

## Keynote

Digitalization has reached all aspects of our lives. Some areas make faster progress, whereas others progress slower. Employees' attitudes and abilities in the digital realm are usually the deciding factors for the speed of digitalization and not hard- and software constraints.

Digitalization allows to outright revolutionize business processes. Digitalization enables productivity increases in orders of magnitude and can dramatically reduce unit costs. Organizations clinging to traditional processes will suffer the most as the digital transformation progresses. Looking at these things, we must bear in mind that our core business is air traffic control with all its special regulations and not all the administrative processes that support it.

Data are sometimes called the new oil. However, this analogy is only partially accurate. Whereas oil is a limited resource, data are omnipresent and can be copied without any limitations. Nonetheless, there are still some parallels, which are useful for our analysis. Just like oil, data need to be refined before use. When petroleum replaced whale oil as primary lamp fuel a crude refining process was sufficient for use as lamp fuel but not for use in combustion engines. Combustion engines require more advanced methods of refinement and adherence to consistent product specifications. If fuel manufacturers were to violate these strict standards, combustion engines would not work as designed and can even be damaged by non-standard fuels. The introduction of such strict standards leads to economies of scale and competition. Today, you can fuel your car with a combustion engine at any gas station and buy standardized fuels that are guaranteed to work correctly.

Similarly, relevant data are often extracted from big data sets. Insufficient standardization of data formats and interfaces makes any data processing substantially more difficult. Economies of scale cannot be realized since considerable efforts must be expended to turn data into harmonized formats fit for productive use. Economies of scale are the motor of digitalization. Once data formats and interfaces are sufficiently standardized, competition is based on best customer value.

Today, this kind of competition hardly occurs in aeronautical data since data formats and interfaces for their exchange and processing are not sufficiently standardized. Current data integration processes - in manned as well as unmanned aviation - are largely semi-automatic at best, since data from national aeronautical information publications are not yet available as harmonized data sets. Even if digital data are available from AIS providers, they cannot be easily exchanged but require extensive - bespoke pre-processing - before they can be exchanged. This is in part due to the deficient standardization mechanisms employed in civil aviation, which are unfit for efficient digitalization: Reference implementations and test systems, which would guarantee a degree of standardization suitable for easy data exchanges as showcased by many other industry sectors, are nearly completely absent. No true platform standards currently exist in AIM, which would allow a fast and successful digital transformation. Only platform standards will allow the aeronautical information domain to generate the economies of scale necessary for a successful digitalization.

There is a growing potential for opportunities to restructure entire industries through platforms and providing incentives for companies to join such platforms. Such incentives can be extremely potent since they draw in investments from a variety of stakeholders instead of burdening the creator of the platform with all the expenses for the creation and maintenance of the platform.

An example for a platform standard in aviation is the US military's FACE initiative, the Future Airborne Capability Environment founded in 2010. At that time, the US military realized that new systems and system updates were extremely expensive, took a long time, required extensive certification tests, were hard to integrate and often not interoperable with existing systems.

These issues were tackled by the introduction of a platform standard supported by reference implementations and strict conformity tests, which enabled independent third parties to carry out unbiased conformity tests. Through this independently assured, strict standard compliance, a new marketplace for vendors was created, which allowed them to compete for business on all compliant airframes. This greatly reduced the required certification and integration efforts and enabled a much greater degree of system modularity and deployment speed.

This conference is about digitalization in the AIM domain with benefits for ATM and UTM.

What can we learn from these examples?

Providing an AIP in PDF format is not a step that will bring us significantly closer to digitalization. We need real digital data that can be seamlessly exchanged and processed by all compliant systems without the friction we experience with AIXM today.

AIXM 5.1 has been around since 2010 and yet we have not seen the sweeping changes. AIM is still suffering from an inability of stakeholders to multilaterally exchange their AIXM data. Most ATM systems still use bespoke data formats and are not directly tied into a digital data flow. There are also disparities between what data are operationally used by different airborne and ground-based stakeholders. The data formats used are not aligned and when national data sets are integrated into international data sets, different rulesets are applied by the stakeholders performing the integration. That leads to every stakeholder playing from a different sheet of music. This situation limits our automation possibilities and forces us to maintain manual workflows instead of automation.

What can we do about this situation?

To make progress, we need to work together to finally achieve seamless interoperability of our AIM data and coordinate with each other to create harmonized, international data sets before we even publish our data. The signing of the InterFAB declaration on closer cooperation on AIM at this conference is an important step in the right direction.

What can you expect during these next 2 days?

In the first session "The future of Aeronautical Data Exchange" we will hear about ideas to pave the way for successful automation based on new approaches and an example from Austria on automated data conversion.

The second session will focus on harmonisation possibilities and best practices for AIM. They are a prerequisite for more efficient AIM processes.

The first session tomorrow morning will concentrate on geodata for UTM, ATM and possible new applications. How can we avoid the failures that have been made in AIM in the past? Can we tackle some of the data problems of manned and unmanned aviation together?

The last session of our event will be the signing ceremony of the InterFAB declaration to deepen the cooperation in the domain of Aeronautical Information Management, concluded between the four FAB partners FABEC, DANUBE FAB, FAB CE and BALTIC FAB.

This conference will allow us to exchange ideas and find new approaches to move aeronautical information forward. We are all in this together. Please keep an open mind and embrace new ideas and approaches that will advance AIM.