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Quality Improving of the Air Traffic Controller Selection Process at the University of Defence

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Abstract:

This study analyses the admission procedure for air traffic controller specialization applicants at the University of Defence in the Czech Republic. SWOT analysis identified strengths in the historically proven selection and it has also identified weaknesses in the assessment of air traffic controller-specific psychomotor skills. Key opportunities include integrating simulation technologies and enhancing collaboration with secondary schools. Key threats stem from outdated processes misaligned with Generation Z preferences and their declining interest in military fields. Recommended strategies focus on modernising the admissions process through simulation-based exercises, improving the promotion of the specialization, and adapting to the preferences of the current and future generation. The study provides a basis for evidence-based improvements in military air traffic controller candidate selection, emphasising a balanced approach between traditional and innovative assessment methods.

Keywords:

air traffic control, air traffic controller selection, selection procedure, performance testing, generation Z, admission process

1 Introduction

In recent years, there has been a notable increase in the complexity and volume of air traffic, which has presented significant challenges for both civil and military air traffic control. This growth can be attributed to various factors, including globalisation, technological innovations, and increasing demand for air services. Consequently, the environment in which air traffic operations have become ever more dynamic and demanding, necessitating constant adaptation and improvement of procedures to ensure its

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fluidity, safety, and efficiency. This reality also presents a challenge for air traffic controllers within the Czech Air Forces (CAF), who are required to continuously monitor and adapt their procedures and systems to reflect modern trends [1].

The demanding nature of their work can be attributed to several factors. The work environment is characterised by high levels of stress, involving the ability to make decisions with optimal precision. The dynamic nature of their work is characterised by unexpected changes and technological advancements. The maintenance of safety and efficiency in air traffic within the airspace is contingent upon not only expertise but also the capacity for rapid adaptation to changes in the operational environment [2].

In the present era, the question of quality in the selection and subsequent education of military air traffic controllers is of paramount importance. From a theoretical standpoint, the selection of prospective air traffic controllers represents a pivotal aspect that significantly influences the safety, efficiency, and reliability of air transportation.

The current format of the admission process for the Air Traffic Control (ATC) specialisation at the University of Defence (UoD) is considerably influenced by the criteria for admission to military universities. The UoD is the sole state-run military university in the Czech Republic. This fact is enshrined in the Ministry of Defence Decree No. 279/1999 Sb. Coll. [3], which establishes the scope of professional knowledge required for personnel at air traffic service stations and defines the theoretical education requirements according to the study programs for the respective study fields, as outlined in a special regulation of Act No. 111/1998 Coll., on Higher Education Institutions [4]. The principal criteria employed in the evaluation of applicants to the current programme of study and in the Admission Process (AP) are the Study Aptitude Test (SAT), the Test of English Language (TEL), the Practical Test of Physical Fitness (PTPF) and the Professional Aptitude Test (PAT).

Although this multifactorial approach provides some insight into the capabilities of applicants, it can be argued that it does not result in a comprehensive assessment of all relevant prerequisites necessary for the successful training of the air traffic controller profession. The existing admissions structure is deficient in the provision of specific tools for the evaluation of certain key cognitive, psychomotor and personality characteristics, which are considered to be critical for this demanding profession.

The current trends in the lifestyles and preferences of Generation Z present significant challenges to traditional recruitment and educational methods. The upbringing of this generation in an era of digital technology and virtual environments has resulted in distinctive patterns of behaviour with regard to the acquisition of information and interaction with the external world. The prevailing tendency towards sedentary lifestyles, coupled with the intensive use of digital devices, has the potential to result in a range of health risks, including obesity and physical fitness problems. Furthermore, the elevated incidence of mental health issues such as anxiety and depression, in conjunction with novel modes of social interaction facilitated by digital platforms, gives rise to a multifaceted set of considerations that must be incorporated into the design of efficacious adoption processes [5].

This article thus addresses the potential for modifying the selection process for prospective students pursuing a specialisation in ATC. The objective is to emphasise identifying individuals who demonstrate the capacity to successfully complete the academic component of their professional development, as well as the potential and motivation to complete the subsequent practical training necessary to obtain an air

traffic controller license. The objective of this article is to examine the existing admission process and to identify potential avenues for improvement.

