Does not provide an integrative analytical framework
Maritime Governance	Institutions and cooperation	Normative and institutional focus	Does not capture adaptive and emergent processes
Maritime Architecture	Organisation of Capabilities	Predominantly structural	Describes the structure, not the dynamics of the system
Maritime Network	Connectivity of actors	Focus on relationships	Does not capture processes of adaptation and co-evolution
Maritime Strategic Ecosystem (<i>this study</i>)	Relationships between stakeholders, infrastructure, norms, technologies and strategic processes	Requires further empirical validation	Integrates structural, functional and adaptive dimensions into a single unit of analysis

Figure 2.
Architecture of the Maritime Strategic Ecosystem (MSE)



Note: The MSE operates as an open, dynamic and adaptive system in continuous interaction with the external environment (geopolitical, technological, economic, climatic and social context), generating strategic effects at the regional, euro-atlantic and global levels.

4.2. Conceptual justification and terminological delineation of the concepts developed within the Maritime Strategic Ecosystem

Defining a new fundamental unit of analysis, represented in this research by **the Maritime Strategic Ecosystem**, involves not only identifying the systemic relationships that characterise the contemporary maritime environment, but also developing conceptual tools capable of describing the specific processes taking place within this ecosystem. From this perspective, the concepts introduced in this study do not aim to replace the established terminology in the specialist literature, but rather to supplement it by developing concepts designed to explain phenomena that are inadequately captured by existing models.

The comparative analysis carried out in the previous chapter highlighted the fact that both classical and contemporary literature employ established concepts such as **Sea Power, Maritime Strategy, Maritime Security, Maritime Governance, Maritime Domain Awareness, Centre of Gravity, Resilience, Integrated Security** and **Multi-Domain Operations**, each of which explains a particular dimension of the maritime domain. However, the rapid transformations brought about by digitalisation, artificial intelligence, the vulnerability of critical maritime infrastructure and the convergence of the legal, military, economic and information domains call for analytical tools capable of capturing the relationships between these dimensions and the systemic effects produced by their interaction.

In this context, the new concepts proposed in this research are developed on the basis of two fundamental methodological criteria. The first consists of identifying the explanatory limits of existing concepts in relation to the subject of the research. The second aims to formulate notions that enable the analysis of the relationships between the components of the Strategic Maritime Ecosystem and the assessment of the effects produced on the security architecture.

From this perspective, each concept introduced addresses a distinct analytical question.

The Strategic Maritime Ecosystem explains the fundamental unit of analysis and describes the overall set of relationships between actors, infrastructure, legal norms, technologies and strategic processes.

The Maritime Strategic Centre of Gravity explains why certain maritime spaces, infrastructures or logistical hubs simultaneously concentrate legal, economic, energy, technological and military interests and generate systemic effects across the entire ecosystem.

Maritime Strategic Convergence explains how the interaction between these dimensions produces emergent effects that cannot be deduced through the isolated analysis of each domain.

Maritime Strategic Resilience describes the ecosystem's capacity to maintain its essential functions under conditions of major disruption.

Maritime Strategic Elasticity explains the processes through which the ecosystem not only withstands external shocks, but also adapts its structure and modifies its mode of operation to respond to a strategic environment undergoing continuous transformation.

Maritime Cognitive Superiority highlights an actor's ability to integrate available information, anticipate developments in the strategic environment and generate decision-making advantages within the ecosystem.

Consequently, these concepts do not describe independent components, but rather complementary dimensions of the same explanatory model, each contributing to an understanding of how the Maritime Strategic Ecosystem functions.

Matrix – Conceptual justification of the notions developed within the Maritime Strategic Ecosystem

Proposed concept	Established concept(s)	What the existing literature explains	Identified limitation	Added value of the new concept
Strategic Maritime Ecosystem	System, Architecture, Network	Organisation and functioning of the components	Fails to capture the adaptive nature and emerging relationships	Introduces a new systemic unit of analysis
Strategic Maritime Centre of Gravity	Centres of Gravity, Chokepoints	Decisive elements or strategic spaces	Focus on the actor or on the geographical position	Explains the nodes where legal, economic, energy, information and military interests converge simultaneously
Maritime Strategic Convergence	Integrated Security, Multi-Domain Operations	Cooperation between domains	Does not explain the emergent effects produced by interdependence	Analyses the processes of convergence and the transformation of the ecosystem
Strategic Maritime Resilience	Resilience	Capacity for resistance and recovery	Limited focus on systemic adaptation	Integrates functional continuity at the ecosystem level
Strategic Maritime Elasticity	Robustness, Adaptation	Resilience or ad hoc adaptation	Does not explain changes in the system's structure	Highlights the transformation of the ecosystem under the influence of strategic shocks
Maritime Cognitive Superiority	Maritime Domain Awareness, Information Superiority	Situational awareness and information superiority	Predominantly information-based focus	Introduces the dimension of anticipation and strategic decision-making advantage

4.2.1 Conceptual Justification of the Maritime Strategic Centre of Gravity (MSCoG)

The concept of **the Centre of Gravity** occupies a central place in classical military theory and contemporary operational doctrine. Originally formulated by Carl von Clausewitz and subsequently developed in NATO doctrine and allied operational planning, it refers to that principal source of power, will or capability of an actor, the disruption of which results in a significant reduction in the adversary's potential. In this sense, the centre of gravity is analysed in relation to an individual actor and the objectives of a military conflict.

In the maritime field, the literature frequently uses concepts such as *chokepoints*, *strategic maritime corridors*, *sea lines of communication* or *critical maritime infrastructure* to describe the importance of certain maritime areas. These concepts explain the geographical, economic or military significance of areas such as the Strait of Hormuz, the Bosphorus, the Suez Canal or the Black Sea, but each of them analyses only one or a few dimensions of strategic importance.

However, changes in the maritime security environment demonstrate that the strategic value of an area can no longer be explained solely by its geographical position, control of maritime routes or the presence of military capabilities. At present, the importance of a maritime area stems from the overlap and interdependence of legal, economic, energy, technological, informational and military interests, the convergence of which has an impact on the entire strategic ecosystem.

Building on this observation, this study introduces the concept of **the Maritime Strategic Centre of Gravity (MSCoG)**. Unlike the Clausewitzian interpretation, used to identify an actor's decisive point in a conflict, the MSCoG designates a **strategic node within the Maritime**

Strategic Ecosystem, characterised by the simultaneous concentration of critical interests and functions, capable of generating systemic effects on the entire security architecture.

This redefinition shifts the analytical focus from an actor's vulnerability to an analysis of the relationships between the ecosystem's components. Consequently, an MSCG may be represented by a maritime area, critical infrastructure, an energy corridor or a functional entity whose disruption produces cascading effects across the legal, economic, energy, information and military dimensions.

The concept thus allows the strategic importance to be assessed not only in terms of geographical location, but also in terms of the intensity of the relationships that a particular node generates within the Strategic Maritime Ecosystem. From this perspective, the Bosphorus, the Strait of Hormuz, the Suez Canal or the Black Sea can be analysed not merely as transit points or centres of operational gravity, but as genuine Maritime Strategic Centres of Gravity, whose functioning simultaneously influences regional and global security.

Matrix – Conceptual justification of the Maritime Strategic Centre of Gravity (MSCoG)

An established concept	What it explains	Limit	Contribution of this study
Centre of Gravity (Clausewitz)	The decisive element of an actor's power	Focused on the actor and the conflict	Analysis of the strategic nodes of the ecosystem
Chokepoints	Geographical significance	Predominantly geographical focus	Integration of the legal, energy, economic and technological dimensions
Sea Lines of Communication	Maritime flows	Does not explain systemic effects	Analysis of the relationships between flows and the ecosystem
Critical Maritime Infrastructure	Infrastructure vulnerability	Sectoral analysis	Integration of infrastructure into the strategic architecture

4.2.2. Conceptual justification of Maritime Strategic Convergence (MSC)

The concept of convergence occupies an important place in contemporary literature on security and strategic studies, being used to describe the processes through which distinct actors, capabilities or domains cooperate to achieve common objectives. In the military sphere, this trend is reflected in the development of the concepts of **joint operations**, **multi-domain operations**, **integrated deterrence** and **the comprehensive approach**, all of which share the idea of coordinating resources and synchronising actions.

In the field of maritime security, Geoffrey Till, Christian Bueger and Sam Bateman have highlighted the multidimensional nature of the maritime environment and the need for cooperation between civilian and military institutions, between national and international actors, and across different areas of public policy. Similarly, NATO and European Union documents promote the integration of the land, air, maritime, cyber and space domains, as well as the development of common security architectures.

However, the existing literature treats convergence predominantly as a **process of coordination or functional integration**. The emphasis is placed on mechanisms for cooperation, interoperability and the synchronisation of actions, without sufficiently explaining how the continuous interaction between these components generates new properties at the level of the entire strategic system.

Within the Maritime Strategic Ecosystem, convergence is not merely cooperation between institutions or the integration of capabilities. It refers to the process by which the relationships between the legal, military, economic, technological, energy and information dimensions produce emergent effects that alter the functioning of the entire ecosystem.

From this perspective, this study introduces the concept of **Maritime Strategic Convergence (MSC)**, defined as the dynamic process through which the simultaneous interaction

between actors, infrastructure, technologies, legal norms and strategic processes generates new forms of organisation, adaptation and influence within the Maritime Strategic Ecosystem.

Unlike established concepts such as integration or cooperation, Maritime Strategic Convergence does not merely describe the existence of relationships between components, but explains how these relationships produce cumulative effects and transform the security architecture. Thus, changes in a single domain – for example, the development of artificial intelligence, the protection of subsea infrastructure or changes to the international legal framework – generate successive effects on all other components of the ecosystem.

This approach allows maritime security to be interpreted as an evolutionary process, characterised by continuous adaptation and interdependence, going beyond explanations based solely on institutional cooperation or operational coordination. In this context, the NATO Summit in Ankara illustrates not only the integration of security policies, but also the emergence of a genuine strategic convergence between the legal, technological, energy, military and information dimensions of the Euro-Atlantic area.

Matrix – Justification of the Concept of Maritime Strategic Convergence

An established concept	What it explains	Limit	Contribution of this study
Joint Operations	Coordination of forces	Operational focus	Analyses the systemic relationships between all dimensions of the ecosystem
Multi-domain operations	Integration of operational domains	Predominantly military	Includes legal, economic, energy and technological dimensions
Comprehensive Approach	Institutional cooperation	Focus on coordination mechanisms	Explains the emergent effects produced by interdependence
Integrated Security	Policy integration	Does not explain the transformation of the ecosystem	Analyses the convergence processes that alter the strategic architecture
Maritime Strategic Convergence (MSC)	The process of convergence between all components of the Maritime Strategic Ecosystem	—	Explains how interdependence brings about structural transformations and systemic effects

Methodological observation

If the Maritime Strategic Ecosystem represents the fundamental unit of analysis, and the Maritime Strategic Centre of Gravity identifies its critical nodes, Maritime Strategic Convergence explains the mechanism by which the interaction between components generates the transformation of the ecosystem.

4.2.3. Conceptual justification of Maritime Strategic Elasticity (MSEL)

The concept of **elasticity** is well-established in fields such as physics, economics, organisational theory and the analysis of complex systems, where it describes a system's ability to alter its structure or behaviour in response to changes in the external environment, without losing its functional identity. In security studies and the literature on maritime environments, however, the use of this concept is limited, with research focusing primarily on the notion of **resilience**, associated with the capacity to withstand and recover from disruptions.

In NATO and European Union documents, as well as in the literature on critical infrastructure protection, the emphasis is placed on strengthening resilience by developing mechanisms capable of reducing vulnerabilities and ensuring the continuity of essential functions.

This approach is indispensable in crisis management, but it primarily describes a system's ability to absorb shocks and return to a functional state.

However, an analysis of recent transformations in the maritime strategic environment highlights that, in many situations, a return to the previous configuration is no longer possible or even necessary. The introduction of autonomous technologies, the development of artificial intelligence, changes to global logistics chains, the emergence of new forms of hybrid conflict and the transformation of institutional architectures are generating permanent structural changes. Under these circumstances, the strategic advantage no longer lies exclusively with actors capable of withstanding disruptions, but with those who can rapidly adapt their structure, processes and operating mechanisms without losing their strategic coherence.

Building on this observation, this study introduces the concept of **Maritime Strategic Elasticity (Maritime Strategic Elasticity – MSEL)**, defined as **the property of the Maritime Strategic Ecosystem to modify its structure, internal relationships and operational mechanisms in order to respond to transformations in the strategic environment, whilst maintaining its capacity to fulfil its fundamental objectives.**

Unlike resilience, which aims to preserve functionality under conditions of disruption, elasticity describes the ecosystem's **capacity for controlled transformation**. It does not entail a return to the initial configuration, but rather continuous adaptation to new strategic conditions through the reorganisation of relationships between actors, infrastructure, technologies, legal norms and decision-making processes.

Within the Strategic Maritime Ecosystem, elasticity manifests itself through the integration of new technologies, the development of innovative forms of cooperation, the adaptation of institutional architectures, the modification of operational doctrines and the redefinition of strategic priorities. The NATO Summit in Ankara illustrates this evolution through its focus on autonomous systems, artificial intelligence, the protection of undersea infrastructure, multi-domain integration and the strengthening of interoperability – elements that reflect not only the Alliance's resilience but also its ability to transform its own operating model.

Consequently, **Strategic Maritime Elasticity** complements the concept of Strategic Maritime Resilience, without replacing it. The two concepts describe complementary processes: resilience explains the maintenance of functionality under conditions of disruption, whilst elasticity explains the transformation of the ecosystem in response to structural changes in the strategic environment.

Matrix – Justification of the concept of Strategic Maritime Resilience

Established concept	What it explains	Limit	Contribution of this study
Resilience	Capacity for resistance and recovery	Focus on continuity	Introduces the dimension of controlled transformation
Adaptation	Adapting to change	Explains specific processes	Analyses changes across the entire strategic ecosystem
Organisational Agility	Organisational flexibility	Organisational level	Extends the analysis to the maritime architecture level
Transformational Change	Structural change	Not integrated into a maritime strategic model	Links transformation to the functioning of the ecosystem
Maritime Strategic Resilience (MSEL)	The capacity of the Maritime Strategic Ecosystem to transform itself without losing its fundamental strategic functions	—	Explains the ecosystem's continuous structural adaptation in response to changes in the strategic environment

anticipating the effects of changes to these components, and formulating decisions capable of influencing the evolution of the entire strategic architecture.

Following this logic, strategic advantage is determined not only by access to information, but also by the ability of actors to rapidly interpret changes occurring in Maritime Centres of Strategic Gravity, to assess processes of Maritime Strategic Convergence, to evaluate the level of Maritime Strategic Resilience and Elasticity, and to adapt political, legal and military decisions accordingly.

Applying this conceptual framework to the NATO Summit in Ankara confirms the relevance of this concept. The emphasis on artificial intelligence, information sharing, multi-domain integration and threat anticipation reflects a doctrinal orientation in which strategic advantage is increasingly associated with the alliance's collective cognitive capacity and less with traditional military superiority.

Consequently, **Maritime Cognitive Superiority** represents the integrating component of the conceptual architecture developed in this study. It harnesses the information generated by the entire Maritime Strategic Ecosystem and transforms systemic knowledge into a strategic and decision-making advantage.

Matrix – Justification of the concept of Maritime Cognitive Superiority

An established concept	What it explains	Limitations	Contribution of this study
Maritime Domain Awareness (MDA)	Maritime situational awareness	Focus on monitoring and information gathering	Introduces the anticipation of ecosystem developments
Information Superiority	Information superiority	Focus on volume and access to information	Transforms information into a strategic advantage
Decision Superiority	Decision-making superiority	Decision-centred	Integrates a systemic analysis of the maritime ecosystem
Cognitive Warfare	Influencing cognitive processes	Focus on conflict and influence	Extends the analysis to anticipation, adaptation and strategic governance
Maritime Cognitive Superiority (MCS)	The ability to understand, anticipate and influence the evolution of the Maritime Strategic Ecosystem through the integration of multidimensional knowledge	—	Transforms systemic knowledge into a strategic and decision-making advantage

4.2.5. The relationships between the concepts developed within the Maritime Strategic Ecosystem

The concepts developed in this research are not independent notions, but interdependent components of a unified conceptual framework. **The Strategic Maritime Ecosystem** constitutes the fundamental unit of analysis. Within it, **the Strategic Maritime Centres of Gravity** identify the nodes where strategic interests are concentrated. **Maritime Strategic Convergence** explains the processes through which the interaction between components generates systemic transformations. **Maritime Strategic Resilience** describes the ecosystem's capacity to maintain its essential functions under conditions of disruption, whilst **Maritime Strategic Elasticity** highlights its capacity to adapt and transform without losing its strategic coherence. In turn, **Maritime Cognitive**

Superiority harnesses the information generated by the entire ecosystem and enables the anticipation of developments, the formulation of decisions and the attainment of strategic advantage.

Together, these concepts form an integrated conceptual architecture designed to analyse contemporary maritime security from a systemic, interdisciplinary and forward-looking perspective. In this form, they do not seek to replace established concepts in the specialist literature, but rather to complement and expand upon them by developing an explanatory framework adapted to the complexity of the 21st-century strategic environment.

4.3. The need for a new conceptual framework for the analysis of contemporary maritime security

The doctrinal analysis carried out in the previous chapter highlights the fact that the evolution of maritime thought has not taken place through the abandonment of established theories, but through the progressive expansion of the scope of analysis. From the theory of sea power formulated by Alfred Thayer Mahan and the principles of maritime strategy developed by Julian Corbett, to contemporary approaches to maritime security, governance and hybrid threats, each generation of authors has responded to the challenges specific to the historical context in which they developed their own explanatory model.

This evolution demonstrates the robustness of the specialist literature and its capacity to successively integrate new dimensions of the maritime domain. At the same time, however, the comparative analysis has highlighted the existence of an explanatory gap that remains insufficiently addressed. None of the established theories simultaneously addresses the interdependencies between international law, critical subsea infrastructure, the maritime economy, energy security, emerging technologies, artificial intelligence and military capabilities. Each of these dimensions is rigorously analysed within its own disciplinary field, but the relationships between them are rarely made the primary focus of research.

This observation is not intended as a criticism of the existing literature. On the contrary, it confirms that each doctrinal model rigorously explains the phenomenon for which it was designed. The problem lies not in the inadequacy of these theories, but in the profound transformation of the strategic environment. At present, maritime security is influenced simultaneously by legal, economic, technological, energy, information and military factors, and the effects produced by their interaction go beyond the scope of sector-specific explanations.

Over the past two decades, the sea has ceased to be merely the arena in which states project their naval power. It has become the critical infrastructure of globalisation. Submarine cables carry the majority of the world's digital communications; offshore pipelines and maritime terminals underpin energy security; ports serve as essential logistical hubs for international trade; and digital platforms enable the real-time coordination of commercial and military activities. Under these circumstances, damage to a single element can trigger a chain reaction affecting the entire system.

Attacks on submarine cables, the sabotage of offshore energy infrastructure, the disruption of navigation through interference with GNSS systems, the use of artificial intelligence in military decision-making, and the development of autonomous systems demonstrate that the boundaries between traditional domains of security have become increasingly permeable. Events which, in the past, would have been analysed separately — a naval incident, a cyberattack, a disruption to energy flows or a disruption to communications — now produce cumulative effects and must be understood as manifestations of the same strategic system.

In this context, a fundamental shift is taking place in the focus of research. Whilst classical literature was oriented towards the analysis of actors, fleets, naval doctrines or individual threats, contemporary research is called upon to explain how the relationships between these components generate security, vulnerability, adaptation or instability. In other words, the fundamental unit of analysis is no longer represented exclusively by the components of the system, but by the ecosystem formed through their interdependence.

