

## NOVA LEGISLATIVA – „LJUDSKO DJELOVANJE“ ZA REGULATORNE OBRADU, CJELOŽIVOTNO OSPOSOBLJAVANJE I STRUČNO USAVRŠAVANJE

### *NEW LEGISLATION – „HUMAN PERFORMANCE“ FOR REGULATORS, LIFELONG EDUCATION AND PROFESSIONAL TRAINING*

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#### SAŽETAK

Na Elektrotehničkom odjelu Tehničkog veleučilišta u Zagrebu, uz kolegij "Inteligentni sustavi", provode se istraživanja iz područja specijalističkih održavanja i osposobljavanja. Podloga zadnjih razrada i unapređenja programa cjeloživotnog obrazovanja i stručnog usavršavanja, je legislativa koja ističe važnost ljudskih faktora i ljudskog djelovanja uz dominaciju inteligentnih tehnologija, (ICAO Doc 10151). Detaljnijom analizom mogućnosti inteligentnih tehnologija i ljudskog postupanja potvrđena je akceleracija procesa digitalne transformacije. U početku je to bio sustav unapređenja vladanja informacijom i brzinom komunikacije, a razvoj i mogućnosti interaktivnosti nametnule su integraciju i ovisnost ljudi o tehnologijama. Razina inteligentnog ljudskog djelovanja i svijesti proces je demistifikacije i transformacije ljudskih faktora. U radu je prezentirano područje istraživanja koje upućuje na model razvoja svijesti kronološki, povijesno i evolucijski koje je povezano sa stanjem kognicije, odnosno stanjem razvijenosti uma povezanog s razvojem i ostvarenjem tehnike kroz industrijske revolucije. Ekstremno brze promjene u razvoju i korištenju tehnologija, kako na individualnoj tako i na društvenoj razini pokrenuti proces digitalne transformacije mora biti povezan uz proklamiranu legislativu. Na temelju provedenih istraživanja zaključuje se kako digitalizacija mora biti provedena kao digitalna i kognitivna transformacija a što se provod novim modelima cjeloživotnog obrazovanja i stručnog usavršavanja.

*Ključne riječi: ljudski, faktori, djelovanje, održavanje, osposobljavanje, obuka, ovlašteni inženjeri*

#### ABSTRACT

At the Electrical Engineering Department (ELO) of the Zagreb University of Applied Sciences (TVZ), in addition to the course "Intelligent Systems", research is carried out in the field of specialist maintenance and training. The basis for the latest developments and improvement of lifelong education and professional development programs is legislation that emphasizes the importance of human factors and human action with the dominance of intelligent technology, (ICAO Doc 10151) A more detailed analysis of the possibilities of intelligent technologies and human behaviour confirmed the acceleration of the digital transformation process. Initially, it was a system to improve the control of information and the speed of communication, and the development and possibilities of interactivity forced the integration and dependence of people on technologies. The level of intelligent human action and consciousness is a process of demystification and transformation of human factors. The paper presents an area of research that refers to the model of the development of consciousness chronologically, historically and evolutionarily, which is connected with the state of cognition, that is, the state of development of the mind connected with the development and realization of technology through industrial revolutions. Extremely fast changes in the development and use of technologies, both at

the individual and at the social level, the digital transformation process must be connected with the proclaimed legislation. On the basis of the conducted research, it is concluded that digitization must be implemented as a digital and cognitive transformation, which is implemented with new models of lifelong education and professional development.

