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SEEING THE PEOPLE IN CONTROL

I joined the world of aviation in the late 1990s as a Human Factors analyst in air UK traffic management. I had just completed my master's degree in work design and ergonomics, following my bachelor's degree in applied psychology. For the first half of my career, my focus was mostly on micro interactions: breaking down tasks, procedures, and interactions at a granular level – seconds and minutes, button presses and radio transmissions. This work involved incident analysis, critical incident interviewing, human-machine interface evaluation, and simulation observation, all aimed at identifying episodes of what we might call 'loss of control'. Breakdowns and breakages in countless human-human and human-machine loops preceded interactions that sometimes led to losses of separation, level busts and runway incursions.

Looking back, I was primarily using applied cognitive psychology and cognitive ergonomics to understand control through loops of internal mental processes – perception, memory, attention, and decision-making – along with interactions, and feedback and from the environment. This is often depicted in diagrams with boxes and arrows illustrating the processing of information.

In the second half of my career, my work shifted toward the macro level, zooming out to interactions within and between organisations, over months, years, and even decades. I listen carefully to people in various roles about their unique experiences. Here, the loops involve communication, cultures, and changes over time. These loops are inseparable and interdependent, creating formidable complexity in terms of people, technology, processes, structures, and organisations.

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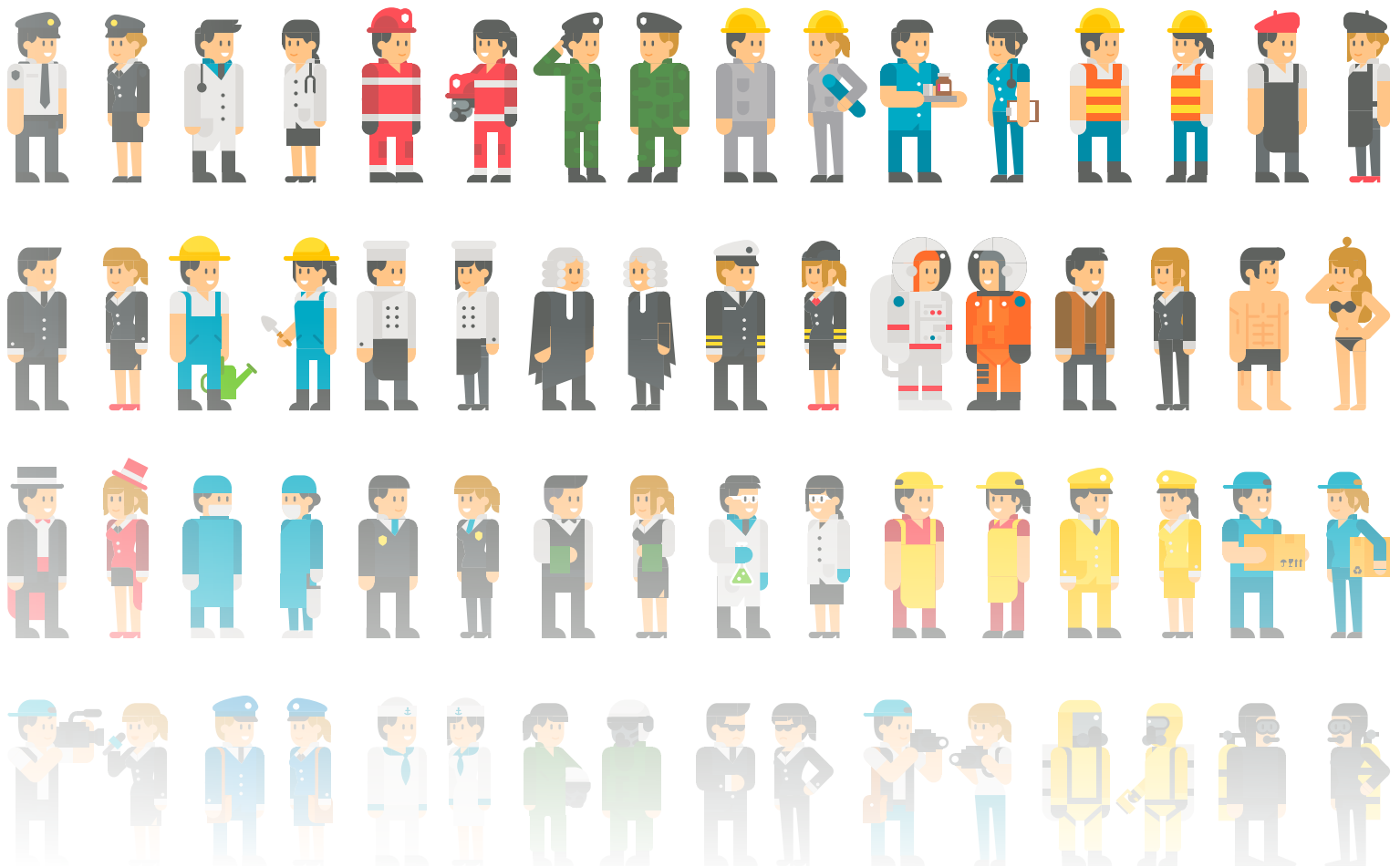
No single frame of understanding suffices; I draw upon many disciplines, especially humanistic and social psychology, systems thinking, complexity science, and the humanities, in my attempts to understand the world. From this perspective, people seek to maintain control collectively through loops of communication and influence that evolve before we can even attempt to describe and document them.

