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The One Company Business Model of Leonardo International

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Abstract

The research focuses on the aerospace and defense sector, looking into one of the key companies from a global standpoint. The top-down industrial market study presented in the first chapter, starts with an overview of global performance, moves on to the European continent, and ended with an introduction to the Italian market and Leonardo Spa.

A theoretical and practical description of internationalization is given in the second chapter. The study examines the internationalization strategies that a company should pursue in accordance with its primary objectives, looking at the ideal harmony between local responsiveness and cost pressure. The international strategies are discussed in the context of the aerospace industry, emphasizing the significance of internationalization in this field as well as the need to act globally with a network of partners in order to cut costs and benefit from the high level of local responsiveness in terms of customer satisfaction.

The third chapter discusses the study's principal goal and the approach used to address the Research Question: *“How Leonardo Spa could unify its business model with the local entities abroad? Which is the role of Leonardo International Spa?”*

The last chapter describes Leonardo Spa (parent company), Leonardo International Spa (commercial subsidiary) and the 26 foreign local entities operating around the world, their goals and strategic orientation in the mid-long term. It gives a general overview of the stakeholders' actual operational and business models, as well as their actual organizational structure and product offerings. A new organizational structure, a different approach to the global offering, and the optimization of the business model through a g-local value chain are suggested as additional key pillars for Leonardo to succeed in a global setting. However, other studies claim that, because of various constraints, it is difficult to apply the recommended transformation. For this reason, Leonardo International is heavily emphasized as the key facilitator capable of managing the foreign local companies and carrying out this transition successfully.

Targeting the areas where the new business model may be used is also crucial, as is determining the best go-to-market strategy based on regional variations and the biggest obstacles that the company will face in the future.

The company case studies for Boeing and Airbus are in the final paragraph. There is a brief study of each company's ecosystem and the outcomes of the international strategy adopted to compete in the Chinese market.

The key suggestions to give to Leonardo Spa are presented in the conclusion. The research specifically advises Leonardo Spa to follow three primary directions. To start, it has to implement a matrix organizational structure in order to benefit from cost savings and increased customer satisfaction. Second, it has to expand the items it offers and seek to provide customers with customized products in a timely way using its network of 26 international local businesses operating abroad. Last but not least, it should innovate its business model along the value chain to create a G-local value chain. This will allow it to develop both more conventional products through the already established global value chain and more innovative products through local centers of excellence that can quickly respond to local needs.

The research also emphasizes Leonardo International Spa's management of the company's transition to the One Company Business Model. Its ability to unify the foreign local entities should make it the primary enabler of this transition. It shall serve as a coordinator for the network of foreign local entities, coordinating the interests and objectives of the Parent Company with those of the foreign entities.

1. Aerospace & Defense Industry

The Aerospace/Defense Industry serves, as its name represents, two main markets: Aerospace, which largely comprises the production, sale, and service of commercial aircraft; Defense, which is dependent on the nation's need for military weapons and systems designed to operate on land, sea, and in the air (sourced from aia-aeroSpace.org). Aerospace and Defense (A&D) companies build aircraft, ships, Spacecraft, weapon systems, and defense equipment. They sell their products and supporting services and sustainment programs to both governments and private companies, but government customers' requirements generally drive product development priorities. Many of these companies are state owned or state influenced to some degree, and some have grown out of public-private partnerships or government functions that have been privatized. This discussion is primarily focused on A&D companies that make military and security equipment. Many of the same developmental challenges also apply to commercial aviation and Space companies, which may face even greater challenges due to lack of government co-investment (Statista, 2022).

Due to rising commercial aviation demand and the development of the military aviation industry, the worldwide aerospace and defense market is expanding. Additionally, factors including quick urbanization, rising air travel demand, expansion of low-cost airlines, rising need for lightweight aircrafts, and fuel-efficient engines are anticipated to support market growth. Additionally, rising government spending on military aviation, the increase in R&D efforts to produce sophisticated aircraft and the introduction of new products by well-known market players, are all expected to lead to attractive prospects in the global aerospace market in the future.

The global aerospace market analysis is based on two major key points: type of application and geographical market opportunities. The most important applications are related to the general aviation, the commercial aircraft and to the military aircraft. While focusing on the geographical factor, North America is anticipated to lead the global aerospace industry and have the largest market share (NextMoveStrategy Consulting, 2022). Favorable government policies, rising military spending, cutting-edge technology, sophisticated infrastructures, and the presence of top aircraft manufacturers are some of the other factors supporting market expansion in this area. At the same time, Asia Pacific is predicted to have quick development and a significant gain in market share due to its fast industrialization, increased government involvement in military aviation, easy access to raw materials, and availability of low-cost

operators. In addition, rising disposable incomes and increased demand for low-cost airlines are anticipated to drive the commercial aviation sector, which will fuel the expansion of the aerospace business (Next Move Strategy Consulting, 2022).

1.1 Market Analysis

Analyzing the Aerospace and Defense (A&D) industry, it is very important to understand the main stakeholders involved, the main products commercialized and the main customers:

- *Products and Services:* A&D goods include satellites, the Space shuttle, ships, tanks, helicopters, and aircraft. Radar, surveillance, and missile systems. They are normally constructed to order, cost several million dollars apiece, and have lengthy wait periods. They need sophisticated engineering and are expensive to produce. Its goods frequently have lengthy product lives. Over the course of their lives, they undergo several engineering adjustments after being created. To operate A&D products, maintenance, repair, and overhaul (MRO) are essential. At different points in the supply chain, such as the airfield, contractor facility, or depot, maintenance might be carried out.
- *Suppliers:* They may be divided into two categories. A small number of major OEMs, including Boeing, Lockheed Martin, Raytheon, and EADS, make and supply Spare parts and MRO (Maintenance, Repair, and Over-haul) services for fixed-wing aircraft, rotorcraft, and other commercial and military systems. These companies are considered Tier I Aerospace manufacturers and Defense contractors. The other companies, that are component manufacturers, producing engines for a variety of aircraft are included in Tier 2 (Safavi, 2005). Since aero-Space systems are rather expensive and often have a life span of more than 20 years, it is frequently more cost-effective to re-manufacture or repair the existing ones than purchase new ones. MRO is a substantial source of income for defense contractors and aerospace manufacturers. As production is increasingly outsourced, Tier 1 suppliers are concentrating on hardware design, assembly, and after-market support. Numerous components, services, and logistical support are offered by other significant Aerospace vendors.
- *Customers:* Since A&D vendors seldom ever sell to consumers, macroeconomic variables like energy costs, discretionary expenditure, population growth, and wage inflation have a significant impact on the demand for commercial hardware. Commercial airlines and tour operators reduce or postpone the acquisition of new aircraft when travelers and tourists are

few or when operational losses are experienced. Contrarily, the demand for aerospace military products is influenced by geopolitical shifts, legislative expenditures, financial limitations, and governmental regulations. US Armed Services and foreign governments are the main consumers of these items. It's crucial to understand how frequently crucial parts need to be repaired. If a significant component has failed and cannot be repaired, it must be replaced. It is a difficult task to predict how many deployed systems will fail and how many of them will be damaged beyond repair over time. One or more components may need to be changed when a system malfunctions. Forecasting the number of components that will need to be replaced (as opposed to fixed) after a system breakdown is also necessary (Vieira & Loures, 2016)

1.1.1 2021 Worldwide Overview Performance

In 2021, the aerospace and military sector recorded \$712 billion in sales, a 4% increase over 2020, and \$62 billion in operating profit, a 136% increase (PwC, 2022). The performance of the sector, however, is still well below pre-pandemic record levels. Industry sales fell 6% short of the 2019 record of \$754 billion, while operating profit fell 24% short of the \$82 billion record set in 2018. As stated in to the PwC research, Boeing, Airbus, and Raytheon Technologies together reported joint profit improvements of over \$24 billion of the \$36 billion gain for the total industry, accounting for almost two-thirds of the sector's overall profit growth (PwC, 2022).

Commercial aviation and aerospace performance 2021 overview

Following the turmoil in 2020, aircraft manufacturers had a partial rebound in 2021, even if there is still a long way to go before reaching pre-pandemic output levels. RPKs¹ are improving in commercial passenger aviation. The demand for international passengers fell by 75.5 percent in 2021 while the demand for domestic passengers in the US fell by 28.2 percent. Despite the Omicron variant's restriction of holiday travel (with overall traffic for December 2021 was 45.1 percent lower than December 2019), demand in early 2022 has increased (PwC, 2022).

¹ Revenue Passenger Kilometers or revenue passenger miles (RPM) measures the air traffic for airbus and aircrafts using the formula: RPK or RPM = P*D where P is the total of revenue paying passengers and D is the distance travelled in kilometers

Defense performance 2021 – 2023 overview

In 2021, 2,113 billion dollars were spent, equal to 2.2% of global GDP. The United States, China, India, the United Kingdom and Russia account for 62% of the total. The economic effects of the Covid-19 pandemic have not stopped the trend towards increasing budgets for the Defense sector since 2015 (SIPRI, 2022). Given the high rate of inflation and the conflict in Ukraine, some Countries are calling for an even larger rise. In reaction to the conflict in Ukraine, a number of European nations, notably Germany, have pledged to increase military expenditure to 2 percent of GDP or perhaps higher, while Sweden and Finland are anticipated to accede to NATO. Additionally, in reaction to China's military modernization, defense expenditure among Pacific allies was already on the rise. A large portion of these increases won't be noticeable until 2023. As a result, it could be anticipated modest growth in the military industry for 2022, however there is a chance that continuing supply chain issues may cause performance to be flat or possibly decline. For 2023, it's predicted high single-digit growth. Probably, that near-peer threats and the aforementioned modernization sectors will be the military priorities: artificial intelligence, directed energy, unmanned systems, tiny satellites, hypersonic flight, and 5G (PwC, 2022).

1.1.2 2020 - 2021 Europe Overview Performance

Despite the modest recovery, passenger traffic in commercial air travel was significantly down (-73%) in September 2020 compared to the same month last year. In September 2020, capacity levels similarly decreased year over year (-63%), while load factors fell to 60%. Due to the ongoing effect on passenger demand, it is anticipated that passenger traffic would decrease by 66% in 2020 before increasing by 75% annually in 2021. Passenger traffic will probably continue to be roughly 40% below pre-pandemic levels notwithstanding the comeback (Deloitte, 2022). Due to unmet demand, a successful COVID-19 vaccination might cause a short-term increase in passenger traffic. However, as virtual meetings are anticipated to continue to replace in-person meetings for a considerable amount of time, this is unlikely to outweigh the continued harm to profitable business trips, which may take two to three years to recoup.

As military projects continue to be essential to national defense, especially in light of geopolitical challenges, it is anticipated that defense expenditures and contractor profits would remain essentially steady in 2021. In 2021, it is anticipated that global defense spending would increase by around 2.8% and surpass \$2 trillion (Deloitte, 2022).

During the period 2022-2027, it is expected that the aerospace and defense market in Europe will grow at a CAGR of around 2.4%. The development of the aerospace and defense sector in Europe has been facilitated by rising demand for both commercial and military aircraft as well as significant increases in defense budget. Leading industry stalwarts like BAE Systems, Rolls Royce, Safran, Thales, and Leonardo are present, which supports local R&D and significant production (MordorIntelligence, 2022).

Covid Impact

The number of passengers transported by the world's airlines fell by more than 60% in comparison to 2019 due to the COVID-19 and global travel restrictions (from 4.5 billion to 1.8 billion). Due to the Covid-19 pandemic's effects, the civil aeronautics industry had to endure the biggest crisis in its history in 2020 (Aerospace and Defense Industry Association of Europe, 2022). Sales dropped to €99.3 billion, a 24% reduction. In March 2020, a dramatic drop in demand for air travel caused a huge number of aircraft orders to be canceled. At the worst of the crisis, new orders nearly came to an end, having a significant negative impact on the whole value chain of European aviation (MorderIntelligence, 2021).

A&D members' exports of civil aeronautics decreased by an extraordinary 19% in 2020 to €88.3 billion, although they still accounted for around two-thirds of all exports. Exports have generally contributed significantly to the European economy's net trade balance, even in the challenging year of 2020 (Aerospace and Defense Industry Association of Europe, 2022).

Moving to the industry future, *Eurocontrol* has released a short-term forecast, showing that 9.5 million flights are expected in the network in 2022 (85% of 2019 levels), despite the impact of the invasion of Ukraine and global economic challenges (Eurocontrol, 2022). This is slightly below the level expected in the previous forecast publication for 2022 (89%) (MorderIntelligence, 2021) – largely as a result of the Omicron variant's impact on the first quarter. It is now expected that the recovery to 2019 levels will take place during 2024, with the baseline scenario indicating 10.6 million flights in 2023, 5% down on 2019. However, there are still significant risks surrounding the forecast, not least as a result of rapidly-evolving events.

1.1.3 2021 Italy Overview Performance

The Italian aerospace industry is composed by Five regional players and over 300 small- and medium-sized enterprises (SMEs) stand out at the national and international level, both in civil and military fields. The major players include Leonardo, Fincantieri, Ge Avio Aero, Thales Alenia Space Italia, Avio S.p.A. and Elettronica. The industry is characterized by a highly skilled workforce. Leonardo counts some 4,000 Italian SME suppliers that support 52 Italian sites. Leonardo Spa is the biggest Italian player in the aerospace industry, providers of aerospace structures and aircraft, highly technology components, communication, navigation, and Earth observation services (International Trade Administration, 2021). One of the top 10 high-tech corporations in the world, it works in the aerospace, defense, and security industries. Its annual revenue, which is over €13 billion in 2021, is derived 85% from the worldwide market.

Regarding the Italian market, **we must highlight the important role that SMEs** may play in this industry and for Leonardo itself, in order to improve technology and productivity for bigger businesses. This is the case of Vitrociset Spa, a Leonardo Group company that, in the past, has worked with important Space agencies (ESA, CNES, ASI), as well as with both public and private companies, on the design, implementation, and validation of operating systems for the ground segments of various Space programs and now it represents a high adding value for Leonardo Spa (SpaceMix, 2022).

Figure 3. Top Defense companies by revenue in Europe 2021

Characteristic	Revenue in billion U.S dollars
Airbus SE	60
BAE Systems PLC	26.82
Thales SA	20.49
Safran SA	20.06
Leonardo SpA	16.18
Rolls-Royce Holdings PLC	12.18
Rheinmetall AG	7.09
Dassault Aviation SA	6.62
Babcock International Group	6.07
TransDigm Group	5.31

Source: Statista 2022, by Financial Times

In the *Chapter 4* of this study there will be an analysis of Leonardo SpA with a comparison to the international strategies implemented by two of the major global players: Boeing and Airbus.

Boeing is the world's largest aerospace company and leading manufacturer of commercial jetliners, defense, Space, security systems, and aftermarket support service providers. Boeing products and tailored services include commercial and military aircraft, satellites, weapons, electronic and defense systems, launch systems, advanced information and communication systems, and performance-based logistics and training (sourced by boeing.com).

Airbus, the largest aerospace and Space corporation in Europe, is at the forefront of the aviation sector and has more than 125,000 workers. It routinely wins a high percentage of all commercial airliner orders because it produces the most cutting-edge commercial aircraft. It is able to provide goods that link people and places via air and Space because of their profound grasp of shifting market demands, customer-centered approach, and technical innovation (sourced by airbus.com).

1.2 Future Trends

After an in depth analysis of the market and its geographic segmentation based on a top-down approach, it's important to understand the future of the industry analyzing the main trends and challenges. Diverse technical, economic, social, and regulatory changes, as well as evolving industry dynamics, will influence the direction of A&D industry in the future.

1.2.1 Technology and Innovation

The A&D industry will be impacted by a variety of technological developments, such as advancements in automation and digitization, new materials, alternative energy sources, and storage, as well as the continued proliferation of data sources and the ability to transmit data, as well as the increasingly quick development cycles brought on by Industry 4.0 (Aerospace and Defence Industries Association of Europe, 2021).

Personalized delivery and transportation services will be made possible by combining universal connection with artificial intelligence (AI). Modern materials that make it possible to provide speedier delivery at a reduced cost will likely be incorporated into new product designs, which will probably be produced quickly. Additionally, improvements in autonomy will save costs while enhancing the safety capabilities of human operators (Camposa & Enriques, 2022). Unmanned traffic management (UTM) will be achievable thanks to AI, high-capacity processing, and widespread cloud computing, freeing passengers from driving and navigating. In some situations, these cars may be powered by alternative energy sources in a future that is more eco-friendly. With more connected devices as a consequence of improved connection, there will certainly be an increase in risk, particularly from cyberthreats that could threaten the security of networks, systems, and data by taking advantage of flaws in technology. Indeed, cybersecurity will be one of A&D's top priorities, especially in light of the changing requirements of the military industry as complicated and many demands for national security are made (Ukwandu, Ben-Farah, & Hindy, 2022)

Regarding the defense industry, the most cutting-edge technologies have always been used in defense systems (e.g. advanced sensors, secure communications, stealth technology). However, future warfare will increasingly be characterized by a system architecture approach that makes use of new, disruptive technologies (such as artificial intelligence, quantum computing, 5G, biotechnology, human augmentation, and novel materials) that are primarily propelled by

significant investments in the commercial sector. Despite the fact that the defense sector won't be leading the way in the development of these technologies, it is essential to adapt and transform them into military systems that satisfy the demands of armed forces. The structure of the defense industrial and technology base is anticipated to be impacted by the growing significance of commercially driven technologies. It will attract new players to the military industry and force defense firms to change their business plans to accommodate the requirement to include these cutting-edge technology into the goods (AeroSpace and Defence Industries Association of Europe, 2021).