**Keywords:** *human factors, performance, education, training, authorized engineers*

## 1. UVOD

### 1. INTRODUCTION

Thanks to the availability of new intelligent technologies and the availability of new knowledge, people are able to recognise, learn and use their brain differently. Comprehension, interpretation and description of phenomena by different disciplines of natural sciences and humanities is possible by cognitive determination of boundaries for insight and recognition of possibilities as well as problems. Individuals in their social and work environment must not become a control over themselves just as they must not become a ruler over others. The application of technique and technology increasingly contributes to well-being and safety, which is specified through the legislative requirements of human factors and human performance (*Human Factors* - HF, *Human Performance* - HP). In the field of air traffic safety, this is evident through the terms *Safety & Security*, [1-3]. The introduction of new legislation is carried out on three levels: 1. "Shall" - a requirement that is mandatory or necessary, 2. "Should" - means a recommended requirement and 3. "May" - means a request that is optional but allowed. In the context of HP, in an increasing number of cases, due to higher technique and technology efficiency, it results in the exemption of people, so the "should" level is increasingly implemented through "must", [4-5]. An example of this are the cooperative, (multilateral) systems which in certain circumstances raise the question of responsibility for which it is important to ensure: - a) a high level of training of the involved professional staff and b) a high level of reliability of technical systems. All of these are the basis for changes in all forms of education, training and professional development.

## 2. LJUDSKI FAKTORI I LJUDSKO DJELOVANJE – LEGISLATIVA I PRAKSA

### 2. HUMAN FACTORS & HUMAN PERFORMANCE – LEGISLATION & PRACTICE

The proven improvement of legislation in addition to safety requirements rests on industry experiences through research, production and user feedback. The significance in the application of legislation has been confirmed through continuous research conducted at ELO - TVZ, [6-8]. The research results contributed to the implementation and improvement of specialist training programs, the design and implementation of numerous expert reports, the rationalization and optimization of maintenance at airports, [9-13]. Through research activities, a chronological review was made from the first appearance of the "term" HP in aviation, through the development of HF components, to the latest regulatory announcements, [14], (Table 1).

**Tablica 1** *Kronološki pregled od prvog pojavljivanja „termina“ human performance in aviation*

**Table 1** *Chronological overview since the first appearance of the "term" human performance in aviation*

Year	Subject	Description
1783	„Mongolfier“	The first hot air balloon flight , (3000 feet, 25 min). HP - mentioned for the first time in aviation
1907	Frank B. Gilbreth & Lillian E. Moller	Procedures - Critical Evaluations in Business and Management, (the book - first ed. 2003)
1931	Heinrich, Herbert William	Industrial Accident Prevention, A Scientific Approach
1972	Edward Edwards	Man and Machine: Systems for Safety. Proceedings of British Pilots, (sheLL)
1975	Frank Hawkins	KLM (Royal Dutch Airlines) The acronym SHELL

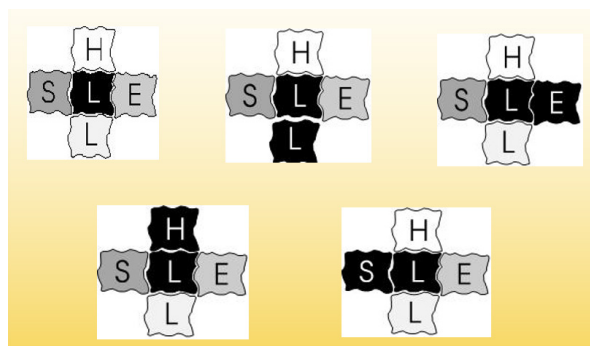
1987	Boff, Kaufman, & Thomas	Handbook of Perception and Human Performance
1996	FAA	FAA Human Factors Design Guide
1998	ICAO - Doc 9683	Human Factors Training Manual
2004	ICAO- Doc 7192-	Air Traffic Safety Electronic Personnel, Part E-2, AN/857
2007	James Stranks	Human Factors and Behavioural Safety
2010	ICAO - Technical Report	"Demystify" the relationship between Human Performance and Human Factors
2011	ICAO - Doc 96832 AN/857 – Chap.14	Human Factors, Workshop Bangkok – Thailand, 25-29 VII 2011
2015	EUROCONTROL-FAA	A Human Performance Standard of Excellence - Action Plan 15 White Paper
2021	ICAO - Doc 10151	Manual on Human Performance (HP) for Regulatory Bodies
2022	ISO-NE PUBLIC	Human Performance Improvement
2023	ICAO – Workshop Mexico	Application of the principles of Human Performance (HP), Raúl A. Martínez Díaz
2024	Balaž, Milošević, Sindik	AEROING & AP Montenegro – Workshop Human Performance, Maintenance and Training at Airports

The obtained results, through analytical and mathematical processing and comparison, confirm that the foundations of specialist training and implementation of maintenance for airport systems and equipment have evolved through *Human Factors* → *Human Performance*. The confirmation is many times over in favour of the used Promethee method for multi-criteria analysis for decision-making [15]. The proclaimed legislation confirmed the structure of specialist training in the field of air navigation safety, which finds its application in all spheres (Figure 1).



