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Business or brotherhood?

The increasing sophistication of aviation technology and the use of automation are weakening the bonds of the "brotherhood of pilots." These are separating us from our environment and from each other, making flying more business than brotherhood.

This is not a Luddite nostalgia for the good old days—advances in aviation technology (and safety) have been truly amazing. This is instead about psychology and the nature of our collective bonds—not about anyone's individual passion for aviation.

I'm using "brotherhood" as a gender-neutral and inclusive term, defined as a fellowship or community that is altruistic in form. It is about the bonds built between individuals who engage in a dangerous and dynamic endeavor that has seemingly endless variables. Historically, flying truly was man over nature and machine—a small group who faced unique and stressful environments in which accidents and emergencies could have disastrous consequences. These connections have even transcended war, where pilots who opposed each other in battle would often find a common and powerful connection after hostilities ended, sometimes even years later. These qualities have driven us, collectively, to approach aviation with a clinical truthfulness about the engineering and science behind our machines and a particularly ruthless analysis of personal skill. (Ever have to do some serious soul-searching after a humbling checkride?) With so much to know, these processes of analysis are iterative and endless, even for those with significant experience. Technology is changing how we approach aviation, however, and changing the brotherhood along the way.

To my first point, technology is separating us from our environment and its extreme qualities, and thus from its extreme requirements. Ultimately, this weakens a crucial and defining psychological connection within a brotherhood that is dependent on shared, demanding experiences. Increasingly advanced and integrated aircraft, airspace and air traffic control make us feel less like "part of the machine" than we did in the past, as these systems become too sophisticated to understand. Due to their technical nature and efficiency-driven (business) design, they are constructed in a manner to minimize the need for in-depth systems analysis and knowledge.

Simplistically, this complex equipment is being built such that if it doesn't adjust, reset or isolate itself, then (a) a human resets it, and if that doesn't work (b) a human turns it off and applies a performance decrement. This is a change from the past for all the right reasons, but one that leaves us knowing ever less about our machines. This philosophical change has psychological ramifications—understanding less makes us feel less integrated. The endless effort to increase systems knowledge is no longer required and, in many cases, is no longer attainable because the information is not available. This is by design. Attempts to overcome it by chasing after what is probably incomplete knowledge could actually be counterproductive if you started to out-think the situation (or emergency checklist).

Lowering these barriers does allow the integration of more participants faster and more efficiently—which is good for business—but reducing requirements and increasing numbers is rarely conducive to building an exclusive community. In addition, again for all the right reasons, technology and regulations have made flying more physiologically comfortable, opening the aperture to more people who are now less exposed to or restrained by the natural elements. Consider Charles Lindbergh's flight across the Atlantic. Our increasing ability to operate in what he would have considered to be extreme environments, in physically comfortably cockpits down to zero-zero weather, illustrates how the aviation brotherhood has changed through time and technology. These advances are being made for all the best reasons, but less extreme environments mean a less exclusive community.

To the second point, technology is also separating us from each other. Cockpit resource management is now less about running systems and coordinating control inputs than it is about establishing a common understanding about data entry and real-time automation monitoring. Cockpit performance has shifted away from being primarily a physical endeavor (stick and rudder manipulation) to being a mental endeavor—from the easily seen to the unseen. Pilots now spend more time "in their heads," which requires extra effort to communicate actions and intentions to others, since a crucial feedback loop (physical action) has now been replaced by computer-driven servos. Increasingly, this drives our activity more into the realm of the mind, which is a personal, not group, endeavor. Automation thus isolates people rather than builds communities.

The drive for efficiency and clarity is also being achieved through the increasing use of machine interfaces. But this in turn also separates us from contact with each other. As an example, advances such as controller–pilot datalink communications (CPDLC) cuts out yet another human-to-human feedback loop. In these situations, real-time human cueing is reduced as pilots hear less about what is going on around them—the tone, content and comments from the controller and other pilots are lost. The further CPDLC penetrates down into our clearance levels (oceanic, routing, arrival, takeoff, landing?) the more this becomes a human/machine interface activity than a human/human activity.

It also remains to be seen what impact the increasing use of unmanned aircraft systems (UASs) and remotely piloted aircraft (RPAs) will have on the psychology of the aviation community. In addition to being physically removed from the flight environment, operators may not even be physically located with the aerospace vehicle, the maintainers, or the launch and recovery team.

Based on human nature alone, a cultural divide between "air-breathers" and UAS operators would be only natural. This is not about the skills or qualifications of one type of aviator over another, but about how technology has changed our shared experiences.

Shared experiences and human-to-human exchanges help forge and strengthen common bonds between aviators.

Conversely, it could be argued that the increasing sophistication of our systems and the technical ability required to succeed in aviation today are actually strengthening the brotherhood. Let's face it—flying has always been, and still is, a test of personal skill validated by rites of passage (solo, checkrides) where experience is highly valued, time consuming and difficult to get. These activities continue to forge common bonds among a proportionately lucky few. And, even though the future of UASs is not set, it is possible, given the speed of technological change, to imagine a sky full of machine-guided RPAs. This development could actually further segregate and strengthen a small remaining group that physically still takes to the sky.

For your consideration, I am proposing that the bonds of the pilot brotherhood are being weakened by technology and automation because they are distancing pilots from their environment and each other. It is hard to dispute that technology is changing how we fly, but it may be making aviation more business than brotherhood.

Note that the comments expressed here are those of the author and do not reflect the official policy or position of the US Government or Dept of Defense. □