1.2.2 Economic and Societal Trends: Attract and Retain Talent Pool

As economic and geopolitical developments take place in the background, technological trends continue. Demographic patterns are anticipated to remain mostly unchanged. Global urbanization will also continue, as will the aging of wealthy nations and the expansion of the middle class. The rivalry for resources will rise as a result of these changes. They may also have an impact on public markets that are more oriented toward consumers and sustained public debt expansion (Wingerter, 2019)

The A&D sector has always been the top choice for personnel that the sector needs most, including aeronautical engineers, mechanical engineers, and electrical engineers, among others. The business could find and develop the talent it required to provide precise solutions and satisfy the demanding of its customers. The solutions that the sector must provide will demand a different kind of expertise as the needs of the consumers change. For instance, if AI becomes more prevalent, the technical workers of today will probably need to acquire the abilities necessary to create machine learning algorithms (Raz, Guariniello, Blasch, & Mian, 2021) Furthermore, the sector will also have to compete with other businesses that could be more appealing to the kinds of people that A&D is hoping to draw (for example, data scientists and computer scientists). There will be fierce competition for talent from both inside and outside the business as the skill mix required by the sector changes. To attract a different talent pool for which the sector may not be the default choice, A&D will need to improve its approach to recruiting, incentives, career growth and more. This will show itself in the difficulties posed by the specific security clearance needs for A&D as well as the obstacles of attracting and keeping talent.

1.2.3 Policy and Regulation

The rate of adoption of new technology has surpassed the capacity of authorities to update standards, as is true in many sectors. For instance, the A&D business has already discovered that the lack of clarity surrounding liability and intellectual property norms, ownership, and rights makes it more difficult to engage in technical advancements, particularly R&D (Strube, 2016). Investment decisions become more difficult due to established criteria that restrict some A&D exports independent of market variations, such as various financial and regulatory requirements, such as the Missile Technology Control Regime (MTCR). Further uncertainty and greater compliance costs for the A&D business are also predicted by the absence of agreement on cybersecurity regulations and increasing emissions rules. Government and business executives are both hopeful and worried about the possibility of rising autonomy in both civil and military applications. On the one hand, autonomy may support and occasionally replace human judgment and act as the framework for effective, adaptable, and practical systems (Koshova & Hbur, 2021). Nevertheless, the security of interconnected assets and automated decision-making continue to pose considerable dangers. Although the public's reaction to these novel technologies is not yet evident, authorities are moving forward with the certification of new platforms and with considerations of platform autonomy for those already in use.

1.2.4 Industry Dynamics

Our understanding of the A&D industry is being expanded by new and unconventional actors, particularly those from nations like China, who are utilizing new technology and business models (Cliff, Yang, & Ohlandt). Startups, for instance, are already engaged in the mobility solutions market. Traditional players are also experimenting with new technologies and business models, notably those involving analytics, quantum computing, cybersecurity and directed energy. Established A&D players are discovering that their current operating and investing paradigms may need to evolve as sources of finance grow more diversified, particularly when the private sector increases its level of investment.

1.2.5 What's Next

Leaders in the industry have presented a positive outlook for the future of A&D. However, many of the components needed to support novel use cases have not yet been created

(What's Next for Aerospace and Defense , 2019). According to experts, the A&D sector has to significantly improve in six categories in order for America to maintain its leading position:

1. *Autonomy and insights:* UTM will be made possible by low-cost sensors, growing AI (a byproduct of autonomous decision-making), and permanent connection, which will allow for dense air traffic. Connectivity, AI, and sensors will all work together to create a system that allows decision-makers to get insights from unstructured data from many sources. Recent competitors are already working on projects focused on handling unstructured data. An outside authority, such as the government or industry groups, must define and publish norms on AI decision-making, privacy, and autonomy in order to ethically and securely activate the promise of autonomy and insights (What's Next for Aerospace and Defense , 2019). There are fewer means to assure safety, dependability, and integrity without rules that hold operators accountable, and public trust and desire to engage in such systems might decline or fail to emerge at all.
2. *Materials, technologies and designs:* Future systems will often be built on cutting-edge materials, technology, and designs. The development of battery technology will determine the availability of clean and dependable electricity necessary to allow energy-dense electric propulsion. Many fresh faces at A&D are already putting these to work. Similar to this, greater energy density is required to retrofit directed energy technologies onto existing platforms. To enable silent supersonic platforms and reduce the difficulties of overland flight, advanced materials and creative designs will be needed (Tiwary, Kumar, & Chohan, 2022). Similar difficulties with hypersonic flight need the creation of very resilient materials and systems that provide efficient control at hypersonic speeds. Flexible force projection (quick and efficient resource deployment to solve crises, create stability, and issue deterrents) will be made possible by these materials and designs. Other hypersonic uses, such the quick delivery of key assets, will necessitate designs with safe landing capabilities. Barriers to entry into the Space sector will be reduced over the next generations, enabling the deployment of both big and small satellite constellations as well as Space manufacturing and resource extraction. An ongoing feature of this developing business will be the development of new materials, technologies, and designs that provide speed and efficiency at a reduced cost.
3. *Connectivity infrastructure:* No matter the altitude or speed, there will be high-bandwidth global connection if infrastructure keeps up with connectivity demands. Updated connection infrastructure can enable secure device-to-device communication, improving

privacy and security (Accenture, 2022). Low-cost, high-bandwidth technologies, miniature hardware, and improved cybersecurity would enable such applications. The development of improved cybersecurity for future-state connectivity infrastructure, including spectrum governance, is already being done by reputable technological businesses. Governing bodies must establish vehicle communication and access standards and allot a enough and suitable spectrum to transfer the heavy data loads securely, reliably, and safely in order to reduce the hazards associated with ubiquitous connectivity.

4. *Physical infrastructures:* They must be upgraded to allow for the usage of air taxis, which utilize vertiports and are frequently found in metropolitan areas, in order to handle the next generation of A&D vehicles. In order to support A&D activities at scale in Space, docking for last-mile delivery vehicles will be required by expanded last-mile delivery operations. The physical environment will require updated vertiport designs and charging infrastructure to accommodate these usages. Aerospace startups are planning ahead to create the physical infrastructure required to enable air taxi software.
5. *Manufacturing processes:* The manufacturing sector will need to take full use of the benefits of mass low-cost production to meet the changing demands of the A&D business. In order to build the necessary hardware at scale and sell it for costs that are cheap enough to win over a broad audience, low-cost production will be paired with digitally enabled, quicker development cycles, and rapid manufacturing (Jayasekara, Lai, Wong, Pawar, & Zhua). The flexibility that new technologies like additive manufacturing may provide to production operations typically comes with the added bonus of lowering material waste.
6. *Industry and government mindset and culture:* To assist them reach their objectives and to draw and keep the great talent needed to actualize this vision, the A&D business and its government client should continue to evolve their thinking and culture. In order to retain a pipeline of great people, this means providing flexible and exciting opportunity routes in place of preset tracks with mostly defined roles, tenures, and expectations.

Some of these advances, such as changes to manufacturing processes, are relatively straightforward and under A&D leaders' control. Others, such as technological and infrastructure improvements, will require broad market advances and new regulatory frameworks involving many different stakeholders. Of course, advances in areas such as connectivity and physical infrastructure are critical to enabling progress. But they also require extensive government participation and regulatory guidance to achieve widespread acceptance and justify investment (Accenture, 2022). Further complicating matters, advances in some

categories — such as connectivity infrastructure — will have an outsized impact on progress simply because advances in many of the other categories depend on it. The current debate over which countries will assume a leading role in building out fifth generation (5G) infrastructure represents only the tip of this iceberg (What's Next for Aerospace and Defense , 2019).

The market analysis provided in this chapter is based on two main points:

- On the one hand, there is a focus on the industry overview, showing the different businesses across the A&D sector, as well as their actual size segmented from Worldwide, through Europe, to Italy. This specific geographical focus is driven by the case study that will be analyzed in the Chapter 4: the internationalization of an Italian A&D Company through the One Company Business Model.
- On the other hand, there is a deep focus on the key trends affecting the industry up to the 2050, with a great focus on the technological enabler, the human factor as well as the policy and regulation.

The next chapter will analyze the A&D industry from a multinational strategy perspective, focusing on which could be the best choice for a company that is willing to internationalize its business across the world.

2. International Strategy in A&D Industry

The current state of the global economy is dynamic, and as a result, businesses must have a wide understanding of their economic plans. When it comes to a company's ability to compete globally and stay viable, economic globalization becomes essential. However, because of the push from abroad, it is becoming more difficult for rivals, suppliers, and customers to enter those markets. Internationalization is now one of the essential components for a company's smooth operation and long-term prospects (A.Hitt, Li, & Xu). It is essential for a business to be globally competitive in order to be successful locally. On the other hand, if a corporation is not successful inside the boundaries of its home nation, internationalization is unlikely to occur.

Aeronautical dynamics suggest that in order to obtain a competitive edge, businesses cannot avoid being compared to the world's existing substantial interdependencies. The theory of competitive advantage has changed focus away from consideration of the drivers for the globalization of operations and toward the pursuit of sustainable competitive advantages, with a strong emphasis on the value chain. By structuring its value chain in a way that allows it to carry out manufacturing operations at lower costs or sets them apart from the competition, the firm must seek out competitive circumstances. This theory contends that in order to achieve global growth, a corporation must strike a balance between configuration (the degree of localization and dispersion of operations) and coordination (the connection and management of the different production and commercial units) (Vahlne, The Uppsala model on evolution of the multinational business enterprise—from internalization to coordination of networks., 2013).

In any case, the internationalization of businesses and the globalization of markets, offering opportunities to businesses that can take advantage of them, can also pose a threat to businesses that are weak or defenseless in the global environment, further dividing winners from losers in the marketplace. The strategic alternatives in the courses of the markets' internationalization address numerous factors, including:

- The target country markets
- The time of entry
- The methods of approach
- The operational choices of rooting and expansion in the selected foreign markets

Although the strategic option represented by the activation and stability of ties and agreements with partners in the export nations has been gaining traction in recent years, it is still important to approach the international scene through exports and direct investments. As a result, the product, which was originally wholly generated by a firm in a single nation, is now the output of several manufacturers dispersed across the world, with varying degrees of autonomy, thanks to the transformation of foreign suppliers into global partners (Vahlne & Bhatti, Relationship development: a micro-foundation for the internationalization process of the multinational business enterprise, 2019)

2.1 Theoretical Framework of International Strategy in A&D

It is challenging for businesses to resist pursuing high levels of openness and, as a result, of relations with the surrounding environment and with other businesses in the supply chain due to the features of the aviation sector. Given the sizeable scope and variety of risks, the product's technical complexity, the absorbing relevance of technology, and the difficult to predict and manage relationship with demand, it is implied that competition between companies begins in the very early stages of research on technologies and products. As a result, the management and administration of the single corporation must prioritize relationships with other nations.

Particularly, the high level of technological complexity of the products necessitates such extensive technological knowledge that businesses often tend to concentrate only on those technological fields in which they are adequately skilled, achieving high levels of technological specialization in that area and seeking out remaining external knowledge (Polese & Proietti, 2014). Therefore, the emphasis on technological specialization can only result in fruitful collaborations in which businesses of all sizes and technologies take part, each playing a particular role in the creation of the final product. Collaborations, however, are difficult to manage since there is an obvious advantage for the higher-level corporation in influencing the technology preferences and the production structure of suppliers or sub-suppliers.

If the development of aeronautics shows that atomistic competition on its own is challenging, if not harmful, the risk of opportunism in network relations indicates that managing or engaging in the network is similarly challenging, although being almost unavoidable. In other words, a key success component that might presuppose a union of strategic intents and a harmony of

vision is the relational openness between company partners (Polese & Proietti, 2014). However, the environment's complexity, which is characterized by unknowns, ambiguities, and ongoing opportunities, makes the relationship dynamics between the actors abrasive and changeable, impeding the stabilization of relationships even between partners who may be inclined, particularly in situations where such relationships develop on the basis of unbalanced power relations.

The specificities and developments of the aeronautical industry force companies to emphasize relationships, which determine an increase in long-term competitive capabilities throughout the supply chain, from which new pressures to relations and internationalization for companies originate. As a result, a cumulative circularity between the openness of individual companies and competitive intensification emerges (Vahlne, The Uppsala model on evolution of the multinational business enterprise—from internalization to coordination of networks., 2013).

Although inherent in the sort of sector under consideration, this strategic conduct is made more apparent by the intensity of the aforementioned relationship opportunities. On one side, businesses from developing nations must interact with Western manufacturers in order to pick up management and productive abilities. On the other side, excellent leaders look for methodical partnerships to reduce and share a variety of risks and complicated projects (operational, technological, market, financial, and even political). In addition, Western suppliers want some end markets to be directly handled. Thus, the potential for technical transfer between large and small businesses is described, exposing leaders to the risk that over time, their direct collaborators would become free and turn into rivals.

This demonstrates an undeniable underlying fragility that somewhat transcends the management of the specific business and affects the long-term balance between advanced and emerging economies. Western businesses are encouraged to seek openness towards developing markets that through partnerships with local industries, which are:

- In part (India, Indonesia, etc.) able to reach autonomous production in a short amount of time in segments with more accessible technologies.
- In part (China) able to manage of a long-term impact on the balance between firms and national production systems (He, 2020).

At the same time, even producers from nations that have been experiencing a technological revolution are encouraged to pursue this openness.

Another industry key point is the risk valuation activity. The company's business strategy, which is focused on partnerships at a worldwide level, places a high priority on the management of risk as a crucial aspect of building corporate value. The dangers of strategic and operational mistakes are really extremely significant in this industry and affect relationships with partners as well as connections with the market, institutions, and the general public (Wang, Nguyen, Le, & Hsueh, 2018).

The following risks have a significant impact on both the finalists and the suppliers involved in the supply chain:

- There are a large number of variables along the non-short manufacturing cycle of the aircraft (changes, inflation, cost of energy resources, technological innovations to be followed, labor costs, various bureaucratic and environmental burdens, economic and political stability of the client countries, etc.), and they have an economic impact on the margins of the entire production circuit.
- The aerospace product design, manufacture, upkeep, sales, and distribution expose to possible liability for claims resulting from harm caused by the product itself.

The current trend is toward fewer direct supplier agreements and toward the formation of long-term partnerships with prime contractors, where both parties participate in the management of the program beginning with the product's conception and industrialization. In order to disperse the risks while preserving ownership of projects and equipment, long-term contracts and project integration were used by Boeing as an example and a precursor, subsequently being followed by McDonnell and Airbus (Schmelzle & Mukandwal , 2022)

Finally, the dynamisms occurring in the aeronautics industry encourage businesses, particularly if they are suppliers to final producers, to concentrate on critical competitive factors like cost reduction, enhancement of the technological offer, raising of quality standards, strengthening of client services, active participation in training processes, and consolidation of specific solutions and know-how. The predicament of smaller businesses that are not naturally linked to the global giants is particularly crucial. They must set up channels for commercial and production internationalization and begin or deepen partnerships with other producers, whether

they are bigger or smaller or from less developed nations. In fact, there are a lot of relational opportunities, not without risks and strategic dangers, that lead to growth strategies communicated by technologically productive partnerships with more advanced, large, and established operators, in more or less stable, unequal alliances that offer opportunities for growth and technological specialization, in a context of growing interdependence.

2.1.1 The off-set in the A&D Marketing

In the context of B2B relationships, offsets represent an absolute peculiarity of the aeronautical business. In fact, the offset consists of the duty placed on the aircraft manufacturer by the customer or client to create the good using particular procedures and activities in the customer's home nation, and even by using particular suppliers, sub-suppliers, and partners (Hajami & Chinoperekweyi, 2019) .

On a legal level and with regard to the principle of free competition and international mobility, offset qualifies as a form of restriction and conditioning of the free market. For this reason, an agreement between customer and manufacturer is an expressly and formally prohibited form in almost all economic activities, with the exception of special cases such as defense and, indeed, aerospace. In economic and managerial terms, offset is presented as a peculiar and significant method of internationalization and, at the same time, a search for consonance between economic actors. A mode that has multiple values and that must be managed with particular attention, in order to better control risks and opportunities (Avascent, 2012).

A first and cursory study of the offset reveals it to be only a contractual and managerial requirement that compels the maker to give up ex ante degrees of discretion in the creation of the product and in the attainment of specific outcomes (Spren, 2007).

The rationale behind this constraint is the customer's need:

- If a governmental agency, to get the settlements of the foreign producer locally and/or entrust them to local processing businesses in order to gain political and image benefits as well as favorable effects on the socioeconomic growth of the nation of origin;
- If it governs a developing country, to encourage the closing of the technology gap that separates indigenous enterprises from foreign ones.

Particularly in the second hypothesis, for the western or international manufacturer, the offset might start unintended technology transfer activities. However, it doesn't appear that the offset can be avoided or overlooked as a potent commercial and global marketing tool given the existing intense rivalry among Western businesses. It is up to each operator to make an effort to turn this limitation into an opportunity or, at the very least, to profit while avoiding the inevitable risks.

