SHOULD WE THROW ATM OUT WITH THE BATHWATER?

Air traffic management, as a complex sociotechnical system, remains basically sound and safe. **Anders Ellerstrand** argues that while there is a potential for improvement, we can do this by building on 'the best of what is' – on what already works well.

Through the last months, I have been a regular listener to the amazing EUROCONTROL 'Straight Talks', where aviation industry leaders describe their present situation and their views on the problems they face, and their views on what needs to be done to improve after the pandemic.

During these talks, I sometimes hear a rather negative view on ATM in Europe. ATM is described as a very conservative part of aviation, without the necessary drivers for change. The common 'proof' is that the Single European Sky, more than 20 years after the initiative was approved, is far from materialising. So, what is the problem? Safety is rarely discussed. Instead, the leaders tend to focus on ATM capacity and cost-efficiency.

One of the solutions suggested includes taking away the borders in the airspace. Another example is virtual centres, where the provision of ATS can be located anywhere and moved to create more flexibility. There is also the recurrent hope for technical solutions like automation, digitalisation, and artificial intelligence.

These requests for quick and drastic changes worry me a bit. ATM is a complex socio-technical system that is already constantly adapting and changing, to cope with the variability of air traffic, with competing goals and limited resources. One of the features of a complex system is that it is not fully predictable. When we decide on an action or introduce a change, we cannot be certain of the result. The outcome is not only a result of our actions and implementations. The outcome emerges as a result of the countless interactions in the system.

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David Snowden, a specialist in complexity science applied to organisations and creator of the 'Cynefin' framework (used to aid decision-making) recently wrote on twitter, *"The single most fundamental error of the last three decades is to try and design an idealised future state rather than working the evolutionary potential of the here and now, the adjacent possibles – it is impossible to gain consensus in the former, easier in the latter."* I like the idea of "working the evolutionary potential of the here and now" and a possible approach could be a method called 'appreciative inquiry'. This is a systemic approach aimed at searching for the best in people, their organisations, and the world around as a basis for change and development. Does this sound like gibberish? Is there really a potential in working the evolutionary potential of the here and now? I believe there is.

In five years, from 2014 to 2018, the ATC Centre in Malmö, where I worked as a Watch Supervisor for fifteen years, saw a traffic increase of 14%. From 2017 to 2018 alone the increase was almost 6%. The total number of ATCOs during these five years went from 176 to 177. Yes, the number of hours in position initially increased, but actually decreased from 2017 to 2018, in spite of the big traffic increase. Productivity (flight hours per ATCO hour) also increased. Was this

achieved at the expense of safety or quality? The key safety performance indicator used is yearly separation minima infringements. Those went from six in 2014 to two in 2018. The performance target for the centre was 0,07 min delay per flight for 2014-2017 and 0,06 for 2018. The average actual performance was below 0,02, with 0,03 for the record year of 2018. As a conclusion, the centre managed a traffic increase of 14% in five years, with the same number of ATCOs, and with maintained or improved performance for safety and quality.

A research project tried to find the enablers behind this achievement, through interviews with a sample of the controllers and a survey directed to all ATCOs. The conclusion was that answers can be found by looking at how the workplace is designed. At the sharp end, human factors must be considered when matching the system to the human, and the human to the system. Among the contributing factors mentioned was the trust in colleagues and the good cooperation between the planner and executive controller, making it possible to learn from each other and harmonise working styles. Another factor is the technical system with automation and tools that support but keeps the controller in the loop to help increase capacity while maintaining safety.

There is also a need for an organisation that provides support adapted to the needs at the sharp end. This is facilitated by the fact that a majority of support staff are controllers that maintain a current rating, which supports a good flow of information, feedback, and ideas between the 'blunt' and the 'sharp' end.

This also helps to close the gap between 'work-as-imagined' and 'work-as-done' (see *HindSight* 25). Underpinning factors are professional pride that drive the will to express views and ideas, and psychological safety that makes this possible.

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The aviation industry is now hoping and preparing for increasing traffic. Europe saw a big increase in traffic before the pandemic and this time we will probably see an increase to a lower level than we experienced in 2019 but an increase at a faster rate and most likely with traffic following new patterns.

I believe Europe has an ATM solution that is basically sound, and with exceptional safety performance. My story from the Malmö Centre 2014-2018 indicates, however, that there is a possibility to maintain the high levels of safety, while improving capacity

and productivity. Such a development does not require us to discard existing systems. There is instead a significant potential, by searching for 'the best of what is' and by building on that foundation. Human Factors can be a valuable tool in such a development, as HF is concerned with the understanding and design of interactions between humans and other elements of the system, to optimise human well-being and overall system performance. In doing this, there is no need to throw out ATM with the bathwater. ⑤

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