CULTURAL INFLUENCES AND INTERACTIONS WITHIN AERONAUTICAL ORGANISATIONAL SYSTEMS AS PREREQUISITES FOR OPERATIONAL PROCESSES

Captain (AF) Valentin-Marian IORDACHE

90th Airlift Base, Air Force Staff

In the society we live in culture tends to become an abstraction, but the elements created in a social and organisational context that derive from culture are extremely important. If we do not understand how to manage these elements, which are in a complex and dynamic system, such as in the aeronautical system, then we will become their victim. Cultures have an impressive ability to create cohesion, performance and identity. They provide rules that allow diversity, regardless of its nature, to coexist. All organisations have a culture, and that of an aeronautical organisation must achieve maximum efficiency in risk conditions.

Knowing the influences of each subculture helps reduce risks, costs, and improves the organisation's efficiency and air safety. This paper aims to present the main cultures, and the link between them, within an aeronautical system and, at the same time, to help raise awareness of the importance of understanding the cultural elements in order to improve efficiency during operational processes.

Keywords: culture; organisation; efficiency; aeronautical safety; operational processes;

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INTRODUCTION

The real efforts to achieve a high level of safety should take into account the need to understand culture and the various cultural influences existing in the conducted operations. The fundamental premise is that it is essential to build on the strengths of national culture and enhance professionalism and organisational culture to achieve a robust safety culture.

Culture surrounds us, it is not something tangible, material. The Indian leader Mahatma Gandhi stated that *"the culture of a nation is found in the hearts and souls of its people"*. It influences the values, beliefs, attitudes and behaviour within a group of people. Cultures are meant to improve the relations within a group and to provide indications and directions regarding the proper behaviour in normal and/or unusual situations.

The lessons learned are those that make us aware that the aeronautical systems development must have as a starting point the organisation. The culture within the aeronautical organisation is what determines, or not, the progress, which influences the mentality and attitudes, but especially, it is the one that conditions the level of aeronautical safety. In order to achieve performance and meet the desired objectives, the first steps are to understand the theories and managerial principles, to thoroughly know all elements, positive or negative within the system, and to effectively adapt, in accordance with the particularities of the system in which the implementation of these elements is intended.

Good organisation is achieved only through an efficient culture; there are no good or bad cultures, everything is related to the underlying values. The existing culture within an organisation has the role of stabilising internal processes, even when the staff involved have other points of view for moral reasons. The level of stability determines the strength of that organisation, and the way in which

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the objectives are met reflects the values that underlie the culture. The issue of culture and the need to define values very clearly are not new aspects. Thus, in his paper *A Proposed Code of Ethics for Air Force Officers*, H.G. Jenseen (1968) offered two examples of values that have the role of imposing stability and from which a power with positive or negative effects can result.

The first example is *The American Revolutionary War* (1775-1783) where the probability of success of revolutionaries, under the austere conditions and the power deficit existing at that time, was extremely low, but overcoming encountered obstacles in the fight with an experienced and professional army, General Washington managed to achieve victory. The mentioned historic success, in Jenseen's opinion, was probably the result of the ethics and values at that time, which acted as elements of force for the American revolutionaries. The second example of values that acted as a factor of power in history is Germany led by Hitler. For a short time, Germany was a stable and strong country, achieving its proposed objectives. The values imposed by Hitler were directed towards conflict, not peace, which pushed him to execute certain military manoeuvres that did not have a realistic execution. History shows us that military success is directly related to ethics because, from a rational point of view, it determines the quality of leadership in an organisation (Janseen, Ib., p.78).

Cultures cannot necessarily be categorised as good or bad, but they can be called so when we talk about resulting effects. Cultures are learned by the members of an organisation, so a change of mentality at organisational level requires a lot of discussion, communication and learning. Changing people's behaviour is another difficult aspect, because people have some fixed patterns that they follow as automatisms, being generally unaware of their own assumptions. Leaders change culture by implementing values and beliefs different from existing ones and by materialising them with words and deeds. Subcultures are present in any organisation, small or large, and in order to be able to modify these subcultures, those that already exist must be very well understood.

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THE MAIN CULTURES IN AVIATION
AND THE RELATION BETWEEN THEM

For aeronautical personnel there are three cultures that shape actions and attitudes. The first, of course, is *national culture*. There is also a *professional culture*, having strong effects, which is associated with belonging to the category of aeronautical personnel. At the same time, *organisations have their own culture*, which is closely linked with the daily activities of its members. While national culture is very resistant to change because it influences the individual since birth, the professional and organisational cultures can be changed if there are strong incentives.