First of all, the offset forms the foundation of the relationship dynamics with some clients, particularly emerging markets or extremely nationalistic and protectionist nations. In this situation, client resistance that is both financial and related to local political interests can be overcome by accepting the requested offsets: a recovering nation, for example one that is applying to join the EU, may decide to choose aircraft that are also particularly capable and qualified if, in the overall cost-benefit analysis, the partial completion of the productions on location permits some socioeconomic cost recovery.

Once more, for a leader, offset may be a means of exploring extra supply prospects in terms of savings or, at the very least, access to particular capabilities that would otherwise be prohibitively expensive or hard to come by. In particular, a prime supplier may use the offset as a weapon to modernize or make more efficient, at least in terms of operational expenses, despite the growing obligations and constraints frequently placed by the leader on businesses in the supply chain. Additionally, the same prime contractor can use offset as a way to prospect for new outlet markets to enter directly and, at the same time, as an experience to develop strong project management skills, which are crucial to managing the suppliers imposed by the client and frequently very challenging due to dimensional, technical, and entrepreneurial deficiencies.

Last but not least, the offset may provide Western or international manufacturers with a simplified route to extra funding or financial resources that are not as readily accessible in the countries of origin. Even western partner suppliers may gain from this possibility, as they could access greater financial resources, get over their fear of being replaced by foreign suppliers, and join the prime contractor or finalist in offset efforts that would help these local businesses (Rossello & Steenhuis, 2018). Additionally, it should be emphasized that offset is not a new concept in developing nations: in Europe, the “just return” principle/clause, which requires that the purchasing country's industry be capable of performing some of the work in international cooperation projects, has been in place for some time. The most ineffective continental

businesses have been able to survive thanks to this institute, which has also slowed down the industry's process of rationalization.

2.2 A&D International Strategies Matrix

During the last 20 years, many barriers to international trade fell and a wave of firms began pursuing global strategies to gain a competitive advantage. However, some industries benefit more from globalization than do others, and some nations have a comparative advantage over other nations in certain industries. After the A&D external context analyzed during the previous paragraph, now there will be a focus on the international strategies characterizing this industry, trying to determine why MNCs decided to entry in new markets with those strategies and the reason behind the balance adopted between the *global integration* and the *local responsiveness*, as it will be possible to see on the International Strategies Matrix.

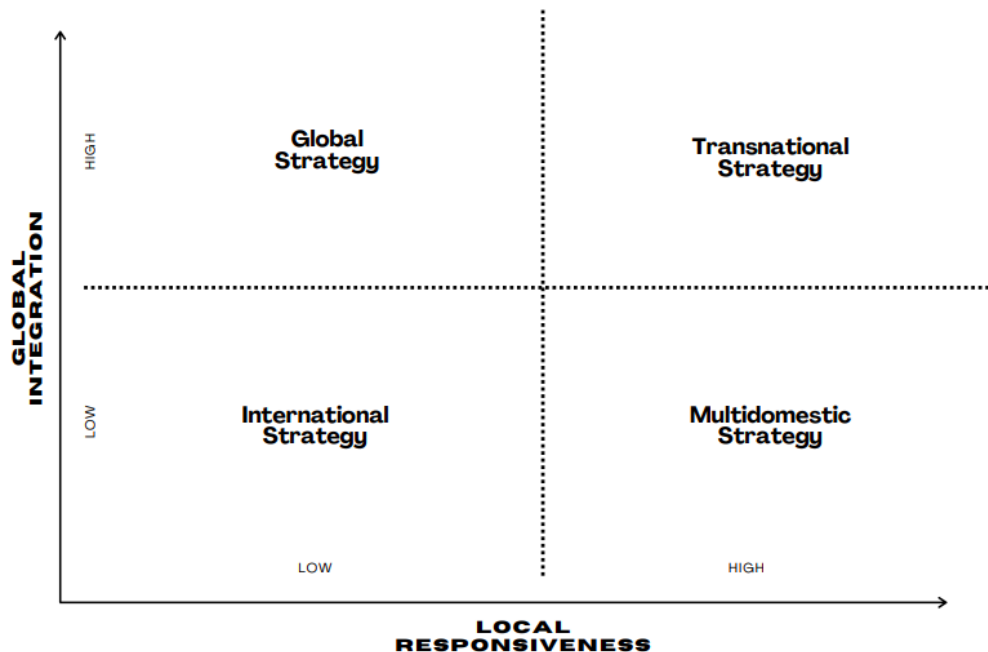
2.2.1 International Strategies

There are four different strategies and each one involves a different approach trying to be sensitive to (1) costs and efficiencies on one hand and trying to be responsive to (2) variation in customer preferences and market conditions across nations.

Any international business strategy balances two sides of one graph:

1. *Global integration*: How centralized operations are vs. globally distributed
2. *Local responsiveness*: How customized a product or service is to a local economy vs. completely standardized

Figure 4. International Strategies Matrix



Source: Created by the Author

Responding or not responding to these two pressures of cost and local cultural conditions determines which of the four types of international strategies will be pursued:

1. **International:** Typically, the organization's goals are largely focused on the domestic market. However, it has some goals for its foreign operations, necessitating a global strategy. The competitive advantage is crucially created primarily for the domestic market. While keeping its manufacturing headquarters domestically, it concentrates on selling goods to markets outside (Grønhaug & Kvitastein, 1992). Thus, businesses are spared the expense of investing in personnel and infrastructure abroad. Adopting a worldwide approach has several drawbacks, like managing global logistics, opening sales offices overseas, and ensuring that your business conforms with international trade laws. The key features of the international strategy are:
 - Business goals and competitive advantage mostly concern the domestic market.
 - Products are made in the nation where the business is based and then shipped to clients all around the world.
 - Frequently used to describe an exporting strategy.
2. **Multi-domestic:** The company operates in a variety of markets outside of its own nation. But since client demand and potentially competition vary by nation, it needs unique tactics for each of these marketplaces. Importantly, each nation's competitive advantage is

assessed independently. The multi-domestic business model invests on entering a foreign market and developing products specifically for that market. To connect with a foreign audience, businesses modify their goods and products as well as their marketing approaches. This entails taking into account diverse cultural norms, traditions, and practices. A multi-domestic business strategy frequently keeps corporate headquarters in the nation of origin. To handle their relationships with global clients more effectively, the corporation may nonetheless build localized headquarters abroad.

The key features of the multi-domestic strategy are:

- Focus on establishing a presence and tailoring products to suit new markets.
- Competitive advantage determined separately for each country.

3. **Global:** With minimal local heterogeneity, the organization views the globe as mainly one market and one source of supplies. It's important to note that competitive advantage is mostly created on a global scale. Employing economies of scale allows businesses to expand their market reach and increase income (Pedersen & Tallman, 2022). Since products and services are homogenized to cut costs while reaching as many people as possible, global enterprises have minimal local variety. These businesses typically operate in international markets while maintaining a central office or headquarters in their home nation. Even if the products and services have been homogenized in most ways, minor adjustments can still be necessary. The key features of the global strategy are:

- An integrated approach across different countries.
- Homogenized products to minimize costs and reach a broad audience.
- Small adjustments needed to break into international markets.

4. **Transnational:** A global and multiple domestic plan are combined in a transnational company strategy. This permits the firm to expand with full-scale operations in international marketplaces while yet allowing the company to continue running out of its country of origin's headquarters. Worldwide, multi-national corporations sell their goods and services in several nations. The way the product is marketed in each nation accounts for the differences (Lei, Lim, Cui, & Wang, 2019) No matter what country it is sold in, a transnational product is the same. The product is the same everywhere and isn't altered to cater to regional customs or tastes; it doesn't change to fit a new market. The international strategy has difficulties in establishing efficient management strategies and high investment expenses (Howe, 1986). The key features of the transnational strategy are:

- Combination of global and multi-domestic strategies.
- Allows the establishment of full-scale operations in foreign markets.

- Companies have separate marketing, research, and development departments to respond to local customers.
- Product or service is the same for different markets.

3. Research Question & Methodology

3.1 Objective of the Study & Research Question

Generally, studies that approach the A&D industry are increasingly focusing on the importance on technologies in operations as well as the new technology and the business models in order to be successful. The literature review of the thesis comprehends a complete and detailed analysis of the empirical evidence that researchers have gathered until now regarding the following themes: analytics, quantum computing, connectivity infrastructure, manufacturing processes and political factors affected the industry, as well as cybersecurity and the international business models adopted to go global by the main market players.

In particular, the analysis has studied and gathered information regarding the evolution of the A&D business models over the years (Boeing Case), while also exploring the effect of different global strategies on the major players in particular markets (Boeing and Airbus Cases). Indeed, the literature review contains strong theoretical notions explaining the importance of the following two dimensions that are the basis of the international strategies matrix: the global integration and the local responsiveness.

However, the research has identified a lack of systematic studies regarding the implementation of this matrix in the Aerospace and Defense industry. Indeed, the international strategy choice could result in a competitive advantage both local and abroad. In order to apply the right strategy, it could be necessary a transformation of the Organizational Design, as well as of the Business Model and the Go-To-Market Strategy currently adopted by some players as in the case of Leonardo Spa.

Internationalization is a key success factor for the main players of the industry such as Boeing and Airbus. It's important to understand which are the rationales behind the choice to go international. In detail, understand the reason why moving from an already existing strategy to another one that could be much more effective if correctly implemented.

The aim of this research is to demonstrate if, in the case of Leonardo, it would be possible to achieve a competitive advantage in the industry, shifting from a multidomestic to a sort of transnational strategy (but featured by a higher degree of local responsiveness) in the market towards the activities managed by Leonardo International through the 26 foreign local entities

operating worldwide. In detail, if it would be possible to re-design the business model, the organizational design, the go-to-market strategy and the global offering of the foreign local entities in order to gain advantages in terms of direct sales and after sales incomes. Otherwise, if not for all, identify in which markets this transformation could be feasible and could generate a long-term competitive advantage.

RQ: *“How Leonardo Spa could unify its business model with the local entities abroad? Which is the role of Leonardo International Spa?”*

An international mindset is crucial to achieve success in a global strategy, finding the right balance between the needs related to the cost pressure and the local responsiveness in order to reduce cost and boost sales. However, there is no research exploring how companies in the Aerospace and Defense industry are proceeding to improve their business model moving from a high number of fragmented entities around the world towards a unique big entity able to represent itself in different countries with a solid global offer and, with a high horizontal and vertical integration along all the activities of the value chain.

Having identified this gap in the literature, the research will explore this topic with the above research question. Specifically, it will explore whether this harmonization and integration of foreign local entities under the Leonardo’s government and strategic orientation could be a means through which companies succeed in internationalization strategy, presenting this as a best practice of the industry or not. Therefore, this study has a single objective that will be analyzed extensively through a defined framework applied to the main use case: Leonardo International.

3.2 Methodology & Framework

A case study is a research approach that is widely used in many domains of knowledge. It is characterized as an empirical inquiry that investigates a current phenomenon in its real-life setting, especially when the borders between phenomena and contexts are ambiguous. Technically, the case study handles a specific circumstance in which there will be many more variables of interest in terms of data difficulties, requiring the use of many sources of evidence and relying on the creation of earlier theoretical propositions to lead the investigation (Yin, 2014). A case study's objective is not to generalize the example (or instances) under

investigation but rather to correctly grasp it in its distinctiveness, originality, complexity, and special social and economic environment. While quantitative techniques focus on quantifying the extent to which the phenomena under research are present, qualitative case studies analyze the presence or absence of phenomena, providing valuable insights into the underlying dynamics of a specific occurrence (Flick, 2014). In addition to the case study analysis, an interview to the Head of Commercial Department of Leonardo International Spa was conducted. It will show qualitative and quantitative insights useful to compare the Leonardo Spa positioning against its competitors.

In this study, the research objectives are based on a qualitative technique:

1. To describe the specifics of a situation or phenomenon: harmonization and integration of the foreign local entities under the Leonardo's governance and strategic orientation to boost sales and after-sales revenues.
2. To place observations into the framework of the applicable theory, defining therefore if companies follow a common path to improve their market position in the worldwide industry and if the reason behind those paths are the same or not.

These objectives follow the research question and serve its aim. Case study research includes both individual and other use cases. This study used a multiple-study strategy: indeed, it allows for the analysis of distinct features between individual cases and, eventually, the discovery of a common pattern between them (Eisenhardt, 1989). As a result, the instances discussed in the next chapter are chosen using a sampling approach. Finally, the purpose of using a multiple case study approach in this thesis is to provide an overview of the Aerospace & Defense industry and the application of strategies aimed at increase efficiency and effectiveness adapting the business model of the foreign local entities to the one of the parent company.

This research uses an exploratory approach. This allows researchers to analyze a phenomenon that is not well characterized and has to be investigated more before researchers can draw any conclusions from its occurrence. According to Yin (2014), an exploratory case study should have the study's question, goal, a unit of analysis, the logic that connects the research to the propositions, and lastly, the criteria for interpreting the results. The Table below defines these aspects:

Table 1. Multiple case study structure

Case study components	Details
<i>Study question</i>	How Leonardo Spa could unify its business model with the local entities abroad? Which is the role of Leonardo International Spa?
<i>Purpose</i>	<ul style="list-style-type: none"> ▪ To define how Leonardo Spa could implement an international strategy to gain a competitive advantage and boost sales ▪ To define the linkage between the business model of the parent company and the business model of the foreign entities ▪ To understand whether it is possible to define the harmonization strategy in terms of global offering and business model as best practice of the industry
<i>Unit of analysis</i>	International strategies and the application of a One Company Business Model in the Aerospace Industry to increase sales and after sales services
<i>Logic linking data to the propositions</i>	Company interview, cross-case analysis and synthesis
<i>Criteria for interpreting results</i>	Results will be interpreted by comparing the multiple case studies analyzed, based on a common framework that derives from the literature review

The technique described above will help the examination of management difficulties in the area of study, as well as the capture of new ideas by recognizing the design of linkages between essential components. Furthermore, inter-organizational liaisons are widely studied using

approaches that yield qualitative data while also allowing for interpretive and exploratory analysis.

Aside from that, exploratory investigations appear to focus on the new topic matter, which sheds light on the study undertaken; on the other hand, data gathering through the triangulation method allows testing the validity of information transiting in this research, as it creates a convergence of information that comes from different sources (Brannick & Roche, 1997).

3.2.1 Criteria for interpreting results: the framework

The sample companies object of the case study have the following common denominators:

- They all belong to the A&D industry.
- They are international companies operating worldwide.
- They have the need of becoming more competitive in the international market.
- They are major market players, using international strategies and foreign local entities or strategic alliance / joint venture to succeed in the targeted market.

However, it is also necessary to build a common framework to analyze and make comparable the findings that derive from the research. This study uses an analysis framework based on the understanding of the international strategy adopted by the identified companies and the rationale behind their strategic choices. In order to answer to the research question, the exploratory research of the case studies will therefore be based on a framework which follows a two steps-analysis:

1. Brief analysis of the firms' ecosystem: this step aims at understanding companies' needs and targets in to the adoption of an international strategy. Moreover, this passage will also outline the companies' roadmap in the implementation of such a strategy.
2. Definition of results achieved by companies and the differences among them. Identification of key success / unsuccessful practices that Leonardo should or not imitate in its internationalization strategy.

3.3 Research Limitations

There are certain drawbacks to doing exploratory case study research: it is time-consuming, difficult to comprehend, and can lead to overgeneralization of conclusions, which can be harmful (Baxter & Jack, 2018).

To prevent overgeneralization, the findings of this study can be considered valid only when applied to situations with similar features (Kumar, 2019). Aiming at analyzing the validity of qualitative research, it is critical to acquire data and information; thus, by consulting a range of sources to draw conclusions, the margin of error is reduced. Indeed, the assumption at the heart is that when more sources and procedures for acquiring and evaluating data are employed, the validity of the research grows. Academic publications, past case studies, press pieces, government reports, consulting websites, reports and internal data provided by the company, are all part of the research. Because of the dispersed character of the topic, the secrecy on which information on the foreign local entities management is held both by Leonardo and by the other industry firms, as well as the absence of other consistent case studies, an interview is part of the sources of this research. Finally, the validity of the study is maximized by comparing analyses and studies published by others.

4. Leonardo International: One Company Business Model

4.1 Leonardo & Leonardo International

4.1.1 Leonardo: From Local...

Leonardo Spa is one of the global players in the Aerospace, Defense and Security industry. It is organized into seven business Divisions (Helicopters; Aircraft; Aerostructures; Avionics and Space Systems; Electronics for Land and Naval Defense; Defense Systems; Systems for Security and Information) and also operates through subsidiaries and joint ventures, such as DRS Technologies, TeleSpazio, Thales Alenia Space, MBDA and ATR. Leonardo-Finmeccanica, which employs over 47,000 employees, boasts a significant industrial presence in Italy, the United Kingdom, the USA and Poland, and is present in 15 countries around the world.

The board of directors of the defense and aerospace group has approved the accounts in 2021 which close with revenues at 14.1 billion (+ 5%), orders for 14.3 billion (+ 4%) and profits at 587 million (+142%) (Leonardo SpA, 2022). The aeronautics sector grew (+15%), in which the aircraft component balances the expected decline in the civil component. The Defense and Security Electronics sector is also growing, benefiting from the positive performance of the European component of the sector. Helicopters recorded a volume of orders substantially in line with the previous year. The defense and government business remains solid, accounting for 88% of Company's revenues.

