SEABURY
SOLUTIONS

White Paper

Civil Aviation Authority:
Challenges and Opportunities for Successful Digital Transformation Initiatives

By: Luc Beaudoin. M.Sc.

Valarian Makori B.Sc. IT

April 2021

SEABURY SOLUTIONS

About the Authors

The contributors include Seabury Solutions, Senior Vice President Luc Beaudoin, Head of Seabury's Global Civil Aviation Practice in the Berlin and Amsterdam offices, and IT Director of the Nairobi office, Valarian Makori. They wish to thank Pablo Bertorello, Sarasati Putri Palawita and Brian Walsh for their contributions to this work.

Lead Author: Passionate about transportation and high-level challenges for his clients, he works to ensure the success of their digital transitions. His expertise also includes transforming the culture and performance of organizations. He assists them in all the regions in which they operate.

Luc Beaudoin, MSc, moved to Seabury Solutions in 2015 after working for Seabury Capital affiliate company, SGI Aviation, since 2008. While working at SGI Aviation, he was involved in many aviation projects such as CAMO and DOA setup, asset management, aircraft valuation and NCAA advisory and training. He is one of the founders of the privately run Guernsey Aircraft Registry. Previously he was the founder and CEO of youmove.ca, managing up to 15 experts within an IT company that developed a unique product to facilitate efficient residential moves. Before this, Mr. Beaudoin worked for Bombardier Capital in Vermont, USA and Bombardier Transportation in Canada and Berlin, Germany. As a Senior Manager, he worked in global corporate strategy and leading mergers and acquisitions activities globally. Before joining Bombardier inc., Mr. Beaudoin worked for the largest Canadian bank, Royal Bank of Canada (RBC), as an investment banker and trader. He holds a Master in Science from Quebec city, University Laval, specializing in derivative finance. He also holds a Canadian Pilot License.

Co-Author: Valarian Makori, Product Owner Seabury Solutions, with BSc Degree in Information Technology, is an Aviation enthusiast with a decade experience in aviation information systems. Valarian designed and developed the Safety Oversight Facilitated Integration Application, that enabled Civil aviation authorities and Regional Safety Oversight Organizations (RSOOs), such as CASSOA, manage safety and oversight functions effectively. This system enabled CAA compliance with ICAO Universal Safety Oversight Program (USOAP) as part of the State Safety Program. Mr. Makori has also been involved in other projects relating to digitization and computerization of legacy processes, data, information, among others, through the development of a quality management system focused on the aviation regulatory space, that aids in managing documents, processes, procedures, and responsibilities with the aim of achieving quality policies and objectives for Civil Aviation authorities that can assist managers of these institutions in ensuring safety and compliance in day-to-day operations.

Summary

As digital technologies dramatically reshape industries, National Civil Aviation Authorities (NCAA[1]) face rapid technological and competitive landscape transformation. In most cases, their stakeholders operate in a highly competitive environment, adapting the Industry X.0 concept. The current COVID-19 crisis exacerbates the situation. In most cases, NCAAs need to support national and international industries while fulfilling their regulatory obligation. When both combine, the NCAA has a challenging role in transforming itself from a proven and stable paper-based system to a digital operation. Many NCAAs face difficulties as they do not have the in-house expertise to conduct such transformation. This white paper explores the challenges and opportunities that NCAAs face for a successful digital transformation.

The authors and IT team within Seabury Solutions have proven global aviation expertise to guide the NCAA organization for a successful digital transformation. By doing so, the NCAA will inevitably increase operational performance and enhance regulatory compliance.

Civil Aviation Authority: Eco-system and Stakeholders

A Complex Eco-system

NCAAs are complex organizations with different internal and external stakeholders. They are governed by national requirements and are influenced by international recommendations and obligations (e.g., ICAO, EASA, FAA, GPDR). NCAAs may be self-governed or departments of a government. NCAA shall meet specific standards as an organization, aiming to remain efficient and effective. NCAAs have a major role in contributing to improving aviation safety standards. They should attempt to bring about long-lasting improvements in aviation systems, the culture of aviation, its capabilities, and processes that are carried out.