National culture represents the common components of national heritage. It includes behavioural norms, attitudes and values. Certain aspects of national culture have been identified as critical in aviation; among them the following can be mentioned: individualism-collectivism, power distance, avoidance of uncertainty or consideration of rules and discipline. Individualism focuses on the individual and his personal benefits while collectivism focuses on the group. Collectivism is often associated with power distance, which reflects the will to accept unequal statutes and respect for superiors. Behaviourally, the superior power distance is the refusal to question the decisions or actions of leaders, even when they are inappropriate. When we talk about a proactive mentality to avoid uncertainty (rules and discipline), it is considered that existing rules should not be violated, even if this would be beneficial for the organisation and its safety. A mindset against avoiding uncertainty is prone to disregarding standard operating procedures, but it can still be more effective in developing methods of cooperation in unknown situations (Helmreich, 1999, p. 2).

Communication between people from different national cultures is often damaged by language barriers as well as by cultural values. The fact that English is (in theory and in practice) a universal language may accentuate the problem. While people from different cultures speak several languages, those in the Anglophone sphere frequently speak English, so it may be possible for them to not understand the problems because other cultures have a different way of expressing

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in English. There is no simple solution to language problem, but it must be accepted and confronted.

National culture differentiates nation-specific features, including the role, place, and individual image of specialists in society, of the organisations to which they belong, as well as the aeronautical activities (including the military ones). This component also includes, in general terms, the way and criteria for allocating, understanding and accepting authority; distribution of resources; responsibility and guilt; morality (Ib.).

A beneficial aspect in pilots' culture is the pride in their profession. They love their chosen profession and they are very motivated to progress and achieve everything very well. This can help organisations to improve operational safety and efficiency. The professional culture of pilots has also a strong negative component in the context of personal invulnerability. It has been found that most pilots in all cultures consider their ability to make decisions in crisis situations to be as effective as in normal situations, that their performance is not affected by personal problems and that they do not make more mistakes in situations of intense stress. This misperception of personal invulnerability may be the result of a failure to properly use management practices as measures against errors (Ib.).

Organisational culture sums up the usual practices and habits of aeronautical organisations; however, certain practices and habits that have become a norm in daily operations do not ensure a high level of safety. The mentioned actions, as well as overloading the aircraft by reaching the limits of flight envelope can become commonplace in activities within an aeronautical organisation. Once they have become a norm and everyone is accustomed to and accept them, those elements that pose a real danger are omitted. In aviation the systems are prone to error. In this respect, one must be aware of the practices and habits that have become norm. Certain beliefs, practices and habits that exist in aeronautical culture can be perceived as both positive and negative. In some cases, dangerous practices may be exploited. Some people believe that such practices/attitudes demonstrate superior skills and they are nothing more than a way in which they can be demonstrated.

In other situations, safe practices, such as refusing to fly tired or not flying when weather conditions are unfavourable, may be perceived as negative by operational air units or by management structures (Sedam, 2006).

An organisation represents the framework in which the national and professional cultures operate, having an important role for behaviour. At organisational level, culture has the greatest influence and it is exercised to create, maintain and sustain the culture of safety. Achieving it requires strong senior management to demonstrate commitment to safety, as well as implementation of policies, regulations that encourage communication and actions rather than denial, in response to undiscovered issues and risks. Together, the organisational and professional culture, placed in the same spirit of simultaneous support, coherent and balanced approach to performance (operational capacity), quality (compliance with rules/rules) and safety (protection of people, property and environment) can be the powerful engine for organisational development.

Culture shapes attitudes about stress and personal abilities; it also influences adherence to standard operating procedures and the way automations are used. Each of these three cultures has strengths and weaknesses. Strengths increase safety, and weaknesses diminish it (Helmreich, Ib., p. 3)

Although the interpretations of definitions regarding organisational culture are varied, the way in which they are developed can help us to understand its nature and content. It continuously operates with various interorganisational factors and substantially influences the efficiency of operations as well as the organisational development. Organisational culture coordinates all ongoing processes. Everything that happens within an organisation as well as everything that is produced as independent entity or in the interest of society, with direct influence on the environment and general public, is the result of collective work.

The success of an organisation consists in achieving the desired objectives in the context of challenges and economic and financial situation at a certain time. The most important element is represented by people – the human resource, who must know and master modern

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methods and procedures and the operating modes for equipment. Moreover, they must be also aware of their involvement, quality of work and responsibility at the group, team and management levels.