2 Materials and Methods

In selecting prospective air traffic controllers, a pivotal criterion is the discernment of individuals equipped with the capacity to navigate challenging scenarios in practice adeptly. The selection of candidates and their subsequent education represent a strategic investment that fulfils the commitment to provide excellent education and actively contributes to the development of CAF professionals from among Air Traffic Controllers (ATCO) who possess the prerequisites to successfully meet all the requirements of this profession [6]. The selection of an appropriate candidate is considered to be a crucial element in ensuring future excellence and sustainable development in the field of air traffic control.

2.1 Profession of Air Traffic Controller

The role of air traffic controllers combines exceptional professional skills with immediate and precise decisions under pressure. Their work requires the art of coordination and airspace management, while dealing with extreme stress, dynamic situations, and technological development every day [6].

ATCOs are professionals responsible for managing the movement of aircraft in airport spaces and airspace. Different specializations of this profession can be distinguished according to the type of service provided and the sphere that secures it. In the CAF environment, we divide these services into:

- Aerodrome Control Service (TWR),
- Approach Control Service (APP/DEP),
- Radar Control Service for Combat Use.

ATCO training can only be conducted by an organization that has successfully obtained permission to provide the given services and has demonstrated compliance with implementing acts to ensure compliance with the main requirements [7]. In the Czech Republic, this organization is the Czech Air Navigation Institute (CANI) in Prague. The training itself can be divided into four types-initial training, unit training, continuation training, and instructor training (see Fig. 1).

The initial training phase represents the inaugural stage of the process leading to the attainment of a Military Air Traffic Controller Student Licence (henceforth referred to as the “MATCSL”). Unit training represents the final stage of the process leading to the attainment of the MATCL, or Military Air Traffic Controller Licence, as it is designated in this context.

Additionally, the CAF includes training for radar controllers who are deployed in combat situations. The training program for this group is distinct and characterised by a defined scope, methodology, and sequence. Upon successful completion of the program, the graduate is awarded an Air Traffic Controller Licence (ATCL) with a combat use radar control qualification [8].

While the fundamental responsibilities of ATCOs are largely consistent across the globe, there are notable variations in the structure and practice of the profession in different countries. For example, in the United States, the Federal Aviation Administration (FAA) employs controllers, whereas in numerous European countries, including the Czech Republic, air navigation service providers may constitute a distinct enti-

ty [9]. The International Civil Aviation Organization (ICAO) provides global standards, but the manner of their implementation may vary [10]. For instance, the use of English as the principal language for air traffic control is customary in the majority of countries, although local languages may also be employed in certain nations [11].