Here are the details on the performance of the individual sectors as can be seen from the press release and the report on the 2021 Leonardo accounts (Leonardo SpA, 2022):

1. **Helicopters:** The 2021 trend confirms the growth trend of Revenues and EBITA, albeit in a context still characterized by the pandemic in the civil / commercial segment, which shows signs of recovery in terms of acquisitions. In the course of 2021, deliveries were made of n. 128 new helicopters (111 in 2020).

The most of the orders is basically online. The growth of acquisitions in the civil / commercial sector balances a reduction in the contribution of acquisitions in the government sector, which was particularly significant in the comparative period.

The main acquisitions of the period include: the second and third orders under the TH-73A (AW119) program for the US Navy for a total of n. 72 helicopters; the second additional

act for the completion of the development activities and for the supply of n. 4 standard helicopters relating to the NEES program (New Helicopter for Exploration and Escort) for the Italian Army; the contracts relating to the supply in Saudi Arabia of n. 9 AW139 helicopters in the government sector for the Saudi Royal Court and 16 AW139 helicopters for The Helicopter Company, a company established by the Public Investment Fund (PIF) as the first and only operator authorized to commercial flights in the Kingdom; the contracts relating to the supply in Italy of n. 8 AW139 helicopters for the Guardia di Finanza; the contract, signed under the Government-to-Government Agreement (G2G) Italy-Austria, for the supply of no. 18 AW169M LUH (Light Utility Helicopter) helicopters for the Austrian Ministry of Defense; additional orders relating to the Italian AW169 LUH programs for the Carabinieri and the Army for a total of no. 17 helicopters; the contract relating to the extension for a further five years of the WIST (Wildcat Integrated Support and Training) program for the supply to the UK Ministry of Defense of logistical support and training services for the AW159 Wildcat helicopter fleet.

Revenues is growing due to increasing government activities, in particular on the NH90 programs for Qatar and TH-73A for the US Navy and on the AW189 / AW149 lines, which absorb the expected slight decline in revenues in the civil commercial sector, in particular on the line AW139.

- 2. Electronics for defense and security:** The results for 2021 are characterized by an excellent commercial performance confirming the good positioning of products and solutions in the sector, with volumes of revenues and profitability growing in all business areas both in the European component and in Leonardo.

The orders are increased compared to 2020, which in the last quarter had benefited from important acquisitions with particular reference to Electronics Europe. The main acquisitions that characterized the excellent commercial performance include the supply of equipment for two U212 Near Future Submarines (NFS) that will become part of the Italian Navy fleet starting from 2027 and, as part of the broad Quadriga program, the order relating to the supply of radar and aerial protection systems that will equip the 38 Typhoon aircraft intended to replace the Tranche 1 aircraft currently supplied to the German Ministry of Defense. In the field of Automation, the order to enhance the logistics management of baggage handling systems, which will be equipped with the safety technology approved by the European Civil Aviation Conference (ECAC) for no. 10 Spanish airports. Finally, for Leonardo DRS, further orders are highlighted for the production of modular hardware systems called Mounted Family of Computer Systems (MFoCS) to be installed on land

combat vehicles to support maneuverability and logistics for the United States army and the M-SHORAD order for the initial supply of a Mission Equipment Package, to be integrated on heavy striker-type vehicles and which will make it possible to neutralize low-altitude aerial threats including those with remote control (drones).

Revenues is growing both in the European component, which last year had been affected by the application of the containment measures of the COVID-19 contagion, and in Leonardo DRS excluding the unfavorable effect of the USD / € exchange rate.

3. Aeronautics: The sector shows an excellent performance of the military business, also recording the first signs of recovery in the regional transport sector, with the GIE-ATR consortium reporting an increase in terms of deliveries and orders. The situation of unsaturation in the Aerostructures Division remains due to the slow recovery of the civil business of the main customers (Boeing and Airbus). The main revenue stream in this sector are:

- **Aerostructures:** For the Division, n. 28 fuselage sections and n. 16 stabilizers for the B787 program (105 fuselages and 72 stabilizers delivered in 2020) and n. 15 fuselages for the ATR program (# 26 in 2020).

The Division was affected by the lack of new orders from Boeing customers (B787 program) and GIE consortium, receiving orders from the Airbus customer only on the A220 and A321 programs, which confirm the growth trend. The demand for B767 remains stable. There is a revenue decrease in the Division, which is affected by the reduction in production rates on the B787 and ATR programs. EBITA: for the Division, the expected reduction in business volumes and the consequent unsaturation of production sites resulted in a net decrease compared to 2020.

- **Aircraft:** From a production point of view for the Division's military programs, it was delivered to Lockheed Martin No. 43 wings and 12 final assys for the F-35 program (37 wings and 7 final assys delivered in 2020). The first 2 deliveries of Typhoon aircraft to Kuwait are also highlighted. The Division has finalized significant export orders for 16 M-346 aircraft, as well as further orders on JSF and logistics support programs for Typhoon aircraft. The revenues trend is driven by a higher production volumes of the Division, in particular on the line of trainers M-346 and the Kuwait program.
- **GIE-ATR:** The consortium recorded an improved result thanks to cost containment actions and the increase in deliveries (31 deliveries in 2021 compared to 10 in 2020).

4. Space: In 2021 the sector recorded, on the main indicators, values well above those of 2020, the year in which the effects of the pandemic had heavily affected commercial

performance, production volumes and profitability, especially in the manufacturing segment. The economic result is up sharply. The satellite services segment is also progressing, which also records a solid performance this year and an extraordinary volume of orders such as to guarantee a significant order backlog to support the volumes of the coming years (Leonardo SpA, 2022).

In addition to the aforementioned industrial performance, there is the significant economic benefit recorded on the Italian component of the manufacturing business deriving from the effects of the realignment of the tax value of goodwill, in compliance with the facilities provided for by the Decree "Urgent measures to support and relaunch the economy", converted with amendments into Law no. 126 of 13 October 2020 and subsequent 2021 Budget Law.

Regarding the international approach of Leonardo SpA, it's important to highlight that Leonardo is an Italian company born in the 1948 under the name of Finmeccanica. The Company was simultaneously witness to and protagonist of the birth of a new chapter in the history of Italy, restoring a new perspective to the impressive skills displayed by many industrial companies in the post-war era and accompanying them towards an international expansion.

The company is based in Italy but operates worldwide thanks to an industrial presence in 4 markets: Italy, the United States, the United Kingdom and Poland. Its commercial network spans around forty countries and its technologies are used in over 150 states. In addition, there are many subsidiaries and joints ventures.

Leonardo SpA operates using a complex supply chain with over 11 thousand suppliers globally. It mostly involves small and medium-sized companies in the high-tech field, which contributes to developing skilled employment in the various territories in which the suppliers operate.

It is a production system that has proved successful up to now with the constant aim of improving over time through innovation and sustainability (Leonardo SpA, 2019). By 2030, Leonardo wants to allow the most recent technologies to lead future developments in favor of companies. Among the objectives is the achievement of 100 percent digitization in operating and the desire to become a reference point for the many new talents from around the world who are specialized in new technologies. As regards sustainability, Leonardo has mixed this element with the aim of having very positive impacts in every territory in which the company operates.

4.1.2 Leonardo International: ...to Global

In this paragraph there will be an analysis of Leonardo International Spa. The most of the data and insights come from the results of the interview to the company reference contact and to additional data shared by the Company but not present online.

Leonardo International Spa is one of the Leonardo Spa subsidiary. It’s responsible for the supervision of shareholdings in companies present in international markets (outside the UK, Poland and USA) and commercially relevant, with the aim of harmonizing operating standards with those of the Parent Company and providing support in terms of planning and management control.

Leonardo Spa organizational structure is based on an ecosystem of joint ventures and strategic partners allowing to create a worldwide framework enabling to:

- Improving cost efficiency using global suppliers
- Developing a strong market position in the foreign countries through commercial local entities and, at same time, to strengthen its position in to the home market.

Analyzing the Corporate framework of Leonardo Spa, it’s stated that Leonardo International Spa is a holding company managing 26 foreign local entities operating all around the world.

Figure 5. Corporate Framework



Source: Internal

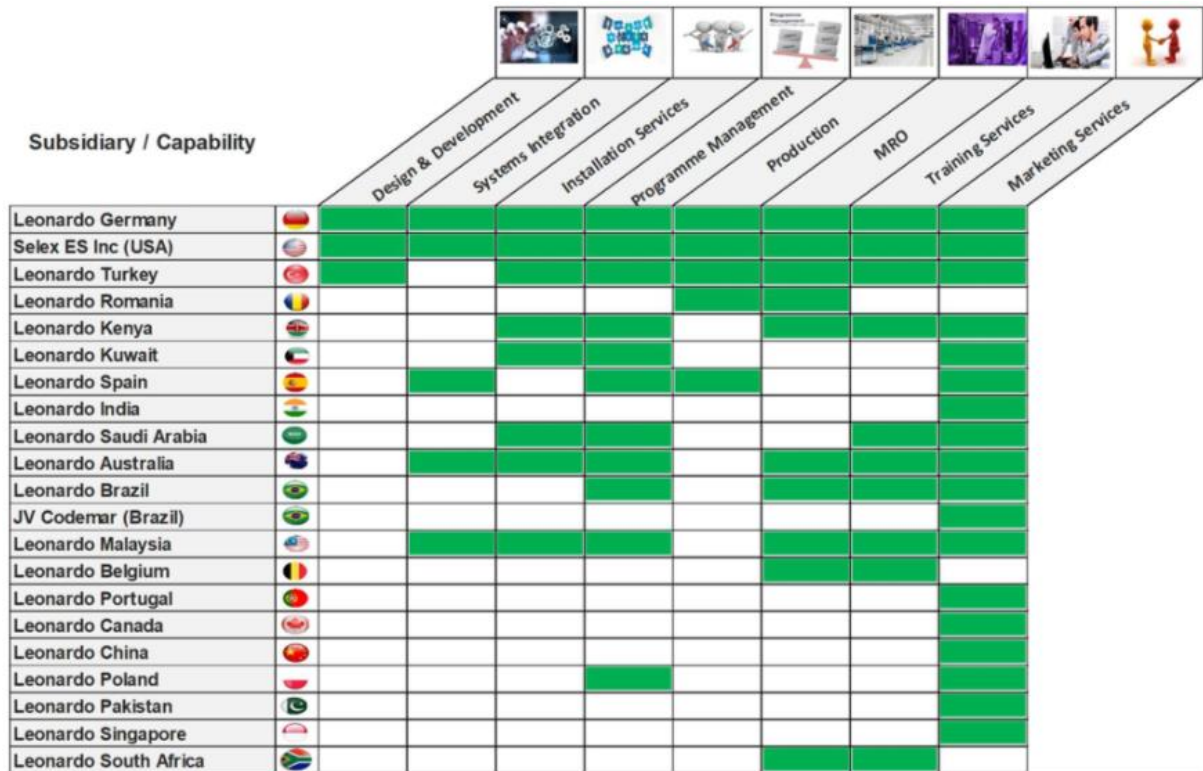
Leonardo International Spa, acting as a holding company of the 26 subsidiaries, is responsible for their financial results and for their strategic coordination according to the main goals defined by the Parent Company: Leonardo Spa.

In detail, the 21 in-country industrial facilities, extended to 26 in 2020, generated annual revenues for €280 Millions and for €290 Millions of orders in 2021. In terms of resources and capabilities, it's important to highlight:

- *Number of employees:* it accounts for more than 1000 workers, a number relatively high considering that the company is founded in 2018.
- *Production Facilities:* 5 high-quality production facilities with 350 skilled employees.
- *R&D Centers of Excellence:* 3 Leonardo centers of excellence for Hardware&Software development
- *System Integration Facilities:* 7 system integration facilities around the world
- *Know-how and expertise:* The holding accounts for more than 200 professional engineers
- *Customer Support:* 8 customer support, services and training facilities

Deep diving in to the main subsidiaries of Leonardo International, it's important to state that actually not all the foreign local entities are capable of carrying out all the activities along the value chain. As it's shown in the below figure, only Germany and USA are actually owner of the most of activities of the value chain, both primary and secondary ones, offering multiple products and services.

Figure 6. Current Capability Map



Source: Internal

From the above image, it's also possible to state that the majority of the foreign entities are responsible for the marketing activities and for the Go-To-Market strategy that is tailored to the customer preferences and the geopolitical factors featuring those countries. However, some countries are very specialized in the production activity and not in the marketing services such as in Leonardo Romania.

The reason behind the allocation of some activities in some countries rather than in all of them is definitely due to the following factors:

- Geo-political constraints
- Knowledge sharing
- Organizational structure of Leonardo Spa
- Creation of capabilities and talent acquisition
- Internationalization strategy
- Acquisition Policy as internal blocker: it's necessary to highlight that these local entities were founded before of Leonardo International and for some of them, even before of Leonardo Spa

Indeed, Leonardo's foreign local entities are organized in such a way to represent Leonardo abroad. However, they do not reflect Leonardo Spa business model, taking into consideration the product divisions and the various activities of the value chain. They appear more as commercial branches with the aim of increasing sales by exploiting the contact with local realities built over the years.

4.1.3 Main Goals and Strategic Orientation

In the previous paragraphs of this chapter the focus was on Leonardo and on Leonardo International. Now, the study presents an analysis of the main goals of these two entities and which are the targets defined for the future.

The markets in which Leonardo operates, both nationally and internationally, are characterized by highly complex ongoing transformation processes and an ever-increasing level of competition, which is exacerbated by the entry of new players coming from countries that did not traditionally belong to the A&D industry, but which are now growing, even in the new technology segments, beginning to cover domestic demand and sometimes even entering the international market (H. Pierre Hsieh, 2020).

In this scenario, Leonardo pursues its objectives concerning the improvement in the competitive positioning on international markets, and the creation of long-term competitive value through responsible business conduct, the ongoing monitoring and an effective management of risks and opportunities, the protection of business continuity, and listening to and collaborating with stakeholders. The processes and technological solutions developed by the Group are marked by a sustainable and inclusive development, in support of double transition, both digital and ecological, with the aim of safeguarding citizens, companies, institutions, territories and strategic infrastructures, which are increasingly exposed to the fragility of systems (Leonardo, 2021). The main trends followed by Leonardo are reported below:

1. **Geopolitical tensions:** Geopolitical tensions and crisis have deepened, sometimes aggravated by internal problems in many nations. Defense and security budgets are growing or stable in most countries.
2. **Big data and security:** The social scenario has been characterized by a renewed focus on the management of borders, citizen and traveler information, clinical and health data and information dissemination, especially through social channels. Security and big data

technologies will be increasingly important to manage risks, flows and sensitive information.

3. **Digital, environmental and technological transition:** The post-pandemic economic recovery will be driven by digital and environmental transitions, accelerated by urgency and extraordinary programmes (such as the European Recovery and Resilience Facility, which translates in Italy into the National Recovery and Resilience Plan - NRRP), which could be the engine of a new technological development. The increasing importance attributed to Defense, even on the side of technology, to support the renewed strategic ambition of Europe and its member states, including at international level, entails positive implications for the Aerospace, Defense and Security (AD&S) sector.
4. **Reducing strategic dependencies:** The concept of technological sovereignty evolved in 2021 based on a better understanding of the effects generated by disruptions of the global supply chains (lockdowns of manufacturing facilities, cascading effects of demand shock, disruption of logistics chains, shortage of raw materials). Technologies continued to be the drivers of institutional, business and individual resilience.
5. **New skills and inclusion:** The implementation and management of ecological and digital transition requires widespread development of new skills, scientific and digital above all, on which the competitiveness of businesses depends. The reskilling of workforce and the promotion of gender equality are among the main levers on which to act in the A&D sector. (Leonardo SpA, 2022)

Leonardo has settled out a renewed strategic vision projected over the next 10 years, in order to be a company that is solid, global and a driver of innovation in 2030, adapting periodically and with the necessary flexibility to the changing relevant context, leveraging its technology skills, as well as its human and intellectual capital. This plan is based on three Pillars in order to be **Solid, Global and Driver of Innovation** (Leonardo SpA, 2021):

1. *Strengthen Our Core:* Further strengthen the core business and operations, including through a more focused and homogeneous portfolio of activities: increasing the critical mass in strategic areas, in particular Helicopters, Electronics, Cyber security and Unmanned vehicles, to strengthen its organization and gain leadership positions at international level; strengthening its footprint in global markets.
2. *Transform to Grow:* Make the organization more modern and flexible to seize the challenges of the new decade and adopt innovative and more effective business models to meet the needs of customers: diversifying the business portfolio, enhancing cross-sector

and distinctive competencies; spreading innovative service-based offer models, measuring customer satisfaction on an ongoing basis and excellence in Simulation & Training solutions and systems.

3. *Master the New*: Innovate and create new technologies and new high-tech markets through Leonardo Labs, technology incubators for the development of innovative competencies across the Company's business areas.

Focusing on the strategic objectives of **Leonardo International**, it's possible to divide them on the strategic objectives of Leonardo International Spa as holding company and then move to the strategic objective of its subsidiaries across the world.

Leonardo International Strategic Goals:

- Setup of new companies, industrial activities and support to the local business in priority markets, according to the strategic and commercial guidelines provided by Corporate Central Unit and Divisions.
- Development of skills and, in specific cases, products and technologies, of International Subsidiaries to meet the needs of customers and Divisions / Leonardo.
- Appropriate sizing regarding the skills and structures of the International Subsidiaries to 'represent' all Leonardo's Divisions. Planning and monitoring of relative KPIs.
- Ensure correct Governance of International Subsidiaries in line with the Directives, processes and policies defined by Leonardo S.p.A.