In this study, this ecosystem is defined as **the Strategic Maritime Ecosystem**, understood as the set of functional relationships between the legal, military, economic, energy, technological, informational and institutional dimensions that shape the security of the maritime domain. The ecosystem is neither an organisational structure nor a new institution. It constitutes a conceptual tool designed for the systemic analysis of maritime security and describes how each of these dimensions influences the functioning of the entire system.

From this perspective, maritime security can no longer be explained solely in terms of control of the seas, naval superiority or military response capability. It emerges as an **emergent property** of the interaction between the components of the strategic maritime ecosystem. The stability or vulnerability of the system depends not only on the performance of each component analysed in isolation, but on the intensity and quality of the relationships between them.

Figure 3. Architecture of the Strategic Maritime Ecosystem.

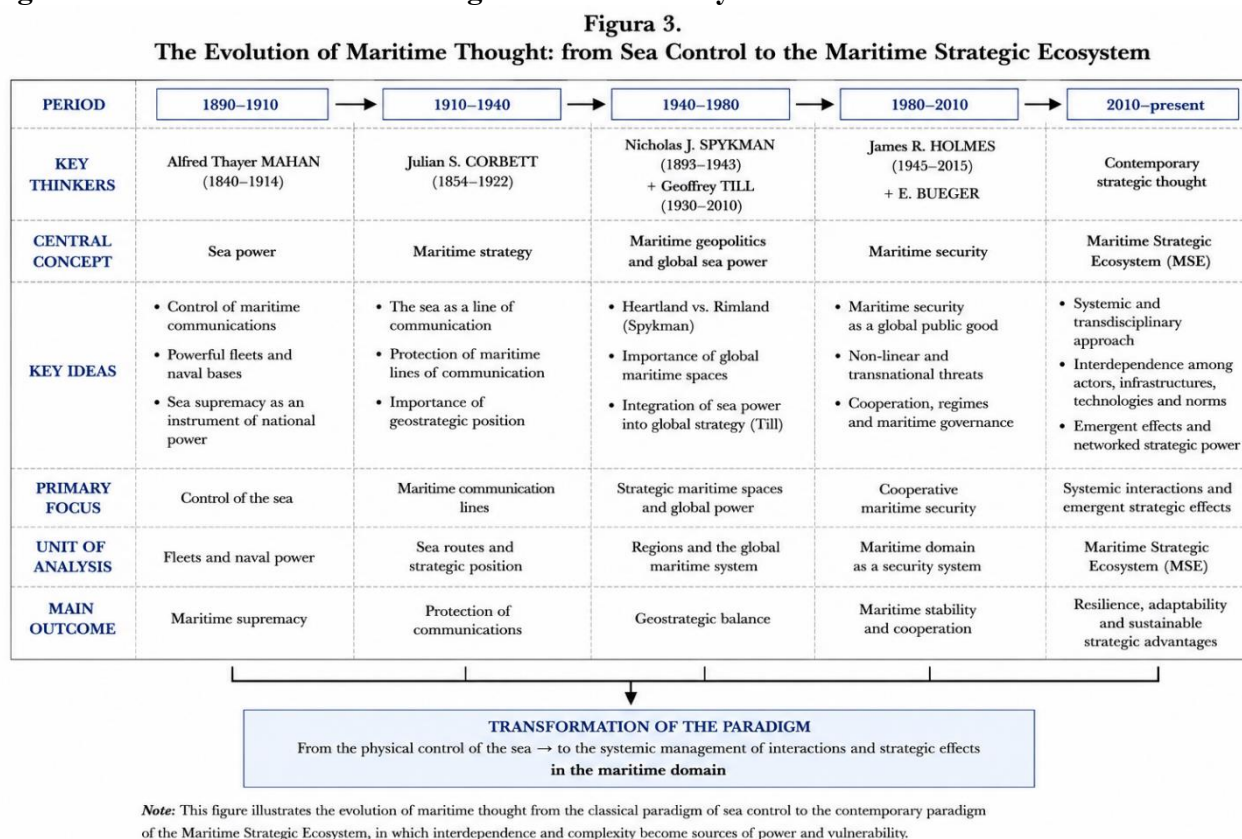


Figure 3 summarises the conceptual architecture proposed in this study. Unlike the doctrinal models analysed previously, in which the emphasis is placed on a single dominant dimension (power, strategy, security, governance or threats), the proposed model treats maritime security as the result of the ongoing interaction between eight fundamental dimensions. From this perspective, the maritime strategic ecosystem represents the integrated unit of analysis for this research and the foundation for the development of the concepts presented in the following chapter.

The figure represents the starting point for the original contribution developed in the following chapters. It highlights the fact that international law, critical infrastructure, the maritime economy, energy security, emerging technologies, military capabilities and governance mechanisms can no longer be analysed in isolation, but must be understood as interconnected elements of the same strategic system. In this model, each component exerts influence on the others, and the resulting security is an expression of the coherent functioning of the entire ecosystem.

Recognising the Strategic Maritime Ecosystem as a fundamental unit of analysis lays the groundwork for the development of a new conceptual architecture. The concepts presented in the following sections are not introduced simultaneously, nor do they constitute mere terminological exercises. They appear successively, in response to phenomena observed during the research, and describe different dimensions of the ecosystem's functioning. Maritime Strategic Gravity explains the mechanisms by which certain maritime spaces concentrate strategic interests and resources; Maritime Strategic Convergence describes the interdependence between the system's dimensions; Maritime Cognitive Superiority highlights the role of information and artificial intelligence in the decision-making process; and Maritime Strategic Resilience and Elasticity explain how the ecosystem withstands and adapts to major disruptions.

Consequently, Chapter 3 does not seek to construct an alternative theory of maritime security, but rather to develop an integrative conceptual framework capable of bringing together, within a unified perspective, the contributions of international law, strategic studies, maritime economics, governance and emerging technologies. This framework will form the methodological foundation subsequently used to analyse the NATO Summit in Ankara and to assess the transformation of the Euro-Atlantic security architecture. The components of the proposed conceptual architecture are set out in turn below.

4.4. The Strategic Maritime Centre of Gravity – the concentration of strategic nodes, functions and interests within the Strategic Maritime Ecosystem

Once the Strategic Maritime Ecosystem has been defined as the fundamental unit of analysis, it becomes necessary to explain a phenomenon observable in all maritime regions of strategic importance: the tendency of certain areas to simultaneously concentrate military, economic, legal, energy and technological interests. The existing literature describes separately the importance of geographical position, the value of trade routes, the relevance of critical infrastructure or the role of naval capabilities, but does not offer an integrated concept to explain why these elements tend to accumulate in the same areas and why certain maritime spaces acquire a strategic importance disproportionate to their geographical size.

An analysis of recent developments shows that this concentration is not coincidental. The Black Sea, the Eastern Mediterranean, the Bosphorus Strait, the Strait of Hormuz, Bab el-Mandeb, the Suez Canal and the Taiwan Strait are examples of areas where critical infrastructure, trade corridors, energy interests, military presence, geopolitical competition and complex legal norms converge. The importance of these regions cannot be explained by a single factor. It stems from the accumulation and simultaneous interaction of multiple factors that generate an increased capacity to attract strategic interests.

To describe this phenomenon, this study proposes the concept of **the Maritime Strategic Centre of Gravity (MSCoG)**

The Maritime Strategic Centre of Gravity (MSCoG) can be defined as **the capacity of a maritime space to attract, concentrate and retain multiple strategic interests, as a result of the interaction between geographical position, critical infrastructure, trade flows, energy resources, emerging technologies, the legal framework and the presence of state and non-state actors.**

The concept should not be confused with geographical importance in the classical sense, nor with the notion of sea power developed by Alfred Thayer Mahan. Mahan explains how control of the sea contributes to the assertion of a state's power. Maritime Strategic Gravity does not describe the power of an actor, but rather the characteristics of a space. The focus thus shifts from the state to the strategic environment in which it operates.

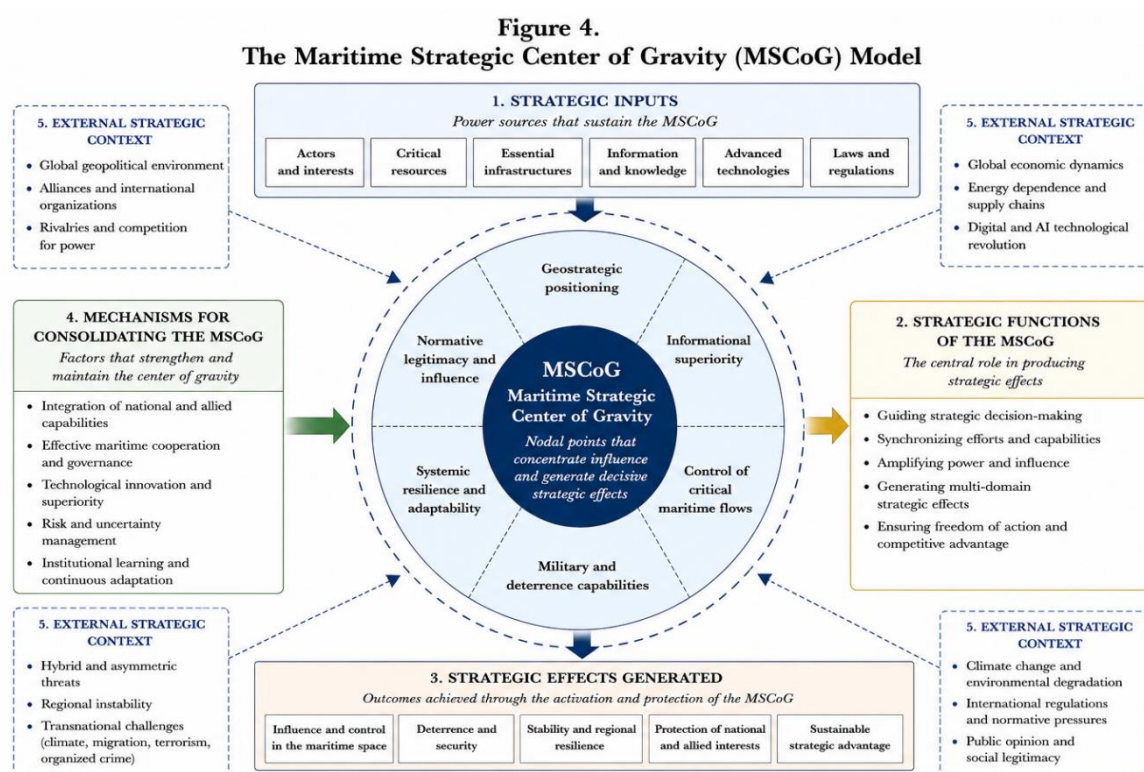
Equally, the concept differs from *the famous 'centre of gravity'* formulated by Carl von Clausewitz. The centre of gravity refers to that element whose neutralisation brings about the collapse of the adversary in a conflict. The Maritime Strategic Centre of Gravity (MSCoG) does not

seek to identify a vulnerable point, nor is it exclusively operational in nature. It expresses the intensity with which a maritime space concentrates strategic values and generates competition between actors.

The differences are also evident in relation to the classical geopolitical theories of Halford Mackinder and Nicholas Spykman. The ‘Heartland’ and ‘Rimland’ theories explain the global distribution of power in terms of geographical position and control over continental or coastal regions. In contrast, Maritime Strategic Gravity is not determined exclusively by geography. Geographical position is merely one component of a system in which submarine digital infrastructure, energy terminals, autonomous technologies, the applicable legal regime and the capacity for information integration influence the strategic value of the maritime space to an equal extent.

This distinction is crucial as it reflects the transformations that have taken place in the contemporary strategic environment. In the past, control of a strait or a maritime route was determined almost exclusively by geographical and military considerations. Today, the strategic value of the same space is amplified by the existence of submarine communications cables, offshore pipelines, smart port infrastructure, autonomous surveillance systems and digital networks that underpin the functioning of the global economy. Strategic significance thus arises from the convergence of these elements rather than from their individual importance.

Figure 4. Figure 4. The Maritime Strategic Centre of Gravity (MSCoG) model



The model highlights that geographical position, critical infrastructure, energy resources, the maritime economy, emerging technologies, military capabilities and the legal framework do not operate independently, but form a dynamic set of interdependencies. The greater the convergence of these components, the greater the strategic significance of the area under analysis and, by extension, the interest of regional and global actors in controlling, protecting or influencing it.

An analysis of the Black Sea confirms the explanatory value of this concept. The region is home to a concentration of trade corridors, energy infrastructure, undersea communications, the

strategic interests of both NATO and the Russian Federation, complex legal regimes and a high level of geopolitical competition. Its importance does not stem from any single characteristic, but from the overlap of all these dimensions. The Eastern Mediterranean, the Red Sea, the Strait of Hormuz and the Taiwan Strait can be interpreted in the same way, each representing an area of high strategic gravity, although the specific reasons for this gravity differ.

The concept of the Maritime Strategic Centre of Gravity (MSCoG) also has an important forward-looking dimension. It enables the early identification of maritime areas likely to become centres of strategic competition before tensions manifest themselves openly. From this perspective, strategic gravity can serve as a useful tool for doctrinal analysis, strategic planning, risk assessment and the development of conflict prevention policies.

Consequently, the Maritime Strategic Centre of Gravity (MSCoG) is not only the first concept of the architecture developed in this research, but also the starting point for a new, e way of interpreting maritime security. Whilst the classical literature explains why states seek to control the sea, the present concept explains why certain maritime spaces naturally concentrate strategic competition and become critical nodes of the maritime strategic ecosystem. It is precisely this concentration that gives rise to the next stage of the analysis: **Maritime Strategic Convergence**, through which the various dimensions of the ecosystem cease to function in isolation and begin to produce systemic effects.

4.5. Maritime Strategic Convergence – the systemic mechanism of maritime interdependence

Identifying areas characterised by high strategic gravity represents only the first level of analysis. In reality, the strategic value of a maritime area does not stem exclusively from the concentration of infrastructure, resources or actors, but above all from the relationships that develop between them. Strategic gravity explains the process of the accumulation of interests, but it does not explain the mechanisms through which these interests begin to interact, influence one another and generate effects that exceed the sum of their individual parts.

Analysis of the contemporary strategic environment demonstrates that this interaction is becoming increasingly intense. Legal decisions influence energy security, the development of critical infrastructure alters the regional military balance, digital technologies transform decision-making processes, and the disruption of a single element produces simultaneous consequences for trade, communications, defence and regional stability. Under such circumstances, analysing each component in isolation is insufficient for understanding how the whole system functions.

The specialist literature acknowledges the existence of these relationships, but generally addresses them from the perspective of each individual discipline. International law analyses the legal regime governing maritime spaces, strategic studies examine competition between actors, maritime economics focuses on the functioning of logistics chains, and research on cyber security concentrates on digital infrastructure. What is missing is a concept capable of describing the process by which all these dimensions operate simultaneously and have reciprocal effects.

To describe this phenomenon, this study introduces the concept of **Strategic Maritime Convergence**.

Maritime Strategic Convergence can be defined as **the process by which the legal, military, economic, energy, technological, informational and institutional dimensions of the maritime strategic ecosystem become progressively interdependent, such that a change in one of them has direct or indirect effects on the functioning of the entire system.**

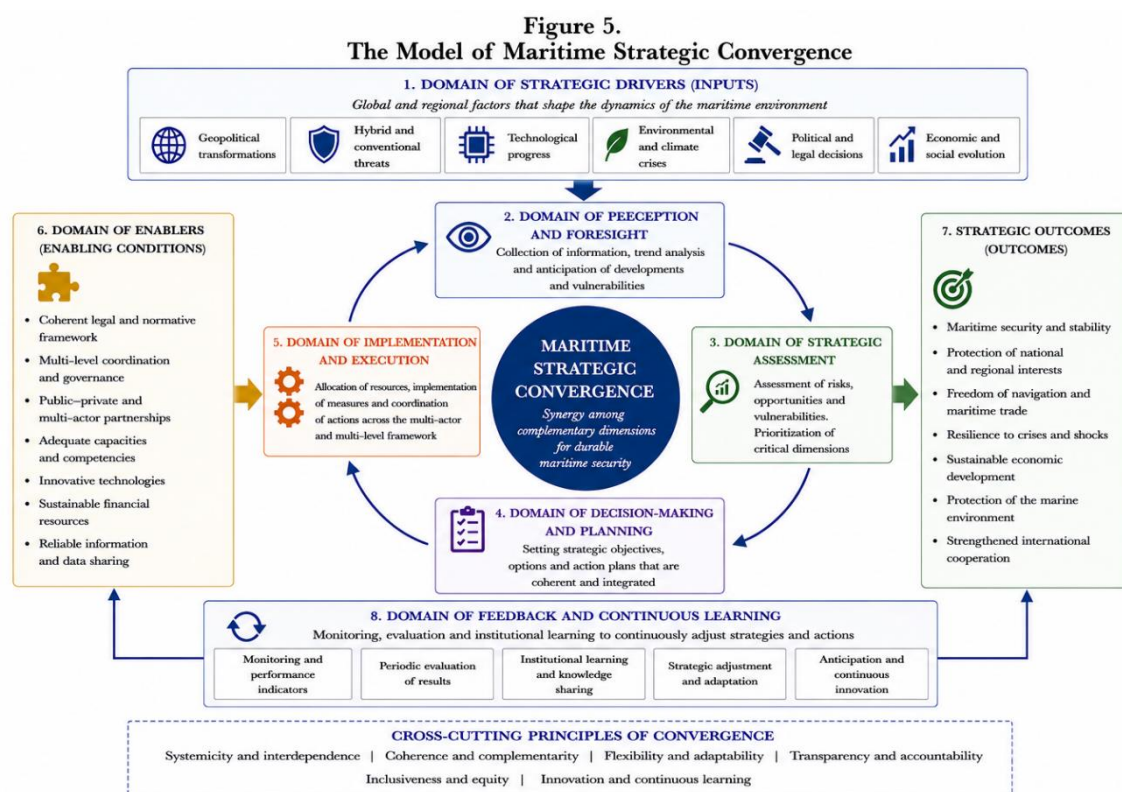
The proposed concept goes beyond traditional interpretations of inter-institutional cooperation or multi-domain coordination. It does not merely describe the existence of relationships between different domains, but explains their transformation into a single system, characterised by continuous feedback, adaptation and mutual influence. From this perspective, convergence represents the functional mechanism of the Maritime Strategic Ecosystem.

The importance of this concept becomes evident when analysing recent events. The sabotage of the Nord Stream pipelines did not merely have energy-related consequences; it also affected European security, international law, NATO strategies, investment in critical infrastructure and policies on the protection of submarine cables. Attacks on commercial shipping in the Red Sea have simultaneously generated economic, logistical, legal and military effects, leading to the reorganisation of maritime routes and the adaptation of global trade strategies. In the Black Sea, the use of maritime drones, the protection of grain export corridors and the strengthening of port infrastructure demonstrate the same interdependence between the legal, military, economic and technological dimensions.

These examples confirm that the contemporary maritime environment functions as a complex system. The vulnerability of one component is rapidly transmitted to the others, and effective solutions can no longer be devised exclusively within a single discipline. International law influences freedom of navigation; this in turn determines trade flows; trade flows affect energy security; and all these elements shape the strategic options available to states and international organisations.

Maritime Strategic Convergence must also be distinguished from established concepts such as *multi-domain operations* or the *whole-of-government* approach. These describe methods of operational or administrative coordination between institutions and fields of activity. The concept proposed in this research operates at a higher level of abstraction. It does not concern itself exclusively with cooperation between actors, but explains how the very structure of the strategic ecosystem generates interdependencies that permanently alter the behaviour of the entire system.