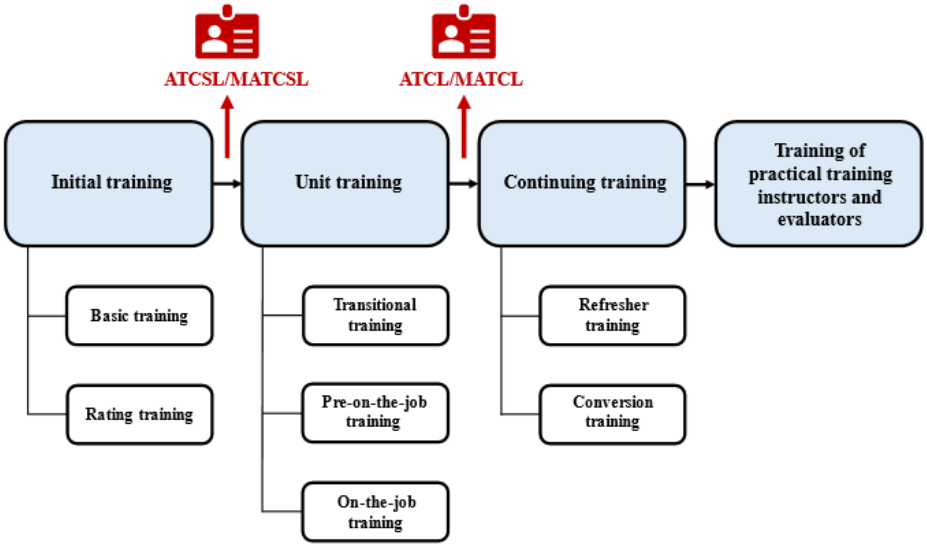

Fig. 1 Air traffic controller training flow

2.2 Legislation

With regard to the legislative framework governing the appointment of air traffic controllers, it is evident that there are certain inconsistencies. No direct regulation governs the selection process; thus, there is no definitive guidance on how it should be conducted or what it should entail. Nevertheless, the Eurocontrol organisation has established a set of regulations and recommendations for the assessment of an air traffic controller's profile. Furthermore, the aforementioned information delineates the prerequisites for training organisations, which subsequently assess, evaluate and enhance these attributes. Examples of these regulations include the following:

- Commission Regulation (EU) 2015/340,
- Regulation L1-Competence of Civil Aviation Personnel,
- CAA Directive-211,
- Act No. 49/1997 Coll., on Civil Aviation as amended,
- ESARR 5-ATM SERVICES' PERSONNEL,
- EUROCONTROL Specifications for the ATCO Common Core Content Initial Training,
- Selection Tests, Interviews and Assessment Centres for Ab Initio Trainee Controllers: Guidelines for Implementation (Revised),
- Guidelines for Selection Procedures and Tests for Ab Initio Trainee Controllers (Revised).

The legislation governing air traffic control in the Czech Republic is closely aligned with that of the European Union, particularly Commission Regulation (EU)

2015/340 [12]. Such harmonisation is a common feature of EU member states. Nevertheless, there are some discrepancies in the manner in which these regulations are implemented across different nations. By way of illustration, the United Kingdom, now outside the EU, maintains comparable standards through its own Civil Aviation Authority [13]. In contrast, the United States adheres to FAA regulations, which, while aligning with ICAO standards, exhibit some distinctive characteristics in domains such as controller certification and training requirements [14].

2.3 Requirements for Air Traffic Controllers

The characteristics of professional competence of applicants for the air traffic controller profession are defined by four groups:

- aptitudes and abilities,
- personality,
- knowledge,
- skills [15].

Aptitudes, also referred to as dispositions, represent the physical and mental prerequisites for developing abilities. These are innate, and in order to develop abilities from them, it is necessary to foster and cultivate them [16].

Ability is a human-acquired trait that arises from one or more aptitudes. It is a prerequisite for successful performance of a given activity, action, or profession, with a superior or above-average result [15].

The term "personality" is often defined as a comprehensive representation of an individual's character, temperament, abilities, and traits [16]. In other contexts, it is defined as a set of characteristics that indicates how an individual will behave in a specific situation [15].

Knowledge can be defined as information obtained through a process of learning, cognition, experience, and engagement in activities that capture one's interest. It is not merely a matter of memorization but rather of comprehension and understanding of the facts in question [15].

Skills are frequently linked to abilities, as they are closely interrelated [17]. In some cases, these abilities are influenced by innate predispositions or aptitudes, but they can primarily be acquired through learning and training [15].

While the core competencies required of air traffic controllers are broadly similar across the globe, there are nevertheless a number of variations in the specific requirements imposed by different countries. To illustrate it the Czech Republic has set the minimum age requirement at 21, which is in alignment with EU regulations [12]. In the United States, however, candidates may commence training at the age of 18, although they are not eligible for full certification as controllers until they reach the age of 21 [18]. Furthermore, there are discrepancies in the educational prerequisites for those aspiring to become air traffic controllers. Some countries, such as Germany and the Netherlands, have established air traffic control academies, while others, including the Czech Republic and the United States, offer university-level programmes in this field [19]. The physical and medical standards required for air traffic controllers are generally stringent worldwide. However, the specific tests and frequency of examinations can differ between countries [20].