Slika 1 ICAO- ATSEP osposobljavanja, [11]

In the very beginning, the understanding of HP through HF, (human factors) is based on observing the abilities and limitations of people with regard to their own functioning, but also with regard to their environment. In the context of HP activities, the role of the organization itself is included. This is how the first ICAO was created, the SHELL-Model, which places the human at the centre of every organizational structure. Each individual, with their own abilities and limitations, develops by recognizing their internal factors and environment (external factors), and vertical (upstream) organizational structure, S=Software; H= Hardware; E = Environment; L<sup>2</sup>= Liveware, (HUMAN), [16], (Figure 2).



Slika 2 ICAO-Human Factors SHELL-Model, [16]

The models process and take into account all HF, everything that is characteristic of a person, including their emotional and mental states (Figure 3).



*Slika 3 Ljudski faktori za proces ljudskog djelovanja u socio-tehničkim sustavima [3]*

*Figure 3 Human factors for the process of human action in socio-technical systems [3]*

In the evaluation of HF, which are viewed as parameters, HP is observed as a process and in that area the principles of human action are recognized as potentials for application to all areas.

Interactions between people, with all elements of the environment affect either positively or negatively the human performance of the socio-technical system. By learning and behaving within the constructs of the culture in which a person exists and lives, group and organizational culture provide a context in which to work together.

Back in the middle of the last century, Winer established the theory of cybernetics for all areas (techniques, technologies, economics, etc.) and all environments (social, political, scientific) [17-18]. At today's stage of technological development, a human being can be aware of the environment, however, information and communication technologies can have a usable quasi-awareness of changes in reality through the recognition of changes in patterns of knowledge use that is already being created on the basis of databases. Through this, it is possible to offer a user new functionalities or new knowledge needed to solve the challenges presented by the new reality, through repeating the process.

### 3. NAČELA LJUDSKOG DJELOVANJA ZA CJELOŽIVOTNO OBRAZOVANJE

#### 3. HUMAN PERFORMANCE PRINCIPLES FOR LIFELONG EDUCATION

According to [14], there are five principles of human actions, namely:

1. People's performance shaped by their abilities
2. Human interpretation of different situations in which they behave in a certain sensible way
3. Adapting to the requirements of a complex and dynamic environment
4. Risk assessment and compromise
5. Interaction with other people, technology and environment

Awareness of HP principles helps to solve the problem through the set standards of human performance excellence (*Human Performance Standard of Excellence* - HPSoE) [16]. The elements, or standards, are:

1. Policy, strategy, resources - degree of recognition of the importance of people by establishing a strategy for actively measuring and monitoring their effectiveness.
2. Health and well-being at work - ensuring the mental and physical health and well-being of staff to improve the effectiveness of people and systems.
3. Equipment and means of support - operability of the environment including equipment, means of support (software and hardware), and encouragement for optimal engagement for work.
4. Operational procedures - optimization of operational procedures (e.g., maintenance procedures), by valorising completed work tasks and involving end users.
5. Teamwork and communication - encouraging communication, performance and common awareness of the situation when working together and through the system interface.
6. Training operativeness - ensuring training for the acquisition of necessary skills, knowledge and competences, (implies successful completion of

training and continuous training for renewal of knowledge required for renewal of licenses and certificates).