Figure 5. The Model of Maritime Strategic Convergence



Note: The model illustrates a cyclical and convergent process through which external factors are transformed into strategic results by integrating the five functional domains, supported by enabling conditions and sustained by feedback and continuous learning mechanisms.

The figure illustrates that the legal, military, economic, energy, technological and institutional dimensions are not arranged hierarchically, but form a network of reciprocal connections. At the centre of this network lies the Maritime Strategic Ecosystem, and convergence

represents the process through which each component simultaneously influences the functioning of all the others.

An analysis of the diagram highlights that the intensification of convergence produces two major effects. The first is an increase in the system's efficiency through the coordination of actors and the integrated use of available resources. The second is the amplification of systemic vulnerabilities, as the disruption of a single component can generate a cascade of effects across the entire ecosystem. Strategic convergence thus represents both a source of competitive advantage and a risk factor, depending on the system's level of resilience.

From this perspective, Strategic Maritime Convergence becomes the mechanism that explains the shift from a static analysis of components to a dynamic analysis of the relationships between them. It provides the conceptual foundation necessary for understanding how international law, technology, critical infrastructure, the maritime economy and military power influence one another and collectively generate security or vulnerability.

Recognising this mechanism, however, leads to a new research question. If maritime security depends on the intensity of convergence between the components of the ecosystem, through what mechanisms can the system withstand shocks and maintain its functionality in times of crisis? The answer to this question requires the development of the following two complementary concepts within the proposed architecture: **Strategic Maritime Resilience** and **Strategic Maritime Elasticity**, which describe the ecosystem's capacity to absorb, adapt to and overcome the disruptions caused by the contemporary strategic environment.

4.6. Strategic Maritime Resilience and Strategic Maritime Elasticity – two complementary dimensions of the strategic ecosystem's adaptation

An analysis of maritime strategic gravity and convergence demonstrates that contemporary maritime security is the result of a system characterised by multiple and dynamic interdependencies. The greater the convergence between components, the greater both the efficiency of the ecosystem's functioning and the likelihood of the rapid propagation of the effects generated by a local incident. This characteristic raises a fundamental question: through what mechanisms does the strategic maritime ecosystem maintain its functionality when affected by major disruptions?

In contemporary literature, the answer is frequently linked to the concept of resilience. In the fields of critical infrastructure, risk management and strategic studies, resilience refers to a system's ability to absorb shocks and continue to function without losing its essential characteristics. The concept has also been adopted in NATO and European Union documents, becoming one of the pillars of modern security architecture.

In the maritime domain, resilience is used to describe the ability of ports, offshore energy infrastructure, logistics networks, submarine cables and maritime institutions to continue operating in the event of natural or man-made incidents. From this perspective, resilience is an indispensable condition for the continuity of economic, military and institutional activities.

However, an analysis of the strategic maritime ecosystem highlights the fact that resilience, whilst necessary, is not sufficient to explain the system's behaviour in the context of contemporary strategic competition. Numerous disruptions in recent years have not been followed by a simple return to the previous state, but have led to structural transformations in the way the ecosystem functions. The rerouting of trade routes following attacks on maritime transport in the Red Sea, the reorganisation of European energy infrastructure after the sabotage of the Nord Stream pipelines, and the accelerated development of autonomous naval systems in the context of the Black Sea conflict illustrate situations in which the system does not revert to its original configuration, but instead modifies its structure in order to continue functioning.

Building on this observation, this study introduces the concept of **Maritime Strategic Resilience**.

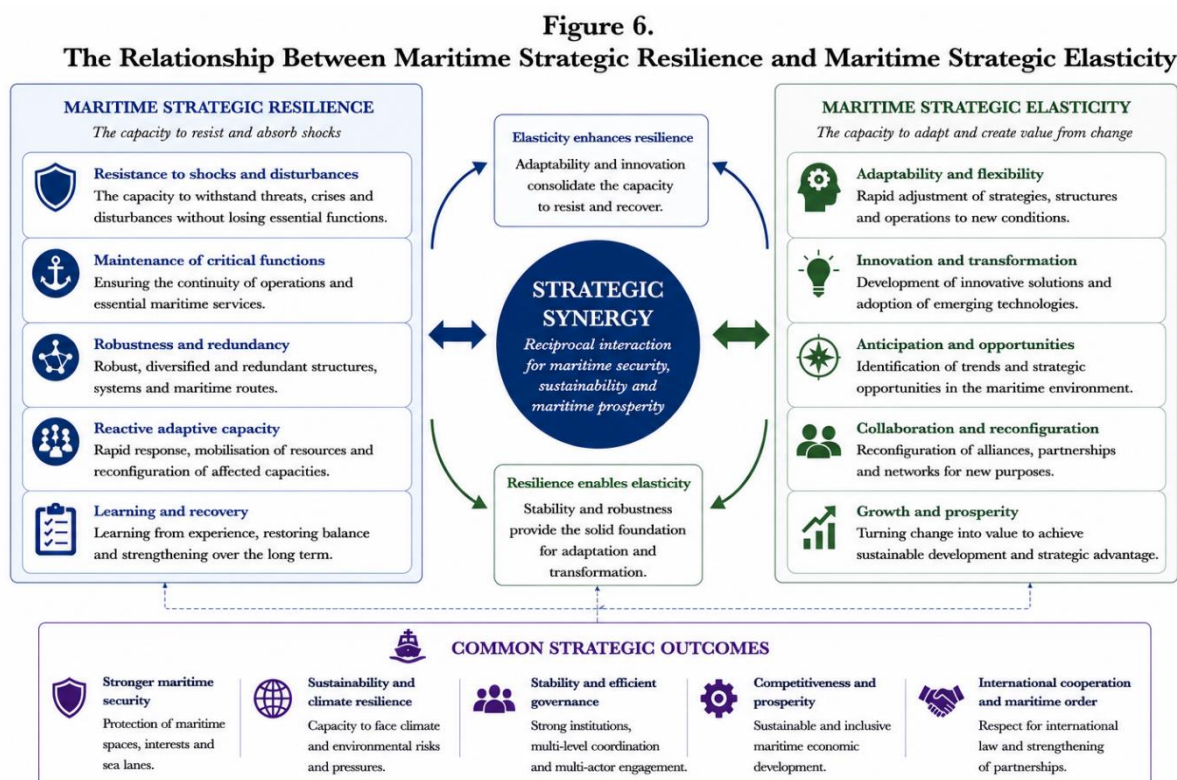
Maritime Strategic Elasticity can be defined as **the capacity of the Maritime Strategic Ecosystem to adapt, reorganise and generate new functional configurations in response to changes in the strategic environment, without losing its operational and institutional coherence.**

The difference between the two concepts is fundamental. Resilience aims to maintain the system's functioning and restore it to an acceptable level of performance following a shock. Elasticity, however, implies the existence of an additional capacity: that of transforming the disruption into a process of adaptation and innovation. Whilst resilience concerns the system's resistance, elasticity concerns its evolution.

This distinction is particularly relevant to contemporary maritime security. In an environment characterised by constant strategic competition, rapid technological change and the emergence of hybrid threats, a return to the previous situation is not always possible, nor is it always desirable. In many situations, the strategic advantage lies with those actors who manage to rapidly adapt their infrastructure, procedures and decision-making mechanisms to the new configuration of the security environment.

The conflict in Ukraine provides numerous examples of this. The temporary blockade of certain ports has led not only to additional protective measures, but also to the development of new maritime corridors, the acceleration of the digitalisation of logistics processes and the diversification of trade routes. The strategic maritime ecosystem has not reverted to its previous form, but has adapted its structure to respond to the new conditions. This is an expression of strategic elasticity, not merely resilience.

Figure 6. Maritime Strategic Resilience versus Maritime Strategic Elasticity



Note: Maritime strategic resilience and maritime strategic elasticity are complementary and interdependent. Together, they contribute to building a safe, adaptable and prosperous maritime ecosystem in the face of current and future challenges.

The figure compares the two concepts and highlights the fact that resilience aims to absorb shocks and maintain the system's functioning, whilst elasticity describes the process by which the

ecosystem alters its structure and develops new forms of organisation in order to respond to changes in the strategic environment.

An interpretation of the figure highlights the complementary relationship between the two concepts. Resilience constitutes the minimum condition for functional continuity, whilst elasticity represents the condition for adaptive development. An ecosystem can be resilient without being elastic, if it merely manages to maintain its functioning. Conversely, an ecosystem with a high level of elasticity is, by necessity, also resilient, as adaptation presupposes the existence of a functional foundation capable of sustaining the process of transformation.

Within the proposed conceptual framework, Strategic Maritime Resilience and Strategic Maritime Elasticity are not competing concepts, but complementary dimensions of the same process of systemic adaptation. Strategic Gravity explains why certain maritime spaces attract strategic interests; Strategic Convergence explains how these interests interact; and Resilience and Elasticity explain the ecosystem's response when this interdependence is subjected to major disruptions.

However, the analysis of these mechanisms leads to a new dimension of research. In an ecosystem characterised by high convergence and continuous adaptation, strategic advantage is no longer determined exclusively by military or economic superiority, but increasingly by the actors' ability to gather information, anticipate developments and make decisions ahead of the adversary. This transformation justifies the introduction of the final concept in the proposed architecture – **Maritime Cognitive Superiority**, which represents the highest level of functioning within the Maritime Strategic Ecosystem.

4.7. Maritime Cognitive Superiority – the new dimension of strategic advantage

The technological transformations of the last two decades have profoundly altered the nature of maritime strategic competition. Whilst, in the classical tradition, strategic advantage was primarily associated with fleet size, control of sea lanes or the technological superiority of naval platforms, the contemporary environment demonstrates that the decisive difference between actors is increasingly determined by their ability to collect, integrate, interpret and utilise information at a faster pace than their adversary.

This shift represents not merely a technological evolution, but a conceptual transformation of how maritime power is understood. In an ecosystem characterised by multiple interdependencies, the advantage no longer lies exclusively with the actor possessing the greatest material resources, but with the one who succeeds in transforming information into strategic decisions ahead of the other competitors.

The established literature on *Maritime Domain Awareness* emphasises the importance of developing a common operational picture of the maritime domain. The International Maritime Organisation, NATO and the European Union use this concept to describe the processes of collecting and exchanging information on navigation, critical infrastructure, economic activities and threats in the maritime domain. However, *Maritime Domain Awareness* is primarily concerned with describing and monitoring the current situation. This research argues that the contemporary strategic environment demands a higher level of cognitive processing, focused not only on observation but also on anticipation and adaptation.

Building on this observation, the concept of **Maritime Cognitive Superiority** is introduced.

Maritime Cognitive Superiority can be defined as **the capacity of a state or institutional actor to integrate information from the entire Maritime Strategic Ecosystem, to anticipate likely developments in the strategic environment, and to make decisions before adversaries can capitalise on their own strategic options.**

This concept does not describe mere informational superiority. Possessing a large volume of information does not automatically guarantee a strategic advantage. Cognitive superiority involves transforming data into knowledge, knowledge into anticipation, and anticipation into decisions

capable of influencing the evolution of the strategic environment. From this perspective, information is merely the raw material of a far more complex cognitive process.

The foundation of this concept lies in the convergence of several contemporary developments: the advancement of artificial intelligence, the expansion of autonomous maritime systems, the proliferation of distributed sensors, the use of commercial satellite imagery, the analysis of massive volumes of data (*Big Data*), predictive computing, and the development of integrated command and control platforms. Together, these technologies enable the construction of a dynamic operational picture, capable not only of reflecting existing reality but also of estimating the probability of future developments.

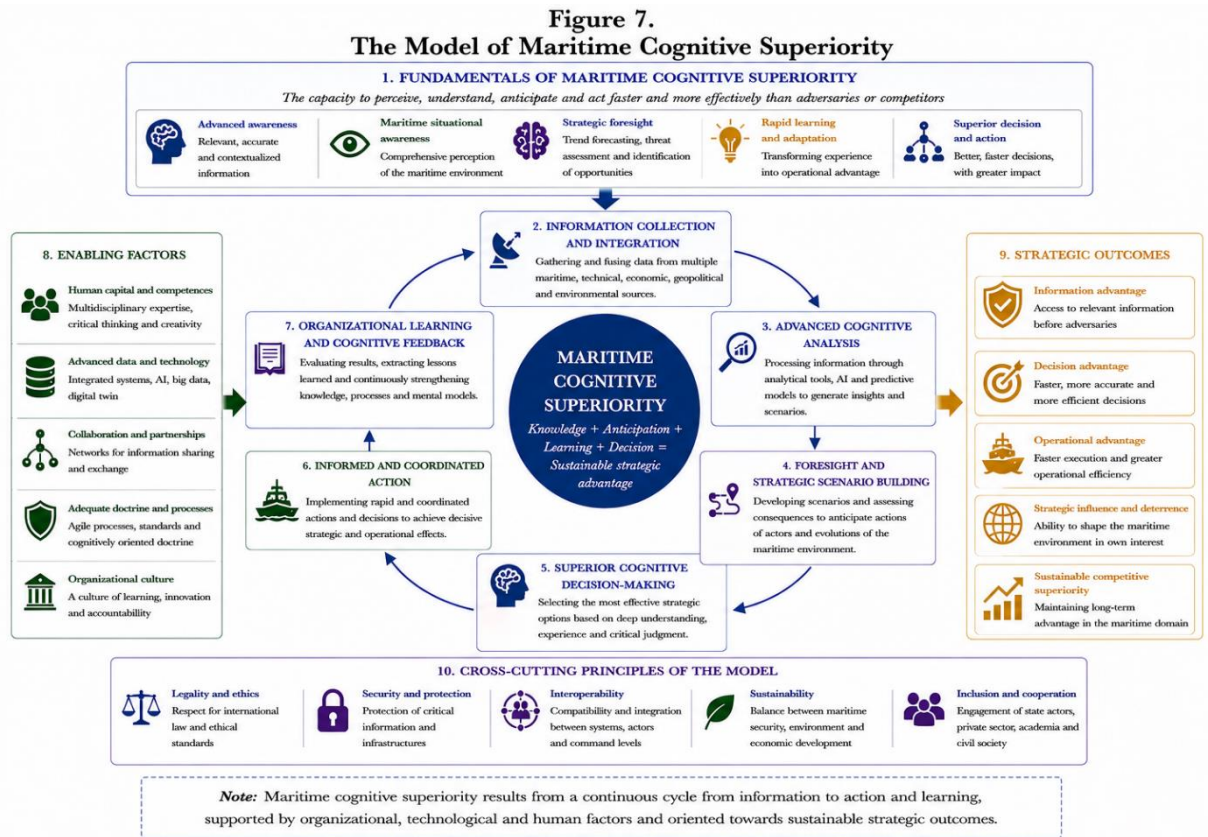
Maritime Cognitive Superiority cannot exist independently of the other concepts developed in this research. Maritime Strategic Gravity identifies the areas on which analytical attention must be focused. Maritime Strategic Convergence explains the relationships between the dimensions of the ecosystem. Strategic Resilience and Elasticity describe the system's behaviour under conditions of disruption. Cognitive Superiority represents the mechanism through which all this information is transformed into a usable strategic advantage.

This relationship is essential. In a strategic environment characterised by high convergence, the actor who is the first to understand the relationships between the components of the ecosystem gains the ability to anticipate changes before they become apparent to other actors. Competitive advantage thus stems not from merely reacting to events, but from the ability to act before their effects are fully realised.

The conflict in Ukraine provides numerous examples of the role of cognitive superiority. The integration of commercial satellite imagery, *open-source intelligence (OSINT)*, distributed sensors and autonomous systems has enabled a much faster decision-making process than in previous conflicts. At the same time, attacks on critical undersea infrastructure and the use of naval drones have demonstrated that anticipating a system's vulnerabilities can produce strategic effects comparable to the use of conventional military force.

Within the proposed conceptual architecture, Maritime Cognitive Superiority represents the highest level of operation within the Strategic Maritime Ecosystem. It does not replace military power, international law or critical infrastructure, but integrates them into a decision-making process capable of transforming the complexity of the strategic environment into an operational and political advantage.

Figure 7. The Maritime Cognitive Superiority Model



The figure highlights the sequence of processes through which data from the maritime strategic ecosystem is collected, integrated, analysed and transformed into strategic decision-making. The model illustrates that cognitive superiority is not the result of a single technology, but of the convergence of information, artificial intelligence, predictive analytics, human expertise and institutional coordination mechanisms.

An interpretation of the figure shows that each stage of the process adds strategic value to the available information. Isolated data is transformed into relevant information; the information is integrated into a common operational picture; predictive analysis generates probable scenarios; and the decision-making process utilises these results to adopt proactive measures. From this perspective, cognitive superiority becomes an expression of an actor's ability to understand and model the evolution of the maritime strategic ecosystem ahead of its competitors.

The introduction of this concept complements the conceptual architecture developed within the research. However, for these concepts to be utilised in empirical analysis, they must be integrated into a single methodological tool. Consequently, the following section develops **the Maritime Strategic Convergence Framework (MSCF)**, the operational framework that brings together , Maritime Strategic Convergence, Maritime Strategic Resilience, Maritime Strategic Elasticity and Maritime Cognitive Superiority into an analytical model designed to assess contemporary maritime security and its application to the 2026 NATO Summit in Ankara.

4.8. Maritime Strategic Convergence Framework (MSCF) – operationalising the conceptual architecture

The concepts developed in the previous sections describe different dimensions of the Strategic Maritime Ecosystem. Maritime Strategic Gravity explains the mechanisms by which strategic interests converge; Maritime Strategic Convergence describes the functional relationships

between the components of the ecosystem; and Resilience, Elasticity and Cognitive Superiority explain the system's response to changes and disruptions in the strategic environment. Although each of these concepts has its own explanatory value, their independent use does not allow for an integrated assessment of contemporary maritime security.

This limitation justifies the development of a methodological tool capable of bringing together all the analysed dimensions within a single interpretative framework. To this end, this research proposes **the Maritime Strategic Convergence Framework (MSCF)**, a conceptual and methodological model designed for the systemic analysis of the maritime strategic environment.

