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A THEORETICAL SUGGESTION FOR THE DEVELOPMENT OF A SAFETY CULTURE: CIVIL AVIATION CONTEXT

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ABSTRACT

Purpose - This paper aims to place aviation safety culture on three pillars theoretically, and by doing so, to distill findings. By more clear words, It tries to give a more detailed explanation of the concept of safety and safety sciences. Regardless of the business branches, safety should be an important branch, depending on its clear importance in aviation, maritime, health and engineering and more technical sciences to give a clear insight into safety another purpose.

Methodology - Methodologically, the differences between the communities of Gemeinschaft and Gesellschaft of Tönnies and epistêmê and technê discrimination of Greek philosophy pave the way for Habermas's Communicative Action Theory to create a cultural form that is exemplified as safety culture in civil aviation depending on the increasing impacts of the communication and communication networks. In the end, it concludes that the safety culture of civil aviation can be explained with this type of theoretical background and this methodology can be utilised in other industrial branches and sciences.

Findings- The main findings of this research can be collected in two groups. One of them is directly related to the creation of a cultural form (safety culture) and its main features by theoretical means, the other one is the evaluation of these theoretical means to the specific ends in a specific business branch, so civil aviation.

Conclusion- Through these ways, the importance of communication, sociological heritage and knowledge forms in aviation safety culture will be more theoretically understandable which is a complementary recipe of the research gap. On the other side, and in clearer words, safety is one of the great problems of humankind and business life. Like many other concepts such as security, the importance of heritage, culture, transmission and transportation of knowledge will be more understandable with these kinds of papers or works.

Keywords: Safety culture, civil aviation, theoretization, communication, knowledge
JEL Codes: B26, O18, R11

1. INTRODUCTION

Since the Paris Agreement of 1919 and especially the Chicago Convention of 1944, civil aviation has grown at such an absolute pace that it was impossible to detect the true directions, timing and place of the last innovations and inventions. For example, hybrid or electrical engine systems are still in ambiguity and a great question mark for airports in terms of the efficiency and effectiveness of fuel systems, on the other hand, unmanned aerial vehicles are still in question if it is concentrated on security matters and international laws.

In the middle of this dense agenda, this paper's first aim is to evaluate civil aviation's place in the world business community. As we realize the first step, we will benefit essentially from the distinction of the great German philosopher Tönnie's dualism (2001) between Gemeinschaft (communion) and Gesellschaft (society). The first question of this research is formed here as what are the main motivations behind aviation communities, therefore we will make a philosophical positioning and we'll focus on this matter so closely. Secondly, we'll concentrate on knowledge analysis, the main tools and vehicles in this analysis will be mainly taken

from the dualism of the age of the Greek Philosophers between *epistêmê*(theory) and *technê*(practice-craft)[1]. We can observe the importance of these knowledge types not only in civil aviation business activities but also in the training and education activities of aviators as a priority that is the heart of every branch and sub-branches of civil aviation, therefore we will pave the way for an investigation in terms of means and ends. Thirdly and lastly, we will theoretically analyse safety culture in aviation. In this analysis, we will make vulnerable and comprehensive contributions from Habermas' Communicative Action Theory (1981a; 1981b). By doing so, we will re-evaluate civil aviation which is said and accepted as a communication-based safety climate and safety culture, because of the lack of theoretical connections in this context.

In light of the arguments above, we will set up a theoretical background for the research in the first section, we will make a literature review in the second section, the discussion which is the essence of our work, in the third step, the conclusion and suggestion will be the last part of the research.

2. THEORETICAL BACKGROUND

While and After the Industrial Revolution, one of the great leaps of organized people was witnessed in the understanding of work and business life and projections of this situation to the human social lives were great. The direction, density, effectiveness and efficiency of the transformation were so frank that philosophers and scientists tried to find new definitions, identifications, classifications and new theorizing to succeed by mean-end chains, articulations and concepts.