NCAA Eco-System and Stakeholders

Internal
- National Requirements
- Human Ressources
- Internal dependance (e.g. IT)
- Finance

External
- Industry & Organisation, Licence holders
- Third-party support / organisation
- Supra-national Organisations (e.g. ICAO, EASA)
- Public / Citizen

Figure 1: CAA Eco-system / Stakeholders

---

[1] *In this document, "NCAA" refers to a National Civil Aviation Authority (NCAA) or any similar organizations such as National Aviation Authority (NAA), Civil Aviation Authority (CAA) or Department of Civil Authority (DCA).*

Digital Transformation: State of the industry and NCAA lesson learnt

Digital transformation is a series of complex tasks, even more, challenging than traditional organizational transformations to carry out.

A well-known consulting firm, McKinsey & Company described in the report "Unlocking success in digital transformations"[2] that years of research on transformations have shown that digitalization's success rate is consistently low: less than 30 percent succeed. In a more comparable industry like aviation, which is a highly regulated industry, the success rate is between 4% and 11%. Over the years, the author has observed with NCAAs a similar success rate from 8% to 17%, depending on the type of project.

The NCAA traditional structure is often based on a proven top-down approach with a highly bureaucratic, paper procedure and thorough approval approach, as is typical for a vertical-driven organization. Digital transformation requires another type of working organization and environment, a flatter and horizontal organization. One of the main observations is authorities try to convert a proven paper-based system to a digital system without reviewing and adapting their business processes and organization. By doing so, the success rate is critically low. Business Process Reengineering (BPR) is a crucial step for a successful digital transformation. Another critical element is that NCAAs often select software vendors to accomplish the digital transformation without doing the preparatory works and establishing a well-defined internal roadmap. In some cases, the vendors lack industry standards and organizational knowledge to support the transformation, or the vendor mandate is ill-defined. The application software is just one of many elements required to complete a successful digital transformation.

Finally, another critical challenge is identifying NCAA-specific constraints and opportunities that a digital organization may bring and carry out the transformation when pursuing day-to-day activities.

Critical factors for successful transformation

Three factors are consistent with successful NCAA digital transformation.

Over the years and the vast amount of NCAA projects, the authors have identified key elements specific to NCAAs for a successful digital transformation. Foremost, the authors observe that the most underestimated factor is the human factor. It is a crucial function for successful transformation. Other factors include organizational capabilities and digital tools. Another global consulting firm, Accenture[3], claims that "it's not enough to have the right technology; businesses must also enable the right people with the right skills." Human factors play a pivotal role in the transformation project.

---

[2] McKinsey & Company, "Unlocking success in digital transformations", October 29, 2018, Survey
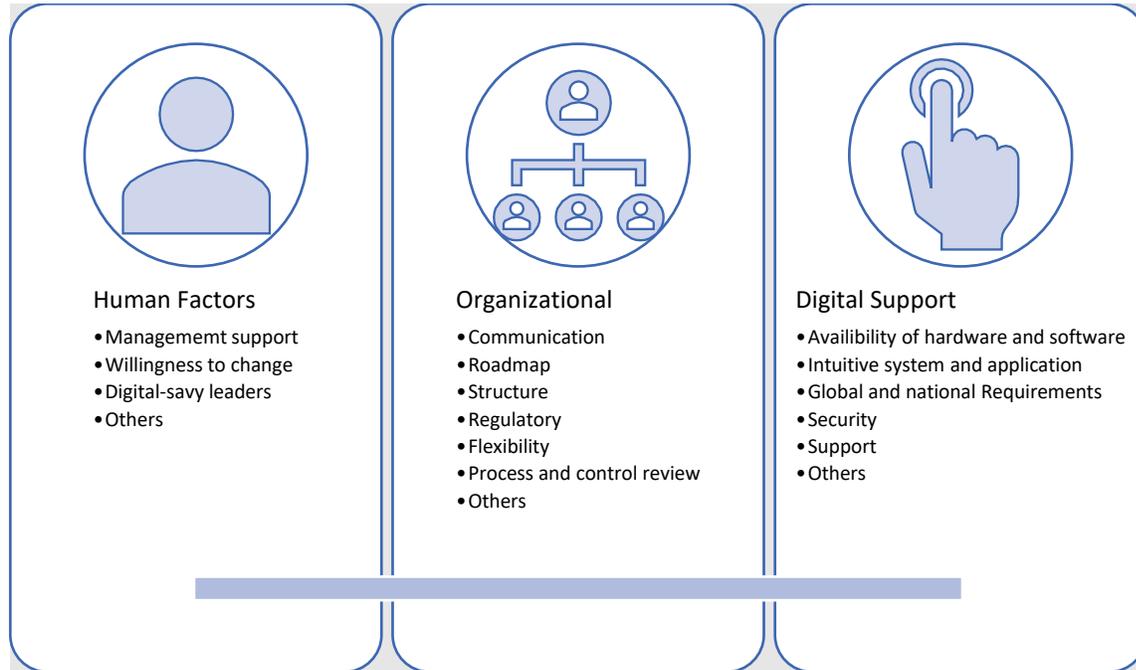[3] https://www.accenture.com/us-en/services/industryx0-index