International Subsidiaries Objectives and Key Enablers:

- Globally represent Leonardo's offer and promote agreements with local third-party companies.
- Establish and maintain valued local relationships throughout the entire programme lifecycle, further developing Leonardo's business.
- Execute industrial activities in support of offset and local content obligations.
- Establish Centers of Excellence, for the whole Leonardo, to address worldwide markets.
- Development of skills and, in specific cases, products and technologies to meet the needs of customers and Divisions / Leonardo.
- Establish local HUBs for logistics and after-sales support services, consolidating relationships with key customers.

- Allow Leonardo's participation in tenders reserved only for local companies.

Leonardo International currently works as a shareholder and monitors market trends in the rest of the world (beyond Italy, UK, USA and Poland) through the 26 legal entities present in the various countries. However, to achieve the objectives defined in the strategic Plan 2030 and therefore "Be Global", the Group got that this is not enough. It's needed to develop a One Company business model that allows the individual legal entities of Leonardo abroad to be transformed into "Little Leonardo". They must be able to offer a global range of products and services allowing to increase sales and after sales revenues. Furthermore, it is necessary to reform the organizational structure in order to facilitate decisions both vertically and horizontally. To do this, it will be necessary to create integrated systems enabling a simpler and more efficient exchange of information between local entities (horizontally) and with the Parent Company (vertically) to offer the right product in the shortest possible time based on the local needs.

Leonardo International places itself in the middle between the Leonardo Group and the rest of the world, to lead a transformation towards the One Company model to achieve top line and bottom line objectives. The company must bring the best practices developed over the years by some local entities (both in terms of value chain activity and in terms of relational activity with local governments) in as many countries as possible, always maintaining the strategic directives of the Parent Company. Through this transformation, an improvement in performance is expected both for local entities and for the Group itself.

4.2 How To Be Successful

Based on the topics analyzed in the first and second chapter of this research, 3 main pillars are crucial in order to be successful: the organizational design, the offering and the business and operating model of Leonardo and of the 26 foreign local entities.

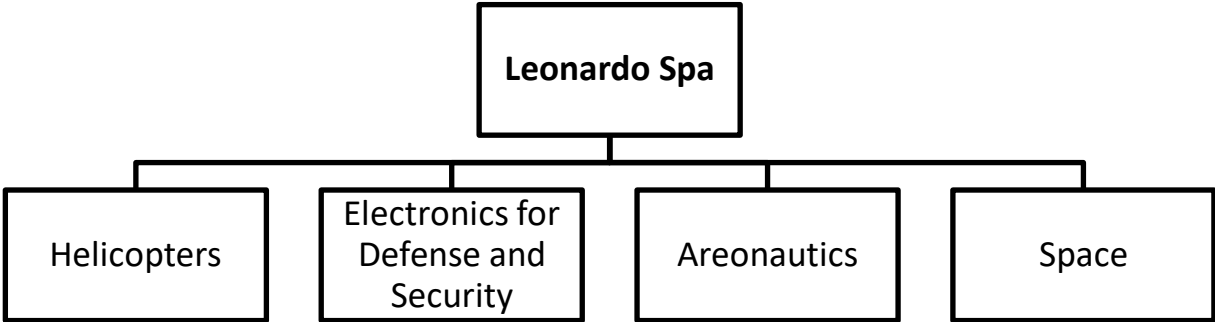
According to the main goals discussed in the previous paragraph and the literature reviewed, the research suggests an international strategy that could help Leonardo to achieve its objectives using Leonardo International as key enabler.

4.2.1 Organizational Design

In a context of internationalization, it's important to set the strategic objectives of the firm to better define which is the organizational structure best fitting Leonardo.

From *the paragraph 4.1* and as result of the interview, it's possible to state that Leonardo has a sort of divisional structure for which the division are segmented by product: helicopters, electronics for defense and security, aeronautics and Space. Below a figure representing the Leonardo's Organizational Design.

Figure 7. Leonardo Divisional Structure



Source: Created by the Author

In the divisional structure, the units are organized on the basis of the products, market or sector they have to deal with. By operating a grouping by sector of competence, better results are achieved in coordinating the various functions that collaborate in the realization of the product or in the management of the market. Divisional units have a complete view of the market or product. The environment is constantly monitored (being a restricted environment) and changes are faster, not having to go through central management. Although autonomy and functional coordination are greater, specialization and economies of scale are affected (Burton & Obel , 2018). This structure is indicated when the company has many products in its portfolio or operates on distinct markets with different characteristics. In this type of structure there may also be centrally managed activities that are used by all divisions (for example research and development shared between the various markets, or marketing shared between the various products) and organized in the form of business units or staff. It is a horizontal structure, which involves collaboration between the various functions (Corkindale, 2011).

Moving the attention to Leonardo International, as resulted from the interview conducted with the Head of Commercial Department of Leonardo International Spa, Dr. P. Solferino, the commercial subsidiary has a structure very similar to the Parent Company. Even if it is a divisional structure, the divisions are segmented by geographic area for which each local

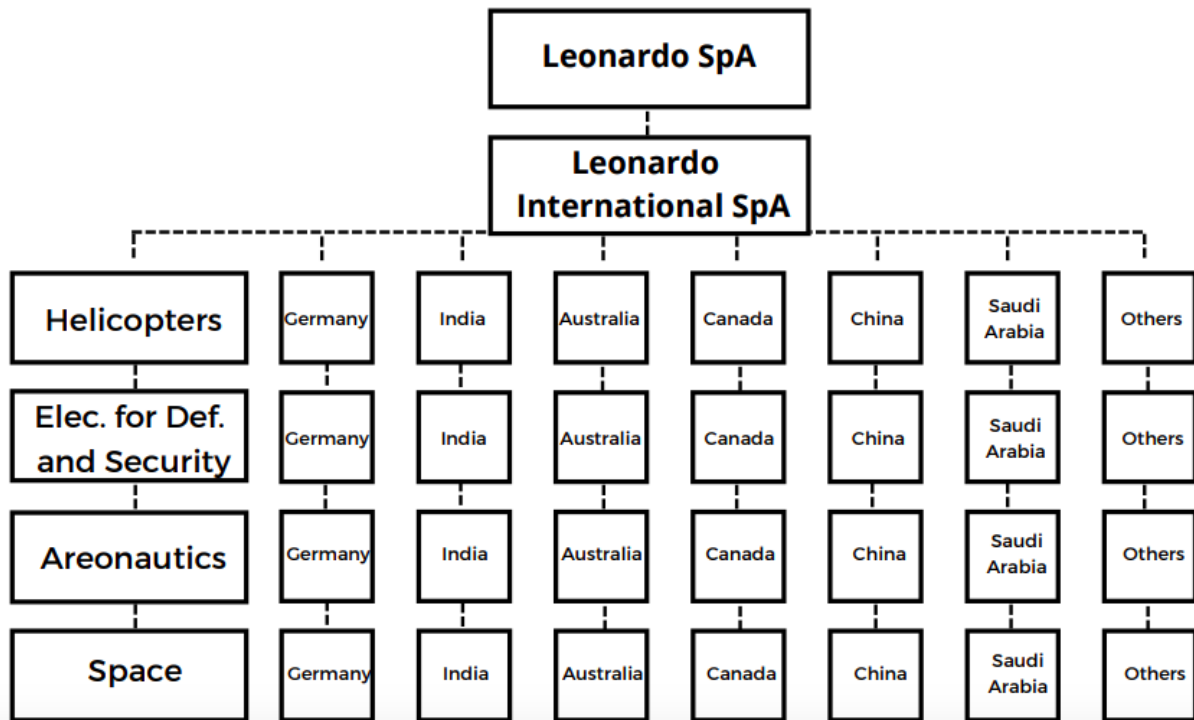
entities manage particular market conditions. This allows to be much more reactive to market changes but it doesn't allow a high cost reduction.

Focusing to the 26 foreign local entities, again, they have a divisional structure segmented by products as Leonardo Spa. Obviously, as we can see from the *Figure 6*, not all of them are responsible for all the value chain activities neither have all the product segments in their business portfolio.

This kind of structure allows to Leonardo Spa to achieve only one of its objectives, the specialization of the divisions by product (as per Leonardo is) or a strong attention to the market (achieved by Leonardo International). However, a cost reduction characterizing the standardization goals defined in Chapter 2 is not achieved. In addition, with the actual model there is no possibility to mix the two advantages previously defined and neither Leonardo and the local entities can exploit their synergies (Adashev & Ismoilov, 2020)

For the reasons discussed above, the study suggests to Leonardo Spa to move to a matrix structure using Leonardo International as enabler to guide this transformation. The best option would be create a matrix structure putting on one axes the product and on the other one the geographical divisions (Chong & Duan, 2022). Below a graph representing the new organizational structure that Leonardo could ideally implement to achieve the goals of cost reduction and product differentiation.

Figure 8. Leonardo Matrix Structure



Source: Created by the Author

It is a hybrid version of the divisional and functional structures. It is a complex structure, where there are both function and division managers, who manage the activities in a transversal way. Therefore, both the needs of specialization in a function (since there is a subdivision by function) and those of global consideration of a product or market are brought together. The structure is therefore both vertical and horizontal, since there are function managers (vertical) and managers responsible for the relations between the various functions in relation to a specific product or market (horizontal) (Elezaj, Morina, & Kuqi, 2020). A structure thus constituted is therefore very flexible, since the department managers adapt the resources to the various products on the basis of the needs expressed by the division managers, but also specialized, given that the functions are grouped. However, the matrix structure is very complex both to design and to manage. In fact, employees are subjected to dual authority (division and function), which can lead to conflicts between managers and confusion among employees, and requires considerable efforts for the coordination of the various activities and for the resolution of conflicts between function managers and between the various division managers (Padalaa & Maheswarib, 2022).

With this structure, there will be multiple advantages for Leonardo:

- *Efficiency*: This structure allows to standardize the offer around the world.
- *Local responsiveness*: It will be easier to manage the local relationship and create products tailored for the specific countries or commercialize them according to the country's needs.
- *Local Intelligence*: In this structure, communication will be more efficient and the local entities will play also a role of intelligence able to report the specific countries' insights to the Parent Company.
- *Improving supply chain*: It will be possible to exchange communication between production sites to solve recurring and new problems in a form of knowledge sharing. In addition, it will be possible to move faster parts and components across warehouses when the needs arise thanks to advanced information system allowing to better share data and information.

4.2.2 Global Offering

Another main topic to dive deep is the offering. As discussed before, Leonardo focuses its business on four main product segments: helicopters, electronics for defense and security, aeronautics and Space. It is actually increasing his presence in other businesses like cybersecurity and other small services (sourced by Leonardo company website).

From the interview conducted with the Company reference contact quoted in the previous paragraph, it's emerged that not all the 26 local entities are able to produce and / or commercialize all of these products. This is due to 4 main factors:

- ***Lack of resources and capabilities***: Some countries are not able to develop by themselves all the products requested due to lack of resources, capabilities and knowledge. In this sense, the human capital could be one of the main intangible asset useful to share knowledge across the network of the foreign local entities (horizontal sharing) and, at the same time, from the parent company to the subsidiaries (vertical sharing). Leonardo International should act as coordinator of this transferable asset, investing its activities in the attraction and retention of a talent pool as key success factor in order to expand the local entities' actual offering, as well as, developing a communication system around the globe allowing to quickly share information among employees, solving issues without waste of time and energies.
- ***Low customer demand***: Probably some countries are specialized in the commercialization of some products rather than of the entire business portfolio due to lack or poor customer

demand. In this environment, the local entities have to investigate on the reason behind the low customer demand. In detail, if it's related to the low level of local responsiveness of the firm, due to the low perception of the brand, due to the high costs or to the absence of needs. They should act as Intelligence point of interest managed by Leonardo International Spa and that will be able to dive deep in to this data and report to the Parent Company. With this activity, Leonardo Spa will increase its knowledge regarding the local markets and it will move in to specific strategies in order to offer the best product in a delivery time that manner.

- ***Parent company low commitment in improving some businesses in specific countries:*** Sometimes, the lack of a global offering is due to some company's cultural constraints. The "offset" practice can better explain this topic. This practice does not consist in offshoring part of the activities to the foreign countries without sharing some important assets. On the contrary, the success of the offset is the knowledge-sharing with the other country and, in Leonardo case, in sharing the expertise, the technologies and the practice used by the parent company to the foreign local entities. Leonardo International should focus on this aspect, proposing itself as a tier between Leonardo Spa and the local entities, as well as a linkage across all the markets. It should be able to share knowledge, competencies, technologies and know-how with the local entities and to recognize the needs of each country and communicate to the parent company how move efficiently to satisfy them.
- ***Legal and political regulation or product compliance:*** The aerospace and defense industry faces numerous compliance requirements from the government with its own internal standards of excellence. Such requirements cover numerous aspects of the supply-chain and include materials usage, counterfeit parts, manufacturing procedures, hiring practices and other aspects of the industry. It could happen that in some countries, there is a political constraints in this grey area of the law. Leonardo International Spa should be responsible for this kind of due diligence in order to respect the requirements determined by the law and, above all, it should anticipate possible changes in this turbulent environment, facing quickly any possible issue.

4.2.3 The new Business Model of the Local Entities

With this transformation, the local business entities should move from simple commercial subsidiaries of Leonardo into well-organized Leonardo's business units acting as Leonardo itself. In detail, they should be able to create their own value chain activities working day-by-day in order to improve the efficiency in terms of cost pressure and, at same time, to

improve their effectiveness in their targeted markets. This new SMEs should build a network among them in order to create a competitive advantage for the Parent Company.

Again, Leonardo International Spa is supposed to be the linkage between the parent company and the subsidiaries. It should act as the enabler managing the connections between the subsidiaries and Leonardo itself. A role that in part it is already responsible for. However, with this re-organization, it's supposed to be much more present in setting the business goals of the foreign legal entities. Goals that are totally aligned with the mid-long term vision and strategic objectives of the Parent Company.

Another important aspect that has to be highlight in the new business model of the local entities is the shifting from the status of mere commercial subsidiaries to the personification of Leonardo S.p.A around the world. Taking into account *figure 6* illustrated in the previous paragraph, the entity that much better present itself as a “Small Leonardo” outside the Italian landscape is Leonardo Germany GmbH. In Germany the most of the activity of the value chain are based in the local territory and a lot of products and services are offered and implemented in order to satisfy both local and global demand. According to Leonardo internal sources and to the results of the interview with the company reference contact, there is a strong positive correlation between the so called “*g-local*” value chain that could be implemented in each country, the in-house activities (level of investment, resources and capabilities involved), the external factor featuring the market itself (GDP, % of spending as share of GDP in aerospace and defense industry) and the alignment of the local entity to the main goal of the Parent Company in generating results.

The alignment to the goals of the holding company and the importance to invest resources and capabilities in the foreign countries have already been discussed, while the level of investment and the GDP factors will be discussed in the next paragraph. In this paragraph, the study will focus on the *g-local* value chain.

Firms are increasingly adopting strategies that combine both global and local sourcing, namely *g-local* sourcing in several industries. To achieve optimal profit, it is crucial to meet the right balance between global and local sourcing. However, this subject receives little attention from researchers, and the parameters to reach the right balance remain unclear. Whether to develop a global, local, or mixed sourcing strategy, Fischer (2003) suggests that it depends on the

characteristics of a product's demand, and demand varies by the product itself and by the stability of demand. Fischer classifies products by demand patterns: (1) functional products in which the demand is predictable or (2) innovative products in which the demand is unpredictable (Fischer, 2003). To reach an optimal result, the supply management must be designed to meet each type of demand. The functional products require a physically efficient process and innovative products require a market-responsive process. For innovative products, due to the great economic gain from reducing stock-outs and excess inventory, the firms should work on increasing market responsiveness to reach the desired efficiency. Fischer's concept can be applied to combining local and global sourcing. For instance, a firm could apply global sourcing to mature products and local sourcing to new-introduced innovative products (Yen, 2022).

Indeed, it is true that this kind of strategy is already implemented in other industries as stated by Yen 2022 (e.g. in food & beverage industry with Pepsi and Nestlè) but it's not totally applied in the Aerospace & Defense industry. Probably, the idea to exploit a global value chain for the "traditional" products while a local one for the "innovative" products could be successful in A&D industry, above all considering the emerging technologies that could improve the actual offering.

Leonardo is already committed in the creation of Center of Excellence for R&D and Innovation activity. This could be a great starting point, totally aligned with the goals to be "Solid, Global and Driver of Innovation" as stated in the "*Accelerating technology evolution*" report published by Leonardo Spa (2021). Adopting this g-local value chain, splitting the traditional products from the innovative ones, there will be advantages for all the stakeholders involved. Leonardo will commit in to the creation and development of the Center of Excellence. In return, it will obtain innovative products and services already tailored to the local (and / or international customers). In addition, the countries involved in this project will obtain advantages in terms of local employment with the creation of the Center of Excellence and more investments from the government in the industry itself. As a consequence, Leonardo could grow both internally in the country and externally in a global perspective, exporting its products abroad.

