

"Revolutions", "Breakthroughs", "Disruptions"

Some considerations about slogans in today's aeronautics

Esteemed President of ICAS, dear Susan, Ladies and Gentlemen, dear Colleagues:

It is a pleasure for me to welcoming you here in this historical place. I am former president of the SVFW Schweizerische Vereinigung für Flugwissenschaften, of the CEAS Council of European Aeronautics and Space Societies and former Head of preliminary and conceptual design of EADS, today Airbus Defence, based in Munich. And today president of the small ALR company.

The following comment I have read in Aviation Week on an article of 7. August entitled "Pilotless Commercial Aircraft Likely In 2020s, 2030s". The article is based on a report written by UBS this summer.

"This is what happens when the bean counters get control of an industry; only the dollar signs matter. They would just as soon have no employees, no raw materials, and no product, if only they could just print money in the basement"

Let's have a look therefore at the way how our sector has been developing in the recent years. I will briefly expand on three topics. For more there is obviously no time, I don't want to spoil appetite and ruin your conversation.

It has also to deal with the digitalization in our time. For sure we are in the midst of the process and there is no way back to comfortable times. But this does not hinder us to have a critical look at some aspects of the actual development.

1. Revolutions in Aircraft Operations?

There are multiple announcement for "Pilotless Commercial Aircraft" in the near future:

Coming back to the study from UBS: it is based on endless billions of Dollars cost-savings throughout the system by simply assuming one technical enabler, the heart of our activities, the "increased technology breakthroughs...". Well, UBS is "Union Bank of Switzerland". This amazes me. Knowing bankers fairly well, they don't like to go into details but, instead, impress you will all sorts of promises. So, there were no engineers and scientists involved in the study, people which could bring some reality into the discussion. Fundamental questions come into my mind:

- Why don't we see such breakthrough in ground-transportation systems, notably with trains, which are obviously much simpler to handle?

- Why is the Air Traffic Management System still based on mainly decades-old procedures where technical development would allow much more flexibility in take-off and landing, of course strongly IT-assisted? And not going first for the most complex task, flying without pilots on board?
- How could we see air taxis realistically operating in our dense urban areas and in all weather conditions, without pilots on board? Taking care of a most complex environment combined with fail-safe redundancies?
- Finally, more details on operational considerations will sooner or later emerge: unexpected situations where the "human sensors" and their fusion play a decisive role: eyes, ears, smell, vibration, talks between colleagues... All this replaced by on-board processing and by datalinks?

We conducted in the Military Aircraft Branch many advanced studies and operations analysis already 15 years ago, with all kind of unmanned systems and automatic assistance in operating military aircraft and systems. Operations of civil air vehicles without pilot on board are now in development of course for surveillance, a variety of missions including transport, for specific tasks and not (yet) for mass use. Safety, certification and cost aspects will dictate the realistic application. Yes, also cost: nobody will tell me if such dramatic cost reductions can really be achieved, if all the safety and operational aspects are considered. Have a look at the man-intensive UAS operations. The "bean counters" of course only see the customer reluctance as main argument slowing down the process. This is for sure not the key argument.

2. Breakthrough in developing new aircraft?

The Disruptive Process appears in many speeches. Disruptive against what? There are slogans such as "going fast", "short-cuts in the processes", "creative destruction", "revolutionize the company" and so on.

Indeed, we see successful developments and business models emerging outside the traditional industries, mainly in space. Fine examples are Space X, Virgin Galactic and some others. Space X has now a market share of 50% in the United States. And in aeronautics, we may also see such undertakings.

Are these examples matching above slogans? Definitely not, especially not with Space X.

The new, smaller companies are faster and more flexible than the large traditional industries, but they do not show short cuts in the process and most importantly, they benefit from experienced employees hired from the companies and from a pool of retired, highly knowledgeable engineers and managers. And they develop and produce with lower cost. The successful approaches today are often quite conservative.

The conceptual design is at the fore front in the process, up to 80% of the performance characteristics, cost and market chances of the product are determined in this design phase. This phase is led or surveyed mostly by the older experienced people. Accelerating the development process is done with IT of course, with broad use of digital programs and simulation. I do not consider this a disruption. The experience of humans is fundamental to achieve a sound and quick result. The experience in aircraft development has a lot to do with the continuous work in a dedicated product line once set up longtime ago. The Airbus military transport A-400M is a typical example where the knowledge of a specific product had been lost since decades. It had to be created from scratch again, with tremendous investment of money and time! Most of the later problems were created in the early specification and preliminary design phase where the experience is of utmost importance. Missing resistance from the program and engineering management against all sort of political influence and unrealistic ideas from the top management was strongly contributing to technical failures, significant time delays and hence, cost increase. A survey shows the considerable number of projects, where the experienced engineers are missing. Project reality is hidden often behind nice Power Point business presentations.

3. Revolutionary Management Processes?

The slogans here are "lean management", "flat hierarchy" and so on. I will be short.

After retirement from an aerospace company, I often feel sorrow with my colleagues who are still there at work. They are in the continuous re-organization processes. What for? Are they creating new products, are they more efficient in developing them? Sometimes I have the impression that their only job is re-organization. Consulting companies are doing the rest and apathy is the disastrous consequence. Have consulting companies and their staff ever designed airplanes?

I the best case, the employees simply continue doing their engineering and management work and try to avoid those processes. What a waste! So, there is not at all any revolution visible.

Flat hierarchies may be useful in many cases, but where is the final responsibility for design, certification, production? Is this still identifiable in committees without a responsible leader?

Or is it melted down into some amorphous groups? We see such dramatic effects with politicians involved in the management of infrastructure projects.

But there have been quite a few successful programs with a small experienced and dedicated team, a clear objective and with little outside interference. (Skunkworks, German VSTOL projects 1955 – 1970 period, CCV 104, X-31, Solarimpulse, etc. Space X again leads today).

Finally, the IT-managed company seems to be the dream in many management heads. Some colleagues are asking the question: where are the products behind the slogan? Rightly said, that IT is not a self-sufficient aim. It is the other way round: it is an excellent instrument helping to design our new products and services.

Ladies and gentlemen, colleagues:

In our 3 examples, from operations over aircraft design and development to industrial management: IT is fundamental today, but it must be used a tool, for us experienced people and specialists and our young successors. We are in the driver seat, not the computers! ICAS groups the best of aeronautics science and research in the world. Let's make more use of our expertise, let's intensify our influence in economy and politics.

I think back to my teachers and leaders in my country: personalities such as Professor Ackeret creating the first close-cycle supersonic wind tunnel in 1934. The 1961 ICAS congress was organized by him in Zurich. I think of aircraft designer Juerg Branger from the Swiss Federal Aircraft Company (today RUAG) with very advanced, far reaching designs, the leaders of Pilatus, the former Altenrhein company FFA , directors of the former Swissair. I have gained important experience in memorable meetings with international personalities such as Ed Heinemann, the famous Douglas airplane designer, Ludwig Bölkow and Wolfgang Herbst from MBB/DASA, pilots like Bill Bedford (Hawker), Dieter Thomas (Dornier) I had the privilege to work with. Then, André Turcat (Aérospatiale), Anatoly Kvotchur (Mikoyan, Sukhoi) and many military and industrial leaders.

The role of research, development and management today is different and the responsibility for an aircraft in development is not with the chief designer alone any more. But experienced charismatic leaders are still needed. And finally, I am convinced that our young engineers and scientists will find new ways not addressed in this speech. And exploit all the opportunities modern technology offers.

Wish you a pleasant stay and a happy return back home!

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