7. Selection of the best candidates to be hired - through the selection process of capability tests, interviews and selection for professional performance.
8. Impact of change - to ensure the identification, assessment and management of the impact of change on human action.
9. Leadership - continuously improve human performance throughout the organization by providing support with the aim of justifying purpose, direction and motivation.
10. Roles and responsibilities - by clearly defining them in order to maintain high efficiency throughout the organization.
11. Research and learning - by identifying strengths and weaknesses related to aspects of human action arising from events and sharing and implementing lessons learned among colleagues.
12. Ensuring human efficiency - by integrating and applying methods and processes of human action suitable for the purpose and aimed at reducing risk. By optimizing the performance of human action, business advantages are realized.

Development changes and use of technologies are present at both the individual and societal level. The process of digital transformation can be recognized through the aforementioned performances, which are not yet sufficiently represented in the new legislation. Through the conducted research, it is concluded that digital and cognitive transformation must encompass the degree of recognition of the importance of people by establishing a strategy for actively measuring and monitoring their effectiveness through established policies and strategies and with available resources. In order to select the best personnel to appear on the labour market, selection procedures will no longer be necessary, but from the created database of available professional profiles, applied professionalism will be profiled, confirmed by a license that is obtained through continuous lifelong education and specialist and professional training.

### 3.1. CJELOŽIVOTNO OBRAZOVANJE I SPECIJALISTIČKO USAVRŠAVANJE TVZ

#### 3.1. *LIFELONG EDUCATION AND PROFESSIONAL TRAINING AT TVZ*

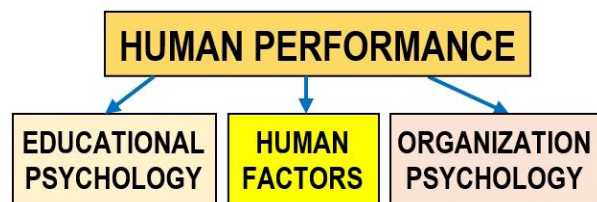
Confirmed examples of lifelong education, professional and specialist training carried out at TVZ are their references with which they use and improve their new programs.

**1. Example** of good references of lifelong education and specialist training carried out at TVZ are AEROING's programs for airport maintenance specialists started in 2011. As the only non-airport institution with the approval of the Croatian Aviation Safety Agency - CCAA, the programs have been improved from the very beginning, and have included the HF and HP components with consideration of the parameters obtained from the user's confirmation:

- a) Error management (including prevention, detection and correction) - such as human error in data entry and the way in which the system or equipment are designed to 'capture' errors;
- b) Task performance - such as the time to complete the task(s), the procedures required to complete the task;
- c) Workload - such as the amount or intensity of effort involved in the task and the order of the task, or overlap with other tasks;
- d) Learning ability and usability - such as the degree to which learning to use and operate the equipment can be done effectively and efficiently;
- e) Complexity - such as the number and/or nature of interconnected/interactive components;
- f) Context – such as the specific operational context and conditions of use;
- g) Situational awareness - such as the operator's awareness of the current and future state of the system and the performance expected of the equipment and the operator in different using conditions;
- h) Maintainability - such as the degree to which the design allows for ease of maintenance and servicing And
- i) Aspects of incident avoidance.

The organisational component being taken into

account along with the psychology of the learning process, the belief is confirmed that human factors and organizational factors are components of human behaviour (Figure 4).



*Slika 4 Ljudski i organizacijski čimbenici u edukacijskim procesima – ljudsko djelovanje [3]*

*Figure 4 Human and organizational factors in educational processes - human action [3]*

**2. Example**, promoted and accepted, and related to the digitization process within the educational sector is in the areas of big data and complex networks management and analysis, where the role of educators of a new profile engaged in educational programs and established inter-university collaborations comes to the fore (Zagreb - Offenburg) [19-20]. It's about the acronym *PraKMEZ*, which represents the educator of the future who is akin to ethical guardians and a creator of the learning experience. The most effective incentive to better develop research habits and formulate deeper questions with evaluation of possible answers is personalized and contextualized learning. The meaning of this acronym is: **K**-curator, **Z**-scientist, **E**-expert. Guardian of the teaching tradition, evaluator and authoritative source of information and empirical knowledge, as a **M**-mentor or **P**ractitioner, they will refine knowledge with verified information from verified databases. As such, it helps mastering and acquiring the skills of searching and providing knowledge. Although seemingly absurd, an effective counter-intuitive way of understanding has been confirmed, which is challenging for everyone and at the same time fulfils the imperative of formulating assessments before content. With the corresponding understanding that is fulfilled in time, the process is no longer the acquisition of knowledge but ends with a cognitive synthesis anchored in the expertise of the conclusions.