4.3 Where and How to apply the Transformation

In the previous paragraph, it's defined which are the main business pillars affecting this transformation. However, due to the turbulent environment featuring the A&D industry and the

differences in terms of customer needs and market demands of each country, it's important to analyze the "where" and the "how" of this transformation, analyzing in which country it could be applied based on direct and indirect returns on the investment needed to modify the business model. In the below paragraphs, it will be analyzed which are the markets that could be most profitable, bringing the greatest advantages, as well as the Go-To-Market strategy most fitting Leonardo's needs.

4.3.1 Targeted Markets

In order to define the markets in which it's profitable to invest financial and human resources, this study will focus on some KPIs such the investment amount in A&D per country, the A&D exports, the level of confidence of implementing this transformation based on the risk featuring those countries and the resources and capabilities already present in them.

As stated in the "*Trends in world military Expenditure, 2021*" published by SIPRI in the April 2022, the economic effects of the Covid-19 pandemic have not ended the continuous upward trend in world military expenditure seen since 2015. As a result of the strong economic recovery across the globe in 2021, world military spending as a share of world gross domestic product (GDP) - the global military burden - reached 2.2 per cent, down from 2.3 per cent in 2020. Average military spending as a share of government expenditure in 2021 remained the same as in 2020, at 5.9 per cent. (SIPRI, 2022). Below a figure illustrating the 40 countries with the highest military expenditure in 2021:

Figure 9. Military Expenditure in 2021

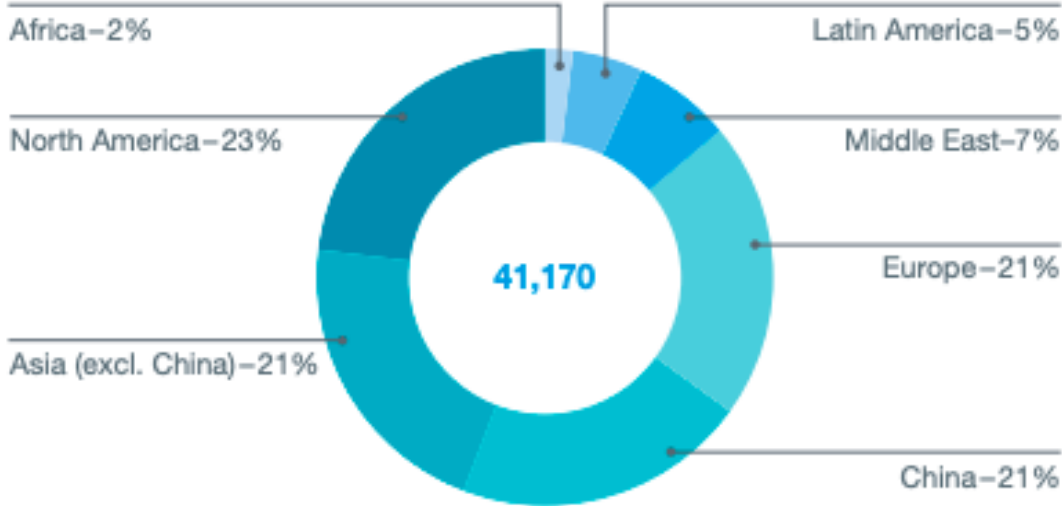
Rank		Country	Spending (\$ b.),		Change (%)		Spending as a share of GDP (%) ^b		World share (%),
2021	2020 ^d		2021	2020-21	2012-21	2021	2012	2021	
1	1	United States	801	-1.4	-6.1	3.5	4.5	38	
2	2	China	[293]	4.7	72	[1.7]	[1.7]	[14]	
3	3	India	76.6	0.9	33	2.7	2.6	3.6	
4	6	United Kingdom	68.4	3.0	3.7	2.2	2.4	3.2	
5	5	Russia	65.9	2.9	11	4.1	3.7	3.1	
Subtotal top 5			1 305	62	
6	8	France	56.6	1.5	13	1.9	1.9	2.7	
7	7	Germany	56.0	-1.4	24	1.3	1.2	2.7	
8	4	Saudi Arabia	[55.6]	-17	-15	[6.6]	[7.7]	[2.6]	
9	9	Japan	54.1	7.3	18	1.1	1.0	2.6	
10	10	South Korea	50.2	4.7	43	2.8	2.5	2.4	
Subtotal top 10			1 578	75	
11	11	Italy	32.0	4.6	9.8	1.5	1.4	1.5	
12	12	Australia	31.8	4.0	42	2.0	1.7	1.5	
13	13	Canada	26.4	3.1	40	1.3	1.1	1.3	
14	18	Iran	24.6	11	-17	2.3	2.8	1.2	
15	14	Israel	24.3	3.1	35	5.2	5.6	1.2	
Subtotal top 15			1 717	81	
16	17	Spain	19.5	5.6	5.2	1.4	1.4	0.9	
17	15	Brazil	19.2	-4.3	-5.3	1.2	1.4	0.9	
18	16	Turkey	15.5	-4.4	63	2.1	2.0	0.7	
19	20	Netherlands	13.8	-0.5	26	1.4	1.2	0.7	
20	19	Poland	13.7	-5.2	58	2.1	1.8	0.6	
21	21	Taiwan	13.0	1.4	7.9	1.7	2.1	0.6	
22	..	Qatar	11.6	4.8	..	0.5	
23	22	Pakistan	11.3	-0.7	47	3.8	3.5	0.5	
24	23	Singapore	11.1	7.1	24	3.0	3.1	0.5	
25	25	Colombia	10.2	4.7	30	3.4	3.2	0.5	
26	24	Algeria	9.1	-6.1	16	5.6	4.5	0.4	
27	30	Kuwait	9.0	25	34	6.7	3.4	0.4	
28	27	Mexico	8.7	-3.4	63	0.7	0.5	0.4	
29	26	Indonesia	8.3	-15	35	0.7	0.7	0.4	
30	28	Norway	8.3	0.8	39	1.8	1.4	0.4	
31	37	Greece	8.1	46	54	3.9	2.4	0.4	
32	32	Sweden	7.9	14	46	1.3	1.1	0.4	
33	29	Thailand	6.6	-8.5	16	1.3	1.4	0.3	
34	36	Belgium	6.3	9.2	17	1.1	1.0	0.3	
35	38	Chile	6.2	8.6	34	2.0	2.0	0.3	
36	34	Ukraine	[5.9]	-8.5	142	[3.2]	[1.6]	[0.3]	
37	45	Finland	5.9	36	50	2.0	1.5	0.3	
38	33	Oman	[5.8]	-9.6	-43	[7.3]	[12]	[0.3]	
39	31	Switzerland	5.7	-13	22	0.7	0.7	0.3	
40	39	Romania ^c	5.6	3.1	161	2.0	1.2	0.3	
Subtotal top 40			1 963	93	
World			2 113	0.7	12	2.2	2.3	100	

Source: "Trends in world military Expenditure, 2021", SIPRI 2022

From this study, it's easy to understand that countries such as US, Russia, as well Germany in Europe and Japan, South Korea, China and India in the APEC market are the ones that are investing more in this industry. In addition, it's very interesting that the number of private equity and venture capital investment deals across India in 2021 is around 10 million dollars as reported by EY in the "PE/VC India Trend Book 2022" (EY, 2022).

Moving to the future, it's possible to identify which are the markets that will grow more. While the impact of the pandemic on airlines and air traffic has been substantial, the Boeing commission remain confident in the long-term resiliency of the industry. Boeing forecasts that airline fleets will nearly double by 2041. Airlines will take delivery of 19,575 airplanes to meet the needs of the market through 2031. Deliveries over the 20 years through 2041 will be 41,170 airplanes. By 2041, approximately 42% of new airplane deliveries will be to airlines based in the Asia-Pacific region. An additional 44% will be delivered to airlines in Europe and North America, with the remaining share delivered to the Middle East, Latin America, and Africa. These regional trends are relatively constant across both the 10-year and 20-year forecast horizons (Boeing, 2022).

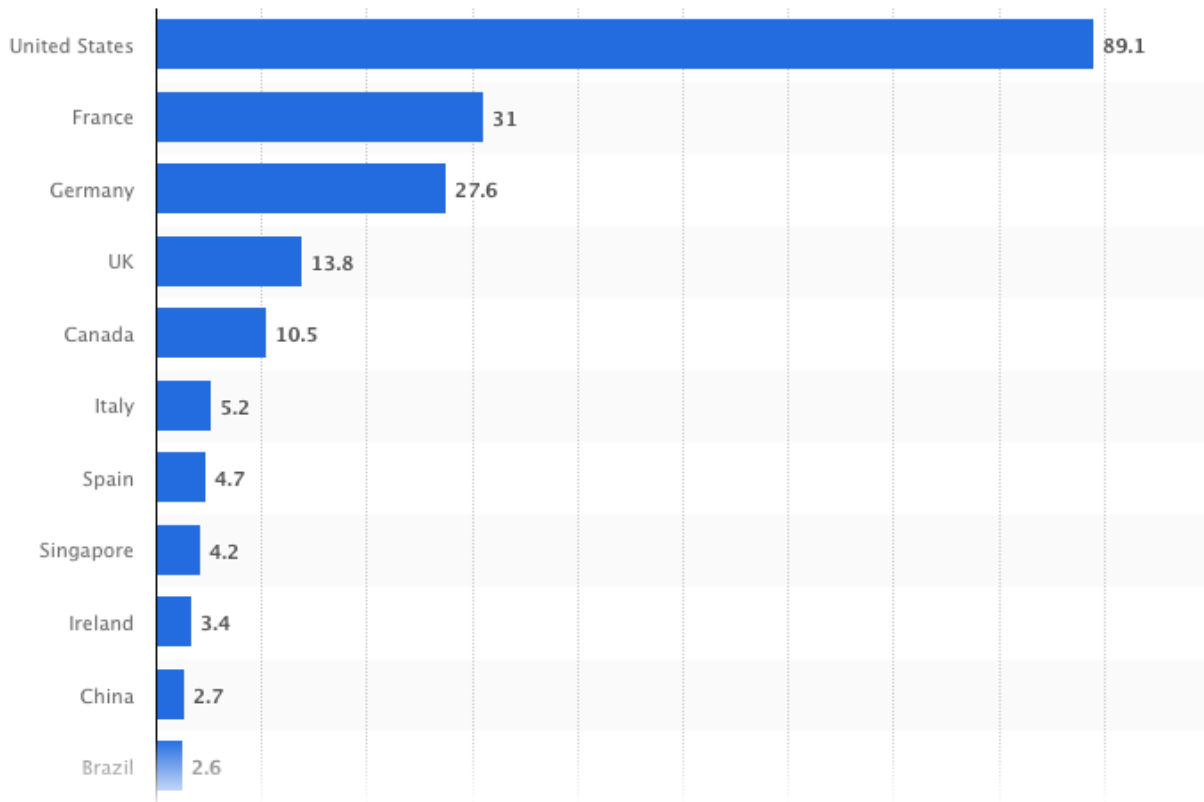
Figure 10. New Airplane Deliveries by Region: 2022 - 2041



Source: Commercial Market Outlook 2022-2041, Boeing 2002

In order to complete this overview by country, it's important also understand which are the most developed ones in terms of resources and, consequently, able to export products around the world. The 5 biggest exporters of aerospace products are USA, France, Germany, United Kingdom and Canada. Collectively, that powerful cohort generated over three-quarters (76.8%) of globally exported aerospace goods in 2021 (Statista, 2022). From a continental perspective, exporters in North America sold the highest dollar value worth of aerospace products on international markets generating 44.7% of the worldwide total. Close behind at 43.4% are suppliers in Europe while another 8.9% worth originated from Asia. Below are the 15 countries that exported the highest dollar value worth of aerospace products during 2021 (data in billion U.S. dollars):

Figure 11. Leading countries with the highest aerospace exports in 2021



Source: “Leading countries with the highest aerospace exports in 2021”, Statista 2022

Among the top exporters, the fastest-growing aerospace products exporters since 2020 were: Netherlands (up 39.3%), Italy (up 26.2%), Switzerland (up 16.9%) and the United States of America (up 9.6%) (Workman, 2022).

Combining the data analyzed in this paragraph and the *figure 6* in the *paragraph 4.1.2*, it’s possible to conclude the following statements:

1. *China, Germany, India, Canada and Brazil.* Outside of the geographical area in which Leonardo S.p.A is already operating without Leonardo International S.p.A (USA, UK and Poland), the most interesting country in which it’s possible to apply the transformation discussed in the *paragraph 4.2* are China, Germany, India, Canada and Brazil. They results to be the most profitable due to the actual spending amount in Aerospace & Defense industry as well as considering the long term results forecasted by Boeing.
2. *Germany as best practice to share with the network of foreign local entities managed by Leonardo International S.p.A.* Germany is the country with the highest exported value of

products according to *Statista 2022*, meaning that it is able to build strong inter-government relationship with the rest of the world commercializing products worldwide with great results (Oxford Analytica, 2022). Furthermore, Germany is the only foreign entity under Leonardo International control (excluding Sales ES Inc. in USA) owing all the activities of the value chain. In addition, according to Fischer (2003) and Yen (2022) and to what suggested in the previous paragraph (Fischer, 2003), Germany could be identified as the Country in which a structured g-local value chain should be implemented, also considering the resources, facilities and the competencies already present in the local territory (Yen, 2022).

4.3.2 Go-To-Market Strategies

In the previous paragraphs, the research explained *how* and *where* is possible to apply the One Company Business Model. However, another important topic in order to understand how to be successful with this transformation is the Go-To-Market activity. If the study has identified Germany as the country able to bring its practices around the world, it's also important to focus on the commercialization of the products and services. Here, two are the topics to discuss:

1. **Product Compliance.** Most organizations operating in the aerospace industry are required to register to one of the specific standards AS 9100, AS 9110, or AS 9120. The AS 91XX family of compliance standards covers a wide range of areas, including product safety, configuration management, raw material testing, post-delivery support and more. Becoming compliant — and embracing the larger objectives of quality management — can have a number of benefits for aerospace manufacturers and suppliers (sourced by sae.org). These standards allow:

- *Accessing international markets:* The AS 91XX family of standards is one of the most recognized in the global aerospace industry. Achieving certification can allow firms to compete in international markets and provides instant credentials that potential stakeholders already know and trust.
- *Managing the risk of counterfeit parts:* Counterfeit parts are a growing problem in the aerospace and defense industry, one that leaves organizations vulnerable to considerable risk and liability. AS 9100D introduces requirements that improve accountability across the supply chain and help you manage these risks in a more effective manner.
- *Streamlining processes and planning for growth:* AS aerospace industry standards are based on a continuous improvement cycle, which is scalable to accommodate increased

demand as necessary. Implementing a certified quality management system will help firms run a leaner, more profitable business, preparing them for future growth in a way that is sustainable over the long term.

Referring to the targeted market discussed before, it's stated that the growing and ambitious aerospace industry in Southeast Asia has been a motivating driver of economic growth within the region. Governments aim at securing contracts from leading aerospace manufacturers, implanting aviation maintenance facilities (Bheekhun & Talib, 2020). Consequently, a wide range of tax and non-tax incentives for various activities in the aerospace industry are being brought forward. Although it seems that the countries of Southeast Asia are pushing forward and anticipating good prospects, it should be noted that an internationally recognized accreditation, that is AS/EN/JIS Q 9100, 9110 and 9120, is primordial for an aerospace company to win contracts worldwide.

In this perspective, Leonardo International Spa should be responsible of all the activities regarding product compliance and due diligence. It should constantly share with the foreign local entities this topics in order avoid any possible legal issues for the future.

2. International Agreement. The globalization spreads the needs to create strong relationship among countries. It is crucial in the A&D industry to build an international supply chain in order to face shortages and delivery products at lower cost in a time that manner for the customers. In addition, it's important also to allow an easy commercialization of the products across the world. Two are the main suggestions to share with Leonardo International for a successful implementation of the new organization:

- *Again, Germany as best practice.* The actions of the German government must be investigated in order to understand the replication feasibility also on the countries identified in the previous paragraph, to push both exports and local sales, after built a solid value chain as previously mentioned.
- Furthermore, Leonardo International has to focus its energies in the *creation of a network among the foreign local entities*, not only regarding the knowledge sharing and the information system discussed in *Chapter 2* but also in the creation of an international agreement among them. This agreement should allow an easy products and components transferability among countries as well as a simpler commercialization.

4.3.3 Main Challenges

Despite of the analysis shown, the implementation of a One Company Business Model is not easy to implement or to manage. There are several challenges to constantly face and they arise both internally and externally.

- *Internally*, there is the cultural issue. Sometimes could happen that the transformation is not accepted by all the stakeholders involved and there are some cultural constraints difficult to overcome. In an international context, in which all the local entities use to act by their own, the ones that are not aligned with the western culture typical of Leonardo, could constitute blockers and slowdown in the transformation process. Leonardo International is supposed to be the entity able to manage this problem with the knowledge acquired during the years by each country, regarding their business visions, priorities and main goals.
- Externally, the market could be the major issue. It's very important to dive deep on the profitability of the targeted countries, analyzing the actual demand and its possible future changes, being able to adapt to each situation. These possible changes of the environment and the feasibility to create this business model in the targeted market should be included in the risk valuation plan that will be defined by Leonardo International. The A&D market is a turbulent environment and external factors, such as changing in customer preferences or natural disaster or pandemic crisis could largely affect the business. The structure of the One Business Company encompassing also the foreign local entities could help Leonardo (through Leonardo International as supervisor) to face the so called V.U.C.A situation (Volatility, Uncertainty, Complexity and Ambiguity). Leonardo International should be able to face each change in the markets following three directions: first, it could count on the local entities network, facing shortages supplied by other countries with compatible products; secondly, developing the local value chain with the Center of Excellence; third, shifting the offering before that the needs arise thanks to the activity of intelligence carried out by the single local entities in their reference markets.