Figure 2: Key factors

Human Factors

The human factor is a crucial aspect of any digital transformation. We observe that when senior management completely supports the project, the transformation is more effective. The management sets the organizational priorities, common achievable goals, organizational review, IT, and human factors. We see that when the NCAA allocates the right, digital-savvy, and aviation experienced personnel in place, the project is more successful. The management and the digital transformation team need to identify the digital HR skills gap in the organization. Then, they may allocate training and develop a capacity build-up program. Another critical element is empowering people to work in new digital ways.

Organizational

Digital transformation is not just a one-off event, but in fact, it changes the dynamic of an organization dramatically. The management often underestimates it.

Digital transformations require both cultural and behavioural changes. We believe that the management should set common goals, roadmaps, and frequently communicate with the organization for a transformation to succeed. We frequently observe that a common goal is not always well defined and

shared. The management should clarify "what" digital transformation means for their NCAA and why everyone should collaborate under a joint mission.

Another critical factor is that the management must support the long-term change and appoint a semi-permanent and specific digital transformation team. We conclude that the management should design a new organization that reflects the updated working organization and the new digital reality for a better chance of success.

From the same McKinsey survey, they found *"nearly 70 percent of all respondents say their organizations' top teams changed during the transformation, most commonly when new leaders familiar with digital technologies joined the management team"*. Unfortunately, we do not observe such drastic organizational change. In the traditional NCAA organizational structure, management change is more complicated than in a private business, and a more realistic solution should be considered. One recurring element is that governmental HR policies often constrain the management, and some positions require well-defined qualifications. The classic NCAA structure is almost universally the same, with well-defined departments (e.g., Licensing, Airworthiness, etc.). The organizational transformation should retain most elements and add flexibility and collaborative platforms while avoiding the build-up of the "siloed" structure. A key component to achieving a more efficient and compliant organization is to use the digital transformation for in-depth Business Process Re-engineering (BPR). BPR serves to enhance customer relationships, update working procedures and handbooks, and increase agility and adaptability for employees, and consequently, the NCAA.

Digital Support

Industry 4.0 and subsequent X.0 bring a new reality for NCAA with the always-on, hyperconnected global stakeholder's search for personalized products and unique relationship. The modern aviation stakeholders are operating on a worldwide basis with modern digital technology. They are engaging with the NCAA on a 24/7 basis and expect the NCAA to respond promptly, when possible, by digital means. Over the years, we note that NCAA personnel are mostly employing their mobile device for their personal tasks and are more familiar with the technology. Digital adoption is becoming less of an issue. Lastly, the NCAA is engaging with non-traditional aviation stakeholders (e.g., technology firms, startups, blockchain, AR[4], Big Data, UAV[5], etc) and require new and modern approaches.

Finally, NCAAs are facing drastic and fast changes in technology. New technology and requirements such as cloud hosting, safe and secure electronic signature, data security, 24/7 customer support, mobile devices usage and security, General Data Protection Regulation (GPDR) compliance, and many other national and global requirements are fundamental. The NCAA faces the situation, in some cases, where they do not control their IT environment as another governmental service provides the infrastructure. With all those challenges, under a digital organization, they still need to provide 24/7 IT operation,

---

[4] Augmented reality
[5] Unmanned aerial vehicle

infrastructure redundancy, security, high-availability service, customer helpdesk, employee hardware, vendors KPI, audit and many other services. Under a traditional NCAA structure, those tasks are not usually a core-competency of an NCAA and may require organization and human factor review.

