HI, TECH!

by Alberto Iovino

My six-year-old elder daughter is saving money to buy a PSP.
If you experienced a sense of momentary disorientation about what a PSP is, that means there's probably a good deal of added value for you in continuing to read on...

So, when my daughter first expressed to me her desire to possess one, I knew what she was talking about, but I immediately had to admit, to myself if not to her, that my knowledge of the dreamed-of device was actually quite superficial and definitely did not extend to its cost. After some investigation on the internet (which of course provides evidence that I am not completely out of date), I discovered that it not only allows you to play video games, which I already suspected, but can also function as a camera, an audio/video recorder, a GPS receiver and much more, all of this at a quite affordable price.

Following that, through a brief family council largely dominated by our one-and-a-half-year-old younger daughter articulating her opinion (I only wish I had been able to better understand what she meant), we as parents came to the inevitable conclusion. Although we disapproved of the idea of our girl becoming a video game addict at such a young age, a denial would have soon bestowed upon her the status of outcast from the circle of her fully-equipped friends and school mates. Perceiving us as unwilling to say yes, but unable to say no, she brilliantly resolved the situation by proposing to buy it on her own, thus offering us the psychological alibi for a trade-off between our concerns for her wider mental development and the valuable lesson of achieving a goal through dedication and consistent effort. Moreover, we (and no doubt she too) recognised that we would likely be the main financial contributors anyway. ▶ ▶

Please! Don't take me away...
I want to stay as an air traffic controller and
not become a number crunching traffic manager...

This anecdote offers some analogies with our approach to modern technology. Generally speaking, we each form our own mental picture of a new environment or experience with reference to models we acquired or developed on first exposure to it. Though, by definition, the aim of technology is to change and manipulate the human environment, inevitably the level of technology you were exposed to whilst growing up assumes, to some extent, the character of normality. For my generation, and in my country, cell phones are a novelty that, over a very short time, have led to dramatic changes in many aspects of our everyday life. For younger people, they are an essential communication tool and obsolescence in their present form can already be anticipated from how they are often used as anything but a telephone. Which closes the loop on those who, coming from the age of phone booths, still ask timidly, and after a fifteen minute lecture by their customer adviser about the wonders of the latest product, where the dial is.

Professionally, keeping oneself up to date is obviously a must. Training is consistently dedicated to new systems and functionalities, designed to address both new ways to do the same thing, and new things to do. Some more basic subjects, by the way, may simply be neglected.

On June 18, 2010, an Airbus A340 and an ATR 42 began near simultaneous take-offs on two intersecting runways at Zurich, one with but the other without an ATC clearance. The crew of a third aircraft alerted the control tower to an incorrect read back which had been inaudible to the controller, who was then immediately able to call the ATR to stop just in time for it not to reach the runway intersection, whilst the A340 performed its departure.

Through the subsequent Investigation by the Swiss BEA/BFU, it was established that the Airbus take-off clearance had been issued right after an instruction to the ATR to line up; the ATR flight crew had misheard the subsequent clearance as being for them. Both crews read back the clearance almost at the same time, with the two communications overlapping. The relatively stronger signal received from the A340 was all that was heard in the tower, but some of the ATR read back was audible to the pilots of the third aircraft, thus allowing them to appreciate what was happening.

About the fact that the controllers did not get any indications of simultaneous transmission, something surprising, to me at least, can be found in the Final Report of the Investigation:

"Air traffic controllers questioned were of the unanimous opinion that they would recognise a multiple transmission due to a superimposed whistling tone. This opinion is based on experience with older aircraft-side transmission equipment, which in the event of dual transmission generally caused a superimposed whistling tone in the receiver in the audible frequency range. However, this is no longer the case with modern transmitters equipped with frequency synthesizers, because these transmit very precisely on the nominal carrier frequency. However, this does cause a superimposed whistling tone (but it) is below the audible range of human hearing."

