AIRBUS

AIRBUS – the beating heart of aviation

An integrated case study on the colossal data driven approach implemented by Airbus in the aerospace industry.

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Airbus is the largest aeronautics company in Europe and a global leader in the Aerospace industry, which is characterized by its high-tech requirements, changing markets, continuous R&D, dynamic decision-making, and innovation. With a market capitalization of €70,223 million and brand value of €12.2 billion it has an unrivaled position in aerospace, military communications, urban cyber security, and utility construction. This paper sheds light on how Airbus manages to be at the forefront of harnessing analytics to redefine the industry.

Insights from Big Data has the potential to radically improve efficiencies in economical, strategical, and operational workings of the aviation companies. New-generation commercial aircraft can produce more than 30GB per day (measuring more than 40,000 operational parameters for different components and systems). Airlines generate an immense amount of data such as commercial data, scheduling data, operational data recorded by pilots, flight attendants, engineers, maintenance technicians, airport representatives, among others. Suppliers and OEMs are also a source of information. Skywise and OneAtlas are two of the major analytical platforms designed by Airbus to achieve greater performance and provide value across all domains.

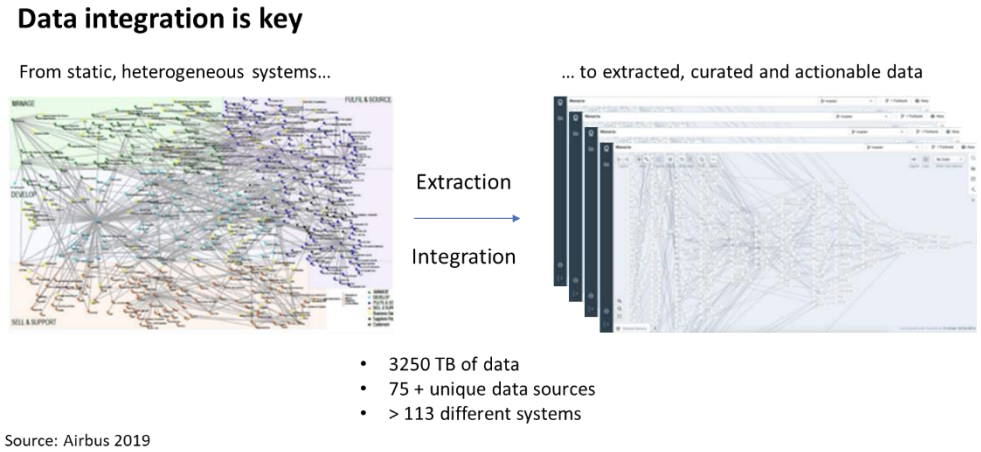

Figure 1- The workings of Airbus platform

With the overwhelming amount of complex and heterogeneous data pouring from a plethora of sources, **Skywise** allows airlines to integrate their operational, maintenance and aircraft data into a secure and open platform. They can store, access, manage, and analyze their own data with selected Airbus and global airline benchmark data without the need of extra infrastructure investments. The technology driving Skywise Platform is created to work with customers' existing IT infrastructures. **OneAtlas** provides seamless access to Airbus imagery data with trusted AI & cloud technology to leverage accurate geospatial information to get the required insights. It has an extensive portfolio of ready-to-use, accurate geospatial analytics that range from land use and change detection. Customers have a choice between immediate analysis or monitoring over time with results delivered in ready-to-use formats.