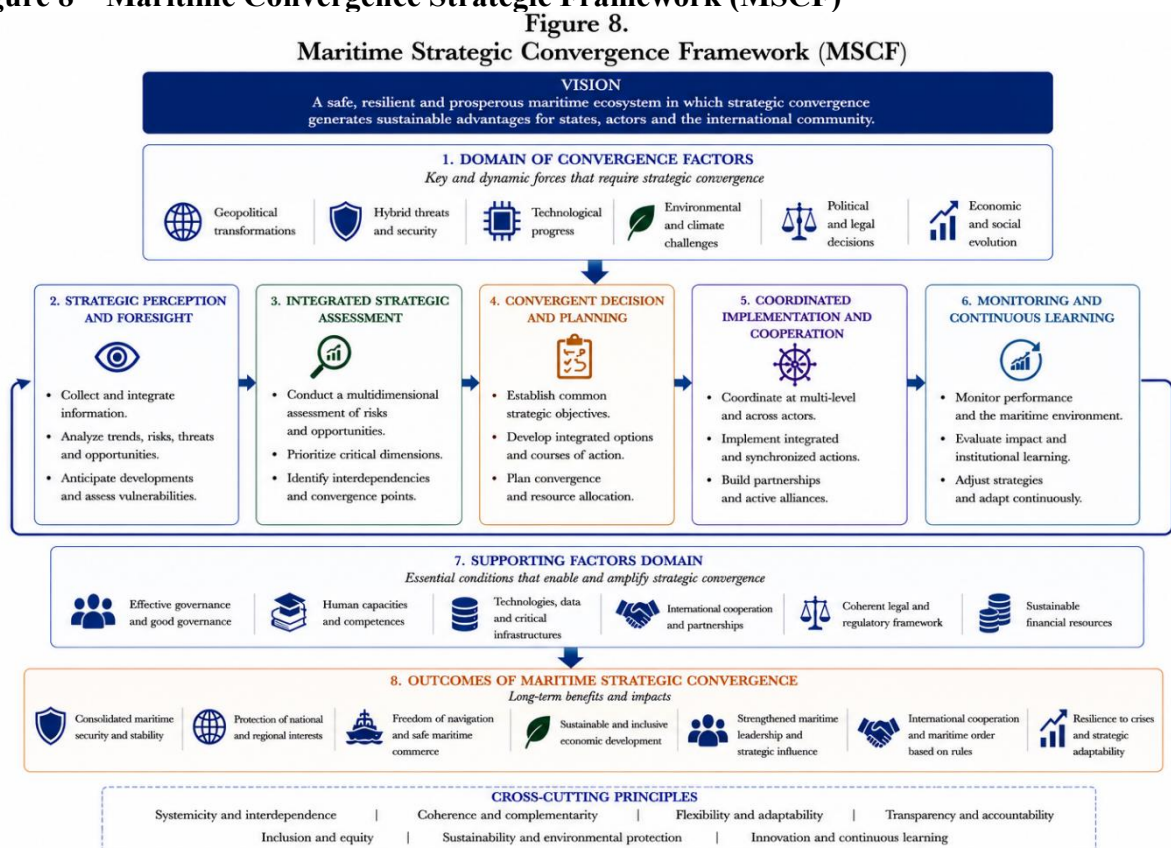
The MSCF can be defined as **an integrated analytical framework that explains how strategic gravity, multidimensional convergence, resilience, elasticity and cognitive superiority interact to determine the functioning of the Maritime Strategic Ecosystem and the evolution of maritime security.**

Unlike classical models, which treat the legal, military, economic or technological dimensions separately, the MSCF is based on the premise that these components can only be understood by analysing the relationships between them. The proposed model thus shifts the focus from assessing the performance of each component to assessing the coherence and functionality of the entire system.

The functioning of the MSCF can be described as a logical sequence of interdependent processes. In a first stage, Maritime Strategic Gravity identifies the areas where strategic interests and resources are concentrated. These areas subsequently give rise to processes of Maritime Strategic Convergence, characterised by the intensification of relations between the legal, military, economic, energy, technological and institutional dimensions. Increased convergence produces both strategic opportunities and systemic vulnerabilities, which necessitates the development of mechanisms for Strategic Resilience and Strategic Elasticity. Finally, the entire process is coordinated through Maritime Cognitive Superiority, which enables the integration of information, the anticipation of developments and the adoption of strategic decisions.

From this perspective, the MSCF is not merely a descriptive model, but also an assessment tool. It enables the identification of strategic focal points, the analysis of relationships between ecosystem components, the assessment of systemic vulnerabilities, and the evaluation of actors' capacity to anticipate and manage transformations in the maritime environment. Thus, the proposed framework can be used both in academic research and in the development of security strategies, operational planning and the evaluation of public policies in the maritime sector.

Figure 8 – Maritime Convergence Strategic Framework (MSCF)



The figure summarises the relationships between the five concepts developed above and illustrates how they converge into a unified analytical model. The Maritime Strategic Centre of Gravity constitutes the entry point for the analysis; Strategic Convergence represents the mechanism by which the ecosystem functions; Resilience and Elasticity describe the capacity for response and adaptation; and Cognitive Superiority coordinates the decision-making process and transforms information into a strategic advantage.

An interpretation of the diagram highlights the circular nature of the model. Cognitive Superiority generates decisions that influence the configuration of the ecosystem, thereby altering strategic gravity and convergence processes. Consequently, the MSCF must be understood as a dynamic system, in a state of constant evolution, rather than as a linear sequence of stages.

From a methodological perspective, the MSCF offers research a significant advantage. It allows for the comparison of different maritime spaces using the same conceptual criteria and facilitates the analysis of transformations over time. Applying this framework to the Black Sea, the Eastern Mediterranean or the Indo-Pacific region highlights how differences in strategic gravity and convergence generate distinct configurations of the maritime ecosystem.

In this study, the MSCF serves as the primary tool for analysing the 2026 NATO Summit in Ankara. Through this framework, the decisions adopted at the summit are interpreted not as isolated measures, but as systemic responses to the transformations occurring within the Strategic Maritime Ecosystem. This approach enables an assessment of the coherence of the Euro-Atlantic security architecture and the identification of likely directions for the evolution of the Alliance's maritime policies.

The development of the MSCF marks the transition from the conceptual to the methodological level of research. However, for the practical application of the model, it is necessary to define an operational architecture capable of organising the relationships between actors, institutions and infrastructure. This stage is achieved through the development of **the Integrated Maritime Security Architecture (IMSA)**, presented in the following section, which

translates the conceptual framework into a model designed to assess and manage contemporary maritime security.

4.9. Integrated Maritime Security Architecture (IMSA) – an operational model of the Strategic Maritime Ecosystem

The development of an integrated conceptual framework represents only the first stage in constructing a theory applicable to contemporary maritime security. In order for the new concepts proposed in this research to be used in the analysis and underpinning of strategic decisions, they must be organised into an architecture capable of describing the concrete functioning of the Strategic Maritime Ecosystem. To this end, this research develops the Integrated Maritime Security Architecture (IMSA), conceived as an operational model of the Strategic Maritime Ecosystem.

IMSA can be defined as an integrated architecture for governance and strategic analysis, designed to coordinate the relationships between the actors, infrastructures and processes that make up the Strategic Maritime Ecosystem, with a view to ensuring adaptive, resilient and proactive maritime security.

The concept of architecture is used here in a functional and systemic sense. IMSA is neither a new international institution nor a proposal for the institutional reorganisation of NATO, the European Union or the International Maritime Organisation. It constitutes an analytical model designed to describe how existing actors can operate within a system characterised by strategic convergence and multidimensional interdependence.

The need for such an architecture stems from changes in the nature of maritime threats. At present, the security of a maritime space no longer depends exclusively on the presence of naval forces or the enforcement of international legal norms. The functioning of the ecosystem is simultaneously conditioned by the security of subsea infrastructure, the continuity of trade flows, energy resilience, the protection of digital networks, the rapid exchange of information, and the capacity of institutions to coordinate multi-domain responses.

In this context, sectoral approaches are proving insufficient. An institution may manage its own area of competence effectively without this guaranteeing the security of the entire ecosystem. IMSA is based on the premise that the system's performance depends on the quality of the relationships between its components and their ability to operate in a coordinated manner.

From a structural point of view, the proposed architecture is organised into five interdependent functional levels.

The first level is the strategic environment, which includes the maritime space itself, critical infrastructure, trade routes, energy resources and the geographical characteristics of the region under analysis. This level constitutes the physical and legal foundation of the ecosystem.

The second level comprises the actors within the strategic maritime ecosystem. These include coastal states, international organisations, political-military alliances, economic operators, port authorities, energy companies, digital infrastructure providers and non-state actors that influence the functioning of the maritime space. The diversity of actors reflects the complexity of the contemporary strategic environment and justifies the need for an integrated approach.

The third level consists of strategic convergence processes, through which the legal, military, economic, energy, technological and informational dimensions interact continuously. This level represents the functional core of the architecture and explains how decisions taken in one domain have an impact on the other components of the ecosystem.

The fourth level consists of strategic adaptation mechanisms, within which the ecosystem's resilience and elasticity enable the absorption of shocks, functional reorganisation and the development of new institutional and operational configurations. This level ensures the continuity of the system's functioning in the event of major disruptions.

Finally, the fifth level is the cognitive and decision-making level, within which information from the entire ecosystem is integrated, analysed and transformed into strategic decisions. Maritime Cognitive Superiority is the coordinating element of the entire architecture, as it enables the

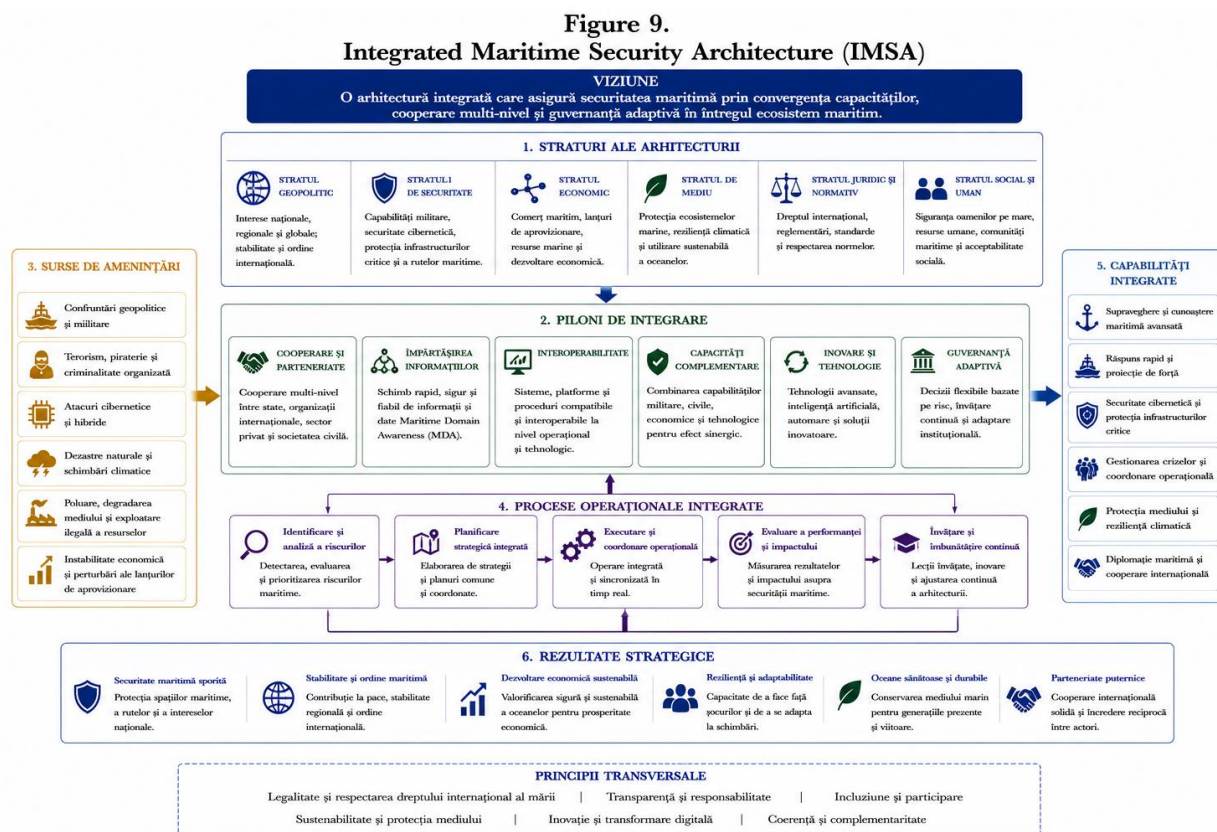
anticipation of developments, the assessment of scenarios and the formulation of proactive responses.

Figure 9. – Integrated Maritime Security Architecture (IMSA).

The figure illustrates the relationships between the five functional levels and highlights the fact that the architecture operates as an open system, characterised by continuous feedback and ongoing adaptation. The bidirectional arrows between the levels indicate that influences are not unidirectional, but circulate constantly between actors, infrastructures, processes and decision-making mechanisms.

An interpretation of the figure highlights the fact that IMSA is not built on a hierarchical logic, but on a network logic. In such a model, the system's performance is not determined solely by the efficiency of a single component, but by the quality of the interactions between all components of the ecosystem. The vulnerability of a single element can affect the functioning of the entire architecture, and strengthening a single dimension is insufficient in the absence of systemic coordination.

A major advantage of IMSA lies in its adaptive nature. The architecture can be applied both at regional level, for the analysis of security in the Black Sea, the Eastern Mediterranean or the Baltic Sea, and at global level, in the assessment of strategic maritime corridors and critical subsea infrastructure. At the same time, the model's flexibility allows for the integration of emerging technologies and new categories of threats without altering the underlying conceptual structure.



From the perspective of this research, IMSA is the tool through which the previously developed conceptual framework is translated into an operational model. Together, MSCF and

IMSA form the methodological foundation used in the following chapters to analyse the NATO Summit in Ankara and to assess how the decisions adopted by the Alliance reflect the transformation of the Euro-Atlantic maritime security architecture.

4.10. Synthesis of the conceptual architecture and integration of the proposed models

The successive development of the concepts presented in this chapter does not aim to expand the terminology used in maritime studies, nor to formulate independent notions. Each concept has been constructed to explain a distinct dimension of the same complex phenomenon, and their explanatory value stems from their integration into a coherent conceptual architecture. From this perspective, the Strategic Maritime Ecosystem is not merely the sum of the concepts analysed, but the systemic framework within which they acquire meaning and functionality.

The analysis carried out demonstrates the existence of a logical and functional relationship between all components of the proposed model. Maritime Strategic Gravity identifies the spaces where strategic interests converge and where critical infrastructure, actors and resources relevant to maritime security are concentrated. These areas give rise to processes of Maritime Strategic Convergence, characterised by an ever-increasing interdependence between the legal, military, economic, energy, technological and institutional dimensions.

Increased convergence inevitably gives rise to both opportunities and systemic vulnerabilities. In such a context, the functioning of the ecosystem depends on the existence of mechanisms capable of limiting the effects of disruptions and ensuring the continuity of essential processes. This role is fulfilled by Strategic Maritime Resilience, which enables the absorption of shocks and the maintenance of critical functions, and by Strategic Maritime Elasticity, which explains how the system reorganises itself and adapts its structure to respond to new strategic conditions.

The entire process is coordinated through Maritime Cognitive Superiority. This transforms information from all components of the ecosystem into strategic knowledge and enables the anticipation of developments, the assessment of risks and the adoption of proactive decisions. From this perspective, cognitive superiority is not an additional dimension of the architecture, but rather the mechanism that ensures the coherence and functioning of the entire system.

These concepts are methodologically integrated through **the Maritime Strategic Convergence Framework (MSCF)**, which provides the analytical framework necessary for assessing the relationships between the ecosystem's components, and through **the Integrated Maritime Security Architecture (IMSA)**, which translates this perspective into an operational model designed to analyse maritime governance and security processes.

Consequently, the proposed conceptual architecture can be interpreted as a system organised across three complementary levels.

The first level is **the conceptual level**, comprising the five original concepts developed in this research. These define the main processes that characterise the functioning of the strategic maritime ecosystem.

The second level is **the methodological level**, comprising the MSCF, which establishes the relationships between concepts and provides the tools necessary for an integrated analysis of maritime security.

The third level is **the operational level**, illustrated by the IMSA, which explains how actors, institutions and infrastructure can operate within a system characterised by strategic convergence and constant adaptation.

This three-level structure reflects one of the main contributions of this research. The existing literature provides sound explanations regarding naval power, maritime strategy, maritime security, governance and hybrid threats; however, these dimensions are predominantly analysed in isolation. The model developed in this study proposes a shift in analytical perspective, directing research towards the relationships between these dimensions and the systemic mechanisms that explain how the whole system functions.

This shift in perspective also has significant methodological implications. The assessment of maritime security can no longer be carried out exclusively through the analysis of naval capabilities, legal regimes or economic indicators considered in isolation. It requires the simultaneous examination of all components of the ecosystem and, above all, of the way in which they interact and influence one another. In this approach, maritime security emerges as an emergent property of the system rather than as the exclusive result of the performance of any single component.

From this perspective, the conceptual framework developed in Chapter III forms the methodological foundation of the entire study. It enables the transition from the theoretical level to empirical analysis and provides the tools necessary for assessing the transformations that have taken place in

the Euro-Atlantic maritime security architecture.

Consequently, the following chapter utilises the MSCF and IMSA to analyse the 2026 NATO Summit in Ankara. The summit is not treated as a mere political-military event, but as an institutional manifestation of the systemic transformations identified during the research. The decisions adopted in Ankara are interpreted through the prism of Maritime Strategic Gravity, Strategic Convergence processes, mechanisms of Resilience and Elasticity, and the consolidation of Maritime Cognitive Superiority, thereby providing the first empirical validation of the proposed conceptual architecture.

Matrix of relationships between the proposed concepts

Concept	Maritime Strategic Centre of Gravity (MSCoG)	Maritime Strategic Convergence (MSC)	Maritime Strategic Resilience (MSR)	Maritime Strategic Elasticity (MSEL)	Maritime Cognitive Superiority (MCS)
Maritime Strategic Centre of Gravity (MSCoG)	—	Creates the conditions for convergence by concentrating strategic interests.	Determines the need to strengthen resilience in areas of high strategic importance.	Fosters the development of adaptive mechanisms in regions of high strategic gravity.	Guides the priorities of the cognitive process and strategic surveillance.
Maritime Strategic Convergence (MSC)	This stems from the existence of areas of high strategic importance.	—	It heightens the need to coordinate resilience mechanisms.	It generates continuous processes of adaptation and strategic reorganisation.	It requires the integration of information from all areas of the ecosystem.
Maritime Strategic Resilience (MSR)	Protects the functioning of areas of high strategic importance.	Supports the continuity of the ecosystem under conditions of high convergence.	—	It forms the foundation of adaptation and transformation processes.	Utilises information provided by cognitive superiority for rapid response.
Maritime Strategic Elasticity (MSEL)	Enables the reconfiguration of strategic spaces following disruptions.	Adapts the relationships between the components of the ecosystem.	It enhances resilience through structural transformation.	—	Harnesses predictive analytics to reorganise the ecosystem.
Maritime Cognitive Superiority (MCS)	Identifies areas of high strategic importance and prioritises their monitoring.	Coordinate convergence processes through information integration.	Optimises resilience mechanisms through anticipation and early warning.	Supports continuous adaptation through predictive analysis and organisational learning.	—

The matrix highlights the fact that the five concepts developed in this research do not operate independently, but form an integrated conceptual system.

“The conceptual architecture summarised in the table forms the methodological foundation of the empirical analysis set out in Chapter 4, in which the Maritime Strategic Convergence Framework (MSCF) and the Integrated Maritime Security Architecture (IMSA) are applied to the 2026 NATO Summit in Ankara.”

Chapter 5

The NATO Summit in Ankara (2026) – empirical validation of the proposed conceptual architecture

5.1. The NATO Summit in Ankara as a critical case study for the transformation of Euro-Atlantic maritime security

Following the development of the conceptual and methodological framework presented in the previous chapters, this research aims to test the explanatory power of the proposed model by applying it to a representative case study. The choice of the NATO Summit held in Ankara in 2026 is not determined solely by the political significance of the event, but by its methodological value. In terms of qualitative research methodology, the summit can be classified as a **critical case study**, as it concentrates within a limited timeframe a series of strategic transformations that reflect the evolution of the Euro-Atlantic maritime security architecture.

In methodological literature, a critical case study is employed when a single event allows for the testing or validation of a conceptual model with broader relevance. The NATO summit in Ankara fulfils this condition because it simultaneously brings together legal, military, economic, technological and institutional dimensions which are usually analysed separately. In this context, the summit is not the primary subject of the research, but rather the empirical setting through which the robustness of the conceptual framework developed in Chapter III is assessed.

This approach differs from most analyses of NATO meetings, which primarily seek to interpret political statements, institutional decisions or immediate geopolitical implications. The present study adopts a different perspective. The summit is analysed as an institutional expression of the transformation of the maritime strategic ecosystem and as a moment when numerous existing evolutionary trends become visible within the framework of a common policy.

The choice of Ankara 2026 is also justified by Turkey’s geostrategic position. Situated at the crossroads of the Black Sea, the Mediterranean and the Middle East, controlling access through the Bosphorus and the Dardanelles, and representing one of the key actors on NATO’s south-eastern flank, Turkey provides a symbolic and operational framework for discussing the transformation of maritime security. The choice of this venue is no coincidence, as the region embodies many of the characteristics of Maritime Strategic Gravity identified in the preceding chapters.