4.4 Additional Case Study Analysis

In the following paragraph, it will be presented a brief analysis of the international strategies pursued by some global players of the industry. In detail, for Boeing it will be shown the path followed by the early stages of the internationalization to the actual strategy with a special attention to the APEC market. On the other hand, Airbus' focus is on its

internationalization in APEC market where indeed the company made a big investment in the last 20 years (Japan and China). At last, there will be highlighted the main differences and the success / unsuccess factors featuring the two market leaders. The choice to analyze case studies in APEC market is due to the findings of the *paragraph 4.3.1*, for which the majority of the targeted country in which Leonardo should focus its resources comes from this region.

4.4.1 Boeing's Internationalization

Around the world, Boeing is developing partnerships that benefit its customers and business partners as well as local economies. As a result, the company is strengthened by growing sales and by tapping the best technologies the world has to offer. International sales are driving company revenues with more than 70 percent of total backlog represented by international customers. Approximately 70 percent of Boeing Commercial Airplanes' revenue historically comes from customers from outside the United States, including many from emerging markets. International sales are rapidly increasing as a portion of Boeing Defense, Space & Security's total revenue (sourced by Boeing company website).

Doing business in today's global economy also means partnering for mutual growth and prosperity, within each country, with local suppliers, universities, research talent, and charitable institutions. Boeing International is focused on growing a meaningful, mutually beneficial global presence (Boeing, 2022).

- The Boeing supplier network includes more than 20,000 suppliers and partners.
- Boeing has 11 research & development centers, 16 consortia and 22 joint research centers.
- Boeing has relationships with more than 50 international universities.
- Boeing employees volunteer around the world to support many charitable endeavors.
- More than 660 charitable grants of \$40 million were distributed outside of the United States.

Boeing's internationalization development process mainly goes through six stages, namely the Initial Stage; Export Stage; International Business Stage; Multinational Stage; Transnational Operation Stage and Super International Stage (Wang J. , 2021).

1. The company started its internationalization during the World War II, exporting its products in to the European Market.

2. After the War, the International Business Stage started: Boeing has further established cooperation with Israel, Indonesia, Italy, North Korea, Japan, France, and other countries. Moreover, it expands international territory by opening offices in Canada, Japan, and other key countries.
3. Then , during the Multinational Stage (from 1970 to 1990), Boeing set up subsidiaries in the Middle East, Russia, China, South Korea, and other countries and regions. At the same time, it established many compensation trade enterprises, and carried out aviation industry cooperation projects, education and training programs with local universities, and initially formed an international customer network.
4. In the last decade of the 20th century, Boeing integrated its aviation technology and international market through merger and acquisition and became the world's largest military and civil aircraft manufacturer.
5. Boeing also continues to push forward the global localization operation by establishing the Boeing technology research center, easy access to the local advantages of the local resources, achieving the test objectives, and reducing cost consumption.
6. In the 21st century, the firm has accelerated globalization and cooperated with governments or airlines of more than 70 countries and regions, such as Japan, Europe, Korea, the Middle East, and Malaysia. At the same time, Boeing has established joint research centers in South Korea, the Middle East, Spain, China, and other countries to develop new aviation technologies jointly.

With its diversification strategy and acquisition strategy, Boeing has expanded its market and increased its revenue sources. By means of strategic alliance, outsourcing other businesses to companies around the world effectively optimizes the company's resource allocation and saves the company's cost; Boeing adopts a differentiation strategy to focus its core competitiveness on design and research and development. Boeing through the implementation of these strategies to make the enterprise bigger and stronger, gradually become the head of the global aviation industry enterprises (Boeing, 2022).

Boeing in China

For more than 40 years, Boeing has been a loyal partner serving the development of China's civil aviation transportation industry. President Nixon's historic visit to China in 1972 also introduced Boeing aircraft to the Chinese market. A major aspect of Boeing's activities in China is its increasing investment in establishing long-term supplier relationships and contracts,

involving collaborative ties and joint-ventures with the local aerospace manufacturers. Boeing has made enormous investments in transferring its technical expertise and operational experience to China's aviation industry and the regulatory authority, aimed at improving flight safety, reliability and efficiency. Boeing has also made significant investments in production quality control initiatives to help improve product quality. Boeing has a resident team in China, offering direct technical assistance/support to the Chinese factories. This team provides free educational training to China's aviation professions on a wide spectrum of topics, not only on technical matters (e.g., pilot techniques, maintenance engineering) but also on regulation development and managerial skills in air traffic management, executive management, airline management and airline marketing. Boeing has continued to expand its training facilities in order to address the needs of the growing Chinese aviation professions. In short, Boeing has been an important contributor to the development of China's aviation and aerospace industry.

Today, Boeing jets are the mainstay of China's air travel and cargo system, as Boeing planes comprise more than 50% of all commercial jetliners operating in China. The country has a component role on every current Boeing commercial airplane model — the 737, 747, 767, 777 and 787 Dreamliner. More than 10,000 Boeing airplanes currently fly throughout the world with parts and assemblies built in China (Boeing, 2019). Boeing activity in China contributes more than \$1 billion annually in direct support of China's economy, including procurement from Boeing's extensive supply base, joint venture revenues, operations, training, and research and development investment.

4.4.2 Airbus Internationalization

Airbus is a leading builder of commercial aircraft, the biggest aerospace and Space corporation in Europe and it also has divisions for helicopters, Space, and defense. With around 180 facilities and 12,000 direct suppliers worldwide, Airbus has built on its strong European background to become genuinely multinational. The corporation has final assembly lines for airplanes and helicopters throughout Asia, Europe, and the Americas, and since 2000, its order book has increased more than six-fold (sourced by Airbus company website).

Airbus recognized the huge potential of the Asia-Pacific market. It has pursued an aggressive strategy over the past decade to strengthen its ties with Asia-Pacific countries and expand its marketing and outsourcing activities in this region. Below a focus of Airbus Internationalization Strategy in China.

Airbus in China

In early 2000, Airbus saw the potential of the Chinese market, with its rapidly growing demand for air travel spurred by its staggering economic growth. It was easy to assume that the Airbus A380 could be considered a great choice for airlines to operate on routes connecting mega-hub cities such as Beijing, Shanghai and Guangzhou to other major cities around the world. While Airbus was still struggling in the Japanese market, it was facing much smoother sailing in China. Its deliveries to Chinese customers have seen gradual growth over the past decade and have posed a potentially serious threat to Boeing's traditional dominance of the Chinese market. In 2005, Airbus overtook Boeing by delivering six more aircraft to Chinese customers. It plans to expand its training and parts centers over the next two years to respond to the growth of its business in China. However, the increase in Airbus' sales in China did not happen overnight or without much effort on its part. In exchange for China's commitment to more orders, Airbus has intensified its cooperation with China since 2002, signing contracts worth \$ 300 million in US dollars (Hornig, *A Comparative Analysis of Supply Chain Management Practices by Boeing and Airbus: Long-term Strategic Implications*, 2007). It also promised to double the procurement of local content from Chinese suppliers to \$ 120 million per year by 2010. In the summer of 2006, Airbus announced that Tianjin should have been the site for Airbus' first final assembly plant outside Europe; the plant was exclusively dedicated to the manufacturing the A320 aircraft and was expected to roll out assembled airplanes. Although Airbus has signed a deal with AVIC I² on subcontracting projects in the production of the upper and lateral panels of the A380 nose landing gear bay, Airbus' outsourcing in China is still focused on the older models. Chinese suppliers' presence in the A380 program was much more limited, compared with their role in Boeing's 787 program. However, it was expected that Chinese suppliers will play a more important role in Airbus' planned A350 program, as Airbus has established an Engineering Center in Beijing that will initially concentrate on design work in connection with the A350 program.

Actually, Airbus confirms the signature of orders with Air China, China Eastern, China Southern, and Shenzhen Airlines for a total of 292 A320 family aircraft, demonstrating the positive recovery momentum and prosperous outlook for the Chinese aviation market (Airbus, 2022). These results have been achieved also with the creation of the “Airbus China Innovation Centre” (ACIC) in 2018. It delivers aerospace solutions that make a real difference in people’s

² China Aviation Industry Corporation I (AVIC I) was a Chinese consortium of aircraft manufacturers.

lives. In China, Airbus is accelerating some of the most promising and disruptive technologies that will transform the future of flight (Airbus, 2018).

4.4.3 Differences, Best Practices and Final Considerations

The disparities between Airbus' and Boeing's outsourcing practices mostly reflect the two businesses' very different overall outsourcing philosophies. Boeing assumed the role of a system integrator and gave its partners complete control. From the beginning, it also gave the Chinese suppliers a considerably larger portion of the task. Contrarily, Airbus has often chosen to enter into industrial offset agreements in connection with its older Airbus aircraft types, despite the fact that it also does so. China is likewise eager to grow its aviation sector, but it has a more pressing need for more local jobs. As a result, the person who is prepared to increase local employment prospects and invest in developing local human resources is more likely to enjoy higher favor.

Boeing may have become complacent as a result of its long-standing supremacy in Asia, and it may have forgotten that providing excellent customer service and building strong personal connections with clients are the keys to gaining their loyalty. This is just another potential element influencing Airbus' expansion in the Chinese market. The other noteworthy feature is that compared to Airbus, Boeing's actions in China are far more focused on education, demonstrating Boeing's dedication to developing the skills of Chinese suppliers as prospective future partners. Instead of placing a strong emphasis on knowledge transfer, Airbus' partnerships with Chinese suppliers still resemble typical "build-to-print" subcontractor relationships. (Horng, A Comparative Analysis of Supply Chain Management Practices by Boeing and Airbus: Long-term Strategic Implications, 2007).

Final Considerations

In the international competitive environment, the ability to develop a transnational organizational capability is the key factor that can help the firm adapt to the changes in the dynamic environment. As the fast rate of globalization renders the traditional ways of doing business irrelevant, it is vital for managers to have a global mindset to be effective. Globalization of business has led to the emergence of global strategic management. A combination of strategic management and international business will result in strategies for global cooperation. However, there are obstacles to progress along the way. The problems caused by these obstacles can be solved by cooperative ventures based on mutual advantages

of the parties involved (Twarowska & Kałol, 2013). Proper effective communication will be a key element for global strategies because what is proper and effective in one culture may be ineffective and improper in another. Marketing products globally is complex and difficult because of several factors including: International Strategic Alliances, coordination and control of international marketing, communication, regional trade blocks, and choice of global strategy. The firm with the choice of an effective global strategy that takes into consideration its strengths and weaknesses in the face of the opportunities and threats in the environment, will survive.

Conclusion & Findings

The research focuses on the Aerospace and Defense industry, investigating one of the major company in an international perspective. The first chapter provides an industry market analysis through a top-down approach, going from the worldwide performance overview, to the European region, concluding with the Italian market and the introduction of Leonardo Spa. In addition, an overview of two major industry players such as Boeing and Airbus is presented. Then, a focus on the main drivers of the industry and the future trends has been described for a better understanding of the future strategic orientation of the A&D industry.

In the second chapter, a theoretical and practical description of the internationalization has been investigated. The study analyzes the different kind of international strategies that a firm should adopt based on its main goals, researching the right balance between the cost pressure and the local responsiveness. After a theoretical overview based on a strong literature review, these international strategies have been described in the Aerospace Industry, highlighting the importance of internationalization in this sector, as well as the importance to act globally with a network of partners in order to reduce costs and gain advantages in terms of customer satisfaction due to the high degree of local responsiveness.

The third chapter describes the main objective of this study and the methodology applied in order to answer to the Research Question: *“How Leonardo Spa could unify its business model with the local entities abroad? Which is the role of Leonardo International Spa?”*

The last chapter is the core of the study. It describes Leonardo Spa (parent company), Leonardo International Spa (commercial subsidiary) and the 26 foreign local entities operating around the world, their goals and strategic orientation in the mid-long term. It provides an overview of the actual organizational structure, the company offering and the operating and business model of the stakeholders involved. In addition, it describes which are the main pillars crucial to be successful in an international environment for Leonardo, suggesting a new organizational design, a different approach in the global offering and the optimization of the business model through a g-local value chain. However, different researches state that implementing a transformation as the one suggested is not easy due to different limits (political, cultural, market demand). For this reason, there is a great focus on Leonardo International as main enabler able to handle the foreign local entities and successful carry out this transformation.

Furthermore, it's important to target the markets in which the new business model could be applied, as well as to define the correct go-to-market strategy based on the countries differences and on the main challenges to face in the future.

In the last paragraph there are the company case studies of Boeing and Airbus. For each of them, there is a brief analysis of the firms' ecosystem and the results derived from the international strategy adopted in the APEC market.

Main Findings

After an in depth analysis of the industry, of its trend and of the main topic affecting the international strategies (e.g. offset), the research has shown the actual situation in which Leonardo Spa is operating and its actual organization structure.

The research suggests the main actions that Leonardo Spa should carry out in order to unify its business model abroad, exploiting Leonardo International Spa (its commercial subsidiary) as key enabler able to realize this scope. According to the literature review and to the interview conducted with the Head of Commercial Department of Leonardo International, the research has first identified the main changes that should affect Leonardo Spa: the organizational design, the global offering and the business model of the foreign local entities.

The actual organizational design of Leonardo Spa is a divisional structure based on a product segmentation; the Leonardo International Spa organizational design is a divisional structure segmented by geographic area (the 26 local entities), while the structure of the foreign legal entities is again a divisional structure segmented by product. The study suggests to Leonardo Spa to move toward a matrix structure, for which on one axes there will be the products and on the other one there are the geographical divisions. This new organizational Space will allow to the Parent Company to achieve a dual goal of cost reduction improving its supply chain and, at same time, to create products tailored to the countries' needs.

In addition, the foreign local entities will act as intelligence department. They are directly linked in a network and could easily catch the changes in local needs, reporting all the data and information gathered to the Parent Company. However, an efficient Communication and Information system is needed in order to be successful. This ICT system will also play an important role in at least other two points: (I) the knowledge sharing is critical in order to

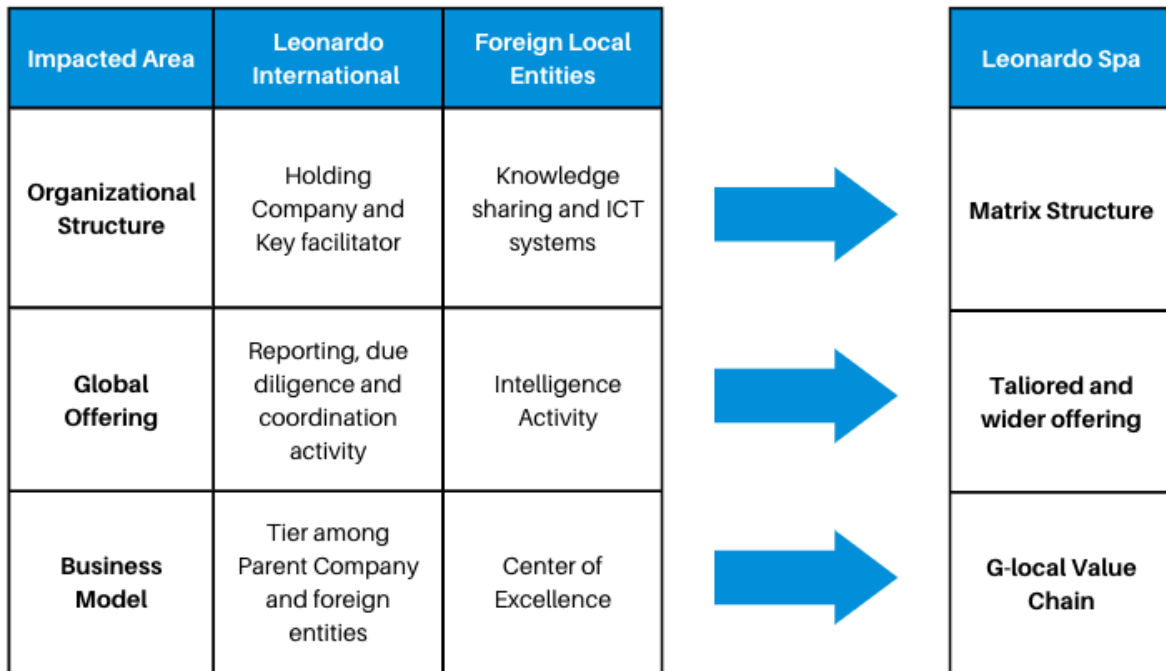
develop skills and new technologies around the world (II) the ICT allows to improve a g-local value chain activity. For the last topic, there are huge advantages for the Parent Company in implementing this structure with the right resources and communication system. In fact, in an interconnected value chain, the processes will be faster and it will be easier to face shortages of components. With an instant communication this missing components could be transferred from a warehouse to another with the final goal to deliver the best product in a time that manner for the customer thanks to a mutual cooperation among the local entities.