On 24 April 1997, Jim Hall, President of National Transportation Safety Board/NTSB, stated three ideas/starting points related to organisational culture (Sedam, 2006), as follows:

- beliefs held by staff and managers within an organisation about how operations should be conducted;
- practices and habits that have become the norm;
- how different factors can be exploited in a manner that is either positive or negative.

These three ideas are, without a doubt, applicable in any modern aeronautical system, and for a better understanding of how these elements affect the organisation, different events must be analysed, an example in this regard being the Challenger space shuttle catastrophe. On 28 January 1986, space shuttle Challenger, having a seven-member crew on board, exploded 73 seconds after launch. It happened because of a technical failure in one of the propellant rockets. Even if the explanation in the final report was relevant and correct, highlighting a technical problem, the organisational culture that existed within NASA at that time was the one that contributed to the mentioned accident because it normalised the attitude that made the decision to launch the rocket. The way in which the culture was organised was questioned, because the decision-makers omitted certain elements, alarm signals, which announced a possible malfunction of the component that failed. Organisational culture is intrinsically linked to safety and it should be a topic of discussion to positively affect safety culture within aeronautical organisations.

Cultures are deeply rooted and their values can be so resistant to change, especially for airlines with strong identity, that desired changes cannot be achieved without determination or generic training programmes. For this reason, organisational culture can be much more difficult to change than policies or processes. However, a combined change in the management programme that involves personal motivations can have dramatic effects in a relatively short time.

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The culture in the structure of aeronautical organisations can significantly differ from one organisation to another. Philosophies, values and expectations at group level can be considered as the culture of an organisation. The attitude and safety practices developed at group level are direct results of organisational culture. Every system has a safety culture, not just the aeronautical one, but the question is whether safety is a priority or not.

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SAFETY CULTURE – FUNDAMENTAL ELEMENT OF OPERATIONAL EFFICIENCY. THE INFLUENCE OF ORGANISATIONAL CULTURE ON SAFETY

The main issue is how the safety culture of the aeronautical organisation is determined; from the moment safety culture is established, then it must be known how it can be influenced, so modelled.

An organisation with a good organisational culture is one in which safety and professional behaviour are fully internalised in the personnel way of thinking and action. Safety is perceived as a necessity during all air operations in which safety and professional practices are not only supported by management, but also proactively demonstrated. The activities and attitudes in the spirit of aeronautical safety must lead to the identification of causes and factors of influence as well as of their activation mechanisms in order to prevent the occurrence of other aviation events.

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Depending on aeronautical organisation and its operational particularities, there can sometimes be pressure because of the financial aspects related to preparing an aircraft for flight in a short time and with functional sacrifices. Given these circumstances, it is very easy to develop a poor safety culture, in which staff members are congratulated and rewarded for preparing the aircraft in a short time, even if everyone knows that compromises have been made to achieve the end result. As an adverse reaction, this attitude can transform the organisational culture in such a way that omissions and violations become commonplace and then become accepted as normal within the organisation. The cultures having such characteristics can be very difficult to modify, the process being a slow one.

Safety culture represents the sustainable values and priorities that affect the individual and the public safety of each member of a group at all organisational levels. It refers to the extent to which individuals and groups assume obligations regarding personal safety responsibilities, such as: actions to maintain, improve and communicate safety-related elements; the desire for continuous learning, adaptation and modification (both individually and organisationally) of behaviour based on lessons learned; recognition of merits in an appropriate manner in relation to the values of adopted culture (Zhang, Wiegmann, Thaden, Sharma, Mitchell, 2002, p. 3).

The safety climate is a temporal state to measure the safety culture, with common topics between individual perceptions within the organisation. It is, therefore, based on situation, and refers to a perceived state of safety at a certain moment and time; it is relatively unstable, and subject to changes, depending on the attributes of environment or prevailing conditions (Ib.). The organisational climate changes very quickly following a significant event, but there is a possibility that the organisational culture cannot change enough to prevent future events. In these situations, management structures will act to implement changes, usually by establishing additional control methods (quality management).