Gemeinschaft (communion) and Gesellschaft (society) are products of these efforts. If underlined here the differences between Gemeinschaft and Gesellschaft as Waters (2016) utilized, Gemeinschaft generally refers to a human unity in which emotions, affections and family relations, for these reasons, personal loyalty to family, ethnic relationships, professional memberships to the religious community and feudal rank. On the other side, Gesellschaft is another form of human unity in which rational motives and rational will, the power of money overcomes all of the other human-belonged-motives, therefore it is a materialistic one. Besides these, Soares (1997) states that a typology of Gemeinschaft and Gesellschaft is so beneficial to explain social relationships and the roles of modernized or industrialized individuals and continues affectivity, particularism, ascription, diffuseness, collectivism are forms of Gemeinschaft, on the other hand, neutrality, universalism, achievement, specificity and individualism are patterns of Gesellschaft. According to Christenson (1984), the other differences can be realised through classifications for spatial (rural-urban) and communal (collectivistic-individualistic). For Greeley (1966), the Christian Church always became a good developer and feeder of Gemeinschaft that carries religion-depended patterns. Nonetheless, as Sanstedt and Westin (2015) underline the Gemeinschaft as a public life indicator, Gesellschaft can be considered as a work and business life descriptor. In addition, Nilsson and Hendrikse (2009) support the idea of different norms behind the Gesellschaft and Gemeinschaft dualism. The emphasis of Bennett (2011) is also so important that she defines Gemeinschaft as a human unity formed around one Geist (Soul), while agreements, protocols or contracts are the main ties or boundaries of Gesellschaft and also it includes all of the modern business habits, norms and even economical theories that begin from the job division of Adam Smith. So, there are strong, concrete and open differences between members of Gesellschaft and Gemeinschaft in life and professional life habits, she exemplified them with plagiarism in science. Consequently, Kornbeck (2001) determines the main Gemeinschaft skills as common-sense knowledge, intuition, traditionally selected implicit communication and negotiation, compassion, subjective appreciation, induction, as comparatively as legal, administrative and psycho-social scientific knowledge, reasoning, deduction, analytical and casework skills, explicit and coherent communication and negotiation are main features of the Gesellschaft individual.

The second theory to form of this analysis is the duality between *epistêmê*(theory) and *technê* (practice-craft), according to ancient Greek philosophical schools, There are five virtues of thought: *technê (technical knowledge)*, *epistêmê(scientific knowledge)*, *phronêsis(daily knowledge)*, *sophia (wisdom)*, and *nous (rationality)*. Various translations have been offered for each of these terms. Most often, *technê* is translated as craft or art. While epistêmê is generally rendered as knowledge, in this context, where it is used in its precise sense, it is sometimes translated as scientific knowledge[2]. In analyses of Karpov (2015), it is underlined that practices of art, craft and science can be counted as technê. He gives examples of the craft of war, playing music, authority administration and agriculture, steering a boat and cookery, real estate management, blacksmithing, medical treatment and mathematical operations, making money, the art of painting, measuring the Earth and the motion planets, witchcraft and

[1] https://plato.stanford.edu/entries/episteme-techne/#:~:text=Epist%C3%AAm%C3%AA%20is%20the%20Greek%20word,'%20or%20'art'). Accessed at 15.07.2022.

[2] https://plato.stanford.edu/entries/episteme-techne/#:~:text=Epist%C3%AAm%C3%AA%20is%20the%20Greek%20word,'%20or%20'art'). Accessed at 15.07.2022.

prophecy are main and different styles of technê in Ancient Greek and adds that they need commerce wisdom. There are some practices of slaves (unworthy of a free man, a citizen). On the other side, Leonard and Tochia (2022) state that epistêmê is an expression and a standard of scientific knowledge that grows with Enlightenment thinking, it is objective, value-free and independent. Here, the classification of Chia and Holt (2008) is also clearly important in this context that technê is more associated with precise, codified and technical instruction, and a tacit form of knowledge, conversely, epistêmê includes experimental (scientifical), explicit and universal knowledge. According to Rawlins (1950), the main projections of technê and epistêmê to the current are "pure science" and "applied science".