2.4 Admission Procedure at UoD

To gain admission to the University of Defence in the Air Traffic Control specialization, applicants must fulfil specific, predefined requirements. These requirements for the new bachelor's program in "Military Air Operations" are detailed in the document titled "Conditions for Admission to Study at the Faculty of Military Technologies", which is published annually.

The minimum entry requirements for applicants to study ATC at the UoD are defined with precision by the relevant components of the Ministry of Defence and Czech Armed Forces, which are responsible for the selection of ATCO candidates. The objective is to ascertain that prospective candidates possess the requisite aptitudes, knowledge, skills and personality traits to develop the competencies essential for ATCO to guarantee safe and efficient flight operations in the future.

The recently introduced Bachelor's degree programme in Military Flight Operations (MFA) has established the fundamental prerequisites for candidates to be considered for admission to the UoD. These include a clean criminal record, a high school diploma and successful completion of medical examinations at the Central Military Hospital and the Institute of Aviation Medicine in Prague. It is crucial to highlight that these prerequisites diverge from those established for candidates directly enlisted into the Czech Armed Forces, reflecting the distinctions in the training curriculum and subsequent roles within the military structure [21].

The ATCO AP consists of four main tests designed to provide a comprehensive assessment of the applicant's skills and abilities. The written SAT assesses mathematical knowledge and logical and numerical reasoning at the level expected of a high school student. The written TEL is designed to assess language proficiency at level B2 as defined by the Common European Framework of Reference (CEFR) or NATO Standardisation Agreement (NATO STANAG) 6001 SLP (2+, 2+,2+,2+) [21].

The written PTPF comprises three disciplines: endurance running, strength endurance and a speed and agility test. These disciplines are designed to assess the physical preparedness of candidates for the rigours of military training and aviation operations [21].

The written PAT is a comprehensive examination that assesses specific skills and knowledge deemed essential for prospective ATC personnel. The examination is comprised of two sections. The initial section assesses cognitive abilities, whereas the subsequent section evaluates fundamental comprehension of aviation-related matters, including geographical knowledge of the country and an understanding of aviation sciences [21].

This comprehensive approach to the admissions process enables the UoD to identify candidates with the greatest potential for success in the demanding and multifaceted role of military air traffic control in the 21st century.

2.5 SWOT Analysis

To understand and analyse the current state of candidate selection for study at UoD, a SWOT analysis was conducted (see Tab. 1), which defined the strengths and weaknesses of the current admission system. These aspects were oriented toward evaluating the internal analysis of the admission process itself. Since this SWOT analysis was created for the purpose of potentially improving the admission process in the future, opportunities and threats coming from the external environment were also defined.

Tab. 1 Input data for SWOT analysis

Strengths	**Weaknesses**
1. Testing the prerequisites for successful college study. 2. A historically proven system for selecting candidates. 3. Similarity of admission procedure with other civil universities. 4. Similarity of the admission procedure with other UoD disciplines. 5. Easy processing and evaluation of results.	1. Not using modern (simulation) technologies. 2. Lack of verification of the required psychomotor skills for the expertise of the Control Room. 3. Less interest in technically oriented fields. 4. The low generational motivation of applicants. 5. Poor physical fitness of applicants.
Opportunities	**Threats**
1. Attracting a more comprehensive range of applicants. 2. Extension of the existing state of the art with simulation technologies. 3. Higher promotion of ATC specialization. 4. Cooperation with secondary schools to prepare students for the UoD. 5. Improving the quality of the current UoD admissions process.	1. An outdated form of admission procedure that does not match the preferences of Generation Z. 2. Low level of candidates' knowledge of secondary school content in key subjects. 3. The declining interest of Generation Z in long-term career commitments. 4. Higher attractiveness of the private sector for applicants. 5. Reduced interest in military fields due to the geopolitical situation.

The final form of the SWOT analysis presented in Tab. 1 was developed through a systematic process of expert evaluation. In order to determine the relative importance of the listed strengths and weaknesses (S&W), it was necessary to assign rankings and weights to the individual criteria. This was done using the pairwise comparison method, as illustrated in Fuller's triangle (see Tab. 2).

