

Airplane Crashes Provide Enlightenment

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The paradox of the information age is that there is an unbelievable amount of useful information readily available but these gems are buried in a sea of useless junk. Perhaps only 1% of the available publications, both electronic and paper, have any real value. Dogbert, who continued the tradition that began with Aristotle, once said that given infinite time, a thousand monkeys with typewriters would eventually write the complete works of Shakespeare. But it would take thousands of lifetimes to read all of their gibberish to find Hamlet.

However, when a trusted colleague recommends something of value, he provides me the service of finding something in that sea of junk. Last year, one of my clients introduced me to a set of articles and books that, in my opinion, have important value.

The story begins with the analysis of airplane crashes in the 1970s. At this point in time, the mechanical systems had been continuously improving until safety reached a lower (but unacceptably high) limit. The missing piece of the puzzle was traced to human factors, which were becoming the dominant source of air disasters. Even though members of the cockpit were highly trained with simulators, human error was still a major issue. In an analysis of crashes in the 1970s, 60% of fatal commercial air carrier accidents were attributed to the management of human resources in the cockpit, and when the statisticians included non-commercial airplanes that rate approached 80%.

UM, SIR, WE'RE ABOUT TO...

To understand the nature of human failure, social scientists studied the dynamics in the cockpit, which had been organized like a corporation with a strong authoritative leader in charge. The buck stops with the captain (or CEO), who is given the mandate to make all decisions. The captain is *the* captain.

A few examples illustrate how human foibles produced fatalities. In 1977, a KLM captain insisted on commencing a takeoff, in heavy fog, without a takeoff clearance. Other members of the cockpit knew they had not received clearance to takeoff and they tried to convey those concerns to the KLM captain. He was preoccupied with the fact that any delay would cause the flight crew to run out of legal duty time. His decision would prove to be the worst air fatality in history.

In a similar type of incident, a UAL captain was preoccupied with the failure of an indicator showing that the landing gears were locked correctly. As he was focusing on solving this technical problem, keeping the airplane in a holding pattern while he tried to determine the failure mechanism, he ignored the warning of his crew that the plane was running out of fuel. After an hour elapsed, all four engines simply stopped.

There are many similar stories where the captain was focusing on a real problem, and ignoring a secondary issue that would later prove to be more deadly. The Titanic sank for similar reasons; the owner on board was preoccupied with the commercial implications of being late to arrive in New York and therefore ignored the advice of those who knew about the risks of icebergs.

Captains and CEOs are also human beings who can become hyper-focused on one issue while ignoring others. The problem is compounded by the organizational structure where the captain (buried in his distraction) does not listen to those who have no “right” to challenge the authority figure. Some Asian cultures give the captain a god-like authority to make all decisions, which can become a serious problem when handling an unexpected crisis in the cockpit.

LET’S NOT VOTE ON IT

The opposite structure does not work either. Decisions cannot be made by a democratic vote, and interminable debates are not acceptable. There has to be a better way. Could social scientists change the behavioral structure of the cockpit to create a real team without undermining the leader’s responsibility?

Over a period of decades, a program called Crew Resource Management (CRM) has been instituted and refined in all the major airlines, with a dramatic reduction in fatalities. The program emphasizes the cognitive and interpersonal skills required to manage the cockpit under adverse conditions. In this context, cognitive skills are defined as the mental processes that evaluate *all* possible sources of information in decision-making. The captain is trained to value inputs from everyone regardless of status and stature. In addition, the flight crew is trained to make their concerns known in a polite but forceful manner. CRM is a culture change that is neither authoritative nor disrespectful. This approach is also being used in the medical industry where the chief surgeon is like the captain or CEO.

The general principles embodied in CRM are neither new nor novel, and they apply to a wide variety of situations, including broadcast stations. Group culture has a very strong influence on individual behavior because it compensates for the evolutionary limitations of the human brain. These limitations are unrelated to intelligence, training, or personality.

GROUP MULTITASKING

Let’s take a simple look at the conscious attention system in the neocortex. Beneath this system, a preconscious sorting process evaluates dozens of stimuli, both internal and external, in terms of their importance. The stimulus that is tagged to be most important for survival and well-being is then passed to the attention system, which is not able to do true multi-tasking. In the case of the airplane crashes, the captain tagged the landing light failure as being most important and ignored the warning that the airplane was running out of fuel. Preoccupation with one stimulus is a failure in tagging. But since tagging is

preconscious activity the victim cannot do anything about it by himself. He needs a social culture to compensate for a failure to correctly tag the most important stimulus.

We arrive at a similar conclusion when we look at the evolutionary history of our species. Ancient hominids (our ancestors) were not the fastest, strongest, or best combatants in fighting with competing species for resources. Why then did we come to dominate all other species, becoming mammalian cockroaches? The answer is that multiple individuals could act like a meta-animal with distributed senses and intelligence. A hunting party of 10 individuals had 10 sets of eyes, ears, noses that fed information to a multiplicity of brains with different skills, abilities, and perspectives. As we now observe by the size of the human population, meta-animals proved to be unbeatable. Our species was an evolutionary experiment that proved to be more successful (to date) than all other species.



LET THE GROUP WORK TOGETHER

Decades ago, I had my first taste of the effect of changing an engineering culture into what I call a meta-animal. I was asked to take over a dysfunctional engineering department that had been tasked with developing a critically important product to protect the company's market position. While I recognized that I was now the "captain," my job was to fuse the group into a collective set of brains that could function like the hunting parties of our ancestors.

My first command was as follows: If anyone brings up a problem in the design and presents it publically, he is no longer responsible for solving the issue. In other words, a public disclosure relieves the engineer of all responsibility. The group would own the

problem and if the collective wisdom could not invent a good solution, I would own the problem.

This was the airplane cockpit in a corporate context. I was dependent on the information that others had but would not make public. To make a long story short, with a cohesive engineering culture, the product made the schedule and was a top performer in the market. And everyone had a stake in making that happen. I was like the conductor in an orchestra, being in charge, but not making the music. I needed their information and wisdom, just as the captain of the cockpit needs the input from the crew.

The same principle has been described in corporate management under the title, “management by walking around.” This idea was popularized in the 1980s because it was becoming clear that executives were becoming isolated from what was really happening in other parts of their company. When information has to pass through too many layers, those who need to know are left in the dark. Without this data, an executive would easily become preoccupied with an issue that was not necessarily the most important one.

In 1965, there was a major power outage across the eastern half of the county. Most radio stations had emergency power systems to keep them on the air. While these systems had been tested weekly, some stations discovered, to their horror, that all of the testing had drained the fuel tanks. Nobody had bothered to put the refueling issue on the table as part of the testing. I have no doubt that some lowly janitor had noticed that the tanks were close to empty, but he did not exist in a culture where that information could capture the attention of executives who were preoccupied with more important issues. The same dynamic happens in airplane cockpits, surgical operating theaters, and executive suites of major corporations.

If the conclusion that group-think is so valuable, why is that insight seldom recognized and incorporated into organization cultures? My answer is that hubris among those with high stature and sophisticated education leads to them to the false conclusion that their brain wiring is superior to that of an illiterate peasant. Regardless of our professional success, we are all limited by the evolutionary brain trajectory of our species.

When someone gets a promotion to become a leader with the corresponding increase in authority and responsibility, his brain has not changed. A title does not increase your intelligence and skills. Actually, a promotion often degrades brain functioning because you focus in creating the illusion that the new position changed your brain. It didn't. As I often say, humility is the key to success.