We recommend that the NCAA set priorities and goals while collaborating with its internal and external stakeholders. Digital tools are an integral part of the roadmap for successful digital transformation to enhance operational performance.

Roadmap for a successful transformation

Prepare, Deploy and Assess: Three vital elements for a successful NCAA Digital Transformation roadmap

After completing various NCAA digital transformation projects, we establish a common approach that may apply to most NCAAs. The key elements are the Prepare, Deploy and Assess. The Figure 3 below presents a common roadmap. We recognize that each NCAA is different, and a personalized roadmap should be created to fit specific national and global requirements.

Prepare: Preparation is a crucial element for the project. The NCAAs that clearly define their digital goals and have a clear understanding of their global and national constraints show a better digital success rate.

Deploy: As a digitalization process, not all areas of the NCAAs should introduce digitalization at once; a phased-in approach may be used. If required, selecting an external vendor may be necessary, and industry knowledge, proven experience, and global scale are critical.

Assess: Digital transformation is undoubtedly changing the organization. It is essential to review the initial goals, audit in-house and external vendors, review leadership team performance, the BPR implementation, and compare the performance against defined KPI[6].

---

[6] Key Performance Indicator
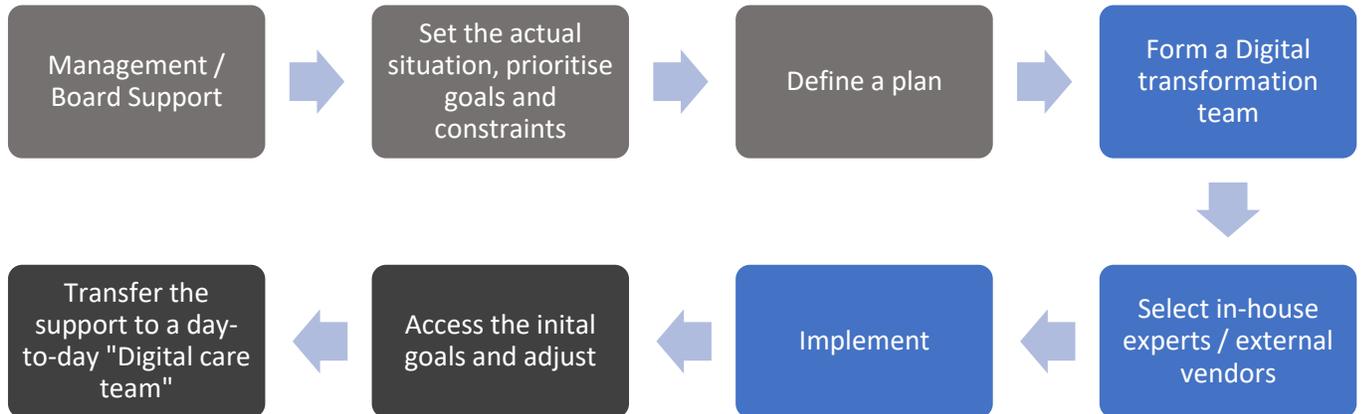
Figure 3: Suggested Roadmap

About Seabury Solutions and NCAAs offering

Seabury Solutions provide a holistic approach to NCAA, specializing in digital transformation advisory and aviation regulatory software. The aviation IT specialists have completed more than 30 NCAA digital authorities' projects. We are offering many applications to support digitalization, such as the leading NCAA application eAuthority. When required, we work closely with our industry-leading partners to provide full digitalization scope, including compliance requirements, regulatory aspects and training.

About Seabury Solutions

Seabury Solutions is a global aviation software development and consultancy company. It was established in 2002 and formed part of Seabury Capital. Seabury Solutions has built its reputation in the market by delivering industry-leading aerospace technology. Having built upon decades of aviation expertise in-house, this knowledge has been leveraged into a suite of products that enhance aviation operations' decision-making process.

With a truly global reach, the network of offices is located in Argentina, Australia, Berlin, Canada, Ireland, Korea, Kenya, the Netherlands, the Philippines, & the USA. This wide geographical spread allows the Seabury Solutions team to provide support 24/7 to all their customers in real-time.