The assessment was conducted by a team of authors in collaboration with 17 experts from the CAF air traffic controller cohort. The group comprised active ATC personnel with a minimum of 10 years' experience in military TWR and APP/DEP operations at military airports, as well as former and current personnel with the Control and Reporting Centre (CRC) experience and ATC personnel from the Air Force Command of the Czech Army.

The evaluation process entailed individual interviews with all experts, during which key aspects of the selection process and requirements for future air traffic controllers were discussed. Subsequently, the experts were requested to assign a ranking to the criteria by means of a pairwise comparison method. This method, based on a sequential comparison of each criterion against the others in order of relative importance, facilitated a systematic evaluation of the various factors involved in the selection process.

Subsequently, the order of importance of S&W was determined according to the calculated weights. In this scoring system, the preferred criteria are assigned a value

of 1 point, whereas in the case of equal preference, both criteria in a pair are assigned a value of 0.5 points. This is how each of the experts interviewed scored.

The number of comparisons is determined by the following relationship:

$$N = \binom{k}{2} = \frac{k!}{2!(k-2)!} = \frac{k(k-1)}{2} \quad (1)$$

N – the total number of comparisons,
k – the number of criteria.

The final weight v_i for the i-th criterion is defined by the formula:

$$v_i = \frac{n_i}{\sum_{i=1}^{k} n_i} = \frac{n_i}{N} \quad (2)$$

n_i – the number of preference points for the criterion.

The resulting S&W rankings are in Tab. 2.

Tab. 2 Pairwise comparison of criteria using Fuller's triangle

	Criteria (*k*)	**Number of rings (points *ni*)**	**Weight (*vi*)**	**Ranking**
Strengths	(1) (1) (1) 1 2 (3) 4 (5)	2.5	0.25	**S3**
	(2) (2) (2) 3 4 5	3.0	0.30	**S1**
	(3) 3 4 (5)	1.5	0.15	**S4**
	4	0	0.00	**S5**
	(5)	3.0	0.30	**S1**
	Criteria (*k*)	**Number of rings (points *ni*)**	**Weight (*vi*)**	**Ranking**
Weaknesses	1 (1) (1) (1) (2) 3 4 5	3.0	0.30	**W2**
	(2) (2) (2) 3 4 5	4.0	0.40	**W1**
	(3) (3) (4) (5)	1.0	0.10	**W5**
	(4)	1.5	0.15	**W3**
	5	0.5	0.05	**W4**

To determine the order of identified Threats and Opportunities (T&O), it is necessary to assign them a certain significance. This can be determined by considering two aspects. The first is determining the attractiveness/severity of the impact of an opportunity from the external environment on the analysed area in case it is utilized. A point scale expressing five basic levels is established for evaluation (Tab. 3). The second aspect is determining the probability of occurrence of the given event, which is expressed in percentages (Tab. 4). The final evaluation score presented in Tab. 5 is calculated by multiplying two factors. For opportunities, the score is determined by multiplying the impact attractiveness rating with the probability of occurrence. Similarly,

for threats, the score is calculated by multiplying the impact severity rating with the probability of occurrence [22]. Based on the SWOT analysis, individual criteria were ranked according to their importance. The resulting ranking of criteria importance is presented in Tab. 6.

Tab. 3 Rating of Attractiveness/Threats

points	impact attractiveness/threats
1	insignificant
2	of little significance
3	significant
4	very significant
5	fundamentally significant

Tab. 4 Rating of Probability

points	probability of occurrence
1	nearly impossible (1-20 %)
2	exceptionally possible (21-40 %)
3	normally possible (41-60 %)
4	very probable (61-80 %)
5	verging on certainty (81-100 %)

Tab. 5 Resulting assessment of opportunities and threats

Opportunities	Impact attractiveness	Probability of occurrence	Level of benefit	Ranking
1.	5	3	15	**O3**
2.	5	4	20	**O2**
3.	4	3	12	**O4**
4.	4	2	8	**O5**
5.	5	5	25	**O1**
Threats	**Impact threats**	**Probability of occurrence**	**Level of benefit**	**Ranking**
1.	5	4	20	**T1**
2.	3	3	9	**T4**
3.	3	4	12	**T3**
4.	4	2	8	**T5**
5.	4	4	16	**T2**

3 Results

In order to identify an appropriate strategy for future use in the admission process, the relationships between individual criteria were subjected to further analysis in the form of SO strategies (strengths – opportunities), WO strategies (weaknesses – opportunities), ST strategies (strengths – threats), and WT strategies (weaknesses – threats) links.