The third pillar of our theoretical base is the Communicative Action Theory of Habermas. If it is looked at the deep roots of the business world, it is so normal to confront with the problematic of communication. In this pillar, we will elaborate following questions and other types of questions, for example, how can we define communication in a business context? Is there a communication type for all of the actions of humans or an action for all of the communications types? etc.

Communicative Action Theory takes its roots in Speech Acts, which aims to minimal use of the unit of communication in messages from A to B, but to increase the message's direction, intensity and correctness. Rationality, mutual understanding and own design of communication (regulative, commissive and declarative) and inclusivity are important determinants in this context (Dietz and Widdershoven, 1991). For Mitrovic (1998), social actions, interests, life world, social system and regulation need different communication types in specific considerations of action such as teleological, norm-regulated, dramaturgical and communicative. These actions are products of different interests of the mind such as theoretical, practical and emancipation. To ensure and sustain a stable development degree in social facts (knowledge), moral justifications (legitimacy) and legal norms (regulation), a good order requires these detailed communication types that are products of examined minds in the Communicative Action Theory of Habermas and according to Risse (2003), because of these reasons, it's one of the main theories which are included and given directions in international legal arrangements agreed upon by national governments, from larger scope, it aims governance without a government by its ultra descriptive and definitive-communication-based structure oriented to reaching understanding while other communication structures focus on the success(Thompson, 1983). Again, Baxter (1987) describes that Habermas aims for a cultural form, which begins from this communication-based structure, and includes cultural standards of interpretations, values, and expressions. Silva, Pereira, and Felizardo (2022) named this interactive process with Habermas' words as "lifeworld" and put it on his triangle that is composed of culture, person and society. While Kihlström and Israel (2002) define communicative action, they put strategic action opposite to it and give great importance to the acts of influencing and manipulating the other. Both of these actions can be observed in the modern business world and life conditions. Nonetheless, Chilton and Cuzzo (1999) maintain that Habermas tries to put forward a wide conflict resolution methodology with this theory.

Regarding its comprehensive nature, Habermas tries to develop a wide theory based on social order. However, according to Hoch (2007), although communicative action theory gives insights into urban/city life, it can not be fully addressed to social, economic and political changes.

Besides these, Kecmanovic and Janson (1999) talk about the significant impact of communicative theory on information systems research especially with the explanative concepts of successfulness, legitimacy, justification, sincerity, truthfulness and cognitive-instrumental rationality about communication. For Kernstock and Brexendorf (2009), the theory of the Habermas is so important not only because it tries to regulate cognitions and moral and aesthetic dependence on knowledge, but also because it increases the validity of communicative actions.

3. LITERATURE REVIEW

The declaration of Ilan and Fowler (2005) is so important that the automobile and aviation industries are the main focus points of safety-related research because of their safety management-dependent nature. This determination also is supported by Turan et al. (2016). To ensure good management practices in civil aviation, we should concentrate on safety matters first. If we look more closely at safety practices and theories, It can be confronted with the needs and requirements of decision-making, safety management systems and the implementation of policies and procedures related to civil aviation. Besides these, proactive safety resource allocation, operational safety management systems, and risk scenarios gain importance, and to ensure efficiency, effectiveness and proactivity good communication is essential (Bhattarai et al., 2022). For Atak and Kingma (2011) development and growth phase of an organisation and the production interests of a company are strictly, soundly and comprehensively concerning its safety culture in aircraft maintenance as well as other branches of civil aviation. If it is historically concentrated on the safety culture development, the increasing interactions of academics, publishers, consultants, regulators and industries and