The second important topic defined is the offering. In order to be competitive, Leonardo should offer as many products as possible to the targeted countries. This will be available only identifying the opportunities arising from the markets and this will be possible with the “intelligence” activity carried out by the foreign local entities in the model suggested. However, it could happen that the constraint is not the market demand but the policy regulation. Indeed, the reporting activity of the foreign company to the legal entity becomes crucial in an complex environment featuring the A&D industry.

The last topic identified is the innovation business model adopted by the local entities. Actually, they play the role of mere commercial subsidiaries commercializing Leonardo’s products. They should re-invent their positioning in the market presenting themselves as SME of Leonardo Spa but acting in behalf of Leonardo itself. The innovation here is characterized in to the value chain: the study suggests to move in to a “*G-local*” value chain. *Global* in terms of relationship with suppliers around the world and with the network of foreign local entities to develop the “functional” products already commercialized. *Local* in terms of innovation, for the development of new products and services according to the local tastes. Leonardo should invest more in the creation of Center of Excellence focused on the innovation and R&D in order to create locally new solutions to deliver to the customers, already tailored to their needs. This will bring benefits for all the stakeholders involved: Leonardo will increase its competitiveness in the market while increasing the employment rate of the countries and providing funding to the guest countries, improving their economies.

Below a table representing the area affecting the transformation discussed above and the main stakeholders involved. The table summarizes the activities and role played by Leonardo International Spa and the foreign local entities, that will deliver the specified outputs for Leonardo Spa.

Table 2. Impacted Area by Stakeholders and Leonardo's Transformation



Source: Created by the Author

The transformation suggested to Leonardo could not be implemented in all the 26 foreign legal entities due to political constraints, the market demands, the resources and capabilities already developed or not in the foreign countries. The research states that the Countries most fitting this One Company Business Model of Leonardo Spa are: *China, Germany, India, Canada and Brazil*. This result is based on a cross-analysis of the world military spending as share of the GDP, the exports of the industry, the level of confidence of implementing this transformation considering the political situation and the resources and capabilities already implemented in each Country. Referring to the level of confidence in implementing the transformation in the targeted country, the results arise from the interview conducted with the company reference contact: he named the following countries as the ones in which Leonardo is evaluating to invest according to the marked demand and the competences developed in these foreign local entities.

Table 3. Targeted Country

CRITERIA	China	India	Germany	Canada	Brazil
Military Spending (\$ bn.)	293	76.6	56.9	26.4	19.2
Exports (\$ bn.)	2.7	1.4	27.6	10.5	2.6

Source: Created by the Author

In addition, this cross-analysis and the interview conducted suggest *Germany as best practice* to share with the network of foreign local entities. It is one of the nations with the largest export value of goods in the industry and it is the only foreign business under Leonardo International ownership (apart from Sales ES Inc. in the USA) carrying out the most of the value chain's activities. Germany might be chosen as the nation where a structured global local value chain should be created, taking into account the resources, infrastructure, and skills currently available in the region.

Hand in hand with this suggestions, the research focuses also on the role of Leonardo International Spa in the development of the One Company business model able to unify the foreign local entities abroad and gain multiple advantages. Leonardo International is the key enabler of this transformation. It should act as a coordinator across the network of the foreign local entities, aligning the Parent Company priorities and goals with the ones of the entities abroad. It should be the tier between Leonardo and the legal entities. It will be responsible of the reporting activity of the local entities as well as of the legal due diligence practices in order to overcome problems related to product compliance. It should create solid inter-government alliances with the foreign Countries in order to boost sales. It has to work in order to create an international agreement among all the countries involved in the project to facilitate the information, components and final products exchange between countries, providing multiple benefits for all the stakeholders.

To support the suggestions provided to Leonardo Spa, the study analyzed two other internationalization cases: Boeing and Airbus. In detail, these two company cases show the international strategies of the players in the APEC market (in detail in China). China is one of the country identified in the research in which the restructuring of Leonardo could be feasible.

In fact, even if with different timings, both Boeing and Airbus built strong relationships with the target country. In addition, this strong relationship is based on the offset practice and on the knowledge sharing with the guest country. In fact, the main difference between Boeing and Airbus in China is that the US Company has given to the Chinese partner the opportunity to be part of the Boeing project as active player and not exploiting them only to overcome political constraints. The Boeing Chinese partner played an important role in the design and production of “functional” and “innovative” products. On the contrary, Airbus’ Chinese partner were secondary in the project and they were only partially involved, focusing only on the much more traditional products without a real knowledge sharing from Airbus to Chinese partner.

This difference between the traditional and innovative products is stated by Yen in 2022 analyzing the g-local value chain. In addition, to remark the importance that the guest country has for Boeing, the company has a resident team in China, offering direct technical assistance / support to the Chinese factories (Yen, 2022). The results of Boeing in China were greater than the Airbus ones. Indeed, the strategic approach chosen by Boeing in a sort of open innovation strategy was successful and remarks what the paper suggests to Leonardo Spa in innovating its business model creating a g-local value chain, in which the innovation center of excellence has to be local and not global.

Moreover, Airbus followed Boeing in this open innovation approach, establishing an Engineering Center in Beijing that concentrate on design work in connection with the A350 program and the “Airbus China Innovation Center” (ACIC) in 2018. Indeed, Airbus evolved during the years towards a transnational operational stage and probably in the future it will move to the super international stage implanted by Boeing and discussed in the *paragraph 4.4.1* (Wang, 2021).

Referring to Boeing as best practice in the industry, it’s possible to state that the Leonardo Spa has some similarities with the US company:

1. *The cultural approach to the foreign country*: it allows to involve as many country as possible in this transformation applying the same open innovation strategy implemented by Boeing in China.
2. Long-term established relationship: Leonardo has an historical background with the targeted countries thanks to the foreign local entities operating there since several years

(even before of the creation of Leonardo International Spa), very similar to the 50 years relationship between Boeing and Chinese government (President Nixon's historic visit to China in 1972).

3. Innovation and inclusivity: it is committed in the creation of center of excellence in the targeted countries to improve local expertise as Boeing did in China with its resident team offering direct support to the Chinese factories.

Indeed, Leonardo Spa has all the resources and capabilities to develop this One Company Business Model. It should focus its energies on the topics discussed above and it should prioritize the role of Leonardo International Spa to create the strategic network among the 26 foreign local entities, bringing advantages in terms of cost reduction, customer satisfaction, reduction of delivery time, better inter-governmental relationship and open innovation.

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Appendix: Company Interview Questions

1. Who is Leonardo for you?
2. What is Leonardo International?
3. Which are the main goals of the parent company and of its commercial subsidiary?
4. How are the two firms structured? Which are their differences?
5. Which are the Countries managed by Leonardo International? Are there something easier to handle?
6. How are the foreign local entities actually performing?
7. Which are the main difference among Countries?
8. Which are the value chain activity carried out in each Country?
9. Which are the most interesting Countries to unify in a One Company Business Model?
10. In your opinion, which are the most profitable Country in the mid-long term?
11. Could Germany be the best practice to share with the network of local entities?
12. Which are the main challenges to face in implementing a One Company Business Model?
13. Which could be the role of Leonardo International in this transformation?

Executive Summary

The study examines a significant corporation from a global viewpoint with an emphasis on the aerospace and defense sector. The first chapter offers a top-down industry market analysis, starting with a global performance review and moving on to the European area before coming to an end with the Italian market and the introduction of Leonardo Spa. Additionally, a brief review of two significant market participants like Boeing and Airbus is provided. For a better understanding of the A&D industry's future strategic direction, a focus on the major industry drivers and future trends has been presented.

A theoretical and practical analysis of internationalization has been looked in the second chapter. Depending on its primary objectives, a company should implement various international tactics, and the study examines the best way to strike a compromise between local responsiveness and cost pressure. The importance of internationalization in the aerospace industry has been highlighted, as well as the need to act globally with a network of partners in order to reduce costs and gain advantages in terms of customer satisfaction due to the high degree of local responsiveness. These international strategies have been described in the aerospace industry following a theoretical overview based on a strong literature review.

The third chapter describes the main objective of this study and the methodology applied in order to answer to the Research Question: *“How Leonardo Spa could unify its business model with the local entities abroad? Which is the role of Leonardo International Spa?”*

The study's final chapter serves as its focal point. It outlines the objectives and long-term strategic direction of the 26 foreign local companies operating across the world, including Leonardo Spa (the parent company) and Leonardo International Spa (the commercial subsidiary). It gives a general overview of the stakeholders' actual operational and business models, as well as their actual organizational structure and product offerings. A new organizational structure, a different approach to the global offering, and the optimization of the business model through a g-local value chain are suggested as additional key pillars for Leonardo to succeed in a global setting. However, other studies claim that, because of various constraints, executing the recommended transformation is difficult (political, cultural, market demand). For this reason, Leonardo International is heavily emphasized as the primary

facilitator capable of managing the foreign local companies and successfully completing this transition. It's crucial to identify the areas where the new business model might be used as well as the best go-to-market strategy based on regional distinctions and the biggest problems that will need to be overcome in the future.

Boeing and Airbus firm case studies are included in the final paragraph. For each of them, a brief study of the businesses' ecology and the outcomes of the global strategy used in the APEC market are provided.

Research Results

The research has shown the true circumstances in which Leonardo Spa is working and its actual organizational structure after a thorough investigation of the industry, its trend, and the key issue influencing the worldwide strategy (e.g. offset).

The study makes recommendations for the major steps Leonardo Spa should take to harmonize its business model internationally, utilizing Leonardo International Spa (its commercial subsidiary) as the primary enabler capable of achieving this goal. The organizational structure, the global offering, and the business model of the foreign local organizations are the three primary changes that should effect Leonardo Spa, according to the literature review and the interview with the head of the commercial department of Leonardo International.

The actual organizational design of Leonardo Spa is a divisional structure based on a product segmentation, while Leonardo International Spa organizational design is a divisional structure segmented by geographic area (the 26 local entities) and the structure of the foreign legal entities is once more a divisional structure segmented by product. This organizational design is actually based on a divisional structure based on a product segmentation. The research advises Leonardo Spa to transition to a matrix structure, for which the geographical divisions will be on one axis and the products will be on the other. The Parent Company will be able to manufacture goods that are specifically suited to the demands of the many nations while also reducing costs and strengthening its supply chain thanks to this new organizational space.

Additionally, the foreign local entities will serve as department of intelligence. Since they are immediately connected, they may easily notice changes in local demands and communicate all

gathered data and information to the Parent Company. However, in order to be effective, a reliable communication and information infrastructure is required. This ICT system will also be crucial in at least the following two areas: (i) Knowledge exchange is essential for the global development of skills and new technologies, and (ii) ICT may be used to enhance g-local value chain activities. Concerning the last point, putting this structure in to place with the appropriate resources and communication system has enormous benefits for the Parent Company. Indeed, operations will move more quickly and it will be simpler to deal with component shortages in a value chain that is integrated. Due to the reciprocal collaboration of the local organizations, missing components may be transported instantly from one warehouse to another in order to give the best product to the client in a timely way.

The offering is the second key concept mentioned. Leonardo should provide as many items to the targeted nations as feasible in order to be competitive. Only by recognizing the market prospects and using the "intelligence" activities carried out by the foreign local firms in the model outlined will this be made available. It is possible, nevertheless, for policy regulation to act as a restraint rather than market demand. In a complicated environment featuring the A&D sector, the foreign company's reporting activities to the legal body becomes vital.

The innovative business model used by local organizations is the final subject chosen. Actually, they only serve as business subsidiaries for Leonardo's products. They ought to reinvent their market positioning as a SME of Leonardo Spa representing Leonardo itself.

The business model innovation may be seen in the value chain, where the research recommends moving to a "G-local" value chain. *Global* in terms of relationships with global suppliers and the network of international local companies who have previously developed "functional" items for the market. *Local* in terms of innovation, for the creation of new products and services tailored to regional preferences. In order to develop locally innovative solutions that can be delivered to clients and that are already suited to their needs, Leonardo should invest more in the establishment of Centers of Excellence focused on innovation and R&D. This will be advantageous for all parties concerned: as nations' employment rates rise and they get investment from Leonardo, the guest countries' economy will grow and become more competitive on the global stage.

Below a table representing the area affecting the transformation discussed above and the main stakeholders involved. The table summarizes the activities and role played by Leonardo International Spa and the foreign local entities, that will deliver the specified outputs for Leonardo Spa.

Table 1. Impacted Area by Stakeholders and Leonardo’s Transformation

Impacted Area	Leonardo International	Foreign Local Entities	Leonardo Spa
Organizational Structure	Holding Company and Key facilitator	Knowledge sharing and ICT systems	Matrix Structure
Global Offering	Reporting, due diligence and coordination activity	Intelligence Activity	Talioed and wider offering
Business Model	Tier among Parent Company and foreign entities	Center of Excellence	G-local Value Chain

Source: Created by the Author

Due to political restrictions, market needs, and resources and capabilities that are either already developed or not in the other nations, the transformation advised to Leonardo could not be realized in all 26 foreign legal entities. According to the analysis, the nations that best match Leonardo Spa One Company Business Model are China, Germany, India, Canada, and Brazil. This conclusion is based on a cross-analysis of global military spending as a percentage of GDP, industrial exports, the degree of confidence in carrying out this transition taking into account the political environment and the resources and capabilities already in place in each Country. Referring to the level of confidence in implementing the transformation in the targeted country, the results arise from the interview conducted with the company reference contact: he named the following countries as the ones in which Leonardo is evaluating to invest according to the marked demand and the competences developed in these foreign local entities.

Table 2. Targeted Country

CRITERIA	China	India	Germany	Canada	Brazil
Military Spending (\$ bn.)	293	76.6	56.9	26.4	19.2
Exports (\$ bn.)	2.7	1.4	27.6	10.5	2.6

Source: Data elaborated by the Author

As best practice to share with the network of foreign local organizations, Germany is also suggested by this cross-analysis and the conducted interview. It is one of the countries with the highest export values in the sector, and it is the only foreign company owned by Leonardo International that performs the majority of the value chain's operations (apart from Sales ES Inc. in the USA). Considering the resources, infrastructure, and talents that are actually present in the area, Germany may be selected as the country where a structured global local value chain should be developed.

Along with these ideas, the research focuses on Leonardo International Spa contribution to the creation of the One Company business model, which may unify foreign local firms abroad and provide many benefits. The main catalyst for this transition is Leonardo International. It shall serve as a coordinator for the network of foreign local entities, coordinating the interests and objectives of the Parent Company with those of the foreign entities. In order to solve issues with product compliance, it will be in charge of local entities' reporting activities as well as legal due diligence procedures. To increase sales, it should forge strong inter-government partnerships with other nations. In order to enable the interchange of information, materials, and finished goods across countries and to provide various advantages for all stakeholders, it must strive to establish an international agreement among all the project's participating nations.

In addition to what the study has shown so far, the research examined Boeing and Airbus internationalization cases to support the recommendations made to Leonardo Spa. These two business examples provide a detailed look at the participants in the APEC market's worldwide strategy (in detail in China). according to the study, one of the nations where the reorganization of Leonardo would be possible was China.

Even if with different timings, both Boeing and Airbus developed solid ties with the intended nation. Additionally, the foundation of this robust connection is the visitor country's offset practice and information sharing. The fundamental distinction between Boeing and Airbus in China is that the US company gave the Chinese partner the chance to participate in the project as an active player rather than using them as a pawn to get around political restrictions. The "functional" and "innovative" items were designed and produced with significant input from the Boeing Chinese partner. The Chinese partner of Airbus, on the other hand, had a secondary role in the project and was only little active, concentrating solely on the far more conventional items without any genuine knowledge transfer from Airbus to the Chinese partner.

This difference between the traditional and innovative products is stated by Yen in 2022 analyzing the g-local value chain. Boeing also has a resident staff in China that provides the manufacturers in that nation with immediate technical support, underscoring the significance that the host nation holds for the firm (Yen, 2022). In China, Boeing's outcomes were better than Airbus'. The document advises to Leonardo Spa to innovate its business model by developing a g-local value chain, in which the innovation center of excellence must be local and not global. In fact, the strategic approach selected by Boeing in a sort of open innovation strategy was effective.

Additionally, Airbus adopted the same open innovation strategy as Boeing and opened an engineering center in Beijing that focuses on design work for the A350 program and the "Airbus China Innovation Centre" (ACIC) in 2018. In fact, Airbus has progressed through the years towards a transnational operational stage and is likely to do so in the future when it transitions to the super international stage introduced by Boeing and covered in *paragraph 4.4.1*. (Wang, 2021).

Indeed, it's possible to state that the Italian corporation, which views Boeing as the industry standard, has a number of similar characteristics with the American business:

1. *The cultural approach to the foreign country*: It enables the application of the same open innovation model used by Boeing in China to engage as many nations as feasible in this change.
2. *Long-term established relationship*: Similar to the 50-year relationship between Boeing and the Chinese government (President Nixon's historic visit to China in 1972), Leonardo

has a history with the targeted countries thanks to foreign local entities operating there for many years (even before the creation of Leonardo International Spa).

3. *Innovation and inclusivity*: As Boeing did in China with its resident team providing direct assistance to the Chinese manufacturers, Leonardo is dedicated to establishing centers of excellence in the selected nations to enhance local knowledge.

In fact, Leonardo Spa possesses the tools and expertise necessary to create this One Company Business Model. It should concentrate its efforts on the issues raised above and give top priority to Leonardo International Spa's role in building a strategic network among the 26 foreign local entities that will benefit from improved intergovernmental relations, open innovation, cost reduction and customer satisfaction.