In an aeronautical organisation, the safety culture should be very strong *(figure no. 1)*, analysing *what people do, not what they say*. Several factors contribute to the creation of a strong safety culture, such as:

- commitment to transparent management;
- effective communication when it comes to safety elements;
- safety is considered, in the organisation mindset, more important than the desired objectives;
- the organisation must always have the willingness to accumulate new knowledge;
- active participation is needed to enforce safety;
- it is ideal to have a sufficient amount of health and safety resources available;
- low level of inappropriate safety behaviours;

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- trust between management and higher echelons;
- effective maintenance management;
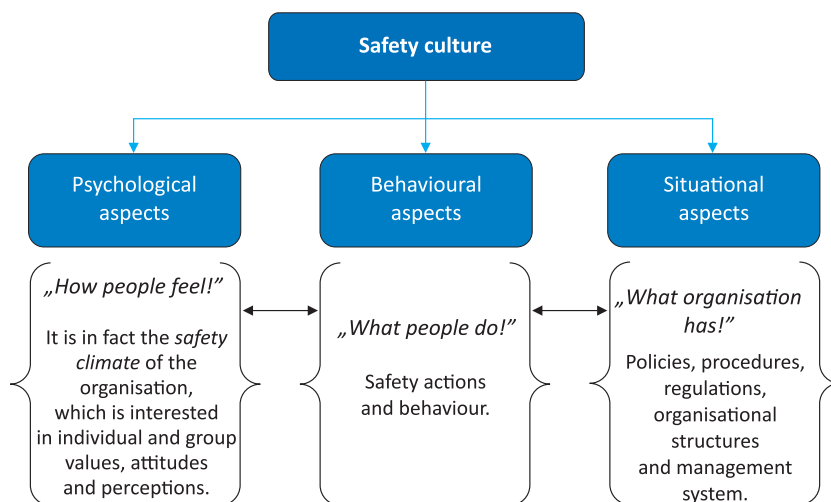- high level of competence (Shaw, Flynn, 2010, p. 35).

Figure no. 1: Important organisational aspects of safety culture
(Shaw, Flynn, 2010, p. 5)

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The structure of aeronautical organisations includes a number of common subcultures such as: *executive culture* – focuses on financial issues, analysis, processes, information and abstractions, being a direct and control culture; *technological culture* – focuses on scientific elements, equipment, automation, technological information and others; *operational culture* – aims to carry out the actual processes; *regulatory culture* – emphasises the role of authorities, the role of experts and the role of public, organisational activities being influenced by this type of subculture.

The safety culture consists of eight key elements (subcultures) as follows: informed culture, reporting culture, just culture, learning culture, flexibility culture, risk perception, safety attitude and safety behaviour. The first five elements were identified by James Reason and are complemented by three elements identified in the works of the Civil Air Navigation Services Organisation – CANSO *(figure no. 2)*.

Informed culture is based on reporting culture that, in turn, is based on just culture. All organisational personnel must understand

and recognise that it is unacceptable for all errors and unsafe actions to be punished regardless of their origin and circumstances, while immunity from sanctions is unacceptable to all actions that contribute, or may contribute, to organisational accidents. The culture of justice, in general terms, refers to a set of principles that delimit acceptable from unacceptable actions (CANSO 2008, p. 5).

Reporting culture depends on the way the organisation manages accountability and sanctions. If blaming is a routine response to errors, then the reports do not have the same meaning; on the other hand, if blame is the result of unsatisfactory behaviour involving, for example, indifference or malicious actions, reporting will not be discouraged. Informed culture refers to embedded management culture where people understand dangers and inherent risks in operational dynamics. Personnel must be provided with necessary knowledge, skills and lessons learned to work safely, they should be encouraged to identify elements that may affect safety and take necessary and effective measures to eliminate them; a good informed culture depends on the quality of reporting culture. Reports are efficient for the organisation if one can learn from it. Learning arises from both reactive and proactive safety assessments and it is promoted through the organisational desire to adapt and improve. A safety culture is flexible, in the context that the decision-making process varies depending on the situation and different operational variables.

Individuals at all organisational levels must have the same perceptions and reasoning regarding the severity of risks, as these perceptions affect behaviour and decision-making. Risk perception or people's reasoning about risk are influenced by different hazards attributes (e.g., controllable-uncontrollable). The attitude regarding safety is the result of the perceptions and behaviours towards safety, which gets materialised not only by respecting procedures, rules and regulations, but also by training, discrimination, communication, demonstration and mutual support.

It must be mentioned and understood that there are interrelations between elements. These connections, in turn, depend on the role played by management structures in establishing the policies, procedures and tools needed to manage the above elements and ensure their dynamic success.

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Figure no. 2: Elements of a safety culture (CANSO, Ib.)

An example of how organisational culture can affect safety culture is Boeing's recent history, as proven following the two air disasters from Indonesia, on 29 October 2018, (flight Lion Air 610) and from Ethiopia, on 10 March 2019, (flight Ethiopian Airlines 302), involving Boeing 737 MAX 8 aircraft.