At the same time, the summit is taking place against a strategic backdrop marked by the war in Ukraine, the accelerated militarisation of the Black Sea, vulnerabilities in undersea infrastructure, attacks on commercial shipping in the Red Sea, and intensifying geopolitical competition in the Indo-Pacific. These developments demonstrate that maritime security can no longer be analysed exclusively in military terms, but requires the integration of all components of the maritime strategic ecosystem.

Consequently, the NATO Summit in Ankara provides a suitable context for testing the central hypothesis of this research: that contemporary maritime security must be analysed through a systemic model based on the Maritime Strategic Ecosystem and the relationships between its components.

The following analysis is organised around the Maritime Strategic Convergence Framework (MSCF). Each major category of decisions adopted at the summit will be assessed in relation to the five concepts developed previously – Maritime Strategic Gravity, Maritime Strategic Convergence,

Maritime Strategic Resilience, Maritime Strategic Elasticity and Maritime Cognitive Superiority – as well as through the lens of the Integrated Maritime Security Architecture (IMSA). This methodology goes beyond a descriptive analysis and transforms the case study into a process of empirical validation of the proposed conceptual architecture.

Consequently, the aim of Chapter IV is not to provide a chronicle of the NATO Summit in Ankara, but to demonstrate the extent to which the decisions adopted reflect the transformation of the maritime security architecture and confirm the analytical utility of the conceptual framework developed in this research.

5.2. The strategic context of the NATO Summit in Ankara – the convergence of transformations in the international maritime environment

The NATO Summit held in Ankara in 2026 took place against a strategic backdrop characterised by one of the most rapid transformations of the international maritime environment since the end of the Cold War. Unlike previous Alliance meetings, which were dominated mainly by issues of military deterrence or regional crisis management, Ankara 2026 reflects the consolidation of a much broader perspective on maritime security, in which the military, legal, economic, energy, technological and informational dimensions are addressed as elements of the same strategic system.

This shift was not driven by a single event, but by the convergence of structural transformations that have profoundly altered the way in which states and international organisations perceive the maritime environment. The conflict launched by the Russian Federation against Ukraine has demonstrated that the Black Sea is no longer merely a regional theatre of operations, but a strategic space with direct implications for European energy security, freedom of navigation, global agricultural exports and the protection of critical undersea infrastructure. The accelerated militarisation of the region, the use of naval drones, the development of electronic warfare and the intensification of information warfare have transformed the Black Sea into a testing ground for new forms of maritime conflict.

At the same time, attacks on commercial shipping in the Red Sea have demonstrated the vulnerability of global supply chains and the ability of certain non-state actors to cause disproportionate economic and strategic consequences by disrupting key maritime corridors. The re-routing of trade routes, rising transport costs and the need for international naval protection operations have confirmed that maritime security can no longer be analysed solely through the prism of inter-state relations.

Another defining feature of the strategic context is the growing importance of critical subsea infrastructure. Communications cables, offshore pipelines, liquefied natural gas terminals and offshore energy installations have become essential components of economic and digital security. The sabotage of the Nord Stream pipelines highlighted the fact that the vulnerability of subsea infrastructure can have geopolitical and economic effects comparable to those generated by the use of conventional military force.

These developments have been amplified by the acceleration of technological change. The integration of artificial intelligence into strategic analysis processes, the development of autonomous naval systems, the expanded use of commercial satellite imagery and the application of predictive analytics algorithms have profoundly altered the way in which intelligence is gathered, risks are assessed and strategic decisions are made. In this context, the competitive advantage of maritime actors depends less and less on the numerical superiority of naval platforms and increasingly on the ability to integrate and utilise information.

Added to these developments is the intensification of global geopolitical competition. The Indo-Pacific region, the Eastern Mediterranean, the Arctic and the Black Sea are all focal points for economic, energy and military interests, and control of infrastructure and maritime routes is becoming a central element of strategic competition between the major powers. In this context, NATO is called upon to adapt its security architecture to an environment in which threats are multidimensional and responses must be integrated.

From a legal perspective, recent developments have also highlighted the need to strengthen the application of international law of the sea. Freedom of navigation, the protection of subsea infrastructure, the delimitation of jurisdiction in maritime zones and compliance with the obligations set out in the United Nations Convention on the Law of the Sea (UNCLOS) have become central elements of debates on maritime security. At the same time, the development of autonomous technologies and the use of artificial intelligence in the naval domain raise new legal issues concerning the attribution of responsibility, the control of the use of force and the protection of critical infrastructure.

The accumulation of these developments justifies the choice of the NATO Summit in Ankara as a case study. The summit does not appear to be a response to a single crisis, but rather an institutional expression of the convergence of systemic transformations that simultaneously affect all components of the Strategic Maritime Ecosystem. From this perspective, Ankara 2026 represents the moment when the Alliance implicitly recognises that maritime security can no longer be addressed exclusively through the strengthening of naval capabilities, but requires the integration of legal, technological, economic, energy and information dimensions into a coherent strategic architecture.

The following analysis takes this premise as its starting point and utilises the Maritime Strategic Convergence Framework to assess the extent to which the decisions adopted in Ankara reflect the transformation of maritime security into a systemic process and confirm the validity of the conceptual architecture developed in this study.

5.3. The NATO Summit in Ankara through the lens of the Maritime Strategic Centre of Gravity

The first level of the empirical analysis aims to test the hypothesis that the decisions adopted at the NATO Summit in Ankara reflect the existence of maritime spaces characterised by high strategic gravity. Within the conceptual framework developed in Chapter III, Maritime Strategic Gravity explains the tendency of certain regions to simultaneously concentrate military, economic, legal, energy and technological interests, thereby generating a strategic importance disproportionate to their geographical size.

An analysis of the documents adopted in Ankara highlights the fact that the Alliance's priorities centre on maritime regions that exhibit precisely these characteristics. The Black Sea occupies a central place in the new strategic architecture, not only because of the conflict in Ukraine, but also due to its role in European energy security, the protection of trade corridors and the defence of NATO's eastern flank. The Eastern Mediterranean, the Baltic Sea and the maritime regions associated with global logistics corridors – where critical infrastructure, commercial interests and the Allied military presence converge – fall into the same category.

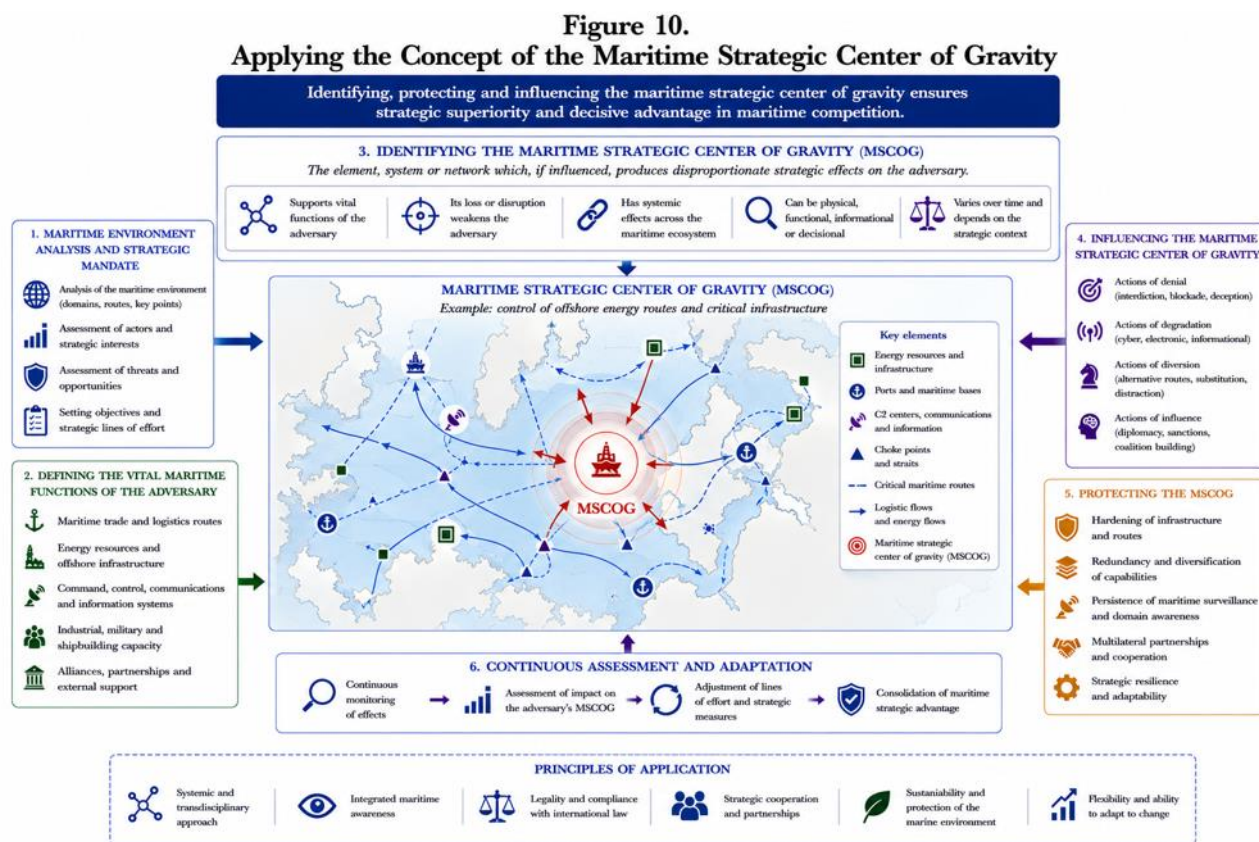
This geographical concentration confirms that the strategic importance of the maritime domain can no longer be explained solely by geographical or military criteria. The summit's decisions reflect an implicit understanding that the security of trade routes, the protection of submarine cables, the resilience of energy infrastructure and freedom of navigation are inseparable elements of the same strategic reality.

Turkey's position lends the Ankara Summit additional significance. Control of the Bosphorus and the Dardanelles, the connectivity between the Black Sea and the Mediterranean, and Ankara's role in the regional strategic balance make the Turkish maritime space a prime example of Maritime Strategic Gravity. The choice of Ankara as the summit's host can also be interpreted as a symbolic recognition of the growing importance of these maritime nodes within the Euro-Atlantic security architecture.

Applying the concept of the Maritime Strategic Centre of Gravity (MSCoG) thus allows NATO's priorities to be reinterpreted not as reactions to isolated crises, but as responses to the consolidation of maritime spaces where multiple strategic interests converge. This perspective

explains why certain regions receive priority attention and provides an additional criterion for anticipating future centres of maritime geopolitical competition.

Figure 10 – Application of the concept of Maritime Strategic Gravity.



The figure highlights the main maritime areas analysed and the factors generating the strategic gravity of each of them.

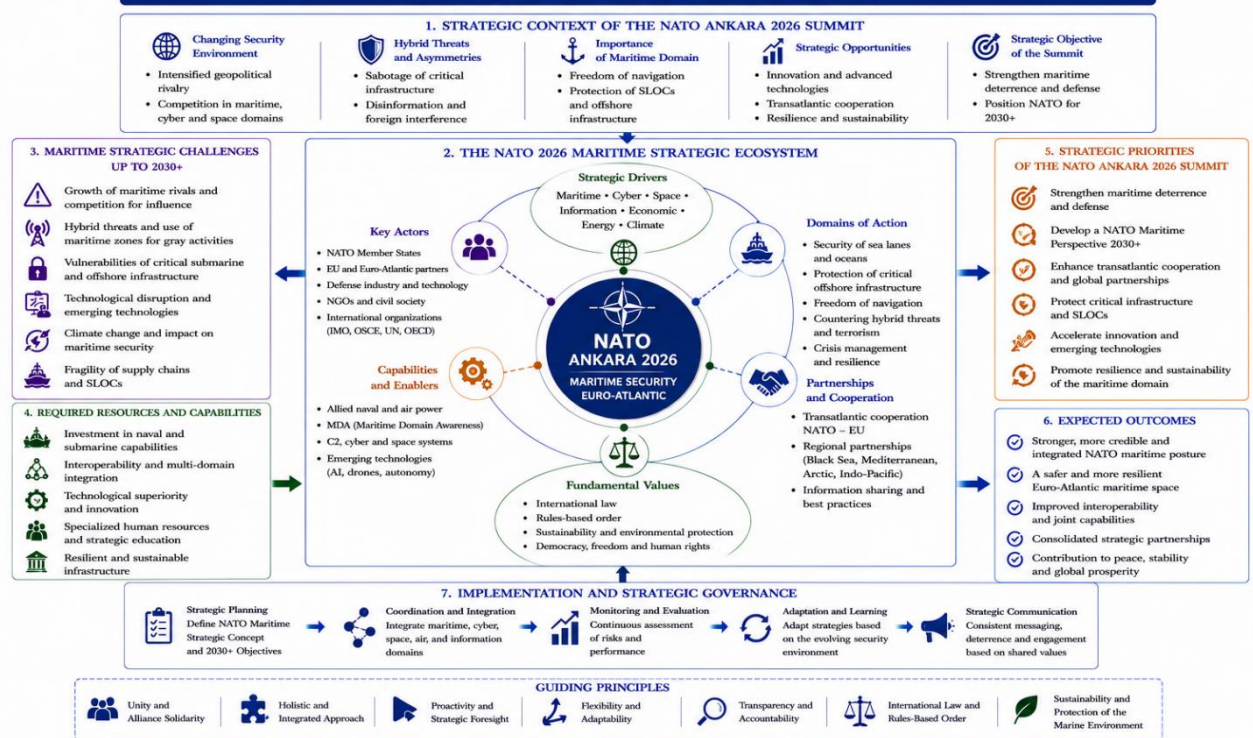
The results of this first stage of analysis confirm that the distribution of the Alliance's strategic interests follows the logic described by the Maritime Strategic Gravity model. However, simply identifying these areas does not explain how the legal, military, economic and technological dimensions interact within the decisions taken. To this end, it is necessary to apply the second concept of the proposed architecture: Maritime Strategic Convergence.

5.4. Maritime Strategic Convergence in the decisions of the NATO Summit in Ankara

Figure 11.

The Maritime Strategic Ecosystem Applied to the NATO Ankara 2026 Summit

VISION: A secure, resilient and prosperous Euro-Atlantic maritime space in which strategic convergence, innovation and transatlantic cooperation consolidate security, stability and shared values.



Analysis conducted through the lens of Maritime Strategic Gravity demonstrates that the NATO Summit in Ankara prioritises certain maritime spaces characterised by a high concentration of strategic interests. However, this observation represents only the first level of interpretation. To understand the true significance of the decisions adopted in Ankara, it is necessary to examine the relationships between the legal, military, economic, energy, technological and institutional dimensions that shape the new maritime security architecture.

The application of the concept of Strategic Maritime Convergence highlights the fact that the summit's key decisions cannot be confined to a single area of public policy. Strengthening naval presence, protecting critical undersea infrastructure, developing information-sharing, integrating new technologies and strengthening cooperation between allies are not independent initiatives, but components of a process of systemic convergence.

This observation is particularly relevant as it alters the way in which NATO's evolution can be interpreted. In the traditional approach, the development of military capabilities was analysed separately from policies on critical infrastructure or technological cooperation. By contrast, the documents adopted in Ankara reflect an implicit understanding that military effectiveness depends directly on the security of digital communications, the continuity of logistical flows, the protection of energy infrastructure and the functioning of international legal mechanisms.

The convergence of these dimensions is evident in the field of critical subsea infrastructure. The protection of communications cables and offshore pipelines is no longer treated exclusively as an economic or technical issue, but as an essential element of strategic deterrence and collective resilience. Equally, the development of maritime surveillance capabilities and the integration of autonomous systems are linked both to the strengthening of collective defence and to the protection of freedom of navigation and the continuity of economic activities.

From a legal perspective, the summit confirms the importance of international law of the sea as the foundation of maritime stability. Respect for freedom of navigation, the protection of subsea infrastructure and the strengthening of international cooperation demonstrate that legal norms no

longer constitute merely the formal framework for state action, but are becoming active components of maritime security . From this perspective, international law and military strategy do not operate in parallel, but converge within the same decision-making process.

The energy dimension provides another relevant example of strategic convergence. Offshore infrastructure, liquefied natural gas terminals and maritime supply corridors are analysed simultaneously from the perspectives of energy security, economic stability and military protection. This approach confirms that energy is no longer exclusively an economic domain, but a determining factor in maritime security and regional strategic balance.

At the same time, the integration of artificial intelligence and the development of digital capabilities demonstrate the expansion of convergence into the technological sphere. Automated information analysis systems, integrated command and control platforms, and the use of predictive algorithms are transforming strategic planning processes and enabling the simultaneous coordination of vast volumes of information from different fields. This development confirms one of the central hypotheses of this research, namely that technology is no longer merely a force multiplier, but a constituent element of the Maritime Strategic Ecosystem.

Applying the MSCF to the decisions taken in Ankara thus highlights the existence of a high level of convergence between the main dimensions of maritime security. From the perspective of the proposed model, this represents one of the most significant transformations of the Euro-Atlantic architecture. NATO is not only redefining its operational priorities but is progressively adopting a systemic approach, in which collective defence, energy security, the protection of critical infrastructure, legal cooperation and technological innovation are treated as inseparable elements of the same ecosystem.

Figure 11 – The Maritime Strategic Convergence Model applied to the NATO Summit

Maritime domain	Determining factors of the Maritime Strategic Centre of Gravity	NATO interests	Estimated level of strategic gravity
Black Sea	War, trade corridors, energy infrastructure, submarine cables	Very high	Very high
Bosphorus – Dardanelles	Access control, strategic connectivity	Very high	Very high
Eastern Mediterranean	Offshore energy, migration, regional security	High	High
The Baltic Sea	Critical infrastructure, energy, NATO deterrence	Very high	Very high
Red Sea	Global trade, freedom of navigation	High	High

This table demonstrates that the model is not merely theoretical, but can be used for the comparative assessment of different maritime areas, thereby reinforcing the practical relevance of the research.

The figure illustrates the relationships between the main areas of action identified in the summit documents and highlights the fact that each decision has simultaneous effects on several components of the strategic maritime ecosystem.

An interpretation of the figure confirms that the decisions adopted in Ankara cannot be assessed solely on the basis of military indicators. Their impact must be analysed in terms of their ability to strengthen convergence between the legal, economic, energy, technological and institutional dimensions. From this perspective, the success of a maritime policy is not determined solely by the effectiveness of a single measure, but by the extent to which it strengthens the integrated functioning of the entire strategic ecosystem.

The results obtained validate the second hypothesis of the research: the transformation of Euro-Atlantic maritime security is characterised by increasing strategic convergence between

domains that were previously treated separately. This conclusion explains why new maritime challenges call for integrated analytical tools and confirms the usefulness of the MSCF as a model for interpreting contemporary developments.

However, the intensification of this convergence also leads to an increase in systemic vulnerabilities. The greater the interdependence between components, the more a disruption in a single dimension can have repercussions across the entire ecosystem. Consequently, the next stage of the analysis examines how the NATO Summit in Ankara addresses this challenge by strengthening Strategic Maritime Resilience and Strategic Maritime Elasticity, thereby confirming the third component of the conceptual framework developed in this research.

5.5. Strategic Maritime Resilience and Strategic Maritime Elasticity in NATO's new security architecture

The application of the concept of Strategic Maritime Convergence highlights the fact that contemporary maritime security is characterised by a high degree of interdependence between critical infrastructure, military systems, logistical networks, energy flows and international legal mechanisms. This interdependence generates significant operational advantages, but simultaneously amplifies the vulnerability of the entire ecosystem. In such an integrated system, the disruption of a single component can have a knock-on effect on all other dimensions of maritime security.