the evolution to global safety culture can be observed (Le Coze, 2019). According to McDonald et al. (2000) and Yorio et al. (2019), safety culture is not only formed by individuals who are subjected to attitudes and behaviours but also, social psychological, sociology and anthropology research, which subjects norms, values and beliefs, assumptions as a necessity. Parker et al. (2006) and Glendon and Stanton (2000) underline the importance of human factors as another variable in physiologically, psychologically and socially determining safety culture. On the other side, Ek et al. (2007) offer ideas-supporting and conflict-solution communication mechanisms to increase the safety culture understanding. If it is concentrated on the other branches, out of some specific and operational conditions, the situation has not any deviations in Airports as concluded by Remawi et al. (2011), Air Traffic Management (Mearns et al., 2013) and Ground Handling (Ek and Akselsson, 2007) and Commercial Flight Operations (Gibbons et al., 2006). In the article of Bates (2023), safety in business aviation is associated with emotional intelligence. In the work of Liao (2015), there is a comparison of safety cultures between Chinese and Western pilots, rather than the results, the methodological approaches and titles are so important in this work, on which there are the increasing impacts of trust, high power distance, sharing information and knowledge, communication and reporting to a high degree of harmony. Legality is another important determinant, especially after a fatal accident, legal reporting and its dimensions such as international law and crime management and cultural identifications, and determinations, so safety culture gain importance (Lawrenson and Braithwaite, 2018). Besides these, Wilke et al. (2014) maintain that data management and informatic sciences, logic and reasoning are very important in safety management, for this reason, a safety database is a necessity. Anyhow, resilient safety culture is a subject and aim of the legal structure of Civil aviation with its special governance structure between policies, practices and procedures (Adjekum and Tous, 2020), as observed in Appendix 19 of ICAO. According to the analysis of Foster and Adjekum (2022) and Adjekum (2014), safety culture is a matter of increasing perceptions, harvesting desired behaviours, and increasing exposure to safety training. While Gill and Shergill (2004) underline the relationship between different cultures, they generalize employee safety responsibilities to more important variables than an effective safety management system and encouraging a positive safety culture.

4. FINDINGS AND DISCUSSIONS

Today, civil aviation is a worldwide regulated community with all of its roots. But, again and again, if it is looked at its deeper sides, it will be confronted with the same traditions of the 1900s such as military patterns, continental differences between Europe and the USA, and regional and cultural differences. For example, there are occupational differences between a Russian pilot and a Japanese pilot or an Iranian ground handler and a German ground handler in terms of discipline, work habits, ethics and morality practically despite standardized certifications and licencing, training and education, law, rules and regulations. Due to safety necessity which is the most exact feature of civil aviation, these differences shall not be and they are direct causes of accidents and incidents. In this part of the work, it will be focussed on developing a safety culture in theory. In this discussion, firstly, it would be concentrate on the community structure of civil aviation, secondly, it would make explanations on current knowledge structure of civil aviation and in the third phase we will evaluate culture and cultural structures in civil aviation benefiting from Habermas' approaches.

Civil aviation is a greatly human-resources-dependent society; therefore, human nature, social sciences and community sciences have priorities. But, in light of the last development, the impacts of technology, computer sciences, statistics and mathematical equations can be effective and efficient in describing aviation problems through simulations. But, the emphasis on safety, according to regulators and rule-makers, a standardized safety, is always the premier step of the definition of achievement in the aviation community. In order to achieve standardization, a context-subject connection is a necessity, for this reason, we should first analyze the main features of the civil aviation community when it is realized the dualism between Gesellschaft and Gemeinschaft will be so beneficial to reach a good benchmark.

It is a well-known reality that civil aviation is a communication, technology, and politics-intensive community, it is easily affected by negative economic variables. And it is a safety-oriented community, therefore, it has got its own tacit, implicit or explicit knowledge. If it's concentrated on the features of the civil aviation community, Appendix 1 will be so explanatory. The second classification of civil aviation can be examined according to cultural knowledge heritage. The most important factor here is to determine and to decide the differences between techne and episteme, Appendix 2 is organized for this purpose. Safety culture is the last component of our analysis. The interpretations of the safety culture with the elements of the communicative action theory of Habermas can be seen in Appendix 3.