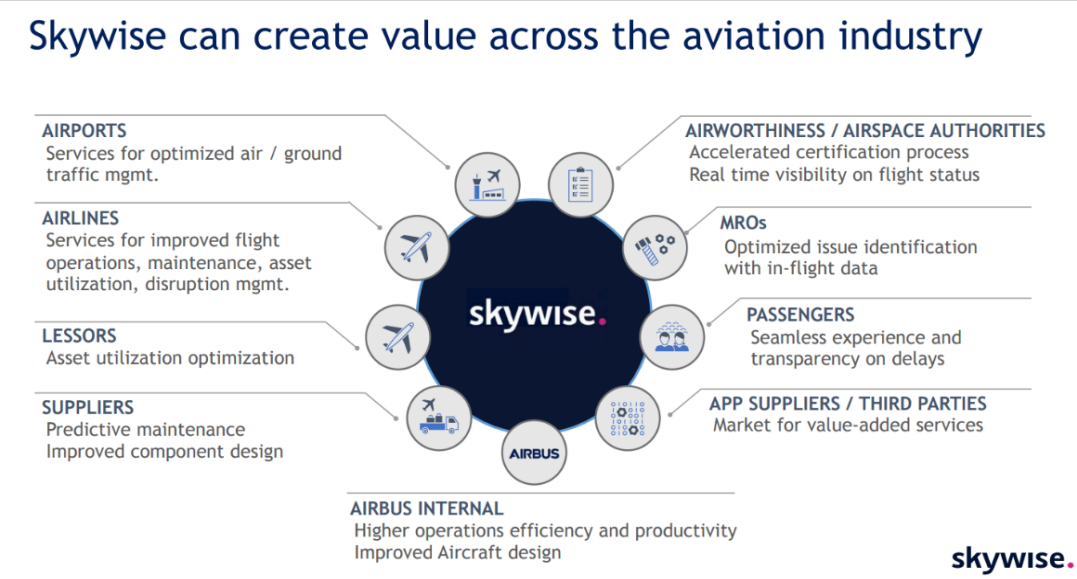

Figure 2- How Skywise generates value

A huge chunk of Airbus analytics derives its power through artificial intelligence. It focuses on aspects such as knowledge extraction from unstructured documents, using computer vision to transform images and video into objects and activities, use of deep-learning for decision-making, finding hidden patterns in data through anomaly detection, designing natural language-interaction systems, optimizing solutions for innately complex constrained problems, and enabling the next generation of aerial vehicles with new capabilities.

Observing the functioning its evident that Airbus is efficiently able to leverage technology in advanced analytics to provide the right information to the right people at the right time – and in a context they understand. It also aids Engineering, Supply chain, After service, Flight Operations, Fleet and inventory control, Maintenance, Pilot and Crew Management product design, marketing, business models and revenue streams. Rather than the mere collection of bulk data, Airbus has the capability to draw value considering the nature of data in terms of volume, variety, velocity, and veracity. These extracted insights also guide the managerial practices in order to achieve a sustainable competitive advantage. With the oligopoly nature of the aerospace industry the pioneering spirit of Airbus helps it to stay afloat and exercise more power in the market.

Another one of Airbus analytical branches permeates into cybersecurity. Airbus Protect, an Airbus subsidiary aims to bringing together the Company's expertise in cybersecurity, safety, and sustainability-related services. The aim of this entity is to provide a unique global service offering to protect Airbus company-wide and meet the needs of national authorities and commercial customers, including critical infrastructures. It utilizes data to create intelligence strategy, risk management, regulatory compliance, reduced downtime and predicting how security needs evolve. Airbus Defense and Space, through its Airbus Cybersecurity unit and partnering with Atos as coprime entity, have been selected by the Council of the European Union to provide cyber security expertise, products, services, and solutions to help protect the IT systems of 17 European institutions and agencies.

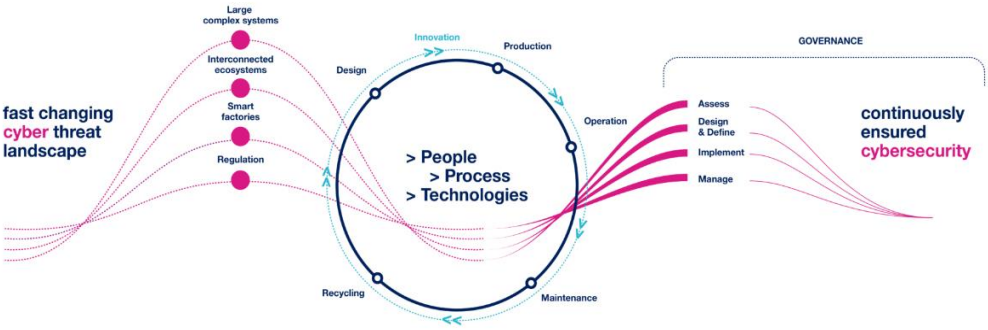

Figure 3- Cyber Security process of Airbus

An intriguing action to address data privacy concerns is being conducted by Airbus. Airbus Ventures-backed Ravel Technologies has revealed that they have developed "several" (patent-pending) advancements in the field of Fully Homomorphic Encryption, the long sought-after Holy Grail of encryption security. It allows personal data to be utilized while never having to be decrypted and re-encrypted as it never leaves the encrypted state thus preventing any nefarious outside actor, including the third party, from gaining access.