Looking at the big picture, what is incredible is not that we sometimes lose control, but that we manage to maintain control at all. (Note that there are various meanings of 'control', from hard

– making something happen – to soft – managing or influencing a process or situation – and it is worth thinking about what it means for you.) This brings me to a question that I often pose to groups, including senior managers: If you had to explain to a neighbour why your organisation is so safe, and generally

works well, what would you say? The responses vary, but in the best-connected environments, different groups – controllers, engineers, managers, safety specialists – recognise and acknowledge each other's contributions, forming large, interconnected loops. It's a vital question to ponder, because if you don't, how do you know what to nurture and extend...or defend in the face of cost cuts?

I recently posed this question to an audience of CEOs and safety directors at a EUROCONTROL conference in Spain. It was heartening to hear some senior leaders acknowledge in detail how people are their organisations' greatest assets. They emphasised that people need to be in control and in the loop. I was surprised at the level of resonance with the theme of this issue of *HindSight*.



The CEOs' comments took my mind back to a groundbreaking report by Charles Billings, *Human-Centered Aviation Automation: Principles and Guidelines*, published in 1996 by NASA. Billings was a former flight surgeon and specialist in aviation medicine, who became an influential and distinguished NASA expert in aviation human factors. The principles in his report remain solid to this day, and the first three are so general that they apply regardless of the presence of automation.

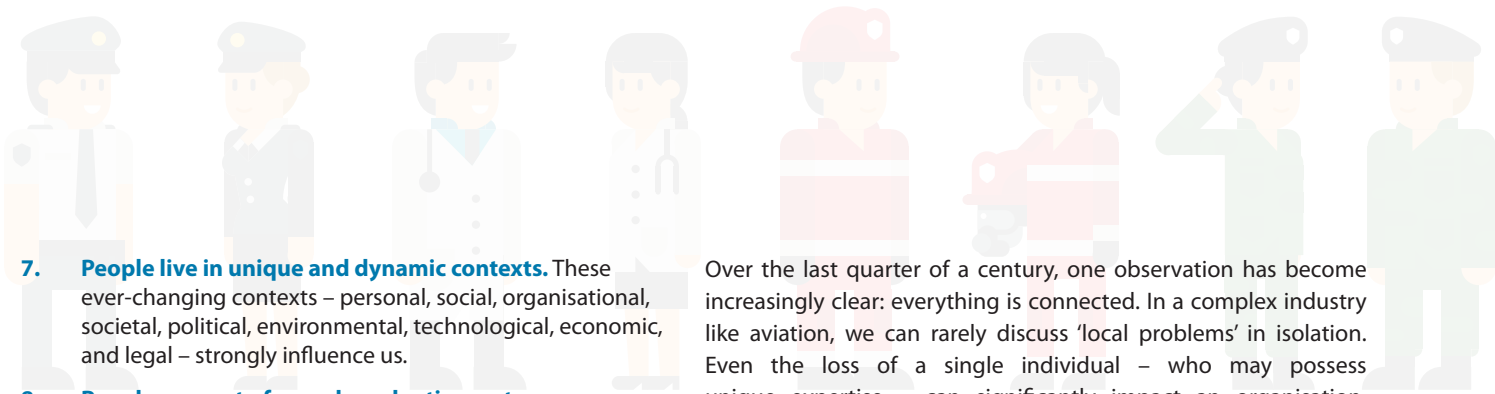
1. The human operator must be in command.
2. To command effectively, the human operator must be involved.
3. To remain involved, the human operator must be appropriately informed.