**3. Example** (initiated by the Erasmus+ cooperation) is a concept that processes and uses large databases (*Big Data - BD*) in the context of the *Internet of Things (IoT)*. With

the operationalization of the language model (*Generative Pretrained Transformer - GPT*) which is represented by artificial intelligence, ChatGPT OpenAI, (*Artificial Intelligence - AI*) which it actually isn't [21], the user is a creator and a searcher for potential knowledge. Learning enhancement is exactly what HP relies on. With the supervision of learning and refinement of feedback information, refined progress and development is enabled for the user, but also for the educator (transmitted in the sense of classical knowledge acquisition). Progress in learning was achieved primarily with the help of HP based on feedback (*Reinforcement Learning from Human Feedback - RLHF*). With an HP-enabled approach, learning is monitored and supported, in which responses are classified and ranked through training that the first model generates for correspondence. Classification and ranking are achieved by another model, the so-called awards, (*Award Model - AM*). In the iterative optimization process, (*Proximal Policy Optimization -PPO*), HP remains in the centre as in the Shell's model. This area, in which the importance of HP has already been confirmed, is an important segment in digitization, which must implement a structure as a decentralized secure chain database (*blockchain*) within the scope of best practice. This topic, included in the TVZ courses, is also transferred to lifelong education and professional and specialist training. The acquisition, extension and renewal of licenses (Certificate of Competence) must come under the jurisdiction of regulatory provisions and include the guarantee of digital certificates and digitization of identity [22]. This area is the subject of new researches carried out at the ELO TVZ, which is connected with distinguishing the role of individual HR ministries and the chambers of authorized engineers themselves and comparing them with good examples of EU practice.

### 3.2. STRUČNO USAVRŠAVANJE OVLAŠTENIH INŽENJERA U HR

#### 3.2. PROFESSIONAL TRAINING OF AUTHORIZED ENGINEERS IN CROATIA

According to the Regulations of the competent ministry on the professional training of persons

who perform spatial planning and construction work, [23] the following are prescribed and defined:

- a) holders of professional training programs, namely the Croatian Chamber of Architects, [24] the Croatian Chamber of Civil Engineers, [25] the Croatian Chamber of Electrical Engineers, [26] and the Croatian Chamber of Mechanical Engineers, [27] and other professional organizations, universities, polytechnics and other legal entities (who receive the approval of the Ministry for the professional development program according to the provisions of the Ordinance),
- b) persons subject to professional training, i.e., persons who, after passing a professional exam, are obliged, in accordance with the law regulating the jobs and activities of spatial planning and construction, to complete and improve their knowledge for performing spatial planning and construction tasks and
- c) professional training programs for learning through which the subject of professional training improves and acquires new knowledge, skills and competences by attending trainings for which approvals of the competent ministry have been obtained.

The Regulations prescribe the conditions and method of conducting and monitoring professional development, which includes various forms of education in order to acquire and improve professional knowledge, in particular:

- by attending lifelong learning programs organized by universities and polytechnics,
- by attending professional training programs of the holder of the professional training program,
- active and passive participation in the work of expert and expert-scientific gatherings, round tables, workshops, etc.

Attendees of professional training are recognized for participating in the work of a professional or professional-scientific meeting in the same number of school hours as the total duration of lectures, round tables, or workshops as part of that meeting.

In addition to the Carrier of the professional training program, for which the consent of the Ministry is obtained for a two-year period, professional training can also be carried out by other Organizers (who are not carriers). With the

prior approval of the Ministry, other expert and/or expert-scientific gatherings can be organized.