From this perspective, one of the most important outcomes of the NATO Summit in Ankara is the explicit focus on strengthening the Alliance's ability to operate in a strategic environment characterised by constant uncertainty and multidimensional threats. An analysis of the summit documents shows that many of the measures adopted are not aimed solely at strengthening military deterrence, but at developing the system's capacity to absorb disruptions and continue to function in crisis conditions.

These developments directly confirm the relevance of the concept of **Strategic Maritime Resilience** developed in this research. Strengthening the protection of critical subsea infrastructure, developing joint mechanisms for responding to maritime incidents, expanding cooperation on information sharing, and intensifying multinational exercises all pursue the same objective: reducing the system's vulnerabilities and maintaining its essential functions even in the event of major attacks or disruptions.

In this context, resilience should not be understood solely as the physical robustness of infrastructure. It includes the ability of institutions to continue the decision-making process, to coordinate the relevant actors swiftly, and to ensure the continuity of communications, logistics and maritime operations. The Ankara Summit reflects this broader approach through its emphasis on inter-institutional cooperation and the development of a common response architecture.

However, analysis of the summit also highlights the existence of a dimension that goes beyond the traditional concept of resilience. Many of the decisions adopted are not merely aimed at restoring the system's functioning following an incident, but at transforming the way in which it operates. The acceleration of the digitalisation of command and control processes, the integration of autonomous systems, the diversification of logistics routes and the development of flexible cooperation mechanisms demonstrate a focus on continuous adaptation and institutional innovation.

These developments validate the concept of **Strategic Maritime Elasticity** proposed in Chapter III. Unlike resilience, which aims to maintain the system's essential functions, elasticity describes its capacity to modify its structure and internal processes in order to respond effectively to changes in the strategic environment. The NATO Summit in Ankara reflects precisely this logic of constant adaptation.

A relevant example is the change in the Alliance's approach to the protection of subsea infrastructure. Whereas previously the focus was mainly on its surveillance and defence, the new approach includes the development of redundant mechanisms, the use of autonomous technologies for monitoring, the integration of artificial intelligence into risk analysis, and the strengthening of

cooperation with civilian operators of critical infrastructure. In this case, the system does not aim to return to its original state, but rather to develop a more effective and adaptable configuration.

The same logic can be observed in the fields of military mobility and maritime logistics. Lessons learnt from the conflict in Ukraine and the disruptions in the Red Sea have led NATO to place greater emphasis on the flexibility of logistics chains and the diversification of operational options. Instead of rigid structures, the security architecture tends to favour solutions capable of adapting rapidly to changes in the strategic environment.

Applying the MSCF to these developments highlights a direct relationship between the level of strategic convergence and the need to develop resilience and strategic maritime elasticity. The more integrated the strategic maritime ecosystem becomes, the more its functioning depends on the ability of actors to anticipate disruptions and rapidly adapt institutional and operational mechanisms.

Figure 12 – Maritime Strategic Resilience and Elasticity in NATO’s security architecture following the Ankara Summit



The figure illustrates how the measures adopted at the summit simultaneously strengthen the maritime strategic ecosystem’s capacity to absorb shocks and its capacity for structural adaptation.

An interpretation of the figure confirms that resilience and elasticity are not two independent objectives, but rather two successive stages of the same process of strategic transformation. Resilience enables the system to continue functioning in times of crisis, whilst elasticity creates the conditions for its evolution and adaptation in an environment characterised by constant change.

The results of the analysis thus validate the third component of the proposed conceptual architecture and demonstrate that the NATO Summit in Ankara marks the transition from an

approach predominantly oriented towards defence and reaction to a strategic architecture oriented towards anticipation, adaptation and continuous transformation.

This conclusion naturally leads to the final stage of empirical validation. Whilst strategic gravity explains the distribution of interests, convergence describes the relationships between components, and resilience and elasticity explain the system's response to disruptions, the mechanism by which all this information is transformed into strategic decisions remains to be analysed. Consequently, the final stage of the case study is devoted to **Maritime Cognitive Superiority**, a concept which represents the highest level of functioning of the Maritime Strategic Ecosystem and the coordinating element of the entire conceptual architecture developed in this research.

5.6. Maritime Cognitive Superiority and the transformation of the decision-making process at the NATO Summit in Ankara

An analysis of strategic gravity, multidimensional convergence, and mechanisms of resilience and elasticity demonstrates that contemporary maritime security functions as a system characterised by permanent interdependencies and accelerated transformations. In such an environment, strategic advantage can no longer be explained solely by military superiority, the scale of naval capabilities or the volume of available economic resources. The ability to rapidly understand developments within the system and to transform information into strategic decisions becomes the determining factor in the competitiveness of maritime actors.

Applying the concept of **Maritime Cognitive Superiority** to the NATO Summit in Ankara highlights one of the most significant transformations in the Euro-Atlantic security architecture. Many of the initiatives promoted at the summit aim to strengthen the Alliance's capacity to integrate information from different domains and to develop mechanisms for strategic anticipation. From this perspective, the decision-making process is no longer based solely on reacting to events that have already occurred, but on the early identification of risks and the assessment of likely scenarios.

This shift reflects the evolution of the contemporary strategic environment. The accelerated pace of technological change, the development of autonomous systems, the use of artificial intelligence, the expansion of digital infrastructure and the proliferation of information sources make it impossible to manage maritime security using traditional methods of analysis. The volume of available information exceeds human processing capacity, and strategic value is no longer determined by access to data, but by the ability to integrate, interpret and utilise it.

The Ankara Summit reflects this development through its emphasis on information sharing, the strengthening of joint analysis platforms, the interoperability of digital systems, and the development of command and control mechanisms capable of operating in an extremely complex information environment. In this context, information is no longer merely a tool to support the decision-making process, but has become one of the Alliance's key strategic resources.

The development of artificial intelligence and its integration into strategic analysis processes plays a key role. Predictive analytics algorithms, automated anomaly detection systems, satellite image processing and the use of advanced simulation models help to reduce the time required to assess operational situations and facilitate the formulation of proactive responses. Consequently, strategic advantage is increasingly determined by cognitive superiority and less and less by the numerical superiority of military platforms.

This observation confirms one of the central hypotheses of the research. Maritime Cognitive Superiority is not an isolated dimension of maritime security, but the mechanism through which the entire Maritime Strategic Ecosystem is coordinated. Strategic Gravity identifies priority areas; Strategic Convergence describes the relationships between components; Resilience and Elasticity explain the system's adaptability; and Cognitive Superiority transforms all this information into an integrated decision-making process.

In the case of the NATO Summit in Ankara, this relationship is evident in the way in which the various initiatives are addressed in an integrated manner. The protection of subsea infrastructure, the strengthening of maritime surveillance, the development of autonomous capabilities, energy security and legal cooperation are analysed within a single decision-making process, coordinated through the continuous exchange of information and joint risk assessment. Thus, cognitive superiority becomes the element that ensures the coherence of the entire security architecture.

Figure 13 – The Maritime Cognitive Superiority Model applied to the NATO decision-making process



The figure highlights how data from critical infrastructure, surveillance systems, military capabilities, open-source intelligence, maritime sensors and institutional mechanisms are integrated into a single process of analysis, anticipation and strategic decision-making.

An interpretation of the figure confirms that cognitive superiority is not solely the result of technological progress. It is the product of the interaction between technology, human expertise, institutional cooperation and the organisational capacity to transform information into strategic action. In this sense, the NATO Summit in Ankara marks the transition towards a security architecture in which the cognitive process becomes one of the main multipliers of maritime power.

Applying the final concept of the architecture developed in this research allows us to draw an important conclusion. The five concepts – Maritime Strategic Gravity, Maritime Strategic Convergence, Maritime Strategic Resilience, Maritime Strategic Elasticity and Maritime Cognitive Superiority – collectively explain the transformations reflected by the NATO Summit in Ankara and demonstrate that contemporary maritime security must be analysed as an integrated system of relationships and processes, not as the sum of independent components.

Consequently, the case study validates the conceptual architecture proposed in Chapter III and confirms the usefulness of the **Maritime Strategic Convergence Framework (MSCF)** and the

Integrated Maritime Security Architecture (IMSA) as methodological tools for analysing contemporary maritime security.

5.7. Validation of the proposed conceptual architecture: theoretical, methodological and operational implications

Applying the conceptual architecture developed in Chapter III to the NATO Summit in Ankara allows for an assessment of both the internal robustness of the proposed model and its ability to explain contemporary transformations in maritime security. The analysis carried out demonstrates that the new concepts introduced in this research are not merely theoretical constructs, but analytical tools capable of describing observable processes in the evolution of the Euro-Atlantic security architecture.

The first conclusion drawn from the case study concerns the validation of the concept of **the Strategic Maritime Ecosystem** as a fundamental unit of analysis. The analysis of the summit highlights that the main decisions adopted by the Alliance cannot be understood by examining the military, legal, economic or technological dimensions in isolation. These form an interdependent whole, within which changes in one area have repercussions for the entire system. Consequently, the research confirms the hypothesis that contemporary maritime security must be analysed as an emergent property of a strategic ecosystem rather than as the result of independent sectoral policies.

The second conclusion concerns the validation of the concept of **the Maritime Strategic Centre of Gravity (MSCoG)**. The case study demonstrates that NATO's priorities are concentrated around maritime areas that simultaneously bring together critical infrastructure, trade corridors, energy resources, legal interests and military capabilities. This concentration cannot be explained solely by geography or the distribution of naval power, but rather by the accumulation and interdependence of multiple strategic factors. The proposed concept thus enables the identification and comparison of maritime areas characterised by different levels of strategic gravity and provides an additional criterion for anticipating areas where geopolitical competition is likely to intensify.

The third conclusion confirms the relevance of **Maritime Strategic Convergence**. An analysis of the decisions adopted in Ankara demonstrates that they are the result of an integrated approach in which international law, collective defence, energy security, digital technologies and the protection of critical infrastructure are addressed simultaneously. The proposed model explains this development through the existence of a process of convergence between domains which, in traditional approaches, were analysed separately. Strategic Maritime Convergence thus proves to be a useful tool for interpreting the transformations taking place in the institutional architecture of maritime security.

The fourth conclusion concerns **Strategic Maritime Resilience** and **Strategic Maritime Elasticity**. The case study confirms that NATO does not seek exclusively to strengthen the resilience of infrastructure and institutions, but rather to develop a permanent capacity to adapt to changes in the strategic environment. This observation validates the conceptual distinction made in Chapter III and demonstrates that elasticity represents a distinct dimension, characterised by functional reorganisation and strategic innovation, going beyond the traditional meaning attributed to resilience.

The fifth conclusion confirms the role of **Maritime Cognitive Superiority** as the integrating mechanism of the entire architecture. The NATO Summit in Ankara highlights that the development of predictive analysis systems, the integration of artificial intelligence, the expansion of information sharing and the strengthening of command and control processes are central elements of the new security architecture. Maritime Cognitive Superiority explains how these developments transform information into a strategic resource and enable risks to be anticipated before they have an impact on the ecosystem.

The simultaneous application of these concepts also validates the two methodological models developed as part of the research. **The Maritime Strategic Convergence Framework (MSCF)** demonstrates the utility of an integrated approach to analysing the relationships between

the various components of maritime security. At the same time, **the Integrated Maritime Security Architecture (IMSA)** provides an operational model capable of describing how actors, institutions and infrastructure can function within a system characterised by strategic convergence and constant adaptation.

From a theoretical perspective, the main contribution of this research lies in modifying the fundamental unit of analysis used in maritime studies. Whilst the classical literature has successively focused on naval power, maritime strategy, maritime functions, maritime security or governance, this research proposes shifting the emphasis towards **the Strategic Maritime Ecosystem**, understood as the totality of relationships between the legal, military, economic, energy, technological and institutional components. This shift enables maritime phenomena to be analysed in a systemic manner and provides a conceptual framework suited to the transformations taking place in the contemporary strategic environment.

From a methodological perspective, the study demonstrates that the MSCF can be used for the comparative assessment of different maritime spaces and for analysing transformations over time. Its application is not limited to the Black Sea or the NATO Summit in Ankara. The proposed framework can be used in the analysis of the Indo-Pacific region, the Baltic Sea, the Eastern Mediterranean, the Arctic, the Persian Gulf or other maritime spaces characterised by strategic competition and complex interdependencies.

From an operational perspective, IMSA provides an interpretative model that can support the development of maritime security policies, the assessment of critical infrastructure, strategic planning and cooperation between international organisations and national actors. Although the proposed architecture is not prescriptive and does not seek to replace existing institutional mechanisms, it can serve as a useful tool for informing strategic decisions and for assessing the impact of new threats on the maritime ecosystem.

Matrix of the original contributions of this study

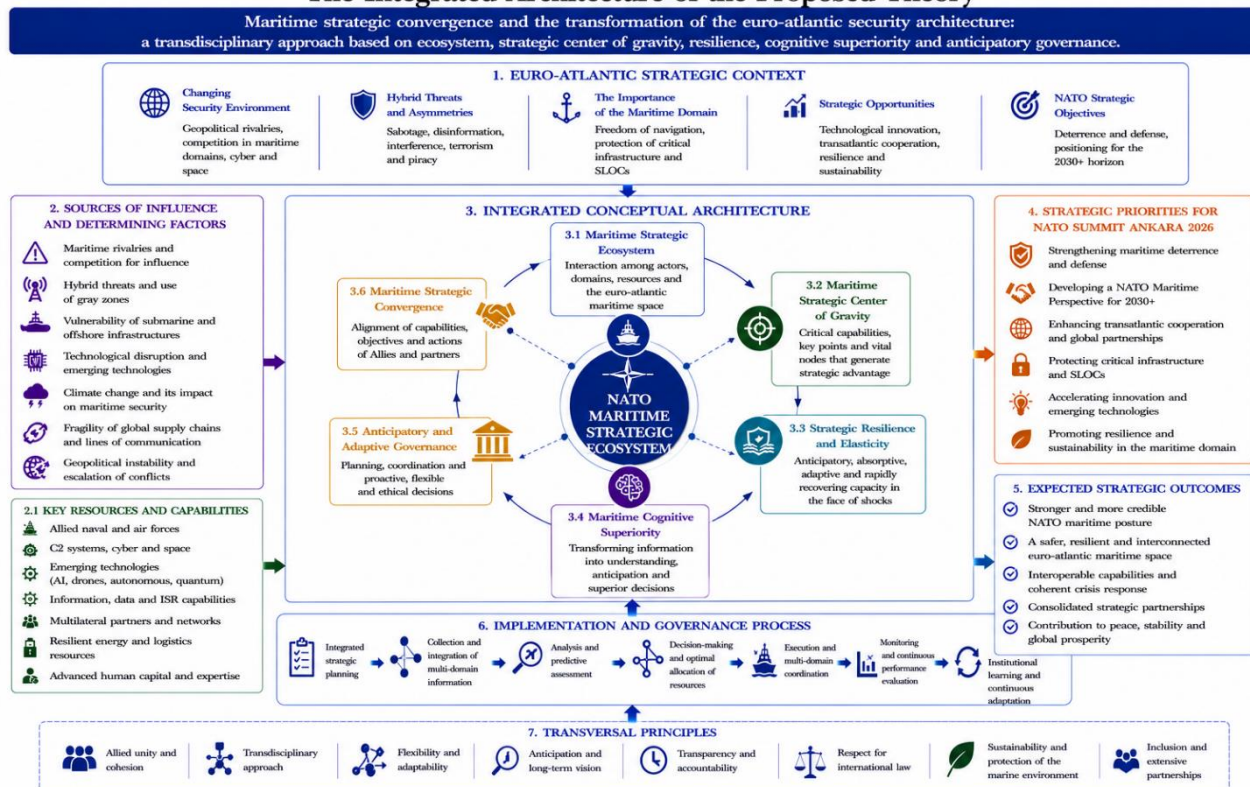
Area analysed	Existing literature	Limitations identified	Original contribution of this study	Added value
Fundamental unit of analysis	Naval power, maritime strategy, maritime security, maritime governance	Sectoral and disciplinary analysis	The Strategic Maritime Ecosystem as a new fundamental unit of analysis	A systemic and interdisciplinary approach
Conceptual foundation	Independently developed concepts	Lack of an integrative model	Unified conceptual architecture based on five original concepts	Theoretical and explanatory coherence
Maritime Strategic Gravity	Geostrategic importance is analysed separately in geopolitics and naval strategy	It does not explain the simultaneous accumulation of strategic interests	The concept of the Maritime Strategic Centre of Gravity (MSCoG)	Identification and assessment of critical maritime spaces
Maritime Strategic Convergence	The legal, military, economic and technological domains are analysed separately	Lack of a mechanism to explain interdependence	The concept of Maritime Strategic Convergence	Explaining how the ecosystem functions through systemic relationships
Resilience and Elasticity	Resilience is analysed predominantly in the context of infrastructure and risk management	Adaptation and transformation are insufficiently distinguished	The distinction between Strategic Maritime Resilience and Strategic Maritime Elasticity	An explanatory model of ecosystem continuity and adaptation
Maritime Cognitive Superiority	Maritime Domain Awareness and	Focus on monitoring, not on	The Concept of Maritime	Integration of AI, predictive analytics

	Information Superiority	anticipation and integration	Cognitive Superiority	and strategic decision-making
Methodology	Descriptive analyses and classic case studies	Lack of an integrative methodological framework	Maritime Strategic Convergence Framework (MSCF)	Tool for comparative analysis and empirical validation
Operationalisation	Separate institutional models	Fragmented cooperation between sectors	Integrated Maritime Security Architecture (IMSA)	Operational model for coordinating the strategic maritime ecosystem
Empirical validation	Analysis of NATO summits is predominantly descriptive	Lack of application of original conceptual models	Application of the MSCF and IMSA to the NATO Summit in Ankara (2026)	Empirical validation of the conceptual architecture
Doctrinal contribution	The progressive expansion of classical maritime theories	The lack of an ecosystemic perspective	The transition from component analysis to Strategic Maritime Ecosystem analysis	A new doctrinal framework for maritime security research in the 21st century

The matrix summarises the main original contributions of the research and highlights the differences between established approaches in the specialist literature and the proposed conceptual model. The analysis demonstrates that the novelty of the study does not lie in the isolated introduction of new concepts, but in the development of an **integrated theoretical and methodological architecture**, built around the Strategic Maritime Ecosystem as a new fundamental unit of analysis.

Figure 14.