How many everyday practices do we rely upon, which come from our consolidated background, and which may have become obsolete without this being appreciated? Clearly, keeping pace with technological developments in one's own working environment is about what no longer applies as well as what is new. And this strongly supports a contention that in our job, interaction with other domains is so strong that a good awareness of other stakeholder's tools is paramount – that's what this issue of HindSight is about.

In my days as an airline employee I had the privilege of working with, for, on and inside the first Boeing 747s that ever flew. By the way, quite in line with a tradition which has more than once applied in time, whenever some significant technological innovation has been officially launched, the first 747 to operate on a scheduled flight was actually the second. I mean, it was the one standing from the bench on 22 January 1970, as the intended first op-

tion definitely refused to prove fit for its illustrious role. On that occasion, 352 passengers originally expecting to depart on the evening of the 21st, experienced a night-time delay of more than six hours at JFK airport; none of them is reported to have given up, thus providing another example of how humans stand up for their rights, especially if they have paid for a ticket to fly to Europe and are hoping for a story to tell to their friends and family.

These 100 series 747s, which were state-of-the art technology at that time, still required the presence of a flight engineer in the cockpit, like the 727, and used to carry flight attendants who looked like Hollywood stars. But by the late eighties/early nineties, the

controllers. Besides any official flow of information in your organisation, working impressions circulate quickly in an ops room, and you will soon hear, if not personally experience, how the newcomer behaves, and will not be caught by surprise. Surprise is more likely when an aircraft type with which you are very familiar begins to be flown in a way you have not previously experienced. I am not referring to isolated aberrations from the normal which may sometimes happen for a wide variety of reasons, but rather to changes in the way operations are conducted. This takes us a little further from understanding how modern aircraft perform, towards obtaining a clearer picture of how modern aircraft are flown.

traffic. "Fast", however, has become a more delicate subject. Pilots aiming to fly continuous climbs or descents are sometimes reluctant to accept high vertical or horizontal speeds, which in the latter case may be procedurally proscribed anyway. What several pilots will increasingly be looking for is less uncertainty and more predictability in both space and time (the so called 4D trajectories), with "management" progressively replacing any other key word, including "control".

So, understanding technological developments in a rapidly changing world requires flexibility and a willingness to adapt, which we all possess in differing degrees. We can generalise and say trivially, and with exceptions, that younger people look better equipped, since they face less novelty in the short term and, probably also because they jumped on board when the average speed was already high. Still, one day they will in all likelihood have to face the same feelings of inadequacy their older colleagues sometimes experience today. As air navigation and ATC are gradually becoming something else, curiosity and an open mind are the only way through.

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same aircraft had aged and you could see increasing maintenance time being required to keep them on line - maintenance involving a good deal of mechanics and, compared to today, relatively little electronics. According to the EUROCONTROL Aircraft Performance Database, they could typically climb at 1000 ft/min to 5000 feet whereas for the most recent (and much heavier) version, the B747-8, the corresponding figure is 2500 ft/min and even the Airbus A380 is stated as offering 1500 ft/min to 5000 feet. So wide-bodied aircraft on long haul no longer fly as "flat" after departure as their predecessors used to - although interestingly, they only continue to do better after 5000 feet at slower airspeeds!

This is the sort of change that is normally absorbed in a short time by

My ATC generation grew accustomed to "the shorter, the faster, the better" but it is not like that any more. In times of economic crises, strong market competition and high fuel prices, even the most solid airlines are very careful with costs, while many other operators simply struggle not to run out of cash. And then there are new environmental concerns – and the associated potential cost penalties. "Short" is therefore still largely appreciated, though more and more in a strategically organised context like free-route airspace, rather than by means of frequent clearance amendments that sometimes appear to challenge pilots adapting to the increasing capability of aircraft automation. Pilots, as Michel Tremaud reminds us elsewhere in this issue, aim to "stay ahead of the aircraft", just like controllers need to stay ahead of air

In any case, once the required sum has been raised, I am looking forward to playing one or two of those video games myself. ◰

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