An attendee of a professional training is credited for attending a professional or a professional-scientific meeting in the same number of school hours as the total duration of lectures, round tables, or workshops, etc. In the two-year period of professional training, a minimum of twenty school hours of lectures must be achieved, of which ten school hours refer to technical regulations, and ten to the professional field.

#### **4. PROCJENA STRUČNOG USAVRŠAVANJA**

#### **4. ASSESSMENT OF PROFESSIONAL DEVELOPMENT**

##### **4.1. PITANJE VREDNOVANJA RAZLIČITIH OBLIKA EDUKACIJA OVLAŠTENIH INŽENJERA**

##### **4.1. THE QUESTION OF EVALUATION OF DIFFERENT FORMS OF AUTHORIZED ENGINEERS TRAINING**

All regulations, ministries and the Chamber of Certified Engineers [23-27] confirm that professional development is achieved by: "*active and passive participation in the work of professional and professional-scientific conferences, round tables, workshops, etc.*". The manner in which it is evaluated was prescribed by the previous regulations with its Annex, (Table of point values for the categories of knowledge improvement and enhancement) which was omitted in the "new" Regulations, (?). Based on the analysis carried out and considering what was explained in the previous chapter, it is proposed to use the amended table, which is forwarded to the Ministry for approval along with the initiative for a workshop on that topic. There is no doubt that every certified engineer, in addition to their professional activity in the framework of business and employment, and in academic and scientific engagement, is professionally improving themselves. In addition to the question of the value of the categories of knowledge improvement and enhancement (evaluation score), there is also the question of

evaluating the content of the training in terms of recognizing the professional and regulatory share. That part of the problem was dealt with using scientific and practical methods, Table 2.

**Tablica 2** *Praktične i znanstvene metode u obradi vrijednosti kategorija unapređivanja i usavršavanja znanja*

**Table 2** *Practical and scientific methods in processing the value of the categories of improving and perfecting knowledge*

Item No.	Method	Objective
1Z	ANALYSIS	breakdown of more complex terms
2Z	COMPILATIONS	of knowledge and conclusion about attitudes and observations
3Z	DESCRIPTIONS	description of established facts
4Z	SYNTHESIS	Connecting simple judgments into more complex ones
5P	INTERVIEW	determination for a specific purpose and goals
6P	PROCESSES - MOKSA	classification of analysis and synthesis for induction, specialization, abstraction and deduction

#### 4.2. PRIJEDLOG I EVALUACIJA RAZLIČITIH OBLIKA EDUKACIJE I SADRŽAJA EDUKACIJSKIH MATERIJALA

#### 4.2. PROPOSAL AND EVALUATION PROCEDURES OF DIFFERENT EDUCATION FORMS AND EDUCATIONAL MATERIALS CONTENT

The scientific and empirical approach in the implementation of research at ELO TVZ, repeatedly confirmed by the application of the Promethee method, [15] resulted in the following conclusion:

- The first level and the basic procedure for determining the content of a training under the title of recognition of the professional and regulatory share is confirmed by the heuristic

action of the reviewer who examines the material,

- The second level in the determination process, apart from the content of the training from the viewpoint of recognition of professional and regulatory participation, (it is applied and is common for determining the content of professional papers and other professional and scientific publications) is used as a program tool "Turnitin"
- The third level for confirmation of professional and regulatory share is a tabular application calculator that includes weighting factors, which has been proven to be an excellent design tool.

TVZ has the resources for all three levels and is continuously proving itself and improving. For the first level, there is an expert and professional teaching staff and a "pool" of reviewers from Polytechnic & Design magazine, which is being prepared for "Scopus" status.

For the second level and from this academic year, TVZ as a public higher education institution can use Turnitin software under a license that enables an unlimited number of checks in line with the procedures and needs of the higher education institution. The mentioned tool is just one example from which it is clear that the used regulatory material is recognized. This is the basis of the originally developed PETAP tool and the MOKSA method, which were confirmed through the Tabular application calculator applied in specialist calculations and programs of numerous projects as well as within the Intelligent Systems course at ELO TVZ [28-29]. Examples of the processing of the content of educational materials have been prepared and proposed for presentation at the planned Workshop upon the approval of the Ministry in cooperation with the Chambers of Certified Engineers.