5. CONCLUSION

This research is structured on three important pillars and a base. It is benefited from three important approaches in the theoretical background. They are the famous theorem of Tönnies, epistêmê and technê differences, and the communicative action theory of Habermas. Benefiting from these theoretical approaches and current aviation safety culture approaches, it is tried to form a framework. According to this theoretical framework, there are community structures, knowledge structures and communication structures through which civil aviation safety culture occurs. If it is made a deep analysis of the matter and focuses on the pillars, civil aviation carries motives and designes for its specific features such as communication dependence (For example, transferring of different knowledge types, cultural heritage, rationality and business-making), knowledge dependence and knowledge dependence between community and communication structures. According to our theoretical explanation, the community structure (Gemeinschaft or Gesellschaft) where is the place of the knowledge creation forms and community structures distil knowledge types via different processes, these processes can be the subject of different research, and at the end, community and knowledge interactions, so dissemination of knowledge via communication frames the last step. It can be stated here clearly that systemized, aimed, framed and cumulative knowledge and its communication is a form of culture.

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APPENDIX 1: Why is Civil Aviation a Gemeinschaft? Why is it a Gesellschaft?

	Why is civil aviation community a Gemeinschaft?	**Why is civil aviation community a Gesellschaft?**
Civil Aviation	• National companies • Cultural habits, • Cultural forms, • Cultural understanding, • National identities, • Semi-military culture. • Transfering tacit and implicit knowledge through special communication • Apprenticeship-expert examples.	• Profit-oriented companies, • Rationality, • No-emotions, • Ruled and standardised explicit communication, • Scientifical knowledge and analytical reasoning • Protocols, procedures and standards,

APPENDIX 2: The differences between Technê and Epistêmê in Civil Aviation

	Technê	**Epistêmê**
Civil Aviation	• Aircraft production and manufacturing, • Airport and aerodrome structuring, • Utilization of Aviation operations (Ramp, Ground Handling and Cargo), • Maintenance, repair and overhaul of the aviation industry and its elements • Realizing Pilotage and Flight Crew, • Making money and business practices through aviation activities.	• Designs of the aviation industry elements and components, • Theories of physics and related sciences and sub-branches. • Social sciences, human sciences and management sciences

APPENDIX 3: Safety Culture in Aviation: A Theoretical Approach

<table>
<tr><td colspan="4">SAFETY CULTURE</td></tr>
<tr><td>COMMUNITY STRUCTURE</td><td colspan="2">KNOWLEDGE STRUCTURE</td><td>COMMUNICATION STRUCTURE</td></tr>
<tr><td>GEMEINSCHAFT
1. Cumulative safety practices through traditions,
2. Safety-oriented norms, values beliefs and assumptions,</td><td>EPISTÊMÊ</td><td><u>TECHNÊ</u>
1. Traditional and cultural experience,
2. Implicit and Tacit knowledge (apprenticeship and expert interactions)
3. Cultural habits, norms, beliefs</td><td rowspan="2"><u>Utilisation of communicative action theory</u>
1. Creation of a rational culture through communication,
2. Creation of legal governance(includes monitor, internal and external audit, supervising technologies and mechanisms) through communication.
3. Protection of cultural habits, norms, beliefs and assumptions through communication.
4. Protection of tacit knowledge through communication.</td></tr>
<tr><td>GESELLSCHAFT
1. Profit-oriented safety
2. Safety-oriented business practices</td><td>1. Explicit knowledge,
2. Scientifical knowledge,
3. Organizational developments.</td><td>1. Traditional and cultural experience,
2. Implicit and Tacit knowledge (apprenticeship and expert interactions)
3. Cultural habits, norms, beliefs</td></tr>
</table>