Airbus does not harness analytics for pure profit gains but also strives to continually push the boundaries on what is possible to safeguard the world for future generations. As civil aviation generates 2% of global CO^2 emission, the acumen from data leads to substantial fuel savings and reducing the environmental impact of aviation footprint. Flight paths are also optimized using data to modify routes in real time to accommodate storms and other disruptions. The Airbus Helicopters Foundation plays a vital role on missions in humanitarian aid when natural disasters occur. With satellite imagery and analysis, they are able to identify areas with limited access and prepare the possible actions with their teams.

The multinational corporation has created an AI Gym challenge back in 2018 that represents a new way of co-innovating by demonstrating the benefits of open partnerships and collaborative relationships in working on artificial intelligence beyond the aerospace industry. These challenges are designed for companies, research laboratories, universities, colleges, and institutes, as well as individuals and teams. The goal is to share some of the aerospace industry data science obstacles and provide data sets to foster research and collaboration within and outside this exciting industry. Its last challenge was to find most accurate unsupervised predictive AI capability for helicopters.

Airbus also spends its resources to maintain a social media presence and it benefits hugely from these endeavors. With more than two million followers on Instagram and Facebook and 800 thousand

in Twitter, Airbus has strengthened its management ability on social media as a way of engagement in the company's real time events and news. Therefore, they have become brand advocates for aerospace and aviation fans. Enforced the ability to constructively utilize Twitter as their engagement tool and receiving positive sentiments appealing the stakeholders along with cultivating public image.

Customer retention management does not seem to be a huge concern for Airbus at all. Product differentiation, manufacturing speed, barriers to entry in the aerospace industry, relentless innovation in analytics makes Airbus one of the most sort after companies. It still aims to ameliorate it by introducing agility framework and software's that forecast accurate order volumes and improve production rates. An amusing fact about this CRM platform creation is its social network interface that will appeal the work pattern of the new generation. This platform also looks forward to breaking data silos and collaborative functioning leading to more efficient performance.

However, like any other field Airbus has its own set of challenges that need to be approached with caution. The burgeoning amount of operational data pumped out by the global commercial fleet might lead to data deluge. A single airplane like the Airbus A350 can have close to 6,000 sensors and generate 2.5TBs of data per day. This is used to monitor the aircraft's health and reliability as well as for performing predictive maintenance. One way to counter this is by having effective data retention and destruction policies. Construction of policies that allow auto-deletion of inessential data after a specific period will aid the deluge. Adding more and more airlines and suppliers puts pressure on the infrastructure that supports the platform, and Airbus must make sure the platform is able to work and perform under such pressure. Any disruption could affect the operations of hundreds of airlines in the future. Apart from these technical hurdles, Airbus also faces problems in dealing with its senior management, supply chain bottlenecks, inability to complete orders, creating an efficient delivery plan, data breaches, privacy lawsuits and fierce competition from its competitor Boeing.

Airbus has some dynamic plans in areas of building and testing alternative propulsion systems – powered by electric, hydrogen and/or solar technology – to enable the aviation industry to disruptively reduce the CO2 emissions. It also aims to venture into designing autonomous flights, unmanned aerial systems, and testing out star link for in flight connectivity. A vision of creating fully digitalized industrial ecosystem across entire product lifecycle is on its way too. These innovations as tempting as they might appear will push Airbus to evaluate the safety and security of its analytics platform more than ever.

To reiterate, Airbus understands the link between emergence of analytical platform leadership and evolution of business ecosystem. The Airbus Group reflects the importance of strategy, the principle of honor, centralization of decision and power. Airbus makes the freedom of flight possible by manufacturing and supporting the world's best jetliners. Its people around the globe are united by a passion for aviation, as well as their desire to create better, more efficient ways for airlines and passengers to fly. With a rich heritage in the design, build and integration of complex inter-connected analytical platforms and systems Airbus elegantly capitalizes on the value of data to drive change and security in its domain.

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