#### 4.3. PROJEKTI KAO REPREZENTATIVNI RESURS OVLAŠTENIH INŽENJERA – NOVI IZAZOVI

#### 4.3. PROJECTS AS A REPRESENTATIVE RESOURCE OF CERTIFIED ENGINEERS - NEW CHALLENGES

The presented issues, through the conducted analyses, indicate how certified engineers integrate the issue of HP - education and human-

centred design (*Human Centred Design - HCD*) with the challenges in their work. User-centred design is an approach that primarily emphasizes how HP in the sense of production (design): systems, equipment, procedures, services, etc. Such approach to the development of the design process has not yet been regulated, although its usefulness and usability are undeniable. The simply established practice of applying intelligent technological aids supports professionalism, which is achieved through: a) *Stakeholder Requirements Specification - StRS*), b) New processes of engineering design, so-called. UX Project, (*User eXperience - UX*), and c) Concept of Operations described by the characteristics of the system from the user's point of view, (*Concept of Operations - ConOps/ CONOPs/CONOPS*).

This is only a small part of the challenges that are set before certified engineers and are parameters for regulators in planning and supporting the implementation of new technologies and managing changes. The International Organization for Standardization (ISO) describes the HCD approach with the following characteristics:

- a) Design is based on an explicit understanding of users, tasks and work environments (i.e., the way that HP principles are evidenced in the operational environment);
- b) Users are involved during design and development;
- c) Design is guided and refined by user-centred evaluation and the use of operational data;
- d) An iterative process based on lessons learned through multiple tests is used;
- e) The process ensures that the overall user experience is addressed under different conditions of use and
- f) The design team have multidisciplinary skills and perspectives, including individuals with relevant HP expertise.

From the point of view of establishing facts and drawing conclusions, systems thinking is an approach to looking at each system in a holistic, integrated way, rather than as isolated components or parts. Examining the connections and interactions between the elements that make up the whole system and systems thinking is especially useful in complex solutions where

small changes in one part of the system can lead to large and unexpected effects on the entire system. For these reasons, the issues dealt with more than 30 years ago coincide with the conclusions of current Case Studies confirming the strategy of further application of HP. It is concluded that HP is undoubtedly dominant for efficiency in all areas of specialist activities, from designing to introducing new technologies and acquiring knowledge. Confirmation is key performance indicators (*Key Performance Indicators - KPIs*). The continuous improvement of HP, through raising the level of improvement of service provision in all processes, confirms the need for further monitoring of learning and refinement of feedback that ensures refined progress and development for both users and educators. The intended use and operationalization of the "tool" ChatGPT-OpenAI [21], will improve learning, but with the indispensable presence and supervision of the recognized HP component, as presented in the third example through the realized programs of lifelong education, and professional and specialist training at TVZ.

## 5. ZAKLJUČAK

### 5. CONCLUSION

The paper presents experiences gained through the implementation of numerous projects, published scientific papers, and empirical and heuristic models developed for the field of education and maintenance. Knowledge bases and databases of specialist education and specialist maintenance created on the basis of numerous trainings and research conducted at ELO TVZ through the course "Intelligent Systems" confirm the importance of the HP component exactly as it is emphasized by the proclaimed legislation ICAO Doc 10151 (*Human Performance for Regulatory Bodies*). The presented processing of specific examples of the application of HP in the evaluation of various forms of education of certified engineers is a confirmation of the recognized cooperation that unites strategies, procedures, systems and performances for specified application requirements. No matter how specific the applicability of certain professions or specializations, the need for certification and

the importance of HP, it is an important segment in digitization that unquestionably unites digital and cognitive transformation and manifests itself through lifelong education and professional development. Competent regulatory bodies must focus their activity in cooperation with the end user, which is the initiative of this work.

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