The SO strategy was devised with the objective of leveraging the strengths of the admission process to derive the greatest benefit from the identified opportunities.

It is recommended that the historically proven candidate selection system (S1) be expanded with the incorporation of simulation exercises (O2) and its simple processing (S1). This will further improve the quality of UoD's admission process (O1), enabling the institution to attract a wider spectrum of candidates (O3).

Tab. 6 Resulting ranking of criteria importance

	Strengths
S1:	A historically proven system for selecting candidates.
S1:	Easy processing and evaluation of results.
S3:	Testing the prerequisites for successful college study.
S4:	Similarity of admission procedure with other civil universities.
S5:	Similarity of the admission procedure with other UoD disciplines.
	Weaknesses
W1:	Lack of verification of the required psychomotor skills for the expertise of the Control Room.
W2:	Not using modern (simulation) technologies.
W3:	Low generational motivation of applicants.
W4:	Poor physical fitness of applicants.
W5:	Lower interest in technically oriented fields.
	Opportunities
O1:	Improving the quality of the current UoD admissions process.
O2:	Extension of the existing state of the art with simulation technologies.
O3:	Attracting a wider range of applicants.
O4:	Higher promotion of ATC specialization.
O5:	Cooperation with secondary schools to prepare students for the UoD.
	Threats
T1:	An outdated form of admission procedure that does not match the preferences of Generation Z.
T2:	Reduced interest in military fields due to the geopolitical situation.
T3:	Declining interest of Generation Z in long-term career commitments.
T4:	Low level of candidates' knowledge of secondary school content in key subjects.
T5:	Higher attractiveness of the private sector for applicants.

The WO strategy was devised to address the identified weaknesses of the admission process, with the aim of leveraging available opportunities.

The current admission process should be expanded with modern simulation technologies (W2, O2) to verify the psychomotor abilities needed for ATC (W1). This will allow for a more comprehensive evaluation of candidates (O1) and increase the attractiveness of the process for applicants (O3, O4).

The ST strategy sought to utilise the strengths of the admission process in order to mitigate the potential risks posed by external factors.

The candidate selection system and result processing, which have a proven historical track record, must be modernised to adapt the admission process to the preferences of Generation Z (T1, T2, T3).

The WT strategy seeks to mitigate the impact of external threats on the admission process, addressing the inherent weaknesses of the current system.

The current admission process should be modernised by implementing simulation technologies (T1, W2) to verify the psychomotor abilities needed for ATC (W1), thereby adapting it to Generation Z preferences (T2, T3).

The admission process demonstrates several notable strengths, primarily a historically validated candidate selection system, straightforward result processing, and assessment of prerequisites for successful university study. The admission process is

also marred by several shortcomings. These include the absence of verification of psychomotor abilities for ATC specialisation, the non-use of modern simulation technologies, and the low generational motivation of applicants. The opportunities for improvement lie in enhancing the quality of the admission process, expanding it with the use of simulation technologies, and fostering collaboration with secondary schools. The main threats to the continued viability of the admission process are the outdated nature of the process in relation to the preferences of Generation Z [5], the reduction in interest in military fields, and competition from the private sector.

The analysis of the relationships between individual factors has led to the identification of three key strategies. These focus on the utilisation of strengths to capitalize on opportunities, the overcoming of weaknesses through the creation of new possibilities, and the leveraging of advantages to mitigate threats. The principal recommendations are as follows:

- The modernisation of the admission process is to be achieved while maintaining the proven elements that have been established thus far.
- The implementation of simulation technologies is to be employed for the purpose of verifying specific abilities.
- The promotion of military fields and ATC specialisation is to be strengthened.
- The objective is to enhance collaboration with secondary educational institutions.