The Integrated Architecture of the Proposed Theory

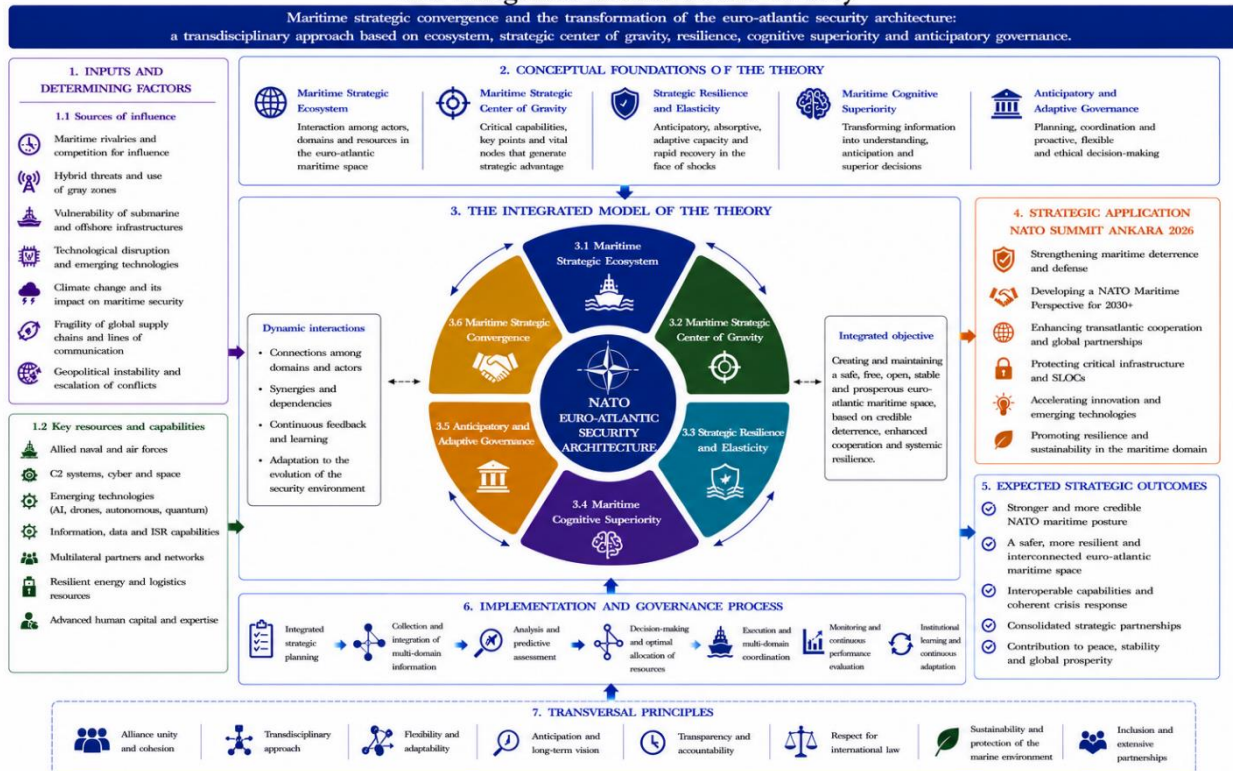


Through the concepts of the Maritime Strategic Centre of Gravity (MSCoG), Maritime Strategic Convergence, Maritime Strategic Resilience, Maritime Strategic Elasticity and Maritime Cognitive Superiority, the research proposes a systemic reinterpretation of contemporary maritime security. The operationalisation of these concepts through the Maritime Strategic Convergence Framework (MSCF) and the Integrated Maritime Security Architecture (IMSA), as well as their

validation through the case study of the NATO Summit in Ankara, lends the model both theoretical consistency and practical applicability.

At the same time, the research also has a number of limitations. The study utilises a single empirical case to validate the conceptual architecture, and the conclusions drawn must be interpreted in light of its specific context. Applying the MSCF and IMSA to other maritime regions and different strategic contexts will enable the degree of generalisability of the model to be tested and any necessary conceptual adjustments to be identified. At the same time, the rapid development of artificial intelligence, autonomous systems and quantum technologies will likely necessitate the future expansion of the conceptual architecture through the integration of new dimensions of maritime security.

Figure 15.
The Integrated Model of the Theory



Overall, the analysis of the NATO Summit in Ankara confirms the central hypothesis of this research. The transformation of the Euro-Atlantic security architecture reflects a shift from a predominantly sectoral and reactive approach to a systemic, anticipatory and multidimensional one. The Strategic Maritime Ecosystem, together with the concepts and methodological models developed in this study, provides an explanatory framework capable of describing this transformation and underpinning future research on the evolution of international maritime security.

Chapter 6

The Legal Implications of the Strategic Maritime Ecosystem

6.1. Beyond the military dimension

One of the limitations of a significant portion of the literature on maritime security lies in the tendency to analyse strategic transformations almost exclusively from a military perspective. Such an approach explains the evolution of naval capabilities, operational doctrines and the balance of power between the actors involved, but only partially captures the complexity of contemporary phenomena. The NATO summit in Ankara demonstrates that developments in maritime security can no longer be understood without integrating the legal, economic, technological and institutional dimensions.

This conclusion has significant implications for the way in which international law of the sea is analysed. In recent decades, legal norms have been interpreted predominantly in relation to the delimitation of maritime zones, freedom of navigation, the jurisdiction of coastal states and the use of marine resources. Recent developments show, however, that these norms operate in a strategic environment radically different from that which existed when they were drafted.

Today, the same legal rule can have simultaneous effects on energy security, the resilience of digital infrastructure, supply chains and regional stability. Consequently, the interpretation of international law must take this interdependence into account, without undermining the fundamental principles of the maritime legal order.

6.2. The functional evolution of freedom of navigation

Freedom of navigation is one of the pillars of international law of the sea and one of the essential conditions for global trade. In its traditional form, this principle sought to guarantee that ships could move without arbitrary restrictions in the high seas.

However, an analysis of the contemporary strategic environment highlights the fact that the effective exercise of this freedom depends on the existence of a set of conditions that go beyond the mere absence of legal obstacles. The functioning of satellite positioning systems, the integrity of submarine cables, the security of digital port systems and the protection of energy infrastructure directly influence the ability to utilise maritime space.

Building on this observation, this study proposes the use of the concept of *Functional Freedom of Navigation*, whereby freedom of navigation is understood not merely as a legal right, but also as the effective possibility of the safe, continuous and predictable use of the maritime space.

The concept does not seek to redefine the legal regime established by international law, but rather to supplement its interpretation by incorporating the technological and infrastructural dimensions that determine the exercise of this right in the 21st century.

6.3. Due diligence in an integrated strategic ecosystem

A similar development can be observed in the case of the duty of *due diligence*. In its classical sense, this imposes on states the obligation to take the reasonable measures necessary to prevent the use of their territory or areas under their jurisdiction for the purpose of causing harm to other states.

In the contemporary maritime environment, this obligation takes on an additional dimension. Protecting subsea infrastructure, preventing hybrid attacks, securing port IT systems and cooperating on information sharing all become components of the same general duty of care.

This is not a matter of the emergence of a new rule of international law, but rather of the extension of the scope of an existing obligation in light of changes in the strategic environment. The

NATO Summit in Ankara indirectly highlights this development through its emphasis on the resilience of critical infrastructure and the strengthening of cooperation amongst allies.

6.4. Critical maritime infrastructure and the collective interest

Perhaps the most significant conceptual consequence of the changes analysed concerns the status of critical maritime infrastructure. Subsea pipelines, communication cables, energy terminals and offshore platforms can no longer be viewed solely as economic assets belonging to operators or states. Their functioning underpins the stability of the international system as a whole.

This observation justifies the development of a perspective according to which the protection of critical maritime infrastructure must also be analysed as an expression of a collective interest of the international community. Such an approach does not alter the legal regime governing ownership or jurisdiction, but it does influence the way in which obligations regarding cooperation, information-sharing and risk prevention are interpreted.

In this regard, the NATO Summit in Ankara can be seen as one of the first instances in which critical infrastructure has been explicitly integrated into the framework of collective security, thereby conferring upon it unprecedented strategic significance.

6.5. A doctrinal architecture in the making

The analysis carried out in this study leads to the conclusion that recent transformations cannot be explained by a single concept or discipline. Maritime Strategic Gravity explains the redistribution of geopolitical interests towards certain maritime areas. Maritime Strategic Convergence describes the progressive integration of the military, legal, energy and technological dimensions. Maritime Cognitive Superiority highlights the role of information in the decision-making process, whilst Maritime Strategic Resilience and Elasticity enable an understanding of how maritime ecosystems respond to and adapt to disruptions.

Together, these concepts form a unified theoretical framework that provides an integrated perspective on contemporary maritime security. The NATO Summit in Ankara does not create this doctrinal framework, but it does provide the first strategic context in which its explanatory value can be observed in a coherent manner.

6.6. Towards a new phase of research in the field of maritime security

The findings of this study suggest that future research in the field of maritime security will need to move beyond the traditional separation between international law, strategic studies, maritime economics and emerging technologies. The complexity of the current environment calls for the development of interdisciplinary models capable of simultaneously explaining the relationships between these fields and providing useful tools for informing public policy.

From this perspective, the concepts and methodological model developed in this study should be understood as a starting point for a line of analysis that is currently taking shape. Their validation will depend on their application in different geographical contexts and on dialogue with the international specialist literature. It is precisely this openness to further research that gives the proposed theoretical framework the character of an academic contribution which goes beyond a one-off analysis of the NATO Summit in Ankara and aims to develop a new perspective on maritime security in the 21st century.

6.7. A shift in perspective on collective security

If the hypotheses developed in this study are correct, then the implications go far beyond an analysis of the NATO Summit in Ankara. In reality, we are witnessing a shift in the way collective security is conceived and organised. For decades, collective defence has been built around the idea

of protecting the territory of member states against armed aggression. However, developments in recent years demonstrate that the functioning of the Euro-Atlantic area depends to an ever-greater extent on the protection of infrastructure and flows that transcend national borders.

In this context, the focus of collective security is no longer exclusively on territory, but on the strategic ecosystem that enables it to function. Ports, submarine cables, offshore energy infrastructure, digital communications systems and logistics corridors are becoming elements whose disruption can have effects comparable to those caused by a conventional military attack.

This development is driving the expansion of NATO's sphere of interest and justifies the increasing emphasis placed on resilience, critical infrastructure and multi-domain cooperation.

6.8. NATO and the transformation of the role of naval power

In the new strategic context, naval power retains its importance, but its function is changing. Whereas in classical doctrine it was primarily associated with control of the maritime domain and the projection of force, today it also serves as a guarantor of the functioning of a complex system of infrastructure and economic interdependencies.

This transformation entails an expansion of naval missions. Protecting trade routes, monitoring undersea infrastructure, cooperating with civilian authorities and integrating information from the cyber and space domains are becoming integral components of maritime operations.

Consequently, operational success can no longer be assessed solely on the basis of military engagement capability. It must also be judged by the contribution that naval forces make to maintaining the stability of the strategic maritime ecosystem.

6.9. The European Union and strategic complementarity

The analysis carried out highlights that many of the vulnerabilities identified in the maritime environment cannot be managed solely through military means. The protection of energy infrastructure, port security, the digitalisation of logistics chains and economic resilience are areas in which the European Union's competences are essential.

This reality underscores the complementarity between NATO and the European Union. Whilst the Alliance provides the primary framework for collective defence and deterrence, the European Union has regulatory, economic and financial instruments capable of strengthening the resilience of critical infrastructure and reducing systemic vulnerabilities.

From this perspective, convergence between the two organisations is no longer merely a political option, but a necessary condition for the effective functioning of European maritime security.

6.10. Romania in the new strategic landscape

For Romania, the transformations analysed in this study are of particular relevance. Its geographical position on the Black Sea, its simultaneous membership of NATO and the European Union, and the development of offshore energy projects confer upon the Romanian state a strategic responsibility greater than that which existed in previous decades.

The importance of the Port of Constanța, the development of exploitation activities within the exclusive economic zone, and Romania's role in supporting regional logistics corridors demonstrate that national security is increasingly closely linked to the security of the regional maritime ecosystem.

This development calls for the development of an integrated strategy that brings together the military dimension, the protection of critical infrastructure, digitalisation, energy security and international cooperation. Such an approach would enable Romania to capitalise on the advantages of its geographical position and to contribute actively to strengthening the security of the Alliance's eastern flank.

6.11. Implications for international law

The developments analysed do not give rise to a new law of the sea, nor do they diminish the importance of existing legal instruments. On the contrary, they demonstrate the robustness of the international legal framework and the need to interpret it in light of new technological and strategic realities.

Freedom of navigation, the duty to cooperate, the exercise of jurisdiction in good faith and the duty of *due diligence* take on increased relevance in a context characterised by interdependence and the vulnerability of critical infrastructure. In this regard, international law is not merely a set of rules applicable to the maritime domain, but one of the mechanisms enabling the functioning of the strategic ecosystem described in this study.

6.12. Convergence as an organising principle

The analysis carried out in this study leads to the conclusion that the common element underlying all recent transformations is convergence. Neither technology, nor critical infrastructure, nor geopolitical competition alone explains the changes taking place in the maritime environment; rather, it is the constant interaction between them.

In this context, Maritime Strategic Convergence is not merely one of the concepts developed in this paper. It constitutes the organising principle of the entire theoretical framework. Maritime Strategic Gravity explains the distribution of interests and vulnerabilities. Maritime Cognitive Superiority explains the mechanisms through which strategic advantage is achieved. Maritime Strategic Resilience and Maritime Strategic Elasticity describe how the system responds to and adapts to disruptions. The Maritime Strategic Convergence Framework provides the methodological tool through which these relationships can be analysed and compared.

Taken together, these elements form a coherent conceptual framework, in which convergence is no longer merely a feature of the contemporary strategic environment, but the fundamental criterion for understanding and assessing maritime security in the 21st century.

6.13. The significance of Ankara 2026 in the evolution of strategic thinking

From this perspective, the NATO Summit in Ankara takes on a significance that goes beyond the confines of a political or military event. Its relevance lies in the fact that it reflects the maturing of an intellectual and institutional transformation through which maritime security is understood as the result of the integrated functioning of complex and deeply interdependent systems.

Thus, Ankara 2026 can be interpreted as the moment when this evolution begins to be reflected in NATO's strategic direction. It is not the summit that brings about the change, but rather recognises it and gives it institutional expression. It is precisely this interpretation that explains why the meeting can be regarded as a landmark in the contemporary evolution of thinking on maritime security and justifies the development of a doctrinal framework capable of explaining this transformation in a systemic and interdisciplinary manner.

Chapter 7

Implications for maritime security governance in the 21st century

7.1. From reaction to anticipation

One of the most significant consequences of the transformations analysed in the preceding chapters concerns the change in the way maritime security governance is conceived. Traditional models were built around a reactive logic, in which institutions intervened after an incident, a conflict or a breach of international law had occurred. Recent developments, however, demonstrate that this approach is no longer sufficient in an environment characterised by complex interdependencies and the acceleration of technological processes.

At present, many of the vulnerabilities in the maritime domain develop gradually and remain invisible until they produce systemic effects. Cyber-attacks on port infrastructure, the compromise of submarine cables, interference with navigation systems or the disruption of logistics chains are not isolated events, but manifestations of processes that evolve over time and can only be identified through continuous monitoring and the integration of information from different sources.

This reality necessitates a shift from a reactive approach to governance to one built around strategic anticipation. The ability of institutions to identify emerging trends and to act before vulnerabilities turn into crises is becoming one of the fundamental prerequisites of contemporary maritime security.

7.2. Integration of institutional actors

The complexity of the current strategic environment highlights the limitations of fragmented institutional models. For decades, responsibilities for maritime security have been divided amongst naval authorities, military structures, port authorities, regulatory bodies, environmental protection agencies and institutions responsible for critical infrastructure. Each of these bodies has developed its own procedures and analytical mechanisms.

Under current conditions, efficiency no longer depends exclusively on the performance of each institution, but on their ability to function as components of the same system. Information sharing, technological interoperability, the coordination of decision-making processes and the development of common risk assessment mechanisms are becoming essential components of maritime governance.

This development does not entail a reduction in institutional powers, but rather the development of a higher level of integration capable of reducing the time required for decision-making and limiting the effects of administrative fragmentation.

7.3. Artificial intelligence and the transformation of maritime governance

Technological progress is bringing about one of the most profound changes in the management of the maritime domain. The volume of information generated by satellites, sensors, autonomous systems, commercial platforms and digital infrastructure exceeds the capacity of human analysis alone. In this context, artificial intelligence is becoming an indispensable tool for identifying anomalies, anticipating risks and informing strategic decisions.

However, the integration of these technologies raises complex legal and ethical issues. Algorithm transparency, accountability for automated decisions, data protection and the maintenance of human control over critical processes are essential conditions for the legitimate use of artificial intelligence in the field of maritime security.

Future governance will not depend solely on technological performance, but on the ability to integrate innovation into a legal and institutional framework compatible with the values of the rule of law and the principles of international law.

7.4. International law and regulatory adaptation

The transformations analysed in this research do not require the abandonment of existing rules of international law of the sea. The United Nations Convention on the Law of the Sea continues to provide the legal foundation for the use of the maritime space and remains one of the most stable normative instruments of the international order.

However, the application of existing norms requires an interpretation capable of responding to technological and strategic realities that did not exist at the time the Convention was adopted. The protection of subsea infrastructure, the use of autonomous systems, cross-border data exchange and the security of maritime communications call for the development of interpretative and institutional practices that allow the law to adapt to changes in the strategic environment without undermining its stability.

In this regard, the evolution of international law will depend more on the consolidation of state practice and international cooperation than on the drafting of entirely new legal instruments.

7.5. Convergence as the foundation of maritime governance

The research findings lead to the conclusion that the effectiveness of maritime governance can no longer be assessed solely in terms of the performance of individual institutions or the robustness of individual legal instruments. The decisive criterion is the system's capacity to integrate expertise, technologies and information into a coherent decision-making process.

In this context, convergence transcends the status of an analytical concept and becomes a principle of institutional organisation. It explains how military security, energy security, cyber security, the protection of critical infrastructure and the application of international law can function as complementary elements of the same governance system.

This perspective allows maritime security to be reinterpreted not as the result of the actions of a single institution, but as the effect of the coordinated functioning of a complex set of actors and legal, technological and strategic mechanisms.

7.6. Perspectives on the evolution of maritime security

The transformations analysed in this study suggest that the coming decades will be characterised by intensified competition for control over critical infrastructure, information flows and the technologies that underpin the functioning of the maritime domain. In this context, strategic advantage will depend to an ever-greater extent on the ability of states and international organisations to anticipate changes, to integrate knowledge from different fields and to continually adapt institutional mechanisms to the dynamics of the strategic environment.

This development confirms that maritime security can no longer be understood solely as an expression of naval power. It is the result of the functioning of a strategic ecosystem in which law, technology, the economy, critical infrastructure and international cooperation are deeply interdependent. It is precisely this conclusion that provides the key to interpreting the NATO Summit in Ankara and explains its place in the contemporary evolution of the Euro-Atlantic security architecture.

7.7. The practical function of conceptual frameworks

Any conceptual framework proves its worth to the extent that it can guide analysis and improve the decision-making process. In the absence of such utility, concepts remain mere theoretical exercises with no impact on institutional practice. From this perspective, the conceptual framework developed in the course of this research aims not only to explain the transformations taking place in the maritime environment, but also to facilitate a more comprehensive assessment of strategic risks and opportunities.

The changes observed in recent years demonstrate that sectoral approaches frequently lead to incomplete assessments. Analyses focused exclusively on the military dimension tend to underestimate the role of critical infrastructure and digital technologies, whilst legal or economic assessments often ignore the strategic implications of geopolitical transformations. In these circumstances, a framework capable of bringing together different perspectives into a common interpretation is required.

7.8. A method of systemic analysis

Applying the conceptual framework developed in this research involves examining each maritime space as an integrated strategic system. The analysis does not begin with an inventory of military capabilities, nor with the identification of specific incidents, but with an understanding of the relationships between actors, infrastructure, legal norms and economic flows.

In this context, the fundamental question is no longer whether a particular actor possesses naval superiority, but whether the entire maritime ecosystem is capable of maintaining its functionality in the event of simultaneous disruptions. The focus thus shifts from assessing individual elements to evaluating the performance of the system as a whole.

Such an approach makes it possible to identify vulnerabilities that are not apparent when each component is analysed separately. For example, a high-performing port infrastructure may become vulnerable in the absence of effective cyber-security mechanisms, just as a modern fleet may see its efficiency diminished if it relies on inadequately protected information systems or fragile logistics chains.

7.9. Anticipating systemic risks

One of the main consequences of adopting an integrated approach is the development of the capacity to anticipate. Systemic risks do not arise suddenly, nor are they the result of a single event. In most situations, they arise through the accumulation of seemingly independent vulnerabilities, which only become apparent when analysed together.