Boeing aircraft safety has proven to be particularly high among US airlines – many companies have preferred Boeing aircraft in their own fleets over others. US companies did not have any fatal accidents for nine years until 2018 when a passenger died after being almost pulled out of the aircraft during flight because of a broken window – the event occurred on a Southwest Airlines flight. This state of safety was the main element that led to a very high level of confidence in the equipment and systems implemented on Boeing's aircraft for operators in the US commercial air transport market.

It is a proven mistake to believe that progress in the field of automation has made flight much safer; Boeing's mistake was also human error. Gapper (2019) said that Boeing was lured into hubris due to its commercial success and safety record. They did not start from the premise that they could be so wrong in trying to support the human factor by implementing the MCAS (Manoeuvring Characteristics Augmentation System), which acts on flight controls; as an adverse

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reaction, this system, in both air disasters, was the main cause for the fight between man and machine, for priority over flight commands, the system receiving erroneous information from sensors regarding the aircraft's flight attitude.

The two aircraft that crashed in Indonesia and Ethiopia had one thing in common: they were not equipped with safety features that could have prevented these accidents. These items were optional, with Boeing implementing them on aircraft only if requested by airlines, implicitly paying for them.

The mentioned optional elements could have helped pilots understand the problem in a timely manner, and aeronautics experts say they should not have been optional from the start. Bjorn Fehrm, an analyst at aeronautical consulting firm Leeham, said that *"these are critical elements and the cost is almost nothing for the airlines. Boeing is asking for money for them because it can. But they are vital to flight safety"*.

The implementation of a new system led to several problems, which could have been avoided through communication – organisational and interorganisational reporting system – and a much more active involvement of those in aeronautical structures. All these aspects can be remedied in the future only by creating a well-defined plan/algorithm/process to follow well-defined and logical steps to improve operational quality with implementation of new technologies and many features that can create new risks.

Following the two events, Boeing will implement the warning elements not only on new aircraft but also on the operational ones, in addition to updating the 737 MAX 8 aircraft control system software.

Regarding this situation within Boeing, Cătălin Prunariu (2020, p. 39) concludes: *"At the moment, Boeing is facing an identity crisis rather than a financial crisis. To get out of this impasse, the company will have to redefine its entire set of policies and hierarchical relations between employees. They will also have to change their approach regarding risk management. The main role of feedback from employees and small management, particularly the one that reports risks associated with flight safety, will be very important and will have to reach the highest levels of company management. Managers in upper*

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echelons will have to take this information into account and adjust their decisions accordingly, putting first the aviation safety and production quality and secondly the financial interests. To achieve these goals, a new leadership will be needed, with a set of values unaltered by the company culture that has existed so far".

It is obvious that even within Boeing there is a problem of organisational culture that directly affects safety culture; therefore, the values needed to improve the efficiency and safety of the aircraft they produce must be redefined and implemented in order to realign them to the worldwide needs and rigours of commercial air transport market.

CONCLUSIONS

Although it is a rare topic, culture is of fundamental importance not only in the development of aeronautical organisation, but also in improving the operational processes carried out in order to achieve the established objectives.

Every process must have a starting point, a foundation, and culture is the one that has the role of establishing this foundation on which to continue the organisational development, constantly taking into account those elements of adjacent culture – national and professional – to optimise processes and thus to improve efficiency.

The problem of organisational culture has theoretical solutions, being a very complex phenomenon, difficult to define and which can have unpleasant repercussions, but which significantly affects the long-term success of an organisation. It can be the source of power for an organisation, being a strong advantage, or it can hinder the development of an organisation, there being the possibility that it will be the main element that will destroy it.

Each organisation has its own particularities. To a large extent, these particularities are, from my point of view, influenced by national culture. There is no ideal pattern for culture. An effective culture for achieving a strong system depends on how its particularities and characteristics are understood, adapted and managed. In order to achieve performance, a leader must be aware of such particularities and characteristics, identifying them in time, and adapt into the internal

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organisational structure the necessary elements to achieve a strong culture system, with clearly defined values, beliefs, visions and habits on the basis of which a strong aeronautical system can be developed and maintained.

Every organisation wants to achieve performance, to be efficient, but in order to achieve it, there is a constant need to improve knowledge. Society is constantly evolving, and organisations must adapt to its requirements; moreover, through its contribution to society and its desire to improve final results, the organisation must have not only the ambition and skills to draw relevant conclusions from its work, but also the will for major reforms if necessary.

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