The objective of these strategies is to enhance the appeal of pursuing studies at UoD for prospective applicants, refine the calibre of the selection process, and equip the institution with the capacity to navigate future challenges in recruiting and educating military professionals.

It can be stated that the current admission process has the potential for significant improvement, which should result in a more effective selection of candidates and a strengthening of UoD's position. The optimal solution is to integrate an air traffic controller simulator exercise into the existing admission process, which will assess the psychomotor abilities of applicants.

4 Discussion and Conclusions

The aim of this study was to analyse and improve the admission process for ATC students at the UoD in the Czech Republic. The main objective was to identify the strengths and weaknesses of the current system, explore opportunities for improvement and develop strategies to mitigate potential threats.

The results of the SWOT analysis revealed several key findings, namely that the current admission procedure has strengths in the historically proven selection system and easy processing of results, but also significant weaknesses, in particular insufficient verification of specific psychomotor skills required for ATC and the lack of use of modern simulation technologies. At the same time, the performed analysis highlighted opportunities for improvement, especially in the area of the quality of the admission process, e.g. through the implementation of simulation technologies. As the main threats, the analysis identified the obsolescence of the admission process in relation to the preferences of generation Z and, at the same time, the reduced interest of this generation in serving in the army and thus in studying at the University of Defence.

Interpretation of these findings suggests that the current system, while having a solid foundation, does not adequately assess critical skills specific to ATC expertise.

The lack of simulation-based testing significantly limits the ability to predict potential candidate performance in real-world ATC scenarios, which can lead to suboptimal candidate selection.

The conclusions of the SWOT analysis results are consistent with broader trends in ATC selection processes around the world. For example, the EUROCONTROL guidelines [23] emphasise the importance of using a variety of selection methods, including simulation exercises, to assess the capabilities and skills of candidates. The recommendation arising from the results of our SWOT analysis to incorporate simulation techniques into the recruitment process is in line with these international best practices.

This study differs from previous research in that it focuses on the initial selection process rather than on on-the-job performance or coping with occupational difficulties. For example, Pilmann et al. [24] examined the effect of stress and psychological strain on ATC performance and reliability. Although valuable, these studies are less applicable to candidate selection because these skills are not yet developed in applicants. These skills cannot be tested for specialty selection purposes because applicants do not have them at that time.

Another related study by Hsu et al. [25] monitored the physiological parameters of subjects under psychological stress. Of course, for admission purposes, the measurement and monitoring of physiological parameters can be included, but it would be necessary to exclude the influence of innate predispositions that could negatively affect the results.

Our findings on the need for more comprehensive assessments of candidates are consistent with the results of a study using the Human Factors Analysis and Classification System (HFACS) to analyse errors made by aviation supervisors [26], which highlighted the need for greater attention to the development of more comprehensive assessments at all levels.

The main limitations of the presented SWOT analysis are as follows:

- Despite its comprehensive nature, the analysis is based on the expert observation of a limited sample of specialists (military air traffic controllers), which may not be sufficiently indicative.
- It is not yet possible to verify the results presented in practice.

Based on the results of the SWOT analysis, we propose the following measures to eliminate the weaknesses of the current admission procedure:

- It is recommended that the admission procedure be amended to include an assessment of ATC-specific psychomotor skills using simulation technologies.
- Furthermore, the admission procedure should be adapted to better suit the preferences of Generation Z, who have different expectations regarding the use of information technology and interactive elements.
- It would be beneficial to enhance collaboration with secondary school with the objective of fostering early motivation among prospective candidates.
- It would be beneficial to implement a more extensive promotional strategy for the army.

Future research in this area should focus on practical testing of the implications of the proposed measures in order to quantify their impact on candidate selection and subsequently their performance in ATCO training and operations. Long-term studies tracking the success rate of candidates selected through the improved process could yield valuable insights into the long-term effectiveness of these changes.

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