Simultaneously assessing the legal, technological, economic and military dimensions enables these processes to be identified before they produce irreversible effects. In this regard, anticipation should not be understood as a predictive exercise based on certainties, but as a continuous process of reducing uncertainty through the integration of relevant information.

This approach is compatible with the development of modern early-warning mechanisms and the use of artificial intelligence to analyse the large volumes of data generated by the maritime ecosystem.

7.10. Underpinning strategic decision-making

The complexity of the contemporary security environment necessitates moving beyond decision-making models based exclusively on expertise in a single field. Decisions concerning the protection of subsea infrastructure, the development of naval capabilities or the management of hybrid incidents simultaneously involve legal, economic, technological and military aspects.

The conceptual framework developed in this research facilitates the integration of these perspectives into a unified decision-making process. Its value lies not in providing pre-determined solutions, but in structuring the analysis so that decision-makers can assess the systemic consequences of each option.

In this way, the strategic process becomes more coherent and better suited to the multidimensional nature of maritime security.

7.11. Adaptability of the model

The interdisciplinary nature of the conceptual framework allows it to be applied in a variety of geographical and institutional contexts. Although the research uses the NATO Summit in Ankara and the Black Sea region as a case study, the mechanisms analysed are not limited to this area.

Regions such as the Baltic Sea, the Eastern Mediterranean, the Arctic or the Indo-Pacific exhibit different levels of strategic gravity, convergence and resilience, but can be examined using the same analytical principles. Similarly, the model can contribute to the analysis of strategies developed by NATO, the European Union, the International Maritime Organisation or other regional organisations concerned with maritime security.

This flexibility is one of the main arguments in favour of its use as a tool for research and strategic assessment.

7.12. A shift in methodology in maritime studies

The analysis carried out in this research suggests that the evolution of the strategic environment also calls for an evolution in the methods used in maritime studies. The shift from sectoral to systemic approaches is not merely a terminological change, but a change in the way research questions are formulated and the relationships between the various components of security are interpreted.

From this perspective, the key contribution of the integrated conceptual framework lies in its ability to create a common language for disciplines that typically develop separately. International law, strategic studies, maritime economics, cyber security and critical infrastructure analysis do not lose their autonomy, but are brought together within an approach capable of reflecting the complexity of the contemporary maritime environment.

This approach offers not only a different way of interpreting the NATO Summit in Ankara, but also a starting point for developing an interdisciplinary methodology dedicated to maritime security research in the coming decades.

7.13. Research methodology

Research Objectives

This research aims to analyse recent transformations in maritime security within the context of the evolving international strategic environment and to assess the significance of the NATO Summit held in Ankara in 2026 within this process. The central hypothesis is that the Ankara summit is not merely a politically significant moment in the evolution of the North Atlantic Alliance, but reflects the consolidation of a more profound shift in the way maritime security is organised and understood. The research aims to demonstrate that contemporary maritime security can no longer be analysed exclusively through the prism of naval power or international law of the sea, but requires an approach capable of integrating the legal, military, economic, energy, technological and cognitive dimensions.

To this end, the research pursues four objectives. The first is to identify the main transformations that have taken place in the maritime strategic environment over the last two decades. The second aims to assess the significance of the NATO Summit in Ankara in relation to these transformations. The third seeks to develop an integrated conceptual framework designed to explain the relationships between the various dimensions of maritime security. The final objective is to assess the usefulness of this framework by applying it to the case study under analysis and by highlighting its implications for future research.

Research questions

The central question underpinning this research is whether 21st-century maritime security can still be explained by classical models of maritime power, or whether recent developments necessitate the development of an integrated conceptual perspective.

Several lines of analysis stem from this question. Firstly, the research aims to establish to what extent the transformations taking place in the Black Sea and other maritime spaces are altering

the nature of maritime security. Secondly, the relevance of the NATO Summit in Ankara as an institutional expression of these transformations is analysed. Thirdly, the study assesses the explanatory limitations of the main existing doctrinal models and the possibility of developing a conceptual framework capable of integrating the legal, military, economic, energy and technological dimensions into a unified interpretation.

Research methods

The research employs an interdisciplinary methodology combining legal analysis, doctrinal analysis, case studies, strategic analysis and systemic analysis.

Legal analysis is used to examine the relevant provisions of the international law of the sea and the official documents adopted within NATO and other international organisations. Doctrinal analysis enables an assessment of the evolution of classical concepts regarding maritime power and collective security, as well as the identification of their limitations in relation to recent transformations in the strategic environment.

The case study method is applied to the NATO Summit in Ankara, chosen not as the sole subject of the research, but as a representative moment for observing a broader strategic evolution. Systemic analysis complements these methods by examining the relationships between critical infrastructure, institutional actors, emerging technologies, the maritime economy and the international legal framework.

Combining these methods allows us to move beyond a sectoral approach and facilitates the development of an integrated perspective on maritime security.

The process of constructing the conceptual framework

A distinctive feature of this research is the process of developing the conceptual architecture used throughout the analysis.

The concepts introduced in this paper did not form the starting point of the research, nor were they formulated prior to the analysis of documents and specialist literature. They represent the result of an inductive process carried out during the research, in which recurring patterns were identified that could not be satisfactorily explained by established conceptual tools.

A comparative analysis of NATO strategic documents, developments in the Black Sea region, transformations in critical maritime infrastructure, and the literature on maritime security highlighted the existence of systemic relationships between domains traditionally analysed separately. Rather than being treated as independent phenomena, these relationships were interpreted as manifestations of the same process of strategic integration.

As the research progressed, it became evident that the explanations offered by existing doctrinal models were insufficient to describe these interdependencies. Consequently, analytical concepts were gradually formulated to describe different dimensions of the same phenomenon.

Thus, the observation of the concentration of geopolitical, economic and military interests in certain maritime areas led to the formulation of the concept of the Maritime Strategic Centre of Gravity (MSCoG). Analysis of the growing interdependence between the military, legal, energy and technological domains enabled the development of the concept of Maritime Strategic Convergence. An assessment of the role of information and emerging technologies in the decision-making process underpinned the concept of Maritime Cognitive Superiority. An examination of the behaviour of infrastructure and institutions during and after major disruptions led to the distinction between Maritime Strategic Resilience and Maritime Strategic Elasticity.

The result of this process was not the emergence of independent concepts, but the gradual shaping of a conceptual architecture in which each notion explains a different dimension of the same strategic ecosystem. Subsequently, this architecture was operationalised through the Maritime Strategic Convergence Framework and conceptually represented by the Integrated Maritime Security Architecture.

From this perspective, the conceptual architecture presented in this paper should be understood as the result of the research rather than as its premise.

Choice of case study

The NATO Summit in Ankara was selected because it provides a particularly relevant context for observing the transformations analysed in the research. The summit is used as a case study as it brings together, at a single point in time, policy directions on critical infrastructure, resilience, emerging technologies, energy security and strategic cooperation, thereby enabling an assessment of the coherence of the conceptual framework developed throughout the analysis.

Consequently, the summit does not constitute the foundation of the theory developed in this research, but rather the main context used to test its explanatory utility.

Limitations of the research

The research findings must be interpreted within the limits of the methodology employed. The conceptual framework developed in this paper represents an analytical proposal derived from the interpretation of a range of legal, doctrinal and strategic sources and validated through its application to a representative case study. Its consolidation requires application to other maritime areas, comparison of the results with other explanatory models, and the integration of contributions from future research.

From this perspective, the research does not aim to formulate a definitive theory of maritime security, but rather to develop the foundations of an interdisciplinary conceptual framework capable of facilitating the analysis of the transformations taking place in the contemporary strategic environment.

I believe this version resolves an important methodological issue. It shows that **you did not invent the concepts**, but that they **emerged through induction** as you realised that the existing literature did not sufficiently explain certain relationships between phenomena. This is a much stronger and more credible position in the eyes of reviewers and is in line with the way in which conceptual contributions are presented in high-level academic literature.

Conclusions

The transformations that have taken place in the international security environment over the last two decades have profoundly altered the way in which the maritime domain and its role in the stability of the international order are understood. The intensification of geopolitical competition, the development of critical undersea infrastructure, the acceleration of technological progress and the growth of economic interdependencies have led to the expansion of the strategic functions of the sea beyond the traditional dimension of naval confrontation. In these circumstances, maritime security can no longer be interpreted solely in terms of military control of the maritime domain or freedom of navigation, but must be analysed within the context of the complex interrelationships between infrastructure, technology, law, the economy and strategic power.

An analysis of the NATO Summit held in Ankara in 2026 confirms this development. The significance of the meeting stems not only from the policy guidelines adopted, but above all from the fact that these reflect the maturing of a conceptual shift that has gradually taken place within the Euro-Atlantic security architecture. The summit does not represent the origin of this transformation, nor does it mark the emergence of an entirely new doctrine. Its significance lies in the institutional recognition of a strategic reality in which the protection of critical infrastructure, societal resilience, technological development, industrial cooperation and energy security are integrated into the same framework of collective security.

Building on this observation, the research sought to develop a conceptual framework capable of explaining the relationships between the legal, military, economic and technological dimensions of maritime security. The analysis demonstrated that these dimensions no longer operate autonomously, but rather form a system characterised by interdependence and constant adaptation. In this context, maritime security emerges as an emergent property of the functioning of a strategic

ecosystem, rather than as the result of the performance of a single institutional or operational component.

This shift in perspective constitutes the main contribution of the research. Instead of an approach centred exclusively on actors, military capabilities or individual incidents, the analysis proposes directing research towards the functioning of strategic maritime ecosystems. Such an approach enables an understanding of the relationships between critical infrastructure, naval power, emerging technologies, the maritime economy and international law as elements of the same security system.

In this regard, the conceptual and methodological framework developed in this paper aims to complement established analytical tools, without diminishing the relevance of classical theories of maritime power or international law of the sea. On the contrary, the robustness of these doctrinal constructs makes it possible to integrate them into a more comprehensive explanation, adapted to the transformations taking place in the contemporary strategic environment.

The implications of this perspective extend beyond an analysis of the NATO Summit in Ankara. In a context characterised by multi-domain competition, accelerated digitalisation and the vulnerability of critical infrastructure, the assessment of maritime security requires the development of methods capable of simultaneously capturing the legal, strategic, economic and technological dimensions of the same phenomenon. Such an approach can contribute both to underpinning interdisciplinary research and to strengthening strategic planning and public policy-making processes in the field of maritime security.

At the same time, the research findings must be interpreted within the limits of the methodology employed. The conceptual framework developed requires further validation through its application to other maritime areas and through comparison with findings from different geopolitical contexts. Regions such as the Baltic Sea, the Arctic, the Eastern Mediterranean or the Indo-Pacific offer significant opportunities to test the model's explanatory power and flexibility in relation to distinct strategic configurations.

From this perspective, the analysis of the NATO Summit in Ankara represents not so much the conclusion of a research project as the beginning of a line of inquiry into how maritime security is evolving within an international system characterised by convergence, interdependence and continuous adaptation. To the extent that this approach is developed, critically discussed and applied in subsequent research, it may contribute to a more comprehensive understanding of maritime security in the 21st century and to the development of an interdisciplinary dialogue between international law, strategic studies, maritime economics and the technology sciences.

This study proposes not only a new interpretation of contemporary maritime security, but also a new unit of analysis and a new conceptual framework capable of integrating the legal, strategic, technological and institutional transformations of the maritime domain within a systemic perspective.

Bibliography

Studies and analyses by the Maritime Security Forum

1. Aurel Popa, Constantin Ciorobea, Cornel Rogozan, Ioan Crăciun, Ion Custură and Sorin Learschi, *Romania's Maritime Resilience in the Era of Hybrid Threats and the Importance of a Maritime Security Strategy* (Published by the 'Mircea cel Bătrân' Naval Academy, 2023). ([Rezilienta-maritima-a-Romaniei-in-era-amenintarilor-hibride2-BT.pdf](#))
2. Aurel Popa and Sorin Learschi, *The Operationalisation of the European Maritime Security Hub in the Black Sea: Romania's Urgent Institutional Obligations between Strategy, Governance and Capacity* (Maritime Security Forum 2026). ([The-Operationalisation-of-the-European-Maritime-Security-Hub-in-the-Black-Sea – Maritime Security Forum](#))

3. Aurel Popa and Sorin Learschi, '*Russia's Strategic Naval Collapse in the Context of the War in Ukraine (2022–2025)*' (Maritime Security Forum 2025). ([Russia's Strategic Naval Collapse \(2022–2025\) in the Context of the War in Ukraine – Maritime Security Forum](#))
4. Aurel Popa, 'Critical maritime infrastructure: importance, vulnerabilities and international regulations' (Maritime Security Forum, 18 February 2025), accessed 10 July 2026. (<https://www.forumulsecuritatiimaritime.ro/artificial-intelligence-and-the-new-maritime-defence-architecture-case-study-the-black-sea-and-the-port-of-constantia/>)
5. Sorin Learschi and Aurel Popa, 'Liminal Maritime Aggression in the Black Sea: Romania at a Crossroads of Energy Security' (Maritime Security Forum, 10 April 2026), accessed 10 July 2026. ([Liminal Maritime Aggression in the Black Sea: Romania at a Crossroads of Energy Security – Maritime Security Forum](#))
6. Aurel Popa and Sorin Learschi, 'Artificial Intelligence and the New Maritime Defence Architecture: Modern Systems for the Detection and Countermeasures against Unmanned Surface Vehicles and Artificial Intelligence-Assisted Sensor Fusion for the Protection of Critical Maritime Infrastructure—Case Study: the Black Sea and the Port of Constanța' (Maritime Security Forum, 8 July 2026), accessed 10 July 2026. ([ARTIFICIAL INTELLIGENCE AND THE NEW MARITIME DEFENCE ARCHITECTURE—Case study: the Black Sea and the Port of Constanța – Maritime Security Forum](#))
7. Sorin Learschi, 'Network-Centric Warfare and Its Implications for the Maritime Domain' (Maritime Security Forum, 30 October 2025), accessed 10 July 2026. ([Romania's and the Autonomous Naval : towards NATO's first hybrid fleet Maritime Security Forum](#))
8. Aurel Popa and Sorin Learschi, 'Romania's Fleet and the Autonomous Naval Revolution: Towards NATO's First Hybrid Fleet in the Black Sea' (Maritime Security Forum, 18 May 2026), accessed 10 July 2026. ([Romania's and the Autonomous Naval : towards the first NATO hybrid Maritime Security Forum](#))
9. Aurel Popa and Sorin Learschi, 'The Possibility of Establishing a Special Regime for the Strait of Hormuz: Legal, Maritime and Geopolitical Arguments' (Maritime Security Forum, 20 March 2026), accessed 10 July 2026. ([forumulsecuritatiimaritime.ro](#))
10. Aurel Popa, Cristina Elena Popa Tache and Sorin Learschi, '*Beyond the Dispute: The Legal, Strategic and Geopolitical Implications of the Arbitral Award in Ukraine v. the Russian Federation for the Future of the Black Sea*' (Maritime Security Forum 2026). ([SUMMARY OF THE STUDY – The Ukraine v. Russian Federation Arbitral – Maritime Security Forum](#))

I. Books

1. Bateman S, *Solving the "Wicked Problems" of Maritime Security: Are Regional Forums up to the Task?* (RSIS Monograph No 23, S Rajaratnam School of International Studies 2011).
2. Booth K, *Navies and Foreign Policy* (Croom Helm 1977).
3. Bueger C and Edmunds T (eds), *The Routledge Handbook of Maritime Security* (Routledge 2024).
4. Corbett JS, *Some Principles of Maritime Strategy* (Longmans Green 1911).
5. Gray CS, **The Leverage of Sea Power: The Strategic Advantage of Navies in War** (Free Press 1992).
6. Haydon P, *Maritime Strategy and the Nuclear Age* (Naval Institute Press 1998).
7. Mahan AT, *The Influence of Sea Power upon History, 1660–1783* (Little, Brown and Company 1890).
8. Murphy MN, **Small Boats, Weak States, Dirty Money: Piracy and Maritime Terrorism in the Modern World** (Hurst 2009).
9. Till G, *Seapower: A Guide for the Twenty-First Century* (4th ed., Routledge 2018).

II. Chapters in edited volumes

1. Bateman S, 'Maritime Security Governance' in Geoffrey Till (ed), **Seapower: A Guide for the Twenty-First Century** (Routledge 2018).
2. Bueger C, 'What is Maritime Security?' in Christian Bueger and Timothy Edmunds (eds), *The Routledge Handbook of Maritime Security* (Routledge 2024).

III. Articles

1. Bueger C, 'What is Maritime Security?' (2015) 53 *Marine Policy* 159.
2. Klein N, 'Maritime Security and the Law of the Sea' (2011) 71 *Zeitschrift für ausländisches öffentliches Recht und Völkerrecht* 267.
3. Kraska J, 'The Law of Naval Warfare and the Maritime Domain' (2020) 95 *International Law Studies* 1.
4. Murphy MN, 'Maritime Security Challenges' (2013) 89 *International Affairs* 7.
5. Till G, 'Maritime Strategy in a Globalised World' (2016) 92 *RUSI Journal* 32.
6. Popa Tache CE, 'Artificial Intelligence, Existential Risks and International Obligations' in Cătălin-Silviu Săraru, Cristina Elena Popa Tache and Francesco Cristani (eds), *Law, Ethics and Human Vulnerability* (Springer 2026).
7. Popa Tache CE, Săraru CS and Salles SdS, **Digital Boom – Current Issues from International Investment to Human Rights** (Cambridge University Press, forthcoming).
8. Popa Tache CE, Pasquier F, Săraru CS, Vădean Tarmure M and Salles SdS, *A Transdisciplinary Legal Methodology Guide and Lexicon for Crisis Response* (Palgrave Macmillan 2025).

IV. NATO Documents

1. North Atlantic Treaty Organisation, *Brussels Summit Communiqué* (2021).
2. North Atlantic Treaty Organisation, *NATO 2022 Strategic Concept* (Madrid 2022).
3. North Atlantic Treaty Organisation, *Washington Summit Declaration* (2024).
4. North Atlantic Treaty Organisation, *Ankara Summit Declaration* (2026).
5. North Atlantic Treaty Organisation, *Maritime Strategy* (2011).
6. North Atlantic Treaty Organisation, *Emerging and Disruptive Technologies Strategy* (2023).

V. UN and IMO documents

1. International Maritime Organisation, *Revised Maritime Security Measures* (IMO 2021).
2. United Nations, *Convention on the Law of the Sea* (adopted 10 December 1982, entered into force 16 November 1994) 1833 UNTS 397.
3. United Nations General Assembly, *Our Common Agenda* (UN Doc A/75/982, 2021).
4. United Nations Secretary-General, *Our Common Agenda – Policy Brief on a New Agenda for Peace* (2023).

VI. The European Union

1. Council of the European Union, *European Union Maritime Security Strategy* (2023).
2. European Commission, *Joint Communication on the Update of the European Union Maritime Security Strategy and its Action Plan JOIN(2023) 8 final*.
3. European External Action Service, *Strategic Compass for Security and Defence* (2022).

VII. Case law

1. *Military and Paramilitary Activities in and against Nicaragua (Nicaragua v United States of America)* (Merits) [1986] ICJ Rep 14.
2. *South China Sea Arbitration (Philippines v China)* PCA Case No 2013–19, Award (12 July 2016).
3. *Dispute concerning Coastal State Rights in the Black Sea, Sea of Azov and Kerch Strait (Ukraine v Russian Federation)* PCA Case No 2017–06, Award (2024).

VIII. Literature on AI and security

1. Russell S, **Human Compatible** (Viking 2019).
2. Scharre, P., **Army of None** (WW Norton, 2018).
3. Scharre P, **Four Battlegrounds** (WW Norton 2023).