The remaining principles focus on the relationship between human operators and automated systems:

4. The human operator must be informed about automated systems behaviour.
5. Automated systems must be predictable.
6. Automated systems must also monitor the human operators.
7. Each agent in an intelligent human-machine system must have knowledge of the intent of the other agents.
8. Functions should be automated only if there is a good reason for doing so.
9. Automation should be designed to be simple to train, to learn, and to operate.

While these principles remain valid, they primarily address the operator-machine dynamic, or 'joint cognitive system'. This was the focus of my interest in cognitive psychology and cognitive ergonomics. But the humanistic psychologist and systems thinker in me seeks principles that recognise people as more than operators, with control (or influence) distributed throughout organisations, industries, and societies. To this end, I propose the following nine principles to help 'see' the people in control:

1. **People are whole and complex beings.** We are greater than the sum of our mental, emotional, or behavioural 'parts', and cannot be fully understood by focusing on tasks, functions, roles, or occupations.
2. **People have unique virtues, values, gifts, and passions.** For these to be expressed fully, we need a supportive and nurturing environment that values individuality, diversity, and inclusion.
3. **People have goals, and seek meaning, purpose, and creativity.** We often seek these things through relationships, work, and personal pursuits.
4. **People naturally strive to learn, grow, and develop.** We tend to flourish in a supportive and enabling environment.
5. **People are inherently social beings.** We seek meaningful connections with others to find belonging, identity, support, and shared purpose, and are profoundly influenced by social norms, expectations, and pressures.
6. **People's subjective experience is unique.** Our experience shapes how we interpret and respond to the world around us and affects our wellbeing.

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- 7. People live in unique and dynamic contexts.** These ever-changing contexts – personal, social, organisational, societal, political, environmental, technological, economic, and legal – strongly influence us.
 - 8. People are part of complex adaptive systems.** Our interactions are influenced by a dynamic network of interactions, which are interconnected and interdependent, with outcomes that are often unpredictable.
 - 9. People have some choice, control, and responsibility.** But agency is distributed among many and shaped by the opportunities and constraints of the contexts in which we exist, along with our capabilities and motivation.

Over the last quarter of a century, one observation has become increasingly clear: everything is connected. In a complex industry like aviation, we can rarely discuss ‘local problems’ in isolation. Even the loss of a single individual – who may possess unique expertise – can significantly impact an organisation. This is equally true for the loss of critical resources. For instance, in our conversation in this issue of *HindSight*, Captain James Burnell discussed the effects of losing crew rooms at some airports. I revisited this impact through the lens of the nine principles I have just outlined. When I recently shared this story with another pilot from a different country, he was horrified at the prospect. “Crew rooms are sacred!”, he said, “There would be riots!” Crew rooms are shared resources that help crews to stay in the loop and maintain control and have even broader benefits for people.

These principles remind us that people are more than operators and need to be considered in the broader context. Although these principles have remained valid over millennia, the contexts and the complex adaptive systems in which we live and work (Principles 7 and 8) have changed dramatically, impacting our choices, control, and responsibilities (Principle 9). I encourage you to consider the principles in the light of any activity or change, inside or outside of an organisation.

Going back to my “If you had to explain to a neighbour...” question, my answer is that things work because people make things work, bridging the gaps in the loops as they arise in order to stay in control. We do this using our remarkable expertise, creativity and connectivity, and do this sometimes to our personal cost. What is amazing is that things work as well as they do. It’s time that we fully acknowledged the reason for this – us – and respect people as so much more than operators and overseers of machines and processes.

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